FINAL REPORT

ENVIRONMENTAL AND GEOLOGIC STUDIES FOR KARTCHNER CAVERNS STATE PARK

VOLUME II

APPENDICES

January 1992

Arizona State Parks

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FINAL REPORT

ENVIRONMENTAL AND GEOLOGIC STUDIES

FOR

KARTCHNER CAVERNS STATE PARK

VOLUME II

APPENDICES

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APPENDIX A

Surface Climate Data

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	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
06/01/89	89.0	54.0	71.5	-	-	-	861.3	858.5	859.9
06/02/89	89.5	54.0	71.8	-	-	-	861.3	856.8	859.1
06/03/89	84.0	54.0	69.0	-	-	-	857.8	854.0	855.9
06/04/89	88.0	56.0	72.0	-	-	-	858.4	855.3	856.9
06/05/89	89.0	58.5	73.8	-	-	-	860.5	857.7	859.1
06/06/89	90.0	55.0	72.5	-	-	-	858.8	855.2	857.0
06/07/89	94.0	58.0	76.0	-	-	-	857.6	853.5	855.6
06/08/89	87.5	59.5	73.5	-	-	-	856.1	853.4	854.8
06/09/89	88.5	55.7	72.1	-	-	-	856.5	853.2	854.9
06/10/89	88.4	60.0	74.2	-	-	-	860.1	854.9	857.5
06/11/89	91.9	57.3	74.6	-	-	-	860.9	856.9	858.9
06/12/89	90.0	58.1	74.1	-	-	-	860.5	856.4	858.5
06/13/89	91.6	60.3	75.9	-	-	-	859.3	856.0	857.7
06/14/89	97.4	63.8	80.6	-	-	-	859.4	856.6	858.0
06/15/89	96.5	67.4	82.0	-	-	-	861.1	858.1	859.6
06/16/89	97.7	69.3	83.5	-	-	-	861.2	858.0	859.6
06/17/89	98.7	72.5	85.6	-	-	-	860.4	857.2	858.8
06/18/89	104.3	68.8	86.6	-	-	-	861.2	857.0	859.1
06/19/89	103.9	73.9	88.9	-	-	-	860.1	856.0	858.1
06/20/89	98.3	71.8	85.1	-	-	-	858.9	855.2	857.1
06/21/89	99.2	73.7	86.4	-	-	-	857.0	852.6	854.8
06/22/89	94.7	69.4	82.0	-	-	-	-	-	-
06/23/89	91.9	62.2	77.0	-	-	-	-	-	-
06/24/89	102.5	67.0	84.7	-	-	-	859.3	856.8	858.1
06/25/89	93.7	61.1	77.4	-	-	-	859.9	856.2	858.1
06/26/89	93.6	63.9	78.7	-	-	-	861.1	856.0	858.6
06/27/89	91.9	65.4	78.7	-	-	-	861.2	858.2	859.7
06/28/89	95.7	66.6	81.1	-	-	-	862.2	859.6	860.9
06/29/89	97.1	64.4	80.7	-	-	-	862.0	857.9	860.0
06/30/89	-	-	-	-	-	-	860.3	855.9	858.1
07/01/89	-	-	-	-	-	-	860.2	857.0	858.6
07/02/89	-	-	-	-	-	-	860.8	859.3	860.1
07/03/89	-	-	-	-	-	-	860.3	857.0	858.7
07/04/89	100.2	77.0	88.6	-	-	-	860.3	856.4	858.4
07/05/89	100.8	70.4	85.6	51.5	16.1	33.8	863.2	856.9	860.1
07/06/89	99.6	71.9	85.7	47.2	18.8	33.0	862.7	858.2	860.5
07/07/89	98.7	68.8	83.7	40.6	15.1	27.9	865.0	860.3	862.7
07/08/89	94.0	69.1	81.6	52.8	27.0	39.9	862.3	856.9	859.6
07/09/89	89.4	62.9	76.1	93.1	34.6	63.8	860.2	855.6	857.9
07/10/89	86.3	61.5	73.9	93.2	37.7	65.5	861.2	858.0	859.6
07/11/89	85.8	61.9	73.8	93.8	42.4	68.1	861.9	860.6	861.3
07/12/89	93.4	63.9	78.7	92.7	16.3	54.5	864.0	859.5	861.8
07/13/89	98.6	66.3	82.5	63.1	15.8	39.5	861.9	856.7	859.3
07/14/89	98.9	74.2	86.6	40.3	16.7	28.5	859.9	855.9	857.9
07/15/89	92.0	71.7	81.8	85.8	32.7	59.3	863.2	859.3	861.3
07/16/89	90.3	63.9	77.1	93.3	30.5	61.9	865.9	859.3	862.6

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
07/17/89	93.9	67.0	80.5	92.6	27.4	60.0	862.8	858.6	860.7
07/18/89	99.6	67.8	83.7	93.4	18.8	56.1	-	-	-
07/19/89	96.2	65.3	80.7	93.3	24.0	58.7	-	-	-
07/20/89	95.4	65.8	80.6	92.4	21.3	56.9	-	-	-
07/21/89	94.7	65.6	80.2	93.1	24.2	58.7	861.0	855.9	858.5
07/22/89	88.3	65.9	77.1	93.6	30.3	61.9	861.9	858.1	860.0
07/23/89	86.1	66.7	76.4	93.3	39.2	66.2	861.3	860.0	860.7
07/24/89	91.4	66.3	78.9	93.4	30.2	61.8	861.2	856.0	858.6
07/25/89	86.0	66.1	76.1	93.6	30.4	62.0	861.7	857.2	859.5
07/26/89	89.2	63.5	76.3	93.8	31.0	62.4	863.1	859.0	861.1
07/27/89	86.7	65.0	75.8	93.2	32.9	63.0	862.9	859.3	861.1
07/28/89	83.3	62.1	72.7	93.3	39.2	66.2	862.0	858.5	860.3
07/29/89	83.9	66.1	75.0	93.3	42.5	67.9	861.1	857.6	859.4
07/30/89	86.8	63.1	75.0	93.6	37.4	65.5	860.9	858.4	859.7
07/31/89	85.9	66.2	76.1	93.9	37.6	65.7	860.8	857.5	859.2
08/01/89	87.4	63.5	75.5	93.2	35.0	64.1	860.3	857.5	858.9
08/02/89	86.7	64.9	75.8	93.3	34.5	63.9	860.4	857.3	858.9
08/03/89	82.2	66.3	74.2	93.3	59.3	76.3	861.4	859.2	860.3
08/04/89	80.4	64.7	72.6	-	-	-	861.3	859.4	860.4
08/05/89	84.2	64.3	74.2	-	-	-	862.6	858.1	860.4
08/06/89	86.8	62.5	74.6	-	-	-	861.7	857.3	859.5
08/07/89	86.3	66.3	76.3	90.7	34.8	62.7	861.2	856.9	859.1
08/08/89	83.1	63.5	73.3	92.5	28.2	60.4	862.1	857.9	860.0
08/09/89	88.3	62.1	75.2	92.4	18.0	55.2	861.0	856.9	859.0
08/10/89	84.5	63.9	74.2	92.7	44.4	68.5	862.2	859.9	861.1
08/11/89	87.7	61.7	74.7	92.7	34.9	63.8	861.9	858.0	860.0
08/12/89	88.9	64.9	76.9	92.7	28.6	60.7	861.8	857.6	859.7
08/13/89	93.0	66.4	79.7	92.4	25.8	59.1	859.9	855.9	857.9
08/14/89	92.4	66.5	79.4	92.1	27.3	59.7	860.7	856.5	858.6
08/15/89	92.1	63.8	77.9	91.6	22.4	57.0	860.6	855.9	858.3
08/16/89	92.6	64.5	78.5	92.4	31.5	62.0	858.9	855.7	857.3
08/17/89	88.2	67.0	77.6	99.0	37.1	68.0	859.9	856.0	858.0
08/18/89	86.9	63.0	75.0	99.2	38.6	68.9	861.3	859.3	860.3
08/19/89	87.8	64.5	76.1	98.6	37.2	67.9	861.3	857.2	859.3
08/20/89	90.0	62.9	76.4	98.7	23.8	61.3	859.7	855.9	857.8
08/21/89	89.6	64.1	76.8	96.4	27.7	62.1	859.3	856.4	857.9
08/22/89	89.8	62.6	76.2	99.0	22.1	60.5	861.0	858.0	859.5
08/23/89	90.8	63.3	77.0	85.5	22.5	54.0	860.5	856.7	858.6
08/24/89	89.8	62.1	76.0	74.4	16.4	45.4	858.1	854.5	856.3
08/25/89	89.7	61.4	75.5	42.7	15.4	29.0	857.8	854.8	856.3
08/26/89	90.0	60.8	75.4	89.7	27.2	58.5	859.7	856.6	858.2
08/27/89	90.5	58.4	74.4	99.3	21.1	60.2	860.4	856.8	858.6
08/28/89	91.2	66.2	78.7	59.6	22.4	41.0	861.0	857.0	859.0
08/29/89	89.5	66.2	77.8	72.9	35.0	53.9	859.7	856.4	858.1
08/30/89	85.7	64.2	74.9	98.8	31.9	65.3	859.1	854.9	857.0
08/31/89	89.9	60.0	75.0	99.7	22.9	61.3	859.4	855.4	857.4

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
09/01/89	94.3	64.3	79.3	86.0	20.5	53.2	861.0	856.9	859.0
09/02/89	87.7	67.4	77.6	99.2	32.5	65.8	862.4	859.4	860.9
09/03/89	88.7	65.5	77.1	99.5	37.9	68.7	861.4	859.9	860.7
09/04/89	89.8	61.3	75.6	99.0	30.4	64.7	860.9	857.7	859.3
09/05/89	92.8	66.2	79.5	69.0	28.3	48.6	861.2	857.5	859.4
09/06/89	89.4	70.0	79.7	77.7	36.6	57.2	860.3	856.9	858.6
09/07/89	88.8	66.5	77.6	73.2	37.8	55.5	859.1	856.1	857.6
09/08/89	90.4	68.9	79.6	53.4	21.8	37.6	858.9	855.9	857.4
09/09/89	89.8	59.5	74.6	42.3	15.4	28.8	859.7	856.4	858.1
09/10/89	89.2	58.6	73.9	47.4	20.7	34.0	858.9	855.9	857.4
09/11/89	88.8	59.0	73.9	58.5	19.4	39.0	858.4	854.7	856.6
09/12/89	86.7	65.8	76.2	98.4	39.7	69.1	859.9	855.3	857.6
09/13/89	83.4	63.3	73.3	98.9	23.7	61.3	861.6	857.9	859.8
09/14/89	85.4	60.6	73.0	65.3	11.4	38.4	861.6	858.5	860.1
09/15/89	88.2	59.5	73.8	92.9	16.5	54.7	861.9	857.7	859.8
09/16/89	89.4	58.3	73.8	42.1	15.8	29.0	859.6	855.5	857.6
09/17/89	88.2	65.2	76.7	66.6	27.6	47.1	857.8	854.4	856.1
09/18/89	87.7	65.1	76.4	84.5	18.4	51.5	857.4	853.4	855.4
09/19/89	87.6	60.7	74.1	66.3	33.3	49.8	856.2	852.5	854.4
09/20/89	88.4	52.7	70.6	91.5	11.5	51.5	857.8	854.8	856.3
09/21/89	93.3	55.0	74.1	40.4	9.1	24.7	857.8	854.1	856.0
09/22/89	93.9	65.5	79.7	97.8	19.7	58.8	861.8	856.2	859.0
09/23/89	83.1	62.2	72.6	80.9	27.2	54.1	865.8	860.5	863.2
09/24/89	88.1	57.6	72.8	60.4	18.4	39.4	862.2	857.9	860.1
09/25/89	91.6	63.7	77.6	41.1	15.3	28.2	861.7	858.7	860.2
09/26/89	86.7	60.6	73.6	38.7	17.9	28.3	864.8	860.9	862.9
09/27/89	84.1	55.6	69.8	37.6	14.9	26.3	863.9	860.4	862.2
09/28/89	86.0	56.5	71.2	33.8	10.0	21.9	864.4	860.6	862.5
09/29/89	87.9	55.2	71.5	30.7	10.9	20.8	864.0	860.4	862.2
09/30/89	90.6	58.7	74.6	27.4	10.9	19.1	862.3	857.8	860.1
10/01/89	86.2	55.7	70.9	38.3	14.0	26.2	859.7	856.5	858.1
10/02/89	76.5	62.0	69.2	72.3	32.0	52.1	860.3	858.3	859.3
10/03/89	80.2	58.8	69.5	69.0	37.5	53.2	860.9	858.9	859.9
10/04/89	-	-	-	-	-	-	861.0	856.4	858.7
10/05/89	-	-	-	-	-	-	860.6	849.9	855.3
10/06/89	-	-	-	-	-	-	862.1	859.9	861.0
10/07/89	-	-	-	-	-	-	862.2	859.2	860.7
10/08/89	-	-	-	-	-	-	861.3	858.9	860.1
10/09/89	-	-	-	-	-	-	862.6	860.1	861.4
10/10/89	-	-	-	-	-	-	863.0	859.7	861.4
10/11/89	84.7	65.5	75.1	39.9	25.2	32.5	863.3	860.7	862.0
10/12/89	85.9	57.7	71.8	52.9	22.2	37.5	863.5	860.3	861.9
10/13/89	87.2	61.1	74.1	43.9	18.2	31.0	863.4	859.9	861.7
10/14/89	84.2	55.7	69.9	59.3	22.4	40.8	860.8	856.5	858.7
10/15/89	76.1	54.2	65.1	39.9	19.7	29.8	856.7	853.4	855.1
10/16/89	76.7	49.7	63.2	73.0	24.1	48.5	859.4	856.0	857.7

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
10/17/89	77.8	51.2	64.5	53.9	25.2	39.5	862.8	858.8	860.8
10/18/89	72.1	48.0	60.1	72.0	36.1	54.0	866.4	862.8	864.6
10/19/89	70.4	44.5	57.5	78.5	35.4	57.0	868.1	864.0	866.1
10/20/89	59.6	50.4	55.0	97.7	62.0	79.8	866.1	863.0	864.6
10/21/89	74.2	48.3	61.3	97.5	29.6	63.5	864.4	860.4	862.4
10/22/89	73.0	49.2	61.1	97.7	39.6	68.7	865.6	863.5	864.6
10/23/89	78.9	53.9	66.4	91.1	24.5	57.8	865.1	861.9	863.5
10/24/89	82.3	55.5	68.9	72.0	14.1	43.0	862.7	857.9	860.3
10/25/89	78.0	52.8	65.4	79.0	15.0	47.0	858.7	855.9	857.3
10/26/89	64.6	44.3	54.4	97.1	21.8	59.4	860.7	858.3	859.5
10/27/89	75.4	39.5	57.5	60.1	14.1	37.1	861.1	857.9	859.5
10/28/89	70.9	41.6	56.3	50.8	17.6	34.2	860.3	857.4	858.9
10/29/89	65.6	39.7	52.7	41.9	22.2	32.0	862.2	858.6	860.4
10/30/89	66.1	39.0	52.6	44.2	15.3	29.7	863.9	860.6	862.3
10/31/89	70.5	44.0	57.3	37.9	21.6	29.7	861.2	857.4	859.3
11/01/89	66.7	47.3	57.0	45.1	21.1	33.1	864.1	859.9	862.0
11/02/89	67.1	39.0	53.0	47.4	25.1	36.2	864.1	860.4	862.3
11/03/89	70.3	41.0	55.6	62.0	27.2	44.6	860.7	856.9	858.8
11/04/89	73.0	45.8	59.4	50.8	26.5	38.7	859.9	856.5	858.2
11/05/89	71.6	43.9	57.8	67.5	30.5	49.0	860.6	858.7	859.7
11/06/89	71.5	43.4	57.5	87.9	22.3	55.1	861.4	858.3	859.9
11/07/89	71.9	42.0	57.0	67.3	21.9	44.6	858.9	855.8	857.4
11/08/89	69.7	41.0	55.3	79.9	23.1	51.5	861.4	858.4	859.9
11/09/89	72.3	42.5	57.4	35.0	16.5	25.8	862.6	858.8	860.7
11/10/89	76.2	49.4	62.8	31.0	15.5	23.3	860.9	857.7	859.3
11/11/89	76.8	46.9	61.9	36.1	17.6	26.9	861.0	857.9	859.5
11/12/89	75.3	45.2	60.3	43.2	21.0	32.1	860.9	857.6	859.3
11/13/89	72.8	46.0	59.4	61.7	24.9	43.3	861.4	858.4	859.9
11/14/89	71.7	46.4	59.0	78.2	25.3	51.7	861.6	858.0	859.8
11/15/89	70.0	42.4	56.2	60.0	17.3	38.7	864.4	861.4	862.9
11/16/89	69.6	40.3	55.0	28.7	14.8	21.7	862.2	855.6	858.9
11/17/89	67.5	39.4	53.5	37.6	20.8	29.2	858.4	854.3	856.4
11/18/89	67.7	43.0	55.3	37.3	25.6	31.5	862.9	858.4	860.7
11/19/89	67.8	42.4	55.1	55.3	29.8	42.5	863.6	860.4	862.0
11/20/89	70.3	46.4	58.4	98.2	37.8	68.0	863.1	860.3	861.7
11/21/89	62.3	40.9	51.6	98.8	40.3	69.6	862.4	859.4	860.9
11/22/89	69.4	40.0	54.7	99.1	18.1	58.6	861.8	859.3	860.6
11/23/89	70.2	40.9	55.5	64.2	21.9	43.0	861.6	857.4	859.5
11/24/89	70.9	43.6	57.3	56.9	12.1	34.5	857.8	853.8	855.8
11/25/89	67.1	41.4	54.3	85.7	24.2	54.9	859.4	856.3	857.9
11/26/89	67.6	45.6	56.6	98.6	19.7	59.2	859.9	856.7	858.3
11/27/89	59.5	38.2	48.9	99.0	22.6	60.8	861.6	858.7	860.2
11/28/89	53.0	32.1	42.5	66.6	11.8	39.2	863.9	860.8	862.4
11/29/89	49.5	31.4	40.4	47.2	29.1	38.2	864.0	860.9	862.5
11/30/89	49.8	31.6	40.7	58.3	41.9	50.1	863.2	860.2	861.7
12/01/89	58.7	34.3	46.5	61.9	20.8	41.4	864.9	861.4	863.2

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
12/02/89	53.7	33.0	43.3	71.5	32.3	51.9	868.8	864.9	866.9
12/03/89	59.8	34.3	47.0	84.3	37.5	60.9	869.3	864.9	867.1
12/04/89	64.3	34.7	49.5	99.6	22.9	61.3	864.7	859.3	862.0
12/05/89	71.5	38.1	54.8	47.0	12.3	29.6	861.1	856.8	859.0
12/06/89	68.4	40.7	54.6	43.7	17.3	30.5	858.6	853.4	856.0
12/07/89	61.4	38.7	50.0	32.8	16.4	24.6	864.9	856.4	860.7
12/08/89	60.8	37.3	49.0	49.9	19.8	34.9	867.4	856.4	861.9
12/09/89	71.7	38.3	55.0	39.7	12.7	26.2	863.6	856.4	860.0
12/10/89	68.0	41.7	54.9	31.5	12.2	21.9	859.5	855.1	857.3
12/11/89	46.5	33.9	40.2	28.1	16.9	22.5	863.0	855.6	859.3
12/12/89	51.8	23.5	37.7	47.8	15.1	31.5	863.6	856.4	860.0
12/13/89	59.6	28.8	44.2	36.0	12.6	24.3	861.8	856.4	859.1
12/14/89	64.0	34.6	49.3	36.0	14.2	25.1	863.0	856.4	859.7
12/15/89	63.7	30.9	47.3	39.6	13.6	26.6	861.4	856.4	858.9
12/16/89	53.7	40.9	47.3	67.9	20.3	44.1	856.8	853.6	855.2
12/17/89	55.3	35.5	45.4	79.0	42.1	60.5	856.0	853.3	854.7
12/18/89	58.8	33.4	46.1	96.2	43.5	69.8	858.3	853.7	856.0
12/19/89	56.7	37.0	46.8	98.3	36.6	67.4	-	-	-
12/20/89	60.4	39.2	49.8	86.7	31.8	59.3	-	-	-
12/21/89	58.2	32.7	45.4	85.6	30.0	57.8	-	-	-
12/22/89	60.6	31.3	46.0	58.3	15.8	37.0	-	-	-
12/23/89	62.7	31.0	46.8	44.8	14.0	29.4	-	-	-
12/24/89	67.9	34.3	51.1	38.9	10.9	24.9	-	-	-
12/25/89	65.7	35.4	50.5	44.0	16.0	30.0	-	-	-
12/26/89	59.0	34.8	46.9	45.9	24.5	35.2	-	-	-
12/27/89	64.6	40.7	52.7	56.6	28.4	42.5	-	-	-
12/28/89	59.2	41.4	50.3	99.0	40.1	69.6	859.2	852.4	855.8
12/29/89	49.9	34.1	42.0	99.0	52.5	75.7	855.6	850.4	853.0
12/30/89	53.8	32.8	43.3	98.8	33.9	66.3	859.1	853.7	856.4
12/31/89	53.0	33.2	43.1	97.2	22.5	59.9	864.3	856.4	860.4
01/01/90	56.4	32.1	44.2	45.1	18.0	31.6	864.3	856.4	860.4
01/02/90	56.1	33.8	45.0	99.8	33.7	66.7	859.5	852.0	855.8
01/03/90	40.5	31.5	36.0	100.5	44.4	72.5	862.4	854.9	858.7
01/04/90	48.5	27.4	38.0	97.9	40.6	69.3	862.4	856.4	859.4
01/05/90	49.1	32.3	40.7	94.1	40.8	67.4	861.9	856.4	859.2
01/06/90	48.0	32.2	40.1	94.0	23.6	58.8	866.3	856.4	861.4
01/07/90	56.0	26.9	41.5	65.4	19.9	42.7	866.3	856.4	861.4
01/08/90	67.4	32.1	49.7	64.2	17.6	40.9	865.2	856.4	860.8
01/09/90	70.1	38.8	54.4	69.0	19.8	44.4	866.3	856.4	861.4
01/10/90	72.0	44.6	58.3	48.8	18.0	33.4	867.3	856.4	861.9
01/11/90	71.4	46.8	59.1	42.8	18.9	30.8	865.0	856.4	860.7
01/12/90	68.0	41.4	54.7	43.8	23.8	33.8	864.2	856.4	860.3
01/13/90	66.2	40.4	53.3	81.7	36.5	59.1	861.7	856.4	859.1
01/14/90	65.2	39.6	52.4	98.3	14.3	56.3	861.0	856.4	858.7
01/15/90	58.2	35.6	46.9	98.6	27.6	63.1	859.1	856.0	857.6
01/16/90	50.7	33.7	42.2	98.5	29.9	64.2	858.1	855.6	856.9

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
01/17/90	51.4	25.7	38.5	76.1	20.6	48.3	856.8	852.6	854.7
01/18/90	48.8	31.4	40.1	98.6	25.1	61.8	855.0	852.4	853.7
01/19/90	40.5	29.5	35.0	98.8	58.3	78.5	858.3	853.8	856.1
01/20/90	49.6	28.3	38.9	88.2	19.1	53.7	860.6	856.4	858.5
01/21/90	56.8	28.5	42.7	65.9	20.1	43.0	863.1	856.4	859.8
01/22/90	63.3	38.4	50.9	98.6	34.4	66.5	862.1	856.4	859.3
01/23/90	62.7	42.3	52.5	98.4	27.8	63.1	861.4	856.4	858.9
01/24/90	60.0	36.2	48.1	98.6	9.1	53.8	865.7	856.4	861.1
01/25/90	61.2	31.2	46.2	17.4	1.3	9.3	867.0	856.4	861.7
01/26/90	71.1	34.0	52.6	23.5	0.8	12.2	861.5	856.0	858.8
01/27/90	67.2	38.1	52.6	19.8	5.5	12.7	861.4	856.4	858.9
01/28/90	60.7	29.3	45.0	55.8	7.3	31.5	865.1	856.4	860.8
01/29/90	64.8	36.2	50.5	18.5	7.8	13.2	862.7	855.4	859.1
01/30/90	68.9	35.1	52.0	23.8	5.9	14.9	857.1	850.6	853.9
01/31/90	51.1	38.8	45.0	99.4	14.2	56.8	853.8	850.5	852.2
02/01/90	45.4	36.5	40.9	99.8	54.4	77.1	854.5	851.1	852.8
02/02/90	40.9	29.0	34.9	99.6	44.4	72.0	861.6	851.7	856.7
02/03/90	50.5	26.4	38.4	98.7	21.6	60.2	865.2	856.4	860.8
02/04/90	61.9	32.5	47.2	64.8	11.5	38.2	863.3	853.2	858.3
02/05/90	52.6	34.1	43.3	98.6	24.1	61.3	861.3	852.5	856.9
02/06/90	62.7	32.7	47.7	82.6	14.4	48.5	861.7	856.4	859.1
02/07/90	65.0	34.1	49.5	84.4	15.1	49.7	859.7	856.4	858.1
02/08/90	51.2	40.7	46.0	99.0	55.9	77.5	857.6	855.0	856.3
02/09/90	51.4	32.6	42.0	98.8	40.8	69.8	863.5	856.4	860.0
02/10/90	64.3	30.5	47.4	98.8	11.5	55.1	863.6	856.4	860.0
02/11/90	73.7	38.3	56.0	80.8	11.9	46.4	862.7	856.4	859.6
02/12/90	72.5	43.7	58.1	63.7	10.3	37.0	858.5	853.5	856.0
02/13/90	61.5	53.8	57.6	55.1	22.9	39.0	855.1	852.1	853.6
02/14/90	50.8	22.8	36.8	98.8	51.2	75.0	851.9	846.1	849.0
02/15/90	35.8	19.0	27.4	79.4	28.2	53.8	859.5	850.3	854.9
02/16/90	50.0	21.4	35.7	67.5	14.7	41.1	862.2	856.4	859.3
02/17/90	59.4	30.2	44.8	42.4	9.4	25.9	861.7	856.4	859.1
02/18/90	58.6	31.9	45.2	39.0	13.4	26.2	860.9	856.4	858.7
02/19/90	45.4	27.4	36.4	98.9	20.6	59.8	861.6	855.9	858.8
02/20/90	49.4	26.1	37.7	89.8	35.5	62.6	862.7	856.4	859.6
02/21/90	59.4	29.6	44.5	93.6	9.6	51.6	862.4	856.4	859.4
02/22/90	64.5	32.6	48.5	97.9	11.8	54.8	863.9	856.4	860.2
02/23/90	70.6	41.1	55.8	40.5	8.6	24.5	866.2	856.4	861.3
02/24/90	74.3	45.1	59.7	29.8	5.3	17.6	867.1	856.4	861.8
02/25/90	75.2	45.6	60.4	26.4	6.6	16.5	865.2	856.4	860.8
02/26/90	69.0	49.4	59.2	40.9	20.7	30.8	863.2	856.4	859.8
02/27/90	64.6	47.9	56.3	63.9	28.4	46.1	863.8	856.4	860.1
02/28/90	67.9	45.6	56.7	99.3	30.6	65.0	864.2	856.4	860.3
03/01/90	65.7	39.2	52.4	99.3	27.0	63.1	864.1	856.4	860.3
03/02/90	69.6	45.8	57.7	58.6	14.2	36.4	862.6	856.4	859.5
03/03/90	71.0	48.1	59.6	45.6	17.5	31.6	860.9	856.4	858.7

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
03/04/90	73.7	49.6	61.6	50.6	21.0	35.8	857.8	853.3	855.6
03/05/90	66.2	40.1	53.1	99.5	20.1	59.8	855.6	849.3	852.5
03/06/90	56.5	34.6	45.5	61.8	21.1	41.5	858.9	855.4	857.2
03/07/90	66.0	34.1	50.0	52.2	14.6	33.4	860.2	856.4	858.3
03/08/90	74.3	40.7	57.5	33.4	7.8	20.6	859.7	855.8	857.8
03/09/90	68.8	50.8	59.8	49.1	18.1	33.6	858.3	855.9	857.1
03/10/90	57.4	42.1	49.7	98.6	38.3	68.4	857.8	852.1	855.0
03/11/90	57.9	37.0	47.4	77.5	26.2	51.8	857.1	853.9	855.5
03/12/90	59.4	40.8	50.1	80.0	26.0	53.0	857.5	854.3	855.9
03/13/90	48.8	31.4	40.1	91.3	31.3	61.3	857.8	854.3	856.1
03/14/90	49.3	27.9	38.6	60.1	10.9	35.5	858.8	856.2	857.5
03/15/90	54.9	28.8	41.8	43.9	19.2	31.5	859.2	854.7	857.0
03/16/90	60.6	36.5	48.5	39.2	8.1	23.7	862.3	856.4	859.4
03/17/90	75.3	41.5	58.4	22.9	2.5	12.7	862.1	856.4	859.3
03/18/90	73.2	40.7	57.0	24.4	5.0	14.7	861.0	856.4	858.7
03/19/90	74.9	47.7	61.3	30.0	12.9	21.4	865.8	856.4	861.1
03/20/90	80.7	44.9	62.8	46.3	9.4	27.8	865.4	856.4	860.9
03/21/90	81.0	48.3	64.6	33.8	13.6	23.7	861.8	856.4	859.1
03/22/90	81.1	53.5	67.3	25.4	11.3	18.4	862.3	856.4	859.4
03/23/90	80.9	48.4	64.6	28.3	13.2	20.7	861.3	856.4	858.9
03/24/90	81.7	52.7	67.2	28.7	10.6	19.6	859.8	855.8	857.8
03/25/90	77.8	50.9	64.4	33.5	11.6	22.6	862.2	856.4	859.3
03/26/90	73.0	51.7	62.3	29.2	13.2	21.2	862.8	856.4	859.6
03/27/90	73.2	57.5	65.3	27.4	12.5	19.9	858.6	855.5	857.1
03/28/90	64.7	52.3	58.5	32.2	17.7	25.0	855.8	851.9	853.9
03/29/90	51.9	37.4	44.7	98.4	24.3	61.4	855.8	852.9	854.4
03/30/90	58.2	34.4	46.3	98.7	24.1	61.4	856.0	853.2	854.6
03/31/90	60.9	39.6	50.3	98.8	20.6	59.7	857.5	852.7	855.1
04/01/90	62.3	40.9	51.6	98.8	21.1	60.0	859.5	855.3	857.4
04/02/90	66.5	42.5	54.5	80.6	16.2	48.4	861.3	856.4	858.9
04/03/90	74.7	40.3	57.5	90.4	8.6	49.5	862.0	856.4	859.2
04/04/90	76.1	47.5	61.8	68.5	20.4	44.5	859.7	855.1	857.4
04/05/90	67.2	50.8	59.0	79.4	33.5	56.5	858.5	855.6	857.1
04/06/90	74.0	45.2	59.6	93.5	25.5	59.5	860.2	856.1	858.2
04/07/90	74.5	48.2	61.4	79.4	17.9	48.7	859.6	855.0	857.3
04/08/90	73.8	53.5	63.7	61.7	27.4	44.5	859.4	856.3	857.9
04/09/90	70.0	50.3	60.2	73.4	18.4	45.9	862.8	856.4	859.6
04/10/90	80.1	56.1	68.1	40.1	12.2	26.2	864.5	856.4	860.5
04/11/90	81.8	56.3	69.1	26.4	11.8	19.1	861.8	856.2	859.0
04/12/90	81.1	50.3	65.7	32.1	9.3	20.7	858.9	856.0	857.5
04/13/90	82.9	55.6	69.2	20.8	11.1	16.0	861.8	856.4	859.1
04/14/90	86.8	51.7	69.2	28.1	10.0	19.1	863.3	856.4	859.9
04/15/90	83.2	54.8	69.0	22.8	10.3	16.6	860.6	855.8	858.2
04/16/90	75.1	55.2	65.1	24.7	15.5	20.1	857.1	855.2	856.2
04/17/90	75.5	56.6	66.0	37.5	20.0	28.7	856.5	853.5	855.0
04/18/90	69.5	45.1	57.3	51.2	25.7	38.5	857.7	854.5	856.1

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
4/19/90	73.6	47.1	60.4	69.8	24.3	47.1	860.3	856.4	858.4
4/20/90	81.1	51.3	66.2	52.9	12.5	32.7	860.6	856.4	858.5
4/21/90	82.0	49.1	65.5	40.0	11.4	25.7	859.2	855.0	857.1
4/22/90	75.6	51.9	63.7	41.3	17.1	29.2	857.6	854.2	855.9
4/23/90	71.5	47.0	59.3	36.8	20.0	28.4	854.9	851.8	853.4
4/24/90	61.5	43.1	52.3	98.0	39.0	68.5	852.8	848.9	850.9
4/25/90	64.3	46.1	55.2	69.8	30.3	50.1	857.6	853.1	855.4
4/26/90	72.3	43.1	57.7	95.4	16.0	55.7	856.7	854.2	855.5
4/27/90	80.1	55.8	67.9	26.7	12.0	19.4	858.9	856.1	857.5
4/28/90	85.8	58.5	72.1	24.8	6.1	15.5	858.4	853.6	856.0
4/29/90	78.6	61.2	69.9	18.4	9.2	13.8	854.1	850.7	852.4
4/30/90	75.6	54.9	65.2	32.7	18.4	25.6	853.0	850.1	851.6
5/1/90	68.0	44.5	56.3	99.0	30.0	64.5	852.2	849.9	851.1
5/2/90	57.0	43.0	50.0	95.0	46.0	70.5	-	-	-
5/3/90	73.5	40.0	56.8	89.0	18.0	53.5	-	-	-
5/4/90	77.0	52.5	64.8	58.0	21.0	39.5	-	-	-
5/5/90	77.5	53.5	65.5	57.0	22.0	39.5	-	-	-
5/6/90	77.0	49.0	63.0	53.0	22.0	37.5	-	-	-
5/7/90	84.0	51.0	67.5	54.0	16.0	35.0	-	-	-
5/8/90	83.0	64.0	73.5	29.0	16.0	22.5	-	-	-
5/9/90	84.0	52.0	68.0	33.0	12.0	22.5	860.4	857.7	859.1
5/10/90	76.0	61.5	68.8	28.0	17.0	22.5	857.6	853.2	855.4
5/11/90	75.0	53.5	64.3	40.0	13.0	26.5	857.8	851.9	854.9
5/12/90	81.5	45.5	63.5	55.0	6.0	30.5	859.1	855.8	857.5
5/13/90	85.0	50.5	67.8	38.0	10.0	24.0	859.3	854.6	857.0
5/14/90	82.0	57.5	69.8	78.0	26.0	52.0	858.1	854.5	856.3
5/15/90	80.0	56.5	68.3	64.0	19.0	41.5	858.6	854.6	856.6
5/16/90	84.5	50.0	67.3	44.0	12.0	28.0	861.1	858.3	859.7
5/17/90	86.5	56.5	71.5	26.0	12.0	19.0	860.4	856.4	858.4
5/18/90	83.0	61.0	72.0	18.0	10.0	14.0	858.2	854.9	856.6
5/19/90	80.0	50.5	65.3	22.0	14.0	18.0	856.9	853.3	855.1
5/20/90	82.0	46.0	64.0	37.0	16.0	26.5	860.3	855.9	858.1
5/21/90	90.0	53.0	71.5	40.0	16.0	28.0	861.4	857.9	859.7
5/22/90	90.0	58.0	74.0	38.0	18.0	28.0	861.1	858.2	859.7
5/23/90	92.5	60.0	76.3	39.0	20.0	29.5	859.4	854.1	856.8
5/24/90	89.0	67.0	78.0	33.0	20.0	26.5	856.7	854.0	855.4
5/25/90	86.5	64.0	75.3	38.0	17.0	27.5	858.7	855.9	857.3
5/26/90	86.5	54.5	70.5	40.0	12.0	26.0	858.7	854.9	856.8
5/27/90	87.5	55.0	71.3	27.0	14.0	20.5	857.0	852.9	855.0
5/28/90	83.0	54.5	68.8	34.0	18.0	26.0	853.9	849.7	851.8
5/29/90	77.0	50.0	63.5	85.0	21.0	53.0	858.0	853.4	855.7
5/30/90	84.0	50.0	67.0	68.0	18.0	43.0	857.9	854.9	856.4
5/31/90	85.0	50.0	67.5	59.0	15.0	37.0	857.9	854.2	856.1
6/1/90	85.0	59.0	72.0	44.0	18.0	31.0	858.9	854.9	856.9
6/2/90	93.0	57.0	75.0	42.0	17.0	29.5	861.5	858.4	860.0
6/3/90	99.0	60.0	79.5	36.0	13.0	24.5	862.7	858.4	860.6

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
6/4/90	103.0	64.0	83.5	28.0	10.0	19.0	861.2	854.9	858.1
6/5/90	97.5	65.5	81.5	24.0	12.0	18.0	858.9	855.0	857.0
6/6/90	94.5	72.0	83.3	33.0	14.0	23.5	859.1	856.4	857.8
6/7/90	93.0	62.0	77.5	99.0	30.0	64.5	861.9	858.3	860.1
6/8/90	91.5	64.0	77.8	89.0	20.0	54.5	860.8	857.3	859.1
6/9/90	86.0	63.5	74.8	99.0	32.0	65.5	860.9	856.4	858.7
6/10/90	88.0	61.0	74.5	98.0	17.0	57.5	861.0	857.2	859.1
6/11/90	91.5	61.5	76.5	57.0	12.0	34.5	861.3	856.4	858.9
6/12/90	88.5	60.0	74.3	43.0	14.0	28.5	859.4	855.4	857.4
6/13/90	88.0	61.0	74.5	24.0	9.0	16.5	858.0	855.6	856.8
6/14/90	88.5	65.0	76.8	32.0	19.0	25.5	859.9	856.4	858.2
6/15/90	86.5	64.5	75.5	47.0	20.0	33.5	858.4	855.2	856.8
6/16/90	89.5	53.5	71.5	37.0	6.0	21.5	858.7	855.9	857.3
6/17/90	96.0	59.5	77.8	22.0	13.0	17.5	860.4	857.9	859.2
6/18/90	100.0	64.0	82.0	34.0	16.0	25.0	861.9	857.0	859.5
6/19/90	99.5	68.0	83.8	28.0	13.0	20.5	859.9	855.2	857.6
6/20/90	100.5	65.0	82.8	20.0	6.0	13.0	858.4	857.1	857.8
6/21/90	103.0	64.5	83.8	21.0	8.0	14.5	-	-	-
6/22/90	102.0	69.5	85.8	16.0	8.0	12.0	-	-	-
6/23/90	100.5	68.0	84.3	16.0	9.0	12.5	860.9	856.4	858.7
6/24/90	102.0	70.0	86.0	50.0	14.0	32.0	861.1	856.6	858.9
6/25/90	107.0	72.5	89.8	34.0	10.0	22.0	860.9	856.4	858.7
6/26/90	109.5	81.0	95.3	21.0	10.0	15.5	859.6	855.3	857.5
6/27/90	106.0	80.5	93.3	32.0	12.0	22.0	858.6	853.9	856.3
6/28/90	104.0	79.0	91.5	25.0	12.0	18.5	858.3	853.7	856.0
6/29/90	98.0	70.0	84.0	60.0	23.0	41.5	860.6	855.2	857.9
6/30/90	101.0	73.0	87.0	46.0	18.0	32.0	860.3	855.9	858.1
7/1/90	101.0	77.0	89.0	39.0	17.0	28.0	860.7	855.8	858.3
7/2/90	89.5	64.0	76.8	99.0	18.0	58.5	859.7	857.0	858.4
7/3/90	87.5	62.0	74.8	99.0	30.0	64.5	859.9	856.4	858.2
7/4/90	85.5	67.0	76.3	99.0	36.0	67.5	860.4	857.8	859.1
7/5/90	82.0	68.0	75.0	98.0	42.0	70.0	861.1	858.2	859.7
7/6/90	85.0	65.0	75.0	98.0	30.0	64.0	859.9	855.7	857.8
7/7/90	79.0	64.5	71.8	98.0	41.0	69.5	860.5	856.4	858.5
7/8/90	82.5	64.0	73.3	98.0	41.0	69.5	862.1	858.2	860.2
7/9/90	80.0	62.0	71.0	98.0	50.0	74.0	862.2	859.7	861.0
7/10/90	91.5	66.0	78.8	100.0	29.0	64.5	862.2	858.7	860.5
7/11/90	95.0	67.0	81.0	100.0	26.0	63.0	864.1	857.5	860.8
7/12/90	90.0	67.0	78.5	99.0	31.0	65.0	864.4	860.8	862.6
7/13/90	90.0	66.0	78.0	99.0	28.0	63.5	865.2	858.8	862.0
7/14/90	84.0	67.0	75.5	99.0	40.0	69.5	860.9	855.9	858.4
7/15/90	77.0	64.0	70.5	98.0	60.0	79.0	858.9	856.0	857.5
7/16/90	77.0	65.5	71.3	100.0	60.0	80.0	861.4	858.8	860.1
7/17/90	86.5	63.5	75.0	100.0	37.0	68.5	861.4	859.1	860.3
7/18/90	92.0	66.0	79.0	99.0	29.0	64.0	860.9	857.4	859.2
7/19/90	92.0	68.0	80.0	86.0	29.0	57.5	859.9	856.0	858.0

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
7/20/90	84.5	65.0	74.8	98.0	35.0	66.5	861.3	857.7	859.5
7/21/90	86.0	67.0	76.5	98.0	40.0	69.0	862.1	857.6	859.9
7/22/90	88.0	62.0	75.0	98.0	27.0	62.5	860.9	857.4	859.2
7/23/90	85.5	64.0	74.8	98.0	32.0	65.0	862.9	856.4	859.7
7/24/90	76.0	66.5	71.3	97.0	33.0	65.0	861.1	857.4	859.3
7/25/90	86.0	61.0	73.5	100.0	26.0	63.0	860.8	858.4	859.6
7/26/90	87.0	64.0	75.5	99.0	22.0	60.5	862.5	859.4	861.0
7/27/90	88.5	67.0	77.8	50.0	23.0	36.5	861.5	858.1	859.8
7/28/90	90.5	63.5	77.0	55.0	20.0	37.5	861.4	857.6	859.5
7/29/90	93.5	63.0	78.3	76.0	20.0	48.0	863.2	858.3	860.8
7/30/90	88.5	63.5	76.0	99.0	26.0	62.5	864.6	859.5	862.1
7/31/90	89.0	65.0	77.0	97.0	30.0	63.5	862.9	858.1	860.5
8/1/90	84.0	62.0	73.0	99.0	33.0	66.0	862.2	858.4	860.3
8/2/90	78.0	62.0	70.0	98.0	43.0	70.5	861.9	859.9	860.9
8/3/90	83.0	62.0	72.5	98.0	36.0	67.0	863.4	859.9	861.7
8/4/90	89.0	62.5	75.8	98.0	22.0	60.0	864.0	859.9	862.0
8/5/90	85.0	63.5	74.3	86.0	36.0	61.0	864.4	861.2	862.8
8/6/90	72.0	64.0	68.0	95.0	56.0	75.5	865.6	862.8	864.2
8/7/90	79.0	61.5	70.3	100.0	46.0	73.0	864.7	861.2	863.0
8/8/90	84.0	60.0	72.0	98.0	33.0	65.5	864.2	859.4	861.8
8/9/90	85.0	63.0	74.0	98.0	34.0	66.0	862.4	859.8	861.1
8/10/90	90.0	63.0	76.5	96.0	18.0	57.0	862.8	859.1	861.0
8/11/90	87.5	62.0	74.8	95.0	27.0	61.0	862.7	859.4	861.1
8/12/90	75.0	59.0	67.0	98.0	47.0	72.5	863.8	858.9	861.4
8/13/90	67.0	61.5	64.3	100.0	72.0	86.0	859.9	858.4	859.2
8/14/90	76.0	58.5	67.3	100.0	51.0	75.5	859.7	857.9	858.8
8/15/90	74.0	62.5	68.3	99.0	58.0	78.5	860.9	858.7	859.8
8/16/90	80.5	60.0	70.3	99.0	43.0	71.0	861.9	858.4	860.2
8/17/90	83.0	63.5	73.3	98.0	30.0	64.0	860.3	857.6	859.0
8/18/90	84.0	62.5	73.3	90.0	31.0	60.5	860.9	858.2	859.6
8/19/90	83.0	62.0	72.5	74.0	34.0	54.0	860.6	857.4	859.0
8/20/90	86.0	63.0	74.5	98.0	23.0	60.5	860.9	857.9	859.4
8/21/90	88.0	61.0	74.5	72.0	37.0	54.5	862.8	859.9	861.4
8/22/90	88.0	63.0	75.5	78.0	30.0	54.0	862.0	857.7	859.9
8/23/90	88.0	61.0	74.5	82.0	20.0	51.0	859.1	856.4	857.8
8/24/90	86.0	57.0	71.5	64.0	18.0	41.0	861.0	858.4	859.7
8/25/90	88.0	56.0	72.0	74.0	23.0	48.5	862.1	859.4	860.8
8/26/90	91.0	62.0	76.5	76.0	32.0	54.0	863.7	861.1	862.4
8/27/90	90.0	66.0	78.0	100.0	30.0	65.0	864.3	860.9	862.6
8/28/90	91.5	63.0	77.3	77.0	30.0	53.5	863.4	859.5	861.5
8/29/90	93.5	66.0	79.8	90.0	30.0	60.0	862.3	858.4	860.4
8/30/90	91.0	63.0	77.0	99.0	26.0	62.5	861.9	857.3	859.6
8/31/90	89.0	65.5	77.3	99.0	33.0	66.0	861.4	857.7	859.6
9/1/90	82.0	62.5	72.3	98.0	46.0	72.0	862.4	858.9	860.7
9/2/90	88.0	65.0	76.5	99.0	34.0	66.5	861.9	858.4	860.2
9/3/90	81.0	65.0	73.0	99.0	38.0	68.5	861.9	858.4	860.2

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
9/4/90	84.0	63.0	73.5	98.0	34.0	66.0	863.9	860.3	862.1
9/5/90	82.0	61.5	71.8	98.0	40.0	69.0	864.3	860.6	862.5
9/6/90	85.0	60.5	72.8	98.0	32.0	65.0	863.7	859.4	861.6
9/7/90	89.0	64.0	76.5	96.0	24.0	60.0	861.4	857.9	859.7
9/8/90	91.5	69.0	80.3	92.0	31.0	61.5	860.9	857.6	859.3
9/9/90	92.5	66.0	79.3	95.0	29.0	62.0	860.6	857.4	859.0
9/10/90	95.0	67.0	81.0	78.0	20.0	49.0	860.7	858.2	859.5
9/11/90	95.5	67.5	81.5	80.0	21.0	50.5	861.9	857.8	859.9
9/12/90	90.0	66.0	78.0	93.0	26.0	59.5	861.2	856.4	858.8
9/13/90	90.5	62.5	76.5	82.0	28.0	55.0	860.0	856.7	858.4
9/14/90	84.0	61.0	72.5	98.0	42.0	70.0	861.3	858.3	859.8
9/15/90	94.5	60.0	77.3	98.0	26.0	62.0	861.3	856.4	858.9
9/16/90	84.0	61.5	72.8	99.0	30.0	64.5	858.4	854.9	856.7
9/17/90	84.0	62.0	73.0	78.0	24.0	51.0	859.6	857.6	858.6
9/18/90	84.0	61.0	72.5	70.0	32.0	51.0	860.6	857.6	859.1
9/19/90	84.0	58.0	71.0	98.0	22.0	60.0	859.2	855.4	857.3
9/20/90	82.0	59.0	70.5	98.0	28.0	63.0	859.5	855.0	857.3
9/21/90	80.5	55.5	68.0	98.0	26.0	62.0	861.6	858.9	860.3
9/22/90	69.5	60.5	65.0	98.0	39.0	68.5	864.1	861.4	862.8
9/23/90	73.0	62.0	67.5	98.0	54.0	76.0	863.4	861.5	862.5
9/24/90	83.0	56.0	69.5	100.0	24.0	62.0	863.8	855.2	859.5
9/25/90	85.0	63.0	74.0	80.0	28.0	54.0	862.9	860.9	861.9
9/26/90	88.0	59.0	73.5	63.0	18.0	40.5	862.6	858.9	860.8
9/27/90	86.5	63.0	74.8	42.0	13.0	27.5	860.0	856.1	858.1
9/28/90	83.5	52.0	67.8	51.0	14.0	32.5	859.0	855.9	857.5
9/29/90	78.8	57.0	67.9	59.0	28.0	43.5	862.5	857.5	860.0
9/30/90	68.0	56.0	62.0	98.0	49.0	73.5	864.0	860.4	862.2
10/1/90	69.0	54.5	61.8	100.0	58.0	79.0	863.8	857.9	860.9
10/2/90	74.0	54.5	64.3	100.0	39.0	69.5	858.5	853.5	856.0
10/3/90	78.0	51.0	64.5	99.0	32.0	65.5	863.4	857.4	860.4
10/4/90	81.0	60.5	70.8	66.0	26.0	46.0	865.9	863.2	864.6
10/5/90	82.0	59.0	70.5	72.0	28.0	50.0	864.4	860.0	862.2
10/6/90	81.0	57.0	69.0	84.0	32.0	58.0	860.7	858.3	859.5
10/7/90	79.0	57.0	68.0	99.0	24.0	61.5	860.9	858.4	859.7
10/8/90	77.5	56.0	66.8	98.0	30.0	64.0	864.1	860.1	862.1
10/9/90	75.0	45.0	60.0	53.0	16.0	34.5	866.8	863.4	865.1
10/10/90	79.0	41.0	60.0	69.0	18.0	43.5	863.9	858.1	861.0
10/11/90	81.0	49.5	65.3	41.0	11.0	26.0	860.6	858.2	859.4
10/12/90	80.0	50.0	65.0	36.0	13.0	24.5	861.9	859.2	860.6
10/13/90	80.0	47.0	63.5	40.0	12.0	26.0	860.6	857.1	858.9
10/14/90	80.5	52.0	66.3	61.0	16.0	38.5	860.6	858.0	859.3
10/15/90	78.5	51.0	64.8	64.0	23.0	43.5	861.2	857.9	859.6
10/16/90	79.5	50.0	64.8	98.0	29.0	63.5	860.1	856.2	858.2
10/17/90	78.0	54.0	66.0	68.0	28.0	48.0	863.6	859.2	861.4
10/18/90	82.0	55.0	68.5	78.0	20.0	49.0	863.9	858.4	861.2
10/19/90	79.0	55.0	67.0	80.0	18.0	49.0	858.4	852.4	855.4

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
10/20/90	68.5	43.5	56.0	78.0	14.0	46.0	861.0	854.7	857.9
10/21/90	69.0	45.0	57.0	55.0	22.0	38.5	863.6	860.9	862.3
10/22/90	75.5	44.0	59.8	59.0	21.0	40.0	862.0	857.9	860.0
10/23/90	80.0	50.0	65.0	48.0	20.0	34.0	862.7	859.5	861.1
10/24/90	83.0	50.0	66.5	49.0	16.0	32.5	864.7	862.1	863.4
10/25/90	83.0	54.0	68.5	42.0	16.0	29.0	865.5	862.3	863.9
10/26/90	83.0	53.0	68.0	40.0	14.0	27.0	863.6	860.3	862.0
10/27/90	83.5	51.0	67.3	41.0	14.0	27.5	864.6	861.8	863.2
10/28/90	78.0	50.5	64.3	48.0	19.0	33.5	866.7	862.6	864.7
10/29/90	80.5	51.0	65.8	50.0	22.0	36.0	864.4	861.1	862.8
10/30/90	80.0	51.0	65.5	62.0	22.0	42.0	865.4	862.3	863.9
10/31/90	79.0	53.0	66.0	85.0	28.0	56.5	863.8	860.0	861.9
11/1/90	71.0	54.5	62.8	99.0	49.0	74.0	860.9	855.6	858.3
11/2/90	62.0	39.0	50.5	96.0	30.0	63.0	855.6	850.1	852.9
11/3/90	56.5	37.0	46.8	67.0	24.0	45.5	862.2	855.4	858.8
11/4/90	60.5	38.5	49.5	67.0	27.0	47.0	864.2	861.5	862.9
11/5/90	72.0	46.5	59.3	41.0	15.0	28.0	861.5	853.2	857.4
11/6/90	68.5	46.0	57.3	98.0	20.0	59.0	855.1	852.5	853.8
11/7/90	58.5	37.0	47.8	98.0	25.0	61.5	857.8	852.1	855.0
11/8/90	59.5	42.0	50.8	62.0	25.0	43.5	862.7	859.4	861.1
11/9/90	66.0	41.0	53.5	69.0	21.0	45.0	865.7	863.1	864.4
11/10/90	73.0	42.0	57.5	76.0	14.0	45.0	865.4	862.6	864.0
11/11/90	74.5	44.0	59.3	72.0	16.0	44.0	866.8	864.0	865.4
11/12/90	74.5	48.5	61.5	57.0	21.0	39.0	867.7	864.2	866.0
11/13/90	76.0	46.5	61.3	61.0	21.0	41.0	864.6	861.1	862.9
11/14/90	78.0	51.0	64.5	42.0	26.0	34.0	862.7	859.6	861.2
11/15/90	76.0	50.0	63.0	45.0	18.0	31.5	865.0	862.2	863.6
11/16/90	79.0	45.0	62.0	72.0	20.0	46.0	866.0	862.8	864.4
11/17/90	77.5	50.0	63.8	43.0	17.0	30.0	864.4	859.5	862.0
11/18/90	79.0	47.0	63.0	65.0	15.0	40.0	860.2	856.5	858.4
11/19/90	72.5	52.5	62.5	84.0	26.0	55.0	857.9	854.6	856.3
11/20/90	61.0	39.0	50.0	98.0	27.0	62.5	858.7	854.1	856.4
11/21/90	63.5	42.0	52.8	62.0	20.0	41.0	861.9	858.3	860.1
11/22/90	66.0	40.5	53.3	60.0	23.0	41.5	863.9	860.9	862.4
11/23/90	68.0	46.5	57.3	98.0	21.0	59.5	864.1	860.7	862.4
11/24/90	73.0	52.0	62.5	98.0	34.0	66.0	863.1	859.5	861.3
11/25/90	68.5	49.5	59.0	98.0	38.0	68.0	862.1	853.8	858.0
11/26/90	53.0	31.0	42.0	99.0	21.0	60.0	855.9	849.0	852.5
11/27/90	55.0	27.0	41.0	78.0	26.0	52.0	863.3	854.1	858.7
11/28/90	58.5	38.0	48.3	45.0	23.0	34.0	869.2	863.3	866.3
11/29/90	60.0	35.0	47.5	78.0	21.0	49.5	870.7	866.1	868.4
11/30/90	67.5	41.0	54.3	70.0	24.0	47.0	865.9	859.6	862.8
12/1/90	68.5	38.5	53.5	65.0	18.0	41.5	862.0	858.9	860.5
12/2/90	65.5	35.0	50.3	42.0	10.0	26.0	865.0	860.5	862.8
12/3/90	59.5	38.5	49.0	33.0	19.0	26.0	866.4	863.6	865.0
12/4/90	60.0	33.0	46.5	60.0	20.0	40.0	868.3	865.3	866.8

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
12/05/90	65.5	32.5	49.0	62.0	20.0	41.0	865.5	860.4	863.0
12/06/90	59.5	35.0	47.3	50.0	17.0	33.5	867.2	862.7	865.0
12/07/90	59.0	33.5	46.3	41.0	18.0	29.5	868.1	865.2	866.7
12/08/90	66.5	34.5	50.5	40.0	12.0	26.0	866.7	863.7	865.2
12/09/90	68.0	41.0	54.5	44.0	14.0	29.0	866.9	863.9	865.4
12/10/90	68.5	44.5	56.5	56.0	24.0	40.0	865.4	861.9	863.7
12/11/90	68.5	47.0	57.8	99.0	31.0	65.0	863.7	859.2	861.5
12/12/90	67.0	48.0	57.5	99.0	38.0	68.5	862.1	858.4	860.3
12/13/90	61.0	48.5	54.8	90.0	40.0	65.0	861.6	858.1	859.9
12/14/90	62.0	45.0	53.5	87.0	29.0	58.0	860.4	858.0	859.2
12/15/90	55.5	44.5	50.0	99.0	46.0	72.5	859.4	856.4	857.9
12/16/90	51.5	31.0	41.3	99.0	38.0	68.5	856.9	849.7	853.3
12/17/90	45.0	25.0	35.0	98.0	36.0	67.0	861.9	855.2	858.6
12/18/90	50.0	28.5	39.3	82.0	32.0	57.0	861.5	854.7	858.1
12/19/90	59.0	40.5	49.8	65.0	10.0	37.5	854.7	850.0	852.4
12/20/90	49.0	35.5	42.3	98.0	47.0	72.5	852.4	848.7	850.6
12/21/90	43.0	31.5	37.3	99.0	55.0	77.0	853.1	849.2	851.2
12/22/90	37.0	19.5	28.3	99.0	45.0	72.0	860.4	850.8	855.6
12/23/90	39.0	24.0	31.5	72.0	28.0	50.0	865.3	860.4	862.9
12/24/90	46.0	26.5	36.3	78.0	22.0	50.0	865.4	860.6	863.0
12/25/90	56.5	35.0	45.8	66.0	14.0	40.0	861.0	858.0	859.5
12/26/90	56.0	30.5	43.3	66.0	22.0	44.0	861.2	857.6	859.4
12/27/90	55.0	43.5	49.3	98.0	36.0	67.0	861.4	855.6	858.5
12/28/90	56.5	47.0	51.8	99.0	51.0	75.0	855.4	851.4	853.4
12/29/90	56.0	41.5	48.8	98.0	49.0	73.5	860.2	853.7	857.0
12/30/90	58.5	37.0	47.8	99.0	45.0	72.0	865.6	860.6	863.1
12/31/90	62.5	39.0	50.8	99.0	22.0	60.5	866.1	863.4	864.8
01/01/91	62.0	42.0	52.0	74.0	25.0	49.5	865.5	862.6	864.1
01/02/91	66.0	49.0	57.5	74.0	25.0	49.5	864.9	862.6	863.8
01/03/91	59.0	48.5	53.8	74.0	40.0	57.0	863.2	858.9	861.1
01/04/91	60.0	47.5	53.8	100.0	46.0	73.0	859.0	857.0	858.0
01/05/91	53.0	44.0	48.5	100.0	66.0	83.0	861.1	857.7	859.4
01/06/91	56.5	39.0	47.8	100.0	52.0	76.0	864.9	861.1	863.0
01/07/91	58.5	40.0	49.3	98.0	35.0	66.5	864.8	861.4	863.1
01/08/91	59.0	39.0	49.0	98.0	36.0	67.0	861.8	857.3	859.6
01/09/91	59.5	40.5	50.0	98.0	20.0	59.0	860.4	855.9	858.2
01/10/91	55.0	33.5	44.3	99.0	32.0	65.5	863.6	860.2	861.9
01/11/91	56.0	32.0	44.0	99.0	28.0	63.5	866.0	863.4	864.7
01/12/91	60.5	35.0	47.8	70.0	17.0	43.5	866.7	862.9	864.8
01/13/91	66.5	38.0	52.3	54.0	15.0	34.5	863.8	858.7	861.3
01/14/91	57.5	36.5	47.0	54.0	32.0	43.0	861.9	857.9	859.9
01/15/91	60.5	33.0	46.8	58.0	20.0	39.0	862.0	855.7	858.9
01/16/91	53.0	34.5	43.8	98.0	36.0	67.0	857.1	854.2	855.7
01/17/91	44.0	32.0	38.0	98.0	57.0	77.5	862.1	856.9	859.5
01/18/91	53.5	35.0	44.3	82.0	26.0	54.0	864.1	861.4	862.8
01/19/91	58.0	33.0	45.5	82.0	22.0	52.0	862.9	858.4	860.7

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
01/20/91	51.0	36.0	43.5	94.0	34.0	64.0	860.2	855.9	858.1
01/21/91	51.5	29.0	40.3	98.0	36.0	67.0	860.3	857.8	859.1
01/22/91	53.0	33.0	43.0	98.0	37.0	67.5	860.4	856.6	858.5
01/23/91	52.5	32.0	42.3	92.0	32.0	62.0	862.7	856.4	859.6
01/24/91	59.0	33.0	46.0	70.0	14.0	42.0	863.9	860.0	862.0
01/25/91	61.5	34.0	47.8	48.0	13.0	30.5	862.3	859.3	860.8
01/26/91	66.0	40.0	53.0	42.0	9.0	25.5	861.4	857.5	859.5
01/27/91	62.0	36.5	49.3	40.0	14.0	27.0	858.6	855.1	856.9
01/28/91	59.0	35.0	47.0	93.0	20.0	56.5	856.4	852.7	854.6
01/29/91	50.0	24.0	37.0	70.0	24.0	47.0	860.9	851.6	856.3
01/30/91	55.0	23.0	39.0	64.0	13.0	38.5	866.9	861.1	864.0
01/31/91	63.0	36.0	49.5	43.0	12.0	27.5	868.2	863.5	865.9
02/01/91	65.0	36.0	50.5	45.0	14.0	29.5	866.3	862.8	864.6
02/02/91	68.0	41.0	54.5	44.0	18.0	31.0	866.0	862.3	864.2
02/03/91	65.5	38.5	52.0	44.0	18.0	31.0	865.0	862.2	863.6
02/04/91	65.5	40.5	53.0	38.0	16.0	27.0	865.4	862.9	864.2
02/05/91	65.0	41.0	53.0	39.0	18.0	28.5	864.9	860.9	862.9
02/06/91	68.0	42.0	55.0	39.0	22.0	30.5	863.9	860.0	862.0
02/07/91	69.5	40.0	54.8	41.0	22.0	31.5	863.7	859.4	861.6
02/08/91	65.0	37.0	51.0	50.0	20.0	35.0	863.4	860.9	862.2
02/09/91	63.5	43.0	53.3	47.0	23.0	35.0	863.9	860.9	862.4
02/10/91	65.0	42.5	53.8	97.0	28.0	62.5	862.2	859.6	860.9
02/11/91	56.5	45.0	50.8	99.0	56.0	77.5	862.7	860.4	861.6
02/12/91	58.5	42.0	50.3	99.0	44.0	71.5	861.8	858.8	860.3
02/13/91	67.5	41.5	54.5	92.0	17.0	54.5	862.6	859.8	861.2
02/14/91	70.0	49.0	59.5	46.0	18.0	32.0	862.6	859.0	860.8
02/15/91	65.5	48.5	57.0	48.0	25.0	36.5	860.5	858.2	859.4
02/16/91	67.0	47.0	57.0	64.0	28.0	46.0	859.6	855.9	857.8
02/17/91	59.5	36.0	47.8	99.0	34.0	66.5	856.4	851.4	853.9
02/18/91	45.0	33.0	39.0	99.0	28.0	63.5	861.0	854.1	857.6
02/19/91	50.5	35.0	42.8	53.0	21.0	37.0	867.7	861.1	864.4
02/20/91	60.0	36.0	48.0	66.0	16.0	41.0	867.0	863.4	865.2
02/21/91	69.0	46.0	57.5	56.0	9.0	32.5	864.9	861.6	863.3
02/22/91	72.5	46.5	59.5	42.0	8.0	25.0	863.4	858.9	861.2
02/23/91	68.0	45.5	56.8	42.0	14.0	28.0	859.4	857.1	858.3
02/24/91	69.0	42.0	55.5	43.0	15.0	29.0	861.7	857.4	859.6
02/25/91	64.0	44.0	54.0	37.0	19.0	28.0	863.8	860.5	862.2
02/26/91	62.5	41.5	52.0	76.0	22.0	49.0	861.2	858.3	859.8
02/27/91	66.0	43.5	54.8	99.0	27.0	63.0	858.9	852.8	855.9
02/28/91	50.0	45.5	47.8	99.0	55.0	77.0	853.3	848.0	850.7
03/01/91	49.5	41.5	45.5	100.0	55.0	77.5	853.4	849.7	851.6
03/02/91	53.5	34.5	44.0	99.0	36.0	67.5	864.9	853.1	859.0
03/03/91	67.0	40.0	53.5	52.0	17.0	34.5	865.9	862.6	864.3
03/04/91	77.0	53.5	65.3	62.0	10.0	36.0	863.8	857.4	860.6
03/05/91	72.5	54.0	63.3	56.0	35.0	45.5	859.2	856.0	857.6
03/06/91	64.0	37.0	50.5	65.0	27.0	46.0	857.2	854.0	855.6

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
03/07/91	54.5	32.0	43.3	79.0	27.0	53.0	859.9	855.4	857.7
03/08/91	64.5	33.0	48.8	74.0	18.0	46.0	859.9	856.9	858.4
03/09/91	71.5	45.0	58.3	42.0	13.0	27.5	862.1	858.6	860.4
03/10/91	77.0	50.5	63.8	33.0	12.0	22.5	860.2	855.8	858.0
03/11/91	64.0	33.0	48.5	73.0	22.0	47.5	860.4	854.9	857.7
03/12/91	64.0	35.5	49.8	52.0	17.0	34.5	860.3	857.7	859.0
03/13/91	58.5	43.0	50.8	42.0	18.0	30.0	860.1	852.1	856.1
03/14/91	53.5	30.5	42.0	71.0	30.0	50.5	853.7	849.9	851.8
03/15/91	56.5	30.5	43.5	99.0	23.0	61.0	853.7	849.7	851.7
03/16/91	47.0	29.0	38.0	79.0	28.0	53.5	862.4	851.9	857.2
03/17/91	62.5	40.5	51.5	44.0	12.0	28.0	862.4	859.2	860.8
03/18/91	73.5	47.0	60.3	42.0	8.0	25.0	860.8	854.7	857.8
03/19/91	54.0	34.5	44.3	99.0	31.0	65.0	854.9	851.6	853.3
03/20/91	60.5	34.0	47.3	99.0	18.0	58.5	856.2	849.4	852.8
03/21/91	44.0	28.5	36.3	99.0	44.0	71.5	857.5	849.2	853.4
03/22/91	54.0	35.0	44.5	89.0	28.0	58.5	863.4	857.5	860.5
03/23/91	69.0	44.0	56.5	56.0	12.0	34.0	862.6	858.6	860.6
03/24/91	73.0	51.5	62.3	26.0	7.0	16.5	859.9	854.9	857.4
03/25/91	65.0	37.5	51.3	99.0	19.0	59.0	856.2	852.9	854.6
03/26/91	47.0	32.0	39.5	99.0	28.0	63.5	858.4	850.5	854.5
03/27/91	57.0	32.0	44.5	99.0	19.0	59.0	857.9	851.9	854.9
03/28/91	50.0	29.0	39.5	99.0	46.0	72.5	860.4	854.4	857.4
03/29/91	55.0	37.0	46.0	70.0	26.0	48.0	859.8	856.1	858.0
03/30/91	63.0	40.5	51.8	43.0	11.0	27.0	864.6	858.5	861.6
03/31/91	72.0	48.0	60.0	34.0	10.0	22.0	865.3	860.9	863.1
04/01/91	74.5	41.0	57.8	59.0	9.0	34.0	862.2	856.2	859.2
04/02/91	69.5	45.0	57.3	57.0	15.0	36.0	862.1	859.7	860.9
04/03/91	72.5	43.0	57.8	64.0	18.0	41.0	861.9	858.7	860.3
04/04/91	76.0	47.0	61.5	63.0	16.0	39.5	863.1	860.6	861.9
04/05/91	80.0	54.5	67.3	42.0	14.0	28.0	864.9	860.7	862.8
04/06/91	82.0	53.0	67.5	44.0	15.0	29.5	860.9	856.4	858.7
04/07/91	78.0	57.0	67.5	29.0	13.0	21.0	858.0	854.1	856.1
04/08/91	74.5	49.0	61.8	38.0	14.0	26.0	861.9	856.7	859.3
04/09/91	77.0	47.5	62.3	40.0	16.0	28.0	862.9	858.2	860.6
04/10/91	76.0	44.0	60.0	42.0	14.0	28.0	858.7	850.0	854.4
04/11/91	69.5	40.0	54.8	33.0	16.0	24.5	852.6	847.2	849.9
04/12/91	59.0	32.5	45.8	41.0	16.0	28.5	858.8	853.1	856.0
04/13/91	60.0	34.5	47.3	38.0	22.0	30.0	860.6	857.9	859.3
04/14/91	70.5	43.5	57.0	36.0	16.0	26.0	860.9	856.4	858.7
04/15/91	76.0	41.0	58.5	35.0	10.0	22.5	857.2	853.4	855.3
04/16/91	73.0	49.0	61.0	32.0	10.0	21.0	858.2	855.4	856.8
04/17/91	73.5	50.0	61.8	42.0	19.0	30.5	858.1	854.8	856.5
04/18/91	72.0	47.0	59.5	42.0	20.0	31.0	857.8	855.0	856.4
04/19/91	77.5	45.5	61.5	40.0	15.0	27.5	860.2	855.6	857.9
04/20/91	81.0	50.0	65.5	40.0	10.0	25.0	860.3	856.0	858.2
04/21/91	73.0	46.0	59.5	32.0	13.0	22.5	857.6	855.1	856.4

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
04/22/91	73.0	44.0	58.5	55.0	16.0	35.5	857.6	853.9	855.8
04/23/91	72.0	48.0	60.0	63.0	17.0	40.0	856.3	853.4	854.9
04/24/91	75.0	44.5	59.8	50.0	17.0	33.5	859.1	855.4	857.3
04/25/91	74.0	48.0	61.0	65.0	18.0	41.5	857.0	853.0	855.0
04/26/91	71.0	51.0	61.0	55.0	31.0	43.0	855.8	853.8	854.8
04/27/91	70.0	38.5	54.3	40.0	16.0	28.0	855.9	852.1	854.0
04/28/91	60.0	36.0	48.0	41.0	17.0	29.0	857.9	854.9	856.4
04/29/91	70.5	40.5	55.5	42.0	14.0	28.0	858.7	855.7	857.2
04/30/91	79.5	44.0	61.8	34.0	14.0	24.0	859.9	856.0	858.0
05/01/91	80.0	51.5	65.8	29.0	14.0	21.5	858.2	853.7	856.0
05/02/91	71.5	45.0	58.3	28.0	16.0	22.0	855.5	853.2	854.4
05/03/91	72.0	41.5	56.8	43.0	17.0	30.0	858.4	854.6	856.5
05/04/91	73.5	41.0	57.3	41.0	17.0	29.0	862.5	858.2	860.4
05/05/91	79.5	49.5	64.5	32.0	15.0	23.5	864.4	859.9	862.2
05/06/91	85.0	53.0	69.0	29.0	10.0	19.5	861.1	854.9	858.0
05/07/91	83.5	51.0	67.3	34.0	17.0	25.5	859.8	856.3	858.1
05/08/91	86.5	54.0	70.3	38.0	18.0	28.0	860.4	855.9	858.2
05/09/91	81.0	58.5	69.8	36.0	21.0	28.5	856.1	852.2	854.2
05/10/91	76.5	58.0	67.3	39.0	21.0	30.0	857.7	852.3	855.0
05/11/91	77.0	45.0	61.0	43.0	16.0	29.5	861.2	857.0	859.1
05/12/91	82.0	45.5	63.8	39.0	16.0	27.5	861.9	858.4	860.2
05/13/91	84.0	51.5	67.8	34.0	12.0	23.0	859.6	855.4	857.5
05/14/91	78.5	44.0	61.3	40.0	14.0	27.0	856.9	852.6	854.8
05/15/91	74.0	45.0	59.5	46.0	24.0	35.0	858.2	855.6	856.9
05/16/91	83.0	48.5	65.8	38.0	18.0	28.0	858.6	855.6	857.1
05/17/91	84.0	51.0	67.5	45.0	15.0	30.0	859.0	856.1	857.6
05/18/91	83.5	48.0	65.8	48.0	13.0	30.5	858.7	856.4	857.6
05/19/91	84.5	50.0	67.3	50.0	13.0	31.5	859.6	855.7	857.7
05/20/91	85.0	49.0	67.0	48.0	18.0	33.0	858.1	853.6	855.9
05/21/91	79.5	47.0	63.3	88.0	22.0	55.0	855.9	853.1	854.5
05/22/91	80.0	47.0	63.5	88.0	14.0	51.0	858.3	855.2	856.8
05/23/91	81.0	52.0	66.5	54.0	19.0	36.5	860.0	857.2	858.6
05/24/91	85.5	52.0	68.8	49.0	19.0	34.0	860.7	856.6	858.7
05/25/91	90.0	53.0	71.5	44.0	14.0	29.0	858.4	854.6	856.5
05/26/91	86.5	53.0	69.8	44.0	14.0	29.0	857.1	855.5	856.3
05/27/91	84.5	50.0	67.3	46.0	18.0	32.0	858.3	856.2	857.3
05/28/91	82.5	51.5	67.0	49.0	16.0	32.5	859.1	856.7	857.9
05/29/91	84.0	54.5	69.3	35.0	14.0	24.5	858.6	855.1	856.9
05/30/91	82.0	55.5	68.8	28.0	12.0	20.0	855.6	849.3	852.5
05/31/91	69.0	45.5	57.3	62.0	32.0	47.0	854.2	848.7	851.5
Jun-89	93.7	62.8	78.3	-	-	-	859.8	856.2	858.0
Jul-89	92.0	66.6	79.3	83.2	28.5	55.9	861.9	858.0	859.9
Aug-89	88.3	63.8	76.0	89.8	29.5	59.7	860.5	857.0	858.7
Sep-89	88.7	61.6	75.1	66.7	21.8	44.2	860.8	857.2	859.0

	Temperature			Relative Humidity			Barometer		
Date	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Oct- 89	75.7	50.9	63.3	65.0	25.4	45.2	862.3	858.8	860.5
Nov-89	68.0	42.0	55.0	62.8	23.5	43.2	861.7	858.2	859.9
Dec-89	60.1	35.2	47.6	62.8	23.9	43.3	862.0	856.4	859.2
Jan-90	58.8	34.6	46.7	71.7	22.1	46.9	862.0	855.4	858.7
Feb-90	58.9	35.0	46.9	76.2	22.6	49.4	861.6	854.9	858.2
Mar-90	67.4	42.9	55.1	54.8	16.9	35.8	859.9	855.1	857.5
Apr- 90	75.2	50.3	62.8	53.9	17.7	35.8	859.0	854.8	856.9
May-90	81.5	53.4	67.5	49.0	17.6	33.3	858.4	854.6	856.5
Jun-90	96.4	65.9	81.2	41.9	14.5	28.2	860.1	856.2	858.1
Jul-90	86.8	65.3	76.0	92.6	32.5	62.6	861.6	857.7	859.7
Aug-90	84.2	62.0	73.1	91.2	34.9	63.1	862.3	859.1	860.7
Sep-90	84.6	61.5	73.1	87.7	30.0	58.9	861.6	858.0	859.8
Oct- 90	78.6	51.5	65.0	66.5	22.6	44.6	862.9	859.1	861.0
Nov-90	67.6	43.3	55.5	73.3	23.6	48.4	862.8	858.3	860.6
Dec-90	57.3	36.6	46.9	76.8	29.3	53.1	862.3	857.9	860.1
Jan-91	57.5	36.2	46.9	79.4	28.6	54.0	862.5	858.4	860.5
Feb-91	63.6	41.8	52.7	62.3	23.4	42.8	862.6	858.9	860.7
Mar-91	61.1	38.5	49.8	70.2	22.8	46.5	859.9	854.7	857.3
Apr- 91	73.0	45.2	59.1	44.5	15.7	30.1	859.2	855.3	857.3
May-91	80.9	49.7	65.3	44.1	16.7	30.4	858.8	855.0	856.9

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
06/01/89	-	-	-	0	0
06/02/89	-	-	-	0	0
06/03/89	-	-	-	0	0
06/04/89	-	-	-	0	0
06/05/89	-	-	-	0	0
06/06/89	-	-	-	0	0
06/07/89	-	-	-	0	0
06/08/89	-	-	-	0	0
06/09/89	-	-	-	0	0
06/10/89	-	-	-	0	0
06/11/89	-	-	-	0	0
06/12/89	-	-	-	0	0
06/13/89	-	-	-	0	0
06/14/89	-	-	-	0	0
06/15/89	-	-	-	0	0
06/16/89	-	-	-	0	0
06/17/89	-	-	-	0	0
06/18/89	-	-	-	0	0
06/19/89	-	yes	-	0	0
06/20/89	-	-	-	0	0
06/21/89	-	yes	-	0	0
06/22/89	-	-	-	0	0
06/23/89	-	-	-	0	0
06/24/89	-	yes	-	0	0
06/25/89	-	yes	-	0	0
06/26/89	-	yes	-	0	0
06/27/89	-	-	-	0	0
06/28/89	-	yes	-	0	0
06/29/89	-	-	-	0	0
06/30/89	-	-	-	0	0
07/01/89	-	yes	-	0	0
07/02/89	0.05	yes	-	0	0
07/03/89	-	-	-	0	0
07/04/89	-	yes	-	0	0
07/05/89	-	-	10.1	0	0
07/06/89	-	-	9.9	0	0
07/07/89	-	-	7.9	0	0
07/08/89	-	yes	10.6	0	0
07/09/89	0.07	yes	14.3	0	0
07/10/89	-	-	13.7	0	0
07/11/89	0.37	-	14.2	0	5
07/12/89	-	-	13.2	0	5
07/13/89	-	-	10.8	0	4
07/14/89	-	-	8.8	0	3
07/15/89	-	-	15.8	0	3
07/16/89	0.33	-	14.3	0	6

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
07/17/89	-	-	15.4	0	5
07/18/89	-	-	-	0	4
07/19/89	0.25	-	-	0	5
07/20/89	0.20	-	-	0	5
07/21/89	0.83	yes	14.9	0	21
07/22/89	-	-	14.3	0	19
07/23/89	0.11	-	15.0	0	18
07/24/89	0.10	-	15.1	0	17
07/25/89	-	-	13.9	0	16
07/26/89	-	-	14.0	0	29
07/27/89	0.65	-	14.0	0	27
07/28/89	0.03	-	13.3	0	25
07/29/89	-	-	14.7	0	38
07/30/89	0.57	-	14.2	0	35
07/31/89	0.09	-	14.7	0	34
08/01/89	0.25	-	14.1	0	33
08/02/89	0.05	-	14.2	0	32
08/03/89	0.27	-	16.1	0	35
08/04/89	0.16	-	-	0	35
08/05/89	0.08	-	-	0	34
08/06/89	-	-	-	0	31
08/07/89	0.08	-	14.1	0	30
08/08/89	-	-	12.4	0	28
08/09/89	-	-	12.0	0	26
08/10/89	0.05	-	14.4	0	24
08/11/89	-	-	13.7	0	22
08/12/89	-	-	13.9	0	20
08/13/89	0.05	-	14.8	0	18
08/14/89	0.07	-	14.8	0	17
08/15/89	-	-	13.5	0	15
08/16/89	0.03	-	14.9	0	14
08/17/89	0.04	-	15.9	0	13
08/18/89	0.05	-	14.9	0	12
08/19/89	0.03	-	15.2	0	11
08/20/89	-	-	13.8	0	10
08/21/89	-	-	14.2	0	9
08/22/89	-	-	13.6	0	8
08/23/89	-	-	12.4	0	7
08/24/89	-	-	10.1	0	6
08/25/89	-	-	6.4	0	6
08/26/89	-	-	12.8	0	6
08/27/89	-	-	12.8	0	6
08/28/89	-	-	9.9	0	5
08/29/89	0.03	-	12.7	0	5
08/30/89	0.14	-	14.1	0	5
08/31/89	-	-	13.2	0	5

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
09/01/89	-	-	13.1	0	5
09/02/89	-	-	15.4	0	5
09/03/89	0.25	-	15.9	0	5
09/04/89	-	-	14.3	0	5
09/05/89	-	-	12.1	0	5
09/06/89	-	-	14.3	0	5
09/07/89	-	-	13.0	0	5
09/08/89	-	-	9.4	0	5
09/09/89	-	-	6.1	0	5
09/10/89	-	-	7.1	0	5
09/11/89	-	-	8.1	0	5
09/12/89	0.35	yes	15.5	0	10
09/13/89	-	-	12.6	0	9
09/14/89	-	-	7.8	0	8
09/15/89	-	-	11.4	0	7
09/16/89	-	-	6.0	0	6
09/17/89	-	-	10.7	0	6
09/18/89	-	-	11.6	0	6
09/19/89	-	-	10.5	0	6
09/20/89	-	-	9.7	0	6
09/21/89	-	-	5.2	0	6
09/22/89	0.15	-	14.7	0	6
09/23/89	-	-	10.8	0	6
09/24/89	-	-	7.9	0	6
09/25/89	-	-	6.6	0	6
09/26/89	-	-	5.9	0	6
09/27/89	-	-	4.8	0	6
09/28/89	-	-	4.2	0	6
09/29/89	-	-	4.0	0	6
09/30/89	-	-	4.1	0	6
10/01/89	-	-	5.0	0	6
10/02/89	-	-	9.4	0	6
10/03/89	-	-	9.7	0	6
10/04/89	1.25	-	-	0	35
10/05/89	2.11	-	-	36	59
10/06/89	-	-	-	0	49
10/07/89	-	-	-	0	45
10/08/89	-	-	-	0	41
10/09/89	-	-	-	0	39
10/10/89	-	-	-	0	37
10/11/89	-	-	7.0	0	34
10/12/89	-	-	7.3	0	32
10/13/89	-	-	6.5	0	30
10/14/89	-	-	7.5	0	28
10/15/89	-	-	4.7	0	27
10/16/89	-	-	7.2	0	26

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
10/17/89	-	-	6.1	0	25
10/18/89	-	-	7.2	0	24
10/19/89	-	-	7.0	0	24
10/20/89	0.02	-	8.9	0	24
10/21/89	0.08	-	8.8	0	24
10/22/89	-	-	9.5	0	23
10/23/89	-	-	9.5	0	22
10/24/89	-	-	7.7	0	21
10/25/89	-	yes	7.5	0	20
10/26/89	-	-	6.5	0	20
10/27/89	-	-	4.5	0	20
10/28/89	-	-	4.0	0	20
10/29/89	-	-	3.3	0	20
10/30/89	-	-	3.1	0	20
10/31/89	-	-	3.6	0	20
11/01/89	-	-	4.0	0	19
11/02/89	-	-	3.8	0	19
11/03/89	-	-	5.1	0	19
11/04/89	-	-	5.0	0	18
11/05/89	-	-	6.0	0	17
11/06/89	-	-	6.7	0	16
11/07/89	-	-	5.3	0	15
11/08/89	-	-	5.8	0	15
11/09/89	-	-	3.1	0	14
11/10/89	-	-	3.4	0	13
11/11/89	-	-	3.8	0	12
11/12/89	-	-	4.3	0	12
11/13/89	-	-	5.6	0	12
11/14/89	-	-	6.6	0	12
11/15/89	-	-	4.5	0	12
11/16/89	-	-	2.4	0	12
11/17/89	-	-	3.1	0	12
11/18/89	-	-	3.6	0	12
11/19/89	-	yes	4.8	0	12
11/20/89	-	-	8.5	0	12
11/21/89	0.02	-	6.9	0	12
11/22/89	-	-	6.5	0	12
11/23/89	-	-	4.9	0	12
11/24/89	-	-	4.2	0	12
11/25/89	-	-	6.0	0	12
11/26/89	-	-	7.0	0	12
11/27/89	-	-	5.5	0	12
11/28/89	-	-	2.8	0	12
11/29/89	-	-	2.5	0	12
11/30/89	-	-	3.4	0	12
12/01/89	-	-	3.4	0	12

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
12/02/89	-	-	3.8	0	12
12/03/89	-	-	5.2	0	12
12/04/89	-	-	5.7	0	12
12/05/89	-	-	3.3	0	12
12/06/89	-	-	3.4	0	12
12/07/89	-	-	2.3	0	12
12/08/89	-	-	3.2	0	12
12/09/89	-	-	2.9	0	12
12/10/89	-	yes	2.4	0	12
12/11/89	-	yes	1.5	0	12
12/12/89	-	-	1.9	0	12
12/13/89	-	-	1.9	0	12
12/14/89	-	-	2.3	0	12
12/15/89	-	-	2.3	0	12
12/16/89	-	-	3.8	0	12
12/17/89	-	-	4.8	0	12
12/18/89	-	-	5.7	0	12
12/19/89	-	-	-	0	12
12/20/89	-	-	-	0	12
12/21/89	-	-	-	0	12
12/22/89	-	-	-	0	12
12/23/89	-	-	-	0	12
12/24/89	-	-	-	0	12
12/25/89	-	-	-	0	12
12/26/89	-	-	-	0	12
12/27/89	-	-	-	0	12
12/28/89	-	-	6.6	0	12
12/29/89	0.05	-	5.3	0	12
12/30/89	0.05	-	4.9	0	12
12/31/89	-	-	4.4	0	12
01/01/90	-	-	2.4	0	12
01/02/90	0.10	yes	5.3	0	15
01/03/90	0.25	-	4.1	0	21
01/04/90	-	-	4.2	0	21
01/05/90	-	-	4.5	0	21
01/06/90	-	-	3.9	0	21
01/07/90	-	-	3.0	0	21
01/08/90	-	-	3.8	0	21
01/09/90	-	-	4.9	0	21
01/10/90	-	-	4.2	0	21
01/11/90	-	-	4.0	0	21
01/12/90	-	-	3.7	0	21
01/13/90	-	-	6.2	0	21
01/14/90	-	-	5.8	0	21
01/15/90	-	-	5.3	0	21
01/16/90	-	-	4.6	0	21

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
01/17/90	-	-	3.0	0	21
01/18/90	-	-	4.1	0	21
01/19/90	0.15	-	4.3	0	25
01/20/90	-	-	3.4	0	25
01/21/90	-	-	3.1	0	25
01/22/90	-	-	6.5	0	25
01/23/90	0.05	-	6.5	0	25
01/24/90	-	-	4.7	0	25
01/25/90	-	-	0.8	0	25
01/26/90	-	-	1.3	0	25
01/27/90	-	-	1.3	0	25
01/28/90	-	-	2.5	0	25
01/29/90	-	-	1.3	0	25
01/30/90	-	-	1.5	0	25
01/31/90	0.12	-	4.5	0	28
02/01/90	0.05	yes	5.2	0	29
02/02/90	0.22	-	3.9	0	35
02/03/90	-	-	3.7	0	35
02/04/90	-	-	3.3	0	34
02/05/90	-	yes	4.5	0	34
02/06/90	-	-	4.2	0	33
02/07/90	-	-	4.6	0	32
02/08/90	-	-	6.3	0	32
02/09/90	0.12	-	4.9	0	35
02/10/90	-	-	4.7	0	34
02/11/90	-	-	5.4	0	33
02/12/90	-	yes	4.6	0	32
02/13/90	-	yes	4.8	0	31
02/14/90	0.06	yes	4.4	0	33
02/15/90	0.08	yes	2.2	0	35
02/16/90	-	-	2.3	0	35
02/17/90	-	-	2.0	0	35
02/18/90	-	-	2.1	0	35
02/19/90	-	yes	3.4	0	35
02/20/90	-	-	3.8	0	35
02/21/90	-	-	4.0	0	35
02/22/90	-	-	4.9	0	34
02/23/90	-	-	2.8	0	33
02/24/90	-	-	2.3	0	32
02/25/90	-	-	2.2	0	31
02/26/90	-	-	4.0	0	30
02/27/90	-	-	5.4	0	29
02/28/90	-	-	7.7	0	28
03/01/90	-	-	6.5	0	27
03/02/90	-	-	4.5	0	26
03/03/90	-	-	4.1	0	25

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
03/04/90	-	-	5.0	0	24
03/05/90	-	yes	6.3	0	24
03/06/90	-	-	3.3	0	24
03/07/90	-	-	3.1	0	24
03/08/90	-	-	2.5	0	24
03/09/90	-	-	4.4	0	23
03/10/90	0.12	-	6.4	0	25
03/11/90	-	-	4.4	0	25
03/12/90	-	-	5.0	0	25
03/13/90	-	yes	4.0	0	25
03/14/90	-	yes	2.2	0	25
03/15/90	-	yes	2.2	0	25
03/16/90	-	-	2.1	0	25
03/17/90	-	-	1.6	0	24
03/18/90	-	-	1.8	0	24
03/19/90	-	-	3.0	0	23
03/20/90	-	-	4.1	0	22
03/21/90	-	-	3.7	0	21
03/22/90	-	-	3.1	0	20
03/23/90	-	-	3.2	0	19
03/24/90	-	-	3.3	0	18
03/25/90	-	-	3.5	0	17
03/26/90	-	-	3.0	0	16
03/27/90	-	-	3.1	0	15
03/28/90	-	-	3.2	0	14
03/29/90	0.09	-	4.8	0	16
03/30/90	-	-	5.1	0	18
03/31/90	0.10	-	5.7	0	18
04/01/90	-	-	6.0	0	18
04/02/90	-	-	5.3	0	18
04/03/90	-	-	6.0	0	17
04/04/90	-	-	6.3	0	16
04/05/90	-	-	7.2	0	15
04/06/90	-	-	7.8	0	14
04/07/90	-	-	6.8	0	13
04/08/90	-	yes	6.7	0	12
04/09/90	-	yes	6.1	0	12
04/10/90	-	-	4.5	0	11
04/11/90	-	-	3.4	0	10
04/12/90	-	-	3.3	0	9
04/13/90	-	-	2.9	0	8
04/14/90	-	-	3.4	0	8
04/15/90	-	-	3.0	0	8
04/16/90	-	yes	3.2	0	8
04/17/90	-	yes	4.6	0	8
04/18/90	-	yes	4.7	0	8

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
4/19/90	-	-	6.3	0	8
4/20/90	-	-	5.3	0	8
4/21/90	-	-	4.1	0	8
4/22/90	-	-	4.4	0	8
4/23/90	-	yes	3.7	0	8
4/24/90	0.44	yes	7.0	0	18
4/25/90	-	-	5.6	0	18
4/26/90	-	yes	6.8	0	17
4/27/90	-	yes	3.3	0	16
4/28/90	-	yes	3.0	0	15
4/29/90	-	yes	2.5	0	14
4/30/90	-	yes	4.0	0	13
5/1/90	-	yes	7.5	0	13
5/2/90	0.03	-	6.6	0	13
5/3/90	-	-	6.4	0	12
5/4/90	-	-	6.1	0	11
5/5/90	-	-	6.3	0	10
5/6/90	-	-	5.5	0	10
5/7/90	-	-	6.0	0	9
5/8/90	-	yes	4.6	0	8
5/9/90	-	-	3.9	0	8
5/10/90	-	yes	4.0	0	8
5/11/90	-	yes	4.1	0	8
5/12/90	-	-	4.5	0	8
5/13/90	-	yes	4.1	0	8
5/14/90	-	yes	9.5	0	8
5/15/90	-	-	7.2	0	8
5/16/90	-	-	4.7	0	8
5/17/90	-	-	3.7	0	7
5/18/90	-	-	2.8	0	6
5/19/90	-	yes	2.8	0	6
5/20/90	-	-	4.0	0	6
5/21/90	-	-	5.4	0	6
5/22/90	-	yes	5.9	0	6
5/23/90	-	-	6.6	0	5
5/24/90	-	-	6.3	0	5
5/25/90	-	yes	6.0	0	5
5/26/90	-	-	4.9	0	5
5/27/90	-	-	3.9	0	5
5/28/90	-	yes	4.6	0	5
5/29/90	-	-	7.9	0	5
5/30/90	-	-	7.2	0	5
5/31/90	-	-	6.3	0	5
6/1/90	-	yes	6.1	0	5
6/2/90	-	-	6.4	0	5
6/3/90	-	-	6.1	0	5

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
6/4/90	-	-	5.3	0	4
6/5/90	-	yes	4.8	0	4
6/6/90	-	-	6.6	0	4
6/7/90	0.52	-	15.1	0	12
6/8/90	0.01	-	12.9	0	11
6/9/90	0.17	-	14.1	0	11
6/10/90	0.24	-	12.2	0	13
6/11/90	-	-	7.8	0	12
6/12/90	-	yes	6.0	0	11
6/13/90	-	yes	3.5	0	10
6/14/90	-	yes	5.8	0	9
6/15/90	-	yes	7.4	0	8
6/16/90	-	-	4.2	0	7
6/17/90	-	-	4.1	0	6
6/18/90	-	-	6.7	0	5
6/19/90	-	-	5.8	0	4
6/20/90	-	-	3.6	0	4
6/21/90	-	-	4.1	0	4
6/22/90	-	-	3.6	0	3
6/23/90	-	-	3.6	0	3
6/24/90	-	-	9.7	0	3
6/25/90	-	-	7.5	0	3
6/26/90	-	-	6.2	0	2
6/27/90	-	-	8.3	0	2
6/28/90	-	-	6.6	0	2
6/29/90	-	-	11.8	0	2
6/30/90	-	-	10.0	0	2
7/1/90	-	-	9.3	0	2
7/2/90	0.57	-	13.4	0	11
7/3/90	-	-	13.9	0	10
7/4/90	-	-	15.2	0	9
7/5/90	-	-	15.1	0	8
7/6/90	-	-	13.8	0	7
7/7/90	0.75	-	13.6	0	22
7/8/90	1.58	-	14.2	8	52
7/9/90	0.17	-	14.1	0	51
7/10/90	-	-	15.7	0	45
7/11/90	0.06	-	16.4	0	42
7/12/90	0.58	-	15.7	2	51
7/13/90	-	-	15.1	0	45
7/14/90	-	-	15.3	0	41
7/15/90	0.87	-	14.8	9	52
7/16/90	0.25	-	15.4	2	51
7/17/90	-	-	14.8	0	46
7/18/90	-	-	15.7	0	41
7/19/90	-	-	14.5	0	37

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
7/20/90	0.15	-	14.3	0	37
7/21/90	-	-	15.6	0	33
7/22/90	-	-	13.5	0	30
7/23/90	0.06	-	14.0	0	29
7/24/90	0.10	-	12.5	0	28
7/25/90	-	-	13.0	0	26
7/26/90	-	-	13.3	0	24
7/27/90	-	-	8.6	0	22
7/28/90	-	-	8.6	0	20
7/29/90	0.40	-	11.5	0	25
7/30/90	-	-	13.9	0	23
7/31/90	-	-	14.6	0	21
8/1/90	0.32	-	13.4	0	25
8/2/90	0.42	-	13.0	0	33
8/3/90	0.74	-	13.4	0	48
8/4/90	-	-	13.3	0	44
8/5/90	-	-	12.9	0	40
8/6/90	-	-	13.0	0	38
8/7/90	0.45	-	13.6	0	46
8/8/90	-	-	12.9	0	42
8/9/90	0.02	-	13.8	0	39
8/10/90	-	-	12.9	0	36
8/11/90	-	-	13.1	0	33
8/12/90	1.50	-	12.1	18	55
8/13/90	0.65	-	13.2	15	55
8/14/90	0.06	-	12.8	0	50
8/15/90	0.40	-	13.7	6	52
8/16/90	0.56	-	13.2	11	53
8/17/90	-	-	13.1	0	47
8/18/90	-	-	12.4	0	42
8/19/90	-	-	10.8	0	39
8/20/90	-	-	12.9	0	36
8/21/90	-	-	11.6	0	33
8/22/90	-	-	11.9	0	30
8/23/90	-	-	10.9	0	28
8/24/90	-	-	7.9	0	26
8/25/90	-	-	9.5	0	24
8/26/90	-	-	12.2	0	22
8/27/90	-	-	15.4	0	20
8/28/90	-	-	12.4	0	18
8/29/90	-	-	15.1	0	16
8/30/90	-	-	14.4	0	15
8/31/90	0.93	-	15.3	0	35
9/1/90	0.18	-	14.3	0	36
9/2/90	-	-	15.1	0	33
9/3/90	-	-	13.9	0	30

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
9/4/90	0.14	-	13.6	0	30
9/5/90	0.83	-	13.5	0	48
9/6/90	-	-	13.1	0	44
9/7/90	-	-	13.6	0	40
9/8/90	0.08	-	15.7	0	38
9/9/90	-	-	15.3	0	34
9/10/90	-	-	12.8	0	31
9/11/90	-	-	13.4	0	28
9/12/90	-	-	14.1	0	26
9/13/90	-	-	12.5	0	24
9/14/90	0.05	-	14.0	0	23
9/15/90	-	-	14.4	0	21
9/16/90	-	-	13.0	0	20
9/17/90	-	-	10.3	0	19
9/18/90	-	-	10.2	0	18
9/19/90	-	-	11.4	0	17
9/20/90	0.20	-	11.8	0	19
9/21/90	-	-	10.7	0	18
9/22/90	0.33	-	10.7	0	24
9/23/90	-	-	12.9	0	23
9/24/90	-	-	11.2	0	22
9/25/90	-	-	11.3	0	20
9/26/90	-	-	8.3	0	19
9/27/90	-	-	5.9	0	17
9/28/90	-	-	5.6	0	16
9/29/90	0.11	-	7.5	0	16
9/30/90	0.26	-	10.4	0	21
10/1/90	1.20	-	11.1	0	49
10/2/90	0.02	-	10.6	0	48
10/3/90	-	-	10.1	0	46
10/4/90	-	-	8.7	0	43
10/5/90	-	-	9.4	0	40
10/6/90	-	-	10.4	0	38
10/7/90	0.14	-	10.6	0	39
10/8/90	0.28	-	10.6	0	44
10/9/90	-	-	4.6	0	42
10/10/90	-	-	5.8	0	40
10/11/90	-	-	4.1	0	38
10/12/90	-	-	3.8	0	36
10/13/90	-	-	3.9	0	35
10/14/90	-	-	6.3	0	34
10/15/90	-	-	6.8	0	33
10/16/90	-	-	9.9	0	32
10/17/90	-	-	7.8	0	31
10/18/90	-	-	8.6	0	29
10/19/90	-	yes	8.2	0	28

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
10/20/90	-	-	5.3	0	27
10/21/90	-	-	4.6	0	26
10/22/90	-	-	5.3	0	25
10/23/90	-	-	5.3	0	24
10/24/90	-	-	5.3	0	23
10/25/90	-	-	5.1	0	22
10/26/90	-	-	4.7	0	21
10/27/90	-	-	4.6	0	20
10/28/90	-	-	5.1	0	19
10/29/90	-	-	5.8	0	18
10/30/90	-	-	6.7	0	17
10/31/90	-	-	9.1	0	16
11/1/90	-	-	10.8	0	15
11/2/90	0.01	yes	6.0	0	15
11/3/90	-	-	3.8	0	15
11/4/90	-	-	4.3	0	15
11/5/90	-	-	3.6	0	14
11/6/90	0.08	-	7.1	0	14
11/7/90	0.29	yes	5.4	0	20
11/8/90	0.03	-	4.2	0	20
11/9/90	-	-	4.8	0	20
11/10/90	-	-	5.5	0	19
11/11/90	-	-	5.7	0	18
11/12/90	-	-	5.4	0	17
11/13/90	-	-	5.7	0	16
11/14/90	-	-	5.2	0	15
11/15/90	-	-	4.6	0	14
11/16/90	-	-	6.5	0	13
11/17/90	-	-	4.5	0	12
11/18/90	-	-	5.9	0	12
11/19/90	-	-	7.9	0	12
11/20/90	-	yes	5.9	0	12
11/21/90	-	-	4.3	0	12
11/22/90	-	-	4.4	0	12
11/23/90	-	-	7.2	0	12
11/24/90	-	-	9.5	0	12
11/25/90	0.19	-	8.7	0	15
11/26/90	0.44	yes	4.2	0	26
11/27/90	-	-	3.5	0	26
11/28/90	-	-	3.0	0	25
11/29/90	-	-	4.3	0	25
11/30/90	-	-	5.1	0	25
12/1/90	-	-	4.4	0	25
12/2/90	-	-	2.5	0	25
12/3/90	-	-	2.4	0	25
12/4/90	-	-	3.3	0	25

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
12/05/90	-	-	3.7	0	25
12/06/90	-	-	2.9	0	25
12/07/90	-	-	2.4	0	25
12/08/90	-	-	2.5	0	25
12/09/90	-	-	3.2	0	25
12/10/90	-	-	4.7	0	25
12/11/90	-	-	8.0	0	25
12/12/90	-	-	8.4	0	25
12/13/90	0.06	-	7.2	0	26
12/14/90	-	-	6.2	0	25
12/15/90	-	-	6.8	0	25
12/16/90	0.72	yes	4.7	0	43
12/17/90	-	-	3.6	0	43
12/18/90	-	-	3.6	0	43
12/19/90	-	yes	3.5	0	42
12/20/90	-	yes	5.2	0	42
12/21/90	0.34	yes	4.6	1	50
12/22/90	0.03	yes	3.0	0	51
12/23/90	-	-	2.4	1	50
12/24/90	-	-	2.9	0	50
12/25/90	-	-	3.2	0	50
12/26/90	-	-	3.3	0	50
12/27/90	0.35	-	6.1	8	52
12/28/90	0.19	-	7.5	4	52
12/29/90	-	yes	6.6	0	49
12/30/90	-	-	6.3	0	48
12/31/90	-	-	5.8	0	47
01/01/91	-	-	5.0	0	46
01/02/91	-	-	6.0	0	45
01/03/91	-	-	6.1	0	44
01/04/91	0.09	-	7.8	0	45
01/05/91	0.60	-	7.4	9	52
01/06/91	-	-	6.6	0	50
01/07/91	-	-	6.1	0	48
01/08/91	-	-	6.1	0	47
01/09/91	-	-	5.5	0	46
01/10/91	-	-	5.0	0	46
01/11/91	-	-	4.8	0	46
01/12/91	-	-	3.8	0	45
01/13/91	-	-	3.5	0	44
01/14/91	-	yes	3.6	0	44
01/15/91	-	-	3.3	0	44
01/16/91	0.36	-	5.0	3	51
01/17/91	0.06	-	4.7	2	51
01/18/91	-	-	4.1	0	50
01/19/91	-	-	4.2	0	50

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
01/20/91	-	-	4.8	0	50
01/21/91	-	-	4.4	0	50
01/22/91	-	-	4.9	0	50
01/23/91	-	-	4.4	0	50
01/24/91	-	-	3.4	0	50
01/25/91	-	-	2.6	0	49
01/26/91	-	-	2.7	0	48
01/27/91	-	-	2.5	0	47
01/28/91	-	-	4.8	0	46
01/29/91	-	-	2.8	0	46
01/30/91	-	-	2.4	0	46
01/31/91	-	-	2.5	0	45
02/01/91	-	-	2.8	0	44
02/02/91	-	-	3.4	0	43
02/03/91	-	-	3.1	0	42
02/04/91	-	-	2.8	0	41
02/05/91	-	-	3.0	0	40
02/06/91	-	-	3.4	0	39
02/07/91	-	-	3.5	0	38
02/08/91	-	-	3.4	0	37
02/09/91	-	-	3.7	0	36
02/10/91	-	-	6.7	0	35
02/11/91	0.32	-	7.5	0	42
02/12/91	0.72	-	6.8	9	52
02/13/91	-	-	6.0	0	50
02/14/91	-	-	4.2	0	47
02/15/91	-	-	4.4	0	46
02/16/91	-	yes	5.5	0	45
02/17/91	-	yes	5.8	0	44
02/18/91	0.33	-	4.0	2	51
02/19/91	-	-	2.7	0	50
02/20/91	-	-	3.6	0	49
02/21/91	-	-	4.0	0	48
02/22/91	-	-	3.3	0	46
02/23/91	-	-	3.3	0	45
02/24/91	-	-	3.3	0	44
02/25/91	-	-	3.0	0	43
02/26/91	-	-	4.9	0	42
02/27/91	-	-	7.0	0	41
02/28/91	0.84	yes	6.7	11	53
03/01/91	0.30	yes	6.2	8	53
03/02/91	-	yes	5.1	0	51
03/03/91	-	-	3.7	0	49
03/04/91	-	-	5.7	0	47
03/05/91	-	yes	6.7	0	45
03/06/91	-	yes	4.4	0	44

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
03/07/91	-	-	3.9	0	44
03/08/91	-	-	4.1	0	43
03/09/91	-	-	3.4	0	41
03/10/91	-	-	3.4	0	39
03/11/91	-	yes	4.2	0	38
03/12/91	-	-	3.2	0	37
03/13/91	-	-	2.9	0	36
03/14/91	-	yes	3.6	0	36
03/15/91	0.12	yes	4.5	0	39
03/16/91	0.11	-	3.3	0	42
03/17/91	-	-	2.8	0	41
03/18/91	-	-	3.3	0	39
03/19/91	-	yes	5.0	0	39
03/20/91	0.13	yes	5.0	0	41
03/21/91	0.29	yes	4.1	0	48
03/22/91	0.02	-	4.5	0	49
03/23/91	-	-	4.0	0	48
03/24/91	-	-	2.4	0	46
03/25/91	-	-	5.8	0	45
03/26/91	0.26	yes	4.1	2	51
03/27/91	0.17	yes	4.6	4	51
03/28/91	0.10	-	4.7	3	51
03/29/91	-	-	3.9	0	49
03/30/91	-	-	2.7	0	48
03/31/91	-	-	2.9	0	46
04/01/91	-	yes	4.2	0	44
04/02/91	-	-	4.4	0	42
04/03/91	-	-	5.0	0	40
04/04/91	-	-	5.5	0	38
04/05/91	-	-	4.7	0	36
04/06/91	-	-	5.0	0	34
04/07/91	-	-	3.6	0	32
04/08/91	-	-	3.7	0	31
04/09/91	-	-	4.0	0	30
04/10/91	-	yes	3.7	0	29
04/11/91	-	yes	2.7	0	28
04/12/91	-	-	2.3	0	27
04/13/91	-	-	2.6	0	26
04/14/91	-	-	3.1	0	25
04/15/91	-	-	2.8	0	24
04/16/91	-	-	2.9	0	23
04/17/91	-	-	4.3	0	22
04/18/91	-	-	4.0	0	21
04/19/91	-	-	3.8	0	20
04/20/91	-	yes	4.0	0	19
04/21/91	-	-	2.9	0	18

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
04/22/91	-	-	4.5	0	17
04/23/91	-	-	5.3	0	16
04/24/91	-	-	4.4	0	15
04/25/91	-	-	5.7	0	14
04/26/91	-	-	5.9	0	13
04/27/91	-	yes	3.1	0	13
04/28/91	-	yes	2.5	0	13
04/29/91	-	-	3.2	0	12
04/30/91	-	-	3.4	0	12
05/01/91	-	-	3.5	0	11
05/02/91	-	yes	2.8	0	11
05/03/91	-	-	3.6	0	11
05/04/91	-	-	3.5	0	11
05/05/91	-	-	3.6	0	10
05/06/91	-	-	3.5	0	9
05/07/91	-	-	4.3	0	8
05/08/91	-	-	5.2	0	8
05/09/91	-	yes	5.2	0	8
05/10/91	-	yes	5.1	0	8
05/11/91	-	-	4.0	0	8
05/12/91	-	-	4.1	0	8
05/13/91	-	-	3.9	0	8
05/14/91	-	yes	3.7	0	8
05/15/91	-	-	4.6	0	8
05/16/91	-	-	4.5	0	8
05/17/91	-	-	5.1	0	8
05/18/91	-	-	4.9	0	8
05/19/91	-	-	5.3	0	8
05/20/91	-	-	5.5	0	8
05/21/91	-	-	8.1	0	8
05/22/91	-	-	7.6	0	8
05/23/91	-	-	6.0	0	8
05/24/91	-	-	6.0	0	8
05/25/91	-	-	5.6	0	7
05/26/91	-	-	5.3	0	7
05/27/91	-	-	5.4	0	7
05/28/91	-	-	5.4	0	7
05/29/91	-	-	4.4	0	7
05/30/91	-	-	3.5	0	7
05/31/91	-	yes	5.7	0	7
Jun-89	0.00	-	-	-	-
Jul-89	3.65	-	13.2	-	-
Aug-89	1.38	-	13.4	-	-
Sep-89	0.75	-	9.8	-	-

Date	Precip	High Winds	Air Moisture gm/m3	Moisture Surplus	Moisture Balance
Oct- 89	3.46	-	6.7	-	-
Nov-89	0.02	-	4.8	-	-
Dec-89	0.10	-	3.7	-	-
Jan-90	0.67	-	3.8	-	-
Feb-90	0.53	-	4.1	-	-
Mar-90	0.31	-	3.8	-	-
Apr- 90	0.44	-	4.9	-	-
May-90	0.03	-	5.5	-	-
Jun-90	0.94	-	7.2	-	-
Jul-90	5.54	-	13.8	-	-
Aug-90	6.05	-	12.8	-	-
Sep-90	2.18	-	12.0	-	-
Oct- 90	1.64	-	7.0	-	-
Nov-90	1.04	-	5.6	-	-
Dec-90	1.69	-	4.5	-	-
Jan-91	1.11	-	4.6	-	-
Feb-91	2.21	-	4.4	-	-
Mar-91	1.50	-	4.1	-	-
Apr- 91	0.00	-	3.9	-	-
May-91	0.00	-	4.8	-	-

Tombstone Monthly Temperatures and Precipitation

	January		February		March		April		May		June		July	
	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.
1931	45.7	0.64	48.6	3.15	54.4	0.00	62.1	0.44	70.2	0.39	77.6	0.42	79.9	4.06
1932	41.6	1.17	51.3	1.19	53.5	0.27	61.5	0.13	68.4	0.00	77.2	0.00	78.6	8.30
1933	45.2	0.89	45.3	1.16	56.0	0.00	58.2	0.14	65.1	0.00	77.4	0.50	79.8	4.78
1934	46.6	0.25	53.8	0.47	60.2	0.15	64.8	0.35	72.2	0.11	76.2	0.51	80.4	1.86
1935	50.2	0.52	49.0	1.52	54.2	0.59	62.3	0.04	63.4	0.11	79.0	0.18	81.0	1.98
1936	47.8	0.56	48.8	0.79	56.0	0.02	64.2	0.02	72.6	0.00	80.3	0.38	80.6	2.23
1937	39.8	1.01	50.0	0.08	53.2	0.69	61.7	0.00	71.2	0.04	77.4	0.70	80.2	2.86
1938	49.8	0.83	50.8	0.63	53.8	0.61	61.8	0.20	68.4	T	79.0	1.15	77.7	2.40
1939	46.6	0.75	42.5	0.68	55.8	0.00	63.4	0.35	70.4	0.00	79.0	T	78.8	3.96
1940	47.5	0.48	47.6	2.25	57.0	0.25	61.2	0.11	69.0	0.00	75.8	1.23	78.4	2.66
1941	46.6	0.95	51.0	1.18	54.2	0.13	57.6	0.85	70.5	0.39	77.0	0.00	79.2	1.19
1942	49.5	0.52	47.8	1.14	53.2	0.22	60.6	1.68	72.2	0.00	79.3	0.00	82.6	0.93
1943	49.6	0.45	53.8	0.13	57.0	0.41	66.1	0.00	72.4	T	78.4	1.96	80.3	1.41
1944	44.8	0.52	47.6	0.50	51.2	1.01	59.0	0.33	69.5	0.00	76.9	T	79.6	3.10
1945	46.4	0.73	50.4	0.16	50.5	0.47	60.0	0.09	71.2	0.00	76.2	0.00	79.8	5.59
1946	42.0	1.91	48.2	0.00	55.0	0.09	67.1	0.00	69.6	0.00	81.8	0.17	79.4	4.75
1947	-	-	-	-	58.2	0.29	60.9	0.11	71.8	0.59	75.8	0.10	80.6	1.00
1948	48.0	0.02	48.2	1.03	50.5	0.01	66.0	0.00	72.1	0.00	80.4	0.00	81.8	6.23
1949	37.2	2.64	47.2	0.99	-	-	-	-	72.0	0.00	76.7	1.90	78.3	7.16
1950	50.6	0.46	56.6	0.44	58.8	0.18	66.8	0.00	69.3	0.00	77.3	0.65	76.1	7.17
1951	50.3	1.39	-	0.24	-	0.36	57.7	1.27	-	-	76.1	0.00	80.7	1.10
1952	50.7	0.46	-	-	46.4	2.54	-	-	-	-	-	-	-	-
1953	-	0.01	-	1.28	57.3	0.60	61.0	0.59	64.9	0.00	80.4	0.21	80.1	3.56
1954	50.9	0.83	55.2	0.23	54.3	0.34	67.8	0.00	71.8	0.88	78.2	2.72	80.6	2.45
1955	-	1.61	45.7	0.28	55.4	0.43	60.0	0.00	67.7	0.01	77.5	0.57	78.0	11.53
1956	52.4	0.79	46.1	0.42	57.5	0.00	60.4	0.00	72.6	0.03	80.4	0.56	78.0	4.88
1957	50.3	2.13	58.0	0.30	55.0	1.67	60.4	0.19	65.7	0.47	79.2	0.43	80.5	2.50
1958	45.9	0.05	51.6	1.42	49.5	2.96	60.1	0.92	74.2	0.08	80.2	0.31	79.8	2.25
1959	51.4	0.00	49.4	0.62	55.2	0.00	65.1	0.32	69.0	0.00	80.5	1.05	78.9	4.69
1960	43.4	2.04	45.5	0.60	58.7	0.48	62.8	0.00	69.5	0.00	80.0	0.20	79.2	1.73
1961	48.3	0.57	51.0	0.27	54.6	0.11	63.9	0.00	71.0	0.00	80.3	1.19	80.1	1.49
1962	45.2	1.72	52.8	0.18	50.6	0.75	66.7	0.00	68.2	0.00	76.4	0.00	77.0	5.07
1963	48.6	0.33	54.2	0.39	54.0	0.04	59.6	0.15	72.9	0.00	76.5	0.01	80.9	3.14

Tombstone Monthly Temperatures and Precipitation

	August		September		October		November		December		Mean Annual	Total Annual
	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temperature	Precipitation
1931	74.6	8.22	72.8	3.43	66.0	0.20	50.8	1.77	45.6	1.10	62.4	23.82
1932	77.8	2.95	74.4	0.03	64.5	0.09	57.6	0.00	44.6	2.22	62.6	16.35
1933	77.6	2.31	75.0	2.61	65.9	0.61	56.8	0.54	56.8	0.00	63.3	13.54
1934	75.3	3.93	75.0	0.84	69.2	0.38	55.4	0.31	50.9	2.05	65.0	11.21
1935	75.7	6.37	71.6	0.66	66.6	0.00	54.4	1.79	47.6	1.35	62.9	15.11
1936	78.1	3.01	73.0	1.49	66.2	0.05	54.4	2.01	47.9	0.51	64.2	11.07
1937	78.6	4.82	75.8	0.32	67.2	1.36	57.1	0.00	49.6	1.09	63.5	12.97
1938	77.7	4.03	73.4	4.84	67.2	0.04	53.6	0.00	51.1	1.89	63.7	16.62
1939	75.8	4.33	72.0	2.46	62.2	1.55	54.4	0.76	-	0.42	63.7	15.26
1940	-	-	73.8	1.90	65.8	0.10	53.2	0.99	51.5	1.44	61.9	11.41
1941	77.8	2.13	74.2	3.02	63.4	0.17	56.2	0.45	48.4	1.83	63.0	12.29
1942	78.6	2.21	75.8	1.19	64.5	0.66	60.6	0.00	50.2	0.52	64.6	9.07
1943	77.4	4.39	75.2	2.05	64.4	0.63	55.6	0.00	46.6	0.56	64.7	11.99
1944	78.7	4.68	72.6	1.61	66.6	1.01	51.0	1.02	47.4	1.27	62.1	15.05
1945	78.8	1.39	74.2	0.10	67.0	0.60	56.6	0.00	45.8	0.25	63.1	9.38
1946	77.5	3.76	75.5	2.07	62.8	1.04	51.6	0.58	50.9	0.41	63.5	14.78
1947	78.2	2.12	77.0	0.63	67.6	0.04	51.4	0.70	42.8	0.31	66.4	5.89
1948	77.4	4.03	74.6	1.06	65.3	0.59	54.0	0.00	47.0	1.10	63.8	14.07
1949	80.7	1.55	76.7	2.82	-	0.43	60.1	0.00	46.7	1.20	64.0	18.69
1950	-	1.88	74.5	0.06	75.5	0.00	62.0	0.00	56.2	0.00	65.8	10.84
1951	-	-	-	-	68.1	1.35	55.1	0.61	47.7	0.54	62.2	6.86
1952	-	-	-	-	-	-	-	-	-	-	48.6	3.00
1953	78.0	0.91	77.1	0.00	68.8	0.09	57.7	0.09	46.4	0.06	67.2	7.40
1954	74.4	6.51	76.5	0.34	69.2	0.55	58.6	0.00	50.1	0.03	65.6	14.88
1955	75.3	3.66	75.6	0.31	69.3	0.00	56.5	0.06	53.6	0.31	65.0	18.77
1956	76.3	1.60	78.0	0.00	67.6	0.32	52.8	0.10	48.7	0.19	64.2	8.89
1957	76.6	5.98	74.5	0.00	63.2	1.97	50.2	0.08	51.5	0.77	63.8	16.49
1958	76.6	7.09	73.5	2.46	64.1	2.10	54.6	0.80	53.5	0.00	63.6	20.44
1959	75.1	4.20	74.8	0.06	65.6	1.31	53.4	1.04	47.8	1.42	63.9	14.71
1960	78.3	1.28	75.8	1.29	63.7	0.70	57.8	0.02	47.0	0.48	63.5	8.82
1961	76.4	4.95	73.1	0.64	64.8	2.13	51.8	0.66	47.8	1.31	63.6	13.32
1962	80.9	0.67	75.2	1.61	67.6	0.31	59.6	0.78	50.8	1.22	64.3	12.31
1963	76.2	3.19	75.4	2.35	69.2	0.35	54.9	1.52	49.3	1.31	64.3	12.78

Tombstone Monthly Temperatures and Precipitation

	January		February		March		April		May		June		July	
	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.
1964	45.9	0.30	44.9	0.00	51.0	0.93	58.7	0.00	68.9	0.00	77.0	0.02	78.8	4.79
1965	50.7	0.94	48.1	0.13	51.8	0.41	61.8	0.07	67.9	0.11	73.6	0.12	78.5	4.09
1966	45.0	0.50	44.8	0.88	56.2	0.09	63.1	0.20	70.9	0.03	77.7	0.07	79.2	3.96
1967	49.6	0.00	52.6	0.41	60.9	0.06	58.9	0.20	66.9	0.30	74.8	0.40	78.3	2.82
1968	48.2	0.65	54.3	1.45	53.0	1.22	57.1	0.25	67.6	0.00	79.1	0.00	-	-
1969	-	0.59	-	0.70	49.4	0.12	62.9	0.00	70.2	0.55	77.1	0.00	79.0	5.60
1970	46.1	0.00	51.8	0.27	51.1	1.48	57.3	0.23	70.0	0.11	78.9	0.04	81.6	1.36
1971	50.0	0.06	50.1	0.30	58.2	0.00	61.2	0.00	67.8	0.00	78.7	0.10	83.1	3.23
1972	49.1	0.00	54.0	0.00	62.7	-	63.7	-	69.3	0.11	77.3	1.81	81.6	2.63
1973	45.0	0.48	50.1	1.40	49.9	2.72	57.5	0.00	69.6	0.16	78.4	0.70	80.1	3.47
1974	48.7	1.47	48.9	-	58.3	0.45	63.4	-	71.8	0.12	82.8	0.05	78.7	4.50
1975	47.7	0.60	48.2	-	52.2	0.40	56.4	0.45	66.5	0.07	77.2	0.00	77.6	5.80
1976	47.1	0.15	52.3	1.15	53.3	0.32	59.5	0.60	67.3	0.80	76.9	0.03	76.8	3.11
1977	45.1	1.42	50.9	0.00	51.2	0.50	62.1	0.04	68.2	0.03	79.9	0.25	79.1	2.70
1978	47.9	2.55	47.6	1.97	56.7	0.73	61.7	0.12	69.3	0.58	81.7	0.30	82.5	2.60
1979	42.1	2.95	49.8	0.34	52.5	0.79	61.2	0.02	66.2	0.41	76.3	0.66	81.1	2.53
1980	49.2	0.48	53.2	1.16	52.7	0.57	61.4	0.00	67.2	0.05	82.2	0.06	82.3	2.95
1981	46.7	0.77	49.8	0.64	50.2	1.60	63.5	0.16	68.0	0.05	80.3	1.50	78.6	4.40
1982	48.1	0.76	51.9	0.45	56.3	0.49	62.6	0.03	68.5	0.40	77.4	-	79.1	2.60
1983	47.5	2.58	50.7	1.90	52.6	1.98	56.5	0.16	68.9	0.03	75.9	0.00	79.3	2.44
1984	47.3	1.37	49.4	0.00	56.5	0.00	60.0	0.72	74.3	0.05	76.6	2.14	78.0	3.59
1985	44.0	1.91	48.1	1.07	55.1	0.60	63.4	0.70	70.3	0.15	79.5	0.00	80.5	3.00
1986	52.4	0.08	53.6	1.35	58.6	0.93	65.6	0.10	72.2	0.07	79.3	1.05	77.9	1.66
1987	46.5	0.48	48.3	1.22	52.0	0.35	63.4	1.19	67.2	0.75	79.0	0.51	81.0	1.27
1988	47.0	1.05	53.6	0.09	55.9	0.20	61.2	1.13	71.1	0.00	79.3	0.60	80.0	2.65
1989	45.9	1.15	53.9	-	60.9	0.50	70.6	-	74.2	0.30	80.1	0.00	81.3	3.10
1990	47.3	0.15	47.1	0.70	55.8	0.30	63.3	0.47	68.1	0.23	82.7	0.65	77.3	4.98
1991	47.1	1.14	51.9	1.25	-	-	-	-	-	-	-	-	-	-

Tombstone Monthly Temperatures and Precipitation

	August		September		October		November		December		Mean Annual	Total Annual
	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temperature	Precipitation
1964	76.3	1.81	73.7	2.57	68.7	0.60	53.2	0.06	49.3	0.00	62.2	11.08
1965	77.9	2.97	73.3	0.54	68.0	0.00	60.6	0.35	49.5	3.39	63.5	13.12
1966	76.0	5.64	72.0	1.61	65.4	0.00	58.4	0.75	48.8	0.00	63.1	13.73
1967	76.5	2.98	71.9	1.94	65.6	0.44	57.8	0.05	44.6	1.58	63.2	11.18
1968	-	-	-	-	-	-	-	-	-	-	59.9	3.57
1969	80.0	1.86	75.1	0.85	64.2	0.02	53.1	0.48	49.5	0.58	66.1	11.35
1970	79.1	4.18	73.5	1.83	62.6	0.00	57.7	0.00	51.3	0.40	63.4	9.90
1971	77.2	5.99	75.8	1.19	62.1	1.94	56.8	0.23	45.6	1.72	63.9	14.76
1972	78.1	4.15	74.4	0.51	64.9	2.71	51.4	0.97	47.9	0.12	64.5	13.01
1973	79.7	1.00	76.4	0.05	67.7	0.00	57.6	0.44	50.2	0.00	63.5	10.42
1974	76.9	3.34	72.1	1.02	63.5	1.85	54.8	0.04	43.8	0.25	63.6	13.09
1975	80.5	0.54	73.2	2.15	65.9	0.00	55.5	0.29	48.3	0.27	62.4	10.57
1976	76.9	1.23	70.7	1.55	59.6	1.09	52.0	0.50	45.6	0.17	61.5	10.70
1977	78.5	4.09	74.3	4.41	65.6	3.05	57.1	0.30	52.5	0.61	63.7	17.40
1978	78.2	1.32	73.9	0.14	67.5	2.23	55.2	1.37	44.3	2.23	63.8	16.14
1979	76.6	1.50	75.7	0.31	68.4	0.23	51.7	0.40	48.9	0.18	62.5	10.32
1980	78.0	3.11	75.7	1.25	63.6	0.03	55.1	0.08	52.4	0.25	64.4	9.99
1981	77.7	1.54	74.2	0.39	63.3	0.69	58.6	0.25	52.7	0.00	63.6	11.99
1982	77.7	2.89	76.1	2.09	66.3	0.00	54.3	1.21	46.6	2.52	63.7	13.44
1983	78.8	1.87	77.4	5.64	63.1	2.85	53.1	1.31	50.3	0.54	62.8	21.30
1984	76.1	2.89	74.7	2.23	61.4	2.92	54.5	1.16	49.1	3.65	63.1	20.72
1985	78.3	1.04	71.7	3.17	64.2	2.12	54.1	1.66	49.9	0.21	63.2	15.63
1986	78.7	5.76	72.7	1.15	63.6	0.77	55.1	0.37	47.3	2.60	64.7	15.89
1987	76.2	4.66	72.6	1.40	69.7	0.86	54.2	0.06	47.2	2.27	63.1	15.02
1988	76.0	5.23	71.5	1.90	66.9	3.08	54.5	0.45	46.2	0.20	63.6	16.58
1989	77.5	1.88	75.6	0.23	64.8	1.77	56.0	0.08	47.8	0.10	65.7	9.11
1990	73.8	3.36	73.9	1.77	65.5	0.85	55.6	1.06	45.9	1.10	63.0	15.62
1991	-	-	-	-	-	-	-	-	-	-	49.5	2.39

Sierra Vista Monthly Temperatures and Precipitation

	January		February		March		April		May		June		July	
	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.
1954	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	42.1	2.74	45.1	0.60	54.5	0.35	60.8	0.02	66.6	0.00	77.8	0.00	77.0	4.91
1956	51.9	0.76	45.2	0.17	57.3	0.00	59.9	0.20	72.1	0.02	80.3	0.77	76.9	6.86
1957	48.0	1.15	56.0	0.13	53.3	0.59	59.7	0.02	64.7	0.16	79.1	1.17	79.4	2.25
1958	45.3	0.02	50.6	0.89	48.2	2.43	59.7	0.33	72.7	0.03	79.0	0.69	77.9	3.71
1959	50.6	0.00	48.7	0.81	54.5	0.00	63.8	0.53	67.4	0.00	79.2	0.81	77.6	3.20
1960	41.8	1.49	44.4	0.39	57.5	0.07	61.6	0.00	67.9	0.01	78.7	0.24	77.5	3.62
1961	47.1	0.56	49.8	0.00	54.4	0.05	62.2	0.00	69.1	0.00	78.1	1.10	77.5	3.79
1962	44.8	1.71	51.4	0.15	49.2	0.97	65.7	0.00	67.7	0.00	75.4	0.12	76.6	1.33
1963	44.8	0.26	52.6	0.24	54.2	0.00	60.6	0.20	71.9	0.10	75.8	0.00	78.5	3.88
1964	43.1	0.45	43.4	0.64	50.0	0.92	58.1	0.25	68.4	0.00	75.6	0.00	77.9	8.90
1965	48.8	0.60	46.9	0.50	51.2	0.34	60.6	0.14	65.8	0.20	72.6	0.23	76.9	3.60
1966	42.4	1.11	42.6	1.87	55.5	0.12	61.5	0.00	70.2	0.01	76.0	0.39	78.7	4.59
1967	46.7	0.02	50.7	0.32	57.0	0.41	58.4	0.34	66.8	0.12	73.6	0.33	76.2	7.32
1968	46.4	0.83	53.3	0.91	52.4	0.92	56.9	0.61	67.5	0.00	77.6	0.01	75.4	5.39
1969	50.4	0.19	47.3	0.72	49.3	0.40	61.8	0.06	68.8	0.39	75.6	0.13	77.7	4.95
1970	46.2	0.00	50.8	0.82	50.8	1.09	56.5	0.11	68.9	0.00	77.2	0.07	78.7	3.48
1971	47.9	0.17	48.3	0.70	56.2	0.00	58.3	0.07	64.7	0.00	74.6	0.27	78.7	2.63
1972	48.1	0.00	52.0	0.00	60.7	0.01	62.0	0.00	67.1	0.01	75.1	1.48	78.9	4.47
1973	42.1	0.68	48.1	2.10	47.4	1.55	55.5	0.00	68.4	0.07	77.4	0.23	77.6	1.98
1974	48.3	1.13	48.5	0.00	56.6	0.07	60.9	0.00	68.9	0.07	81.7	0.13	75.8	7.33
1975	47.8	0.46	48.2	0.02	51.2	0.85	54.2	0.69	65.7	0.00	76.1	0.03	76.8	4.04
1976	46.8	0.30	52.8	0.99	53.8	0.37	59.7	1.01	68.4	0.28	77.0	0.15	75.5	5.80
1977	46.0	1.42	52.0	0.03	50.5	0.40	61.0	0.11	66.3	0.10	78.2	0.29	77.8	3.80
1978	48.6	2.31	48.1	1.49	56.8	0.83	60.8	0.00	67.9	0.51	79.4	0.49	80.2	1.60
1979	43.5	2.59	49.9	0.23	52.8	1.17	61.3	0.00	66.0	0.49	76.2	0.56	80.2	1.80
1980	49.3	0.70	54.1	1.23	52.4	0.42	61.1	0.25	66.4	0.01	80.3	0.69	80.7	1.87
1981	46.3	1.62	49.3	0.53	53.7	2.21	60.4	0.77	68.2	0.64	77.1	1.13	77.9	4.22
1982	46.3	0.00	49.3	0.00	54.8	0.61	62.9	0.09	67.6	0.35	75.7	0.00	78.9	2.95
1983	44.8	1.25	48.8	1.36	51.0	1.99	55.1	0.46	67.8	0.00	74.4	0.00	78.8	3.02

Sierra Vista Monthly Temperatures and Precipitation

	January		February		March		April		May		June		July	
	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.
1984	45.6	2.20	48.5	0.00	55.3	0.00	58.3	0.90	72.9	0.38	75.6	1.01	75.6	4.94
1985	43.6	1.83	45.3	0.35	53.6	0.15	61.2	0.82	68.8	0.00	77.3	0.88	79.1	2.51
1986	50.1	1.05	51.1	1.43	57.5	1.01	63.4	0.33	69.7	0.60	77.7	0.58	76.6	1.90
1987	45.4	0.26	47.9	1.05	51.4	0.20	62.1	2.30	66.2	1.76	78.2	0.53	79.0	1.58
1988	45.9	1.58	51.1	0.42	54.9	0.26	60.1	0.87	69.1	0.03	77.9	0.18	79.0	7.01
1989	44.2	0.96	52.7	0.19	60.2	0.20	67.9	0.19	71.2	0.25	78.6	0.00	80.1	2.43
1990	44.7	0.45	46.5	0.80	56.2	0.23	63.7	0.32	68.5	0.14	82.7	0.34	76.0	3.91
1991	45.8	1.46	51.3	1.63	-	-	-	-	-	-	-	-	-	-

Sierra Vista Monthly Temperatures and Precipitation

	August		September		October		November		December		Mean Annual	Total Annual
	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temperature	Precipitation
1954	-	-	75.3	2.79	68.0	1.79	57.8	0.00	50.0	0.10	62.8	4.68
1955	74.3	7.67	75.3	0.05	69.1	0.65	55.5	0.13	52.7	0.22	62.6	17.34
1956	75.5	1.88	77.0	0.04	64.9	0.71	51.2	0.02	46.0	0.75	63.2	12.18
1957	75.9	4.50	75.1	0.00	62.2	1.58	49.2	0.20	49.7	0.10	62.7	11.85
1958	75.9	5.06	71.8	2.90	63.1	0.73	53.2	0.73	51.6	0.00	62.4	17.52
1959	73.2	3.41	73.1	0.03	64.0	1.63	51.7	1.22	45.8	1.22	62.5	12.86
1960	76.9	2.06	74.6	1.21	62.3	0.85	55.4	0.01	45.2	1.00	62.0	10.95
1961	74.2	6.98	70.8	1.16	63.4	2.06	50.5	0.07	46.9	0.42	62.0	16.19
1962	80.0	0.39	73.4	0.58	66.6	0.51	57.9	0.13	48.7	1.32	63.1	7.21
1963	73.4	3.78	73.4	0.99	67.3	0.41	53.4	2.10	47.4	0.68	62.8	12.64
1964	74.4	3.08	69.4	5.82	65.3	1.28	50.6	0.95	48.2	0.06	60.4	22.35
1965	76.3	3.26	70.0	1.51	65.6	0.00	57.8	0.32	46.4	4.09	61.6	14.79
1966	74.3	5.07	70.3	2.93	62.7	0.00	56.5	0.40	47.4	0.44	61.5	16.93
1967	75.0	1.74	70.8	4.13	65.2	0.15	57.2	0.26	43.2	4.78	61.7	19.92
1968	72.3	2.07	71.9	0.37	66.0	0.11	52.6	0.35	45.4	1.00	61.5	12.57
1969	78.2	3.05	73.2	0.80	62.0	0.03	52.2	0.62	47.9	0.39	62.0	11.73
1970	75.4	8.06	70.1	2.13	60.5	0.04	55.7	0.02	49.7	0.50	61.7	16.32
1971	73.6	4.40	72.1	1.96	58.8	2.01	53.5	0.22	44.1	2.45	60.9	14.88
1972	75.0	2.65	71.1	1.58	59.6	2.72	47.7	0.97	43.9	0.50	61.8	14.39
1973	77.9	0.42	74.6	0.87	65.9	0.00	55.7	0.00	49.1	0.00	61.6	7.90
1974	75.1	1.83	70.6	2.80	61.8	2.59	53.4	0.01	44.4	0.23	62.2	16.19
1975	78.9	0.88	71.0	3.68	64.3	0.06	54.0	0.94	47.8	0.33	61.3	11.98
1976	76.0	1.69	70.4	1.04	60.9	0.74	52.2	0.66	46.2	0.27	61.6	13.30
1977	77.1	4.06	73.4	2.35	64.6	5.48	56.0	0.20	53.1	0.78	63.0	19.02
1978	75.8	3.57	71.7	2.45	66.7	2.99	53.8	2.16	43.7	3.50	62.8	21.90
1979	75.7	2.40	75.3	0.62	69.2	0.11	52.1	0.22	50.6	0.27	62.7	10.46
1980	76.7	3.16	74.3	1.63	62.8	0.10	54.5	0.09	52.5	0.46	63.8	10.61
1981	75.7	2.09	72.5	2.62	64.1	1.05	53.6	0.36	47.4	0.00	62.2	17.24
1982	77.0	2.85	73.8	1.44	64.0	0.00	52.0	0.82	44.6	3.12	62.2	12.23
1983	76.3	5.29	74.1	6.67	63.2	2.30	51.7	1.08	48.8	0.48	61.2	23.90

Sierra Vista Monthly Temperatures and Precipitation

	August		September		October		November		December		Mean Annual	Total Annual
	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temp.	Precip.	Temperature	Precipitation
1984	74.0	5.46	71.7	1.21	60.5	1.99	52.3	0.24	45.9	3.89	61.4	22.22
1985	76.4	2.35	70.1	2.49	61.9	2.28	52.7	1.20	47.2	0.25	61.4	15.11
1986	77.1	4.98	71.1	0.60	63.2	0.95	53.1	0.89	45.9	2.45	63.0	16.77
1987	75.1	7.13	71.4	2.53	68.4	0.40	52.9	0.05	45.8	2.57	62.0	20.36
1988	76.0	6.19	72.0	1.56	67.2	3.95	54.6	0.13	45.9	0.60	62.8	22.78
1989	75.9	1.74	73.6	0.71	63.0	2.34	54.6	0.00	46.3	0.08	64.0	9.09
1990	73.9	2.76	73.0	1.93	64.9	0.47	54.8	0.46	45.6	0.97	62.5	12.78
1991	-	-	-	-	-	-	-	-	-	-	-	-

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Sep-54	75.3	2.79	11.35	1.03	11.69	-1.81		
Oct-54	68.0	1.79	8.19	0.98	8.03	-1.37		
Nov-54	57.8	0.00	4.55	0.89	4.05	-1.60		
Dec-54	50.0	0.10	2.41	0.88	2.12	-0.74		
Jan-55	42.1	2.74	0.87	0.90	0.78	2.43	2.43	2.43
Feb-55	45.1	0.60	1.38	0.87	1.20	0.13	0.13	2.56
Mar-55	54.5	0.35	3.58	1.03	3.68	-1.10		0.13
Apr-55	60.8	0.02	5.53	1.08	5.97	-2.33		
May-55	66.6	0.00	7.64	1.18	9.01	-3.55		
Jun-55	77.8	0.00	12.53	1.18	14.78	-5.82		
Jul-55	77.0	4.91	12.15	1.20	14.57	-0.83		
Aug-55	74.3	7.67	10.89	1.14	12.41	2.78	2.78	2.78
Sep-55	75.3	0.05	11.35	1.03	11.69	-4.55		2.78
Oct-55	69.1	0.65	8.64	0.98	8.47	-2.68		
Nov-55	55.5	0.13	3.86	0.89	3.44	-1.22		
Dec-55	52.7	0.22	3.09	0.88	2.72	-0.85		
Jan-56	51.9	0.76	2.88	0.90	2.59	-0.26		
Feb-56	45.2	0.17	1.40	0.87	1.21	-0.31		
Mar-56	57.3	0.00	4.40	1.03	4.53	-1.78		
Apr-56	59.9	0.20	5.23	1.08	5.64	-2.02		
May-56	72.1	0.02	9.91	1.18	11.69	-4.58		
Jun-56	80.3	0.77	13.76	1.18	16.24	-5.62		
Jul-56	76.9	6.86	12.10	1.20	14.52	1.14	1.14	1.14
Aug-56	75.5	1.88	11.44	1.14	13.04	-3.25		1.14
Sep-56	77.0	0.04	12.15	1.03	12.51	-4.88		
Oct-56	64.9	0.71	6.99	0.98	6.85	-1.99		
Nov-56	51.2	0.02	2.70	0.89	2.41	-0.93		
Dec-56	46.0	0.75	1.55	0.88	1.36	0.21	0.21	0.21
Jan-57	48.0	1.15	1.96	0.90	1.76	0.46	0.46	0.67
Feb-57	56.0	0.13	4.01	0.87	3.49	-1.24		0.46

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Mar-57	53.3	0.59	3.25	1.03	3.34	-0.73		
Apr-57	59.7	0.02	5.16	1.08	5.57	-2.17		
May-57	64.7	0.16	6.91	1.18	8.16	-3.05		
Jun-57	79.1	1.17	13.16	1.18	15.53	-4.94		
Jul-57	79.4	2.25	13.31	1.20	15.97	-4.04		
Aug-57	75.9	4.50	11.63	1.14	13.25	-0.72		
Sep-57	75.1	0.00	11.26	1.03	11.59	-4.56		
Oct-57	62.2	1.58	6.01	0.98	5.89	-0.74		
Nov-57	49.2	0.20	2.23	0.89	1.98	-0.58		
Dec-57	49.7	0.10	2.34	0.88	2.06	-0.71		
Jan-58	45.3	0.02	1.41	0.90	1.27	-0.48		
Feb-58	50.6	0.89	2.56	0.87	2.22	0.01	0.01	0.01
Mar-58	48.2	2.43	2.00	1.03	2.06	1.62	1.62	1.63
Apr-58	59.7	0.33	5.16	1.08	5.57	-1.86		1.62
May-58	72.7	0.03	10.17	1.18	12.00	-4.70		
Jun-58	79.0	0.69	13.11	1.18	15.47	-5.40		
Jul-58	77.9	3.71	12.58	1.20	15.09	-2.23		
Aug-58	75.9	5.06	11.63	1.14	13.25	-0.16		
Sep-58	71.8	2.90	9.78	1.03	10.07	-1.07		
Oct-58	63.1	0.73	6.33	0.98	6.20	-1.71		
Nov-58	53.2	0.73	3.22	0.89	2.87	-0.40		
Dec-58	51.6	0.00	2.80	0.88	2.47	-0.97		
Jan-59	50.6	0.00	2.56	0.90	2.30	-0.91		
Feb-59	48.7	0.81	2.11	0.87	1.84	0.09	0.09	0.09
Mar-59	54.5	0.00	3.58	1.03	3.68	-1.45		0.09
Apr-59	63.8	0.53	6.58	1.08	7.11	-2.27		
May-59	67.4	0.00	7.95	1.18	9.39	-3.70		
Jun-59	79.2	0.81	13.21	1.18	15.59	-5.33		
Jul-59	77.6	3.20	12.43	1.20	14.92	-2.67		
Aug-59	73.2	3.41	10.39	1.14	11.85	-1.26		

SIERRA VISTA, AZ
Soil Moisture Balance

Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Sep-59	73.1	0.03	10.35	1.03	10.66	-4.17		
Oct-59	64.0	1.63	6.66	0.98	6.52	-0.94		
Nov-59	51.7	1.22	2.83	0.89	2.52	0.23	0.23	0.23
Dec-59	45.8	1.22	1.51	0.88	1.33	0.70	0.70	0.93
Jan-60	41.8	1.49	0.83	0.90	0.74	1.20	1.20	1.89
Feb-60	44.4	0.39	1.25	0.87	1.09	-0.04		1.20
Mar-60	57.5	0.07	4.46	1.03	4.59	-1.74		
Apr-60	61.6	0.00	5.80	1.08	6.26	-2.47		
May-60	67.9	0.01	8.15	1.18	9.62	-3.78		
Jun-60	78.7	0.24	12.97	1.18	15.30	-5.78		
Jul-60	77.5	3.62	12.38	1.20	14.86	-2.23		
Aug-60	76.9	2.06	12.10	1.14	13.79	-3.37		
Sep-60	74.6	1.21	11.03	1.03	11.36	-3.26		
Oct-60	62.3	0.85	6.04	0.98	5.92	-1.48		
Nov-60	55.4	0.01	3.83	0.89	3.41	-1.33		
Dec-60	45.2	1.00	1.40	0.88	1.23	0.52	0.52	0.52
Jan-61	47.1	0.56	1.77	0.90	1.59	-0.07		0.52
Feb-61	49.8	0.00	2.37	0.87	2.06	-0.81		
Mar-61	54.4	0.05	3.55	1.03	3.65	-1.39		
Apr-61	62.2	0.00	6.01	1.08	6.49	-2.56		
May-61	69.1	0.00	8.64	1.18	10.19	-4.01		
Jun-61	78.1	1.10	12.67	1.18	14.95	-4.79		
Jul-61	77.5	3.79	12.38	1.20	14.86	-2.06		
Aug-61	74.2	6.98	10.84	1.14	12.36	2.11	2.11	2.11
Sep-61	70.8	1.16	9.35	1.03	9.63	-2.63		2.11
Oct-61	63.4	2.06	6.44	0.98	6.31	-0.42		
Nov-61	50.5	0.07	2.53	0.89	2.25	-0.82		
Dec-61	46.9	0.42	1.73	0.88	1.52	-0.18		
Jan-62	44.8	1.71	1.32	0.90	1.19	1.24	1.24	1.24
Feb-62	51.4	0.15	2.75	0.87	2.40	-0.79		1.24

SIERRA VISTA, AZ
Soil Moisture Balance

Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Mar-62	49.2	0.97	2.23	1.03	2.29	0.07	0.07	0.07
Apr-62	65.7	0.00	7.29	1.08	7.88	-3.10		0.07
May-62	67.7	0.00	8.07	1.18	9.53	-3.75		
Jun-62	75.4	0.12	11.39	1.18	13.44	-5.17		
Jul-62	76.6	1.33	11.96	1.20	14.35	-4.32		
Aug-62	80.0	0.39	13.61	1.14	15.51	-5.72		
Sep-62	73.4	0.58	10.48	1.03	10.80	-3.67		
Oct-62	66.6	0.51	7.64	0.98	7.49	-2.44		
Nov-62	57.9	0.13	4.58	0.89	4.08	-1.48		
Dec-62	48.7	1.32	2.11	0.88	1.86	0.59	0.59	0.59
Jan-63	44.8	0.26	1.32	0.90	1.19	-0.21		0.59
Feb-63	52.6	0.24	3.06	0.87	2.66	-0.81		
Mar-63	54.2	0.00	3.49	1.03	3.60	-1.42		
Apr-63	60.6	0.20	5.46	1.08	5.90	-2.12		
May-63	71.9	0.10	9.82	1.18	11.59	-4.46		
Jun-63	75.8	0.00	11.58	1.18	13.66	-5.38		
Jul-63	78.5	3.88	12.87	1.20	15.44	-2.20		
Aug-63	73.4	3.78	10.48	1.14	11.95	-0.93		
Sep-63	73.4	0.99	10.48	1.03	10.80	-3.26		
Oct-63	67.3	0.41	7.91	0.98	7.76	-2.64		
Nov-63	53.4	2.10	3.27	0.89	2.91	0.95	0.95	0.95
Dec-63	47.4	0.68	1.83	0.88	1.61	0.05	0.05	1.00
Jan-64	43.1	0.45	1.03	0.90	0.93	0.09	0.09	0.13
Feb-64	43.4	0.64	1.08	0.87	0.94	0.27	0.27	0.36
Mar-64	50.0	0.92	2.41	1.03	2.48	-0.06		0.27
Apr-64	58.1	0.25	4.65	1.08	5.02	-1.73		
May-64	68.4	0.00	8.35	1.18	9.86	-3.88		
Jun-64	75.6	0.00	11.49	1.18	13.55	-5.34		
Jul-64	77.9	8.90	12.58	1.20	15.09	2.96	2.96	2.96
Aug-64	74.4	3.08	10.93	1.14	12.47	-1.83		2.96

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Sep-64	69.4	5.82	8.76	1.03	9.03	2.27	2.27	2.27
Oct-64	65.3	1.28	7.14	0.98	7.00	-1.47		2.27
Nov-64	50.6	0.95	2.56	0.89	2.27	0.05	0.05	0.05
Dec-64	48.2	0.06	2.00	0.88	1.76	-0.63		0.05
Jan-65	48.8	0.60	2.14	0.90	1.92	-0.16		
Feb-65	46.9	0.50	1.73	0.87	1.50	-0.09		
Mar-65	51.2	0.34	2.70	1.03	2.78	-0.76		
Apr-65	60.6	0.14	5.46	1.08	5.90	-2.18		
May-65	65.8	0.20	7.33	1.18	8.65	-3.21		
Jun-65	72.6	0.23	10.13	1.18	11.95	-4.48		
Jul-65	76.9	3.60	12.10	1.20	14.52	-2.12		
Aug-65	76.3	3.26	11.81	1.14	13.47	-2.04		
Sep-65	70.0	1.51	9.01	1.03	9.28	-2.14		
Oct-65	65.6	0.00	7.25	0.98	7.11	-2.80		
Nov-65	57.8	0.32	4.55	0.89	4.05	-1.28		
Dec-65	46.4	4.09	1.63	0.88	1.43	3.53	3.53	3.53
Jan-66	42.4	1.11	0.92	0.90	0.82	0.79	0.79	4.31
Feb-66	42.6	1.87	0.95	0.87	0.82	1.55	1.55	2.33
Mar-66	55.5	0.12	3.86	1.03	3.98	-1.45		1.55
Apr-66	61.5	0.00	5.77	1.08	6.23	-2.45		
May-66	70.2	0.01	9.10	1.18	10.73	-4.22		
Jun-66	76.0	0.39	11.67	1.18	13.77	-5.03		
Jul-66	78.7	4.59	12.97	1.20	15.56	-1.54		
Aug-66	74.3	5.07	10.89	1.14	12.41	0.18	0.18	0.18
Sep-66	70.3	2.93	9.14	1.03	9.41	-0.78		0.18
Oct-66	62.7	0.00	6.19	0.98	6.06	-2.39		
Nov-66	56.5	0.40	4.16	0.89	3.70	-1.06		
Dec-66	47.4	0.44	1.83	0.88	1.61	-0.19		
Jan-67	46.7	0.02	1.69	0.90	1.52	-0.58		
Feb-67	50.7	0.32	2.58	0.87	2.24	-0.56		

SIERRA VISTA, AZ
Soil Moisture Balance

Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Mar-67	57.0	0.41	4.31	1.03	4.44	-1.34		
Apr-67	58.4	0.34	4.74	1.08	5.12	-1.68		
May-67	66.8	0.12	7.72	1.18	9.11	-3.47		
Jun-67	73.6	0.33	10.57	1.18	12.48	-4.58		
Jul-67	76.2	7.32	11.77	1.20	14.12	1.76	1.76	1.76
Aug-67	75.0	1.74	11.21	1.14	12.78	-3.29		1.76
Sep-67	70.8	4.13	9.35	1.03	9.63	0.34	0.34	0.34
Oct-67	65.2	0.15	7.10	0.98	6.96	-2.59		0.34
Nov-67	57.2	0.26	4.37	0.89	3.89	-1.27		
Dec-67	43.2	4.78	1.04	0.88	0.92	4.42	4.42	4.42
Jan-68	46.4	0.83	1.63	0.90	1.46	0.25	0.25	4.67
Feb-68	53.3	0.91	3.25	0.87	2.82	-0.20		0.25
Mar-68	52.4	0.92	3.01	1.03	3.10	-0.30		
Apr-68	56.9	0.61	4.28	1.08	4.62	-1.21		
May-68	67.5	0.00	7.99	1.18	9.43	-3.71		
Jun-68	77.6	0.01	12.43	1.18	14.67	-5.77		
Jul-68	75.4	5.39	11.39	1.20	13.67	0.01	0.01	0.01
Aug-68	72.3	2.07	10.00	1.14	11.40	-2.42		0.01
Sep-68	71.9	0.37	9.82	1.03	10.12	-3.61		
Oct-68	66.0	0.11	7.41	0.98	7.26	-2.75		
Nov-68	52.6	0.35	3.06	0.89	2.72	-0.72		
Dec-68	45.4	1.00	1.43	0.88	1.26	0.50	0.50	0.50
Jan-69	50.4	0.19	2.51	0.90	2.26	-0.70		0.50
Feb-69	47.3	0.72	1.81	0.87	1.58	0.10	0.10	0.10
Mar-69	49.3	0.40	2.25	1.03	2.32	-0.51		0.10
Apr-69	61.8	0.06	5.87	1.08	6.34	-2.44		
May-69	68.8	0.39	8.52	1.18	10.05	-3.57		
Jun-69	75.6	0.13	11.49	1.18	13.55	-5.21		
Jul-69	77.7	4.95	12.48	1.20	14.98	-0.95		
Aug-69	78.2	3.05	12.72	1.14	14.50	-2.66		

SIERRA VISTA, AZ
Soil Moisture Balance

Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Sep-69	73.2	0.80	10.39	1.03	10.71	-3.42		
Oct-69	62.0	0.03	5.94	0.98	5.82	-2.26		
Nov-69	52.2	0.62	2.96	0.89	2.63	-0.42		
Dec-69	47.9	0.39	1.94	0.88	1.71	-0.28		
Jan-70	46.2	0.00	1.59	0.90	1.43	-0.56		
Feb-70	50.8	0.82	2.60	0.87	2.27	-0.07		
Mar-70	50.8	1.09	2.60	1.03	2.68	0.03	0.03	0.03
Apr-70	56.5	0.11	4.16	1.08	4.49	-1.66		0.03
May-70	68.9	0.00	8.56	1.18	10.10	-3.98		
Jun-70	77.2	0.07	12.24	1.18	14.44	-5.62		
Jul-70	78.7	3.48	12.97	1.20	15.56	-2.65		
Aug-70	75.4	8.06	11.39	1.14	12.99	2.95	2.95	2.95
Sep-70	70.1	2.13	9.05	1.03	9.33	-1.54		2.95
Oct-70	60.5	0.04	5.43	0.98	5.32	-2.05		
Nov-70	55.7	0.02	3.92	0.89	3.49	-1.35		
Dec-70	49.7	0.50	2.34	0.88	2.06	-0.31		
Jan-71	47.9	0.17	1.94	0.90	1.74	-0.52		
Feb-71	48.3	0.70	2.02	0.87	1.76	0.01	0.01	0.01
Mar-71	56.2	0.00	4.07	1.03	4.19	-1.65		0.01
Apr-71	58.3	0.07	4.71	1.08	5.09	-1.93		
May-71	64.7	0.00	6.91	1.18	8.16	-3.21		
Jun-71	74.6	0.27	11.03	1.18	13.01	-4.85		
Jul-71	78.7	2.63	12.97	1.20	15.56	-3.50		
Aug-71	73.6	4.40	10.57	1.14	12.05	-0.35		
Sep-71	72.1	1.96	9.91	1.03	10.21	-2.06		
Oct-71	58.8	2.01	4.87	0.98	4.77	0.13	0.13	0.13
Nov-71	53.5	0.22	3.30	0.89	2.94	-0.94		0.13
Dec-71	44.1	2.45	1.20	0.88	1.05	2.04	2.04	2.04
Jan-72	48.1	0.00	1.98	0.90	1.78	-0.70		2.04
Feb-72	52.0	0.00	2.90	0.87	2.53	-0.99		

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Mar-72	60.7	0.01	5.49	1.03	5.66	-2.22		
Apr-72	62.0	0.00	5.94	1.08	6.41	-2.53		
May-72	67.1	0.01	7.84	1.18	9.25	-3.63		
Jun-72	75.1	1.48	11.26	1.18	13.28	-3.75		
Jul-72	78.9	4.47	13.06	1.20	15.68	-1.70		
Aug-72	75.0	2.65	11.21	1.14	12.78	-2.38		
Sep-72	71.1	1.58	9.48	1.03	9.76	-2.26		
Oct-72	59.6	2.72	5.13	0.98	5.02	0.74	0.74	0.74
Nov-72	47.7	0.97	1.90	0.89	1.69	0.31	0.31	1.05
Dec-72	43.9	0.50	1.16	0.88	1.02	0.10	0.10	0.40
Jan-73	42.1	0.68	0.87	0.90	0.78	0.37	0.37	0.47
Feb-73	48.1	2.10	1.98	0.87	1.72	1.42	1.42	1.79
Mar-73	47.4	1.55	1.83	1.03	1.89	0.81	0.81	2.23
Apr-73	55.5	0.00	3.86	1.08	4.17	-1.64		0.81
May-73	68.4	0.07	8.35	1.18	9.86	-3.81		
Jun-73	77.4	0.23	12.34	1.18	14.56	-5.50		
Jul-73	77.6	1.98	12.43	1.20	14.92	-3.89		
Aug-73	77.9	0.42	12.58	1.14	14.34	-5.22		
Sep-73	74.6	0.87	11.03	1.03	11.36	-3.60		
Oct-73	65.9	0.00	7.37	0.98	7.22	-2.84		
Nov-73	55.7	0.00	3.92	0.89	3.49	-1.37		
Dec-73	49.1	0.00	2.20	0.88	1.94	-0.76		
Jan-74	48.3	1.13	2.02	0.90	1.82	0.41	0.41	0.41
Feb-74	48.5	0.00	2.07	0.87	1.80	-0.71		0.41
Mar-74	56.6	0.07	4.19	1.03	4.31	-1.63		
Apr-74	60.9	0.00	5.56	1.08	6.01	-2.36		
May-74	68.9	0.07	8.56	1.18	10.10	-3.91		
Jun-74	81.7	0.13	14.47	1.18	17.08	-6.59		
Jul-74	75.8	7.33	11.58	1.20	13.90	1.86	1.86	1.86
Aug-74	75.1	1.83	11.26	1.14	12.83	-3.22		1.86

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Sep-74	70.6	2.80	9.27	1.03	9.54	-0.96		
Oct-74	61.8	2.59	5.87	0.98	5.75	0.33	0.33	0.33
Nov-74	53.4	0.01	3.27	0.89	2.91	-1.14		0.33
Dec-74	44.4	0.23	1.25	0.88	1.10	-0.20		
Jan-75	47.8	0.46	1.92	0.90	1.72	-0.22		
Feb-75	48.2	0.02	2.00	0.87	1.74	-0.67		
Mar-75	51.2	0.85	2.70	1.03	2.78	-0.25		
Apr-75	54.2	0.69	3.49	1.08	3.77	-0.79		
May-75	65.7	0.00	7.29	1.18	8.60	-3.39		
Jun-75	76.1	0.03	11.72	1.18	13.83	-5.41		
Jul-75	76.8	4.04	12.05	1.20	14.46	-1.65		
Aug-75	78.9	0.88	13.06	1.14	14.89	-4.98		
Sep-75	71.0	3.68	9.44	1.03	9.72	-0.15		
Oct-75	64.3	0.06	6.77	0.98	6.63	-2.55		
Nov-75	54.0	0.94	3.44	0.89	3.06	-0.26		
Dec-75	47.8	0.33	1.92	0.88	1.69	-0.33		
Jan-76	46.8	0.30	1.71	0.90	1.54	-0.31		
Feb-76	52.8	0.99	3.11	0.87	2.71	-0.08		
Mar-76	53.8	0.37	3.38	1.03	3.48	-1.00		
Apr-76	59.7	1.01	5.16	1.08	5.57	-1.18		
May-76	68.4	0.28	8.35	1.18	9.86	-3.60		
Jun-76	77.0	0.15	12.15	1.18	14.33	-5.49		
Jul-76	75.5	5.80	11.44	1.20	13.73	0.40	0.40	0.40
Aug-76	76.0	1.69	11.67	1.14	13.31	-3.55		0.40
Sep-76	70.4	1.04	9.18	1.03	9.46	-2.68		
Oct-76	60.9	0.74	5.56	0.98	5.45	-1.41		
Nov-76	52.2	0.66	2.96	0.89	2.63	-0.38		
Dec-76	46.2	0.27	1.59	0.88	1.40	-0.28		
Jan-77	46.0	1.42	1.55	0.90	1.39	0.87	0.87	0.87
Feb-77	52.0	0.03	2.90	0.87	2.53	-0.96		0.87

SIERRA VISTA, AZ
Soil Moisture Balance

Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Mar-77	50.5	0.40	2.53	1.03	2.61	-0.63		
Apr-77	61.0	0.11	5.59	1.08	6.04	-2.27		
May-77	66.3	0.10	7.52	1.18	8.88	-3.39		
Jun-77	78.2	0.29	12.72	1.18	15.01	-5.62		
Jul-77	77.8	3.80	12.53	1.20	15.03	-2.12		
Aug-77	77.1	4.06	12.19	1.14	13.90	-1.41		
Sep-77	73.4	2.35	10.48	1.03	10.80	-1.90		
Oct-77	64.6	5.48	6.88	0.98	6.74	2.83	2.83	2.83
Nov-77	56.0	0.20	4.01	0.89	3.57	-1.20		2.83
Dec-77	53.1	0.78	3.19	0.88	2.81	-0.33		
Jan-78	48.6	2.31	2.09	0.90	1.88	1.57	1.57	1.57
Feb-78	48.1	1.49	1.98	0.87	1.72	0.81	0.81	2.38
Mar-78	56.8	0.83	4.25	1.03	4.37	-0.89		0.81
Apr-78	60.8	0.00	5.53	1.08	5.97	-2.35		
May-78	67.9	0.51	8.15	1.18	9.62	-3.28		
Jun-78	79.4	0.49	13.31	1.18	15.71	-5.69		
Jul-78	80.2	1.60	13.71	1.20	16.45	-4.88		
Aug-78	75.8	3.57	11.58	1.14	13.20	-1.63		
Sep-78	71.7	2.45	9.74	1.03	10.03	-1.50		
Oct-78	66.7	2.99	7.68	0.98	7.52	0.03	0.03	0.03
Nov-78	53.8	2.16	3.38	0.89	3.01	0.98	0.98	1.00
Dec-78	43.7	3.50	1.13	0.88	0.99	3.11	3.11	4.08
Jan-79	43.5	2.59	1.09	0.90	0.98	2.20	2.20	5.31
Feb-79	49.9	0.23	2.39	0.87	2.08	-0.59		2.20
Mar-79	52.8	1.17	3.11	1.03	3.21	-0.09		
Apr-79	61.3	0.00	5.70	1.08	6.15	-2.42		
May-79	66.0	0.49	7.41	1.18	8.74	-2.95		
Jun-79	76.2	0.56	11.77	1.18	13.88	-4.91		
Jul-79	80.2	1.80	13.71	1.20	16.45	-4.68		
Aug-79	75.7	2.40	11.53	1.14	13.15	-2.78		

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Sep-79	75.3	0.62	11.35	1.03	11.69	-3.98		
Oct-79	69.2	0.11	8.68	0.98	8.51	-3.24		
Nov-79	52.1	0.22	2.93	0.89	2.61	-0.81		
Dec-79	50.6	0.27	2.56	0.88	2.25	-0.62		
Jan-80	49.3	0.70	2.25	0.90	2.02	-0.10		
Feb-80	54.1	1.23	3.46	0.87	3.01	0.04	0.04	0.04
Mar-80	52.4	0.42	3.01	1.03	3.10	-0.80		0.04
Apr-80	61.1	0.25	5.63	1.08	6.08	-2.14		
May-80	66.4	0.01	7.56	1.18	8.92	-3.50		
Jun-80	80.3	0.69	13.76	1.18	16.24	-5.70		
Jul-80	80.7	1.87	13.96	1.20	16.75	-4.73		
Aug-80	76.7	3.16	12.00	1.14	13.68	-2.23		
Sep-80	74.3	1.63	10.89	1.03	11.22	-2.79		
Oct-80	62.8	0.10	6.22	0.98	6.10	-2.30		
Nov-80	54.5	0.09	3.58	0.89	3.18	-1.16		
Dec-80	52.5	0.46	3.03	0.88	2.67	-0.59		
Jan-81	46.3	1.62	1.61	0.90	1.45	1.05	1.05	1.05
Feb-81	49.3	0.53	2.25	0.87	1.96	-0.24		1.05
Mar-81	53.7	2.21	3.35	1.03	3.46	0.85	0.85	0.85
Apr-81	60.4	0.77	5.39	1.08	5.82	-1.52		0.85
May-81	68.2	0.64	8.27	1.18	9.76	-3.20		
Jun-81	77.1	1.13	12.19	1.18	14.39	-4.53		
Jul-81	77.9	4.22	12.58	1.20	15.09	-1.72		
Aug-81	75.7	2.09	11.53	1.14	13.15	-3.09		
Sep-81	72.5	2.62	10.09	1.03	10.39	-1.47		
Oct-81	64.1	1.05	6.69	0.98	6.56	-1.53		
Nov-81	53.6	0.36	3.33	0.89	2.96	-0.81		
Dec-81	47.4	0.00	1.83	0.88	1.61	-0.63		
Jan-82	46.3	0.00	1.61	0.90	1.45	-0.57		
Feb-82	49.3	0.00	2.25	0.87	1.96	-0.77		

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Mar-82	54.8	0.61	3.66	1.03	3.77	-0.87		
Apr-82	62.9	0.09	6.26	1.08	6.76	-2.57		
May-82	67.6	0.35	8.03	1.18	9.48	-3.38		
Jun-82	75.7	0.00	11.53	1.18	13.61	-5.36		
Jul-82	78.9	2.95	13.06	1.20	15.68	-3.22		
Aug-82	77.0	2.85	12.15	1.14	13.85	-2.60		
Sep-82	73.8	1.44	10.66	1.03	10.98	-2.88		
Oct-82	64.0	0.00	6.66	0.98	6.52	-2.57		
Nov-82	52.0	0.82	2.90	0.89	2.59	-0.20		
Dec-82	44.6	3.12	1.29	0.88	1.13	2.67	2.67	2.67
Jan-83	44.8	1.25	1.32	0.90	1.19	0.78	0.78	3.46
Feb-83	48.8	1.36	2.14	0.87	1.86	0.63	0.63	1.41
Mar-83	51.0	1.99	2.65	1.03	2.73	0.91	0.91	1.54
Apr-83	55.1	0.46	3.75	1.08	4.05	-1.13		0.91
May-83	67.8	0.00	8.11	1.18	9.57	-3.77		
Jun-83	74.4	0.00	10.93	1.18	12.90	-5.08		
Jul-83	78.8	3.02	13.02	1.20	15.62	-3.13		
Aug-83	76.3	5.29	11.81	1.14	13.47	-0.01		
Sep-83	74.1	6.67	10.80	1.03	11.12	2.29	2.29	2.29
Oct-83	63.2	2.30	6.37	0.98	6.24	-0.16		2.29
Nov-83	51.7	1.08	2.83	0.89	2.52	0.09	0.09	0.09
Dec-83	48.8	0.48	2.14	0.88	1.88	-0.26		0.09
Jan-84	45.6	2.20	1.47	0.90	1.32	1.68	1.68	1.68
Feb-84	48.5	0.00	2.07	0.87	1.80	-0.71		1.68
Mar-84	55.3	0.00	3.80	1.03	3.92	-1.54		
Apr-84	58.3	0.90	4.71	1.08	5.09	-1.10		
May-84	72.9	0.38	10.26	1.18	12.11	-4.39		
Jun-84	75.6	1.01	11.49	1.18	13.55	-4.33		
Jul-84	75.6	4.94	11.49	1.20	13.78	-0.49		
Aug-84	74.0	5.46	10.75	1.14	12.26	0.63	0.63	0.63

SIERRA VISTA, AZ
Soil Moisture Balance

Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Sep-84	71.7	1.21	9.74	1.03	10.03	-2.74		0.63
Oct-84	60.5	1.99	5.43	0.98	5.32	-0.10		
Nov-84	52.3	0.24	2.98	0.89	2.65	-0.80		
Dec-84	45.9	3.89	1.53	0.88	1.35	3.36	3.36	3.36
Jan-85	43.6	1.83	1.11	0.90	1.00	1.44	1.44	4.80
Feb-85	45.3	0.35	1.41	0.87	1.23	-0.13		1.44
Mar-85	53.6	0.15	3.33	1.03	3.43	-1.20		
Apr-85	61.2	0.82	5.66	1.08	6.12	-1.59		
May-85	68.8	0.00	8.52	1.18	10.05	-3.96		
Jun-85	77.3	0.88	12.29	1.18	14.50	-4.83		
Jul-85	79.1	2.51	13.16	1.20	15.80	-3.71		
Aug-85	76.4	2.35	11.86	1.14	13.52	-2.97		
Sep-85	70.1	2.49	9.05	1.03	9.33	-1.18		
Oct-85	61.9	2.28	5.90	0.98	5.79	0.00	0.00	0.00
Nov-85	52.7	1.20	3.09	0.89	2.75	0.12	0.12	0.12
Dec-85	47.2	0.25	1.79	0.88	1.58	-0.37		0.12
Jan-86	50.1	1.05	2.44	0.90	2.19	0.19	0.19	0.19
Feb-86	51.1	1.43	2.68	0.87	2.33	0.51	0.51	0.70
Mar-86	57.5	1.01	4.46	1.03	4.59	-0.80		0.51
Apr-86	63.4	0.33	6.44	1.08	6.95	-2.41		
May-86	69.7	0.60	8.89	1.18	10.49	-3.53		
Jun-86	77.7	0.58	12.48	1.18	14.73	-5.22		
Jul-86	76.6	1.90	11.96	1.20	14.35	-3.75		
Aug-86	77.1	4.98	12.19	1.14	13.90	-0.49		
Sep-86	71.1	0.60	9.48	1.03	9.76	-3.24		
Oct-86	63.2	0.95	6.37	0.98	6.24	-1.51		
Nov-86	53.1	0.89	3.19	0.89	2.84	-0.23		
Dec-86	45.9	2.45	1.53	0.88	1.35	1.92	1.92	1.92
Jan-87	45.4	0.26	1.43	0.90	1.29	-0.25		1.92
Feb-87	47.9	1.05	1.94	0.87	1.69	0.39	0.39	0.39

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Mar-87	51.4	0.20	2.75	1.03	2.84	-0.92		0.39
Apr-87	62.1	2.30	5.97	1.08	6.45	-0.24		
May-87	66.2	1.76	7.48	1.18	8.83	-1.72		
Jul-87	78.2	0.53	12.72	1.18	15.01	-5.38		
Jul-87	79.0	1.58	13.11	1.20	15.74	-4.62		
Aug-87	75.1	7.13	11.26	1.14	12.83	2.08	2.08	2.08
Sep-87	71.4	2.53	9.61	1.03	9.90	-1.37		2.08
Oct-87	68.4	0.40	8.35	0.98	8.19	-2.82		
Nov-87	52.9	0.05	3.14	0.89	2.79	-1.05		
Dec-87	45.8	2.57	1.51	0.88	1.33	2.05	2.05	2.05
Jan-88	45.9	1.58	1.53	0.90	1.38	1.04	1.04	3.09
Feb-88	51.1	0.42	2.68	0.87	2.33	-0.50		1.04
Mar-88	54.9	0.26	3.69	1.03	3.80	-1.24		
Apr-88	60.1	0.87	5.29	1.08	5.72	-1.38		
May-88	69.1	0.03	8.64	1.18	10.19	-3.98		
Jul-88	77.9	0.18	12.58	1.18	14.84	-5.66		
Jul-88	79.0	7.01	13.11	1.20	15.74	0.81	0.81	0.81
Aug-88	76.0	6.19	11.67	1.14	13.31	0.95	0.95	1.77
Sep-88	72.0	1.56	9.87	1.03	10.16	-2.44		0.95
Oct-88	67.2	3.95	7.87	0.98	7.72	0.91	0.91	0.91
Nov-88	54.6	0.13	3.60	0.89	3.21	-1.13		0.91
Dec-88	45.9	0.60	1.53	0.88	1.35	0.07	0.07	0.07
Jan-89	44.2	0.96	1.21	0.90	1.09	0.53	0.53	0.60
Feb-89	52.7	0.19	3.09	0.87	2.69	-0.87		0.53
Mar-89	60.2	0.20	5.33	1.03	5.49	-1.96		
Apr-89	67.9	0.19	8.15	1.08	8.81	-3.28		
May-89	71.2	0.25	9.52	1.18	11.23	-4.17		
Jul-89	78.6	0.00	12.92	1.18	15.24	-6.00		
Jul-89	80.1	2.43	13.66	1.20	16.39	-4.02		
Aug-89	75.9	1.74	11.63	1.14	13.25	-3.48		

			SIERRA VISTA, AZ					
			Soil Moisture Balance					
Date	Mean Temp.	Precipitation	PE (cm)	Adj.	Adj. PE (cm)	Precip-PE	Excess (in)	2 Month total
Sep-89	73.6	0.71	10.57	1.03	10.89	-3.58		
Oct-89	63.0	2.34	6.29	0.98	6.17	-0.09		
Nov-89	54.6	0.00	3.60	0.89	3.21	-1.26		
Dec-89	46.3	0.08	1.61	0.88	1.41	-0.48		
Jan-90	44.7	0.45	1.30	0.90	1.17	-0.01		
Feb-90	46.5	0.80	1.65	0.87	1.43	0.24	0.24	0.24
Mar-90	56.2	0.23	4.07	1.03	4.19	-1.42		0.24
Apr-90	63.7	0.32	6.55	1.08	7.07	-2.46		
May-90	68.5	0.14	8.39	1.18	9.91	-3.76		
Jun-90	82.7	0.34	14.99	1.18	17.69	-6.62		
Jul-90	76.0	3.91	11.67	1.20	14.01	-1.60		
Aug-90	73.9	2.76	10.71	1.14	12.21	-2.05		
Sep-90	73.0	1.93	10.31	1.03	10.61	-2.25		
Oct-90	64.9	0.47	6.99	0.98	6.85	-2.23		
Nov-90	54.8	0.46	3.66	0.89	3.26	-0.82		
Dec-90	45.6	0.97	1.47	0.88	1.29	0.46	0.46	0.46
Jan-91	45.8	1.46	1.51	0.90	1.36	0.93	0.93	1.39
Feb-91	51.3	1.63	2.73	0.87	2.37	0.70	0.70	1.62

APPENDIX B

Entrance Passages Data Logger System Data

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Entrance Passages Data Logger System

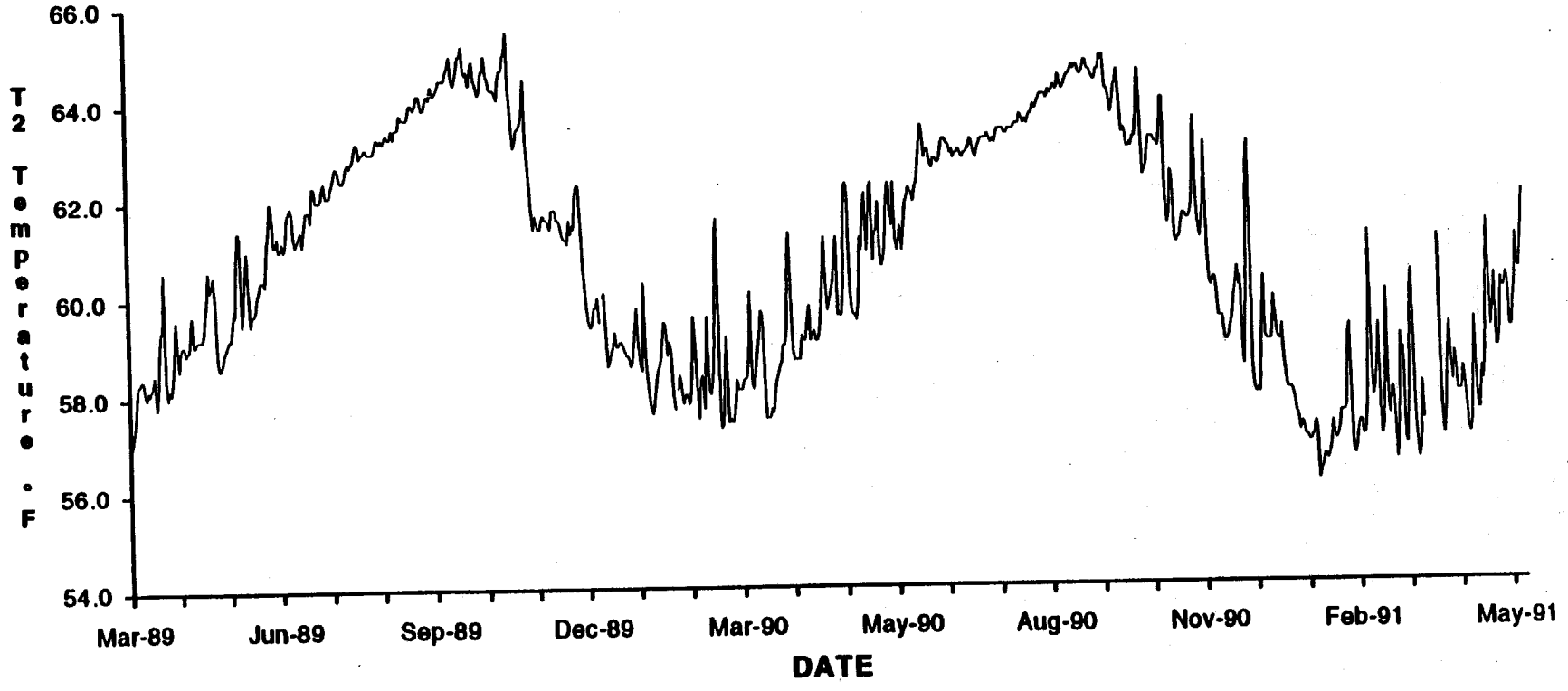
A computerized data logging system for measuring temperatures was installed in the LEM Room in March 1989. This system consists of an OWL data logger, Radio Shack Model 102 computer and seven temperature probes. As presently configured the system can operate on battery power for approximately 40 days. The computer is downloaded once a month for convenience.

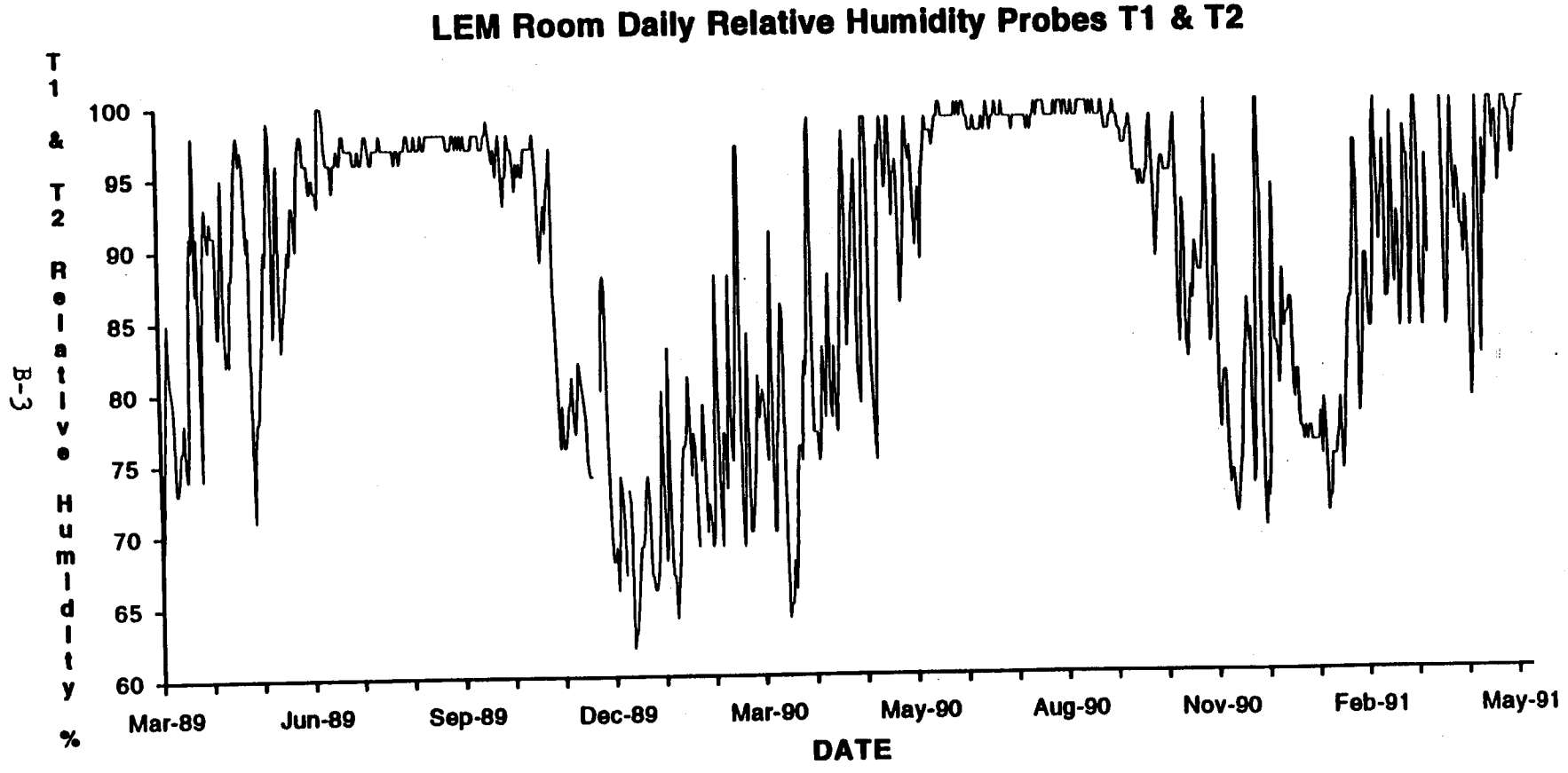
The seven temperature probes are strung out over approximately 150 feet of passages. Two of the probes are wet bulbs and provide a measurement of the relative humidity. Each wet bulb is paired with a dry bulb temperature probe. The remaining three probes are all dry bulb temperature probes. Each temperature probe is an LM34 integrated circuit temperature sensor. These have been individually calibrated to within 0.3°F of each other. Temperature readings are taken once each hour. This system has a temperature resolution of 0.5°F which is adequate for the entrance passages since they typically vary by several degrees per year.

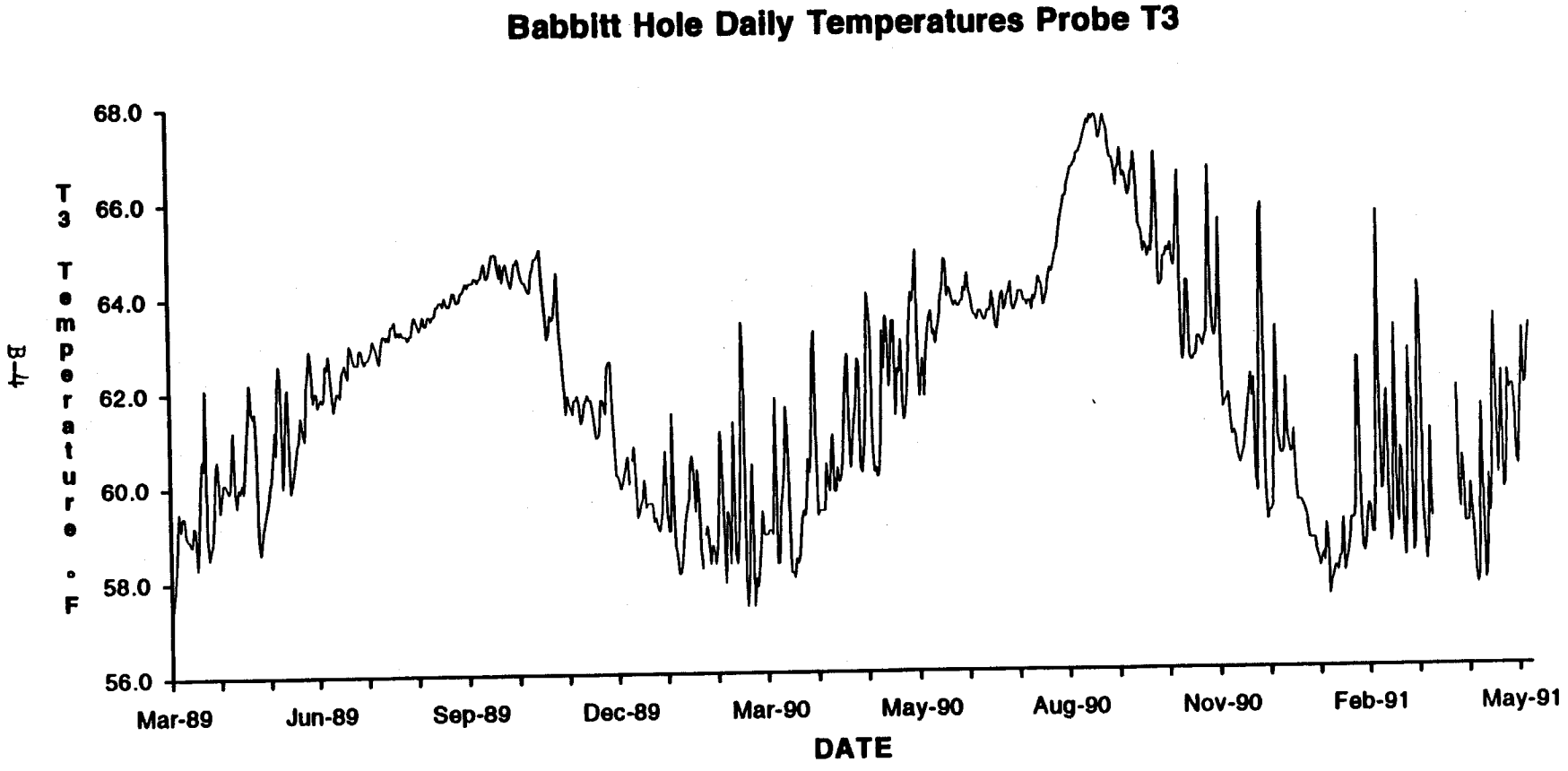
The system has been in operation for 27 months and has been very reliable. It has collected 97.4% of the possible data. During this time two probes have failed and been replaced. The other problems resulting in loss of data have been battery failure and failing to download the computer before the memory is filled up. We had anticipated that rats gnawing on the wires would be a problem but this has only occurred in a few places and has caused no failures.

The following pages summarize the data collected during the study. The hourly data has been averaged to yield daily temperature, maximums and minimums. Relative humidity has been computed from the differences in wet bulb and dry bulb temperatures.

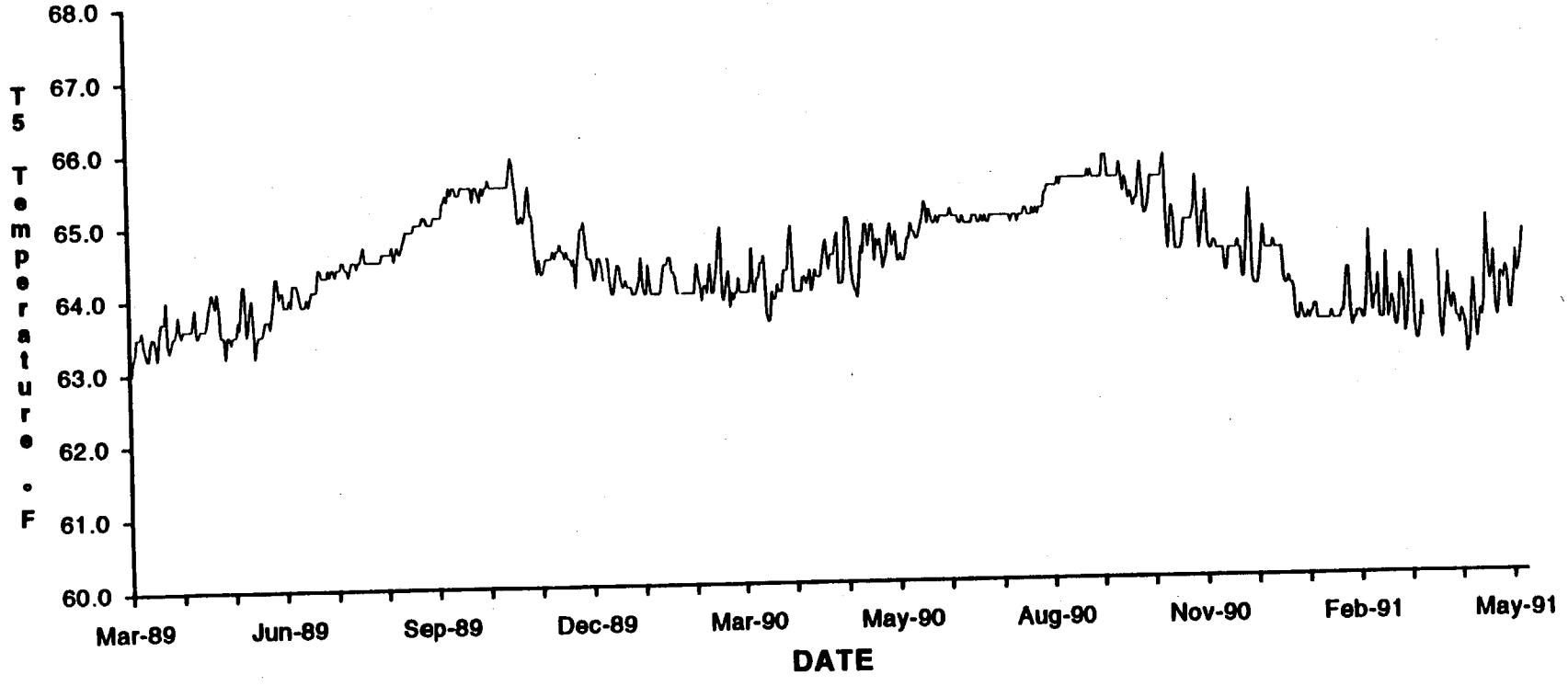
LEM Room Daily Temperatures Probe T2

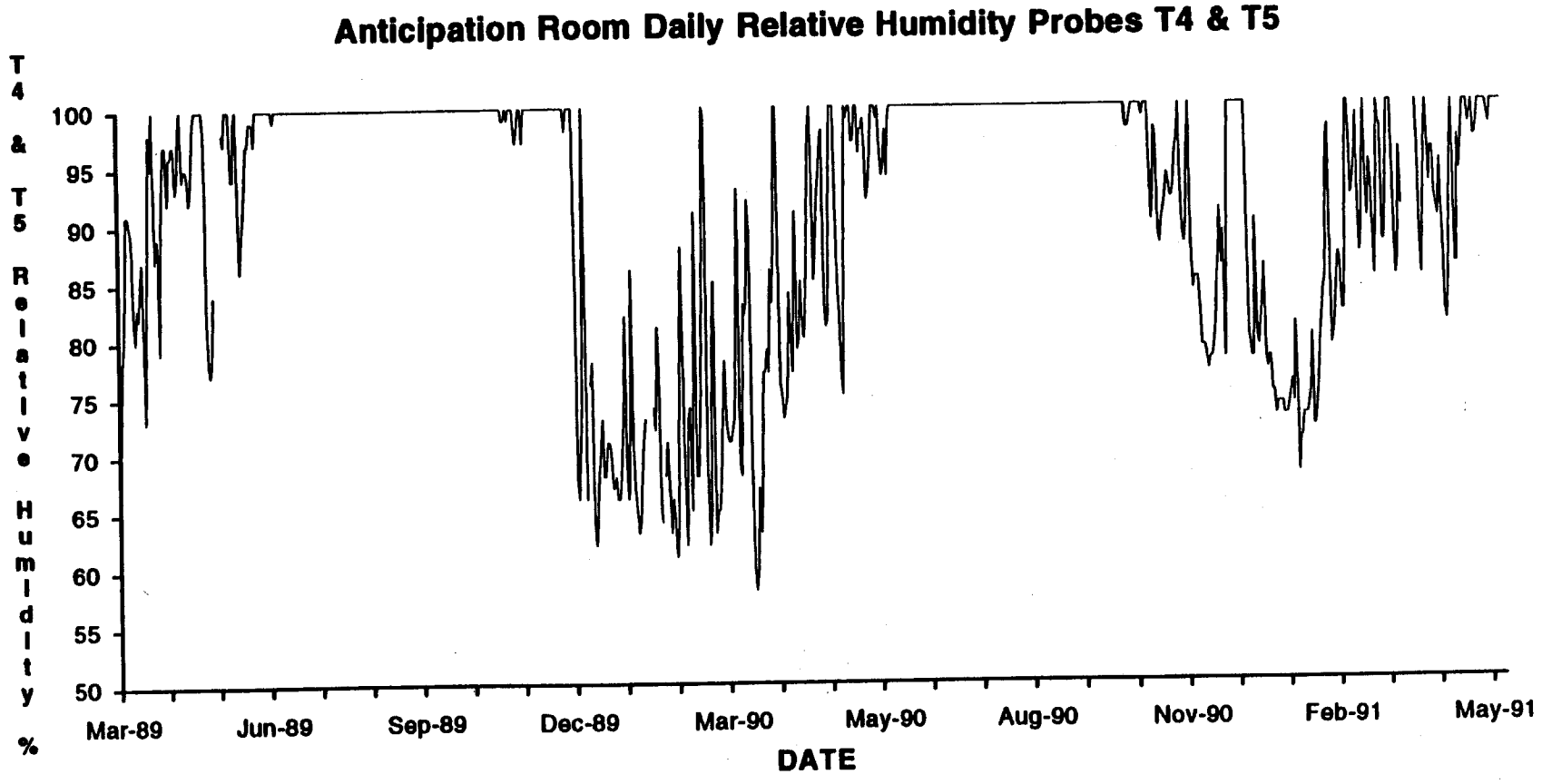



LEM Room Daily Relative Humidity Probes T1 & T2
T1 & T2 Relative Humidity %
100
95
90
85
80
75
70
65
60
Mar-89
Jun-89
Sep-89
Dec-89
Mar-90
May-90
Aug-90
Nov-90
Feb-91
May-91
DATE

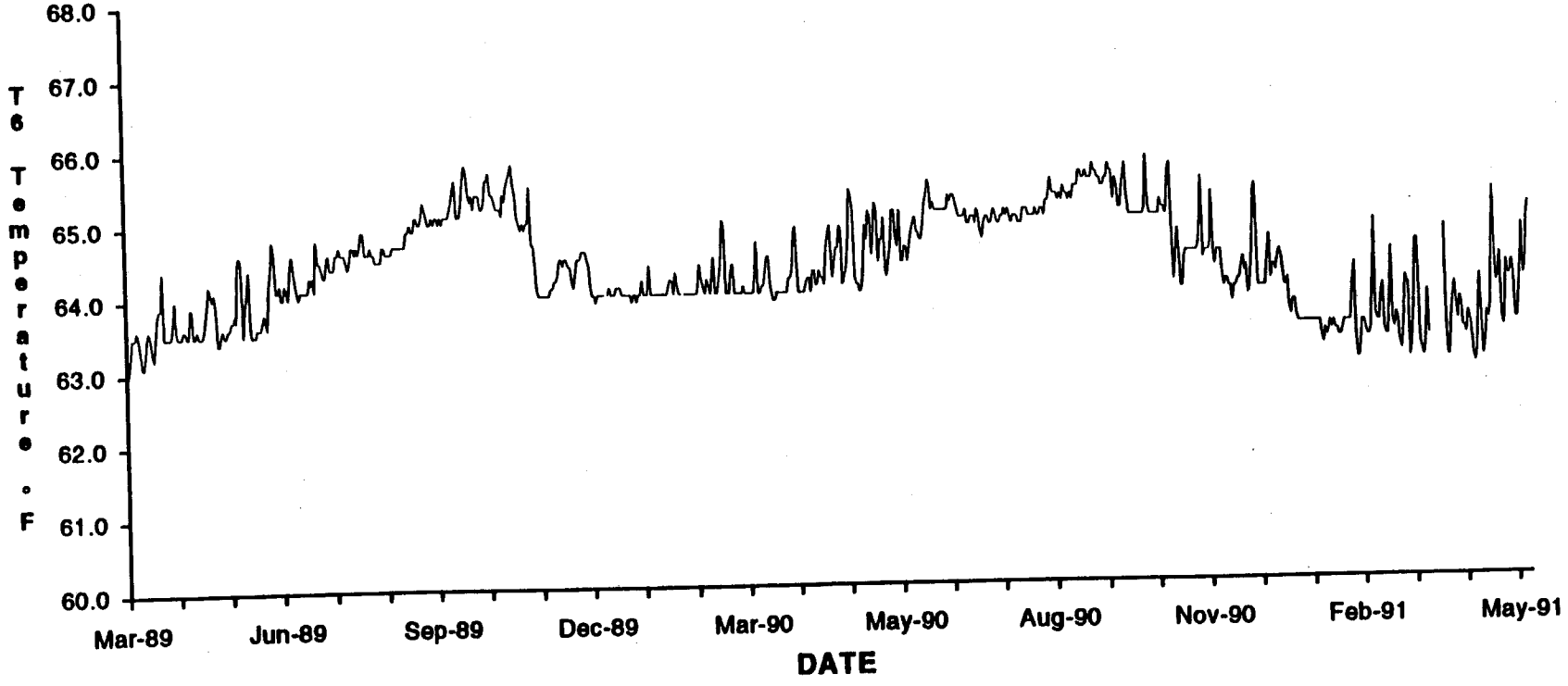

Babbitt Hole Daily Temperatures Probe T3
T3 Temperature °F
68.0
66.0
64.0
62.0
60.0
58.0
56.0
Mar-89
Jun-89
Sep-89
Dec-89
Mar-90
May-90
Aug-90
Nov-90
Feb-91
May-91
DATE

Anticipation Room Daily Temperatures Probe T5

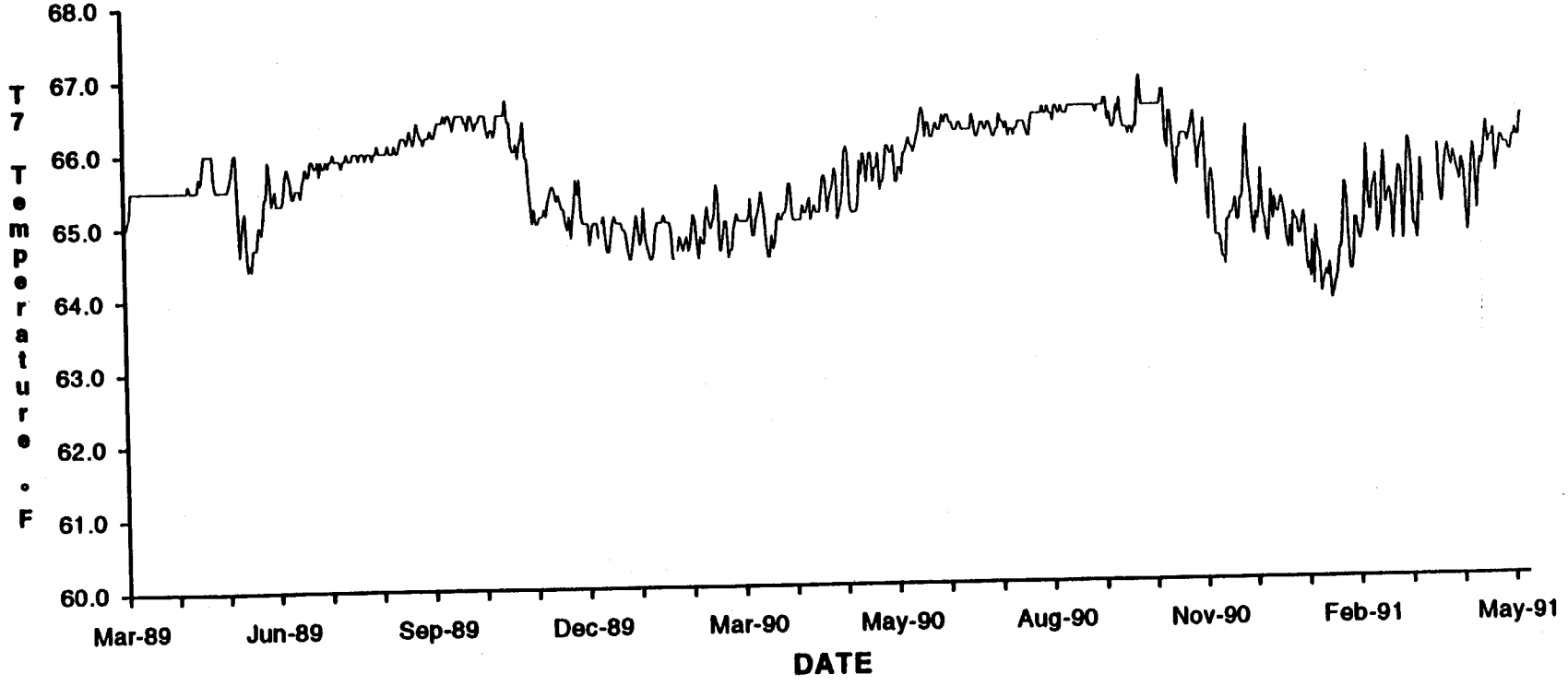



Anticipation Room Daily Relative Humidity Probes T4 & T5
T4 & T5 Relative Humidity %
100
95
90
85
80
75
70
65
60
55
50
Mar-89
Jun-89
Sep-89
Dec-89
Mar-90
May-90
Aug-90
Nov-90
Feb-91
May-91
DATE

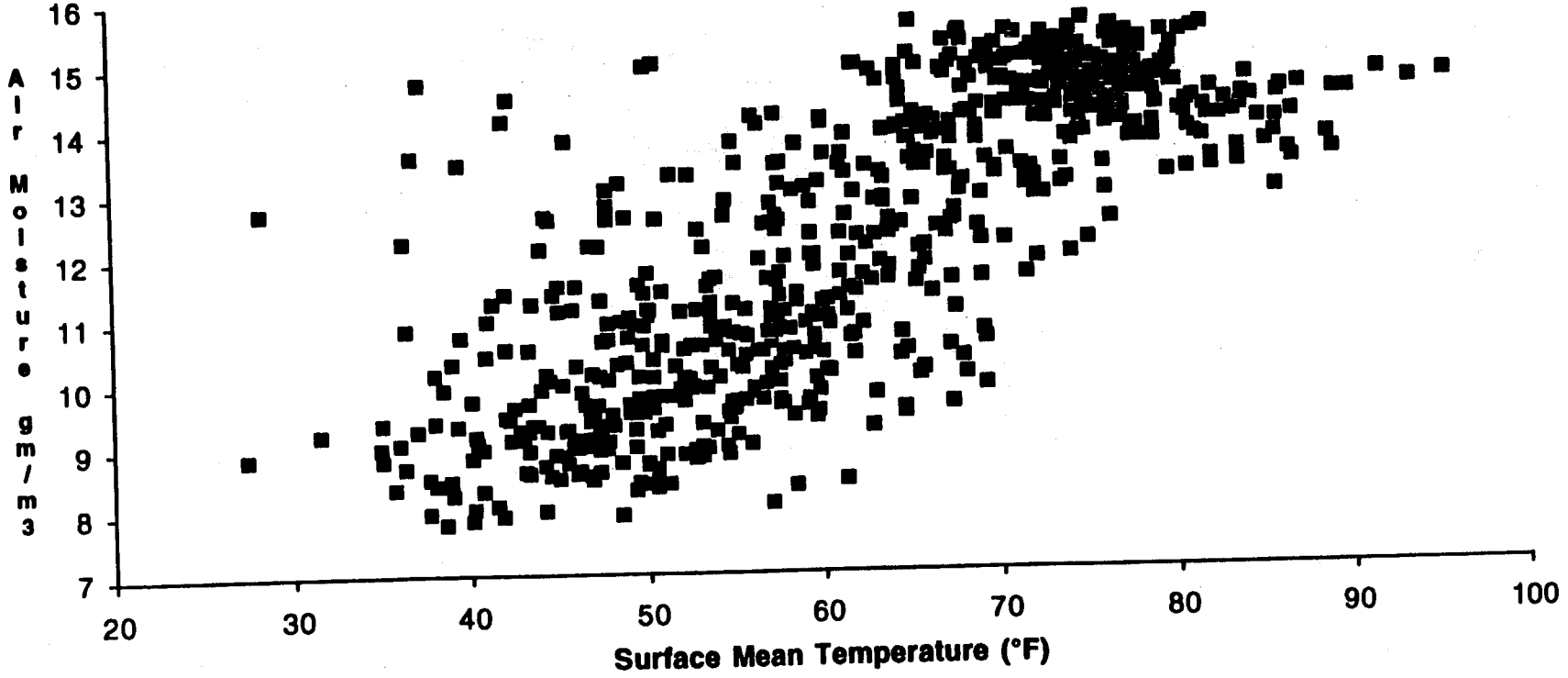
Anticipation Room Daily Temperatures Probe T6

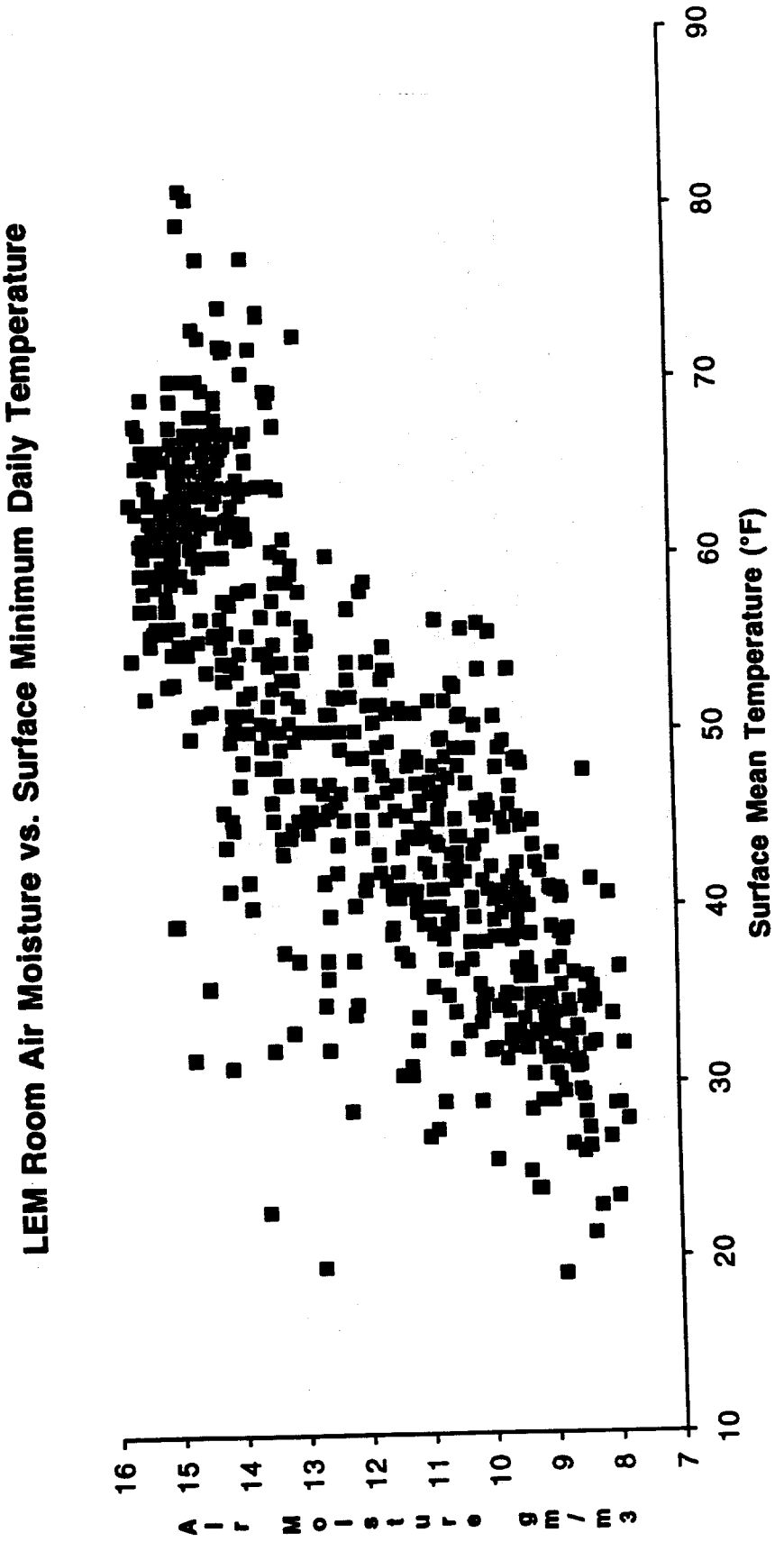


Pop-Up Daily Temperatures Probe T7

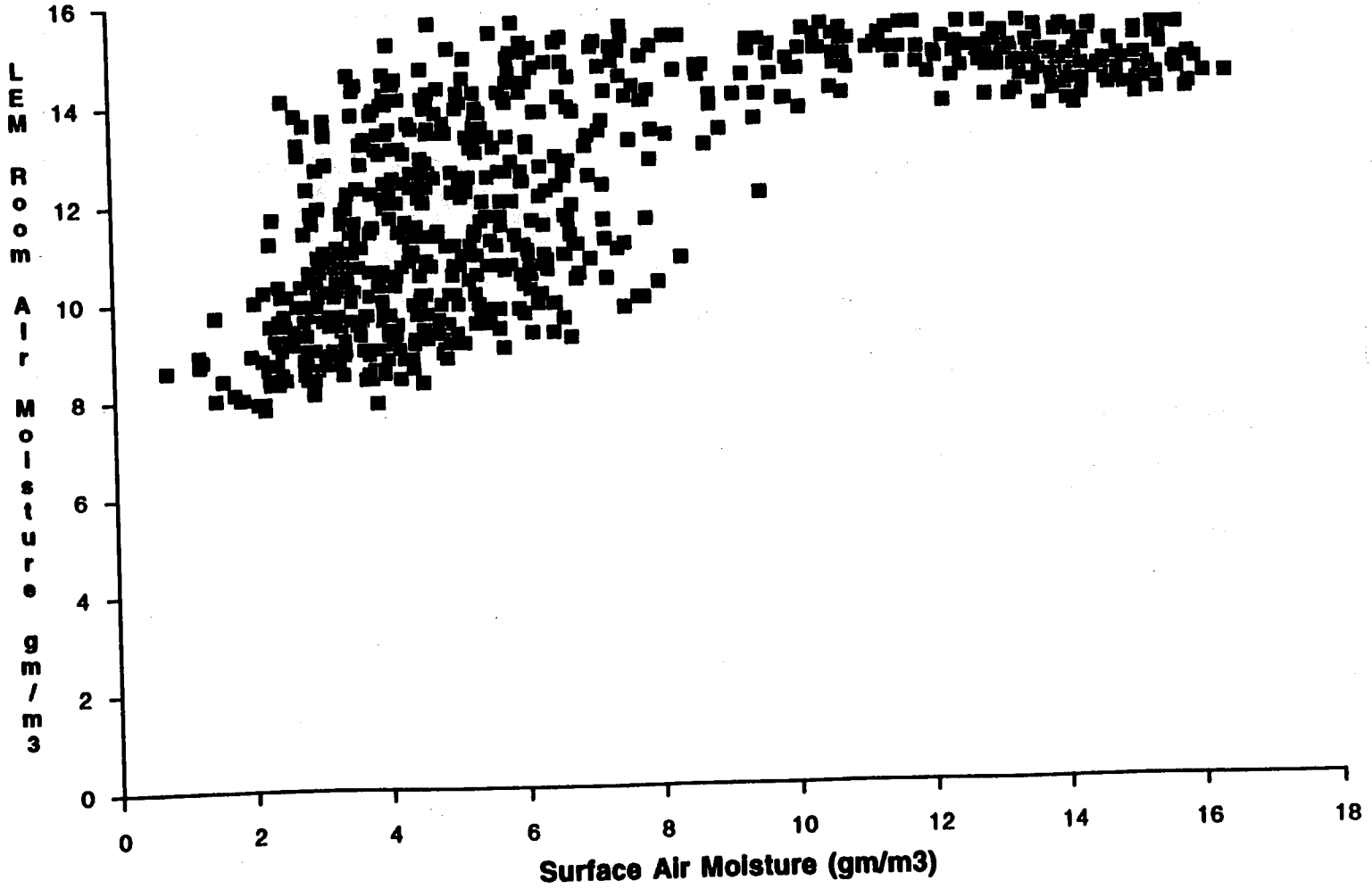


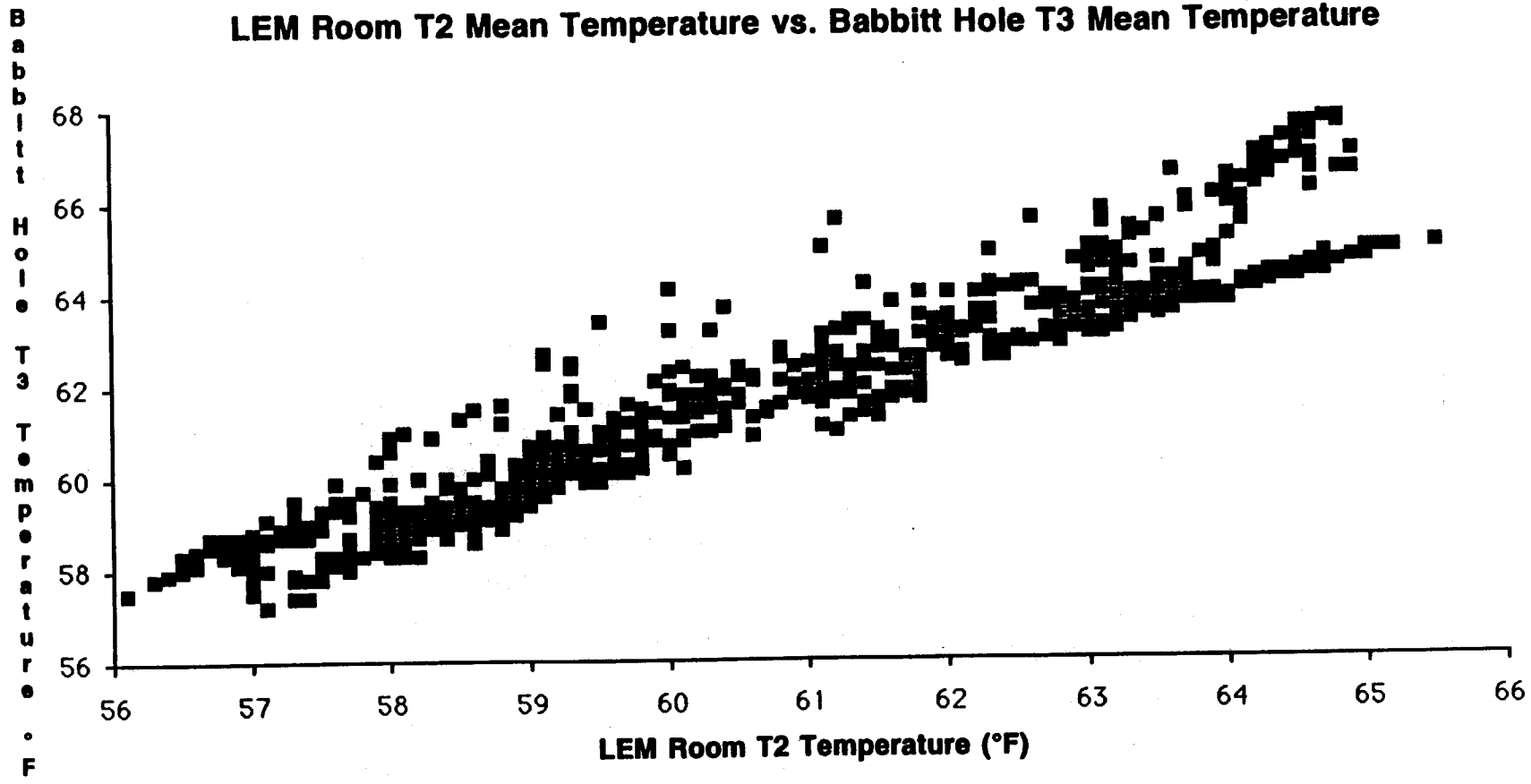
LEM Room Air Moisture vs. Surface Mean Daily Temperature




LEM Room Air Moisture vs. Surface Minimum Daily Temperature
Air Moisture gm/m3
16
15
14
13
12
11
10
9
8
7
10
20
30
40
50
60
70
80
90
Surface Mean Temperature (°F)

Surface/LEM Room Air Moisture Relationship




LEM Room T2 Mean Temperature vs. Babbitt Hole T3 Mean Temperature
Babbitt Hole T3 Temperature °F
68
66
64
62
60
58
56
56
57
58
59
60
61
62
63
64
65
66
LEM Room T2 Temperature (°F)

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

	Moisture	Temperatures				Temperatures				Temperatures				RH (%)
DATE	gm/m3	T3 Ave	T3 Max	T3 Min	T3 Hrs	T4 Ave	T4 Max	T4 Min	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	(T4,T5)
04/23/89	12.8	61.6	63.0	60.5	24	64.1	64.5	63.5	24	64.0	64.0	64.0	24	100
04/24/89	13.0	61.5	62.5	60.0	24	64.1	64.5	62.5	24	63.9	64.0	63.5	24	100
04/25/89	13.0	61.6	62.5	59.5	24	64.1	64.5	62.0	24	64.1	64.5	63.5	24	100
04/26/89	12.2	60.7	62.0	59.0	24	63.5	64.5	60.5	24	63.9	64.5	63.5	24	98
04/27/89	11.5	58.9	59.5	58.5	24	59.8	61.5	58.0	24	63.5	63.5	63.0	24	82
04/28/89	11.5	58.6	59.5	58.0	24	59.0	62.0	57.5	24	63.5	63.5	63.0	24	78
04/29/89	10.1	58.8	59.5	58.5	24	58.7	61.0	56.0	24	63.5	64.5	63.0	24	77
04/30/89	9.0	59.1	62.5	58.5	24	58.6	61.5	56.5	24	63.2	63.5	63.0	24	78
05/01/89	9.7	59.3	60.5	59.0	24	60.2	61.5	58.5	17	63.5	63.5	63.0	24	84
05/02/89	10.0	59.5	61.5	59.0	24	-	-	-	-	63.5	63.5	63.0	24	-
05/03/89	10.0	59.7	62.0	59.0	24	-	-	-	-	63.4	63.5	63.0	24	-
05/04/89	10.5	60.0	61.5	59.0	24	-	-	-	-	63.5	63.5	63.0	24	-
05/05/89	10.7	60.2	62.0	59.0	24	-	-	-	-	63.5	63.5	63.5	24	-
05/06/89	11.1	60.7	62.0	59.5	24	-	-	-	-	63.5	63.5	63.5	24	-
05/07/89	11.9	61.2	62.5	60.0	24	63.4	64.5	62.0	12	63.7	64.0	63.5	23	98
05/08/89	11.7	60.7	62.0	59.5	24	63.0	64.5	61.5	24	63.6	64.0	63.5	24	97
05/09/89	12.8	62.1	63.0	60.0	24	63.9	65.0	62.0	24	63.9	64.5	63.5	24	100
05/10/89	13.8	62.6	63.5	61.0	24	64.6	65.0	64.0	24	64.2	64.5	64.0	24	100
05/11/89	13.6	62.2	63.0	60.5	24	64.6	65.0	63.5	24	64.2	64.5	63.5	24	100
05/12/89	11.0	60.0	61.0	59.5	24	62.4	64.0	61.0	24	63.5	63.5	63.5	24	94
05/13/89	11.4	60.6	62.0	59.0	24	62.5	64.5	60.0	24	63.6	64.0	63.0	24	94
05/14/89	12.7	61.8	63.0	59.5	24	63.8	64.5	61.5	24	63.9	64.5	63.5	24	99
05/15/89	13.2	62.1	63.0	60.0	24	64.1	64.5	62.0	24	64.0	64.5	63.5	24	100
05/16/89	11.7	60.6	63.0	59.5	24	62.1	64.5	60.5	24	63.6	64.5	63.0	24	92
05/17/89	10.8	59.9	60.5	59.5	24	60.3	61.0	59.5	24	63.2	63.5	63.0	24	86
05/18/89	11.2	60.1	61.5	59.5	24	61.2	63.0	59.5	24	63.4	63.5	63.0	24	89
05/19/89	11.3	60.3	62.0	59.5	24	61.6	63.5	60.0	24	63.5	63.5	63.5	24	91
05/20/89	11.6	60.6	62.0	59.5	24	62.4	63.5	61.0	24	63.5	63.5	63.5	24	94
05/21/89	12.0	60.9	62.5	60.0	24	63.0	64.0	62.0	24	63.5	64.0	63.5	24	97
05/22/89	11.9	61.0	62.5	60.0	24	63.0	64.0	62.0	24	63.6	64.0	63.5	24	97
05/23/89	12.5	61.5	62.5	60.5	24	63.6	64.0	62.5	24	63.7	64.0	63.5	24	99
05/24/89	12.5	61.3	62.5	60.5	24	63.6	64.0	62.5	24	63.7	64.0	63.5	24	99
05/25/89	12.4	61.1	62.5	60.5	24	63.5	64.0	62.5	24	63.7	64.0	63.5	24	99
05/26/89	12.1	61.0	62.5	60.0	24	63.1	64.0	61.5	24	63.6	64.0	63.5	24	97
05/27/89	13.1	62.1	63.0	60.5	24	64.1	64.5	63.5	24	63.8	64.0	63.5	24	100
05/28/89	13.5	62.4	63.0	60.5	24	64.3	64.5	63.5	24	64.0	64.5	63.5	24	100
05/29/89	13.9	62.9	63.5	61.0	24	64.5	65.0	64.0	24	64.3	64.5	64.0	24	100
05/30/89	13.8	62.6	63.0	61.5	24	64.5	65.0	64.0	24	64.3	64.5	63.5	24	100
05/31/89	13.2	61.8	63.5	61.0	24	64.1	64.5	63.5	24	64.0	64.5	63.5	24	100
06/01/89	13.2	62.0	63.0	61.0	24	64.2	64.5	63.5	24	64.1	64.5	64.0	24	100
06/02/89	13.3	62.0	63.0	61.0	24	64.2	64.5	64.0	24	64.1	64.5	63.5	24	100
06/03/89	12.9	61.7	63.0	61.0	24	64.0	65.0	63.5	24	63.9	64.5	63.5	24	100
06/04/89	12.9	61.8	63.0	61.0	24	64.0	64.5	63.5	24	63.9	64.0	63.5	24	100
06/05/89	13.1	61.9	63.0	60.5	24	64.1	64.5	63.0	24	63.9	64.5	63.5	24	100
06/06/89	12.9	61.8	63.0	61.0	24	63.9	64.5	63.5	24	64.0	64.5	63.5	24	99
06/07/89	12.9	61.9	63.0	61.0	24	64.0	64.5	63.5	24	63.9	64.0	63.5	24	100
06/08/89	13.1	62.6	63.5	61.5	18	64.4	65.0	64.0	18	64.2	64.5	63.5	18	100
06/09/89	14.1	62.5	63.5	61.5	24	64.4	64.5	64.0	24	64.2	64.5	63.5	24	100
06/10/89	14.1	62.8	63.5	62.0	24	64.6	65.0	64.0	24	64.2	64.5	64.0	24	100

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

	Moisture	Temperatures				Temperatures				Temperatures				RH (%)
DATE	gm/m3	T3 Ave	T3 Max	T3 Min	T3 Hrs	T4 Ave	T4 Max	T4 Min	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	(T4,T5)
06/11/89	14.1	62.3	63.0	61.5	24	64.4	64.5	64.0	24	64.1	64.5	64.0	24	100
06/12/89	13.7	62.0	63.0	61.0	24	64.2	64.5	63.5	24	64.0	64.5	63.5	24	100
06/13/89	13.4	61.6	62.5	61.0	24	64.0	64.5	63.5	24	63.9	64.0	63.5	24	100
06/14/89	13.3	61.8	63.0	61.0	24	63.9	64.5	63.5	24	63.9	64.0	63.5	24	100
06/15/89	13.3	62.0	63.0	61.0	24	64.1	64.5	63.5	24	63.9	64.0	63.5	24	100
06/16/89	13.4	62.0	63.5	61.0	24	64.2	64.5	63.5	24	64.0	64.5	63.5	24	100
06/17/89	12.9	61.9	63.0	61.0	24	64.0	64.5	63.0	24	63.9	64.5	63.5	24	100
06/18/89	13.4	62.4	63.0	61.5	24	64.2	64.5	63.5	24	64.0	64.5	63.5	24	100
06/19/89	13.5	62.5	63.5	61.0	24	64.5	65.0	63.5	24	64.1	64.5	63.5	24	100
06/20/89	13.7	62.6	63.0	62.0	24	64.4	64.5	64.0	24	64.1	64.5	63.5	24	100
06/21/89	13.5	62.4	63.0	61.5	24	64.4	65.0	64.0	24	64.1	64.5	63.5	24	100
06/22/89	13.4	62.3	63.0	61.5	24	64.3	64.5	64.0	24	64.1	64.5	64.0	24	100
06/23/89	14.0	63.0	63.5	62.0	24	64.6	65.0	64.0	24	64.4	64.5	64.0	24	100
06/24/89	14.0	62.9	63.5	62.5	24	64.6	65.0	64.0	24	64.4	64.5	64.0	24	100
06/25/89	13.8	62.7	63.5	62.0	24	64.5	65.0	64.0	24	64.3	64.5	64.0	24	100
06/26/89	13.8	62.6	63.0	62.0	24	64.4	64.5	64.0	24	64.3	64.5	64.0	24	100
06/27/89	13.8	62.6	63.5	62.0	24	64.5	64.5	64.0	24	64.3	64.5	64.0	24	100
06/28/89	13.8	62.6	63.5	62.0	24	64.5	65.0	64.5	24	64.3	64.5	64.0	24	100
06/29/89	13.9	62.9	63.5	62.5	24	64.5	65.0	64.5	24	64.4	64.5	64.0	24	100
06/30/89	13.8	62.9	64.0	62.0	24	64.6	65.0	64.0	24	64.3	64.5	63.5	24	100
07/01/89	13.7	62.7	63.5	62.0	24	64.5	65.0	64.0	24	64.4	64.5	64.0	24	100
07/02/89	13.7	62.6	63.0	61.5	24	64.4	64.5	64.0	24	64.4	64.5	64.0	24	100
07/03/89	13.8	62.7	63.0	62.0	24	64.5	65.0	64.0	24	64.3	64.5	64.0	24	100
07/04/89	13.8	62.7	63.0	62.0	24	64.6	65.0	64.0	24	64.4	64.5	63.5	24	100
07/05/89	13.8	62.8	63.0	61.5	24	64.5	65.0	63.0	24	64.4	64.5	63.5	24	100
07/06/89	14.0	62.9	63.5	62.5	24	64.7	65.0	64.0	24	64.4	64.5	63.5	24	100
07/07/89	14.2	63.1	63.5	62.5	24	64.8	65.0	64.5	24	64.5	64.5	64.5	24	100
07/08/89	14.2	63.0	63.5	62.5	24	64.8	65.0	64.5	24	64.5	64.5	64.0	24	100
07/09/89	14.0	62.9	63.5	62.0	24	64.6	65.0	64.0	24	64.4	64.5	64.0	24	100
07/10/89	13.8	62.7	63.5	62.0	24	64.6	65.0	64.0	24	64.4	64.5	64.0	24	100
07/11/89	13.8	62.6	63.5	62.0	24	64.5	65.0	64.0	24	64.3	64.5	64.0	24	100
07/12/89	14.0	63.0	63.5	62.5	24	64.6	65.0	64.5	24	64.4	64.5	64.0	24	100
07/13/89	14.1	63.2	63.5	62.0	24	64.7	65.0	64.5	24	64.5	65.0	64.0	24	100
07/14/89	14.1	63.2	63.5	62.5	24	64.7	65.0	64.0	24	64.5	64.5	64.0	24	100
07/15/89	14.1	63.1	63.5	62.5	24	64.7	65.0	64.0	24	64.5	64.5	64.0	24	100
07/16/89	14.3	63.2	63.5	62.5	24	64.7	65.0	64.0	24	64.4	65.0	63.5	24	100
07/17/89	14.1	63.1	63.5	62.5	24	64.7	65.0	64.5	24	64.5	64.5	64.0	24	100
07/18/89	14.2	63.4	64.0	62.5	24	64.8	65.0	64.0	24	64.5	65.0	64.0	24	100
07/19/89	14.3	63.4	64.0	62.5	24	64.9	65.0	64.5	24	64.6	65.0	64.0	24	100
07/20/89	14.3	63.5	64.0	63.0	24	64.9	65.0	64.5	24	64.7	65.0	64.5	24	100
07/21/89	14.2	63.2	63.5	62.5	24	64.8	65.0	64.5	24	64.5	65.0	64.0	24	100
07/22/89	14.2	63.3	63.5	63.0	24	64.9	65.0	64.5	24	64.5	64.5	64.0	24	100
07/23/89	14.2	63.2	63.5	63.0	24	64.8	65.0	64.5	24	64.5	64.5	64.0	24	100
07/24/89	14.3	63.3	64.0	62.5	24	64.9	65.0	64.0	24	64.5	65.0	63.5	24	100
07/25/89	14.1	63.2	63.5	62.5	24	64.8	65.0	64.5	24	64.5	65.0	64.0	24	100
07/26/89	14.2	63.2	64.0	62.5	24	64.8	65.0	64.0	24	64.5	65.0	64.0	24	100
07/27/89	14.2	63.2	63.5	63.0	24	64.7	65.0	64.5	24	64.5	64.5	64.5	24	100
07/28/89	14.1	63.1	64.0	62.5	24	64.7	65.0	64.0	24	64.5	64.5	64.0	24	100
07/29/89	14.2	63.2	63.5	63.0	24	64.7	65.0	64.5	24	64.5	64.5	64.5	24	100

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
07/30/89	14.3	63.2	63.5	62.5	24	64.8	65.0	64.0	24	64.5	65.0	64.0	24	100
07/31/89	14.4	63.5	64.0	63.0	24	65.0	65.0	64.5	24	64.6	65.0	64.5	24	100
08/01/89	14.5	63.6	64.0	63.0	24	64.9	65.0	64.5	24	64.6	65.0	64.5	24	100
08/02/89	14.5	63.5	64.0	63.0	24	65.0	65.0	64.5	24	64.6	65.0	64.5	24	100
08/03/89	14.4	63.4	64.0	63.0	24	64.9	65.0	64.5	24	64.6	65.0	64.5	24	100
08/04/89	14.3	63.3	64.0	63.0	24	64.9	65.0	64.5	24	64.6	65.0	64.5	24	100
08/05/89	14.4	63.4	64.0	63.0	24	64.9	65.0	64.5	24	64.6	65.0	64.0	24	100
08/06/89	14.6	63.6	64.0	63.0	24	64.9	65.0	64.5	24	64.7	65.0	64.0	24	100
08/07/89	14.4	63.4	64.0	63.0	24	64.9	65.0	64.5	24	64.5	65.0	64.5	24	100
08/08/89	14.4	63.4	64.0	63.0	24	64.9	65.0	64.5	24	64.6	65.0	64.5	24	100
08/09/89	14.5	63.6	64.0	63.0	24	65.0	65.0	65.0	24	64.7	65.0	64.5	24	100
08/10/89	14.5	63.6	64.0	63.0	24	64.9	65.0	64.5	24	64.6	65.0	64.5	24	100
08/11/89	14.5	63.5	64.0	63.0	24	65.0	65.0	64.5	24	64.6	65.0	64.5	24	100
08/12/89	14.5	63.6	64.0	63.5	24	64.9	65.0	64.5	24	64.7	65.0	64.5	24	100
08/13/89	14.6	63.6	64.0	63.5	24	64.9	65.0	64.5	24	64.8	65.0	64.5	24	100
08/14/89	14.8	63.8	64.0	63.5	24	65.0	65.5	64.5	24	64.9	65.0	64.5	24	100
08/15/89	14.7	63.8	64.5	63.5	24	65.1	65.5	65.0	24	64.9	65.0	64.5	24	100
08/16/89	14.7	63.9	64.5	63.5	24	65.1	65.5	64.5	24	64.9	65.0	64.5	24	100
08/17/89	14.7	63.9	64.5	63.5	24	65.1	65.5	65.0	24	64.9	65.0	64.5	24	100
08/18/89	14.7	63.8	64.5	63.5	24	65.1	65.5	65.0	24	64.9	65.0	64.5	24	100
08/19/89	14.8	64.0	64.5	63.5	24	65.2	65.5	65.0	24	65.0	65.0	64.5	24	100
08/20/89	14.9	63.9	64.5	63.5	24	65.3	65.5	65.0	24	65.0	65.0	64.5	24	100
08/21/89	14.9	63.8	64.0	63.5	24	65.3	65.5	65.0	24	65.0	65.0	65.0	24	100
08/22/89	14.8	63.8	64.5	63.5	24	65.2	65.5	65.0	24	65.0	65.0	64.5	24	100
08/23/89	14.9	63.9	64.5	63.5	24	65.3	65.5	65.0	24	65.0	65.0	64.5	24	100
08/24/89	15.0	64.1	64.5	63.5	24	65.4	65.5	65.0	24	65.1	65.5	65.0	24	100
08/25/89	14.8	64.1	64.5	63.5	24	65.4	65.5	65.0	24	65.1	65.5	65.0	24	100
08/26/89	14.7	63.9	64.5	63.5	24	65.3	65.5	64.5	24	65.0	65.0	64.0	24	100
08/27/89	14.7	63.9	64.5	63.5	24	65.3	65.5	65.0	24	65.0	65.0	65.0	24	100
08/28/89	14.8	63.9	64.0	63.5	24	65.3	65.5	65.0	24	65.0	65.0	65.0	24	100
08/29/89	14.9	64.1	65.0	63.5	24	65.5	65.5	65.0	24	65.0	65.5	65.0	24	100
08/30/89	14.8	64.1	64.5	63.5	24	65.5	65.5	65.5	24	65.1	65.5	65.0	24	100
08/31/89	14.9	64.2	65.0	63.5	24	65.4	65.5	65.0	24	65.1	65.5	65.0	24	100
09/01/89	14.9	64.3	64.5	64.0	24	65.5	65.5	65.0	24	65.1	65.5	65.0	24	100
09/02/89	15.0	64.2	64.5	64.0	24	65.5	65.5	65.5	24	65.1	65.5	65.0	24	100
09/03/89	14.8	64.3	64.5	63.5	24	65.5	65.5	65.0	24	65.1	65.5	65.0	24	100
09/04/89	15.0	64.3	64.5	63.5	24	65.5	65.5	65.5	24	65.1	65.5	65.0	24	100
09/05/89	14.9	64.3	64.5	63.5	24	65.5	65.5	65.5	24	65.3	65.5	65.0	24	100
09/06/89	15.0	64.4	64.5	64.0	24	65.5	65.5	65.5	24	65.3	65.5	65.0	24	100
09/07/89	15.0	64.4	64.5	64.0	24	65.5	65.5	65.5	24	65.4	65.5	65.0	24	100
09/08/89	15.0	64.3	64.5	64.0	24	65.5	65.5	65.5	24	65.3	65.5	65.0	24	100
09/09/89	15.1	64.4	64.5	64.0	24	65.5	65.5	65.5	24	65.5	65.5	65.0	24	100
09/10/89	15.2	64.4	65.0	64.0	24	65.5	66.0	65.5	24	65.4	65.5	65.0	24	100
09/11/89	15.3	64.6	65.0	64.0	24	65.7	66.0	65.5	24	65.5	65.5	65.5	24	100
09/12/89	15.4	64.7	65.0	64.5	24	65.8	66.0	65.5	24	65.5	65.5	65.5	24	100
09/13/89	15.0	64.4	64.5	64.0	24	65.5	65.5	65.5	24	65.4	65.5	65.0	24	100
09/14/89	14.9	64.4	64.5	64.0	24	65.5	65.5	65.5	24	65.4	65.5	65.0	24	100
09/15/89	15.0	64.5	65.0	64.0	24	65.5	66.0	65.5	24	65.4	65.5	65.0	24	100
09/16/89	15.2	64.7	65.0	64.0	24	65.6	66.0	65.5	24	65.5	65.5	65.0	24	100

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

	Moisture	Temperatures				Temperatures				Temperatures				RH (%)
DATE	gm/m3	T3 Ave	T3 Max	T3 Min	T3 Hrs	T4 Ave	T4 Max	T4 Min	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	(T4,T5)
09/17/89	15.4	64.9	65.0	64.5	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
09/18/89	15.5	64.9	65.0	64.5	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
09/19/89	15.5	64.9	65.0	64.5	24	66.0	66.0	65.5	24	65.5	65.5	65.5	24	100
09/20/89	15.1	64.6	65.0	64.0	24	65.7	66.0	65.5	24	65.5	65.5	65.0	24	100
09/21/89	14.9	64.4	65.0	64.0	24	65.8	66.0	65.5	24	65.5	65.5	65.5	24	100
09/22/89	15.1	64.7	65.0	64.0	24	65.8	66.0	65.5	24	65.5	65.5	65.0	24	100
09/23/89	14.6	64.3	65.0	64.0	24	65.5	66.0	65.0	24	65.3	65.5	65.0	24	100
09/24/89	15.1	64.6	65.0	64.0	24	65.6	66.0	65.5	24	65.5	65.5	65.5	24	100
09/25/89	15.3	64.7	65.0	64.5	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
09/26/89	14.6	64.5	65.0	63.5	24	65.7	66.0	65.0	24	65.4	65.5	65.0	24	100
09/27/89	14.3	64.3	65.0	63.5	24	65.6	66.0	65.0	24	65.3	65.5	65.0	24	100
09/28/89	14.5	64.2	65.0	64.0	24	65.5	66.0	65.0	24	65.5	65.5	65.0	24	100
09/29/89	14.6	64.4	65.0	63.5	24	65.6	66.0	65.0	24	65.4	65.5	65.0	24	100
09/30/89	15.2	64.7	65.0	64.5	24	65.9	66.0	65.5	24	65.5	66.0	65.5	24	100
10/01/89	15.1	64.7	65.0	64.0	24	65.8	66.0	65.5	24	65.5	66.0	65.0	24	100
10/02/89	15.2	64.8	65.0	64.5	24	66.0	66.0	65.5	24	65.6	66.0	65.5	24	100
10/03/89	14.9	64.6	65.0	64.0	24	65.8	66.0	65.5	24	65.5	65.5	65.0	24	100
10/04/89	14.5	64.4	65.0	64.0	24	65.6	66.0	65.5	24	65.5	65.5	65.5	24	100
10/05/89	14.7	64.3	65.0	64.0	24	65.5	66.0	65.5	24	65.5	65.5	65.5	24	100
10/06/89	14.6	64.3	64.5	64.0	24	65.5	66.0	65.5	24	65.5	65.5	65.5	24	100
10/07/89	14.7	64.2	64.5	64.0	24	65.5	66.0	65.5	24	65.5	65.5	65.5	24	100
10/08/89	14.5	64.1	64.5	64.0	24	65.5	65.5	65.5	24	65.5	65.5	65.5	24	100
10/09/89	14.5	64.1	64.5	64.0	24	65.5	65.5	65.5	24	65.5	65.5	65.5	24	100
10/10/89	15.0	64.5	65.0	64.0	24	65.8	66.0	65.5	24	65.5	65.5	65.5	24	100
10/11/89	15.1	64.6	65.0	64.5	24	65.8	66.0	65.5	24	65.5	65.5	65.5	24	100
10/12/89	15.1	64.8	66.0	64.5	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
10/13/89	15.2	64.8	65.0	64.5	24	66.0	66.0	65.5	24	65.5	66.0	65.5	24	100
10/14/89	15.3	64.9	65.5	64.5	24	66.0	66.0	66.0	24	65.7	66.0	65.5	24	100
10/15/89	15.6	65.0	65.5	64.5	24	66.2	66.5	66.0	24	65.9	66.0	65.5	24	100
10/16/89	14.7	64.3	65.0	63.5	24	65.9	66.0	65.5	24	65.8	66.0	65.5	24	100
10/17/89	14.4	63.9	64.0	63.5	24	65.7	66.0	65.5	24	65.5	65.5	65.5	24	100
10/18/89	13.6	63.6	64.0	63.0	24	65.3	66.0	65.0	24	65.4	65.5	65.0	24	100
10/19/89	13.1	63.1	63.5	63.0	24	64.8	65.5	64.5	24	65.0	65.5	65.0	24	99
10/20/89	13.4	63.2	63.5	63.0	24	64.7	65.5	64.5	24	65.0	65.0	65.0	24	99
10/21/89	13.9	63.6	64.5	63.0	24	65.0	65.5	64.5	24	65.1	65.5	65.0	24	100
10/22/89	13.6	63.5	63.5	63.5	24	64.7	65.0	64.5	24	65.0	65.0	65.0	24	99
10/23/89	14.1	63.6	64.5	63.5	24	65.1	65.5	64.5	24	65.1	65.5	65.0	24	100
10/24/89	14.3	64.0	64.5	63.5	24	65.4	65.5	65.0	24	65.4	65.5	65.0	24	100
10/25/89	15.0	64.5	65.0	64.0	24	65.7	66.0	65.5	24	65.5	65.5	65.0	24	100
10/26/89	12.9	63.3	64.5	63.0	24	64.7	65.5	64.0	24	65.1	65.5	65.0	24	98
10/27/89	12.5	62.9	64.0	62.5	24	64.5	65.5	64.0	24	65.1	65.5	65.0	24	97
10/28/89	11.9	62.6	63.5	62.0	24	64.3	64.5	64.0	24	64.8	65.0	64.5	24	98
10/29/89	11.1	62.1	63.0	62.0	24	64.5	65.5	64.0	24	64.5	64.5	64.0	24	100
10/30/89	10.6	61.5	62.0	61.5	24	64.4	64.5	64.0	24	64.3	64.5	64.0	24	100
10/31/89	11.1	61.9	63.0	61.5	24	64.0	64.5	62.0	24	64.5	64.5	64.0	24	97
11/01/89	10.6	61.7	62.0	61.5	24	64.4	64.5	64.0	24	64.3	64.5	64.0	24	100
11/02/89	10.6	61.6	62.5	61.5	24	64.5	65.0	64.5	24	64.3	64.5	64.0	24	100
11/03/89	10.7	61.5	62.0	61.5	24	64.5	65.0	64.5	24	64.4	64.5	64.0	24	100
11/04/89	11.1	61.8	62.5	61.5	24	64.6	65.5	64.5	24	64.5	64.5	64.5	24	100

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
11/05/89	11.1	61.8	62.5	61.5	24	64.6	65.5	64.0	24	64.5	64.5	64.5	24	100
11/06/89	11.3	61.9	62.5	61.5	24	64.6	65.0	64.5	24	64.5	64.5	64.5	24	100
11/07/89	10.9	61.7	62.5	61.0	24	64.6	65.0	64.5	24	64.5	64.5	64.5	24	100
11/08/89	10.7	61.3	61.5	61.0	24	64.6	65.5	64.5	24	64.6	65.5	64.5	24	100
11/09/89	11.0	61.4	62.5	61.0	24	64.7	65.5	64.5	24	64.5	64.5	64.5	24	100
11/10/89	11.6	61.7	62.0	60.0	24	64.9	66.0	64.5	24	64.6	65.5	64.5	24	100
11/11/89	11.4	61.8	62.0	61.5	24	65.0	65.5	64.5	24	64.6	65.0	64.5	24	100
11/12/89	11.3	61.9	62.5	61.5	24	65.0	65.5	64.5	24	64.7	65.0	64.5	24	100
11/13/89	11.1	61.8	63.0	61.5	24	65.0	65.5	64.5	24	64.6	65.0	64.5	24	100
11/14/89	10.9	61.8	65.0	61.5	24	65.0	65.5	64.5	24	64.6	65.0	64.5	24	100
11/15/89	10.5	61.6	62.0	61.5	24	64.9	65.0	64.5	24	64.5	65.0	64.5	24	100
11/16/89	10.3	61.3	63.0	61.0	24	64.9	65.0	64.5	24	64.6	65.0	64.5	24	100
11/17/89	10.2	61.0	61.0	60.5	24	65.0	65.5	64.5	24	64.5	64.5	64.5	24	100
11/18/89	10.2	61.0	61.5	60.5	24	64.7	65.5	64.5	24	64.5	65.0	64.5	24	100
11/19/89	-	61.1	61.5	61.0	24	64.7	65.0	64.5	24	64.4	65.0	64.0	24	100
11/20/89	-	61.8	62.5	61.5	24	64.9	65.5	64.5	24	64.5	65.0	64.5	24	100
11/21/89	-	61.8	62.0	61.5	24	64.3	65.0	61.0	24	64.1	64.5	60.5	24	100
11/22/89	-	61.6	62.0	61.5	24	65.0	65.0	65.0	24	64.5	65.0	64.5	24	100
11/23/89	11.1	61.5	62.0	61.5	24	65.0	65.0	64.5	24	64.6	65.0	64.5	24	100
11/24/89	12.4	62.5	63.5	61.5	24	64.9	65.5	64.0	24	64.9	65.0	64.5	24	100
11/25/89	12.6	62.6	64.0	62.0	24	64.4	65.5	61.5	24	64.9	65.0	64.5	24	98
11/26/89	12.5	62.6	64.0	62.0	24	65.1	65.5	64.5	24	65.0	65.0	65.0	24	100
11/27/89	10.7	61.6	62.0	61.5	24	65.0	65.0	65.0	24	64.7	65.0	64.5	24	100
11/28/89	9.6	60.9	62.0	60.5	24	64.8	65.0	64.5	24	64.5	64.5	64.5	24	100
11/29/89	9.1	60.2	60.5	60.0	24	64.5	64.5	64.5	24	64.5	64.5	64.5	24	100
11/30/89	9.0	60.2	60.5	60.0	24	62.2	66.5	57.5	24	64.5	64.5	64.5	24	89
12/01/89	9.0	60.1	60.5	60.0	24	57.6	58.0	57.0	24	64.4	64.5	64.0	24	68
12/02/89	8.6	59.9	60.0	59.5	24	56.9	58.0	55.0	24	64.2	64.5	63.5	24	66
12/03/89	9.1	60.0	60.5	59.5	24	58.1	59.0	57.5	24	64.3	64.5	64.0	24	71
12/04/89	9.8	60.2	60.5	60.0	24	59.0	60.0	58.0	24	64.5	64.5	64.0	24	74
12/05/89	9.6	60.4	60.5	60.0	24	64.7	68.5	58.5	24	64.5	64.5	64.0	24	100
12/06/89	9.4	60.6	63.0	59.5	24	61.4	67.0	56.5	24	64.4	64.5	64.0	24	85
12/07/89	8.7	60.0	60.0	60.0	16	57.0	57.5	56.5	16	64.2	64.5	64.0	16	66
12/08/89	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/09/89	9.7	60.5	60.5	60.0	13	59.5	61.5	58.5	13	64.5	64.5	64.5	13	76
12/10/89	9.6	60.8	62.5	60.0	24	59.8	64.0	58.0	24	64.5	64.5	64.5	24	78
12/11/89	8.0	60.1	61.5	59.5	24	56.5	58.0	55.5	24	64.2	64.5	64.0	24	64
12/12/89	8.0	59.3	59.5	59.0	24	55.9	56.0	55.0	24	64.0	64.0	64.0	24	62
12/13/89	8.0	59.4	60.0	59.0	24	56.2	56.5	55.5	24	64.0	64.5	64.0	24	64
12/14/89	8.3	59.6	62.0	59.0	24	57.3	60.0	56.0	24	64.2	65.0	64.0	24	68
12/15/89	8.6	59.7	61.0	59.0	24	58.0	60.0	56.5	24	64.4	65.0	64.0	24	70
12/16/89	8.9	60.1	62.0	59.5	24	58.6	63.0	56.5	24	64.4	64.5	64.0	24	73
12/17/89	8.9	59.5	60.0	59.5	24	57.3	57.5	56.5	24	64.2	64.5	64.0	24	68
12/18/89	9.0	59.6	60.0	59.5	24	57.3	58.0	57.0	24	64.1	64.5	64.0	24	68
12/19/89	9.4	59.6	60.0	59.5	24	57.9	58.5	57.5	24	64.1	64.5	64.0	24	71
12/20/89	9.5	59.6	60.0	59.5	24	58.0	59.0	57.5	24	64.2	64.5	64.0	24	71
12/21/89	9.2	59.6	60.5	59.5	24	57.7	59.0	57.0	24	64.1	64.5	64.0	24	70
12/22/89	8.6	59.2	59.5	59.0	24	57.0	58.0	56.0	24	64.1	64.5	64.0	24	67
12/23/89	8.5	59.3	60.0	58.5	24	57.1	61.0	56.0	24	64.1	64.5	64.0	24	67

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

	Moisture	Temperatures				Temperatures				Temperatures				RH (%)
DATE	gm/m3	T3 Ave	T3 Max	T3 Min	T3 Hrs	T4 Ave	T4 Max	T4 Min	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	(T4,T5)
12/24/89	8.4	59.1	60.0	59.0	24	57.1	61.0	56.0	24	64.0	64.5	64.0	24	68
12/25/89	8.4	59.0	59.5	58.5	24	56.7	57.5	56.0	24	64.0	64.0	64.0	24	66
12/26/89	8.5	59.1	59.5	59.0	24	56.8	57.5	56.5	24	64.0	64.0	64.0	24	66
12/27/89	8.8	59.4	60.5	59.0	24	57.2	58.5	56.5	24	64.1	64.5	64.0	24	68
12/28/89	9.6	60.1	63.0	59.5	24	58.6	64.0	57.0	24	64.2	64.5	64.0	24	73
12/29/89	10.5	60.7	63.5	59.5	24	60.8	64.5	58.0	24	64.5	65.0	64.0	24	82
12/30/89	9.2	59.4	59.5	59.0	24	57.6	58.0	57.0	24	64.1	64.5	64.0	24	69
12/31/89	8.6	59.0	59.0	58.5	24	56.8	57.5	56.0	24	64.0	64.5	64.0	24	66
01/01/90	8.7	59.0	59.5	58.5	24	57.2	58.0	56.5	24	64.0	64.0	64.0	24	68
01/02/90	11.1	61.5	63.5	59.0	24	61.6	65.0	57.0	24	64.4	65.0	64.0	24	86
01/03/90	9.1	59.4	60.5	58.5	24	58.0	60.5	57.0	24	64.1	64.5	64.0	24	71
01/04/90	8.4	58.7	59.0	58.5	24	57.0	57.5	56.5	24	64.0	64.5	64.0	24	67
01/05/90	8.3	58.5	59.0	58.5	24	56.6	57.0	56.0	24	64.0	64.0	64.0	24	65
01/06/90	7.9	58.1	58.5	58.0	24	56.0	57.0	55.0	24	64.0	64.0	64.0	24	63
01/07/90	8.1	58.1	58.5	58.0	24	56.3	57.0	56.0	24	64.0	64.0	64.0	24	64
01/08/90	8.4	58.4	59.0	58.0	24	57.1	58.0	56.0	24	64.0	64.0	64.0	24	68
01/09/90	9.0	58.9	59.5	58.5	24	57.9	59.0	57.0	24	64.0	64.5	64.0	24	71
01/10/90	9.5	59.3	60.0	59.0	24	58.5	59.0	57.5	13	64.2	64.5	64.0	24	73
01/11/90	9.6	59.5	59.5	59.5	24	-	-	-	-	64.4	64.5	64.0	24	-
01/12/90	9.7	59.7	61.5	59.5	24	-	-	-	-	64.4	65.0	64.0	24	-
01/13/90	9.9	60.4	63.5	59.5	24	-	-	-	-	64.4	64.5	64.0	24	-
01/14/90	10.6	60.6	63.0	59.5	24	-	-	-	-	64.5	65.0	64.0	24	-
01/15/90	10.1	60.2	63.0	59.5	24	59.0	59.0	59.0	4	64.5	64.5	64.0	24	74
01/16/90	9.4	59.4	60.5	59.0	24	58.5	59.5	57.5	24	64.3	64.5	64.0	24	72
01/17/90	9.9	60.3	63.0	58.5	24	60.3	64.5	56.0	24	64.3	64.5	64.0	24	81
01/18/90	9.7	59.8	63.5	59.0	24	59.4	64.5	56.5	24	64.2	64.5	64.0	24	77
01/19/90	8.8	58.6	59.0	58.5	24	56.5	57.0	56.0	24	64.0	64.0	64.0	24	65
01/20/90	8.5	58.2	58.5	58.0	23	56.3	57.5	56.0	23	64.0	64.0	64.0	23	64
01/21/90	-	-	-	-	-	-	-	-	-	-	-	-	-	-
01/22/90	9.3	58.9	59.5	58.5	9	57.2	59.5	56.5	9	64.0	64.0	64.0	9	68
01/23/90	9.9	59.1	60.5	59.0	24	57.8	60.0	57.0	24	64.0	64.0	64.0	24	71
01/24/90	9.3	58.8	59.5	58.0	24	57.0	58.0	56.0	24	64.0	64.0	64.0	24	67
01/25/90	8.6	58.3	58.5	58.0	24	56.1	57.5	55.0	24	64.0	64.0	64.0	24	63
01/26/90	8.9	58.7	60.5	58.5	24	56.8	59.0	55.5	24	64.0	64.5	64.0	24	66
01/27/90	8.8	58.6	59.0	58.5	24	56.3	59.0	55.0	24	64.0	64.0	64.0	24	64
01/28/90	8.5	58.3	58.5	58.0	24	55.5	56.5	54.5	24	64.0	64.0	64.0	24	61
01/29/90	8.7	58.7	61.0	58.0	24	56.3	59.0	55.0	24	64.0	64.0	64.0	24	64
01/30/90	9.7	59.5	62.5	58.0	24	59.1	64.0	55.5	24	64.2	64.5	64.0	24	76
01/31/90	11.5	61.1	63.5	59.0	24	62.0	64.5	57.5	24	64.4	64.5	64.0	24	88
02/01/90	10.4	60.3	63.5	58.5	24	59.9	64.5	57.0	24	64.2	64.5	64.0	24	79
02/02/90	9.0	59.1	63.5	58.0	24	57.6	64.0	55.5	24	64.1	64.5	64.0	24	69
02/03/90	8.4	57.9	58.0	57.5	24	55.8	56.5	55.0	24	63.9	64.0	63.5	24	62
02/04/90	9.7	59.4	63.0	57.5	24	58.5	64.0	55.5	24	64.1	64.5	63.5	24	73
02/05/90	9.7	59.3	63.5	58.0	24	58.6	64.5	56.0	24	64.1	64.5	64.0	24	74
02/06/90	9.0	58.3	59.0	58.0	24	56.5	57.0	55.5	24	64.0	64.0	64.0	24	65
02/07/90	10.1	59.5	63.0	58.0	24	59.4	64.0	56.0	24	64.2	64.5	64.0	24	77
02/08/90	11.5	61.3	63.5	59.0	24	62.6	64.5	58.5	24	64.4	64.5	64.0	24	91
02/09/90	9.5	58.5	59.0	58.0	24	57.3	58.0	57.0	24	64.0	64.0	64.0	24	68
02/10/90	9.3	58.3	59.0	58.0	24	57.1	58.0	56.5	24	64.0	64.0	64.0	24	68

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
02/11/90	9.9	58.9	60.5	58.5	24	58.6	61.0	57.0	24	64.2	64.5	64.0	24	73
02/12/90	10.8	60.5	63.0	59.0	24	61.1	64.0	58.0	24	64.4	64.5	64.0	24	84
02/13/90	13.4	63.4	64.0	61.5	24	64.8	65.0	64.5	24	64.8	65.0	64.5	24	100
02/14/90	13.6	62.8	64.0	60.0	24	64.7	65.5	62.0	24	64.9	65.0	64.5	24	99
02/15/90	8.8	58.0	59.5	57.5	24	57.5	61.0	56.0	24	64.0	64.5	63.5	24	69
02/16/90	8.4	57.4	58.0	57.0	24	55.8	56.5	55.0	24	63.9	64.0	63.5	24	62
02/17/90	8.9	57.8	58.5	57.5	24	56.5	58.5	55.5	24	64.0	64.5	64.0	24	65
02/18/90	10.0	59.5	63.0	57.5	24	59.8	64.0	55.5	24	64.2	64.5	64.0	24	79
02/19/90	10.9	60.4	64.0	57.5	24	61.3	65.0	56.5	24	64.3	65.0	64.0	24	85
02/20/90	8.5	57.4	58.0	57.0	24	56.0	56.5	55.5	24	63.8	64.0	63.5	24	63
02/21/90	8.5	58.0	59.5	57.5	24	56.6	60.5	56.0	24	64.0	64.0	63.5	24	65
02/22/90	8.8	57.8	58.5	57.5	24	56.4	57.5	55.5	24	63.9	64.0	63.5	24	65
02/23/90	9.0	58.3	58.5	58.0	24	57.2	58.5	56.0	24	64.0	64.0	64.0	24	68
02/24/90	9.5	58.8	61.0	58.0	24	58.3	61.0	57.0	24	64.0	64.0	64.0	24	73
02/25/90	10.2	59.4	62.5	58.5	24	59.6	64.0	57.5	24	64.2	64.5	64.0	24	78
02/26/90	9.7	58.9	60.0	58.5	24	58.4	60.5	57.0	24	64.0	64.5	64.0	24	73
02/27/90	9.8	58.9	59.5	58.5	24	58.1	60.5	56.5	24	64.0	64.5	64.0	24	72
02/28/90	10.0	58.9	59.5	58.5	24	58.0	61.5	57.0	24	64.0	64.5	64.0	24	71
03/01/90	9.9	59.0	59.5	58.5	24	58.0	59.0	57.5	24	64.0	64.0	64.0	24	71
03/02/90	9.7	59.0	59.5	58.5	24	58.1	59.0	57.0	24	64.0	64.0	64.0	24	72
03/03/90	9.4	58.9	60.5	58.5	24	58.4	61.5	57.5	24	64.0	64.5	64.0	24	73
03/04/90	10.7	60.5	63.0	58.5	24	60.6	64.5	57.5	24	64.2	64.5	64.0	24	83
03/05/90	12.1	61.8	64.0	59.0	24	63.2	65.0	60.0	24	64.6	65.0	64.0	24	93
03/06/90	8.7	58.3	59.5	58.0	24	57.4	59.5	55.5	24	64.0	64.0	64.0	24	69
03/07/90	8.7	58.3	59.5	57.5	24	57.3	60.5	55.5	24	64.0	64.5	64.0	24	68
03/08/90	9.7	59.5	61.5	59.0	21	60.6	63.0	58.0	21	64.2	64.5	64.0	21	83
03/09/90	9.9	59.8	61.5	59.0	13	60.5	63.5	58.5	13	64.2	64.5	64.0	13	82
03/10/90	10.6	60.3	63.5	59.5	24	61.0	64.5	58.5	24	64.4	64.5	64.0	24	83
03/11/90	11.3	61.6	63.5	59.5	24	62.7	64.5	59.0	24	64.4	64.5	64.0	24	92
03/12/90	11.1	60.9	63.0	60.0	24	62.3	64.0	60.0	24	64.5	64.5	64.5	24	89
03/13/90	8.8	59.1	61.0	58.0	24	57.8	63.0	55.0	24	64.1	64.5	63.5	24	70
03/14/90	7.8	58.1	58.5	58.0	24	55.1	56.0	54.5	24	63.7	64.0	63.5	24	60
03/15/90	7.9	58.1	59.5	57.5	24	54.6	56.0	54.0	24	63.6	64.0	63.5	24	58
03/16/90	7.9	58.0	58.5	58.0	24	55.1	56.5	54.0	24	63.6	64.0	63.5	24	60
03/17/90	8.4	58.4	59.5	58.0	24	56.9	59.0	55.5	24	64.0	64.0	63.5	24	67
03/18/90	8.1	58.3	60.0	57.5	24	56.0	58.0	55.0	24	63.9	64.0	63.5	24	63
03/19/90	8.4	58.5	59.0	58.0	24	56.7	58.0	55.5	24	63.9	64.0	63.5	24	66
03/20/90	9.3	59.2	61.5	58.5	24	59.3	62.5	57.0	24	64.1	64.5	64.0	24	77
03/21/90	9.6	59.4	61.5	58.5	24	59.3	63.0	58.0	24	64.0	64.5	64.0	24	77
03/22/90	9.6	59.3	61.0	59.0	24	59.6	62.5	58.0	24	64.0	64.5	64.0	24	79
03/23/90	9.5	59.5	61.0	59.0	24	59.3	62.0	57.5	24	64.0	64.5	64.0	24	77
03/24/90	10.5	60.5	62.5	59.0	24	61.5	64.0	58.5	24	64.3	64.5	64.0	24	86
03/25/90	10.4	60.2	62.5	59.0	24	60.9	64.0	58.5	24	64.3	64.5	64.0	24	83
03/26/90	10.9	60.8	63.0	59.0	24	61.8	64.0	59.0	24	64.3	64.5	64.0	24	88
03/27/90	13.4	62.8	64.0	61.0	24	64.7	65.0	63.5	24	64.7	65.0	64.5	24	100
03/28/90	13.7	63.2	64.0	61.0	24	64.9	65.5	64.0	24	64.9	65.0	64.5	24	100
03/29/90	11.4	60.5	63.5	59.5	24	61.9	65.0	59.0	24	64.4	65.0	64.0	24	88
03/30/90	9.9	59.3	59.5	59.0	24	59.0	60.0	58.5	24	64.0	64.0	64.0	24	76
03/31/90	9.8	59.4	60.0	59.0	24	58.7	59.5	57.5	24	64.0	64.0	64.0	24	75

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

	Moisture	Temperatures				Temperatures				Temperatures				RH (%)
DATE	gm/m3	T3 Ave	T3 Max	T3 Min	T3 Hrs	T4 Ave	T4 Max	T4 Min	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	(T4,T5)
04/01/90	9.8	59.4	60.5	59.0	24	58.4	60.5	57.5	24	64.0	64.0	64.0	24	73
04/02/90	9.5	59.4	62.0	59.0	24	58.5	61.5	57.5	24	64.0	64.5	64.0	24	74
04/03/90	9.7	59.4	60.5	59.0	24	58.8	61.5	57.5	24	64.0	64.5	64.0	24	75
04/04/90	10.7	60.4	62.5	59.0	24	61.0	64.5	58.0	24	64.2	64.5	64.0	24	84
04/05/90	10.4	60.0	61.0	59.5	24	60.1	62.0	58.0	24	64.2	64.5	64.0	24	80
04/06/90	10.0	59.8	62.5	59.5	24	59.3	61.5	58.0	24	64.1	64.5	64.0	24	77
04/07/90	11.1	60.6	62.5	59.5	24	61.3	64.5	58.5	24	64.2	64.5	64.0	24	86
04/08/90	11.6	61.0	63.0	60.0	24	62.5	64.5	59.5	24	64.3	64.5	64.0	24	91
04/09/90	10.2	59.8	60.5	59.5	24	59.7	61.0	58.0	24	64.0	64.5	64.0	24	79
04/10/90	10.1	59.8	60.5	59.5	24	60.0	62.5	58.0	24	64.1	64.5	64.0	24	80
04/11/90	10.8	60.3	62.0	59.5	24	61.3	63.5	59.0	24	64.3	64.5	64.0	24	85
04/12/90	10.2	60.0	62.5	59.5	24	60.2	62.5	59.0	24	64.2	64.5	64.0	24	81
04/13/90	9.9	60.1	62.0	59.0	24	60.0	62.5	57.5	24	64.2	64.5	64.0	24	80
04/14/90	10.6	60.4	63.0	59.5	24	61.0	63.5	59.0	24	64.2	64.5	64.0	24	84
04/15/90	11.6	61.4	63.5	59.5	24	62.6	65.0	59.5	24	64.4	65.0	64.0	24	91
04/16/90	12.8	62.4	63.5	60.5	24	64.2	65.0	62.0	24	64.6	65.0	64.5	24	98
04/17/90	13.5	62.7	64.5	61.0	24	64.7	65.5	63.5	24	64.7	65.0	64.5	24	100
04/18/90	12.6	61.5	63.5	60.5	24	63.7	65.0	62.0	24	64.5	65.0	64.0	24	96
04/19/90	10.9	60.3	61.5	60.0	24	61.3	63.0	60.0	24	64.3	64.5	64.0	24	85
04/20/90	11.4	60.8	63.0	60.0	24	62.1	64.5	60.0	24	64.5	64.5	64.0	24	88
04/21/90	11.7	61.3	63.0	60.0	24	62.8	65.0	61.0	24	64.5	65.0	64.0	24	92
04/22/90	12.3	61.6	63.5	60.0	24	63.3	65.0	60.5	24	64.5	65.0	64.0	24	94
04/23/90	12.8	62.6	64.5	60.0	24	64.0	65.0	61.5	24	64.7	65.0	64.5	24	97
04/24/90	13.3	62.5	64.0	60.5	24	64.3	65.5	62.0	24	64.8	65.0	64.0	24	98
04/25/90	10.7	60.3	61.0	60.0	24	60.7	62.0	59.5	24	64.1	64.5	64.0	24	83
04/26/90	10.5	60.2	62.0	60.0	24	60.2	62.5	59.5	24	64.1	64.5	64.0	24	81
04/27/90	10.3	60.6	62.5	59.5	24	60.3	62.5	59.0	24	64.1	64.5	64.0	24	82
04/28/90	11.9	61.4	63.5	60.0	24	62.4	65.0	59.5	24	64.3	64.5	64.0	24	91
04/29/90	14.1	64.0	64.0	63.5	24	65.3	65.5	65.0	24	65.0	65.0	65.0	24	100
04/30/90	14.2	63.6	64.5	62.0	24	65.4	65.5	65.0	24	65.0	65.0	65.0	24	100
05/01/90	14.1	63.2	64.5	61.5	24	65.3	65.5	64.0	24	64.9	65.0	64.5	24	100
05/02/90	11.7	60.9	62.0	60.0	24	62.6	64.0	61.0	24	64.3	64.5	64.0	24	92
05/03/90	10.8	60.2	61.0	60.0	24	61.1	62.5	60.0	24	64.1	64.5	64.0	24	85
05/04/90	10.5	60.3	62.0	60.0	24	60.2	61.5	58.0	24	64.0	64.0	63.5	24	82
05/05/90	10.1	60.1	60.5	60.0	24	59.2	61.0	57.0	24	64.0	64.5	63.5	24	77
05/06/90	9.8	60.2	62.0	60.0	24	58.8	61.0	56.0	24	63.9	64.0	63.5	24	75
05/07/90	11.1	60.9	63.0	60.0	24	61.4	63.5	59.5	24	64.2	64.5	64.0	24	86
05/08/90	13.4	63.2	64.0	61.5	24	64.8	65.5	64.0	24	64.6	65.5	64.5	24	100
05/09/90	13.1	62.4	63.5	61.0	24	64.3	65.0	63.0	24	64.5	65.0	64.0	24	99
05/10/90	14.0	63.5	64.5	61.5	24	65.0	65.5	64.5	24	64.9	65.0	64.5	24	100
05/11/90	14.0	63.1	64.0	61.0	24	65.0	65.5	63.5	24	64.9	65.0	64.5	24	100
05/12/90	12.9	62.0	63.5	60.5	24	63.9	65.0	62.0	24	64.6	65.0	64.0	24	97
05/13/90	13.1	62.4	63.5	60.5	24	64.1	65.0	62.0	24	64.7	65.0	64.0	24	97
05/14/90	14.1	63.4	64.0	62.0	24	65.2	65.5	64.5	24	64.9	65.0	64.5	24	100
05/15/90	14.2	63.4	64.0	62.0	24	65.2	65.5	64.5	24	64.9	65.0	64.5	24	100
05/16/90	12.5	61.4	62.5	60.5	24	63.5	64.5	62.5	24	64.4	64.5	64.0	24	96
05/17/90	13.2	62.4	64.0	61.0	24	64.3	65.0	63.0	24	64.7	65.0	64.5	24	98
05/18/90	13.2	62.3	64.0	61.0	24	64.3	65.0	63.5	24	64.6	65.0	64.5	24	98
05/19/90	13.6	63.0	64.5	61.0	24	64.6	65.5	62.5	24	64.7	65.0	64.0	24	99

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
05/20/90	12.4	61.6	63.5	60.5	24	63.6	65.0	62.0	24	64.5	65.0	64.0	24	96
05/21/90	11.6	61.3	63.0	60.5	24	62.7	64.0	61.5	24	64.3	64.5	64.0	24	92
05/22/90	12.0	61.5	62.5	60.5	24	63.0	64.5	61.0	24	64.4	64.5	64.0	24	93
05/23/90	12.5	62.1	63.5	61.0	24	63.6	65.0	62.0	24	64.5	65.0	64.0	24	96
05/24/90	13.8	63.3	64.5	61.5	24	64.8	65.5	63.5	24	64.8	65.5	64.5	24	100
05/25/90	14.2	64.0	67.0	62.5	22	65.2	65.5	65.0	24	64.9	65.0	64.5	24	100
05/26/90	13.6	63.8	68.0	62.0	23	64.7	65.0	64.0	24	64.6	65.0	64.5	24	100
05/27/90	13.4	64.2	68.5	61.5	24	64.5	65.0	63.0	24	64.7	65.0	64.5	24	99
05/28/90	13.9	64.9	67.5	62.0	24	64.9	65.5	63.5	24	64.8	65.0	64.5	24	100
05/29/90	12.8	62.6	65.0	61.0	24	63.6	65.0	61.5	24	64.4	65.0	63.5	24	96
05/30/90	12.3	61.8	63.5	60.5	24	63.1	65.0	61.5	24	64.4	64.5	64.0	24	94
05/31/90	12.7	62.2	64.0	61.0	24	63.5	65.0	61.5	24	64.5	65.0	64.0	24	95
06/01/90	13.1	62.6	64.0	61.0	24	64.1	65.0	62.0	24	64.4	65.0	64.0	24	98
06/02/90	12.2	61.8	63.5	61.0	24	63.2	64.5	62.0	24	64.4	64.5	64.0	24	94
06/03/90	13.2	62.7	63.5	61.5	24	64.3	65.0	63.5	24	64.5	65.0	64.5	24	99
06/04/90	13.6	63.2	64.0	61.5	24	64.7	65.5	63.5	24	64.7	65.0	64.5	24	100
06/05/90	13.8	63.5	64.0	62.0	24	64.9	65.0	64.0	24	64.7	65.0	64.5	24	100
06/06/90	14.1	63.6	64.5	62.5	24	65.1	65.5	64.5	24	64.9	65.0	64.5	24	100
06/07/90	14.0	63.1	64.0	62.0	24	64.9	65.5	64.5	24	64.8	65.0	64.5	24	100
06/08/90	14.0	63.2	64.5	62.0	24	64.9	65.5	64.0	24	64.8	65.0	64.5	24	100
06/09/90	13.9	62.9	64.0	62.0	24	64.7	65.5	64.0	24	64.7	65.0	64.5	24	100
06/10/90	13.9	63.2	64.0	62.5	24	64.8	65.5	64.0	24	64.7	65.0	64.5	24	100
06/11/90	14.0	63.4	64.0	62.5	24	65.0	65.5	64.5	24	64.8	65.0	64.5	24	100
06/12/90	14.4	63.9	64.5	62.5	24	65.2	65.5	64.5	24	64.9	65.0	64.5	24	100
06/13/90	14.6	64.1	65.0	63.0	24	65.4	65.5	64.5	24	65.0	65.5	64.5	24	100
06/14/90	14.9	64.7	65.0	64.5	24	65.5	65.5	65.5	24	65.2	65.5	65.0	24	100
06/15/90	14.8	64.6	66.0	63.5	24	65.5	66.0	65.0	24	65.1	65.5	64.5	24	100
06/16/90	14.4	63.9	65.0	62.5	24	65.3	65.5	65.0	24	64.9	65.0	64.5	24	100
06/17/90	14.5	64.1	65.0	63.0	24	65.4	65.5	65.0	24	65.1	65.5	64.5	24	100
06/18/90	14.5	64.0	65.0	63.0	24	65.4	65.5	65.0	24	65.0	65.5	64.5	24	100
06/19/90	14.4	63.8	64.5	62.5	24	65.3	65.5	64.5	24	64.9	65.0	64.5	24	100
06/20/90	14.3	63.7	64.5	63.0	24	65.3	65.5	65.0	24	64.9	65.0	64.5	24	100
06/21/90	14.4	63.8	64.5	63.0	24	65.3	65.5	65.0	24	65.0	65.0	64.5	24	100
06/22/90	14.4	63.7	64.5	62.5	24	65.3	65.5	64.5	24	64.9	65.0	64.5	24	100
06/23/90	14.4	63.7	64.5	62.5	24	65.4	65.5	64.5	24	65.0	65.0	64.5	24	100
06/24/90	14.5	63.8	64.5	63.0	24	65.3	65.5	65.0	24	65.0	65.0	64.5	24	100
06/25/90	14.5	63.8	64.5	63.0	24	65.4	65.5	65.0	24	65.0	65.0	64.5	24	100
06/26/90	14.7	64.1	64.5	63.5	24	65.5	65.5	65.0	24	65.0	65.5	65.0	24	100
06/27/90	14.6	64.0	64.5	63.5	24	65.4	65.5	65.0	24	65.0	65.0	64.5	24	100
06/28/90	14.8	64.4	65.5	63.5	24	65.5	65.5	65.0	24	65.0	65.5	65.0	24	100
06/29/90	14.7	64.0	64.5	62.5	24	65.5	65.5	64.5	24	65.1	65.5	64.5	24	100
06/30/90	14.6	63.9	64.5	63.0	24	65.4	65.5	64.5	24	65.0	65.5	64.5	24	100
07/01/90	14.5	63.6	65.0	63.0	24	65.4	65.5	65.0	24	65.0	65.5	65.0	24	100
07/02/90	14.4	63.5	64.5	63.0	24	65.4	65.5	64.5	24	65.0	65.0	64.5	24	100
07/03/90	14.3	63.5	64.0	63.0	24	65.2	65.5	65.0	24	65.0	65.0	64.5	24	100
07/04/90	14.3	63.4	64.0	62.5	24	65.2	65.5	65.0	24	64.9	65.0	64.5	24	100
07/05/90	14.5	63.6	64.5	63.0	24	65.3	65.5	64.5	24	64.9	65.0	64.5	24	100
07/06/90	14.4	63.6	64.5	63.0	24	65.2	65.5	64.5	24	65.0	65.0	64.5	24	100
07/07/90	14.3	63.5	64.5	63.0	24	65.1	65.5	64.5	24	64.9	65.0	64.5	24	100

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

	Moisture	Temperatures				Temperatures				Temperatures				RH (%)
DATE	gm/m3	T3 Ave	T3 Max	T3 Min	T3 Hrs	T4 Ave	T4 Max	T4 Min	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	(T4,T5)
07/08/90	14.3	63.4	64.5	63.0	24	65.1	65.5	64.5	24	64.9	65.0	64.5	24	100
07/09/90	14.3	63.4	64.0	63.0	24	65.0	65.5	64.5	24	64.9	65.0	64.5	24	100
07/10/90	14.5	63.6	64.5	63.0	24	65.2	65.5	64.5	24	64.9	65.0	64.5	24	100
07/11/90	14.4	63.6	64.5	63.0	24	65.2	65.5	64.5	24	64.9	65.0	64.5	24	100
07/12/90	14.5	63.6	64.5	63.0	24	65.1	65.5	65.0	24	65.0	65.0	64.5	24	100
07/13/90	14.8	64.0	64.5	63.0	24	65.3	65.5	65.0	24	65.0	65.0	64.5	24	100
07/14/90	14.6	63.7	64.5	63.0	24	65.2	65.5	64.5	24	65.0	65.0	64.5	24	100
07/15/90	14.3	63.3	64.5	63.0	24	65.0	65.5	64.5	24	64.9	65.0	64.5	24	100
07/16/90	14.4	63.2	64.0	63.0	24	65.0	65.5	64.5	24	64.9	65.0	64.5	24	100
07/17/90	14.5	63.5	64.5	63.0	24	65.1	65.5	65.0	24	65.0	65.0	64.5	24	100
07/18/90	14.7	63.9	64.5	63.0	24	65.3	65.5	64.0	24	64.9	65.0	64.0	24	100
07/19/90	14.6	64.0	64.5	63.0	24	65.3	65.5	65.0	24	65.0	65.0	64.5	24	100
07/20/90	14.6	63.6	64.5	63.0	24	65.2	65.5	64.5	24	64.9	65.0	64.5	24	100
07/21/90	14.6	63.7	64.5	63.0	24	65.2	65.5	65.0	24	64.9	65.0	64.5	24	100
07/22/90	14.8	63.9	64.5	63.5	24	65.3	65.5	65.0	24	65.0	65.0	64.5	24	100
07/23/90	14.7	64.0	64.5	63.5	24	65.4	65.5	65.0	24	65.0	65.0	65.0	24	100
07/24/90	14.6	64.2	66.0	63.5	23	65.3	65.5	65.0	24	65.0	65.0	65.0	24	100
07/25/90	14.6	63.7	64.5	63.5	24	65.1	65.5	65.0	24	65.0	65.0	64.5	24	100
07/26/90	14.6	63.6	64.0	63.0	24	65.2	65.5	65.0	24	65.0	65.0	64.5	24	100
07/27/90	14.6	63.7	64.5	63.0	24	65.1	65.5	64.5	24	65.0	65.0	64.5	24	100
07/28/90	14.5	63.8	64.5	63.0	24	65.2	65.5	64.5	24	65.0	65.0	64.5	24	100
07/29/90	14.7	64.0	64.5	63.0	24	65.4	65.5	65.0	24	65.0	65.0	65.0	24	100
07/30/90	14.7	64.0	64.5	63.0	24	65.4	65.5	64.5	24	65.0	65.0	64.5	24	100
07/31/90	14.7	64.0	64.5	63.5	24	65.4	65.5	65.0	24	65.0	65.0	65.0	24	100
08/01/90	14.7	63.8	64.5	63.5	24	65.3	65.5	65.0	24	65.0	65.0	65.0	24	100
08/02/90	14.7	63.8	64.5	63.5	24	65.3	65.5	65.0	24	65.0	65.0	65.0	24	100
08/03/90	14.7	63.7	64.5	63.0	24	65.2	65.5	64.5	24	64.9	65.0	64.5	24	100
08/04/90	14.7	63.8	64.5	63.0	24	65.3	65.5	65.0	24	65.0	65.0	64.5	24	100
08/05/90	14.7	63.8	64.5	63.0	24	65.2	65.5	65.0	24	65.0	65.0	64.5	24	100
08/06/90	14.6	63.6	64.0	63.0	24	65.1	65.5	65.0	24	65.0	65.0	64.5	24	100
08/07/90	14.7	63.9	64.5	63.5	24	65.2	65.5	64.5	24	64.9	65.0	64.5	24	100
08/08/90	14.6	63.8	64.5	63.5	24	65.2	65.5	64.5	24	65.0	65.0	64.5	24	100
08/09/90	14.8	64.0	64.5	63.5	24	65.3	65.5	65.0	24	65.0	65.0	65.0	24	100
08/10/90	14.8	64.3	64.5	63.5	24	65.4	65.5	65.0	24	65.0	65.0	65.0	24	100
08/11/90	15.0	64.2	65.0	63.5	24	65.4	65.5	65.0	24	65.1	65.5	65.0	24	100
08/12/90	14.8	64.1	64.5	63.5	24	65.4	65.5	65.0	24	65.1	65.5	64.5	24	100
08/13/90	14.9	63.7	64.5	63.5	24	65.2	65.5	65.0	24	65.0	65.0	65.0	24	100
08/14/90	15.0	63.8	65.0	63.5	24	65.2	65.5	65.0	24	65.0	65.5	65.0	24	100
08/15/90	14.9	64.0	64.5	63.5	24	65.2	65.5	65.0	24	65.0	65.5	65.0	24	100
08/16/90	15.0	64.3	65.0	63.5	24	65.3	65.5	65.0	24	65.1	65.5	65.0	24	100
08/17/90	14.9	64.5	65.0	64.0	24	65.5	65.5	65.0	24	65.0	65.5	65.0	24	100
08/18/90	14.9	64.4	65.0	64.0	24	65.5	65.5	65.0	24	65.1	65.5	65.0	24	100
08/19/90	15.0	64.6	65.0	64.0	24	65.5	65.5	65.5	24	65.0	65.5	65.0	24	100
08/20/90	14.9	64.8	65.5	64.5	24	65.5	65.5	65.0	24	65.1	65.5	65.0	24	100
08/21/90	15.0	64.9	65.5	64.5	24	65.5	65.5	65.5	24	65.1	65.5	65.0	24	100
08/22/90	15.0	65.2	66.0	64.5	24	65.5	66.0	65.5	24	65.1	65.5	65.0	24	100
08/23/90	15.2	65.5	66.0	65.0	24	65.6	66.0	65.5	24	65.3	65.5	65.0	24	100
08/24/90	15.1	65.6	66.0	65.0	24	65.6	66.0	65.0	24	65.3	65.5	65.0	24	100
08/25/90	15.2	65.8	66.5	65.0	24	65.7	66.0	65.5	24	65.4	65.5	65.0	24	100

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

	Moisture	Temperatures				Temperatures				Temperatures				RH (%)
DATE	gm/m3	T3 Ave	T3 Max	T3 Min	T3 Hrs	T4 Ave	T4 Max	T4 Min	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	(T4,T5)
08/26/90	15.2	66.0	66.5	65.5	24	65.7	66.0	65.5	24	65.4	65.5	65.0	24	100
08/27/90	15.2	66.0	66.5	65.5	24	65.5	66.0	65.5	24	65.4	65.5	65.0	24	100
08/28/90	15.1	66.3	67.0	65.5	24	65.6	66.0	65.5	24	65.4	65.5	65.0	24	100
08/29/90	15.2	66.4	67.0	66.0	24	65.6	66.0	65.5	24	65.4	65.5	65.0	24	100
08/30/90	15.3	66.6	67.0	66.0	24	65.7	66.0	65.5	24	65.4	65.5	65.0	24	100
08/31/90	15.2	66.6	67.0	66.0	24	65.7	66.0	65.5	24	65.5	65.5	65.0	24	100
09/01/90	15.1	66.7	67.0	66.0	24	65.7	66.0	65.5	24	65.4	65.5	65.0	24	100
09/02/90	15.3	66.7	67.5	66.0	24	65.7	66.0	65.5	24	65.5	65.5	65.0	24	100
09/03/90	15.3	66.9	67.5	66.5	23	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
09/04/90	15.2	66.9	67.5	66.5	24	65.7	66.0	65.5	24	65.5	65.5	65.0	24	100
09/05/90	15.1	67.0	67.5	66.5	24	65.7	66.0	65.5	24	65.5	65.5	65.0	24	100
09/06/90	15.3	67.1	67.5	66.5	24	65.8	66.0	65.5	24	65.5	65.5	65.0	24	100
09/07/90	15.4	67.3	68.0	67.0	24	65.8	66.0	65.5	24	65.5	65.5	65.5	24	100
09/08/90	15.4	67.4	68.0	67.0	24	65.9	66.0	65.5	24	65.5	65.5	65.0	24	100
09/09/90	15.4	67.6	68.0	67.0	24	66.0	66.0	65.5	24	65.5	65.5	65.5	24	100
09/10/90	15.5	67.5	68.0	67.0	24	66.0	66.0	65.5	24	65.5	65.5	65.0	24	100
09/11/90	15.5	67.7	68.0	67.0	24	66.0	66.0	66.0	24	65.5	65.5	65.5	24	100
09/12/90	15.3	67.6	68.5	67.0	24	66.0	66.0	65.5	24	65.5	65.5	65.0	24	100
09/13/90	15.5	67.7	68.0	67.0	24	66.0	66.0	65.5	24	65.5	66.0	65.5	24	100
09/14/90	15.4	67.7	68.0	67.0	24	66.0	66.0	65.5	24	65.5	65.5	65.5	24	100
09/15/90	15.4	67.5	68.0	67.0	24	66.0	66.0	65.5	24	65.5	65.5	65.5	24	100
09/16/90	15.3	67.2	68.0	67.0	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
09/17/90	15.3	67.3	68.0	67.0	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
09/18/90	15.4	67.6	68.0	67.0	24	66.0	66.0	66.0	24	65.6	66.0	65.5	24	100
09/19/90	15.4	67.7	68.0	67.0	24	66.0	66.0	66.0	24	65.5	66.0	65.5	24	100
09/20/90	15.5	67.5	68.0	67.0	24	66.0	66.0	66.0	24	65.6	66.0	65.5	24	100
09/21/90	15.3	67.4	68.0	67.0	24	66.0	66.0	66.0	24	65.5	66.0	65.5	24	100
09/22/90	15.1	67.0	67.5	66.5	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
09/23/90	15.1	66.8	67.5	66.5	24	65.8	66.0	65.5	24	65.5	65.5	65.5	24	100
09/24/90	15.1	66.8	67.5	66.5	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
09/25/90	15.3	66.6	67.5	65.5	24	66.0	66.0	66.0	24	65.5	65.5	65.5	24	100
09/26/90	15.3	66.2	66.5	65.5	24	66.0	66.0	66.0	24	65.5	65.5	65.5	24	100
09/27/90	15.6	66.6	67.0	66.0	24	66.0	66.5	66.0	24	65.8	66.0	65.5	24	100
09/28/90	15.4	66.6	67.0	66.0	24	66.1	66.5	66.0	24	65.8	66.0	65.5	24	100
09/29/90	15.5	67.0	67.5	66.0	24	66.1	66.5	66.0	24	65.8	66.0	65.5	24	100
09/30/90	15.0	66.4	67.5	66.0	24	65.8	66.0	65.5	24	65.5	66.0	65.5	24	100
10/01/90	15.0	66.5	67.5	66.0	24	65.9	66.0	65.5	24	65.5	66.0	65.5	24	100
10/02/90	14.7	66.3	67.0	66.0	24	65.7	66.0	65.5	24	65.5	66.0	65.5	24	100
10/03/90	14.6	66.0	66.5	65.5	24	65.5	66.0	65.5	24	65.5	65.5	65.5	24	100
10/04/90	14.7	66.1	67.0	65.5	24	65.6	66.0	65.5	24	65.5	65.5	65.5	24	100
10/05/90	15.0	66.5	67.0	66.0	24	66.0	66.0	65.5	24	65.5	65.5	65.5	24	100
10/06/90	15.0	66.5	67.0	66.0	24	65.9	66.0	65.5	24	65.5	65.5	65.5	24	100
10/07/90	15.3	66.9	67.5	66.0	24	66.0	66.0	65.5	24	65.7	66.0	65.5	24	100
10/08/90	14.9	66.4	67.0	65.5	24	65.8	66.0	65.5	24	65.5	65.5	65.5	24	100
10/09/90	14.1	65.4	66.0	65.0	24	65.4	65.5	65.0	24	65.3	65.5	65.0	24	100
10/10/90	14.1	65.3	66.5	65.0	24	65.5	66.0	65.0	24	65.5	65.5	65.0	24	100
10/11/90	14.1	65.2	66.5	64.5	24	65.5	66.0	65.0	24	65.4	65.5	65.0	24	100
10/12/90	13.8	64.8	65.5	64.5	24	65.3	65.5	65.0	24	65.2	65.5	65.0	24	100
10/13/90	13.9	65.0	65.5	64.5	24	65.4	65.5	65.0	24	65.3	65.5	65.0	24	100

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
10/14/90	13.8	64.9	65.5	64.5	24	65.3	65.5	65.0	24	65.2	65.5	65.0	24	100
10/15/90	13.8	64.7	65.5	64.5	24	65.2	65.5	65.0	24	65.1	65.5	65.0	24	100
10/16/90	14.0	64.9	66.0	64.5	24	65.2	66.0	65.0	24	65.2	65.5	65.0	24	100
10/17/90	14.0	64.8	65.5	64.5	24	65.1	65.5	64.5	24	65.2	65.5	65.0	24	100
10/18/90	14.7	65.8	66.5	65.0	23	65.7	66.0	65.5	24	65.5	65.5	65.5	24	100
10/19/90	15.3	66.9	67.5	65.5	24	66.0	66.5	65.5	24	65.7	66.0	65.0	24	100
10/20/90	14.2	65.6	67.5	64.5	24	65.5	66.0	65.0	24	65.4	65.5	65.0	24	100
10/21/90	12.8	64.1	65.0	64.0	24	64.6	65.0	64.0	24	65.0	65.0	65.0	24	98
10/22/90	13.1	64.1	65.5	63.5	24	64.6	65.5	64.0	24	65.0	65.5	65.0	24	98
10/23/90	13.5	64.2	65.5	63.5	24	64.9	66.0	64.5	24	65.1	66.0	65.0	24	99
10/24/90	13.9	64.7	66.0	64.0	24	65.2	65.5	64.5	24	65.2	65.5	65.0	24	100
10/25/90	14.2	64.7	66.0	64.0	24	65.4	66.0	64.5	24	65.5	65.5	65.0	24	100
10/26/90	14.2	64.9	66.0	64.0	24	65.5	66.0	65.0	24	65.5	65.5	65.0	24	100
10/27/90	14.0	64.8	66.0	64.5	24	65.4	66.0	65.0	24	65.5	65.5	65.0	24	100
10/28/90	14.0	65.0	66.0	64.5	24	65.5	66.0	65.0	24	65.5	65.5	65.0	24	100
10/29/90	14.0	64.6	65.5	64.0	24	65.4	66.0	64.5	24	65.5	65.5	65.0	24	100
10/30/90	13.9	64.5	65.5	64.0	24	65.2	65.5	64.5	24	65.5	65.5	65.0	24	99
10/31/90	14.1	64.8	66.0	64.0	24	65.4	66.0	64.5	24	65.5	65.5	65.0	24	100
11/01/90	14.9	65.9	67.0	64.5	24	65.9	66.5	65.0	24	65.7	66.0	65.5	24	100
11/02/90	15.0	66.5	67.5	64.5	24	65.8	66.5	65.0	24	65.8	66.0	65.5	24	100
11/03/90	12.2	63.4	64.5	62.5	24	63.8	65.0	62.5	24	64.8	65.0	64.5	24	95
11/04/90	11.5	62.5	63.0	62.0	24	62.5	63.0	62.0	24	64.5	65.0	64.5	24	90
11/05/90	12.3	62.8	64.5	62.5	24	63.5	65.5	63.0	24	64.9	65.0	64.5	24	93
11/06/90	13.4	64.2	66.0	62.0	24	64.6	66.0	62.0	24	65.1	65.5	64.5	24	98
11/07/90	13.0	64.2	66.5	63.0	24	64.2	66.0	62.0	24	64.9	65.5	64.5	24	97
11/08/90	11.4	62.6	63.0	62.5	24	62.2	62.5	62.0	24	64.5	64.5	64.5	24	89
11/09/90	11.3	62.5	63.0	62.0	24	62.0	63.0	61.5	24	64.5	64.5	64.5	24	88
11/10/90	11.7	62.5	62.5	62.5	24	62.5	64.0	61.5	24	64.5	64.5	64.5	24	90
11/11/90	12.0	62.6	63.5	62.5	24	62.6	64.0	62.0	24	64.5	65.0	64.5	24	91
11/12/90	12.0	62.6	63.0	62.5	24	63.0	64.5	62.0	24	64.6	65.0	64.5	24	92
11/13/90	12.6	63.0	64.0	62.5	24	63.6	65.0	62.5	24	64.9	65.0	64.5	24	94
11/14/90	12.5	63.0	64.0	62.5	24	63.4	65.0	62.5	24	64.9	65.0	64.5	24	93
11/15/90	12.3	62.9	63.0	62.5	24	63.2	64.5	62.5	24	64.9	65.0	64.5	24	92
11/16/90	12.3	62.8	63.0	62.5	24	63.2	64.5	62.0	24	64.9	65.0	64.5	24	92
11/17/90	12.3	63.0	63.5	62.5	24	63.5	65.0	62.0	24	64.9	65.0	64.5	24	93
11/18/90	12.8	63.1	64.5	62.5	24	64.1	65.5	62.5	24	65.0	65.0	64.5	24	96
11/19/90	13.4	64.1	66.0	62.5	24	64.5	66.0	62.5	24	65.1	65.5	64.5	24	97
11/20/90	15.0	66.6	67.5	65.0	24	65.9	66.0	65.0	24	65.5	65.5	65.5	24	100
11/21/90	12.4	64.0	65.0	63.5	24	63.6	65.0	62.5	24	65.0	65.5	64.5	24	93
11/22/90	11.5	63.2	63.5	63.0	24	62.3	63.0	62.0	24	64.5	65.0	64.5	24	89
11/23/90	11.6	63.0	63.5	62.5	24	62.3	63.0	61.5	24	64.7	65.0	64.5	24	88
11/24/90	12.1	63.2	63.5	63.0	24	62.9	64.5	62.5	24	65.0	65.0	64.5	24	90
11/25/90	13.1	64.0	65.5	63.5	24	64.2	65.5	63.0	24	65.0	65.0	65.0	24	96
11/26/90	14.1	65.5	67.0	63.5	24	65.2	66.0	63.5	24	65.3	65.5	65.0	24	100
11/27/90	11.0	62.5	63.5	61.5	24	62.1	63.5	61.5	24	64.6	65.0	64.5	24	88
11/28/90	10.3	61.5	61.5	61.5	24	61.1	61.5	60.5	24	64.5	64.5	64.5	24	84
11/29/90	10.7	61.6	62.0	61.5	24	61.4	63.0	61.0	24	64.5	65.0	64.5	24	85
11/30/90	10.9	61.7	62.0	61.5	24	61.5	62.0	61.0	24	64.6	65.0	64.5	24	85
12/01/90	10.9	61.8	62.0	61.5	24	61.6	62.0	61.0	24	64.6	65.0	64.5	24	85

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
12/02/90	10.1	61.3	62.0	61.0	24	60.8	61.5	60.0	24	64.5	64.5	64.5	24	82
12/03/90	9.5	60.9	61.0	60.5	24	60.1	60.5	59.5	24	64.5	64.5	64.5	24	79
12/04/90	9.7	61.0	61.5	60.5	24	60.1	61.0	59.5	24	64.5	64.5	64.5	24	79
12/05/90	9.7	60.9	61.0	60.5	24	60.1	61.0	59.5	24	64.5	64.5	64.5	24	79
12/06/90	9.3	60.6	61.0	60.5	24	59.8	60.5	59.5	24	64.5	64.5	64.0	24	78
12/07/90	9.1	60.4	60.5	60.0	24	59.4	60.5	58.5	24	64.2	64.5	64.0	24	77
12/08/90	9.2	60.3	61.0	57.5	24	59.6	60.0	59.0	24	64.2	64.5	64.0	24	78
12/09/90	9.5	60.5	61.0	60.0	24	59.9	60.5	59.5	24	64.5	64.5	64.0	24	78
12/10/90	9.7	60.6	61.0	60.5	24	60.1	60.5	60.0	24	64.5	64.5	64.5	24	79
12/11/90	10.3	61.0	61.5	60.5	24	60.6	61.5	60.0	24	64.5	64.5	64.5	24	81
12/12/90	10.8	61.4	63.0	61.0	24	61.4	64.0	60.5	24	64.5	64.5	64.5	24	85
12/13/90	11.2	61.8	64.5	61.0	24	61.9	64.5	61.0	24	64.5	64.5	64.5	24	87
12/14/90	11.6	62.2	64.5	61.5	24	62.8	65.0	61.5	24	64.6	65.0	64.5	24	91
12/15/90	11.1	61.7	63.5	61.0	24	61.7	63.5	61.0	24	64.5	64.5	64.5	24	86
12/16/90	11.3	62.1	64.5	61.0	24	62.2	64.5	60.5	24	64.5	65.0	64.5	24	89
12/17/90	9.4	60.1	61.0	59.5	24	59.6	60.5	59.0	24	64.1	64.5	64.0	24	78
12/18/90	9.3	59.7	60.0	59.5	24	61.4	64.5	59.0	24	64.1	65.5	64.0	24	87
12/19/90	11.4	62.3	65.0	59.5	24	65.0	65.5	64.5	24	64.5	65.0	64.0	24	100
12/20/90	14.5	65.6	66.0	64.0	24	65.5	65.5	65.0	24	65.0	65.0	65.0	24	100
12/21/90	14.7	65.8	66.5	64.0	24	65.7	66.0	65.0	24	65.3	65.5	65.0	24	100
12/22/90	12.7	63.2	66.5	60.5	24	65.0	66.0	64.0	24	65.0	65.5	64.5	24	100
12/23/90	9.2	59.8	60.5	59.5	24	64.5	64.5	64.5	24	64.1	64.5	64.0	24	100
12/24/90	8.7	59.1	59.5	59.0	24	64.5	64.5	64.5	24	64.0	64.0	64.0	24	100
12/25/90	9.0	59.3	59.5	59.0	24	64.5	64.5	64.5	24	64.0	64.5	64.0	24	100
12/26/90	8.9	59.3	60.5	59.0	24	64.5	65.0	64.5	24	64.0	64.5	64.0	24	100
12/27/90	9.3	59.4	60.0	59.0	24	64.5	65.0	64.5	24	64.2	64.5	64.0	24	100
12/28/90	11.1	61.4	64.0	60.0	24	64.8	65.5	64.0	24	64.5	65.0	64.0	24	100
12/29/90	12.6	63.2	65.5	61.0	24	65.1	65.5	64.5	24	64.8	65.0	64.5	24	100
12/30/90	10.7	60.9	61.5	60.5	24	62.8	65.0	60.5	24	64.5	64.5	64.5	24	92
12/31/90	10.7	60.7	61.0	60.5	24	60.4	61.0	59.5	24	64.5	64.5	64.5	24	80
01/01/91	10.5	60.5	60.5	60.5	24	60.2	60.5	59.5	24	64.5	64.5	64.5	24	79
01/02/91	10.3	60.5	61.5	60.0	24	59.9	60.5	59.5	24	64.5	64.5	64.5	24	78
01/03/91	10.7	60.6	62.5	60.0	24	60.0	60.5	59.0	24	64.5	64.5	64.5	24	78
01/04/91	11.6	62.1	64.5	60.5	24	62.5	65.0	59.5	24	64.6	65.0	64.5	24	90
01/05/91	11.0	60.9	61.5	60.5	24	60.3	61.0	59.5	24	64.5	64.5	64.5	24	80
01/06/91	10.9	60.7	61.0	60.5	24	60.2	60.5	60.0	24	64.5	64.5	64.5	24	79
01/07/91	10.9	60.5	61.0	60.5	24	60.6	61.0	60.0	24	64.5	64.5	64.5	24	81
01/08/91	11.0	60.6	61.5	60.5	24	60.9	61.5	60.5	24	64.5	64.5	64.5	24	83
01/09/91	11.2	61.0	63.5	60.0	24	61.6	64.0	60.5	24	64.5	64.5	64.0	24	86
01/10/91	10.1	60.0	61.0	59.5	24	59.6	60.0	58.5	24	64.1	64.5	64.0	24	78
01/11/91	9.9	59.5	60.0	59.5	24	59.3	60.0	59.0	24	64.0	64.0	64.0	24	77
01/12/91	10.1	59.5	60.0	59.0	24	59.4	60.0	59.0	24	64.0	64.0	64.0	24	78
01/13/91	10.1	59.5	60.0	59.0	24	59.6	60.0	59.0	24	64.1	64.5	64.0	24	78
01/14/91	9.6	59.4	60.0	59.0	24	58.8	59.5	58.0	24	64.0	64.0	64.0	24	75
01/15/91	9.5	59.3	60.0	58.0	24	58.8	60.5	57.5	24	64.0	64.0	64.0	24	75
01/16/91	9.3	59.2	59.5	59.0	24	58.3	59.0	57.5	24	63.9	64.0	63.5	24	73
01/17/91	9.4	58.9	59.0	58.5	24	58.1	58.5	57.5	24	63.6	64.0	63.5	24	74
01/18/91	9.2	58.7	59.0	58.5	24	58.0	58.5	57.0	24	63.5	64.0	63.5	24	74
01/19/91	9.3	58.7	60.0	58.5	24	58.1	59.0	57.0	24	63.5	64.0	63.5	24	74

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
01/20/91	9.3	58.7	59.0	58.5	24	58.3	59.5	57.5	24	63.7	64.0	63.5	24	74
01/21/91	9.2	58.7	59.0	58.5	24	58.0	59.5	57.5	24	63.6	64.0	63.5	24	73
01/22/91	9.1	58.4	58.5	58.0	24	57.9	59.0	57.5	24	63.5	64.0	63.5	24	73
01/23/91	9.1	58.3	58.5	58.0	24	57.9	58.5	57.5	24	63.5	63.5	63.5	24	73
01/24/91	9.1	58.1	58.5	58.0	24	58.3	59.0	57.5	24	63.6	64.0	63.5	24	74
01/25/91	9.1	58.3	58.5	58.0	24	58.4	59.0	58.0	24	63.5	63.5	63.5	24	75
01/26/91	9.4	58.4	59.0	58.0	24	58.7	60.0	58.0	24	63.6	64.0	63.5	24	76
01/27/91	9.0	58.2	58.5	58.0	24	58.3	59.5	57.5	24	63.6	64.0	63.5	24	74
01/28/91	9.6	59.0	61.5	58.0	24	59.7	63.5	57.5	24	63.7	64.0	63.5	24	81
01/29/91	9.3	58.6	61.5	57.5	24	58.4	61.5	56.0	24	63.7	64.0	63.5	24	75
01/30/91	8.3	57.5	58.0	57.0	24	56.8	57.5	56.0	24	63.5	63.5	63.5	24	68
01/31/91	8.4	57.8	58.0	57.5	24	57.4	58.5	56.5	24	63.5	64.0	63.5	24	71
02/01/91	8.5	57.9	58.5	57.5	24	57.4	59.0	56.5	24	63.5	63.5	63.5	24	71
02/02/91	8.9	58.1	58.5	57.5	24	57.9	60.0	57.0	24	63.5	63.5	63.5	24	73
02/03/91	8.9	58.1	59.0	58.0	24	57.9	59.0	57.0	24	63.5	63.5	63.5	24	73
02/04/91	8.8	58.0	58.5	58.0	24	57.8	58.5	57.0	24	63.5	63.5	63.5	24	73
02/05/91	9.0	58.3	59.5	58.0	24	58.1	58.5	57.0	24	63.5	63.5	63.5	24	74
02/06/91	9.2	58.3	60.0	58.0	24	58.3	59.5	57.5	24	63.5	64.0	63.5	24	75
02/07/91	9.6	59.1	63.0	58.0	24	59.5	64.0	57.0	24	63.6	64.0	63.5	24	80
02/08/91	8.9	58.0	58.5	58.0	24	57.6	58.5	56.5	24	63.5	63.5	63.5	24	72
02/09/91	9.0	58.2	58.5	58.0	24	57.7	58.5	57.0	24	63.5	63.5	63.5	24	72
02/10/91	9.2	58.4	59.0	58.0	24	58.0	58.5	57.0	24	63.5	63.5	63.5	24	74
02/11/91	9.8	58.7	59.0	58.5	24	58.6	59.0	58.0	24	63.5	63.5	63.5	24	76
02/12/91	10.4	59.1	60.0	59.0	24	59.4	60.5	58.5	24	63.5	64.0	63.5	24	80
02/13/91	10.5	59.1	59.5	59.0	24	59.9	61.0	59.0	24	63.6	64.0	63.5	24	82
02/14/91	10.5	59.1	59.5	58.5	24	60.3	61.5	59.5	24	63.6	64.0	63.5	24	84
02/15/91	11.1	59.5	61.0	59.0	24	60.9	63.5	60.0	24	63.9	64.0	63.5	24	85
02/16/91	12.5	62.5	64.5	60.0	24	63.6	64.5	61.5	24	64.2	64.5	64.0	24	97
02/17/91	12.6	62.5	65.0	60.5	24	63.8	65.0	62.5	24	64.2	64.5	64.0	24	98
02/18/91	10.3	59.5	60.5	58.5	24	60.8	63.0	59.5	24	63.6	64.0	63.5	24	86
02/19/91	9.3	58.5	59.0	58.0	24	59.2	60.0	58.5	24	63.4	63.5	63.0	24	79
02/20/91	9.5	58.4	58.5	58.0	24	59.3	60.0	58.5	24	63.5	63.5	63.0	24	80
02/21/91	10.0	58.7	59.0	58.5	24	59.8	60.5	59.0	24	63.5	64.0	63.5	24	82
02/22/91	10.7	59.1	62.0	58.5	24	60.6	63.0	60.0	24	63.6	64.0	63.5	24	85
02/23/91	10.8	59.4	62.0	59.0	24	61.0	63.5	60.0	24	63.6	64.0	63.5	24	87
02/24/91	10.4	59.3	62.0	58.5	24	60.7	63.0	60.0	24	63.6	64.0	63.5	24	86
02/25/91	10.1	58.8	59.5	58.5	24	59.8	60.5	59.5	24	63.5	63.5	63.5	24	82
02/26/91	10.1	58.8	59.0	58.0	24	59.8	60.5	59.5	24	63.5	63.5	63.5	24	82
02/27/91	10.8	59.9	64.0	58.5	24	61.3	64.5	59.5	24	63.7	64.0	63.5	24	88
02/28/91	12.8	63.4	65.0	60.0	24	64.2	65.0	63.0	24	64.2	64.5	64.0	24	100
03/01/91	13.8	65.6	66.5	62.5	24	65.1	65.5	64.5	24	64.7	65.0	64.0	24	100
03/02/91	12.1	61.2	65.0	59.5	24	63.4	65.0	62.0	24	64.0	64.5	63.5	24	97
03/03/91	11.1	59.7	61.0	59.5	24	62.0	62.5	61.5	24	63.6	64.0	63.5	24	92
03/04/91	11.5	59.9	62.5	59.5	24	62.3	63.0	62.0	24	63.8	64.0	63.5	24	93
03/05/91	11.9	61.3	64.5	59.5	24	62.9	64.5	61.5	24	63.8	64.5	63.5	24	95
03/06/91	12.6	61.8	64.0	59.5	24	64.0	65.0	62.5	24	64.1	64.5	63.5	24	99
03/07/91	10.5	59.3	60.0	58.5	24	61.7	62.5	61.0	24	63.5	63.5	63.5	24	91
03/08/91	10.3	58.6	59.5	58.5	24	60.9	61.5	60.5	24	63.5	63.5	63.0	24	87
03/09/91	10.5	58.9	61.5	58.5	24	61.2	62.0	60.5	24	63.5	63.5	63.5	24	89

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
03/10/91	11.8	60.9	64.0	59.0	24	62.9	65.5	61.0	24	63.8	64.5	63.5	24	95
03/11/91	13.1	63.2	64.5	60.0	24	64.6	65.0	63.5	24	64.4	64.5	64.0	24	100
03/12/91	10.9	59.3	60.5	59.0	24	62.2	63.5	61.0	24	63.5	64.0	63.5	24	93
03/13/91	10.6	59.0	61.0	58.5	24	61.6	63.5	60.5	24	63.6	64.0	63.5	24	90
03/14/91	11.4	60.6	63.5	58.5	24	62.8	64.0	61.0	24	63.8	64.0	63.5	24	95
03/15/91	11.3	60.4	64.5	58.0	24	62.4	64.5	60.0	24	63.7	64.0	63.0	24	93
03/16/91	10.1	58.8	63.0	58.0	24	61.2	64.5	60.0	24	63.4	64.5	63.0	24	89
03/17/91	10.3	58.3	59.5	58.0	24	60.4	61.0	60.0	24	63.4	63.5	63.0	24	85
03/18/91	11.0	59.5	63.5	58.0	24	61.7	64.0	60.5	24	63.6	64.0	63.0	24	91
03/19/91	12.6	62.7	64.5	59.0	24	64.2	65.0	62.0	24	64.1	64.5	63.5	24	100
03/20/91	12.2	61.5	64.5	59.0	24	63.5	65.0	62.0	24	63.9	64.5	63.5	24	98
03/21/91	12.2	61.6	64.5	59.0	24	63.7	65.0	61.5	24	64.0	64.5	63.5	24	98
03/22/91	10.0	58.4	59.0	58.0	24	60.8	61.5	60.5	24	63.3	63.5	63.0	24	88
03/23/91	10.5	58.6	60.5	58.0	24	60.9	62.0	60.5	24	63.4	63.5	63.0	24	88
03/24/91	11.7	60.9	64.0	58.5	24	62.6	64.5	61.0	24	63.7	64.5	63.5	24	94
03/25/91	13.3	64.1	65.0	61.0	24	64.8	65.0	64.5	24	64.4	64.5	64.0	24	100
03/26/91	13.5	63.7	65.5	61.0	24	64.8	65.5	64.0	24	64.4	65.0	64.0	24	100
03/27/91	12.6	62.4	65.0	59.0	24	64.2	65.0	63.0	24	64.1	64.5	63.5	24	100
03/28/91	10.7	59.3	61.0	58.5	24	62.1	63.5	61.0	24	63.4	64.0	63.0	24	93
03/29/91	10.3	58.7	59.5	58.5	24	60.9	61.5	60.0	24	63.2	63.5	63.0	24	89
03/30/91	9.9	58.2	58.5	58.0	24	60.1	60.5	59.5	24	63.2	63.5	63.0	24	85
03/31/91	10.4	58.7	60.0	58.0	24	60.7	61.5	60.0	24	63.4	63.5	63.0	24	87
04/01/91	12.0	61.0	64.0	58.5	24	62.9	64.5	61.0	24	63.7	64.5	63.5	24	96
04/02/91	10.8	59.1	60.5	58.5	14	61.7	63.0	61.0	14	63.5	63.5	63.0	14	91
04/03/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/04/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/05/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/06/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/07/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/08/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/09/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/10/91	-	-	-	-	-	-	-	-	-	-	-	-	-	-
04/11/91	13.8	65.0	65.0	65.0	4	65.0	65.5	64.0	11	64.4	65.0	64.0	7	100
04/12/91	11.2	-	-	-	-	62.7	64.0	61.0	24	63.5	64.0	63.0	24	96
04/13/91	10.1	-	-	-	-	60.8	61.5	60.0	24	63.2	63.5	63.0	24	88
04/14/91	10.2	-	-	-	-	60.2	61.0	59.5	24	63.3	63.5	63.0	24	85
04/15/91	11.4	-	-	-	-	61.9	64.5	60.0	24	63.6	64.0	63.0	24	91
04/16/91	12.3	-	-	-	-	63.5	64.5	61.5	24	63.8	64.0	63.5	24	98
04/17/91	13.0	61.9	63.0	60.0	12	64.2	64.5	63.5	24	64.1	64.5	63.5	24	100
04/18/91	12.0	59.8	62.0	59.0	24	63.2	64.5	62.0	24	63.7	64.0	63.5	24	97
04/19/91	11.5	59.3	61.0	58.5	24	62.3	64.0	61.5	24	63.6	64.0	63.5	24	93
04/20/91	12.1	60.4	62.5	58.5	24	63.0	64.5	61.5	24	63.8	64.5	63.5	24	96
04/21/91	11.8	59.9	62.5	59.0	24	63.0	64.5	62.0	24	63.7	64.5	63.5	24	96
04/22/91	11.3	59.0	61.0	58.5	24	62.0	64.0	61.0	24	63.5	64.0	63.0	24	92
04/23/91	11.3	59.0	60.5	58.5	24	61.8	63.5	60.5	24	63.5	64.0	63.0	24	91
04/24/91	11.0	59.0	61.0	58.0	24	61.5	63.5	60.0	24	63.4	64.0	63.0	24	90
04/25/91	11.7	59.8	62.0	58.5	24	62.6	64.5	60.5	24	63.6	64.0	63.5	24	95
04/26/91	11.3	59.2	60.5	58.5	24	61.9	63.0	61.0	24	63.5	63.5	63.5	24	92
04/27/91	10.8	58.7	59.5	58.0	24	61.0	62.0	59.5	24	63.4	63.5	63.0	24	88

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min	T4 Hrs	Temperatures T5 Ave	T5 Max	T5 Min	T5 Hrs	RH (%) (T4,T5)
04/28/91	9.5	58.0	58.5	57.5	24	59.3	60.0	58.5	24	63.0	63.5	63.0	24	82
04/29/91	9.7	57.7	60.0	57.0	24	59.2	60.5	58.0	24	63.1	63.5	62.5	24	81
04/30/91	10.4	57.9	60.0	57.0	24	60.2	63.0	59.0	24	63.3	63.5	63.0	24	85
05/01/91	11.9	60.0	62.0	57.5	24	62.5	64.5	60.0	24	63.7	64.0	63.0	24	94
05/02/91	13.0	61.5	63.0	59.0	24	64.2	64.5	63.0	24	64.0	64.5	63.5	24	100
05/03/91	11.6	59.3	62.0	58.0	24	62.7	64.0	61.5	24	63.6	64.0	63.0	24	95
05/04/91	10.0	57.8	58.5	57.5	24	60.3	61.5	59.5	24	63.2	63.5	63.0	24	86
05/05/91	10.7	58.1	59.0	57.5	24	60.5	62.0	59.5	24	63.4	63.5	63.0	24	86
05/06/91	12.2	60.0	62.0	58.5	24	63.1	64.5	61.5	24	63.6	64.0	63.5	24	97
05/07/91	11.6	59.2	60.5	58.5	24	62.4	63.5	61.5	24	63.5	63.5	63.5	24	94
05/08/91	12.2	60.1	62.0	58.5	24	63.1	64.5	61.5	24	63.7	64.0	63.5	24	97
05/09/91	13.3	62.4	64.0	59.5	24	64.5	65.0	63.5	24	64.2	64.5	63.5	24	100
05/10/91	13.9	63.4	64.0	61.0	24	65.0	65.5	64.5	24	64.9	65.0	64.5	24	100
05/11/91	13.4	61.6	63.5	60.0	24	64.5	65.0	64.0	24	64.3	65.0	64.0	24	100
05/12/91	12.5	60.0	62.0	59.5	24	63.7	64.0	63.5	24	64.0	64.0	64.0	24	98
05/13/91	13.0	61.0	63.0	59.5	24	64.0	65.0	63.5	24	64.1	64.5	64.0	24	99
05/14/91	13.3	62.2	64.5	60.0	24	64.4	65.0	63.5	24	64.4	65.0	64.0	24	100
05/15/91	12.0	59.7	62.0	59.0	24	63.1	63.5	62.0	24	63.6	64.0	63.0	24	97
05/16/91	12.1	59.8	61.0	59.0	24	62.9	64.0	62.0	24	63.5	64.0	63.0	24	97
05/17/91	12.5	60.7	62.5	59.0	24	63.4	64.5	62.0	24	63.7	64.0	63.5	24	98
05/18/91	13.4	62.2	63.0	60.0	24	64.4	65.0	63.5	24	64.1	64.5	63.5	24	100
05/19/91	13.3	61.8	63.0	60.0	24	64.3	65.0	63.5	24	64.1	64.5	63.5	24	100
05/20/91	13.3	61.9	63.0	60.0	24	64.3	65.0	63.5	24	64.0	64.5	63.5	24	100
05/21/91	13.3	61.9	63.0	60.0	24	64.4	65.0	63.5	24	64.2	64.5	63.5	24	100
05/22/91	13.2	61.5	63.0	60.0	24	64.2	65.0	63.5	24	64.1	64.5	63.5	24	100
05/23/91	12.4	60.3	62.0	59.5	24	63.5	64.0	63.0	24	63.6	64.0	63.5	24	99
05/24/91	12.4	60.2	61.5	59.5	24	63.2	64.0	62.5	24	63.6	64.0	63.5	24	98
05/25/91	13.1	61.5	63.0	60.0	24	64.0	64.5	63.5	24	63.9	64.5	63.5	24	100
05/26/91	13.2	62.2	63.5	60.0	24	64.2	65.0	63.5	24	64.1	64.5	63.5	24	100
05/27/91	13.8	63.1	63.5	61.5	24	64.8	65.0	64.5	24	64.4	64.5	64.0	24	100
05/28/91	13.5	61.9	63.5	60.5	24	64.4	65.0	64.0	24	64.1	64.5	64.0	24	100
05/29/91	13.5	62.0	63.5	60.5	24	64.4	65.0	64.0	24	64.2	64.5	64.0	24	100
05/30/91	13.8	62.7	64.0	60.5	24	64.7	65.5	64.0	24	64.4	65.0	64.0	24	100
05/31/91	14.2	63.2	64.5	61.0	24	65.1	65.5	64.0	24	64.7	65.5	63.5	24	100

	Moisture	T3 Ave	T3 Max	T3 Min	T3 Hrs	T4 Ave	T4 Max	T4 Min	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	RH T4,T
Average	12.2	61.9	63.0	61.1	24	62.8	63.8	61.9	24	64.4	64.7	64.2	24	92
Maximum	15.6	67.7	68.5	67.0	24	66.2	68.5	66.0	24	65.9	66.0	65.5	24	100
Minimum	7.8	57.2	58.0	57.0	4	54.6	56.0	54.0	4	63.0	63.0	60.5	7	58
S.D.	2.2	2.4	2.3	2.4	1	2.9	2.4	3.3	2	0.7	0.6	0.7	1	11
Count	803.0	803.0	803.0	803.0	803	799.0	799.0	799.0	799	808.0	808.0	808.0	808	799

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
03/05/89	1020.1	9.4	63.0	63.0	63.0	10	65.0	65.5	65.0	10	-	-
03/06/89	1019.4	10.6	63.0	63.5	63.0	24	65.0	65.0	65.0	24	-	-2.3
03/07/89	1018.4	11.5	63.2	63.5	63.0	24	65.1	65.5	65.0	24	-	-2.6
03/08/89	1018.0	11.9	63.5	63.5	63.0	24	65.2	65.5	65.0	24	-	-2.3
03/09/89	1017.0	12.8	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.7
03/10/89	1016.6	13.6	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.9
03/11/89	1016.6	13.6	63.6	64.5	63.0	24	65.5	66.0	65.5	24	-	-3.4
03/12/89	1016.4	13.5	63.5	64.5	62.5	24	65.5	66.0	65.5	24	-	-3.4
03/13/89	1017.0	13.2	63.3	64.0	63.0	24	65.5	65.5	65.5	24	-	-3.3
03/14/89	1017.8	12.2	63.1	63.5	63.0	24	65.5	65.5	65.5	24	-	-3.1
03/15/89	1018.2	11.8	63.1	64.5	62.5	24	65.5	65.5	65.5	24	-	-2.8
03/16/89	1017.9	12.3	63.3	63.5	63.0	24	65.5	65.5	65.5	24	-	-3.0
03/17/89	1017.6	12.2	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.7
03/18/89	1017.1	12.7	63.6	64.5	63.5	24	65.5	65.5	65.5	24	-	-3.2
03/19/89	1016.9	13.0	63.5	64.0	63.5	24	65.5	65.5	65.5	24	-	-3.2
03/20/89	1017.6	12.2	63.3	64.0	63.0	24	65.5	65.5	65.5	24	-	-2.7
03/21/89	1018.8	10.8	63.2	63.5	63.0	24	65.5	65.5	65.5	24	-	-1.7
03/22/89	1017.3	12.4	63.5	63.5	63.0	24	65.5	65.5	65.5	24	-	-2.9
03/23/89	1016.1	13.7	63.8	65.0	63.5	24	65.5	66.0	65.5	24	-	-2.7
03/24/89	1015.5	14.7	63.9	65.0	63.5	24	65.5	65.5	65.5	24	-	-2.9
03/25/89	1015.7	14.3	63.9	65.0	63.5	24	65.5	65.5	65.5	24	-	-2.6
03/26/89	1014.6	15.2	64.4	65.5	63.5	24	65.5	66.5	65.5	24	-	-1.9
03/27/89	1017.1	12.9	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.0
03/28/89	1017.2	13.2	63.5	63.5	63.0	24	65.5	65.5	65.5	24	-	-1.9
03/29/89	1017.0	13.2	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.6
03/30/89	1017.6	11.8	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.6
03/31/89	1016.6	13.4	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.9
04/01/89	1016.1	14.1	63.7	64.5	63.5	24	65.5	65.5	65.5	24	-	-2.4
04/02/89	1015.3	14.6	64.0	65.0	63.5	24	65.5	65.5	65.5	24	-	-2.4
04/03/89	1015.8	14.5	63.6	64.5	63.5	24	65.5	65.5	65.5	24	-	-2.8
04/04/89	1016.5	13.7	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.3
04/05/89	1015.9	14.4	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.6
04/06/89	1015.9	14.4	63.5	63.5	63.5	24	65.5	65.5	65.5	24	-	-2.6
04/07/89	1015.8	14.5	63.6	64.0	63.5	24	65.5	65.5	65.5	24	-	-2.8
04/08/89	1015.8	14.5	63.6	64.0	63.5	24	65.5	65.5	65.5	24	-	-2.9
04/09/89	1016.1	13.9	63.5	64.0	63.0	24	65.5	65.5	65.5	24	-	-3.1
04/10/89	1016.1	14.1	63.5	64.0	63.5	24	65.5	65.5	65.5	24	-	-3.3
04/11/89	1015.2	14.8	63.9	65.0	63.5	24	65.5	65.5	65.5	24	-	-3.0
04/12/89	1014.8	15.1	63.9	64.0	63.5	24	65.6	66.0	65.5	24	-	-2.6
04/13/89	1016.3	14.0	63.5	64.0	63.5	24	65.5	66.0	65.5	24	-	-3.1
04/14/89	1016.2	14.2	63.5	64.0	63.5	24	65.5	65.5	65.5	24	-	-3.6
04/15/89	1016.0	14.2	63.6	64.5	63.5	24	65.5	66.0	65.5	24	-	-3.5
04/16/89	1016.1	14.1	63.5	64.0	63.0	24	65.5	66.0	65.5	24	-	-3.5
04/17/89	1016.2	13.8	63.5	64.0	63.5	24	65.5	65.5	65.5	24	-	-2.4
04/18/89	1016.1	13.9	63.5	64.0	62.5	24	65.7	66.0	65.5	24	-	-2.5
04/19/89	1015.7	14.4	63.6	64.0	63.5	24	65.6	66.0	65.5	24	-	-2.6
04/20/89	1014.9	15.0	63.8	64.0	63.5	24	65.8	66.0	65.5	24	-	-2.4
04/21/89	1014.6	15.2	64.0	65.0	63.5	24	66.0	66.0	65.5	24	-	-2.3
04/22/89	1014.4	15.2	64.2	65.0	64.0	24	66.0	66.0	66.0	24	-	-1.9

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
04/23/89	1014.6	15.2	64.1	65.0	63.5	24	66.0	66.0	66.0	24	-	-2.3
04/24/89	1014.8	15.1	64.0	64.5	63.5	24	66.0	66.0	66.0	24	-	-2.1
04/25/89	1014.4	15.2	64.1	65.0	63.5	24	66.0	66.0	66.0	24	-	-2.3
04/26/89	1015.0	14.8	63.9	64.0	63.5	24	66.0	66.0	66.0	24	-	-2.6
04/27/89	1017.4	12.2	63.4	63.5	63.0	24	65.6	66.0	65.5	24	-	-0.8
04/28/89	1017.7	11.6	63.4	63.5	63.0	24	65.5	65.5	65.5	24	-	-0.1
04/29/89	1017.8	11.5	63.5	64.0	63.0	24	65.5	65.5	65.5	24	-	-1.3
04/30/89	1018.4	11.5	63.6	66.0	63.0	24	65.5	65.5	65.5	24	-	-2.5
05/01/89	1017.2	12.5	63.5	64.0	63.0	24	65.5	65.5	65.5	24	-	-2.8
05/02/89	-	-	63.5	64.0	63.5	24	65.5	65.5	65.5	24	-	-
05/03/89	-	-	63.6	64.0	63.5	24	65.5	65.5	65.5	24	-	-
05/04/89	-	-	63.6	64.5	63.0	24	65.5	65.5	65.5	24	-	-
05/05/89	-	-	63.7	64.5	63.5	24	65.5	66.0	65.5	24	-	-
05/06/89	-	-	63.7	64.5	63.5	24	65.6	66.0	65.5	24	-	-
05/07/89	1015.5	14.7	63.8	64.5	63.5	24	65.7	66.0	65.5	24	-	-2.9
05/08/89	1015.8	14.5	63.7	64.5	63.5	24	65.8	66.0	65.5	24	-	-2.8
05/09/89	1014.8	15.1	64.5	65.0	63.5	24	66.0	66.0	65.5	24	-	-2.3
05/10/89	1014.2	15.3	64.6	65.0	63.5	24	66.0	66.0	66.0	24	-	-1.5
05/11/89	1014.2	15.3	64.5	65.0	63.5	24	65.3	65.5	64.5	24	-	-1.7
05/12/89	1016.3	14.0	63.5	64.0	63.0	24	64.6	65.0	63.5	24	-	-3.1
05/13/89	1016.1	14.1	63.9	65.0	63.0	24	64.9	65.5	64.0	24	-	-2.7
05/14/89	1014.9	15.0	64.1	65.0	63.5	24	65.1	65.5	64.0	24	-	-2.3
05/15/89	1014.6	15.2	64.4	65.0	63.5	24	65.2	65.5	64.0	24	-	-2.0
05/16/89	1016.2	13.8	63.6	65.0	63.0	24	64.6	65.5	63.5	24	-	-2.1
05/17/89	1017.7	12.7	63.5	63.5	63.0	24	64.4	64.5	64.0	24	-	-1.9
05/18/89	1017.0	13.2	63.5	64.5	63.5	24	64.5	65.0	64.0	24	-	-2.1
05/19/89	1016.6	13.6	63.5	63.5	63.5	24	64.4	65.0	63.5	24	-	-2.3
05/20/89	1016.3	14.0	63.6	64.5	63.5	24	64.7	65.0	64.0	24	-	-2.4
05/21/89	1016.0	14.5	63.6	64.5	63.0	24	64.7	65.5	64.0	24	-	-2.5
05/22/89	1015.8	14.5	63.6	65.0	63.5	24	64.7	65.5	63.5	24	-	-2.6
05/23/89	1015.4	14.9	63.7	64.0	63.5	24	65.0	65.5	64.0	24	-	-2.4
05/24/89	1015.4	14.9	63.8	64.5	63.5	24	65.0	65.5	64.5	24	-	-2.4
05/25/89	1015.4	14.9	63.7	64.5	63.5	24	64.9	65.5	64.5	24	-	-2.5
05/26/89	1015.8	14.5	63.6	64.5	63.5	24	65.1	65.5	64.0	24	-	-2.4
05/27/89	1015.1	15.1	64.2	65.0	63.5	24	65.4	65.5	65.0	24	-	-2.0
05/28/89	1014.6	15.2	64.4	65.0	63.5	24	65.4	66.0	64.5	24	-	-1.7
05/29/89	1013.9	15.3	64.8	65.0	64.0	24	65.9	66.0	65.0	24	-	-1.4
05/30/89	1013.9	15.3	64.6	65.0	64.0	24	65.7	66.0	65.0	24	-	-1.5
05/31/89	1014.6	15.2	64.1	65.0	63.5	24	65.3	66.0	65.0	24	-	-1.9
06/01/89	1014.4	15.2	64.1	65.0	64.0	24	65.4	66.0	65.0	24	-	-2.0
06/02/89	1014.4	15.2	64.2	65.0	64.0	24	65.5	66.0	65.0	24	-	-1.9
06/03/89	1014.8	15.1	64.0	64.5	63.5	24	65.3	65.5	65.0	24	-	-2.2
06/04/89	1014.8	15.1	64.0	65.0	63.5	24	65.3	66.0	65.0	24	-	-2.2
06/05/89	1014.8	15.1	64.2	65.0	63.5	24	65.3	66.0	64.5	24	-	-2.0
06/06/89	1014.7	15.0	64.1	66.0	63.5	24	65.3	66.0	65.0	24	-	-2.1
06/07/89	1014.8	15.1	64.0	65.0	63.5	24	65.4	66.0	65.0	24	-	-2.2
06/08/89	1014.2	15.3	64.4	65.5	64.0	18	65.7	66.0	65.0	18	-	-2.2
06/09/89	1014.2	15.3	64.6	65.5	64.0	24	65.8	66.0	65.0	24	-	-1.2
06/10/89	1014.2	15.3	64.4	65.5	64.0	24	65.7	66.0	65.0	24	-	-1.1

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
06/11/89	1014.4	15.2	64.2	65.0	64.0	24	65.6	66.0	65.0	24	-	-1.2
06/12/89	1014.6	15.2	64.1	64.5	64.0	24	65.4	66.0	65.0	24	-	-1.4
06/13/89	1014.8	15.1	64.0	64.5	63.5	24	65.4	66.0	65.0	24	-	-1.8
06/14/89	1014.8	15.1	64.1	65.0	64.0	24	65.5	66.0	65.0	24	-	-1.8
06/15/89	1014.8	15.1	64.1	65.0	64.0	24	65.5	65.5	65.5	24	-	-1.8
06/16/89	1014.6	15.2	64.1	64.5	64.0	24	65.5	66.0	65.0	24	-	-1.8
06/17/89	1014.8	15.1	64.1	65.0	63.5	24	65.4	66.0	65.0	24	-	-2.2
06/18/89	1014.6	15.2	64.1	65.0	64.0	24	65.6	66.0	65.0	24	-	-1.8
06/19/89	1014.4	15.2	64.3	65.5	64.0	24	65.7	66.0	65.0	24	-	-1.7
06/20/89	1014.4	15.2	64.2	65.0	64.0	24	65.8	66.0	65.5	24	-	-1.5
06/21/89	1014.4	15.2	64.3	65.5	64.0	24	65.7	66.0	65.5	24	-	-1.7
06/22/89	1014.4	15.2	64.1	65.0	64.0	24	65.7	66.0	65.5	24	-	-1.8
06/23/89	1013.7	15.4	64.8	65.5	64.0	24	65.9	66.0	65.5	24	-	-1.3
06/24/89	1013.7	15.4	64.5	65.5	64.0	24	65.9	66.0	65.5	24	-	-1.3
06/25/89	1013.9	15.3	64.5	65.0	64.0	24	65.8	66.0	65.5	24	-	-1.6
06/26/89	1013.9	15.3	64.4	65.5	64.0	24	65.8	66.0	65.5	24	-	-1.6
06/27/89	1013.9	15.3	64.3	64.5	64.0	24	65.9	66.0	65.5	24	-	-1.6
06/28/89	1013.9	15.3	64.3	65.5	64.0	24	65.7	66.0	65.5	24	-	-1.5
06/29/89	1013.7	15.4	64.5	65.0	64.0	24	65.9	66.0	65.5	24	-	-1.5
06/30/89	1013.9	15.3	64.6	65.5	64.0	24	65.8	66.0	65.5	24	-	-1.5
07/01/89	1013.7	15.4	64.4	65.5	64.0	24	65.8	66.0	65.5	24	-	-1.7
07/02/89	1013.7	15.4	64.4	65.0	64.0	24	65.9	66.0	65.0	24	-	-1.7
07/03/89	1013.9	15.3	64.4	65.0	64.0	24	65.8	66.0	65.5	24	-	-1.5
07/04/89	1013.7	15.4	64.6	65.5	64.0	24	65.9	66.0	65.5	24	-	-1.6
07/05/89	1013.7	15.4	64.6	65.5	64.0	24	65.9	66.0	65.0	24	-3.7	-1.6
07/06/89	1013.7	15.4	64.7	65.5	64.0	24	66.0	66.0	65.5	24	-4.1	-1.3
07/07/89	1013.5	15.4	64.6	65.0	64.0	24	65.9	66.0	65.5	24	-6.3	-1.2
07/08/89	1013.5	15.4	64.6	65.5	64.0	24	65.9	66.0	65.5	24	-3.6	-1.2
07/09/89	1013.7	15.4	64.6	65.0	64.0	24	65.9	66.0	65.5	24	0.3	-1.4
07/10/89	1013.7	15.4	64.5	65.5	64.0	24	65.9	66.0	65.5	24	-0.1	-1.6
07/11/89	1013.9	15.3	64.4	65.0	64.0	24	65.8	66.0	65.5	24	0.4	-1.5
07/12/89	1013.7	15.4	64.5	65.5	64.0	24	65.9	66.0	65.5	24	-0.8	-1.4
07/13/89	1013.5	15.4	64.7	65.5	64.0	24	65.9	66.0	65.5	24	-3.3	-1.3
07/14/89	1013.5	15.4	64.7	65.5	64.0	24	66.0	66.0	66.0	24	-5.3	-1.3
07/15/89	1013.5	15.4	64.6	65.0	64.5	24	65.9	66.0	65.5	24	1.7	-1.3
07/16/89	1013.7	15.4	64.7	65.5	64.5	24	65.9	66.0	65.5	24	0.0	-1.1
07/17/89	1013.5	15.4	64.6	65.5	64.5	24	65.9	66.0	65.5	24	1.3	-1.3
07/18/89	1013.5	15.4	64.7	65.5	64.0	24	66.0	66.0	65.5	24	-	-1.2
07/19/89	1013.3	15.5	64.9	65.5	64.5	24	66.0	66.0	65.5	24	-	-1.1
07/20/89	1013.0	15.5	64.9	65.5	64.0	24	66.0	66.5	65.5	24	-	-1.2
07/21/89	1013.5	15.4	64.6	65.0	64.5	24	65.9	66.0	65.5	24	0.7	-1.2
07/22/89	1013.5	15.4	64.6	65.5	64.5	24	66.0	66.5	65.5	24	0.1	-1.2
07/23/89	1013.5	15.4	64.6	65.0	64.5	24	66.0	66.0	65.5	24	0.8	-1.2
07/24/89	1013.5	15.4	64.7	65.5	63.5	24	66.0	66.5	65.5	24	0.8	-1.1
07/25/89	1013.5	15.4	64.6	65.5	64.0	24	65.9	66.5	65.5	24	-0.2	-1.3
07/26/89	1013.5	15.4	64.6	65.5	64.0	24	66.0	66.5	65.5	24	-0.2	-1.2
07/27/89	1013.5	15.4	64.5	65.0	64.5	24	66.0	66.0	65.5	24	-0.2	-1.2
07/28/89	1013.5	15.4	64.5	65.5	64.0	24	66.0	66.5	65.5	24	-0.8	-1.3
07/29/89	1013.5	15.4	64.5	64.5	64.5	24	65.9	66.0	65.5	24	0.5	-1.2

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
07/30/89	1013.5	15.4	64.5	65.5	64.0	24	66.0	66.0	65.5	24	-0.1	-1.1
07/31/89	1013.3	15.5	64.7	65.0	64.5	24	66.0	66.5	66.0	24	0.3	-1.1
08/01/89	1013.3	15.5	64.7	65.5	64.5	24	66.1	66.5	66.0	24	-0.4	-0.9
08/02/89	1013.3	15.5	64.6	65.0	64.5	24	66.0	66.0	66.0	24	-0.3	-1.0
08/03/89	1013.3	15.5	64.6	65.0	64.5	24	66.0	66.0	66.0	24	1.7	-1.1
08/04/89	1013.3	15.5	64.6	65.0	64.5	24	66.0	66.0	65.5	24	-	-1.1
08/05/89	1013.3	15.5	64.6	65.5	64.5	24	66.0	66.0	65.5	24	-	-1.1
08/06/89	1013.0	15.5	64.7	65.5	64.5	24	66.0	66.5	66.0	24	-	-1.0
08/07/89	1013.5	15.4	64.7	65.5	64.5	24	66.1	66.5	65.5	24	-0.3	-1.0
08/08/89	1013.3	15.5	64.7	65.5	64.5	24	66.0	66.5	66.0	24	-2.0	-1.1
08/09/89	1013.0	15.5	64.7	65.0	64.5	24	66.0	66.5	66.0	24	-2.5	-1.0
08/10/89	1013.3	15.5	64.7	65.5	64.5	24	66.0	66.5	66.0	24	-0.1	-0.9
08/11/89	1013.3	15.5	64.7	65.5	64.5	24	66.1	66.5	66.0	24	-0.8	-1.0
08/12/89	1013.0	15.5	64.7	65.5	64.5	24	66.0	66.0	66.0	24	-0.6	-1.0
08/13/89	1012.8	15.6	64.7	65.0	64.5	24	66.0	66.0	65.5	24	0.2	-1.0
08/14/89	1012.6	15.6	64.9	65.5	64.5	24	66.1	66.5	65.5	24	0.0	-0.9
08/15/89	1012.6	15.6	64.9	65.5	64.5	24	66.2	66.5	66.0	24	-1.2	-0.9
08/16/89	1012.6	15.6	65.0	65.5	64.5	24	66.2	66.5	66.0	24	0.2	-0.9
08/17/89	1012.6	15.6	64.9	65.5	64.5	24	66.2	66.5	66.0	24	1.2	-0.9
08/18/89	1012.6	15.6	64.9	65.5	64.5	24	66.1	66.5	66.0	24	0.2	-0.9
08/19/89	1012.3	15.7	65.1	65.5	64.5	24	66.2	66.5	66.0	24	0.4	-0.9
08/20/89	1012.3	15.7	65.1	65.5	64.5	24	66.3	66.5	66.0	24	-1.1	-0.8
08/21/89	1012.3	15.7	65.0	65.5	64.5	24	66.2	66.5	66.0	24	-0.7	-0.8
08/22/89	1012.3	15.7	65.0	65.5	64.5	24	66.1	66.5	66.0	24	-1.2	-0.9
08/23/89	1012.3	15.7	65.1	65.5	65.0	24	66.2	66.5	66.0	24	-2.5	-0.8
08/24/89	1012.1	15.7	65.3	66.0	65.0	24	66.4	66.5	66.0	24	-4.9	-0.8
08/25/89	1012.1	15.7	65.2	66.0	64.5	24	66.3	66.5	66.0	24	-8.4	-0.9
08/26/89	1012.3	15.7	65.1	65.5	65.0	24	66.2	66.5	66.0	24	-1.9	-1.0
08/27/89	1012.3	15.7	65.0	65.5	65.0	24	66.2	66.5	66.0	24	-1.9	-1.0
08/28/89	1012.3	15.7	65.0	65.5	64.5	24	66.1	66.5	66.0	24	-4.9	-0.9
08/29/89	1012.3	15.7	65.1	65.5	65.0	24	66.2	66.5	66.0	24	-2.2	-0.8
08/30/89	1012.1	15.7	65.0	65.5	65.0	24	66.2	66.5	66.0	24	-0.7	-0.9
08/31/89	1012.1	15.7	65.1	65.5	65.0	24	66.2	66.5	66.0	24	-1.7	-0.8
09/01/89	1012.1	15.7	65.1	65.5	64.5	24	66.3	66.5	66.0	24	-1.8	-0.8
09/02/89	1012.1	15.7	65.0	65.5	65.0	24	66.2	66.5	66.0	24	0.4	-0.8
09/03/89	1012.1	15.7	65.1	65.5	64.5	24	66.2	66.5	66.0	24	1.1	-0.9
09/04/89	1012.1	15.7	65.0	65.5	65.0	24	66.3	66.5	66.0	24	-0.7	-0.7
09/05/89	1011.7	15.8	65.1	66.0	65.0	24	66.4	66.5	66.0	24	-2.8	-0.9
09/06/89	1011.7	15.8	65.1	65.5	65.0	24	66.4	66.5	66.0	24	-0.7	-0.9
09/07/89	1011.4	15.9	65.1	65.5	65.0	24	66.4	66.5	66.0	24	-1.9	-0.9
09/08/89	1011.7	15.8	65.1	66.0	65.0	24	66.4	66.5	66.0	24	-5.5	-0.9
09/09/89	1011.2	15.9	65.2	66.0	65.0	24	66.5	66.5	66.0	24	-9.0	-0.8
09/10/89	1011.4	15.9	65.3	66.0	65.0	24	66.4	66.5	66.0	24	-8.1	-0.7
09/11/89	1011.2	15.9	65.5	66.0	65.0	24	66.5	66.5	66.5	24	-7.2	-0.7
09/12/89	1011.2	15.9	65.6	66.0	65.0	24	66.5	66.5	66.5	24	0.1	-0.6
09/13/89	1011.4	15.9	65.1	65.5	65.0	24	66.4	66.5	66.0	24	-2.4	-0.9
09/14/89	1011.4	15.9	65.1	65.5	65.0	24	66.3	66.5	66.0	24	-7.1	-1.0
09/15/89	1011.4	15.9	65.1	65.5	65.0	24	66.4	66.5	66.0	24	-3.5	-0.9
09/16/89	1011.2	15.9	65.3	66.0	65.0	24	66.5	66.5	66.0	24	-9.2	-0.7

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
09/17/89	1011.2	15.9	65.6	66.0	65.0	24	66.5	66.5	66.5	24	-4.7	-0.6
09/18/89	1011.2	15.9	65.8	66.0	65.0	24	66.5	66.5	66.0	24	-3.9	-0.4
09/19/89	1011.2	15.9	65.7	66.0	65.0	24	66.5	66.5	66.5	24	-5.0	-0.5
09/20/89	1011.2	15.9	65.4	66.0	65.0	24	66.5	66.5	66.0	24	-5.4	-0.9
09/21/89	1011.2	15.9	65.3	66.0	65.0	24	66.4	66.5	66.0	24	-9.7	-1.1
09/22/89	1011.2	15.9	65.4	66.0	65.0	24	66.4	66.5	66.0	24	-0.4	-0.9
09/23/89	1011.7	15.8	65.2	65.5	65.0	24	66.3	66.5	66.0	24	-3.8	-1.2
09/24/89	1011.2	15.9	65.4	66.0	65.0	24	66.5	66.5	66.0	24	-7.2	-0.9
09/25/89	1011.2	15.9	65.4	66.0	65.0	24	66.5	66.5	66.0	24	-8.7	-0.6
09/26/89	1011.4	15.9	65.4	66.0	65.0	24	66.4	66.5	66.0	24	-8.7	-1.2
09/27/89	1011.7	15.8	65.2	65.5	64.5	24	66.3	66.5	66.0	24	-9.5	-1.5
09/28/89	1011.2	15.9	65.2	65.5	65.0	24	66.4	66.5	66.0	24	-10.3	-1.4
09/29/89	1011.4	15.9	65.3	66.0	65.0	24	66.4	66.5	66.0	24	-10.6	-1.3
09/30/89	1011.2	15.9	65.6	67.0	65.0	24	66.5	66.5	66.5	24	-11.1	-0.7
10/01/89	1011.2	15.9	65.6	66.0	65.0	24	66.5	66.5	66.5	24	-10.1	-0.9
10/02/89	1011.0	16.0	65.7	66.0	65.0	24	66.5	66.5	66.5	24	-5.8	-0.8
10/03/89	1011.2	15.9	65.4	66.0	65.0	24	66.5	66.5	66.0	24	-5.2	-1.1
10/04/89	1011.2	15.9	65.4	66.0	65.0	24	66.3	66.5	66.0	24	-	-1.4
10/05/89	1011.2	15.9	65.3	65.5	65.0	24	66.2	66.5	66.0	24	-	-1.2
10/06/89	1011.2	15.9	65.2	65.5	65.0	24	66.3	66.5	66.0	24	-	-1.4
10/07/89	1011.2	15.9	65.2	65.5	65.0	24	66.3	66.5	66.0	24	-	-1.2
10/08/89	1011.2	15.9	65.2	65.5	65.0	24	66.2	66.5	66.0	24	-	-1.4
10/09/89	1011.2	15.9	65.1	65.5	65.0	24	66.3	66.5	66.0	24	-	-1.5
10/10/89	1011.2	15.9	65.4	66.0	65.0	24	66.5	66.5	66.0	24	-	-1.0
10/11/89	1011.2	15.9	65.3	66.0	65.0	24	66.5	66.5	66.5	24	-8.1	-0.9
10/12/89	1011.2	15.9	65.5	66.0	65.0	24	66.5	66.5	66.5	24	-7.8	-0.9
10/13/89	1011.2	15.9	65.6	66.0	65.0	24	66.5	66.5	66.5	24	-8.7	-0.7
10/14/89	1010.8	16.0	65.7	66.0	65.0	24	66.5	66.5	66.5	24	-7.8	-0.8
10/15/89	1010.3	16.1	65.8	66.0	65.5	24	66.7	67.0	66.5	24	-10.9	-0.5
10/16/89	1010.5	16.1	65.5	66.0	65.5	24	66.4	66.5	66.0	24	-7.5	-1.4
10/17/89	1011.2	15.9	65.4	65.5	65.0	24	66.4	66.5	66.0	24	-8.3	-1.6
10/18/89	1011.4	15.9	65.1	65.5	65.0	24	66.1	66.5	66.0	24	-6.4	-2.3
10/19/89	1012.4	15.5	65.0	65.5	64.5	24	66.0	66.5	66.0	24	-6.1	-2.4
10/20/89	1012.4	15.5	64.9	65.0	64.5	24	66.0	66.0	66.0	24	-4.5	-2.1
10/21/89	1012.1	15.7	65.0	65.5	64.5	24	66.1	66.5	66.0	24	-5.1	-1.9
10/22/89	1012.4	15.5	64.9	65.0	64.5	24	65.9	66.0	65.5	24	-4.1	-1.9
10/23/89	1012.1	15.7	65.0	65.5	65.0	24	66.1	66.5	66.0	24	-4.6	-1.7
10/24/89	1011.4	15.9	65.0	65.5	65.0	24	66.2	66.5	66.0	24	-6.6	-1.6
10/25/89	1011.2	15.9	65.5	66.0	65.0	24	66.4	66.5	66.0	24	-7.5	-1.0
10/26/89	1012.3	15.4	64.7	65.0	64.0	24	65.9	66.0	65.5	24	-6.4	-2.6
10/27/89	1012.4	15.3	64.7	65.5	64.5	24	65.9	66.5	65.5	24	-8.0	-2.7
10/28/89	1013.0	15.3	64.5	64.5	64.0	24	65.6	66.0	65.5	24	-7.9	-3.3
10/29/89	1013.5	15.4	64.1	64.5	64.0	24	65.3	66.0	65.0	24	-7.8	-4.3
10/30/89	1013.9	15.3	64.0	64.0	63.5	24	65.0	65.0	65.0	24	-7.5	-4.7
10/31/89	1013.8	15.0	64.0	64.5	64.0	24	65.2	66.0	65.0	24	-7.5	-3.9
11/01/89	1013.9	15.3	64.0	64.0	64.0	24	65.0	65.5	65.0	24	-6.6	-4.7
11/02/89	1013.9	15.3	64.0	64.0	64.0	24	65.0	65.5	65.0	24	-6.8	-4.7
11/03/89	1013.7	15.4	64.0	64.0	64.0	24	65.1	65.5	65.0	24	-5.6	-4.6
11/04/89	1013.5	15.4	64.0	64.0	64.0	24	65.1	65.5	65.0	24	-6.1	-4.4

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
11/05/89	1013.5	15.4	64.0	64.5	64.0	24	65.1	65.5	64.5	24	-5.1	-4.3
11/06/89	1013.5	15.4	64.1	64.5	64.0	24	65.2	65.5	65.0	24	-4.6	-4.1
11/07/89	1013.5	15.4	64.1	64.5	64.0	24	65.1	65.5	65.0	24	-5.6	-4.5
11/08/89	1013.3	15.5	64.2	65.5	64.0	24	65.3	66.0	65.0	24	-4.9	-4.7
11/09/89	1013.5	15.4	64.2	64.5	64.0	24	65.4	66.0	65.0	24	-7.9	-4.4
11/10/89	1013.3	15.5	64.3	64.5	63.0	24	65.5	66.0	65.0	24	-8.2	-3.9
11/11/89	1013.3	15.5	64.5	64.5	64.5	24	65.5	66.0	65.0	24	-7.6	-4.0
11/12/89	1013.0	15.5	64.5	64.5	64.0	24	65.4	66.0	65.0	24	-7.0	-4.2
11/13/89	1013.3	15.5	64.4	64.5	64.0	24	65.3	66.0	64.5	24	-5.5	-4.4
11/14/89	1013.3	15.5	64.5	65.0	64.0	24	65.4	66.0	65.0	24	-4.3	-4.5
11/15/89	1013.5	15.4	64.5	64.5	64.0	24	65.3	65.5	65.0	24	-6.0	-4.9
11/16/89	1013.3	15.5	64.4	64.5	63.5	24	65.2	65.5	65.0	24	-7.9	-5.2
11/17/89	1013.5	15.4	64.4	64.5	64.0	24	65.2	66.0	65.0	24	-7.1	-5.2
11/18/89	1013.5	15.4	64.2	64.5	64.0	24	65.0	65.0	65.0	24	-6.6	-5.2
11/19/89	1013.7	15.4	64.1	64.5	64.0	24	64.9	65.5	64.5	24	-	-
11/20/89	1013.5	15.4	64.3	64.5	64.0	24	65.1	66.0	65.0	24	-	-
11/21/89	1014.4	15.2	64.5	64.5	63.5	24	64.8	65.5	63.0	24	-	-
11/22/89	1013.5	15.4	64.5	64.5	64.0	24	65.1	65.5	65.0	24	-	-
11/23/89	1013.3	15.5	64.5	64.5	64.5	24	65.2	65.5	65.0	24	-6.2	-4.3
11/24/89	1012.6	15.6	64.6	65.5	64.5	24	65.6	66.0	65.0	24	-8.2	-3.2
11/25/89	1012.8	15.3	64.6	65.0	64.5	24	65.4	66.0	64.5	24	-6.6	-2.7
11/26/89	1012.3	15.7	64.6	65.5	64.5	24	65.6	66.0	64.5	24	-5.5	-3.2
11/27/89	1013.0	15.5	64.5	64.5	64.5	24	65.1	65.5	65.0	24	-5.2	-4.8
11/28/89	1013.5	15.4	64.4	64.5	64.0	24	65.0	65.5	65.0	24	-6.8	-5.8
11/29/89	1013.5	15.4	64.1	64.5	64.0	24	65.0	65.0	65.0	24	-6.6	-6.4
11/30/89	1014.5	13.7	64.0	64.5	64.0	24	65.0	65.0	65.0	24	-5.6	-4.8
12/01/89	1016.7	10.5	64.0	64.0	64.0	24	65.0	65.0	65.0	24	-5.6	-1.4
12/02/89	1017.3	10.1	63.9	64.0	63.5	24	64.7	65.0	64.0	24	-4.8	-1.5
12/03/89	1016.6	10.9	64.0	64.0	64.0	24	64.9	65.0	64.5	24	-3.9	-1.7
12/04/89	1015.9	11.4	64.0	64.5	64.0	24	65.0	65.0	65.0	24	-4.1	-1.7
12/05/89	1013.5	15.4	64.0	64.0	64.0	24	65.0	65.0	65.0	24	-6.3	-5.8
12/06/89	1015.1	13.1	64.0	65.0	64.0	24	65.0	65.0	64.5	24	-6.0	-3.6
12/07/89	1017.3	10.1	64.0	64.0	64.0	16	64.8	65.0	64.5	16	-6.4	-1.3
12/08/89	-	-	-	-	-	-	-	-	-	-	-	-
12/09/89	1015.7	11.7	64.0	64.5	64.0	13	65.0	65.0	65.0	13	-6.8	-2.0
12/10/89	1015.5	12.0	64.1	64.5	64.0	24	65.1	66.0	65.0	24	-7.2	-2.4
12/11/89	1017.5	9.8	64.0	64.5	64.0	24	64.8	65.0	64.5	24	-6.5	-1.7
12/12/89	1018.1	9.4	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-6.1	-1.4
12/13/89	1017.9	9.7	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-6.1	-1.7
12/14/89	1017.1	10.4	64.1	66.5	64.0	24	64.8	65.0	64.5	24	-6.0	-2.1
12/15/89	1016.5	10.8	64.1	66.5	64.0	24	65.0	66.0	65.0	24	-6.3	-2.2
12/16/89	1016.2	11.2	64.1	65.0	64.0	24	65.1	66.0	65.0	24	-5.1	-2.3
12/17/89	1017.1	10.4	64.0	64.0	64.0	24	65.0	65.0	65.0	24	-4.1	-1.5
12/18/89	1017.3	10.3	64.0	64.0	64.0	24	65.0	65.0	65.0	24	-3.3	-1.4
12/19/89	1017.1	10.8	64.0	64.5	64.0	24	65.0	65.0	64.5	24	-	-1.4
12/20/89	1016.8	10.8	64.0	64.0	64.0	24	65.0	65.0	65.0	24	-	-1.3
12/21/89	1017.2	10.7	64.0	64.0	64.0	24	64.9	65.0	64.5	24	-	-1.4
12/22/89	1017.4	10.2	64.0	64.0	64.0	24	64.9	65.0	64.5	24	-	-1.6
12/23/89	1017.4	10.2	63.9	64.5	61.5	24	64.8	65.0	64.5	24	-	-1.7

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
12/24/89	1017.6	10.3	64.0	64.5	64.0	24	64.6	65.0	64.5	24	-	-1.9
12/25/89	1017.7	10.0	64.0	64.0	64.0	24	64.5	64.5	64.5	24	-	-1.7
12/26/89	1017.7	10.0	63.9	64.0	63.5	24	64.5	64.5	64.5	24	-	-1.5
12/27/89	1017.3	10.3	64.0	64.0	63.5	24	64.7	65.0	64.5	24	-	-1.5
12/28/89	1016.7	11.1	64.0	64.0	64.0	24	64.9	65.5	64.5	24	-3.0	-1.6
12/29/89	1015.2	12.6	64.2	65.5	64.0	24	65.1	65.5	64.5	24	-5.2	-2.1
12/30/89	1017.3	10.5	64.0	64.0	64.0	24	64.9	65.0	64.5	24	-4.3	-1.3
12/31/89	1017.7	10.0	64.0	64.5	64.0	24	64.7	65.0	64.5	24	-4.2	-1.4
01/01/90	1017.6	10.3	64.0	64.0	64.0	24	64.8	65.0	64.5	24	-6.3	-1.6
01/02/90	1015.0	13.2	64.4	65.0	64.0	24	65.2	65.5	64.5	24	-5.8	-2.1
01/03/90	1017.1	10.8	64.0	64.0	64.0	24	64.8	65.0	64.5	24	-5.0	-1.8
01/04/90	1017.7	10.2	64.0	64.0	64.0	24	64.7	65.0	64.5	24	-4.2	-1.7
01/05/90	1017.8	9.9	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-3.8	-1.5
01/06/90	1018.0	9.6	64.0	64.0	64.0	24	64.5	64.5	64.5	24	-4.0	-1.7
01/07/90	1017.9	9.7	64.0	64.0	63.5	24	64.5	64.5	64.5	24	-5.1	-1.6
01/08/90	1017.6	10.3	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-4.6	-1.9
01/09/90	1017.3	10.8	64.0	64.0	64.0	24	64.9	65.0	64.5	24	-4.1	-1.8
01/10/90	1016.7	11.1	64.0	64.0	64.0	24	65.0	65.0	64.5	24	-5.3	-1.7
01/11/90	-	-	64.0	64.5	64.0	24	65.0	65.0	65.0	24	-5.6	-
01/12/90	-	-	64.0	64.5	64.0	24	65.0	65.5	65.0	24	-6.0	-
01/13/90	-	-	64.1	65.5	64.0	24	65.0	65.5	64.5	24	-3.7	-
01/14/90	-	-	64.2	65.0	63.5	24	65.1	66.5	64.5	24	-4.8	-
01/15/90	1015.9	11.4	64.2	65.0	64.0	24	65.0	65.5	65.0	24	-4.8	-1.3
01/16/90	1016.5	11.0	64.0	64.5	64.0	24	65.0	65.0	65.0	24	-4.8	-1.6
01/17/90	1015.7	12.4	64.3	66.5	64.0	24	65.0	65.5	64.5	24	-6.9	-2.5
01/18/90	1016.3	11.8	64.1	65.5	64.0	24	64.9	65.5	64.5	24	-5.6	-2.0
01/19/90	1017.8	9.9	64.0	64.0	64.0	24	64.5	65.0	64.5	24	-4.5	-1.0
01/20/90	1017.9	9.7	64.0	64.0	64.0	23	64.5	64.5	64.5	23	-5.1	-1.2
01/21/90	-	-	-	-	-	-	-	-	-	-	-	-
01/22/90	1017.6	10.3	64.0	64.0	64.0	9	64.6	65.0	64.5	9	-2.8	-1.0
01/23/90	1017.3	10.8	64.0	64.0	64.0	24	64.8	65.0	64.5	24	-3.4	-0.8
01/24/90	1017.7	10.2	64.0	64.0	64.0	24	64.7	65.0	64.5	24	-4.6	-0.8
01/25/90	1018.0	9.6	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-7.8	-0.9
01/26/90	1017.7	10.0	64.0	65.0	64.0	24	64.7	65.0	64.5	24	-7.6	-1.1
01/27/90	1017.9	9.7	64.0	64.0	64.0	24	64.8	65.0	64.5	24	-7.5	-0.9
01/28/90	1018.2	9.3	64.0	64.5	64.0	24	64.6	65.0	64.5	24	-6.0	-0.8
01/29/90	1017.9	9.7	64.0	64.0	64.0	24	64.7	65.0	64.5	24	-7.4	-1.0
01/30/90	1016.4	11.6	64.1	64.5	64.0	24	64.9	65.5	64.5	24	-8.2	-1.9
01/31/90	1014.8	13.5	64.4	65.0	64.0	24	65.1	65.5	64.5	24	-7.0	-2.0
02/01/90	1016.1	12.1	64.2	65.0	63.5	24	65.0	65.5	64.5	24	-5.2	-1.6
02/02/90	1017.3	10.5	64.1	64.5	64.0	24	64.7	65.0	64.5	24	-5.1	-1.5
02/03/90	1018.3	9.4	64.0	64.0	64.0	24	64.5	65.0	64.5	24	-4.7	-1.0
02/04/90	1016.9	11.1	64.2	65.5	64.0	24	64.8	65.5	64.5	24	-6.4	-1.4
02/05/90	1016.8	11.3	64.1	65.0	64.0	24	64.7	65.5	64.5	24	-5.2	-1.6
02/06/90	1017.8	9.9	64.0	64.5	63.5	24	64.7	65.0	64.5	24	-4.8	-0.9
02/07/90	1016.3	11.8	64.2	65.0	64.0	24	65.0	65.5	64.5	24	-5.5	-1.7
02/08/90	1014.5	14.0	64.5	65.0	64.0	24	65.2	65.5	65.0	24	-5.2	-2.5
02/09/90	1017.6	10.3	64.0	64.0	64.0	24	65.0	65.0	64.5	24	-4.6	-0.9
02/10/90	1017.6	10.3	64.0	64.0	64.0	24	64.9	65.0	64.5	24	-4.6	-1.0

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
02/11/90	1016.7	11.1	64.2	64.5	64.0	24	65.0	65.0	65.0	24	-4.5	-1.2
02/12/90	1015.2	12.9	64.4	65.0	64.0	24	65.1	65.5	65.0	24	-6.2	-2.1
02/13/90	1012.8	15.6	65.0	65.0	64.5	24	65.5	65.5	65.5	24	-8.6	-2.1
02/14/90	1012.7	15.5	64.9	65.0	64.5	24	65.4	66.0	65.0	24	-9.2	-1.9
02/15/90	1017.5	10.5	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-6.6	-1.6
02/16/90	1018.3	9.4	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-6.1	-1.0
02/17/90	1017.8	9.9	64.0	64.0	64.0	24	64.8	65.0	64.5	24	-6.9	-1.0
02/18/90	1016.1	12.1	64.3	65.0	64.0	24	65.0	65.5	64.5	24	-7.9	-2.1
02/19/90	1015.3	13.0	64.4	65.0	64.0	24	65.0	65.5	64.5	24	-7.5	-2.2
02/20/90	1018.4	9.5	64.0	64.0	64.0	24	64.5	65.0	64.5	24	-4.7	-1.0
02/21/90	1017.8	9.9	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-4.5	-1.3
02/22/90	1018.1	9.8	64.0	64.0	64.0	24	64.6	65.0	64.5	24	-3.9	-1.1
02/23/90	1017.6	10.3	64.0	64.0	64.0	24	64.9	65.0	64.5	24	-6.2	-1.3
02/24/90	1017.1	11.1	64.0	64.0	64.0	24	65.0	65.5	65.0	24	-7.2	-1.6
02/25/90	1016.2	11.9	64.1	64.5	64.0	24	65.1	65.5	65.0	24	-8.0	-1.8
02/26/90	1017.1	11.1	64.0	64.5	64.0	24	65.0	65.5	65.0	24	-5.7	-1.4
02/27/90	1017.2	10.9	64.0	64.0	64.0	24	65.0	65.0	64.5	24	-4.4	-1.1
02/28/90	1017.3	10.8	64.0	64.5	64.0	24	65.0	65.0	65.0	24	-2.3	-0.8
03/01/90	1017.3	10.8	64.0	64.0	64.0	24	65.0	65.0	65.0	24	-3.4	-0.9
03/02/90	1017.2	10.9	64.0	64.0	64.0	24	65.0	65.0	65.0	24	-5.2	-1.3
03/03/90	1017.1	11.1	64.0	65.0	64.0	24	65.0	65.5	65.0	24	-5.3	-1.6
03/04/90	1015.7	12.7	64.3	65.0	64.0	24	65.1	65.5	65.0	24	-5.7	-2.0
03/05/90	1013.9	14.4	64.7	65.0	64.0	24	65.3	65.5	65.0	24	-5.8	-2.3
03/06/90	1017.5	10.5	64.0	64.0	64.0	24	64.8	65.0	64.5	24	-5.4	-1.7
03/07/90	1017.6	10.3	64.0	64.0	64.0	24	64.8	65.0	64.5	24	-5.6	-1.6
03/08/90	1015.7	12.7	64.1	64.5	64.0	21	65.0	65.5	65.0	21	-7.2	-3.0
03/09/90	1015.8	12.5	64.1	64.5	63.5	13	65.1	66.0	65.0	13	-5.5	-2.7
03/10/90	1015.3	12.8	64.3	65.0	64.0	24	65.2	65.5	65.0	24	-4.2	-2.2
03/11/90	1014.5	14.1	64.5	65.0	64.0	24	65.4	66.0	65.0	24	-6.9	-2.8
03/12/90	1014.5	13.7	64.5	65.0	64.0	24	65.2	66.0	65.0	24	-6.1	-2.6
03/13/90	1017.2	10.7	64.1	64.5	64.0	24	65.0	65.0	64.5	24	-4.8	-1.8
03/14/90	1018.9	9.0	64.0	64.0	63.5	24	64.7	65.0	64.5	24	-5.6	-1.2
03/15/90	1019.3	8.7	63.9	64.0	63.5	24	64.5	65.0	64.5	24	-5.7	-0.8
03/16/90	1019.2	9.0	63.9	64.0	63.5	24	64.5	65.0	64.5	24	-5.8	-1.1
03/17/90	1017.7	10.2	64.0	64.0	64.0	24	64.8	65.0	64.5	24	-6.8	-1.8
03/18/90	1018.2	9.5	64.0	64.5	64.0	24	64.6	65.5	64.5	24	-6.3	-1.4
03/19/90	1018.0	10.0	64.0	64.0	64.0	24	64.7	65.0	64.5	24	-5.4	-1.5
03/20/90	1016.5	11.7	64.0	64.5	64.0	24	65.0	65.5	64.5	24	-5.2	-2.4
03/21/90	1016.7	11.7	64.0	64.5	64.0	24	65.1	65.5	65.0	24	-5.9	-2.1
03/22/90	1016.5	12.0	64.0	64.5	63.5	24	65.0	65.5	65.0	24	-6.5	-2.4
03/23/90	1016.7	11.7	64.0	64.5	64.0	24	65.0	65.0	65.0	24	-6.3	-2.2
03/24/90	1015.2	13.2	64.2	64.5	64.0	24	65.1	65.5	65.0	24	-7.2	-2.7
03/25/90	1015.5	12.7	64.2	64.5	63.0	24	65.1	66.0	65.0	24	-6.9	-2.3
03/26/90	1015.0	13.5	64.3	65.0	64.0	24	65.2	65.5	65.0	24	-7.9	-2.6
03/27/90	1013.0	15.5	64.8	65.0	64.0	24	65.5	66.0	65.0	24	-10.3	-2.2
03/28/90	1012.6	15.6	64.9	65.0	64.5	24	65.5	66.0	65.5	24	-10.5	-1.9
03/29/90	1014.8	13.5	64.3	65.0	64.0	24	65.1	65.5	65.0	24	-6.6	-2.1
03/30/90	1016.8	11.5	64.0	64.0	64.0	24	65.0	65.0	65.0	24	-4.8	-1.7
03/31/90	1016.9	11.4	64.0	64.5	64.0	24	65.0	65.0	65.0	24	-4.1	-1.6

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
04/01/90	1017.1	11.1	64.0	64.0	63.5	24	65.0	65.0	65.0	24	-3.8	-1.3
04/02/90	1017.0	11.2	64.0	64.0	64.0	24	65.0	65.5	65.0	24	-4.2	-1.7
04/03/90	1016.9	11.4	64.1	64.5	64.0	24	65.0	65.5	65.0	24	-3.7	-1.7
04/04/90	1015.6	12.8	64.2	65.0	64.0	24	65.2	65.5	65.0	24	-4.4	-2.1
04/05/90	1016.0	12.2	64.2	64.5	64.0	24	65.1	65.5	65.0	24	-3.2	-1.8
04/06/90	1016.5	11.7	64.0	64.5	64.0	24	65.1	66.0	65.0	24	-2.2	-1.7
04/07/90	1015.5	13.1	64.3	65.0	64.0	24	65.2	65.5	65.0	24	-4.3	-2.0
04/08/90	1014.8	13.9	64.3	65.0	64.0	24	65.3	66.0	65.0	24	-4.9	-2.3
04/09/90	1016.5	12.0	64.1	64.5	64.0	24	65.0	65.0	65.0	24	-4.1	-1.8
04/10/90	1016.2	12.2	64.1	64.5	64.0	24	65.1	65.5	65.0	24	-5.6	-2.1
04/11/90	1015.3	13.0	64.3	64.5	63.5	24	65.2	66.0	65.0	24	-7.4	-2.3
04/12/90	1015.9	12.4	64.2	65.0	64.0	24	65.1	66.0	65.0	24	-6.9	-2.2
04/13/90	1016.0	12.2	64.2	64.5	64.0	24	65.1	66.0	65.0	24	-7.0	-2.3
04/14/90	1015.6	12.8	64.1	64.5	62.0	24	65.1	65.5	65.0	24	-7.2	-2.2
04/15/90	1014.5	14.0	64.6	66.5	64.0	24	65.4	66.0	65.0	24	-8.6	-2.4
04/16/90	1013.4	15.2	64.8	65.5	64.0	24	65.6	66.0	65.0	24	-9.6	-2.3
04/17/90	1013.0	15.5	64.9	65.5	64.5	24	65.6	66.0	65.0	24	-8.9	-2.0
04/18/90	1013.9	14.8	64.6	65.0	64.0	24	65.4	66.0	65.0	24	-7.9	-2.2
04/19/90	1015.3	13.0	64.2	64.5	64.0	24	65.1	65.5	65.0	24	-4.6	-2.1
04/20/90	1014.6	13.6	64.4	65.0	64.0	24	65.3	66.0	65.0	24	-6.1	-2.2
04/21/90	1014.2	14.2	64.6	65.5	64.0	24	65.4	66.0	65.0	24	-7.6	-2.5
04/22/90	1014.0	14.5	64.6	65.5	64.0	24	65.5	66.5	65.0	24	-7.9	-2.2
04/23/90	1013.3	15.1	64.9	65.5	64.0	24	65.7	66.0	65.0	24	-9.1	-2.2
04/24/90	1013.0	15.3	64.8	65.5	64.0	24	65.6	66.0	65.0	24	-6.3	-2.0
04/25/90	1016.0	12.6	64.1	64.5	64.0	24	65.0	65.5	65.0	24	-5.1	-1.9
04/26/90	1016.1	12.3	64.2	64.5	64.0	24	65.1	65.5	65.0	24	-3.7	-1.8
04/27/90	1016.0	12.5	64.3	65.0	64.0	24	65.2	66.0	65.0	24	-7.0	-2.1
04/28/90	1014.8	13.9	64.6	65.0	64.0	24	65.4	66.0	65.0	24	-8.9	-2.0
04/29/90	1012.3	15.7	65.4	65.5	65.0	24	65.9	66.0	65.5	24	-11.6	-1.5
04/30/90	1012.3	15.7	65.3	65.5	65.0	24	66.0	66.0	65.5	24	-10.2	-1.5
05/01/90	1012.6	15.6	65.1	65.5	64.5	24	65.9	66.0	65.5	24	-6.6	-1.6
05/02/90	1014.7	14.1	64.2	64.5	64.0	24	65.2	66.0	65.0	24	-	-2.4
05/03/90	1015.8	12.9	64.1	64.5	64.0	24	65.1	66.0	65.0	24	-	-2.2
05/04/90	1016.3	12.4	64.1	64.5	64.0	24	65.1	65.5	65.0	24	-	-2.0
05/05/90	1016.7	11.7	64.0	64.5	64.0	24	65.1	65.5	65.0	24	-	-1.6
05/06/90	1017.1	11.3	64.0	64.5	63.5	24	65.1	66.0	64.5	24	-	-1.5
05/07/90	1015.5	13.1	64.2	65.0	64.0	24	65.2	66.0	65.0	24	-	-2.0
05/08/90	1013.3	15.5	64.9	65.5	64.0	24	65.8	66.0	65.5	24	-	-2.1
05/09/90	1013.6	15.3	64.7	65.5	64.5	24	65.6	66.0	65.0	24	-9.2	-2.1
05/10/90	1012.6	15.6	65.1	65.5	64.5	24	65.9	66.0	65.5	24	-10.0	-1.7
05/11/90	1012.6	15.6	65.0	65.5	64.0	24	65.8	66.0	65.0	24	-9.9	-1.7
05/12/90	1013.5	15.0	64.5	65.5	64.0	24	65.5	66.0	65.0	24	-8.4	-2.1
05/13/90	1013.3	15.1	64.7	65.5	64.0	24	65.7	66.0	65.0	24	-9.0	-1.9
05/14/90	1012.6	15.6	65.2	65.5	64.5	24	65.9	66.0	65.5	24	-4.6	-1.5
05/15/90	1012.6	15.6	65.1	65.5	64.5	24	65.9	66.0	65.5	24	-7.0	-1.4
05/16/90	1014.1	14.8	64.4	65.0	64.0	24	65.5	66.0	65.0	24	-7.8	-2.3
05/17/90	1013.2	15.2	64.7	65.5	64.0	24	65.7	66.0	65.0	24	-9.5	-2.0
05/18/90	1013.4	15.2	64.7	65.5	64.5	24	65.7	66.0	65.0	24	-10.4	-2.0
05/19/90	1013.1	15.4	65.0	65.5	64.0	24	65.9	66.0	65.5	24	-10.8	-1.8

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
05/20/90	1013.9	14.8	64.3	65.0	64.0	24	65.4	66.0	65.0	24	-8.4	-2.4
05/21/90	1014.7	14.1	64.2	65.0	64.0	24	65.5	66.0	65.0	24	-6.2	-2.4
05/22/90	1014.4	14.3	64.4	65.0	64.0	24	65.5	66.0	65.0	24	-6.0	-2.3
05/23/90	1013.9	14.8	64.6	65.5	64.0	24	65.7	66.0	65.0	24	-5.9	-2.3
05/24/90	1012.8	15.6	65.1	66.5	64.5	24	66.0	66.0	65.5	24	-7.5	-1.8
05/25/90	1012.6	15.6	65.1	65.5	64.5	24	66.0	66.0	65.5	24	-8.2	-1.4
05/26/90	1013.3	15.5	64.7	65.5	64.5	24	65.9	66.5	65.5	24	-8.7	-1.9
05/27/90	1013.1	15.4	64.6	65.5	64.0	24	65.9	66.5	65.0	24	-9.5	-2.0
05/28/90	1012.8	15.6	65.1	65.5	64.0	24	66.0	66.5	65.0	24	-9.3	-1.7
05/29/90	1014.1	14.8	64.4	65.0	64.0	24	65.5	66.0	65.0	24	-4.9	-1.9
05/30/90	1014.3	14.4	64.4	65.0	64.0	24	65.5	66.5	65.0	24	-5.1	-2.1
05/31/90	1013.9	14.6	64.6	65.5	64.0	24	65.7	66.0	65.0	24	-6.4	-2.0
06/01/90	1013.9	15.1	64.6	65.5	64.0	24	65.7	66.5	65.0	24	-1.7	-2.0
06/02/90	1014.3	14.4	64.4	65.0	64.0	24	65.6	66.0	65.0	24	0.4	-2.3
06/03/90	1013.6	15.3	64.6	65.0	64.5	24	65.9	66.5	65.5	24	1.2	-2.0
06/04/90	1013.0	15.5	64.8	65.5	64.5	24	65.9	66.5	65.5	24	2.1	-1.9
06/05/90	1013.0	15.5	64.9	65.5	64.5	24	66.0	66.5	65.5	24	0.2	-1.8
06/06/90	1012.6	15.6	65.0	65.5	64.5	24	66.1	66.5	65.5	24	2.1	-1.5
06/07/90	1012.8	15.6	64.8	65.5	64.5	24	66.0	66.5	65.5	24	6.7	-1.6
06/08/90	1012.8	15.6	64.8	66.0	64.0	24	66.0	66.5	65.5	24	5.7	-1.6
06/09/90	1013.0	15.5	64.7	65.5	64.5	24	65.9	66.5	65.5	24	4.7	-1.7
06/10/90	1013.0	15.5	64.7	65.5	64.5	24	66.0	66.5	65.5	24	4.5	-1.7
06/11/90	1012.8	15.6	64.9	65.5	64.5	24	66.1	66.5	65.5	24	1.1	-1.5
06/12/90	1012.6	15.6	65.2	66.0	64.5	24	66.2	66.5	66.0	24	-2.0	-1.2
06/13/90	1012.3	15.7	65.3	66.0	64.5	24	66.4	66.5	66.0	24	-4.1	-1.1
06/14/90	1011.9	15.8	65.5	66.0	65.0	24	66.5	66.5	66.0	24	-2.5	-0.9
06/15/90	1012.1	15.7	65.4	66.0	64.5	24	66.4	66.5	66.0	24	-1.4	-0.9
06/16/90	1012.6	15.6	65.1	65.5	64.5	24	66.1	66.5	65.5	24	-3.9	-1.2
06/17/90	1012.1	15.7	65.2	66.0	65.0	24	66.3	66.5	66.0	24	-2.8	-1.2
06/18/90	1012.3	15.7	65.1	66.0	64.5	24	66.3	66.5	66.0	24	1.1	-1.2
06/19/90	1012.6	15.6	65.1	65.5	64.5	24	66.1	66.5	65.5	24	1.4	-1.2
06/20/90	1012.6	15.6	65.1	65.5	65.0	24	66.1	66.5	66.0	24	-0.2	-1.3
06/21/90	1012.3	15.7	65.1	65.5	64.5	24	66.2	66.5	66.0	24	-	-1.2
06/22/90	1012.6	15.6	65.1	65.5	64.5	24	66.3	66.5	65.5	24	-	-1.2
06/23/90	1012.3	15.7	65.1	65.5	64.5	24	66.2	66.5	65.5	24	0.0	-1.3
06/24/90	1012.3	15.7	65.1	65.5	64.5	24	66.2	66.5	66.0	24	6.1	-1.2
06/25/90	1012.3	15.7	65.1	65.5	65.0	24	66.3	66.5	66.0	24	6.5	-1.2
06/26/90	1012.3	15.7	65.3	66.0	65.0	24	66.4	66.5	66.0	24	8.4	-1.0
06/27/90	1012.3	15.7	65.2	65.5	65.0	24	66.3	66.5	66.0	24	8.9	-1.1
06/28/90	1012.3	15.7	65.3	66.0	65.0	24	66.4	66.5	66.0	24	6.0	-0.9
06/29/90	1012.1	15.7	65.3	66.0	64.5	24	66.4	66.5	66.0	24	5.8	-1.0
06/30/90	1012.3	15.7	65.2	66.0	64.5	24	66.3	66.5	66.0	24	6.2	-1.1
07/01/90	1012.3	15.7	65.1	66.0	64.5	24	66.3	66.5	66.0	24	6.7	-1.2
07/02/90	1012.3	15.7	65.0	66.0	64.5	24	66.2	66.5	66.0	24	5.7	-1.3
07/03/90	1012.3	15.7	65.0	65.5	64.5	24	66.2	66.5	66.0	24	4.3	-1.4
07/04/90	1012.6	15.6	65.0	66.0	64.5	24	66.2	66.5	65.5	24	5.4	-1.3
07/05/90	1012.6	15.6	65.0	65.5	64.5	24	66.3	66.5	66.0	24	4.2	-1.1
07/06/90	1012.3	15.7	65.1	66.0	64.5	24	66.3	66.5	66.0	24	4.3	-1.3
07/07/90	1012.6	15.6	64.9	65.5	64.5	24	66.2	66.5	66.0	24	2.2	-1.3

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DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
07/08/90	1012.6	15.6	64.9	66.0	64.5	24	66.2	66.5	66.0	24	3.2	-1.3
07/09/90	1012.6	15.6	65.0	66.0	64.5	24	66.2	66.5	66.0	24	1.8	-1.3
07/10/90	1012.6	15.6	65.0	66.0	64.5	24	66.2	66.5	66.0	24	7.2	-1.1
07/11/90	1012.6	15.6	65.0	66.0	64.5	24	66.2	66.5	65.5	24	9.2	-1.3
07/12/90	1012.3	15.7	64.9	66.0	64.5	24	66.2	66.5	66.0	24	6.9	-1.2
07/13/90	1012.3	15.7	65.1	66.0	64.5	24	66.4	66.5	66.0	24	6.2	-0.9
07/14/90	1012.3	15.7	65.0	65.5	64.5	24	66.3	66.5	66.0	24	4.6	-1.1
07/15/90	1012.6	15.6	64.8	65.0	64.5	24	66.1	66.5	65.5	24	1.5	-1.3
07/16/90	1012.6	15.6	64.7	65.0	64.5	24	66.1	66.5	66.0	24	2.0	-1.2
07/17/90	1012.3	15.7	64.9	65.5	64.5	24	66.2	66.5	66.0	24	4.4	-1.2
07/18/90	1012.6	15.6	65.0	65.5	64.5	24	66.3	66.5	66.0	24	7.1	-0.9
07/19/90	1012.3	15.7	65.0	65.5	64.5	24	66.3	66.5	66.0	24	6.4	-1.1
07/20/90	1012.6	15.6	64.9	65.5	64.5	24	66.2	66.5	65.5	24	3.9	-1.0
07/21/90	1012.6	15.6	64.9	65.5	64.5	24	66.2	66.5	65.5	24	5.2	-1.0
07/22/90	1012.3	15.7	65.0	66.0	64.5	24	66.3	66.5	66.0	24	3.9	-0.9
07/23/90	1012.3	15.7	65.1	66.0	64.5	24	66.3	66.5	66.0	24	3.8	-1.0
07/24/90	1012.3	15.7	65.0	65.0	64.5	24	66.2	66.5	66.0	24	1.5	-1.1
07/25/90	1012.3	15.7	64.9	65.0	64.5	24	66.1	66.5	66.0	24	3.3	-1.1
07/26/90	1012.3	15.7	64.9	65.5	64.5	24	66.1	66.5	66.0	24	4.6	-1.1
07/27/90	1012.3	15.7	65.0	65.5	64.5	24	66.2	66.5	66.0	24	0.4	-1.1
07/28/90	1012.3	15.7	65.0	65.5	64.5	24	66.2	66.5	66.0	24	0.7	-1.2
07/29/90	1012.3	15.7	65.1	65.5	65.0	24	66.4	66.5	66.0	24	3.8	-1.0
07/30/90	1012.3	15.7	65.0	65.5	64.5	24	66.3	66.5	65.5	24	4.8	-1.0
07/31/90	1012.3	15.7	65.1	66.0	65.0	24	66.3	66.5	66.0	24	5.3	-1.0
08/01/90	1012.3	15.7	65.0	65.5	64.5	24	66.2	66.5	66.0	24	2.7	-1.0
08/02/90	1012.3	15.7	64.9	65.0	64.5	24	66.3	66.5	66.0	24	0.8	-1.0
08/03/90	1012.6	15.6	65.0	66.0	64.0	24	66.1	66.5	65.5	24	2.3	-1.0
08/04/90	1012.3	15.7	65.0	65.5	64.5	24	66.2	66.5	65.5	24	4.5	-1.0
08/05/90	1012.3	15.7	65.0	66.0	64.5	24	66.2	66.5	65.5	24	2.2	-1.0
08/06/90	1012.3	15.7	64.9	65.0	64.5	24	66.1	66.5	65.5	24	-0.5	-1.1
08/07/90	1012.6	15.6	64.9	65.5	64.5	24	66.2	66.5	65.5	24	1.1	-0.9
08/08/90	1012.3	15.7	64.9	65.5	64.5	24	66.2	66.5	66.0	24	2.1	-1.1
08/09/90	1012.3	15.7	65.1	66.0	64.5	24	66.3	66.5	66.0	24	3.2	-0.9
08/10/90	1012.3	15.7	65.1	65.5	65.0	24	66.3	66.5	66.0	24	4.7	-0.9
08/11/90	1012.1	15.7	65.1	66.0	65.0	24	66.3	66.5	66.0	24	3.2	-0.7
08/12/90	1012.1	15.7	65.0	65.5	64.5	24	66.3	66.5	66.0	24	-1.0	-0.9
08/13/90	1012.3	15.7	65.0	65.5	64.5	24	66.2	66.5	66.0	24	-2.3	-0.8
08/14/90	1012.3	15.7	65.0	66.0	64.5	24	66.1	66.5	66.0	24	-0.9	-0.7
08/15/90	1012.3	15.7	65.0	65.5	65.0	24	66.1	66.5	66.0	24	-0.3	-0.8
08/16/90	1012.1	15.7	65.1	66.0	64.5	24	66.3	66.5	66.0	24	0.7	-0.8
08/17/90	1012.3	15.7	65.0	65.5	65.0	24	66.4	66.5	66.0	24	2.6	-0.8
08/18/90	1012.1	15.7	65.0	65.0	65.0	24	66.4	66.5	66.0	24	1.8	-0.9
08/19/90	1012.3	15.7	65.1	65.5	65.0	24	66.4	66.5	66.0	24	-0.4	-0.7
08/20/90	1012.1	15.7	65.1	65.5	65.0	24	66.4	66.5	66.0	24	3.5	-0.8
08/21/90	1012.1	15.7	65.0	65.5	65.0	24	66.4	66.5	66.0	24	0.6	-0.8
08/22/90	1012.1	15.7	65.2	66.0	65.0	24	66.4	66.5	66.0	24	1.9	-0.7
08/23/90	1011.7	15.8	65.2	66.0	65.0	24	66.5	66.5	66.0	24	1.4	-0.6
08/24/90	1011.7	15.8	65.3	66.0	65.0	24	66.4	66.5	66.0	24	-2.0	-0.8
08/25/90	1011.4	15.9	65.5	66.0	65.0	24	66.4	66.5	66.0	24	-0.9	-0.7

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
08/26/90	1011.4	15.9	65.3	66.0	65.0	24	66.5	66.5	66.0	24	2.1	-0.7
08/27/90	1011.4	15.9	65.3	65.5	65.0	24	66.4	66.5	66.0	24	5.9	-0.7
08/28/90	1011.4	15.9	65.3	65.5	65.0	24	66.4	66.5	66.0	24	2.8	-0.8
08/29/90	1011.4	15.9	65.2	66.0	65.0	24	66.3	66.5	66.0	24	6.1	-0.7
08/30/90	1011.4	15.9	65.3	66.0	65.0	24	66.5	66.5	66.0	24	5.0	-0.6
08/31/90	1011.2	15.9	65.2	66.0	65.0	24	66.5	67.0	66.0	24	5.2	-0.8
09/01/90	1011.4	15.9	65.4	66.0	65.0	24	66.4	66.5	66.0	24	1.8	-0.8
09/02/90	1011.2	15.9	65.3	66.0	65.0	24	66.4	66.5	66.0	24	4.6	-0.7
09/03/90	1011.2	15.9	65.3	66.0	65.0	24	66.5	66.5	66.0	24	2.1	-0.7
09/04/90	1011.2	15.9	65.2	65.5	65.0	24	66.4	66.5	66.0	24	2.5	-0.8
09/05/90	1011.2	15.9	65.3	66.0	65.0	24	66.4	66.5	66.0	24	1.4	-0.8
09/06/90	1011.2	15.9	65.2	65.5	65.0	24	66.4	66.5	66.0	24	1.9	-0.6
09/07/90	1011.2	15.9	65.4	66.0	65.0	24	66.5	66.5	66.0	24	4.1	-0.6
09/08/90	1011.2	15.9	65.4	66.0	65.0	24	66.5	66.5	66.0	24	6.5	-0.5
09/09/90	1011.2	15.9	65.4	66.0	65.0	24	66.5	66.5	66.5	24	6.1	-0.5
09/10/90	1011.2	15.9	65.6	66.0	65.0	24	66.5	66.5	66.5	24	5.2	-0.5
09/11/90	1011.2	15.9	65.6	66.0	65.0	24	66.5	66.5	66.0	24	5.9	-0.4
09/12/90	1011.2	15.9	65.5	66.0	65.0	24	66.5	66.5	66.5	24	5.0	-0.6
09/13/90	1011.2	15.9	65.5	66.0	65.0	24	66.5	66.5	66.0	24	2.5	-0.4
09/14/90	1011.2	15.9	65.6	66.0	65.0	24	66.5	66.5	66.5	24	1.6	-0.6
09/15/90	1011.2	15.9	65.5	66.0	65.5	24	66.5	66.5	66.5	24	4.9	-0.5
09/16/90	1011.2	15.9	65.5	65.5	65.5	24	66.5	66.5	66.0	24	2.0	-0.7
09/17/90	1011.2	15.9	65.5	66.0	65.5	24	66.5	66.5	66.0	24	0.0	-0.6
09/18/90	1011.0	16.0	65.7	66.0	65.5	24	66.5	67.0	66.5	24	-1.2	-0.6
09/19/90	1011.2	15.9	65.6	66.0	65.0	24	66.5	66.5	66.5	24	0.7	-0.5
09/20/90	1011.0	16.0	65.6	66.0	65.0	24	66.5	66.5	66.5	24	0.3	-0.5
09/21/90	1011.2	15.9	65.5	66.0	65.0	24	66.5	66.5	66.5	24	-1.0	-0.6
09/22/90	1011.2	15.9	65.5	65.5	65.5	24	66.5	66.5	66.0	24	-2.3	-0.8
09/23/90	1011.2	15.9	65.4	65.5	65.0	24	66.4	66.5	66.0	24	-1.0	-0.9
09/24/90	1011.2	15.9	65.4	65.5	65.0	24	66.5	66.5	66.0	24	0.3	-0.9
09/25/90	1011.2	15.9	65.5	66.0	65.5	24	66.5	66.5	66.0	24	0.8	-0.6
09/26/90	1011.2	15.9	65.5	65.5	65.5	24	66.5	66.5	66.5	24	-1.2	-0.6
09/27/90	1010.5	16.1	65.7	66.0	65.5	24	66.5	67.0	66.5	24	-3.1	-0.5
09/28/90	1010.5	16.1	65.6	66.0	65.0	24	66.6	67.0	66.5	24	-5.2	-0.7
09/29/90	1010.5	16.1	65.6	66.0	65.0	24	66.6	67.0	66.0	24	-4.6	-0.6
09/30/90	1011.2	15.9	65.2	65.5	65.0	24	66.3	66.5	66.0	24	-3.6	-1.0
10/01/90	1011.2	15.9	65.5	66.0	65.0	24	66.4	66.5	66.0	24	-3.6	-1.0
10/02/90	1011.2	15.9	65.4	65.5	65.0	24	66.2	66.5	66.0	24	-2.1	-1.2
10/03/90	1011.2	15.9	65.1	66.0	65.0	24	66.2	66.5	66.0	24	-2.0	-1.4
10/04/90	1011.2	15.9	65.1	65.5	65.0	24	66.3	66.5	66.0	24	-1.8	-1.3
10/05/90	1011.2	15.9	65.4	65.5	65.0	24	66.5	66.5	66.0	24	-1.7	-0.9
10/06/90	1011.2	15.9	65.5	65.5	65.0	24	66.4	66.5	66.0	24	-1.3	-0.9
10/07/90	1010.8	16.0	65.7	66.0	65.0	24	66.6	67.0	66.5	24	-0.9	-0.7
10/08/90	1011.2	15.9	65.2	65.5	65.0	24	66.3	66.5	66.0	24	-1.2	-1.1
10/09/90	1011.7	15.8	65.0	65.5	65.0	24	66.2	66.5	66.0	24	-6.6	-1.8
10/10/90	1011.2	15.9	65.0	65.0	65.0	24	66.2	66.5	66.0	24	-5.5	-1.8
10/11/90	1011.4	15.9	65.0	65.5	65.0	24	66.2	66.5	66.0	24	-5.7	-1.8
10/12/90	1011.9	15.8	65.0	65.0	65.0	24	66.1	66.5	66.0	24	-5.9	-2.0
10/13/90	1011.7	15.8	65.0	65.0	65.0	24	66.2	66.5	66.0	24	-6.2	-1.9

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
10/14/90	1011.9	15.8	65.0	65.0	64.5	24	66.2	66.5	66.0	24	-3.4	-1.9
10/15/90	1012.1	15.7	65.0	65.0	65.0	24	66.1	66.5	66.0	24	-3.8	-1.9
10/16/90	1011.9	15.8	65.0	65.0	65.0	24	66.2	66.5	66.0	24	-1.4	-1.7
10/17/90	1011.9	15.8	65.0	65.0	65.0	24	66.2	66.5	66.0	24	-3.2	-1.7
10/18/90	1011.2	15.9	65.1	66.0	65.0	24	66.6	67.0	66.0	24	-1.8	-1.2
10/19/90	1010.8	16.0	65.8	66.5	65.0	24	66.9	67.0	66.5	24	-3.0	-0.7
10/20/90	1011.4	15.9	65.1	66.0	65.0	24	66.5	67.0	66.5	24	-6.4	-1.7
10/21/90	1012.5	15.4	65.0	65.0	65.0	24	66.5	66.5	66.0	24	-6.1	-2.6
10/22/90	1012.5	15.4	65.0	65.0	64.5	24	66.5	66.5	66.0	24	-5.3	-2.2
10/23/90	1012.2	15.6	65.0	65.5	64.5	24	66.5	66.5	66.0	24	-4.6	-2.1
10/24/90	1011.9	15.8	65.0	65.0	65.0	24	66.5	66.5	66.0	24	-4.4	-1.9
10/25/90	1011.2	15.9	65.0	65.5	65.0	24	66.5	66.5	66.5	24	-4.5	-1.8
10/26/90	1011.2	15.9	65.0	65.5	65.0	24	66.5	66.5	66.5	24	-4.9	-1.8
10/27/90	1011.2	15.9	65.2	65.5	65.0	24	66.5	66.5	66.5	24	-4.9	-1.9
10/28/90	1011.2	15.9	65.1	65.5	65.0	24	66.5	66.5	66.5	24	-5.4	-1.9
10/29/90	1011.2	15.9	65.1	65.5	65.0	24	66.5	66.5	66.5	24	-4.7	-1.9
10/30/90	1011.3	15.8	65.0	65.0	65.0	24	66.5	66.5	66.5	24	-3.7	-1.8
10/31/90	1011.2	15.9	65.1	66.0	65.0	24	66.5	66.5	66.5	24	-1.9	-1.8
11/01/90	1010.8	16.0	65.6	66.0	65.0	24	66.7	67.0	66.0	24	-3.1	-1.2
11/02/90	1010.5	16.1	65.7	67.0	65.0	24	66.7	67.0	66.5	24	-8.0	-1.1
11/03/90	1013.3	14.8	64.6	65.0	64.0	24	66.0	66.5	65.5	24	-7.4	-2.6
11/04/90	1014.4	13.9	64.1	64.5	64.0	24	65.9	66.5	65.0	24	-6.1	-2.3
11/05/90	1013.2	14.5	64.5	64.5	64.0	24	66.4	66.5	66.0	24	-5.8	-2.2
11/06/90	1012.3	15.4	64.8	65.5	64.0	24	66.4	66.5	65.5	24	-4.0	-2.0
11/07/90	1012.9	15.2	64.4	65.0	63.5	24	66.0	66.5	65.0	24	-6.7	-2.1
11/08/90	1014.5	13.7	64.0	64.5	64.0	24	65.5	66.0	65.0	24	-6.0	-2.3
11/09/90	1014.6	13.6	64.0	64.5	64.0	24	65.4	66.0	64.5	24	-4.8	-2.3
11/10/90	1014.4	13.9	64.4	64.5	64.0	24	65.9	66.0	65.0	24	-3.6	-2.2
11/11/90	1014.3	14.0	64.5	65.0	64.0	24	65.9	66.5	65.0	24	-3.5	-2.0
11/12/90	1014.0	14.2	64.5	64.5	64.0	24	66.1	66.5	65.5	24	-3.7	-2.3
11/13/90	1013.1	14.7	64.5	65.0	64.5	24	66.1	66.5	65.5	24	-4.1	-2.1
11/14/90	1013.2	14.5	64.5	65.0	64.5	24	66.1	66.5	65.5	24	-4.3	-2.1
11/15/90	1013.3	14.4	64.5	64.5	64.5	24	66.1	66.5	65.5	24	-4.4	-2.1
11/16/90	1013.3	14.4	64.5	65.0	64.5	24	66.0	66.5	65.5	24	-2.8	-2.1
11/17/90	1013.2	14.5	64.5	65.0	64.5	24	66.1	66.5	65.0	24	-4.3	-2.2
11/18/90	1012.7	15.0	64.6	65.0	64.5	24	66.2	66.5	65.5	24	-3.4	-2.2
11/19/90	1012.4	15.3	64.9	66.0	64.5	24	66.3	66.5	65.5	24	-2.8	-1.9
11/20/90	1011.2	15.9	65.5	66.0	64.5	24	66.4	66.5	66.0	24	-8.0	-1.0
11/21/90	1013.0	14.6	64.4	64.5	63.5	24	66.0	66.5	65.5	24	-6.5	-2.2
11/22/90	1014.5	13.7	64.5	64.5	64.0	24	65.6	66.0	65.0	24	-5.5	-2.2
11/23/90	1014.2	13.7	64.5	64.5	64.5	24	65.9	66.5	65.5	24	-2.2	-2.1
11/24/90	1013.3	14.1	64.5	64.5	64.5	24	66.0	66.5	65.5	24	-0.5	-2.0
11/25/90	1012.7	15.0	64.6	65.0	64.5	24	66.1	66.5	65.5	24	-3.0	-2.0
11/26/90	1011.7	15.8	65.3	66.0	64.5	24	66.3	66.5	65.5	24	-9.1	-1.7
11/27/90	1014.4	13.6	64.5	64.5	64.0	24	65.2	66.0	64.5	24	-7.0	-2.6
11/28/90	1015.0	13.0	64.3	64.5	64.0	24	64.9	65.5	64.5	24	-6.2	-2.7
11/29/90	1014.9	13.1	64.5	64.5	64.0	24	65.5	66.0	64.5	24	-5.3	-2.4
11/30/90	1014.7	13.1	64.5	64.5	64.5	24	65.6	66.0	65.0	24	-4.1	-2.3
12/01/90	1014.7	13.1	64.5	64.5	64.0	24	65.4	66.0	64.5	24	-6.5	-2.3

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
12/02/90	1015.2	12.6	64.2	64.5	64.0	24	64.7	66.0	63.5	24	-7.6	-2.6
12/03/90	1015.4	12.2	64.0	64.5	63.5	24	64.7	66.0	63.5	24	-7.1	-2.7
12/04/90	1015.4	12.2	64.1	64.5	64.0	24	64.7	66.0	64.0	24	-6.4	-2.5
12/05/90	1015.4	12.2	64.1	64.5	64.0	24	64.6	65.5	63.5	24	-6.0	-2.5
12/06/90	1015.5	12.0	64.0	64.0	64.0	24	64.4	65.5	63.5	24	-6.4	-2.7
12/07/90	1016.3	11.8	64.0	64.0	63.5	24	64.4	65.5	63.5	24	-6.7	-2.6
12/08/90	1016.2	11.9	63.8	64.0	63.0	24	64.3	65.5	62.5	24	-6.7	-2.7
12/09/90	1015.5	12.0	64.0	64.5	64.0	24	64.9	65.5	63.5	24	-6.3	-2.5
12/10/90	1015.4	12.2	64.0	64.0	64.0	24	64.9	65.5	64.0	24	-5.0	-2.5
12/11/90	1015.3	12.5	64.1	64.5	64.0	24	65.0	65.5	64.5	24	-2.3	-2.2
12/12/90	1014.9	13.1	64.1	64.5	64.0	24	65.0	66.0	64.0	24	-2.4	-2.3
12/13/90	1014.7	13.4	64.3	64.5	64.0	24	65.1	66.0	63.5	24	-4.0	-2.2
12/14/90	1014.1	14.1	64.4	65.0	64.0	24	65.2	66.0	64.0	24	-5.4	-2.5
12/15/90	1014.8	13.3	64.2	64.5	64.0	24	64.9	66.0	64.0	24	-4.3	-2.2
12/16/90	1014.5	13.7	64.3	65.5	64.0	24	64.9	66.0	64.0	24	-6.6	-2.5
12/17/90	1016.4	11.9	63.9	64.0	63.5	24	65.2	65.5	65.0	24	-5.8	-2.5
12/18/90	1015.6	13.2	64.0	64.0	63.5	24	65.2	66.0	64.5	24	-5.7	-3.9
12/19/90	1013.5	15.4	64.5	65.0	64.0	24	65.5	66.0	64.5	24	-7.9	-4.0
12/20/90	1012.3	15.7	65.3	65.5	65.0	24	66.0	66.5	66.0	24	-9.3	-1.2
12/21/90	1011.7	15.8	65.4	65.5	65.0	24	66.2	66.5	66.0	24	-10.1	-1.1
12/22/90	1012.3	15.7	64.6	65.5	64.0	24	65.5	66.5	64.5	24	-9.7	-3.0
12/23/90	1014.4	15.2	64.0	64.0	63.5	24	65.3	65.5	65.0	24	-6.8	-6.0
12/24/90	1014.6	15.2	64.0	64.0	64.0	24	64.9	65.5	64.0	24	-5.8	-6.5
12/25/90	1014.6	15.2	64.0	64.0	64.0	24	64.7	65.5	63.5	24	-5.8	-6.1
12/26/90	1014.6	15.2	64.0	64.0	64.0	24	65.0	65.5	64.0	24	-5.6	-6.2
12/27/90	1014.2	15.3	64.0	64.0	64.0	24	64.9	65.5	63.5	24	-3.2	-6.0
12/28/90	1013.5	15.4	64.4	65.0	64.0	24	65.1	66.0	64.0	24	-3.6	-4.3
12/29/90	1012.8	15.6	64.7	65.5	64.0	24	65.6	66.0	65.0	24	-6.0	-3.0
12/30/90	1014.2	14.2	64.1	64.5	64.0	24	65.0	66.0	64.5	24	-4.4	-3.5
12/31/90	1015.4	12.3	64.3	64.5	64.0	24	64.9	65.5	64.5	24	-4.9	-1.7
01/01/91	1015.4	12.2	64.3	64.5	64.0	24	64.7	65.5	64.0	24	-5.5	-1.7
01/02/91	1015.5	12.0	64.2	64.5	64.0	24	64.6	65.0	64.0	24	-4.3	-1.8
01/03/91	1015.5	12.0	64.4	64.5	64.0	24	64.9	65.5	63.5	24	-4.6	-1.4
01/04/91	1014.2	13.9	64.5	65.0	64.0	24	65.3	66.0	64.5	24	-3.8	-2.3
01/05/91	1015.4	12.3	64.4	64.5	64.0	24	64.9	65.5	64.0	24	-3.6	-1.4
01/06/91	1015.4	12.2	64.2	64.5	64.0	24	65.2	65.5	65.0	24	-4.3	-1.2
01/07/91	1015.3	12.5	64.0	64.5	64.0	24	65.0	65.5	64.5	24	-4.8	-1.6
01/08/91	1015.1	12.8	64.0	64.5	64.0	24	65.0	65.5	64.5	24	-4.9	-1.8
01/09/91	1014.8	13.3	64.1	64.5	64.0	24	65.1	66.0	64.5	24	-5.7	-2.1
01/10/91	1016.4	11.9	63.7	64.0	63.5	24	65.2	65.5	64.5	24	-5.1	-1.7
01/11/91	1016.7	11.7	63.6	64.0	63.5	24	65.1	65.5	64.5	24	-5.1	-1.8
01/12/91	1016.6	11.8	63.8	64.0	63.5	24	64.9	65.5	64.0	24	-6.3	-1.8
01/13/91	1016.4	11.9	63.8	64.0	63.5	24	64.6	65.5	63.5	24	-6.6	-1.8
01/14/91	1016.9	11.4	63.6	64.0	63.5	24	64.5	65.5	63.5	24	-6.0	-1.8
01/15/91	1016.9	11.4	63.5	64.0	63.5	24	64.8	65.5	64.0	24	-6.2	-1.8
01/16/91	1017.3	11.0	63.5	64.0	63.5	24	64.5	65.5	63.5	24	-4.3	-1.7
01/17/91	1017.9	11.1	63.5	63.5	63.5	24	65.0	65.5	65.0	24	-4.7	-1.7
01/18/91	1018.1	11.0	63.5	63.5	63.0	24	64.9	65.5	64.0	24	-5.1	-1.8
01/19/91	1018.1	11.0	63.5	63.5	63.5	24	64.9	65.5	63.5	24	-5.1	-1.8

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
01/20/91	1017.7	11.1	63.5	63.5	63.5	24	64.7	65.5	63.5	24	-4.5	-1.8
01/21/91	1018.0	10.9	63.5	63.5	63.5	24	64.7	65.5	63.5	24	-4.8	-1.8
01/22/91	1018.2	10.9	63.5	63.5	63.5	24	64.9	65.5	64.0	24	-4.2	-1.8
01/23/91	1018.2	10.9	63.5	63.5	63.5	24	65.0	65.5	64.5	24	-4.7	-1.8
01/24/91	1017.9	11.1	63.5	63.5	63.5	24	64.6	65.5	63.0	24	-5.7	-2.0
01/25/91	1018.0	11.2	63.5	63.5	63.5	24	64.2	65.0	63.5	24	-6.5	-2.1
01/26/91	1017.7	11.4	63.5	63.5	63.5	24	64.3	65.0	63.5	24	-6.7	-2.0
01/27/91	1017.9	11.1	63.5	63.5	63.5	24	64.1	65.0	63.5	24	-6.5	-2.1
01/28/91	1017.0	12.2	63.5	64.0	63.5	24	64.6	65.5	63.5	24	-4.8	-2.6
01/29/91	1017.6	11.3	63.3	63.5	63.0	24	64.0	65.0	61.5	24	-6.5	-2.0
01/30/91	1018.6	10.1	63.2	63.5	63.0	24	64.8	65.0	64.5	24	-5.9	-1.9
01/31/91	1018.4	10.6	63.4	63.5	63.0	24	64.5	65.0	63.5	24	-5.9	-2.2
02/01/91	1018.4	10.6	63.3	63.5	63.0	24	64.4	65.0	63.0	24	-5.7	-2.1
02/02/91	1018.2	10.9	63.4	63.5	63.0	24	63.9	65.0	63.5	24	-5.5	-2.0
02/03/91	1018.2	10.9	63.5	63.5	63.0	24	64.0	64.5	63.0	24	-5.8	-2.0
02/04/91	1018.2	10.9	63.4	63.5	63.0	24	64.1	65.0	63.0	24	-6.0	-2.1
02/05/91	1018.1	11.0	63.5	63.5	63.0	24	64.2	64.5	63.0	24	-6.0	-2.0
02/06/91	1018.0	11.2	63.4	63.5	63.0	24	64.1	65.0	62.5	24	-5.8	-2.0
02/07/91	1017.3	12.0	63.4	64.0	63.0	24	64.3	65.5	62.5	24	-6.1	-2.4
02/08/91	1018.3	10.7	63.3	63.5	63.0	24	63.8	65.0	63.0	24	-5.5	-1.9
02/09/91	1018.3	10.7	63.3	63.5	63.0	24	63.9	65.0	63.5	24	-5.3	-1.8
02/10/91	1018.1	11.0	63.4	63.5	63.0	24	64.0	65.0	62.5	24	-2.5	-1.8
02/11/91	1017.9	11.3	63.5	63.5	63.0	24	64.1	65.0	63.5	24	-2.3	-1.6
02/12/91	1017.6	11.9	63.5	63.5	63.0	24	64.2	65.0	63.5	24	-3.6	-1.6
02/13/91	1017.2	12.3	63.5	63.5	63.0	24	64.5	65.0	63.0	24	-4.5	-1.8
02/14/91	1017.0	12.6	63.5	63.5	63.0	24	64.5	65.0	63.5	24	-6.3	-2.1
02/15/91	1016.2	12.8	63.5	63.5	63.5	24	64.9	65.5	64.0	24	-6.7	-1.7
02/16/91	1014.4	14.8	64.0	64.5	63.5	24	65.4	65.5	64.5	24	-7.0	-2.3
02/17/91	1014.3	15.0	64.3	65.0	64.0	24	65.3	65.5	65.0	24	-6.8	-2.4
02/18/91	1016.8	12.9	63.4	63.5	63.0	24	64.7	65.0	64.0	24	-6.3	-2.6
02/19/91	1017.9	11.7	63.0	63.5	63.0	24	64.2	65.0	63.5	24	-6.6	-2.5
02/20/91	1017.6	11.9	63.0	63.5	62.5	24	64.2	65.0	63.0	24	-5.9	-2.5
02/21/91	1017.4	12.2	63.3	63.5	63.0	24	64.4	65.0	63.5	24	-6.0	-2.2
02/22/91	1016.9	12.7	63.5	63.5	63.0	24	64.9	65.5	64.5	24	-7.4	-2.0
02/23/91	1016.7	13.0	63.5	63.5	63.5	24	64.9	65.5	64.0	24	-7.5	-2.2
02/24/91	1016.8	12.9	63.4	63.5	63.0	24	64.7	65.5	64.0	24	-7.1	-2.4
02/25/91	1017.4	12.2	63.3	63.5	63.0	24	64.6	65.0	63.5	24	-7.1	-2.2
02/26/91	1017.4	12.2	63.3	63.5	63.0	24	64.7	65.0	64.0	24	-5.2	-2.2
02/27/91	1016.4	13.2	63.4	64.5	63.0	24	64.9	65.5	63.5	24	-3.8	-2.4
02/28/91	1014.2	15.3	64.2	65.0	63.0	24	65.5	66.0	65.0	24	-6.1	-2.5
03/01/91	1013.0	15.5	64.9	65.5	63.5	24	65.9	66.0	65.5	24	-7.6	-1.7
03/02/91	1014.9	14.7	63.6	64.5	63.0	24	65.1	65.5	64.0	24	-7.0	-2.6
03/03/91	1016.2	13.8	63.5	63.5	63.0	24	65.0	65.5	64.0	24	-7.4	-2.7
03/04/91	1015.7	14.0	63.5	63.5	63.5	24	65.3	65.5	64.5	24	-5.8	-2.5
03/05/91	1015.5	14.3	63.9	65.0	63.5	24	65.4	66.0	64.5	24	-5.2	-2.5
03/06/91	1014.5	15.1	64.0	65.0	63.5	24	65.5	66.0	64.5	24	-8.2	-2.5
03/07/91	1016.6	13.6	63.4	63.5	63.0	24	64.7	65.5	64.0	24	-6.6	-3.1
03/08/91	1016.9	13.0	63.3	63.5	63.0	24	64.8	65.5	64.0	24	-6.2	-2.7
03/09/91	1016.7	13.3	63.3	64.0	63.0	24	65.0	65.5	64.0	24	-7.1	-2.8

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
03/10/91	1015.5	14.3	63.8	65.0	63.5	24	65.5	66.0	65.0	24	-8.4	-2.5
03/11/91	1013.7	15.4	64.5	65.0	63.0	24	65.8	66.0	65.0	24	-8.9	-2.2
03/12/91	1016.4	13.9	63.5	63.5	63.0	24	65.1	65.5	64.5	24	-7.7	-3.0
03/13/91	1016.4	13.5	63.4	64.0	63.0	24	65.2	65.5	64.5	24	-7.7	-2.9
03/14/91	1015.5	14.3	63.6	65.0	63.0	24	65.3	66.0	64.5	24	-7.8	-2.9
03/15/91	1015.9	14.0	63.5	65.0	63.0	24	65.2	66.0	64.0	24	-6.8	-2.7
03/16/91	1017.0	13.2	63.2	64.0	63.0	24	64.6	66.0	63.5	24	-6.8	-3.1
03/17/91	1017.3	12.6	63.1	63.5	63.0	24	65.0	65.5	64.0	24	-7.5	-2.4
03/18/91	1016.3	13.6	63.4	64.5	63.0	24	65.3	65.5	64.5	24	-7.7	-2.6
03/19/91	1014.4	15.2	64.1	65.0	63.0	24	65.6	66.0	65.0	24	-7.6	-2.6
03/20/91	1015.0	14.8	64.0	65.0	63.5	24	65.6	66.0	65.0	24	-7.2	-2.7
03/21/91	1014.8	14.9	64.0	65.0	63.0	24	65.5	66.0	64.5	24	-8.1	-2.6
03/22/91	1017.3	13.0	63.0	63.0	63.0	24	64.6	65.5	64.0	24	-5.5	-3.0
03/23/91	1017.0	13.1	63.2	63.5	63.0	24	65.1	65.5	64.0	24	-6.5	-2.6
03/24/91	1015.8	14.1	63.7	65.0	63.5	24	65.6	66.0	65.0	24	-9.3	-2.4
03/25/91	1013.7	15.4	64.6	65.0	63.5	24	66.0	66.0	66.0	24	-7.5	-2.1
03/26/91	1013.7	15.4	64.6	65.5	63.5	24	65.9	66.0	65.5	24	-9.4	-1.9
03/27/91	1014.4	15.2	64.1	65.0	63.0	24	65.6	66.0	64.5	24	-8.0	-2.6
03/28/91	1016.6	13.8	63.2	63.5	63.0	24	64.8	65.5	64.0	24	-6.0	-3.1
03/29/91	1017.4	13.1	63.1	63.5	63.0	24	64.8	65.5	64.0	24	-6.4	-2.9
03/30/91	1017.8	12.6	63.0	63.0	62.5	24	64.6	65.5	63.5	24	-7.2	-2.7
03/31/91	1017.1	12.9	63.2	63.5	63.0	24	65.2	65.5	64.5	24	-7.5	-2.5
04/01/91	1015.7	14.4	63.9	65.0	63.5	24	65.7	66.0	65.5	24	-7.8	-2.5
04/02/91	1016.6	13.6	63.3	63.5	63.0	14	65.1	65.5	64.5	14	-6.4	-2.8
04/03/91	-	-	-	-	-	-	-	-	-	-	-	-
04/04/91	-	-	-	-	-	-	-	-	-	-	-	-
04/05/91	-	-	-	-	-	-	-	-	-	-	-	-
04/06/91	-	-	-	-	-	-	-	-	-	-	-	-
04/07/91	-	-	-	-	-	-	-	-	-	-	-	-
04/08/91	-	-	-	-	-	-	-	-	-	-	-	-
04/09/91	-	-	-	-	-	-	-	-	-	-	-	-
04/10/91	-	-	-	-	-	-	-	-	-	-	-	-
04/11/91	1013.7	15.4	64.8	66.0	63.5	10	65.9	66.5	65.5	10	-11.1	-1.6
04/12/91	1016.1	14.3	63.4	63.5	63.0	24	65.3	66.0	64.5	24	-8.9	-3.2
04/13/91	1017.5	13.0	63.0	63.5	63.0	24	65.1	65.5	64.5	24	-7.5	-2.9
04/14/91	1017.5	12.6	63.0	63.5	63.0	24	65.2	65.5	64.5	24	-7.1	-2.4
04/15/91	1016.3	13.6	63.5	64.0	63.0	24	65.6	66.0	65.0	24	-8.6	-2.2
04/16/91	1015.2	14.8	63.8	65.0	63.5	24	65.8	66.0	65.5	24	-9.4	-2.4
04/17/91	1014.4	15.2	64.0	64.5	63.5	24	65.9	66.0	65.5	24	-8.7	-2.3
04/18/91	1015.6	14.6	63.7	64.0	63.5	24	65.7	66.0	65.0	24	-8.0	-2.6
04/19/91	1016.1	13.9	63.5	64.0	63.5	24	65.6	66.0	65.5	24	-7.7	-2.5
04/20/91	1015.4	14.5	63.8	65.0	63.5	24	65.8	66.0	65.5	24	-8.1	-2.4
04/21/91	1015.7	14.4	63.7	65.0	63.5	24	65.7	66.0	65.0	24	-8.9	-2.6
04/22/91	1016.5	13.7	63.4	64.0	63.0	24	65.6	66.0	65.0	24	-6.8	-2.5
04/23/91	1016.6	13.6	63.4	63.5	63.0	24	65.5	66.0	65.0	24	-6.0	-2.3
04/24/91	1016.9	13.4	63.3	63.5	63.0	24	65.4	66.0	64.5	24	-6.6	-2.4
04/25/91	1016.0	14.2	63.6	64.5	63.0	24	65.7	66.0	65.5	24	-6.0	-2.5
04/26/91	1016.5	13.7	63.5	63.5	63.5	24	65.6	66.0	65.0	24	-5.4	-2.4
04/27/91	1017.0	13.1	63.3	63.5	63.0	24	65.2	65.5	63.5	24	-7.7	-2.3

ENTRANCE PASSAGES DATA LOGGER - Daily Summaries

DATE	Density gm/m3	Moisture gm/m3	Temperatures T6 Ave	T6 Max	T6 Min	T6 Hrs	Temperatures T7 Ave	T7 Max	T7 Min	T7 Hrs	Moisture Surf-LEM	Moisture LEM-Anticp
04/28/91	1018.5	12.0	63.0	63.0	62.5	24	64.7	65.5	63.5	24	-7.0	-2.5
04/29/91	1018.3	11.9	62.9	63.0	62.5	24	64.9	65.5	62.5	24	-6.5	-2.2
04/30/91	1017.5	12.6	63.1	63.5	63.0	24	65.4	65.5	64.5	24	-7.0	-2.2
05/01/91	1015.8	14.1	63.6	64.5	63.0	24	65.7	66.0	65.0	24	-8.4	-2.3
05/02/91	1014.6	15.2	64.1	65.0	63.5	24	65.9	66.0	65.5	24	-10.2	-2.2
05/03/91	1016.0	14.2	63.5	64.0	63.0	24	65.6	66.0	64.5	24	-8.0	-2.6
05/04/91	1017.7	12.7	63.0	63.5	62.5	24	65.0	65.5	64.0	24	-6.5	-2.7
05/05/91	1017.2	12.8	63.2	63.5	63.0	24	65.4	65.5	64.5	24	-7.1	-2.0
05/06/91	1015.8	14.5	63.6	65.0	63.5	24	65.7	66.0	65.5	24	-8.7	-2.3
05/07/91	1016.3	14.0	63.5	63.5	63.5	24	65.6	66.0	65.5	24	-7.3	-2.4
05/08/91	1015.6	14.6	63.7	64.5	63.5	24	65.8	66.0	65.5	24	-7.0	-2.4
05/09/91	1014.2	15.3	64.5	65.5	63.5	24	66.0	66.0	65.5	24	-8.1	-1.9
05/10/91	1012.6	15.6	65.3	65.5	64.0	24	66.2	66.5	66.0	24	-8.8	-1.7
05/11/91	1013.9	15.3	64.4	65.0	64.0	24	65.9	66.0	65.5	24	-9.4	-1.9
05/12/91	1014.8	14.9	64.0	64.0	63.5	24	66.0	66.0	65.5	24	-8.4	-2.3
05/13/91	1014.5	15.1	64.1	65.0	63.5	24	66.0	66.0	65.5	24	-9.1	-2.1
05/14/91	1013.7	15.4	64.4	65.5	63.0	24	66.1	66.5	65.5	24	-9.6	-2.1
05/15/91	1015.8	14.5	63.5	64.0	63.0	24	65.5	66.0	65.0	24	-7.4	-2.5
05/16/91	1016.0	14.5	63.4	63.5	63.0	24	65.7	66.0	65.5	24	-7.6	-2.4
05/17/91	1015.5	14.7	63.8	65.0	63.0	24	65.8	66.0	65.0	24	-7.4	-2.2
05/18/91	1014.4	15.2	64.3	65.0	63.5	24	66.0	66.0	65.5	24	-8.5	-1.9
05/19/91	1014.4	15.2	64.1	65.0	63.5	24	66.0	66.0	65.5	24	-8.0	-1.9
05/20/91	1014.6	15.2	64.1	65.5	63.5	24	65.9	66.0	65.5	24	-7.8	-1.9
05/21/91	1014.2	15.3	64.3	65.5	63.5	24	65.9	66.0	65.5	24	-5.2	-2.0
05/22/91	1014.4	15.2	64.1	65.0	63.5	24	65.9	66.0	65.5	24	-5.6	-2.0
05/23/91	1015.6	14.8	63.5	64.0	63.5	24	65.8	66.0	65.5	24	-6.4	-2.4
05/24/91	1015.7	14.7	63.5	64.0	63.5	24	65.8	66.0	65.0	24	-6.4	-2.3
05/25/91	1014.8	15.1	63.9	64.5	63.5	24	66.0	66.0	65.0	24	-7.5	-2.1
05/26/91	1014.4	15.2	64.3	65.5	63.5	24	66.0	66.5	65.5	24	-7.9	-2.0
05/27/91	1013.7	15.4	64.8	65.5	64.0	24	66.1	66.5	66.0	24	-8.4	-1.6
05/28/91	1014.4	15.2	64.1	65.0	64.0	24	66.0	66.5	65.5	24	-8.1	-1.8
05/29/91	1014.2	15.3	64.2	65.0	64.0	24	66.0	66.5	65.5	24	-9.1	-1.8
05/30/91	1013.7	15.4	64.9	65.5	63.5	24	66.3	66.5	66.0	24	-10.3	-1.6
05/31/91	1013.0	15.5	65.1	66.0	64.0	24	66.3	66.5	65.5	24	-8.5	-1.3

	Air Densit	Moisture	T6 Ave	T6 Max	T6 Min	T6 Hrs	T7 Ave	T7 Max	T7 Min	T7 Hrs	Moist Diff	Moist Diff
Average	1014.4	14.1	64.4	64.9	64.0	24	65.6	65.9	65.2	24	-4.1	-1.9
Maximum	1020.1	16.1	65.8	67.0	65.5	24	66.9	67.0	66.5	24	9.2	0.0
Minimum	1010.3	8.7	62.9	63.0	61.5	9	63.8	64.5	61.5	9	-11.6	-6.5
S.D.	2.2	1.9	0.7	0.8	0.7	1	0.6	0.5	0.8	1	4.1	0.9
Count	799.0	799.0	808.0	808.0	808.0	808	808.0	808.0	808.0	808	652.0	795.0

ENTRANCE PASSAGES DATA LOGGER - Monthly Summaries

	Surface Temperature			Moisture	Temperatures				Temperatures		
DATE	Max	Min	Mean	gm/m3	T1 Avg	T1 Max	T1 Min	T1 Hrs	T2 Avg	T2 Max	T2 Min
Mar-89	-	-	-	-	54.6	56.9	52.6	23.2	58.3	59.2	57.8
Apr-89	-	-	-	-	57.4	59.1	55.3	23.9	59.3	60.1	58.8
May-89	-	-	-	-	58.2	59.8	56.3	24.0	60.2	60.9	59.6
Jun-89	93.7	62.8	78.3	-	61.0	61.8	59.8	23.4	61.6	62.2	61.1
Jul-89	92.0	66.6	79.3	13.4	62.2	62.8	61.4	24.0	62.8	63.2	62.3
Aug-89	88.3	63.8	76.0	13.4	63.3	63.6	62.8	24.0	63.7	64.0	63.3
Sep-89	88.7	61.6	75.1	9.8	64.0	64.5	63.1	24.0	64.6	65.0	64.2
Oct-89	75.7	50.9	63.3	6.7	62.3	63.3	61.4	24.0	63.9	64.3	63.5
Nov-89	68.0	42.0	55.0	4.8	57.0	58.5	55.6	23.7	61.4	61.8	61.1
Dec-89	60.1	35.2	47.6	3.7	53.2	54.4	52.3	23.4	59.2	59.8	59.0
Jan-90	58.8	34.6	46.7	3.8	53.4	55.1	52.1	23.3	58.5	59.2	58.1
Feb-90	58.9	35.0	46.9	4.1	54.2	56.5	52.6	24.0	58.4	59.4	57.7
Mar-90	67.4	42.9	55.1	3.8	54.4	56.3	53.1	21.9	58.7	59.5	58.3
Apr-90	75.2	50.3	62.8	4.9	57.0	58.8	55.3	24.0	59.8	60.6	59.3
May-90	81.5	53.4	67.5	5.5	59.6	61.1	57.5	24.0	61.1	61.9	60.4
Jun-90	96.4	65.9	81.2	7.2	62.2	63.0	61.2	24.0	62.6	63.2	61.9
Jul-90	86.8	65.3	76.1	13.8	62.9	63.3	62.5	24.0	63.1	63.5	62.7
Aug-90	84.2	62.0	73.1	12.8	63.6	64.0	63.3	24.0	63.7	64.1	63.5
Sep-90	84.6	61.5	73.1	12.0	64.4	64.9	64.1	24.0	64.5	64.9	64.3
Oct-90	78.6	51.5	65.1	7.0	62.6	63.4	61.6	24.0	63.4	63.9	62.9
Nov-90	67.6	43.3	55.5	5.6	59.3	60.8	57.8	24.0	61.7	62.3	61.3
Dec-90	57.3	36.6	47.0	4.5	55.7	57.1	54.5	24.0	59.6	60.2	59.1
Jan-91	57.5	36.2	46.9	4.6	53.9	55.0	53.0	23.5	57.9	58.2	57.7
Feb-91	63.6	41.8	52.7	4.4	54.1	55.6	52.8	24.0	57.3	57.8	56.9
Mar-91	61.5	38.6	50.1	4.1	56.6	58.5	54.7	24.0	58.1	59.2	57.3
Apr-91	72.9	45.3	59.1	3.9	56.3	58.2	54.6	22.9	58.1	59.0	57.4
May-91	80.9	49.7	65.4	4.8	59.1	60.3	57.6	24.0	59.6	60.5	58.8

ENTRANCE PASSAGES DATA LOGGER - Monthly Summaries

DATE	T2 Hrs	RH (%) (T2,T1)	Density gm/m3	Moisture gm/m3	Temperatures T3 Ave	T3 Max	T3 Min	T3 Hrs	Temperatures T4 Ave	T4 Max	T4 Min
Mar-89	23.5	80.3	1029.0	10.1	59.0	60.6	58.2	23.5	60.4	62.6	58.4
Apr-89	24.0	89.5	1026.0	11.6	60.3	62.0	59.2	24.0	62.5	63.9	60.8
May-89	24.0	89.4	1024.0	12.0	61.1	62.3	59.9	24.0	63.1	64.1	61.8
Jun-89	23.8	96.4	1020.3	13.5	62.3	63.2	61.5	23.8	64.3	64.7	63.8
Jul-89	24.0	96.8	1017.7	14.1	63.1	63.5	62.4	24.0	64.7	65.0	64.2
Aug-89	24.0	97.6	1015.5	14.7	63.8	64.3	63.3	24.0	65.1	65.3	64.8
Sep-89	24.0	97.0	1013.6	15.0	64.5	64.8	64.0	24.0	65.6	65.8	65.4
Oct-89	24.0	92.5	1015.6	14.0	63.9	64.4	63.5	24.0	65.3	65.7	65.0
Nov-89	24.0	77.9	1022.3	10.9	61.6	62.3	61.2	24.0	64.7	65.3	64.0
Dec-89	23.4	69.3	1027.9	8.9	59.8	60.6	59.4	23.4	58.0	59.9	56.7
Jan-90	23.5	73.4	1029.1	9.3	59.2	60.5	58.6	23.5	57.7	59.5	56.3
Feb-90	24.0	78.0	1029.0	9.8	59.2	60.9	58.2	24.0	58.6	61.3	56.8
Mar-90	23.5	77.5	1028.2	9.9	59.7	61.2	58.8	23.5	59.5	61.7	57.6
Apr-90	24.0	85.4	1025.2	11.3	60.9	62.6	59.9	24.0	61.6	63.6	59.8
May-90	24.0	92.2	1021.8	12.7	62.3	63.9	61.0	23.9	63.5	64.6	62.1
Jun-90	24.0	98.2	1018.0	14.2	63.6	64.5	62.6	24.0	65.1	65.4	64.4
Jul-90	24.0	98.8	1016.8	14.5	63.7	64.5	63.1	24.0	65.2	65.5	64.7
Aug-90	24.0	99.3	1015.3	14.9	64.7	65.3	64.2	24.0	65.4	65.7	65.1
Sep-90	24.0	99.2	1013.5	15.3	67.1	67.7	66.6	24.0	65.9	66.1	65.7
Oct-90	24.0	95.5	1016.3	14.2	65.3	66.2	64.7	24.0	65.4	65.8	65.0
Nov-90	24.0	87.9	1020.8	12.4	63.4	64.2	62.7	24.0	63.4	64.5	62.4
Dec-90	24.0	79.8	1026.2	10.5	61.2	62.3	60.4	24.0	62.3	63.2	61.5
Jan-91	24.0	79.0	1030.0	9.8	59.4	60.1	58.9	24.0	59.1	60.1	58.2
Feb-91	24.0	82.9	1031.0	10.1	59.2	60.4	58.5	24.0	59.8	61.2	58.8
Mar-91	24.0	91.8	1028.5	11.5	60.5	62.6	59.0	24.0	62.5	63.7	61.4
Apr-91	22.9	90.6	1028.7	11.3	59.6	61.2	58.8	21.4	62.0	63.3	60.7
May-91	24.0	97.2	1024.8	12.8	61.1	62.6	59.5	24.0	63.7	64.5	62.8

ENTRANCE PASSAGES DATA LOGGER - Monthly Summaries

	Temperatures					RH (%)	Density	Moisture	Temperatures		
DATE	T4 Hrs	T5 Ave	T5 Max	T5 Min	T5 Hrs	(T4,T5)	gm/m3	gm/m3	T6 Ave	T6 Max	T6 Min
Mar-89	23.5	63.4	63.7	63.2	23.5	85.0	1017.3	12.7	63.5	63.9	63.2
Apr-89	24.0	63.7	64.0	63.5	24.0	94.1	1015.9	14.1	63.7	64.3	63.4
May-89	23.3	63.7	64.0	63.4	24.0	96.4	1015.5	14.5	63.9	64.6	63.4
Jun-89	23.8	64.1	64.4	63.7	23.8	100.0	1014.4	15.2	64.3	65.1	63.9
Jul-89	24.0	64.5	64.7	64.0	24.0	100.0	1013.6	15.4	64.6	65.3	64.1
Aug-89	24.0	64.8	65.1	64.6	24.0	100.0	1012.7	15.6	64.9	65.5	64.6
Sep-89	24.0	65.4	65.5	65.2	24.0	100.0	1011.5	15.9	65.3	65.8	65.0
Oct-89	24.0	65.3	65.5	65.1	24.0	99.6	1011.7	15.7	65.1	65.5	64.8
Nov-89	24.0	64.5	64.8	64.3	24.0	99.6	1013.4	15.4	64.3	64.6	64.0
Dec-89	23.4	64.2	64.5	64.0	23.4	70.8	1016.8	10.8	64.0	64.4	63.9
Jan-90	22.2	64.1	64.3	64.0	23.5	69.9	1017.2	10.6	64.1	64.4	64.0
Feb-90	24.0	64.1	64.4	63.9	24.0	73.9	1016.7	11.3	64.2	64.5	64.0
Mar-90	23.5	64.1	64.4	63.9	23.5	77.7	1016.3	11.9	64.2	64.5	63.9
Apr-90	24.0	64.3	64.7	64.1	24.0	86.8	1015.1	13.3	64.4	64.9	64.0
May-90	24.0	64.5	64.8	64.1	24.0	94.9	1013.9	14.7	64.6	65.3	64.1
Jun-90	24.0	64.9	65.1	64.5	24.0	99.7	1012.6	15.6	65.0	65.7	64.6
Jul-90	24.0	65.0	65.0	64.6	24.0	100.0	1012.4	15.7	65.0	65.6	64.5
Aug-90	24.0	65.1	65.3	64.9	24.0	100.0	1012.0	15.7	65.1	65.7	64.8
Sep-90	24.0	65.5	65.7	65.4	24.0	100.0	1011.1	15.9	65.5	65.9	65.1
Oct-90	24.0	65.4	65.6	65.1	24.0	99.8	1011.5	15.8	65.1	65.5	65.0
Nov-90	24.0	64.9	65.1	64.6	24.0	92.6	1013.3	14.5	64.6	65.0	64.3
Dec-90	24.0	64.5	64.7	64.3	24.0	88.7	1014.6	13.7	64.2	64.5	64.0
Jan-91	24.0	63.9	64.1	63.9	24.0	76.7	1016.9	11.6	63.7	63.9	63.6
Feb-91	24.0	63.6	63.8	63.5	24.0	81.3	1017.2	12.2	63.5	63.7	63.1
Mar-91	24.0	63.7	64.1	63.4	24.0	93.4	1015.8	14.1	63.7	64.3	63.1
Apr-91	22.9	63.5	63.9	63.2	22.7	91.8	1016.4	13.7	63.5	64.0	63.1
May-91	24.0	64.0	64.3	63.6	24.0	97.9	1014.9	14.8	64.0	64.8	63.5

ENTRANCE PASSAGES DATA LOGGER - Monthly Summaries

	Temperatures					Moisture	Moisture
DATE	T6 Hrs	T7 Ave	T7 Max	T7 Min	T7 Hrs	Surf-LEM	LEM-Anticp
Mar-89	23.5	65.4	65.6	65.4	23.5	-	-2.7
Apr-89	24.0	65.6	65.7	65.6	24.0	-	-2.5
May-89	24.0	65.2	65.6	64.6	24.0	-	-2.2
Jun-89	23.8	65.6	66.0	65.2	23.8	-	-1.7
Jul-89	24.0	65.9	66.1	65.5	24.0	-0.9	-1.3
Aug-89	24.0	66.1	66.4	65.9	24.0	-1.3	-0.9
Sep-89	24.0	66.4	66.5	66.1	24.0	-5.2	-0.9
Oct-89	24.0	66.2	66.4	66.0	24.0	-7.1	-1.8
Nov-89	24.0	65.2	65.7	64.9	24.0	-6.3	-4.5
Dec-89	23.4	64.9	65.1	64.7	23.4	-5.3	-1.9
Jan-90	23.5	64.8	65.1	64.6	23.5	-5.4	-1.5
Feb-90	24.0	64.9	65.3	64.7	24.0	-5.8	-1.5
Mar-90	23.5	65.0	65.4	64.9	23.5	-6.1	-2.0
Apr-90	24.0	65.3	65.8	65.0	24.0	-6.4	-2.0
May-90	24.0	65.6	66.0	65.1	24.0	-7.9	-1.9
Jun-90	24.0	66.2	66.5	65.7	24.0	2.2	-1.4
Jul-90	24.0	66.2	66.5	65.9	24.0	4.3	-1.1
Aug-90	24.0	66.3	66.5	65.9	24.0	1.9	-0.8
Sep-90	24.0	66.5	66.6	66.2	24.0	1.2	-0.6
Oct-90	24.0	66.4	66.6	66.2	24.0	-3.8	-1.6
Nov-90	24.0	66.0	66.4	65.3	24.0	-4.9	-2.1
Dec-90	24.0	65.0	65.8	64.1	24.0	-5.9	-3.2
Jan-91	24.0	64.8	65.4	63.9	24.0	-5.2	-1.8
Feb-91	24.0	64.5	65.1	63.5	24.0	-5.7	-2.1
Mar-91	24.0	65.3	65.8	64.5	24.0	-7.3	-2.6
Apr-91	22.9	65.5	65.9	64.7	22.9	-7.6	-2.4
May-91	24.0	65.9	66.1	65.4	24.0	-8.0	-2.1

Regression of LEM Room Temperatures from Surface Temperatures

DEPENDENT VARIABLE: T2 N: 23
MULTIPLE R: 0.961
SQUARED MULTIPLE R: 0.923
ADJUSTED SQUARED MULTIPLE R: 0.915
STANDARD ERROR OF ESTIMATE: 0.709

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	51.076	0.811	0.000		62.976	0.000
Surface Temperature	0.139	0.013	0.670	0.928	10.388	0.000
Surface Degree Days	0.059	0.007	0.531	0.928	8.230	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN SQUARE	F-RATIO	P
REGRESSION	120.098	2	60.049	119.384	0.000
RESIDUAL	10.060	20	0.503		

APPENDIX C

Big Room Data Logger System Data

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Big Room Data Logger System

The Big Room data logger is located near the Mud Flats area of the Big Room. The system consists of an OWL data logger and a Radio Shack Model 102 computer with 32K of memory. Despite the small amount of memory available the RS-102 computer has many advantages that make it ideal for use in the cave environment. The data logger is hooked up to five, eight channel multiplexers in various parts of the Big Room. Each multiplexer is hooked up to two environmental stations. Each environmental station has three probes: a wet bulb, dry bulb and soil temperature. Two additional probes on each multiplexer are used to measure soil temperatures in other locations. Two remaining channels on the OWL data logger are used for single probe temperature measurements. Temperature probes are all LM34 integrated circuits that have been individually calibrated. Additional temperature calibration has been necessary in the cave in order to achieve optimum accuracy.

The computer is battery operated and must be downloaded approximately once every 17 days. As a matter of convenience the system is downloaded every two weeks. In order to store the maximum amount of data the temperatures are stored in compressed form which allows approximately 17,000 readings to be stored in 24K of memory.

This system has experienced a large number of problems associated with the failure of a single probe on a multiplexer. The failure of a single probe frequently would cause a constant offset to all other probes on that multiplexer. The sudden offset is readily apparent and can be easily corrected. (This has been done for the data presented in this report.) Unfortunately if two probes go bad on the same multiplexer the interference is more complicated and cannot be corrected.

During the course of the study we have had failures of six probes. These have usually been the wet bulb probes. These are more susceptible to corrosion as the lead wires were left exposed. There has been not problems with the wires used to hook up the system.

Despite these problems the system has been very successful in collecting the needed data. For the period June, 89 through May, 91 the Big Room data logger system collected data for a total of 23,616 probe/days out of a possible 26,620 probe days. The system collected 89% of the possible data.

History of the Big Room Data Logger System.

June 89 to 11:00, Oct. 22, 1989. During this time there were 30 probes installed as 5 banks of 6 probes. Temperature resolution was 0.5°F and hourly temperatures were recorded.

EMS #9 End of Echo Passage	Wet Bulb
	Dry Bulb
	Soil
EMS #10 Start of Echo Passage	Wet Bulb
	Dry Bulb
	Soil

EMS #11 Tarantula Room	Wet Bulb
	Dry Bulb
	Soil
EMS #12 Mud Flats	Wet Bulb
	Dry Bulb
	Soil
EMS #13 Sharon's Saddle	Wet Bulb
	Dry Bulb
	Soil
EMS #14 Main Corridor	Wet Bulb
	Dry Bulb
	Soil
EMS #22 Kartchner Towers	Wet Bulb
	Dry Bulb
	Soil
EMS #19 Lover's Leap	Wet Bulb
	Dry Bulb
	Soil
EMS #21 Big Room Overlook	Wet Bulb
	Dry Bulb
	Soil
EMS #7 Cul-de-Sac	Wet Bulb
	Dry Bulb
	Soil

21:00, Dec. 6, 1989. Number of temperature probes increased from 30 to 38. New probes added as numbers 7 & 8 to each of the five banks of probes. (Bank 1 channels 7 & 8 are empty.) Temperature resolution increased from 0.5°F to 0.1°F. New locations added were:

Guano Pile #2	Shallow
	Deep
Guano Pile #20	Shallow
	Deep
Guano Pile #9A	Shallow
	Deep
Guano Pile #9C	Shallow
	Deep

15:00, May 30, 1990. Number of probes increased from 38 to 40 with the addition of probes 6-1 and 7-1. These are temperature probes on the ceiling above Sharon's Saddle (6-1) and in the Bat House erected at Sharon's Saddle (7-1)

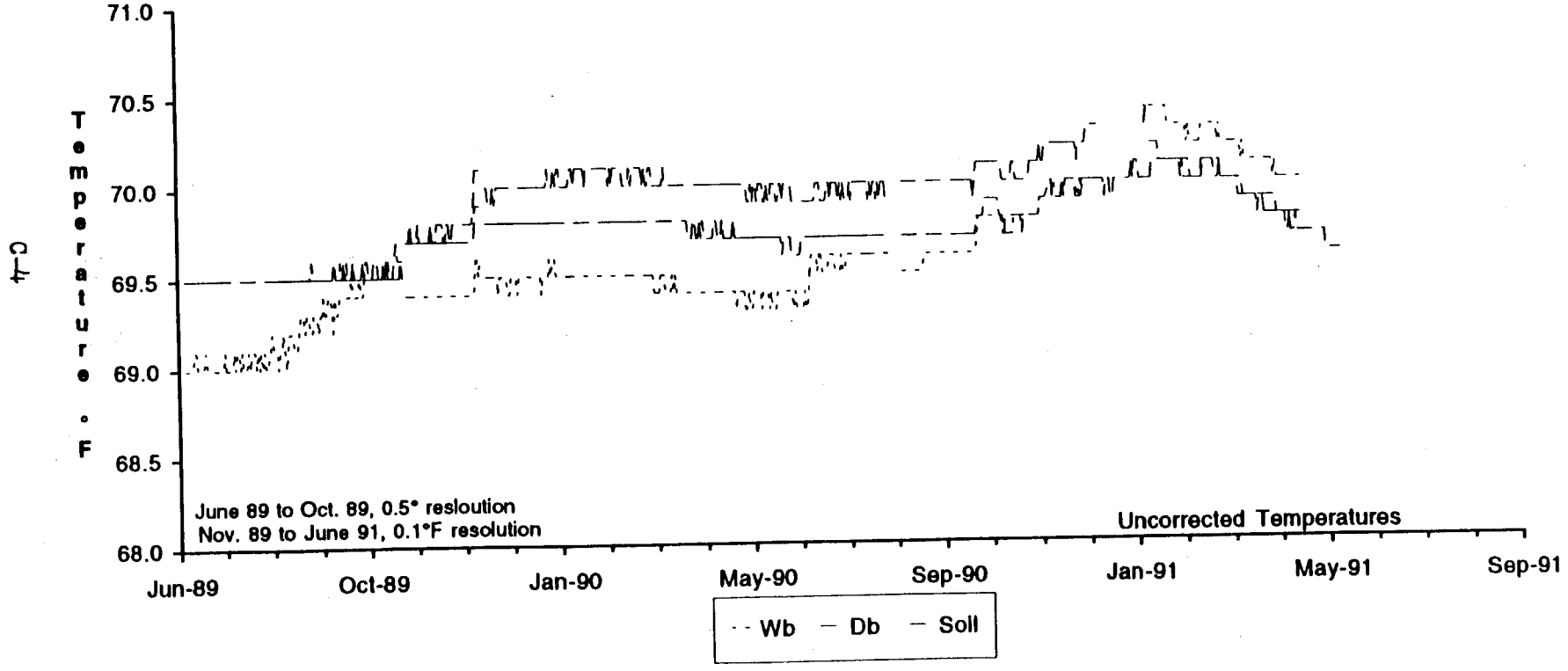
Big Room Data Logger
Corrections to Temperature Probes

EMS Station	Probe	Correction (°F)
14	Wet Bulb	-0.40
	Dry Bulb	-0.40
	Soil	-0.10
13	Wet Bulb	-0.10
	Dry Bulb	-0.40
	Soil	-0.15
19	Wet Bulb	-0.65
	Dry Bulb	-0.85
	Soil	-0.50
22	Wet Bulb	-0.45
	Dry Bulb	-0.15
	Soil	-0.45
12	Wet Bulb	-0.25
	Dry Bulb	-0.15
	Soil	-0.45
11	Wet Bulb	-0.40
	Dry Bulb	-0.40
	Soil	-0.10
21	Wet Bulb	-0.70
	Dry Bulb	-0.50
	Soil	-0.85
7	Wet Bulb	-0.50
	Dry Bulb	-0.75
	Soil	-0.70
10	Wet Bulb	-0.85
	Dry Bulb	-0.90
	Soil	-1.10
9	Wet Bulb	-2.00
	Dry Bulb	-0.55
	Soil	-0.90
	Average	-0.56
	Std. Dev.	0.39

December, 1990

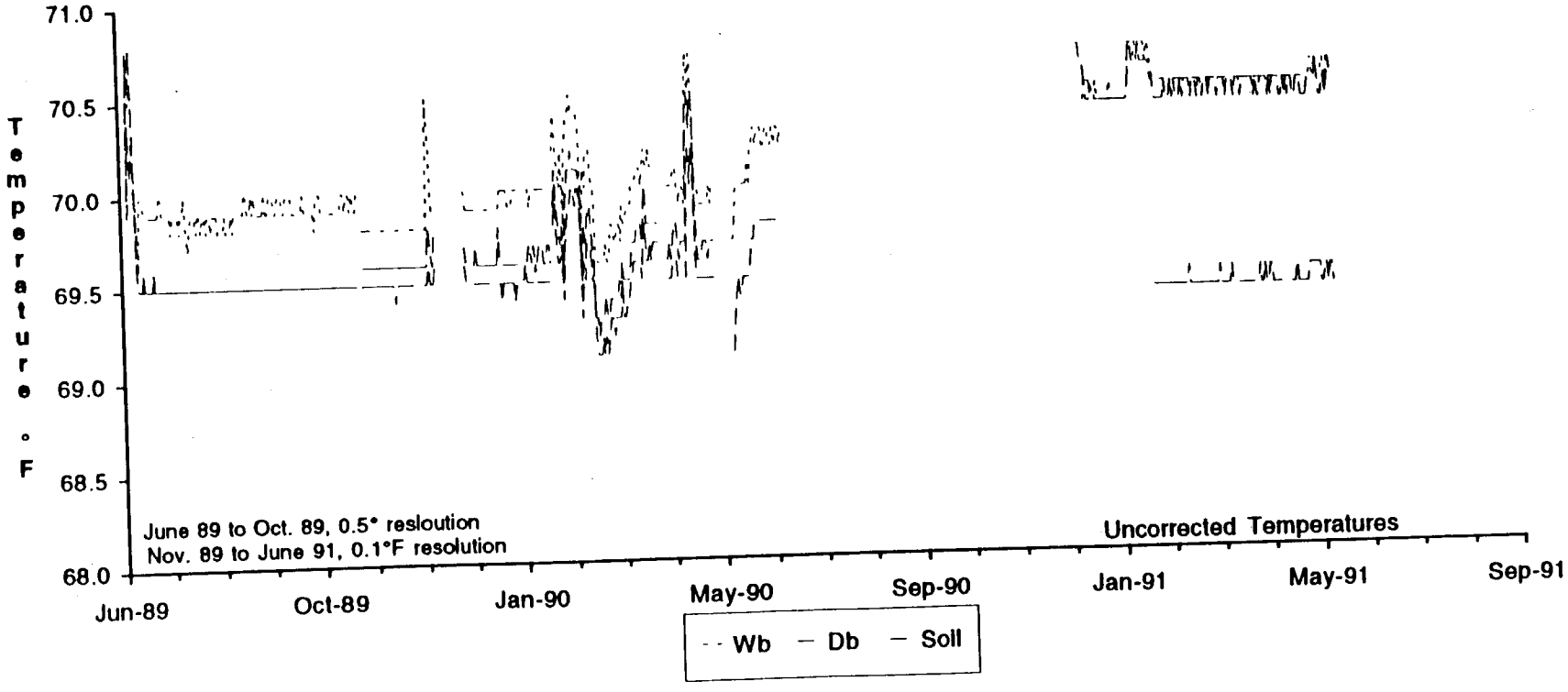
EMS #7 - Cul-de-Sac Data Logger Temperatures

Daily Average Wet Bulb, Dry Bulb & Soil



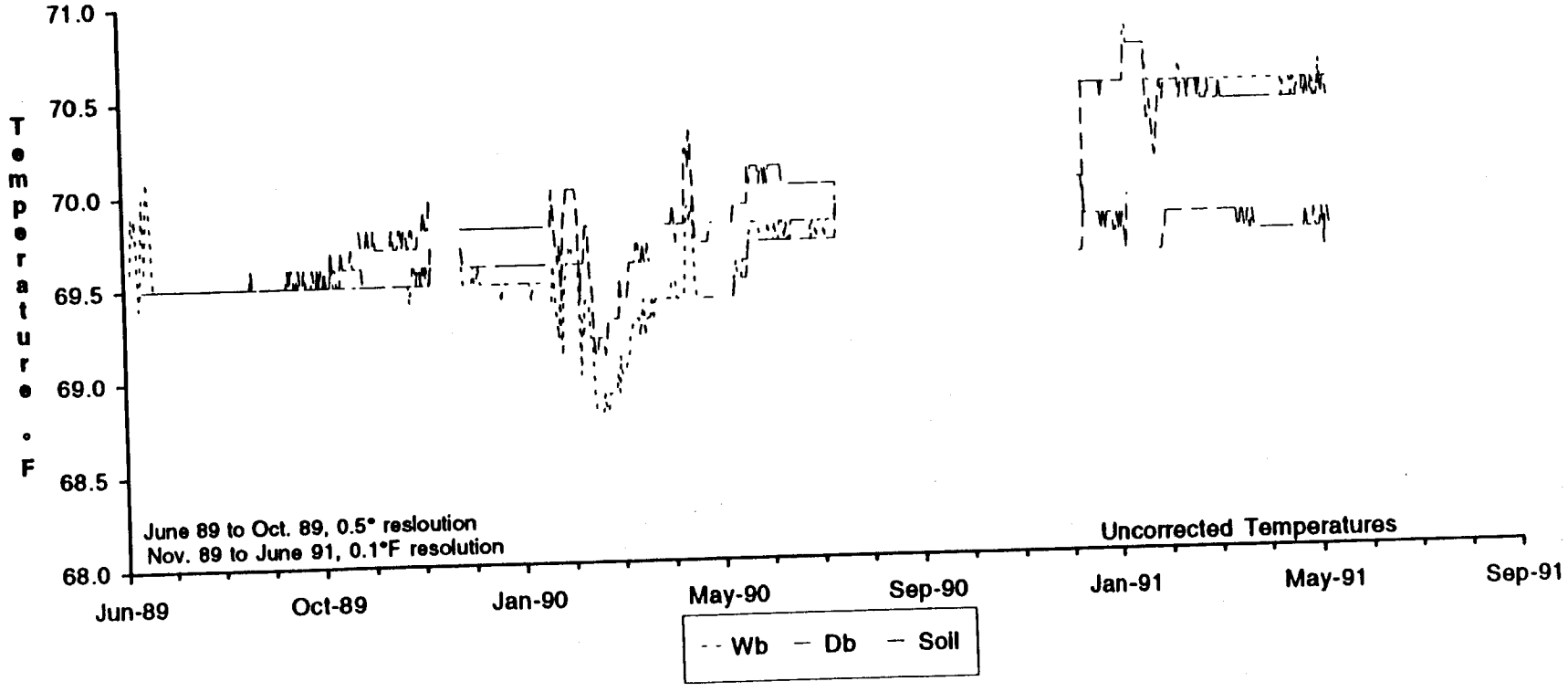
C-4

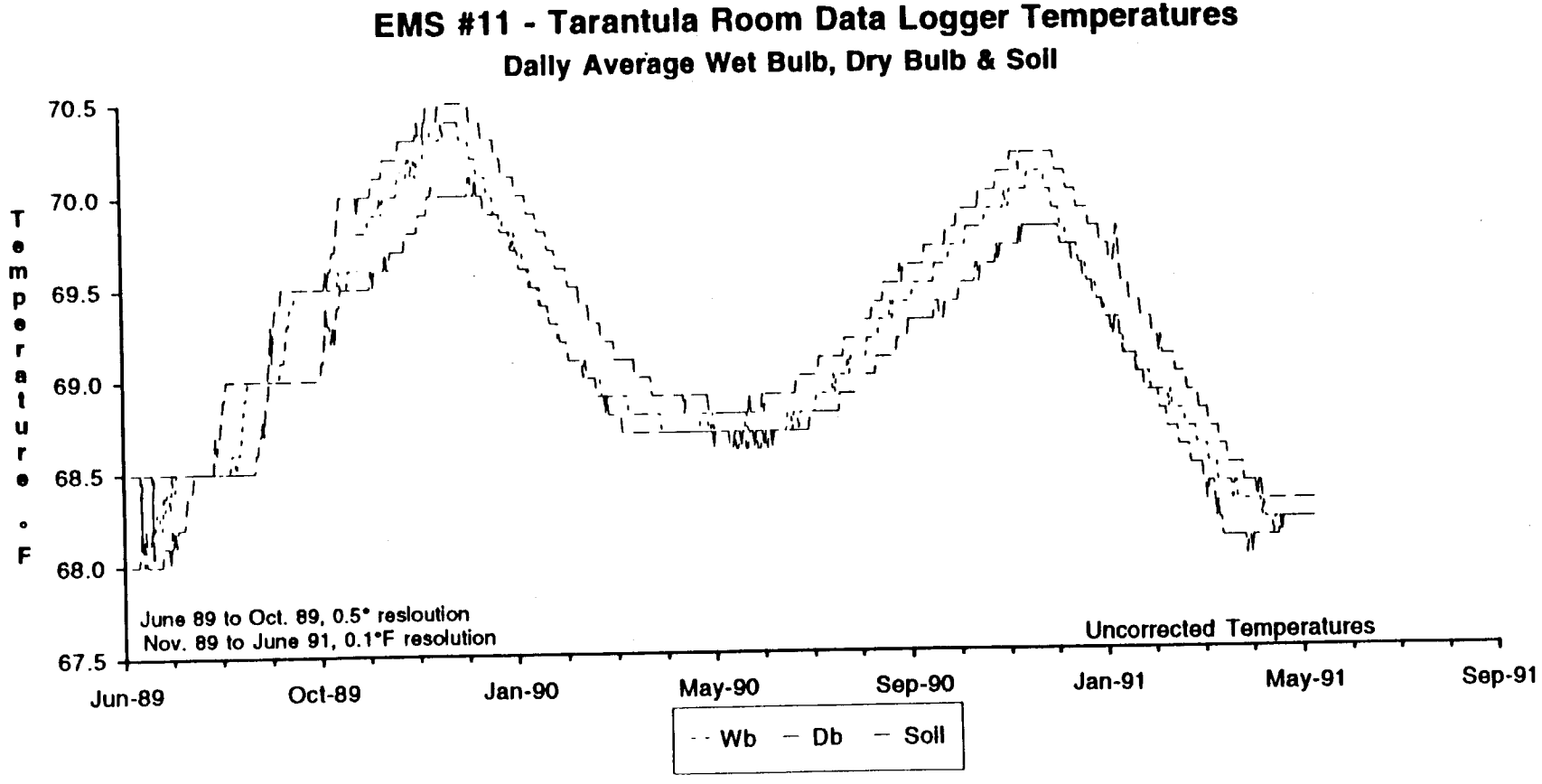
EMS #9 - End Echo Passage Data Logger Temperatures
Daily Average Wet Bulb, Dry Bulb & Soil



EMS #10 - Echo Passage Data Logger Temperatures

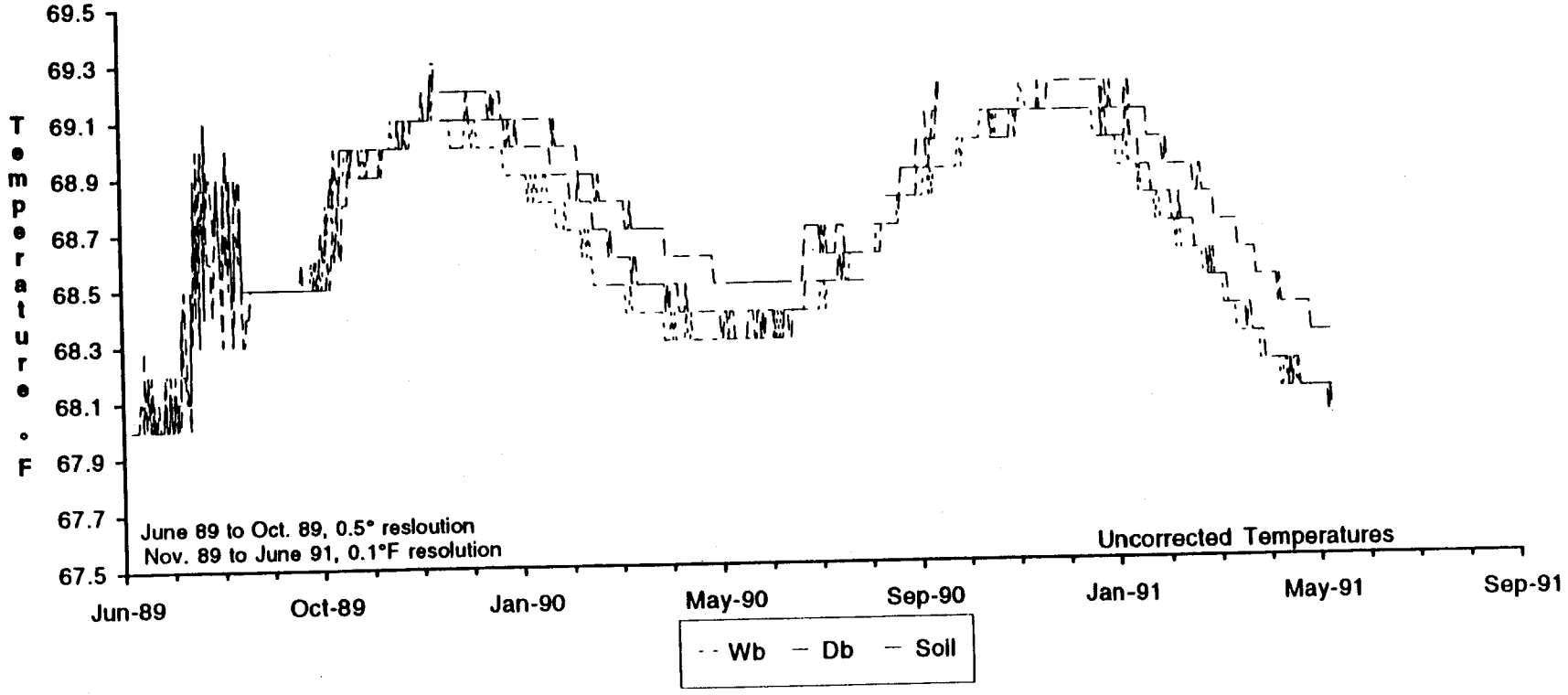
Daily Average Wet Bulb, Dry Bulb & Soil




EMS #11 - Tarantula Room Data Logger Temperatures
Daily Average Wet Bulb, Dry Bulb & Soil
Temperature °F
70.5
70.0
69.5
69.0
68.5
68.0
67.5
June 89 to Oct. 89, 0.5° resloution
Nov. 89 to June 91, 0.1°F resolution
Uncorrected Temperatures
Jun-89
Oct-89
Jan-90
May-90
Sep-90
Jan-91
May-91
Sep-91
Wb
Db
Soil

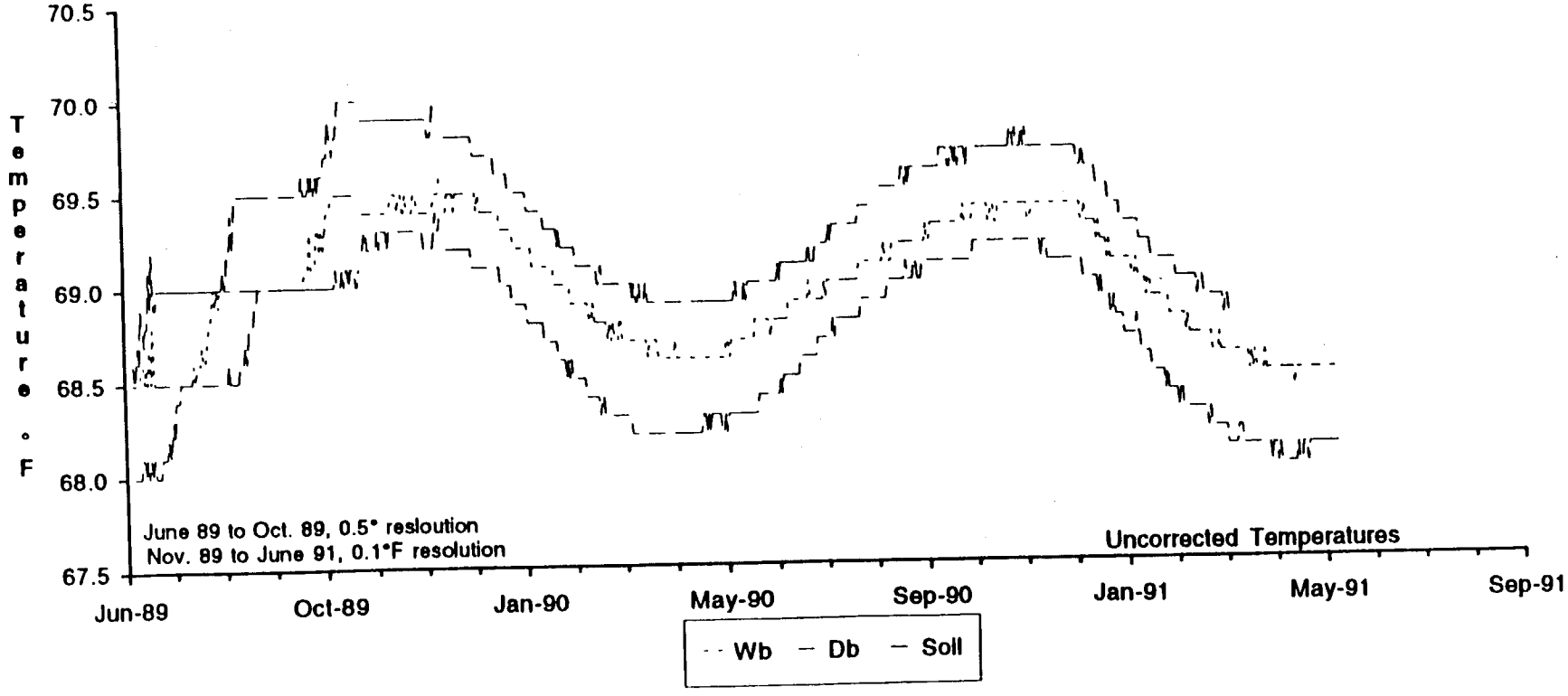
EMS #12 - Mud Flats Data Logger Temperatures

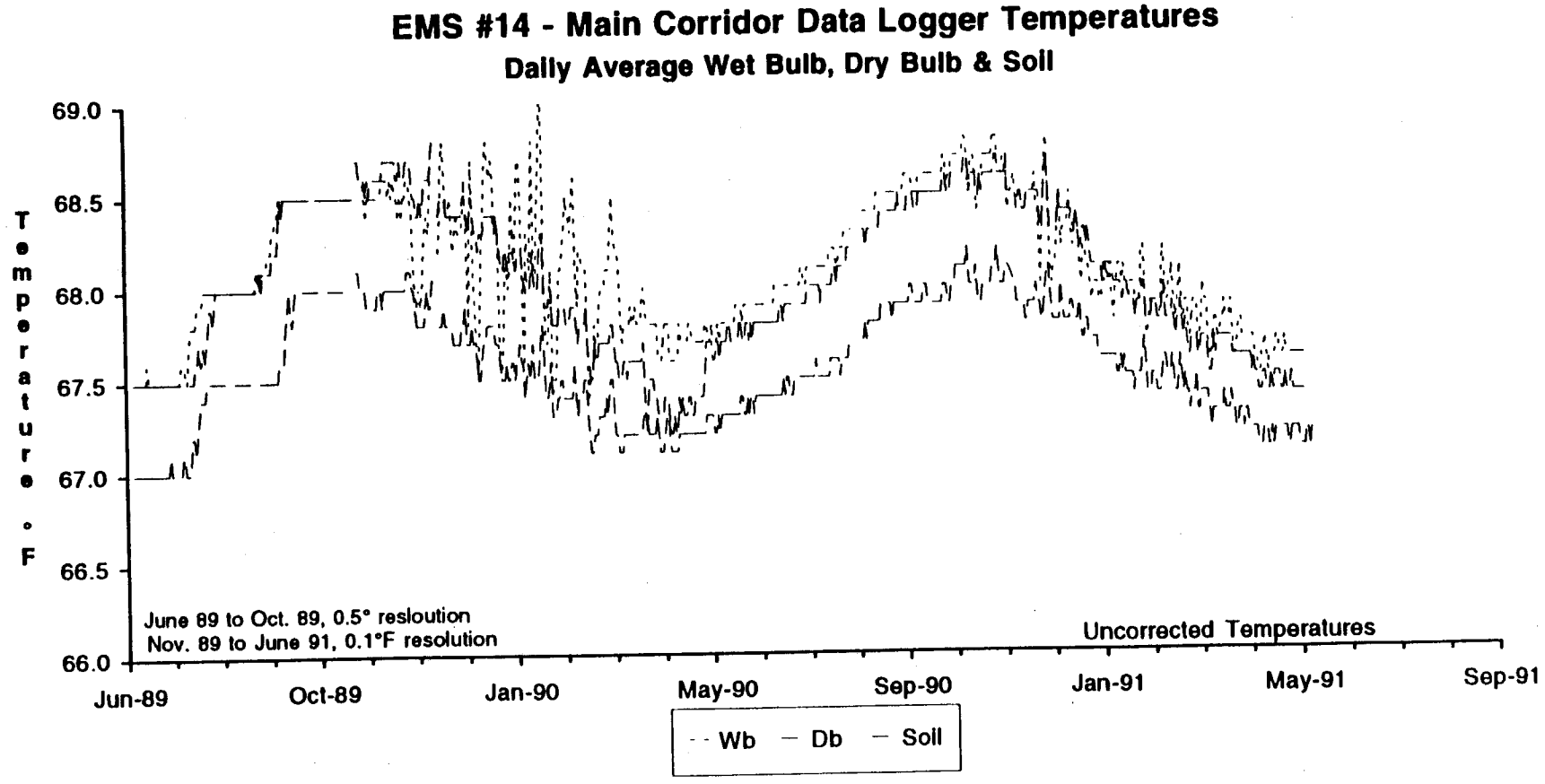
Daily Average Wet Bulb, Dry Bulb & Soil

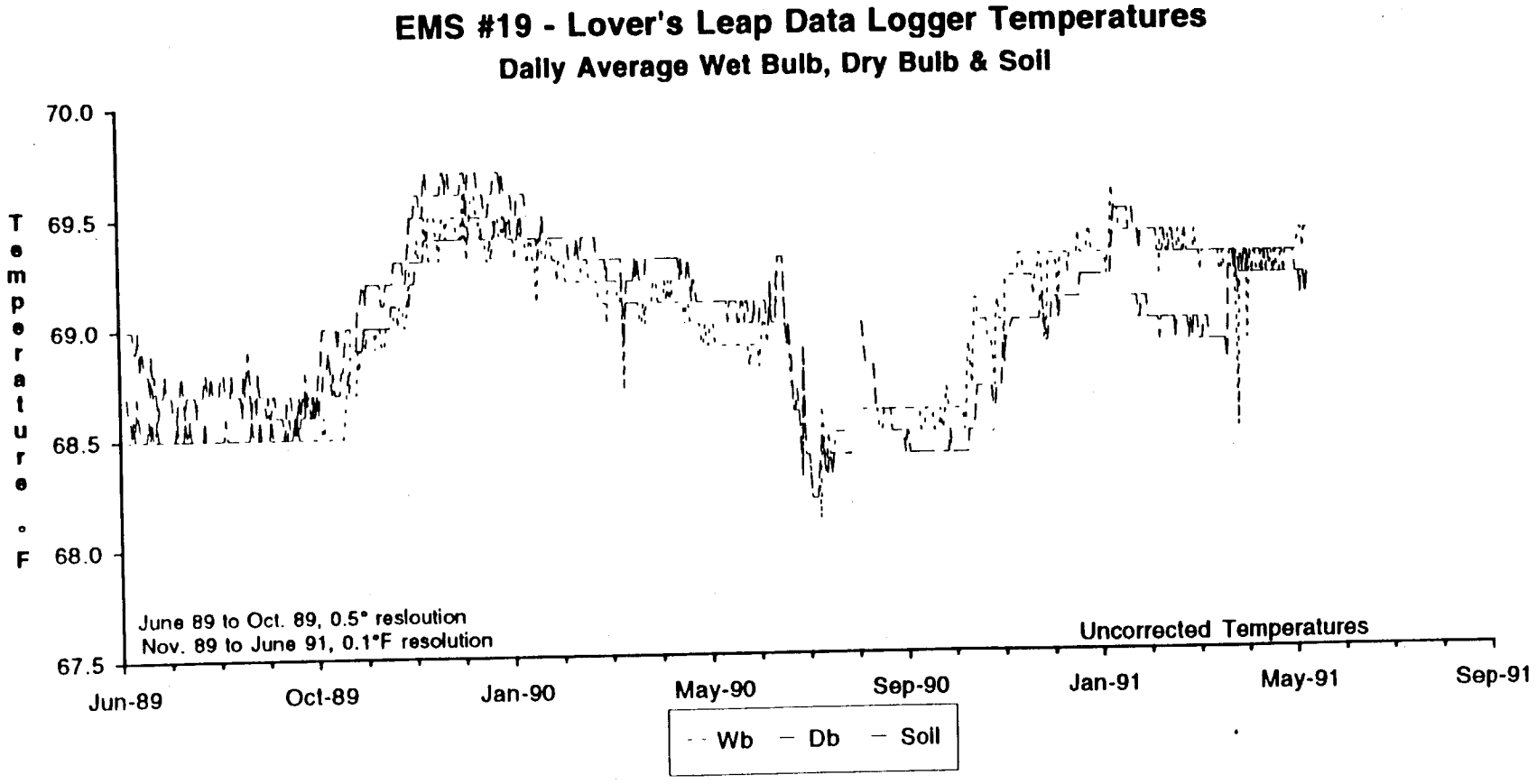


EMS #13 - Sharon's Saddle Data Logger Temperatures

Daily Average Wet Bulb, Dry Bulb & Soil

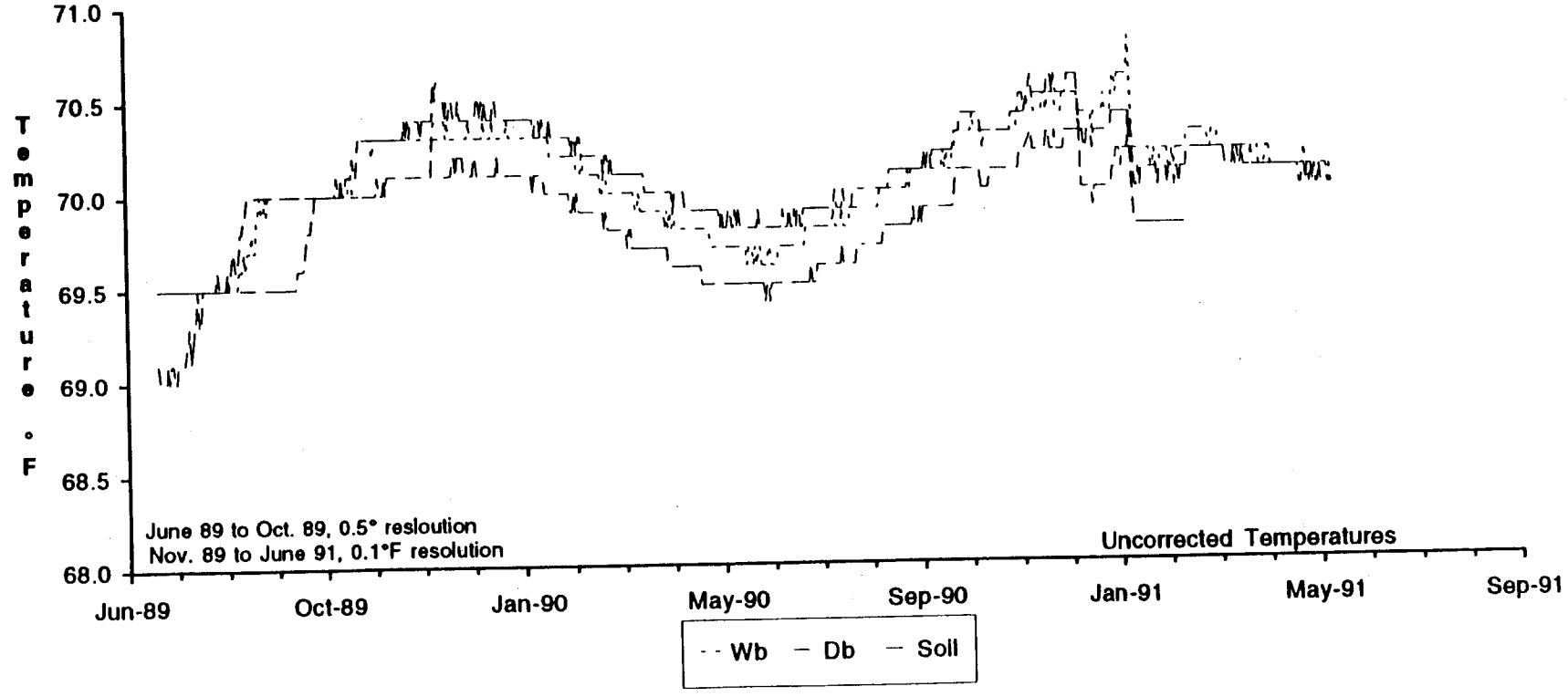



EMS #14 - Main Corridor Data Logger Temperatures
Daily Average Wet Bulb, Dry Bulb & Soil
Temperature °F
69.0
68.5
68.0
67.5
67.0
66.5
66.0
June 89 to Oct. 89, 0.5° resloution
Nov. 89 to June 91, 0.1°F resolution
Uncorrected Temperatures
Jun-89
Oct-89
Jan-90
May-90
Sep-90
Jan-91
May-91
Sep-91
Wb
Db
Soil


EMS #19 - Lover's Leap Data Logger Temperatures
Daily Average Wet Bulb, Dry Bulb & Soil
Temperature °F
70.0
69.5
69.0
68.5
68.0
67.5
June 89 to Oct. 89, 0.5° resloution
Nov. 89 to June 91, 0.1°F resolution
Uncorrected Temperatures
Jun-89
Oct-89
Jan-90
May-90
Sep-90
Jan-91
May-91
Sep-91
Wb
Db
Soil

EMS #21 - Big Room Overlook Data Logger Temperatures

Daily Average Wet Bulb, Dry Bulb & Soil



Kartchner Caverns - Big Room Averages of Daily Temperatures (°F)

	EMS #22 Kartchner Twrs			EMS #19 Lovers' Leap			Guano 9C			Bat
DATE	Wb	Db	Soil	Wb	Db	Soil	Shallow	Deep	Ceiling	House
10-Jun-90	69.3	69.2	69.0	68.9	-	69.1	70.1	70.0	70.2	69.4
11-Jun-90	69.3	69.2	69.0	68.9	-	69.1	70.1	70.0	70.2	69.4
12-Jun-90	69.3	69.2	69.0	68.9	-	69.1	70.1	70.1	70.3	69.4
13-Jun-90	69.3	69.2	69.0	68.9	-	69.1	70.1	70.0	70.3	69.4
14-Jun-90	69.3	69.2	69.0	68.9	-	69.1	70.2	70.1	70.3	69.4
15-Jun-90	69.3	69.2	69.0	68.9	-	69.0	70.2	70.1	70.3	69.4
16-Jun-90	69.3	69.2	69.0	68.9	-	69.0	70.2	70.1	70.3	69.4
17-Jun-90	69.3	69.2	69.0	68.9	-	69.1	70.2	70.1	70.4	69.5
18-Jun-90	69.3	69.2	69.0	68.9	-	69.1	70.2	70.1	70.4	69.4
19-Jun-90	69.3	69.3	69.0	68.9	-	69.0	70.3	70.2	70.5	69.5
20-Jun-90	69.4	69.3	69.0	68.9	-	69.1	-	-	70.7	69.5
21-Jun-90	69.3	69.3	69.0	68.9	-	69.1	-	-	70.8	69.5
22-Jun-90	69.3	69.2	68.9	68.8	-	69.0	-	-	70.8	69.5
23-Jun-90	69.3	69.2	69.0	68.9	-	69.0	-	-	70.9	69.5
24-Jun-90	69.3	69.3	69.0	68.9	-	69.0	-	-	70.9	69.5
25-Jun-90	69.3	69.3	69.0	68.9	-	69.1	-	-	70.9	69.5
26-Jun-90	69.3	69.3	69.0	68.9	-	69.0	-	-	70.9	69.5
27-Jun-90	69.3	69.3	69.0	68.9	-	69.0	-	-	71.0	69.5
28-Jun-90	69.3	69.2	68.9	68.8	-	69.0	-	-	71.1	69.5
29-Jun-90	69.3	69.3	69.0	68.9	-	69.1	-	-	71.1	69.6
30-Jun-90	69.4	69.3	69.1	69.0	-	69.1	-	-	71.1	69.6
01-Jul-90	69.4	69.4	69.1	69.0	-	69.1	-	-	71.2	69.6
02-Jul-90	69.4	69.4	-	69.0	-	69.1	-	-	71.3	69.6
03-Jul-90	69.4	69.3	-	68.9	-	69.0	-	-	71.4	69.6
04-Jul-90	69.4	69.4	69.0	69.0	-	69.0	-	-	71.4	69.7
05-Jul-90	69.5	69.5	69.1	69.1	-	69.2	-	-	71.5	69.7
06-Jul-90	69.4	69.4	69.0	69.0	-	69.0	-	-	71.5	69.7
07-Jul-90	69.4	69.4	69.0	69.0	-	69.0	-	-	71.6	69.7
08-Jul-90	69.4	69.3	69.0	69.0	-	69.0	-	-	71.6	69.7
09-Jul-90	69.5	69.5	69.1	69.1	-	69.2	-	-	71.4	69.8
10-Jul-90	69.6	69.6	69.2	69.3	-	69.3	-	-	71.5	69.8
11-Jul-90	69.7	69.6	69.2	69.3	-	69.3	-	-	71.5	69.8
12-Jul-90	69.7	69.6	69.2	69.3	-	69.3	-	-	71.6	69.8
13-Jul-90	69.6	69.6	-	69.3	-	69.3	-	-	71.7	69.8
14-Jul-90	69.5	69.4	-	69.0	-	69.0	-	-	71.6	69.8
15-Jul-90	69.4	69.3	-	68.9	-	68.9	-	-	71.5	69.8
16-Jul-90	69.4	69.4	-	69.0	-	69.0	-	-	71.4	69.8
17-Jul-90	69.4	69.3	-	68.8	-	68.9	-	-	70.9	69.9
18-Jul-90	69.3	69.2	-	68.7	-	68.8	-	-	71.1	69.9
19-Jul-90	69.2	69.1	-	68.6	-	68.6	-	-	71.2	69.9
20-Jul-90	69.2	69.1	-	68.6	-	68.6	-	-	71.2	69.8
21-Jul-90	69.3	69.2	-	68.6	-	68.7	-	-	71.1	69.9
22-Jul-90	69.2	69.2	-	68.6	-	68.6	-	-	71.2	69.8
23-Jul-90	69.1	69.1	-	68.5	-	68.5	-	-	71.2	69.8
24-Jul-90	69.0	69.0	-	68.3	-	68.3	-	-	71.2	69.8
25-Jul-90	69.4	69.3	-	68.8	-	68.9	-	70.5	71.2	69.8

Kartchner Caverns - Big Room Averages of Daily Temperatures (°F)

	EMS #22 Kartchner Twrs			EMS #19 Lovers' Leap			Guano 9C			Bat
DATE	Wb	Db	Soil	Wb	Db	Soil	Shallow	Deep	Ceiling	House
26-Jul-90	69.1	69.0	-	68.4	-	68.4	-	-	71.2	69.8
27-Jul-90	69.1	69.0	-	68.4	-	68.4	-	70.5	71.1	69.9
28-Jul-90	69.1	69.0	-	68.4	-	68.4	-	70.5	71.1	69.9
29-Jul-90	69.0	68.9	-	68.3	-	68.3	-	70.5	71.1	69.8
30-Jul-90	68.9	68.9	-	68.2	-	68.2	-	70.4	71.1	69.8
31-Jul-90	68.9	68.9	-	68.2	-	68.2	-	70.4	71.1	69.8
01-Aug-90	69.0	68.9	-	68.2	-	68.2	-	70.3	71.1	69.9
02-Aug-90	69.0	68.9	-	68.2	-	68.2	-	70.3	71.1	69.9
03-Aug-90	69.0	69.0	-	68.3	-	68.3	-	70.3	71.1	69.9
04-Aug-90	68.8	68.8	-	68.1	-	68.4	-	70.4	71.1	69.9
05-Aug-90	69.1	69.1	-	68.6	-	68.5	-	-	71.1	69.9
06-Aug-90	69.1	69.1	-	68.5	-	68.4	-	-	71.1	69.9
07-Aug-90	69.0	69.0	-	68.3	-	68.3	-	-	71.1	69.9
08-Aug-90	69.0	69.0	-	68.4	-	68.3	-	-	71.1	69.9
09-Aug-90	69.0	69.1	-	68.5	-	68.4	-	70.7	71.1	69.9
10-Aug-90	69.0	69.1	-	68.4	-	68.4	-	70.8	71.1	69.9
11-Aug-90	69.0	69.1	-	68.4	-	68.3	-	70.7	71.1	69.9
12-Aug-90	69.0	69.1	-	68.4	-	68.4	-	70.8	71.1	69.9
13-Aug-90	69.1	69.1	68.9	68.5	-	68.4	-	70.8	71.1	69.9
14-Aug-90	69.1	69.1	68.9	68.5	-	68.4	-	70.7	71.1	69.9
15-Aug-90	69.1	69.1	68.9	68.5	-	68.4	-	70.7	71.0	69.9
16-Aug-90	69.1	69.1	68.9	68.5	-	68.4	-	70.7	71.0	69.9
17-Aug-90	69.1	69.1	68.8	68.5	-	68.4	-	70.7	71.0	69.8
18-Aug-90	69.1	69.1	68.8	68.5	-	68.4	-	70.7	71.0	69.8
19-Aug-90	69.1	69.1	68.8	68.5	-	68.4	-	70.7	71.0	69.8
20-Aug-90	69.1	69.1	68.8	68.5	-	68.4	-	70.7	71.0	69.8
21-Aug-90	69.1	69.1	68.9	68.5	-	68.4	-	70.7	71.0	69.8
22-Aug-90	69.1	69.1	68.8	68.5	-	68.4	-	70.7	71.0	69.7
23-Aug-90	69.1	69.1	68.9	68.5	-	68.4	-	70.6	71.0	69.7
24-Aug-90	-	-	-	-	-	-	-	-	-	-
25-Aug-90	-	-	-	-	-	-	-	-	-	-
26-Aug-90	-	-	-	-	-	-	-	-	-	-
27-Aug-90	-	-	-	-	-	-	-	-	-	-
28-Aug-90	-	-	-	-	-	-	-	-	-	-
29-Aug-90	-	-	-	-	-	-	-	-	-	-
30-Aug-90	69.1	69.1	68.8	68.6	-	69.0	-	70.6	71.0	-
31-Aug-90	69.1	69.1	68.8	68.6	-	68.9	-	70.6	71.0	-
01-Sep-90	69.1	69.2	68.9	68.6	-	68.8	-	70.6	71.0	-
02-Sep-90	69.1	69.1	68.9	68.6	-	68.8	-	70.6	71.0	-
03-Sep-90	69.1	69.1	68.8	68.6	-	68.8	-	70.6	71.0	-
04-Sep-90	69.1	69.1	68.8	68.6	-	68.8	-	70.6	71.0	-
05-Sep-90	69.1	69.1	68.9	68.6	-	68.8	-	70.6	71.0	-
06-Sep-90	69.1	69.2	68.9	68.6	-	68.8	70.5	70.7	71.0	-
07-Sep-90	69.1	69.1	68.9	68.6	-	68.6	70.7	70.6	71.0	-
08-Sep-90	69.1	69.1	68.9	68.6	-	68.6	70.7	70.6	71.1	-
09-Sep-90	69.1	69.1	68.8	68.5	-	68.6	70.5	70.6	71.1	-

Kartchner Caverns - Big Room Averages of Daily Temperatures (°F)

	EMS #22 Kartchner Twrs			EMS #19 Lovers' Leap			Guano 9C			Bat
DATE	Wb	Db	Soil	Wb	Db	Soil	Shallow	Deep	Ceiling	House
10-Sep-90	69.1	69.1	68.8	68.5	-	68.6	70.7	70.6	71.1	-
11-Sep-90	69.1	69.1	68.8	68.5	-	68.6	70.7	70.6	71.1	-
12-Sep-90	69.1	69.1	68.8	68.6	-	68.6	70.8	70.6	71.0	-
13-Sep-90	69.1	69.2	68.8	68.6	-	68.6	70.7	70.6	71.1	-
14-Sep-90	69.1	69.2	68.9	68.6	-	68.6	70.8	70.6	71.1	-
15-Sep-90	69.2	69.2	68.9	68.6	-	68.6	70.8	70.6	71.1	-
16-Sep-90	69.2	69.2	68.9	68.6	-	68.6	70.8	70.6	71.1	-
17-Sep-90	69.2	69.2	68.9	68.6	-	68.5	70.8	70.6	71.1	-
18-Sep-90	69.1	69.2	68.9	68.6	-	68.5	70.8	70.6	71.1	-
19-Sep-90	69.1	69.2	68.9	68.6	-	68.5	70.8	70.6	71.1	-
20-Sep-90	69.2	69.2	68.9	68.6	-	68.5	70.8	70.6	71.1	-
21-Sep-90	69.2	69.2	69.0	68.6	-	68.5	70.7	70.6	71.1	-
22-Sep-90	69.2	69.2	69.0	68.6	-	68.5	70.8	70.6	71.1	-
23-Sep-90	69.2	69.2	69.0	68.6	-	68.5	70.7	70.6	71.1	-
24-Sep-90	69.2	69.2	69.0	68.6	-	68.5	70.6	70.6	71.1	-
25-Sep-90	69.2	69.2	68.9	68.6	-	68.4	70.7	70.6	71.1	-
26-Sep-90	69.2	69.2	68.9	68.6	-	68.5	70.8	70.6	71.2	69.4
27-Sep-90	69.2	69.2	68.9	68.6	-	68.5	70.8	70.6	71.1	69.5
28-Sep-90	69.2	69.2	68.9	68.6	-	68.4	70.8	70.6	71.1	69.4
29-Sep-90	69.2	69.2	68.9	68.6	-	68.4	70.8	70.6	71.2	69.4
30-Sep-90	69.2	69.3	69.0	68.6	-	68.4	70.8	70.6	71.1	69.8
01-Oct-90	69.2	69.2	69.0	68.6	-	68.4	70.8	70.6	71.1	69.9
02-Oct-90	69.2	69.3	69.0	68.6	-	68.4	70.8	70.6	71.1	69.5
03-Oct-90	69.2	69.3	69.1	68.6	-	68.4	70.8	70.6	71.1	69.4
04-Oct-90	69.2	69.3	69.1	68.6	-	68.4	70.8	70.6	71.1	69.4
05-Oct-90	69.2	69.2	69.0	68.5	-	68.4	70.8	70.6	71.1	69.4
06-Oct-90	69.2	69.3	69.0	68.5	-	68.4	70.8	70.6	71.1	69.4
07-Oct-90	69.2	69.3	69.0	68.5	-	68.4	70.7	70.6	71.1	69.4
08-Oct-90	69.2	69.3	69.0	68.6	-	68.4	70.7	70.6	71.1	69.5
09-Oct-90	69.2	69.3	69.1	68.6	-	68.4	70.7	70.6	71.1	69.5
10-Oct-90	69.2	69.3	69.1	68.6	-	68.4	70.7	70.6	71.1	69.4
11-Oct-90	69.2	69.3	69.0	68.6	-	68.4	70.7	70.6	71.1	69.5
12-Oct-90	69.2	69.3	69.1	68.6	-	68.4	70.7	70.6	71.1	69.5
13-Oct-90	69.2	69.3	69.1	68.5	-	68.4	70.7	70.5	71.0	69.5
14-Oct-90	69.2	69.3	69.1	68.5	-	68.4	70.7	70.5	71.0	69.4
15-Oct-90	69.2	69.3	69.1	68.5	-	68.4	70.7	70.5	71.0	69.3
16-Oct-90	69.2	69.3	69.1	68.5	-	68.4	70.7	70.5	71.0	69.4
17-Oct-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	71.0	69.6
18-Oct-90	69.3	69.3	69.1	68.5	-	68.4	70.7	70.5	71.0	69.6
19-Oct-90	69.2	69.2	69.0	68.5	-	68.4	70.7	70.5	71.0	70.0
20-Oct-90	69.3	69.3	69.0	68.6	-	68.4	70.7	70.6	71.0	70.3
21-Oct-90	69.3	69.3	69.1	68.7	-	68.4	70.7	70.5	71.0	70.4
22-Oct-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	71.0	70.2
23-Oct-90	69.3	69.3	69.1	68.6	-	68.5	70.7	70.5	71.0	70.3
24-Oct-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	71.0	70.1
25-Oct-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	71.0	70.1

Kartchner Caverns – Big Room Averages of Daily Temperatures (°F)

	EMS #22 Kartchner Twrs			EMS #19 Lovers' Leap			Guano 9C			Bat
DATE	Wb	Db	Soil	Wb	Db	Soil	Shallow	Deep	Ceiling	House
26-Oct-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	71.0	69.9
27-Oct-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	70.9	69.9
28-Oct-90	69.3	69.4	69.1	68.6	-	68.4	70.7	70.5	70.9	69.7
29-Oct-90	69.3	69.4	69.1	68.6	-	68.4	70.7	70.5	71.0	69.7
30-Oct-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	70.9	69.7
31-Oct-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	70.9	69.7
01-Nov-90	69.3	69.3	69.1	68.5	-	68.4	70.7	70.5	70.9	69.9
02-Nov-90	69.3	69.3	69.1	68.6	-	68.4	70.7	70.5	71.0	69.9
03-Nov-90	69.3	69.4	69.2	68.8	-	68.4	70.7	70.5	70.9	69.9
04-Nov-90	69.4	69.4	69.2	68.9	-	68.5	70.7	70.6	70.9	69.9
05-Nov-90	69.3	69.4	69.2	68.8	-	68.5	70.7	70.5	70.9	69.7
06-Nov-90	69.3	69.4	69.2	68.7	-	68.5	70.7	70.5	70.9	69.7
07-Nov-90	69.3	69.4	69.2	68.9	-	68.5	70.7	70.5	70.9	69.7
08-Nov-90	69.4	69.4	69.3	69.1	72.2	68.6	70.6	70.4	70.9	69.8
09-Nov-90	69.4	69.4	69.3	69.1	-	68.7	70.7	70.5	70.9	70.0
10-Nov-90	69.4	69.4	69.3	69.0	-	68.7	70.7	70.5	70.9	70.0
11-Nov-90	69.4	69.4	69.3	69.0	-	68.7	70.7	70.5	70.9	70.0
12-Nov-90	69.4	69.4	69.2	69.0	-	68.7	70.7	70.5	70.8	69.9
13-Nov-90	69.4	69.4	69.2	69.0	-	68.7	70.7	70.5	70.8	69.8
14-Nov-90	69.4	69.4	69.2	69.0	-	68.7	70.7	70.5	70.8	69.9
15-Nov-90	69.4	69.4	69.2	69.0	-	68.7	70.7	70.5	70.8	69.7
16-Nov-90	69.4	69.4	69.3	68.9	-	68.7	70.7	70.5	70.7	69.7
17-Nov-90	69.4	69.4	69.2	68.9	-	68.7	70.6	70.5	70.7	69.7
18-Nov-90	69.4	69.4	69.2	68.9	-	68.7	70.6	70.5	70.7	69.8
19-Nov-90	69.4	69.4	69.2	68.8	-	68.6	70.6	70.5	70.7	69.8
20-Nov-90	69.4	69.4	69.1	68.7	-	68.6	70.6	70.5	70.7	69.8
21-Nov-90	69.4	69.5	69.2	69.0	-	68.7	70.6	70.5	70.7	69.9
22-Nov-90	69.4	69.5	69.3	69.1	-	68.7	70.6	70.5	70.6	69.9
23-Nov-90	69.4	69.4	69.3	69.0	-	68.7	70.6	70.5	70.6	69.8
24-Nov-90	69.4	69.4	69.3	69.0	-	68.7	70.6	70.5	70.6	69.8
25-Nov-90	69.4	69.6	69.4	69.0	-	68.9	70.7	70.6	70.6	69.7
26-Nov-90	-	69.5	69.3	68.9	-	68.8	70.7	70.6	70.6	69.6
27-Nov-90	-	69.6	69.4	69.2	-	68.9	70.7	70.6	70.6	69.6
01-Dec-90	-	69.6	69.4	69.2	-	69.0	70.6	70.5	70.5	69.5
02-Dec-90	-	69.6	69.4	69.2	-	69.0	70.7	70.5	70.5	69.5
03-Dec-90	-	69.6	69.5	69.2	-	69.0	70.6	70.5	70.5	69.5
04-Dec-90	-	69.6	69.5	69.2	-	69.0	70.6	70.5	70.5	69.5
05-Dec-90	-	69.6	69.5	69.3	-	69.0	70.6	70.5	70.5	69.5
06-Dec-90	-	69.6	69.5	69.3	-	69.0	70.6	70.5	70.5	69.4
07-Dec-90	-	69.6	69.5	69.3	-	69.0	70.6	70.4	70.4	69.4
08-Dec-90	-	69.6	69.5	69.2	-	69.0	70.6	70.4	70.4	69.4
09-Dec-90	-	69.6	69.5	69.2	-	69.0	70.5	70.4	70.4	69.4
10-Dec-90	-	69.6	69.4	69.2	-	69.0	70.5	70.4	70.3	69.4
11-Dec-90	-	69.6	69.4	69.2	-	69.0	70.5	70.4	70.3	69.4
12-Dec-90	-	69.6	69.4	69.2	-	69.0	70.5	70.3	70.3	69.5
13-Dec-90	-	69.6	69.4	69.2	-	69.0	70.4	70.3	70.3	69.4

Kartchner Caverns - Big Room Averages of Daily Temperatures (°F)

	EMS #22 Kartchner Twrs			EMS #19 Lovers' Leap			Guano 9C			Bat
DATE	Wb	Db	Soil	Wb	Db	Soil	Shallow	Deep	Ceiling	House
14-Dec-90	-	69.5	69.4	69.1	-	69.0	70.5	70.3	70.2	69.4
15-Dec-90	-	69.6	69.4	69.2	-	69.0	70.4	70.3	70.2	69.3
16-Dec-90	-	69.6	69.4	69.2	-	69.0	70.4	70.3	70.2	69.2
17-Dec-90	-	69.6	69.4	69.3	-	69.0	70.4	70.3	70.2	69.3
18-Dec-90	-	69.6	69.4	69.3	-	69.1	70.4	70.3	70.2	69.3
19-Dec-90	-	69.5	69.4	69.2	-	69.1	70.4	70.2	70.2	69.3
20-Dec-90	-	69.5	69.3	68.9	-	69.0	70.4	70.2	70.1	69.2
21-Dec-90	-	69.5	69.3	68.9	-	68.9	70.3	70.2	70.1	69.2
22-Dec-90	-	69.6	69.3	69.1	-	68.9	70.3	70.2	70.1	69.3
23-Dec-90	-	69.6	69.4	69.3	-	69.0	70.3	70.2	70.1	69.2
24-Dec-90	-	69.6	69.4	69.3	-	69.0	70.3	70.2	70.1	69.2
25-Dec-90	-	69.6	69.4	69.3	-	69.1	70.3	70.2	70.1	69.2
26-Dec-90	-	69.6	69.4	69.3	-	69.1	70.3	70.1	70.1	69.2
27-Dec-90	-	69.5	69.4	69.3	-	69.1	70.3	70.1	70.0	69.2
28-Dec-90	-	69.5	69.4	69.2	-	69.1	70.2	70.1	70.0	69.2
29-Dec-90	-	69.5	69.3	69.1	-	69.0	70.2	70.1	70.0	69.1
30-Dec-90	-	69.5	69.4	69.3	-	69.1	70.2	70.1	70.0	69.2
31-Dec-90	-	69.5	69.4	69.3	-	69.1	70.2	70.0	70.0	69.2
01-Jan-91	-	69.5	69.4	69.3	-	69.1	70.1	70.0	69.9	69.2
02-Jan-91	-	69.5	69.4	69.3	-	69.1	70.1	70.0	69.9	69.1
03-Jan-91	-	69.5	69.4	69.3	-	69.1	70.1	70.0	69.9	69.5
04-Jan-91	-	69.5	69.4	69.2	-	69.1	70.1	70.0	69.9	69.1
05-Jan-91	-	69.5	69.4	69.3	-	69.1	70.1	70.0	69.8	69.2
06-Jan-91	-	69.5	69.4	69.3	-	69.1	70.1	70.0	69.8	69.1
07-Jan-91	-	69.5	69.4	69.3	-	69.1	70.1	70.0	69.8	69.0
08-Jan-91	-	69.5	69.4	69.3	-	69.1	70.1	69.9	69.8	69.0
09-Jan-91	-	69.5	69.4	69.3	-	69.1	70.0	69.9	69.8	69.0
10-Jan-91	-	69.5	69.4	69.3	-	69.1	70.0	69.9	69.8	69.0
11-Jan-91	-	69.5	69.4	69.4	-	69.1	70.0	69.9	69.8	69.0
12-Jan-91	-	69.5	69.3	69.3	-	69.2	70.0	69.9	69.8	69.0
13-Jan-91	-	69.5	69.3	69.3	-	69.2	70.0	69.9	69.7	69.0
14-Jan-91	-	69.5	69.3	69.3	-	69.2	70.0	69.9	69.7	69.0
15-Jan-91	-	69.5	69.3	69.3	-	69.2	70.0	69.8	69.7	68.9
16-Jan-91	-	69.4	69.3	69.3	-	69.2	70.0	69.8	69.7	68.9
17-Jan-91	-	69.5	69.3	69.4	-	69.2	70.0	69.9	69.7	68.9
18-Jan-91	-	69.5	69.3	69.4	-	69.2	70.0	69.8	69.7	68.9
19-Jan-91	-	69.4	69.3	69.3	-	69.2	69.9	69.8	69.7	68.9
20-Jan-91	-	69.4	69.3	69.3	-	69.2	69.9	69.8	69.6	68.9
21-Jan-91	-	69.5	69.3	69.3	-	69.2	69.9	69.8	69.6	69.0
22-Jan-91	-	69.4	69.3	69.3	-	69.2	69.9	69.8	69.6	68.9
23-Jan-91	-	69.4	69.3	69.3	-	69.2	69.9	69.8	69.6	69.0
24-Jan-91	-	69.4	69.3	69.3	-	69.2	69.9	69.8	69.6	68.9
25-Jan-91	-	69.4	69.3	69.3	-	69.2	69.8	69.7	69.6	69.1
26-Jan-91	-	69.4	69.3	69.3	-	69.2	69.9	69.8	69.6	69.0
27-Jan-91	-	69.4	69.3	69.3	-	69.2	69.8	69.7	69.6	68.9
28-Jan-91	-	69.4	69.2	69.2	-	69.2	69.8	69.7	69.5	68.9

Kartchner Caverns - Big Room Averages of Daily Temperatures (°F)

	EMS #22 Kartchner Twrs			EMS #19 Lovers' Leap			Guano 9C			Bat
DATE	Wb	Db	Soil	Wb	Db	Soil	Shallow	Deep	Ceiling	House
29-Jan-91	-	69.4	69.3	69.3	-	69.2	69.9	69.8	69.5	68.8
30-Jan-91	-	69.6	69.4	69.3	-	69.2	69.9	69.8	69.6	-
31-Jan-91	-	69.6	69.4	69.5	-	69.3	69.9	69.9	69.5	69.2
01-Feb-91	-	69.5	69.4	69.6	-	69.4	70.0	69.9	69.5	69.1
02-Feb-91	-	69.5	69.4	69.5	-	69.5	70.0	69.9	69.5	69.1
03-Feb-91	-	69.5	69.4	69.5	-	69.5	69.9	69.9	69.5	69.1
04-Feb-91	-	69.5	69.3	69.5	-	69.5	69.9	69.9	69.5	69.1
05-Feb-91	-	69.5	69.3	69.4	-	69.5	69.9	69.8	69.5	-
06-Feb-91	-	69.5	69.3	69.4	-	69.5	69.9	69.8	69.5	-
07-Feb-91	-	69.4	69.3	69.4	-	69.5	69.9	69.8	69.5	-
08-Feb-91	-	69.4	69.3	69.4	-	69.5	69.9	69.8	69.5	-
09-Feb-91	-	69.4	69.3	69.4	-	69.5	69.9	69.8	69.5	-
10-Feb-91	-	69.4	69.3	69.4	-	69.5	69.8	69.8	69.4	68.9
11-Feb-91	-	69.4	69.3	69.4	-	69.4	69.8	69.8	69.4	68.8
12-Feb-91	-	-	-	-	69.1	-	-	-	69.4	68.9
13-Feb-91	69.7	69.6	69.3	-	69.1	69.5	70.1	70.0	69.4	69.2
14-Feb-91	69.7	69.6	69.3	-	69.1	69.4	70.1	70.0	69.4	69.4
15-Feb-91	69.7	69.6	69.3	-	69.1	69.4	70.1	70.0	69.4	69.0
16-Feb-91	69.6	69.6	69.2	-	69.0	69.4	70.0	70.0	69.4	69.0
17-Feb-91	69.6	69.6	69.2	-	69.0	69.3	70.1	70.0	69.4	68.9
18-Feb-91	69.6	69.6	69.2	-	69.1	69.4	70.1	70.0	69.4	68.8
19-Feb-91	69.6	69.6	69.2	-	69.1	69.4	70.1	70.0	69.4	68.7
20-Feb-91	69.6	69.6	69.2	-	69.1	69.4	70.0	70.0	69.4	68.7
21-Feb-91	69.6	69.6	69.2	-	69.1	69.4	70.0	70.0	69.4	68.7
22-Feb-91	69.6	69.6	69.2	-	69.0	69.4	70.0	70.0	69.3	68.6
23-Feb-91	69.6	69.5	69.2	-	69.0	69.4	70.0	70.0	69.3	68.6
24-Feb-91	69.6	69.5	69.2	-	69.0	69.4	70.0	70.1	69.3	68.6
25-Feb-91	69.6	69.5	69.2	-	69.0	69.4	70.0	70.1	69.3	68.6
26-Feb-91	69.6	69.5	69.2	-	69.0	69.4	70.0	70.0	69.3	68.6
27-Feb-91	69.5	69.5	69.2	-	69.0	69.4	70.0	70.0	69.3	68.6
28-Feb-91	69.5	69.5	69.2	-	69.0	69.3	70.0	70.0	69.3	68.6
01-Mar-91	69.5	69.4	69.1	69.2	68.9	69.3	70.0	70.0	69.3	68.8
02-Mar-91	69.5	69.5	69.1	69.4	69.0	69.3	70.0	70.1	69.3	69.0
03-Mar-91	69.5	69.5	69.2	69.4	69.0	69.3	70.0	70.2	69.3	69.0
04-Mar-91	69.5	69.5	69.2	69.4	69.0	69.4	70.0	70.2	69.3	68.9
05-Mar-91	69.5	69.5	69.2	69.3	69.0	69.3	69.9	70.3	69.3	69.0
06-Mar-91	69.5	69.5	69.1	69.3	69.0	69.3	69.9	70.3	69.3	68.9
07-Mar-91	69.5	69.5	69.2	69.4	69.0	69.3	69.9	70.4	69.3	68.9
08-Mar-91	69.5	69.5	69.1	69.4	69.0	69.4	69.9	70.2	69.3	68.9
09-Mar-91	69.5	69.5	69.2	69.4	69.0	69.4	69.9	70.0	69.3	68.9
10-Mar-91	69.5	69.4	69.1	69.3	69.0	69.3	69.9	69.9	69.3	68.9
11-Mar-91	69.4	69.4	69.1	69.3	68.9	69.3	69.9	70.0	69.3	68.9
12-Mar-91	69.4	69.4	69.1	69.3	69.0	69.3	69.9	69.9	69.3	68.9
13-Mar-91	69.4	69.4	69.1	69.4	69.0	69.3	69.9	69.9	69.2	68.9
14-Mar-91	69.5	69.4	69.1	69.3	69.0	69.3	69.9	69.9	69.2	68.9
15-Mar-91	69.4	69.4	69.1	69.3	69.0	69.3	69.8	69.9	69.2	68.9

Kartchner Caverns – Big Room Averages of Daily Temperatures (°F)

	EMS #22 Kartchner Twrs			EMS #19 Lovers' Leap			Guano 9C			Bat
DATE	Wb	Db	Soil	Wb	Db	Soil	Shallow	Deep	Ceiling	House
16-Mar-91	69.4	69.4	69.1	69.4	69.0	69.3	69.9	70.0	69.2	68.9
17-Mar-91	69.4	69.4	69.1	69.4	69.0	69.4	69.9	70.0	69.2	68.9
18-Mar-91	69.4	69.4	69.1	69.3	69.0	69.3	69.8	70.0	69.2	68.9
19-Mar-91	69.4	69.4	69.1	69.3	68.9	69.3	69.8	70.0	69.2	68.9
20-Mar-91	69.4	69.4	69.1	69.3	69.0	69.3	69.8	69.9	69.2	68.9
21-Mar-91	69.4	69.4	69.1	69.3	68.9	69.3	69.8	69.9	69.2	68.9
22-Mar-91	69.4	69.4	69.1	69.3	69.0	69.3	69.8	69.9	69.2	68.9
23-Mar-91	69.4	69.4	69.1	69.4	69.0	69.3	69.8	69.9	69.2	68.8
24-Mar-91	69.4	69.4	69.0	69.3	69.0	69.3	69.8	69.9	69.2	68.8
25-Mar-91	69.4	69.3	69.0	69.3	68.9	69.3	69.8	69.9	69.2	68.8
26-Mar-91	69.3	69.3	69.0	69.2	68.9	69.3	69.8	69.9	69.2	68.8
27-Mar-91	69.3	69.3	69.0	69.3	68.9	69.3	69.8	69.9	69.2	68.8
28-Mar-91	69.3	69.3	69.0	69.3	69.0	69.3	69.8	69.9	69.2	68.8
29-Mar-91	69.4	69.3	69.0	69.3	69.0	69.3	69.8	69.9	69.2	68.8
30-Mar-91	69.3	69.3	69.0	69.3	69.0	69.3	69.8	69.9	69.2	68.8
31-Mar-91	69.3	69.3	69.0	69.3	68.9	69.3	69.8	69.9	69.1	68.8
01-Apr-91	69.3	69.3	69.0	69.3	68.9	69.3	69.8	69.8	69.1	68.8
02-Apr-91	69.3	69.3	69.0	69.3	68.9	69.3	69.8	69.8	69.1	68.8
03-Apr-91	69.3	69.3	69.0	69.3	68.9	69.3	69.8	69.8	69.1	68.8
04-Apr-91	69.3	69.3	69.0	69.3	68.9	69.3	69.8	69.8	69.1	68.8
05-Apr-91	69.3	69.3	69.0	69.3	68.9	69.3	69.8	69.8	69.1	68.8
06-Apr-91	69.3	69.2	69.0	69.3	68.9	69.3	69.8	69.8	69.1	68.7
07-Apr-91	69.3	69.2	69.0	69.2	68.9	69.3	69.8	69.8	69.1	68.8
08-Apr-91	69.3	69.2	69.0	69.2	68.9	69.3	69.7	69.8	69.1	68.8
09-Apr-91	69.3	69.3	69.0	69.3	68.9	69.3	69.8	69.8	69.1	68.8
10-Apr-91	69.2	69.2	69.0	69.2	68.9	69.3	69.7	69.8	69.1	68.7
11-Apr-91	69.2	69.2	68.9	69.2	68.8	69.3	69.8	69.8	69.1	68.8
12-Apr-91	-	69.2	-	-	69.2	69.3	-	-	69.1	68.8
13-Apr-91	69.3	69.3	-	69.3	69.3	69.3	70.0	69.8	69.1	68.7
14-Apr-91	69.3	69.3	-	69.2	69.3	69.3	70.0	69.8	69.1	68.7
15-Apr-91	69.3	69.3	-	69.2	69.3	69.3	70.0	69.8	69.0	68.7
16-Apr-91	69.3	69.3	-	69.2	69.3	69.2	70.0	69.8	69.1	68.7
17-Apr-91	69.4	69.2	-	69.0	69.2	69.3	70.1	70.0	69.1	68.7
18-Apr-91	69.5	69.2	-	68.5	69.1	69.3	-	-	69.1	68.8
19-Apr-91	69.4	69.3	-	69.1	69.2	69.2	70.1	69.9	69.1	68.7
20-Apr-91	69.3	69.3	-	69.2	69.3	69.2	70.0	69.8	69.1	68.8
21-Apr-91	69.3	69.3	-	69.2	69.2	69.2	70.0	69.8	69.1	68.8
22-Apr-91	69.3	69.3	-	69.3	69.3	69.2	69.9	69.7	69.0	68.8
23-Apr-91	69.3	69.3	-	69.3	69.3	69.2	69.9	69.8	69.1	68.8
24-Apr-91	69.4	69.2	-	68.9	69.2	69.3	70.2	70.1	69.0	68.8
25-Apr-91	69.4	69.3	-	69.2	69.2	69.2	70.0	69.8	69.1	68.8
26-Apr-91	69.4	69.3	-	69.3	69.3	69.2	69.9	69.7	69.1	68.8
27-Apr-91	69.3	69.3	-	69.3	69.2	69.2	69.9	69.8	69.1	68.8
28-Apr-91	69.3	69.3	-	69.3	69.3	69.2	69.9	69.8	69.1	69.0
29-Apr-91	69.3	69.3	-	69.3	69.3	69.2	69.9	69.8	69.1	69.0
30-Apr-91	69.3	69.3	-	69.2	69.3	69.2	70.0	69.8	69.1	-

Kartchner Caverns – Big Room Averages of Daily Temperatures (°F)

	EMS #22 Kartchner Twrs			EMS #19 Lovers' Leap			Guano 9C			Bat
DATE	Wb	Db	Soil	Wb	Db	Soil	Shallow	Deep	Ceiling	House
01-May-91	69.3	69.3	-	69.2	69.3	69.2	69.9	69.7	69.1	68.6
02-May-91	69.3	69.3	-	69.2	69.3	69.2	69.9	69.8	69.1	68.5
03-May-91	69.4	69.3	-	69.3	69.2	69.2	69.9	69.7	69.1	68.6
04-May-91	69.3	69.3	-	69.3	69.3	69.2	69.9	69.8	69.1	69.0
05-May-91	69.3	69.3	-	69.3	69.3	69.3	70.0	69.8	69.1	68.9
06-May-91	69.3	69.2	-	69.2	69.3	69.2	70.0	69.8	69.1	68.7
07-May-91	69.3	69.2	-	69.2	69.3	69.3	70.0	69.8	69.1	68.8
08-May-91	69.3	69.2	-	69.2	69.3	69.2	70.0	69.8	69.1	68.7
09-May-91	69.2	69.2	-	69.3	69.3	69.2	70.0	69.8	69.1	68.6
10-May-91	69.2	69.2	-	69.2	69.2	69.2	70.0	69.7	69.1	-
11-May-91	69.2	69.2	-	69.2	69.3	69.2	70.0	69.8	69.1	-
12-May-91	69.3	69.2	-	69.3	69.3	69.2	70.0	69.8	69.1	-
13-May-91	69.3	69.2	-	69.2	69.3	69.2	70.0	69.8	69.1	-
14-May-91	69.3	69.2	-	69.2	69.3	69.2	70.0	69.8	69.1	-
15-May-91	69.3	69.2	-	69.3	69.3	69.2	69.9	69.8	69.1	-
16-May-91	69.2	69.2	-	69.3	69.3	69.2	70.0	69.8	69.1	-
17-May-91	69.2	69.2	-	69.3	69.2	69.2	70.0	69.8	69.2	-
18-May-91	69.2	69.2	-	69.3	69.3	69.2	69.9	69.7	69.2	-
19-May-91	69.2	69.2	-	69.3	69.3	69.2	69.9	69.7	69.2	-
20-May-91	69.3	69.2	-	69.3	69.3	69.2	69.9	69.8	69.3	-
21-May-91	69.3	69.2	-	69.3	69.3	69.2	69.9	69.8	69.3	-
22-May-91	69.3	69.2	-	69.3	69.3	69.2	69.9	69.7	69.3	-
23-May-91	69.3	69.2	-	69.3	69.3	69.2	70.0	69.8	69.3	-
24-May-91	69.3	69.2	-	69.3	69.2	69.2	69.9	69.7	69.4	-
25-May-91	69.2	69.2	-	69.3	69.2	69.2	69.9	69.7	69.4	-
26-May-91	69.2	69.2	-	69.4	69.2	69.2	69.9	69.7	69.4	-
27-May-91	69.2	69.2	-	69.4	69.2	69.1	69.9	69.7	69.5	-
28-May-91	69.2	69.2	-	69.4	69.2	69.2	69.9	69.7	69.5	-
29-May-91	69.3	69.2	-	69.3	69.2	69.2	69.9	69.8	69.5	-
30-May-91	69.2	69.2	-	69.4	69.1	69.1	69.9	69.7	69.5	-
31-May-91	69.2	69.2	-	69.4	69.2	69.2	69.9	69.7	69.6	-
Average	**69.46**	**69.44**	**69.22**	**68.96**	**69.03**	**69.01**	**70.24**	**70.12**	**70.20**	**69.32**
Std. Dev.	**0.29**	**0.26**	**0.29**	**0.36**	**0.44**	**0.34**	**0.36**	**0.34**	**0.82**	**0.44**
Corr. Ave.	**69.01**	**69.29**	**68.77**	**68.31**	**68.18**	**68.51**				

APPENDIX D

Environmental Monitoring Station Data
April 1989 - May 1991

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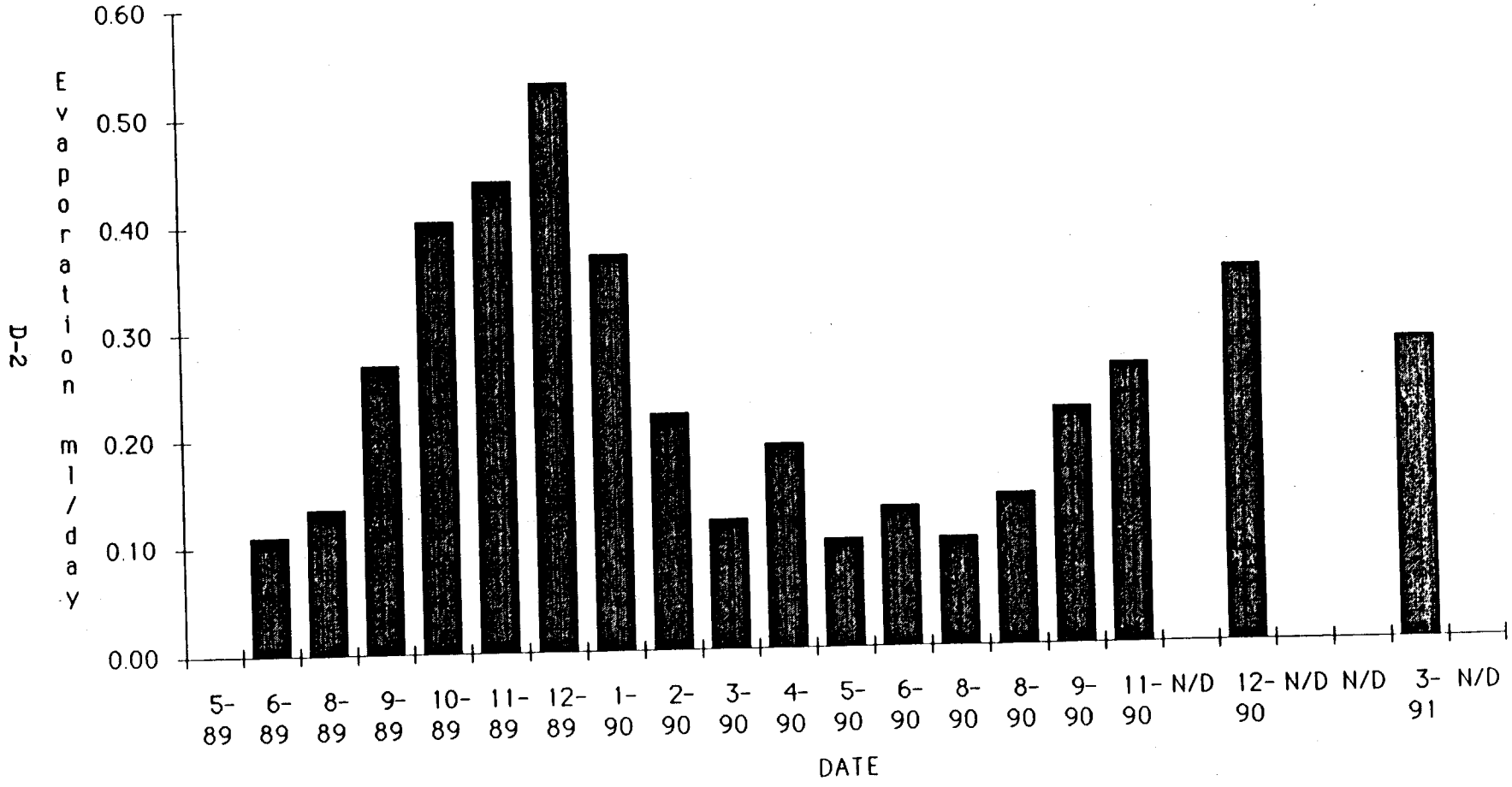
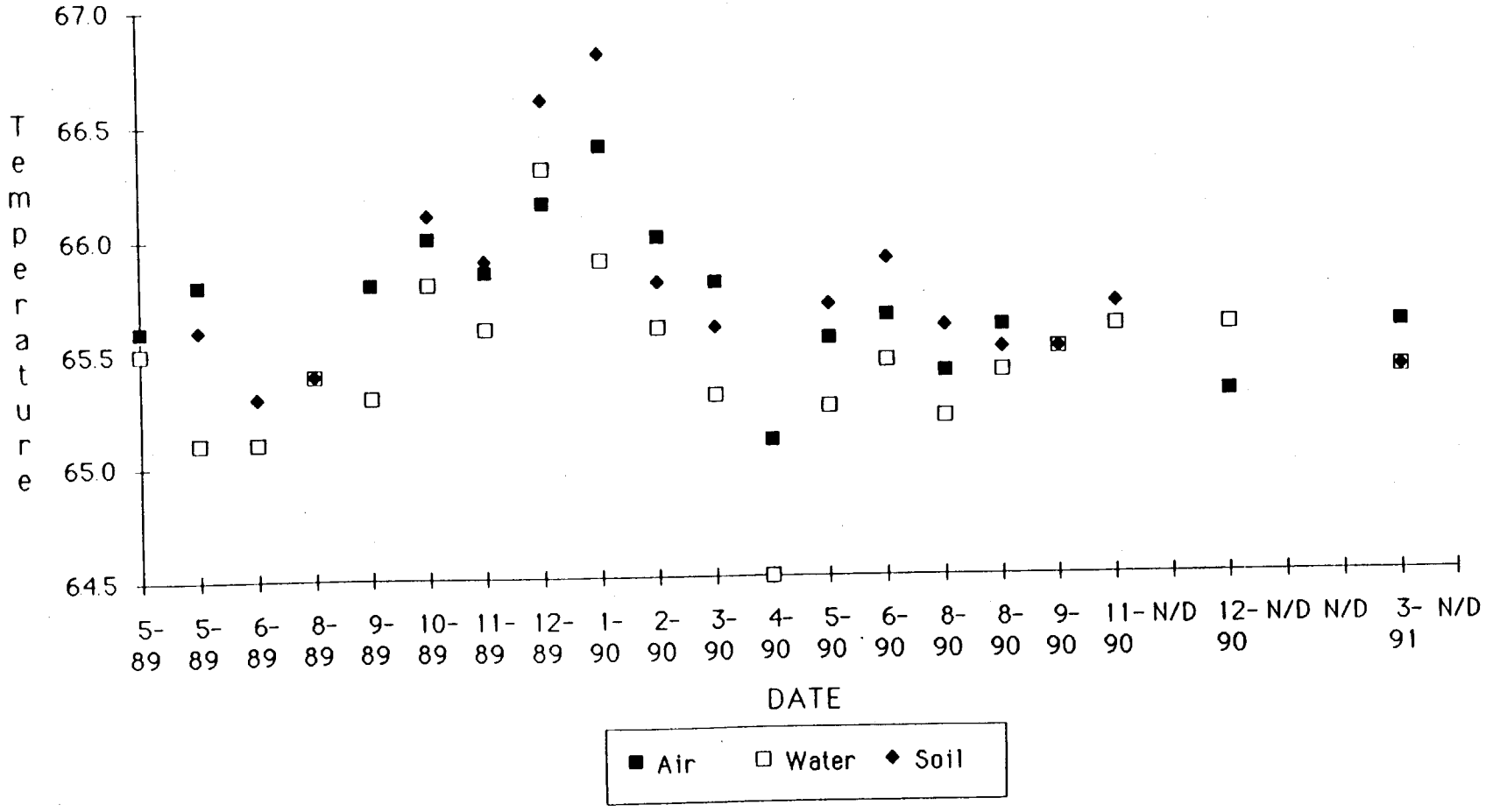
KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
1-Crow's Nest Rock	04/16/89	05/09/89	Bad data	65.5	65.6	65.6	100.00	-	-	-	-	-	-	-
1-Crow's Nest Rock	05/09/89	05/31/89	Bad data	65.1	65.8	65.6	98.50	-	-	-	-	-	-	-
1-Crow's Nest Rock	05/31/89	06/28/89	0.11	65.1	65.1	65.3	99.50	-	-	-	-	-	-	-
1-Crow's Nest Rock	06/28/89	08/19/89	0.14	65.4	65.4	65.4	-	-	-	-	-	-	-	-
1-Crow's Nest Rock	08/19/89	09/14/89	0.27	65.3	65.8	65.8	98.00	-	-	-	-	-	-	-
1-Crow's Nest Rock	09/14/89	10/15/89	0.40	65.8	66.0	66.1	99.00	11	65.9	66.2	65.5	65.1	65.1	64.9
1-Crow's Nest Rock	10/15/89	11/16/89	0.44	65.6	65.9	65.9	97.80	11	66.6	66.6	65.9	65.3	65.3	65.1
1-Crow's Nest Rock	11/16/89	12/23/89	0.53	66.3	66.2	66.6	98.28	11	66.9	67.1	65.9	65.3	65.3	65.1
1-Crow's Nest Rock	12/23/89	01/18/90	0.37	65.9	66.4	66.8	98.29	11	66.9	66.9	66.8	65.3	65.3	65.3
1-Crow's Nest Rock	01/18/90	02/17/90	0.22	65.6	66.0	65.8	99.30	11	67.3	67.3	66.9	65.5	65.5	65.3
1-Crow's Nest Rock	02/17/90	03/22/90	0.12	65.3	65.8	65.6	99.89	11	67.1	67.3	66.9	65.1	65.5	65.1
1-Crow's Nest Rock	03/22/90	04/19/90	0.19	64.5	65.1	65.1	99.01	11	66.9	67.3	66.9	65.1	65.3	65.1
1-Crow's Nest Rock	04/19/90	05/18/90	0.10	65.3	65.6	65.7	99.75	11	66.9	67.1	66.8	65.1	65.1	65.1
1-Crow's Nest Rock	05/18/90	06/23/90	0.13	65.5	65.7	65.9	99.75	11	66.9	67.3	66.8	65.1	65.3	65.1
1-Crow's Nest Rock	06/23/90	08/02/90	0.10	65.2	65.4	65.6	99.81	11	66.9	67.3	66.6	65.1	65.1	64.9
1-Crow's Nest Rock	08/02/90	08/26/90	0.14	65.4	65.6	65.5	99.50	11	67.1	67.1	66.9	65.1	65.3	65.1
1-Crow's Nest Rock	08/26/90	09/30/90	0.22	65.5	65.5	65.5	99.64	11	67.3	67.5	67.1	65.3	65.3	65.1
1-Crow's Nest Rock	09/30/90	11/01/90	0.26	65.6	65.6	65.7	99.51	11	67.7	67.7	67.3	65.3	65.3	65.3
1-Crow's Nest Rock	11/01/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
1-Crow's Nest Rock	11/01/90	12/19/90	0.35	65.6	65.3	-	100.00	11	67.7	67.8	67.5	65.5	65.5	65.3
1-Crow's Nest Rock	12/19/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
1-Crow's Nest Rock	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-
1-Crow's Nest Rock	12/19/90	03/10/91	0.28	65.4	65.6	65.4	100.00	11	67.5	67.8	67.3	65.3	65.5	65.3
1-Crow's Nest Rock	03/10/91	N/D	-	-	-	-	-	-	-	-	-	-	-	-
1-Crow's Nest Rock	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-

EMS #1 Crow's Nest Rock



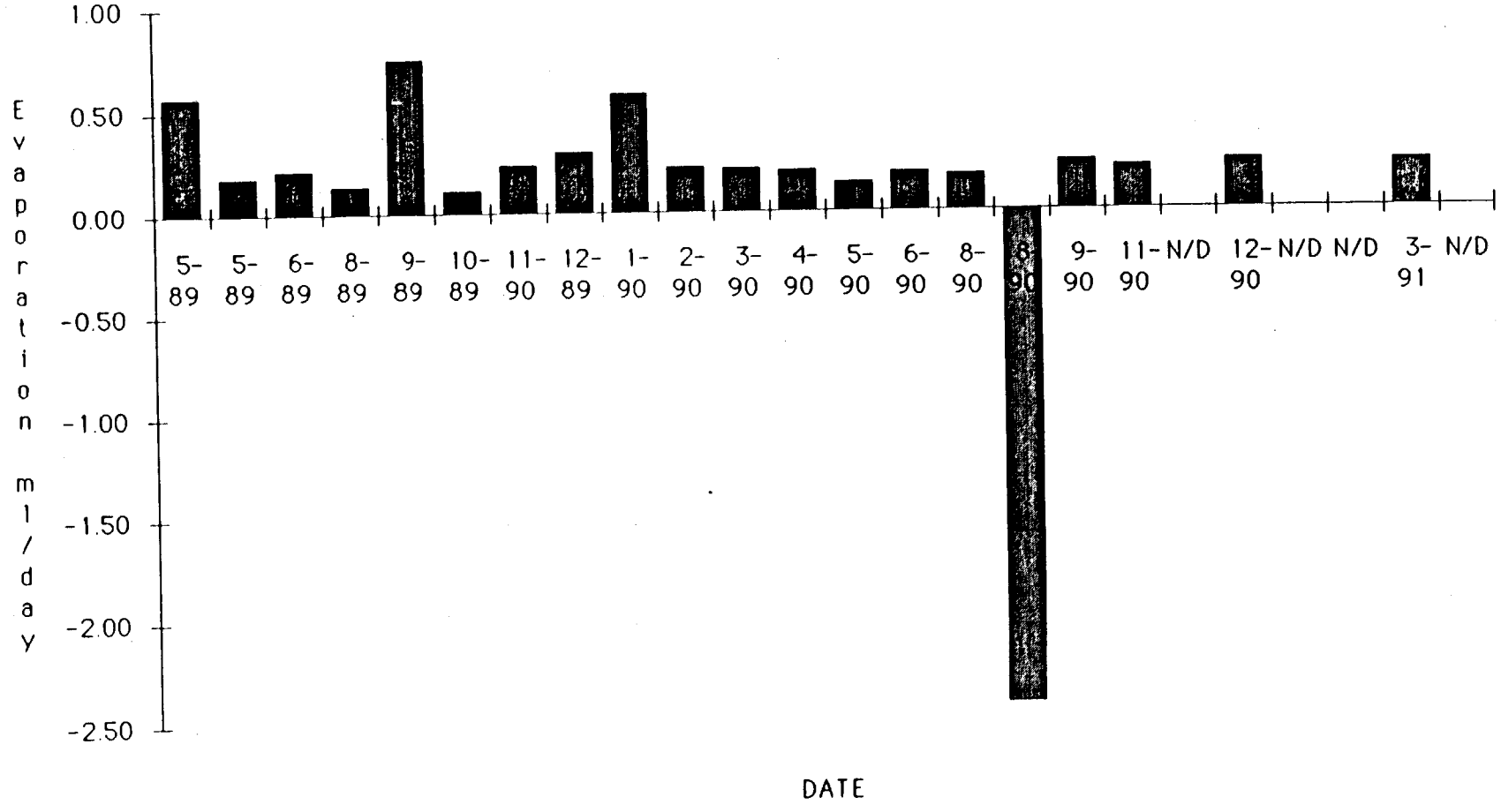
EMS #1 Crow's Nest Rock



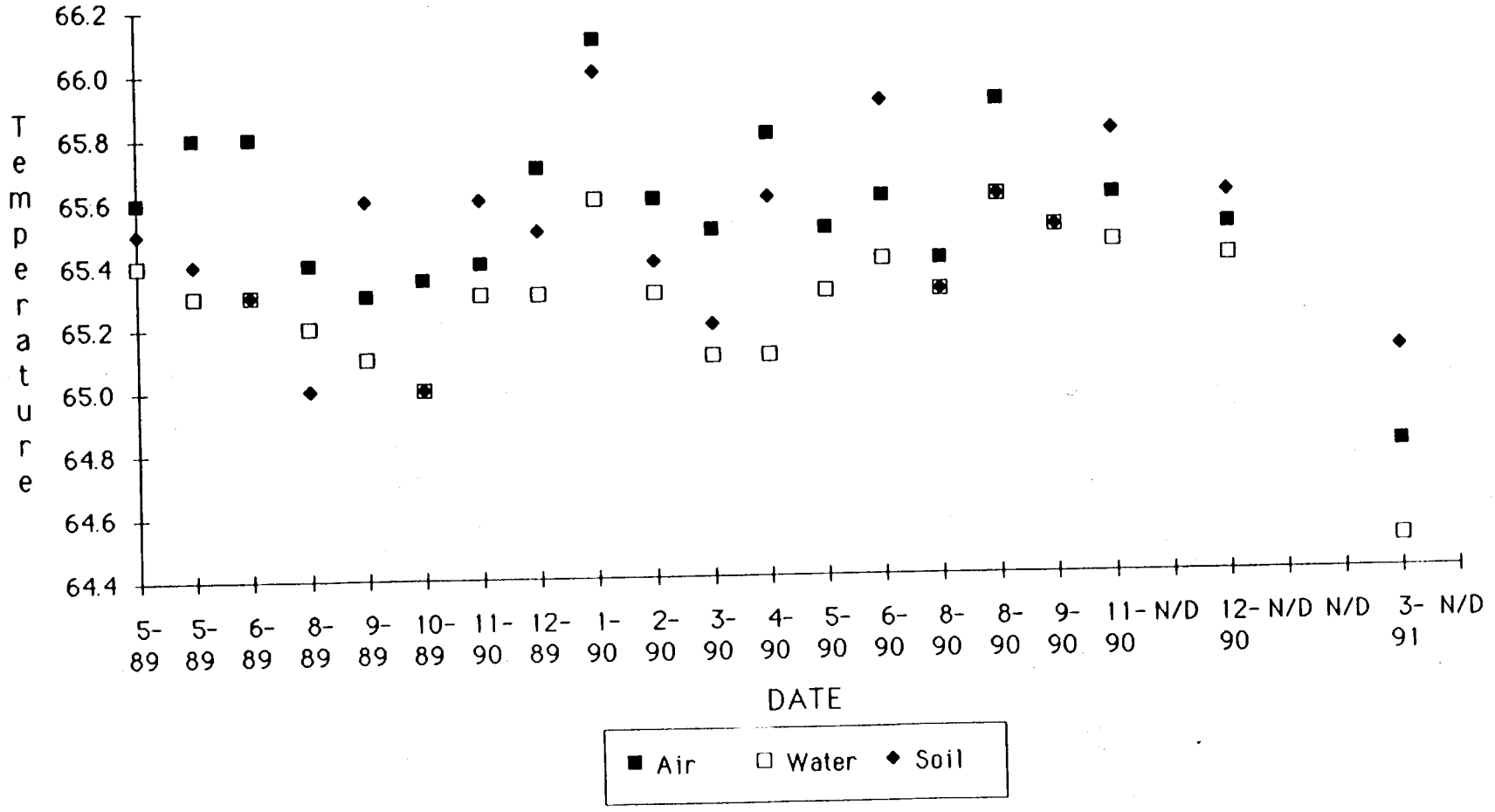
KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
2-Pirate's Den	04/16/89	05/09/89	0.57	65.4	65.6	65.5	-	-	-	-	-	-	-	-
2-Pirate's Den	05/09/89	05/31/89	0.18	65.3	65.8	65.4	99.00	-	-	-	-	-	-	-
2-Pirate's Den	05/31/89	06/28/89	0.21	65.3	65.8	65.3	98.52	-	-	-	-	-	-	-
2-Pirate's Den	06/28/89	08/19/89	0.14	65.2	65.4	65.0	-	-	-	-	-	-	-	-
2-Pirate's Den	08/19/89	09/14/89	0.75	65.1	65.3	65.6	99.51	-	-	-	-	-	-	-
2-Pirate's Den	09/14/89	10/15/89	0.11	65.0	65.4	65.0	98.30	12	65.7	65.7	65.5	65.4	65.4	65.2
2-Pirate's Den	10/15/89	11/16/90	0.23	65.3	65.4	65.6	100.00	12	65.9	65.9	65.7	65.0	65.4	65.0
2-Pirate's Den	11/16/90	12/23/89	0.30	65.3	65.7	65.5	98.52	12	66.1	66.5	65.7	65.2	65.2	65.5
2-Pirate's Den	12/23/89	01/18/90	0.58	65.6	66.1	66.0	98.77	12	66.3	66.3	65.9	65.3	65.2	65.0
2-Pirate's Den	01/18/90	02/17/90	0.22	65.3	65.6	65.4	99.50	12	66.1	66.5	65.9	65.2	65.2	65.0
2-Pirate's Den	02/17/90	03/22/90	0.21	65.1	65.5	65.2	99.70	12	66.1	66.5	65.9	65.2	65.2	65.0
2-Pirate's Den	03/22/90	04/19/90	0.20	65.1	65.8	65.6	98.03	12	66.3	66.3	65.9	65.2	65.2	65.0
2-Pirate's Den	04/19/90	05/18/90	0.14	65.3	65.5	65.5	99.50	12	66.3	66.3	66.1	65.2	65.2	65.0
2-Pirate's Den	05/18/90	06/23/90	0.19	65.4	65.6	65.9	100.00	12	65.9	66.5	66.1	65.2	65.2	65.2
2-Pirate's Den	06/23/90	08/02/90	0.18	65.3	65.4	65.3	99.87	12	66.5	66.8	66.1	65.2	65.2	65.0
2-Pirate's Den	08/02/90	08/26/90	-2.42	65.6	65.9	65.6	100.00	12	67.0	67.0	66.3	65.4	65.4	65.2
2-Pirate's Den	08/26/90	09/30/90	0.24	65.5	65.5	65.5	99.83	12	56.6	67.2	56.4	65.4	65.4	65.4
2-Pirate's Den	09/30/90	11/01/90	0.21	65.5	65.6	65.8	99.51	12	lalfunctic	Thermo	eplace	65.4	65.6	65.2
2-Pirate's Den	11/01/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
2-Pirate's Den	11/01/90	12/19/90	0.24	65.4	65.5	65.6	100.00	18	65.8	66.3	65.2	65.5	65.7	65.5
2-Pirate's Den	12/19/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
2-Pirate's Den	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-
2-Pirate's Den	12/19/90	03/10/91	0.23	64.5	64.8	65.1	100.00	18	66.1	66.3	65.6	65.3	65.5	65.3
2-Pirate's Den	03/10/91	N/D	-	-	-	-	-	-	-	-	-	-	-	-
2-Pirate's Den	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-

EMS #2 Pirate's Den Junction



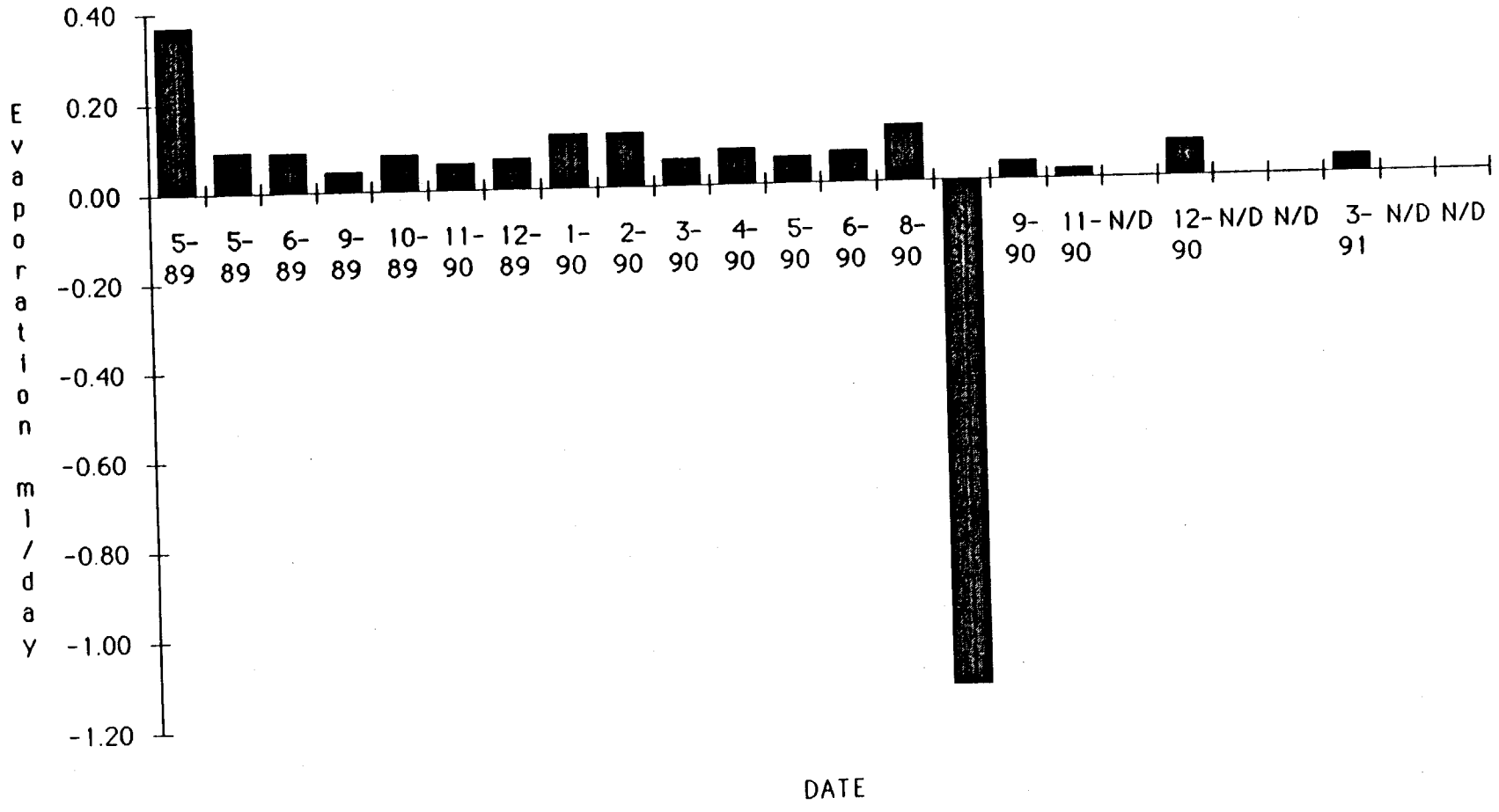
EMS #2 Pirate's Den Junction



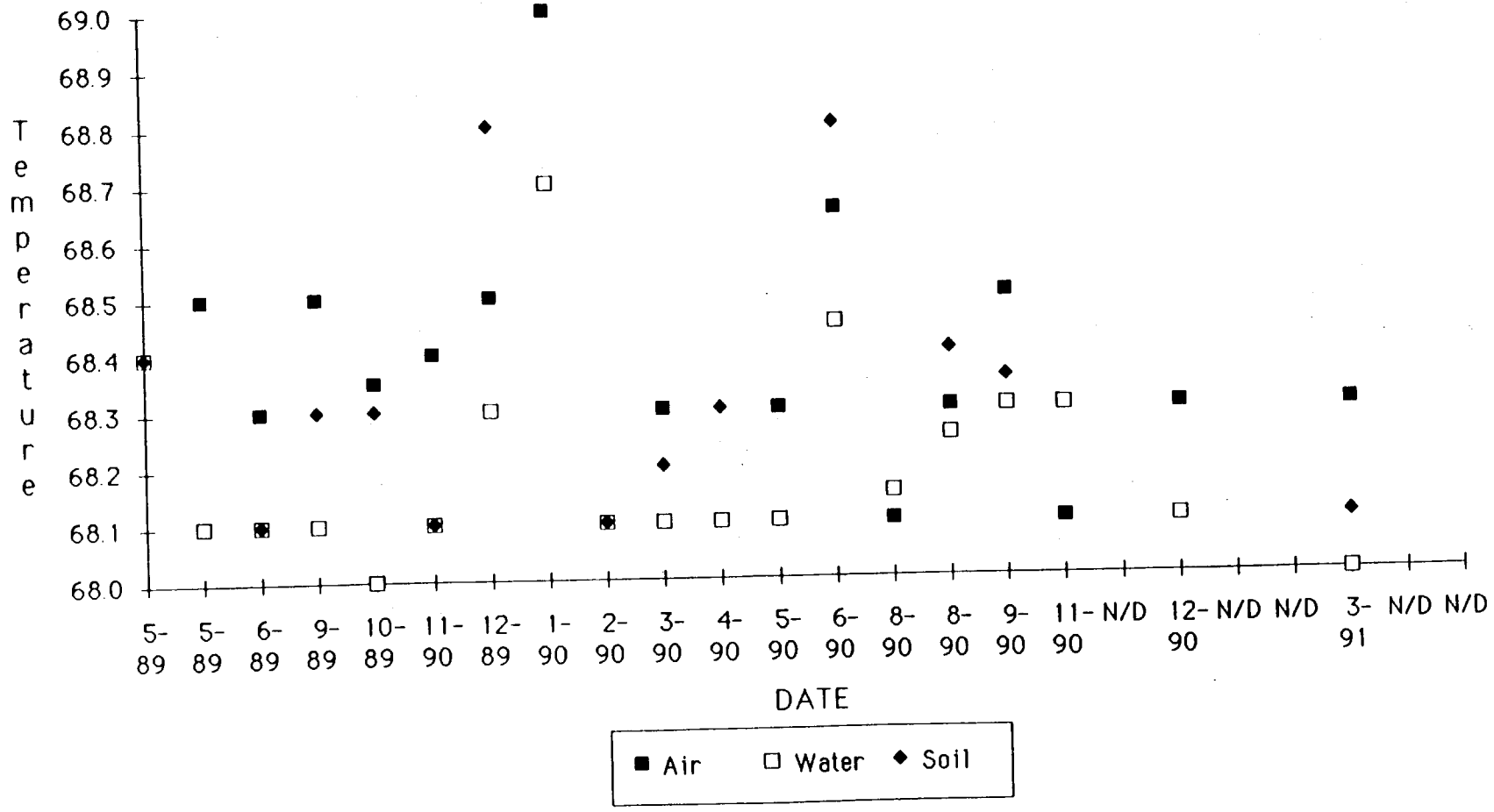
KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
3-Sue's Room	04/16/89	05/09/89	0.37	68.4	68.4	68.4	100.00	-	-	-	-	-	-	-
3-Sue's Room	05/09/89	05/31/89	0.09	68.1	68.5	68.5	99.00	-	-	-	-	-	-	-
3-Sue's Room	05/31/89	06/28/89	0.09	68.1	68.3	68.1	99.00	-	-	-	-	-	-	-
3-Sue's Room	06/28/89	09/14/89	0.05	68.1	68.5	68.3	98.10	-	-	-	-	-	-	-
3-Sue's Room	09/14/89	10/15/89	0.08	68.0	68.4	68.3	99.50	1	68.9	69.8	68.9	68.3	68.3	68.1
3-Sue's Room	10/15/89	11/16/90	0.06	68.1	68.4	68.1	99.50	1	69.1	69.1	68.9	68.5	68.3	68.1
3-Sue's Room	11/16/90	12/23/89	0.07	68.3	68.5	68.8	99.52	1	69.1	69.5	98.9	68.1	68.3	68.1
3-Sue's Room	12/23/89	01/18/90	0.12	68.7	69.0	69.0	98.58	1	69.5	----	69.1	68.3	68.3	68.1
3-Sue's Room	01/18/90	02/17/90	0.12	68.1	68.1	68.1	99.20	1	69.3	69.8	69.1	68.1	68.3	68.1
3-Sue's Room	02/17/90	03/22/90	0.06	68.1	68.3	68.2	99.54	1	69.3	69.5	69.3	68.1	68.3	68.1
3-Sue's Room	03/22/90	04/23/90	0.08	68.1	68.1	68.3	100.00	1	69.5	70.2	69.3	68.3	68.3	68.1
3-Sue's Room	04/23/90	05/18/90	0.06	68.1	68.3	68.3	100.00	1	69.5	70.4	69.5	68.1	68.3	68.1
3-Sue's Room	05/18/90	06/23/90	0.07	68.5	68.7	68.8	99.76	1	69.5	70.2	69.5	68.3	68.4	68.1
3-Sue's Room	06/23/90	08/02/90	0.13	68.2	68.1	68.1	99.82	-	-	-	-	-	-	-
3-Sue's Room	08/02/90	08/26/90	-1.13	68.3	68.3	68.4	100.00	1	69.6	69.8	69.5	68.3	68.4	68.3
3-Sue's Room	08/26/90	09/30/90	0.04	68.3	68.5	68.4	99.36	1	69.8	69.8	69.6	68.3	68.3	68.3
3-Sue's Room	09/30/90	11/01/90	0.02	68.3	68.1	-	98.81	1	69.8	70.2	69.6	68.3	68.3	68.3
3-Sue's Room	11/01/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
3-Sue's Room	11/01/90	12/19/90	0.08	68.1	68.3	68.3	100.00	1	70.2	70.5	69.8	68.3	68.3	68.3
3-Sue's Room	12/19/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
3-Sue's Room	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-
3-Sue's Room	12/19/90	03/10/91	0.04	68.0	68.3	68.1	100.00	1	70.2	70.4	69.8	68.3	68.3	68.3
3-Sue's Room	03/10/91	N/D	-	-	-	-	-	-	-	-	-	-	-	-
3-Sue's Room	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-

EMS #3 Sue's Room



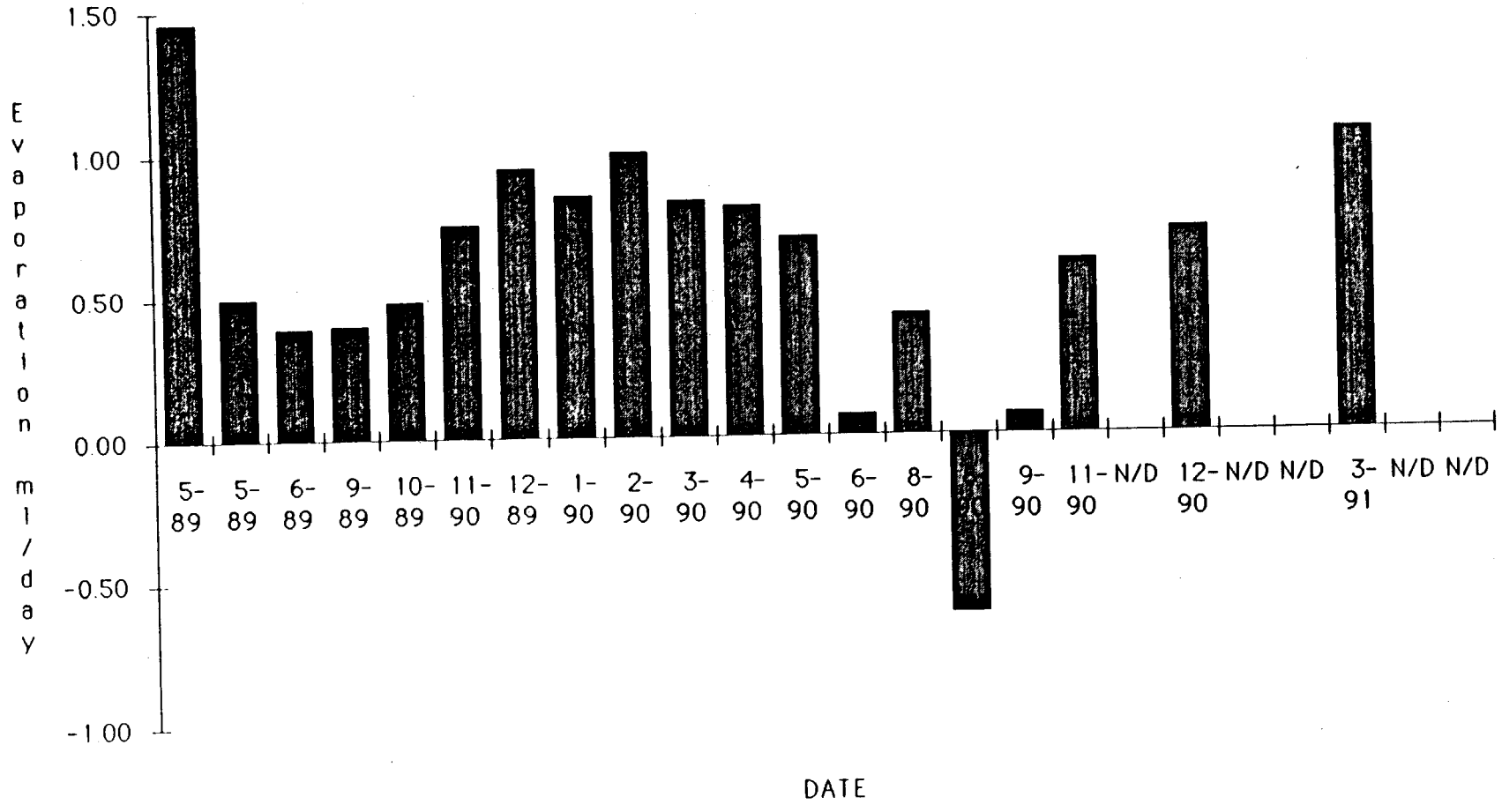
EMS #3 Sue's Room

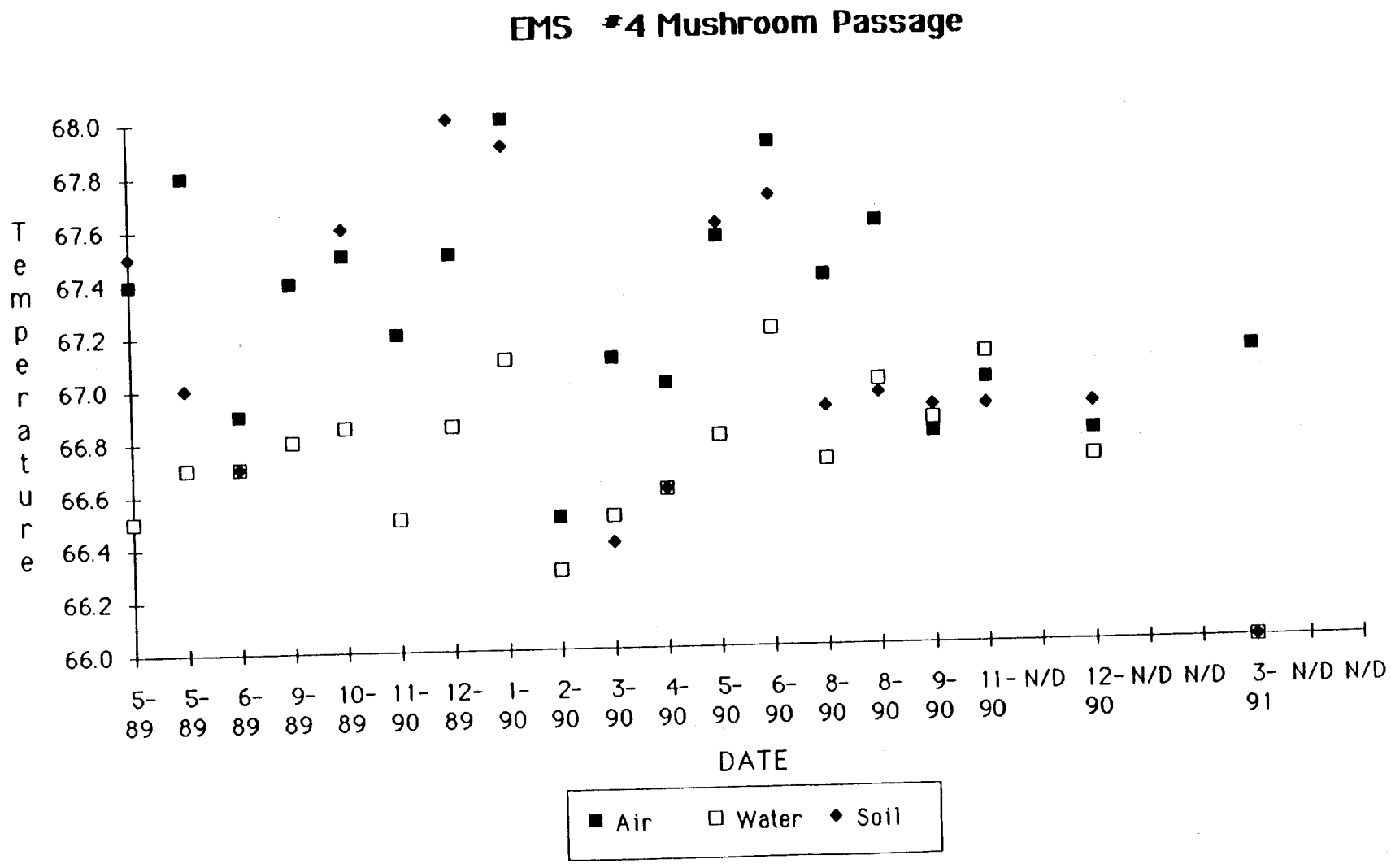


KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
4-Mushroom Passage	04/16/89	05/09/89	1.46	66.5	67.4	67.5	100.00	-	-	-	-	-	-	-
4-Mushroom Passage	05/09/89	05/31/89	0.50	66.7	67.8	67.0	98.10	-	-	-	-	-	-	-
4-Mushroom Passage	05/31/89	06/28/89	0.39	66.7	66.9	66.7	98.55	-	-	-	-	-	-	-
4-Mushroom Passage	06/28/89	09/14/89	0.40	66.8	67.4	67.4	100.00	-	-	-	-	-	-	-
4-Mushroom Passage	09/14/89	10/15/89	0.48	66.9	67.5	67.6	99.30	9	67.9	67.9	67.5	67.1	67.3	67.1
4-Mushroom Passage	10/15/89	11/16/90	0.75	66.5	67.2	67.2	100.00	9	68.0	68.4	67.7	-	-	-
4-Mushroom Passage	11/16/90	12/23/89	0.95	66.9	67.5	68.0	98.07	2	67.4	67.9	67.2	66.8	66.9	66.8
4-Mushroom Passage	12/23/89	01/18/90	0.85	67.1	68.0	67.9	99.76	2	67.9	68.1	67.4	none	none	none
4-Mushroom Passage	01/18/90	02/17/90	1.00	66.3	66.5	66.5	99.50	2	68.1	68.3	67.4	none	none	none
4-Mushroom Passage	02/17/90	03/22/90	0.83	66.5	67.1	66.4	99.81	7	67.7	67.9	67.5	67.1	67.3	67.0
4-Mushroom Passage	03/22/90	04/23/90	0.81	66.6	67.0	66.6	100.00	2	68.1	68.8	67.9	66.8	66.9	66.8
4-Mushroom Passage	04/23/90	05/18/90	0.70	66.8	67.6	67.6	98.80	7	67.1	67.3	67.1	67.9	67.9	67.7
4-Mushroom Passage	05/18/90	06/23/90	0.07	67.2	67.9	67.7	99.04	2	68.3	68.4	67.9	66.9	66.9	66.8
4-Mushroom Passage	06/23/90	08/02/90	0.43	66.7	67.4	66.9	99.70	2	68.3	68.3	68.1	66.8	66.9	66.8
4-Mushroom Passage*	08/02/90	08/26/90	-0.63	67.0	67.6	67.0	99.52	7	67.3	67.3	67.1	68.1	68.1	67.9
4-Mushroom Passage	08/26/90	09/30/90	0.07	66.9	66.8	66.9	99.76	2	66.9	66.9	66.8	68.4	68.6	68.3
4-Mushroom Passage	09/30/90	11/01/90	0.61	67.1	67.0	66.9	99.04	2	68.4	68.6	68.4	66.8	67.1	66.8
4-Mushroom Passage	11/01/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
4-Mushroom Passage	11/01/90	12/19/90	0.72	66.7	66.8	66.9	100.00	2	68.4	-	68.4	66.8	66.9	66.8
4-Mushroom Passage	12/19/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
4-Mushroom Passage	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-
4-Mushroom Passage	12/19/90	03/10/91	1.06	66.0	67.1	66.0	100.00	7	67.1	67.3	67.1	68.3	68.4	68.3
4-Mushroom Passage	03/10/91	N/D	-	-	-	-	-	-	-	-	-	-	-	-
4-Mushroom Passage	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-

EMS #4 Mushroom Passage

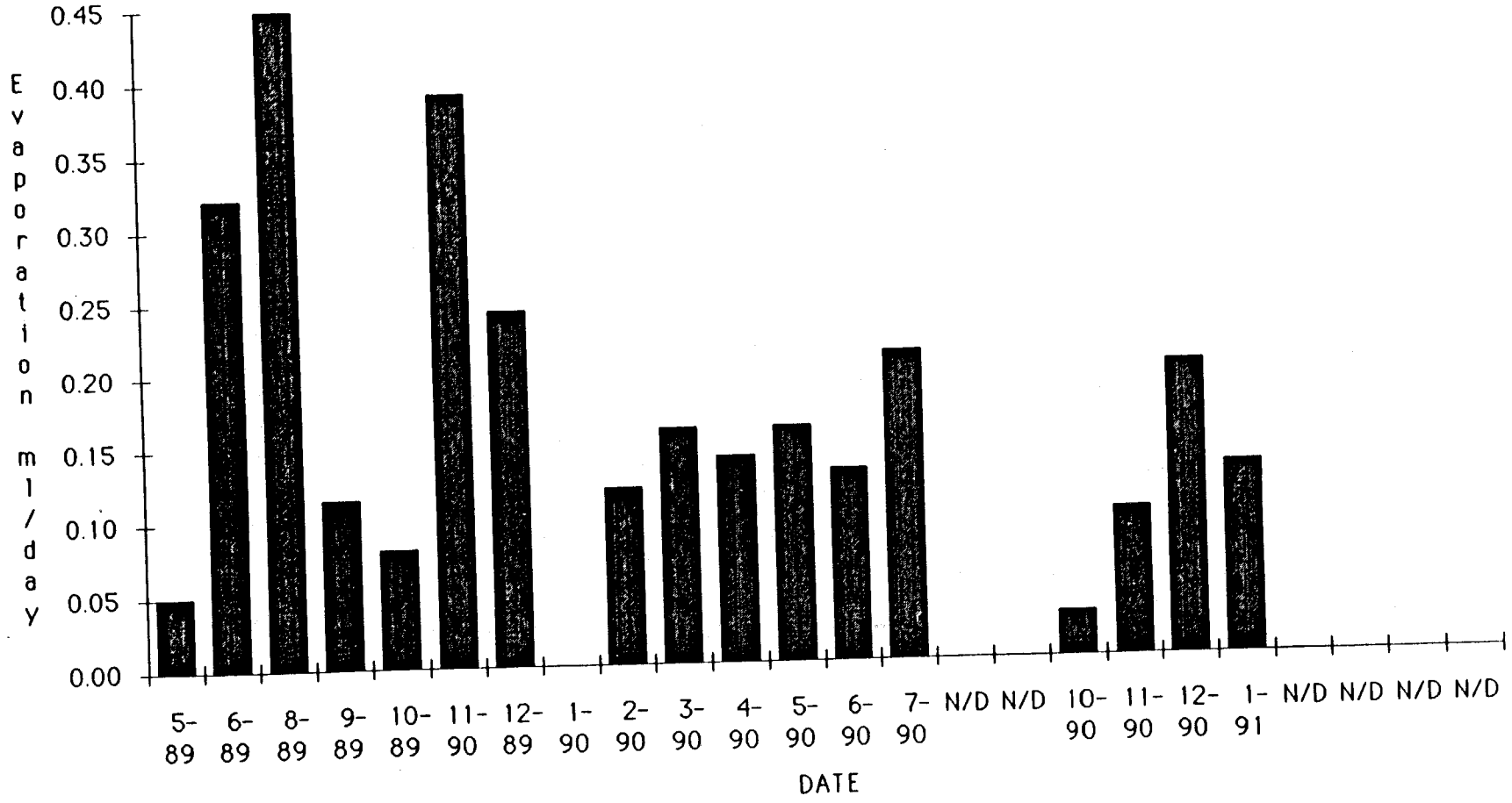



EMS #4 Mushroom Passage
Temperature
68.0
67.8
67.6
67.4
67.2
67.0
66.8
66.6
66.4
66.2
66.0
5-89
5-89
6-89
9-89
10-89
11-90
12-89
1-90
2-90
3-90
4-90
5-90
6-90
8-90
8-90
9-90
11-90
N/D
12-90
N/D
N/D
3-91
N/D
N/D
DATE
Air
Water
Soil

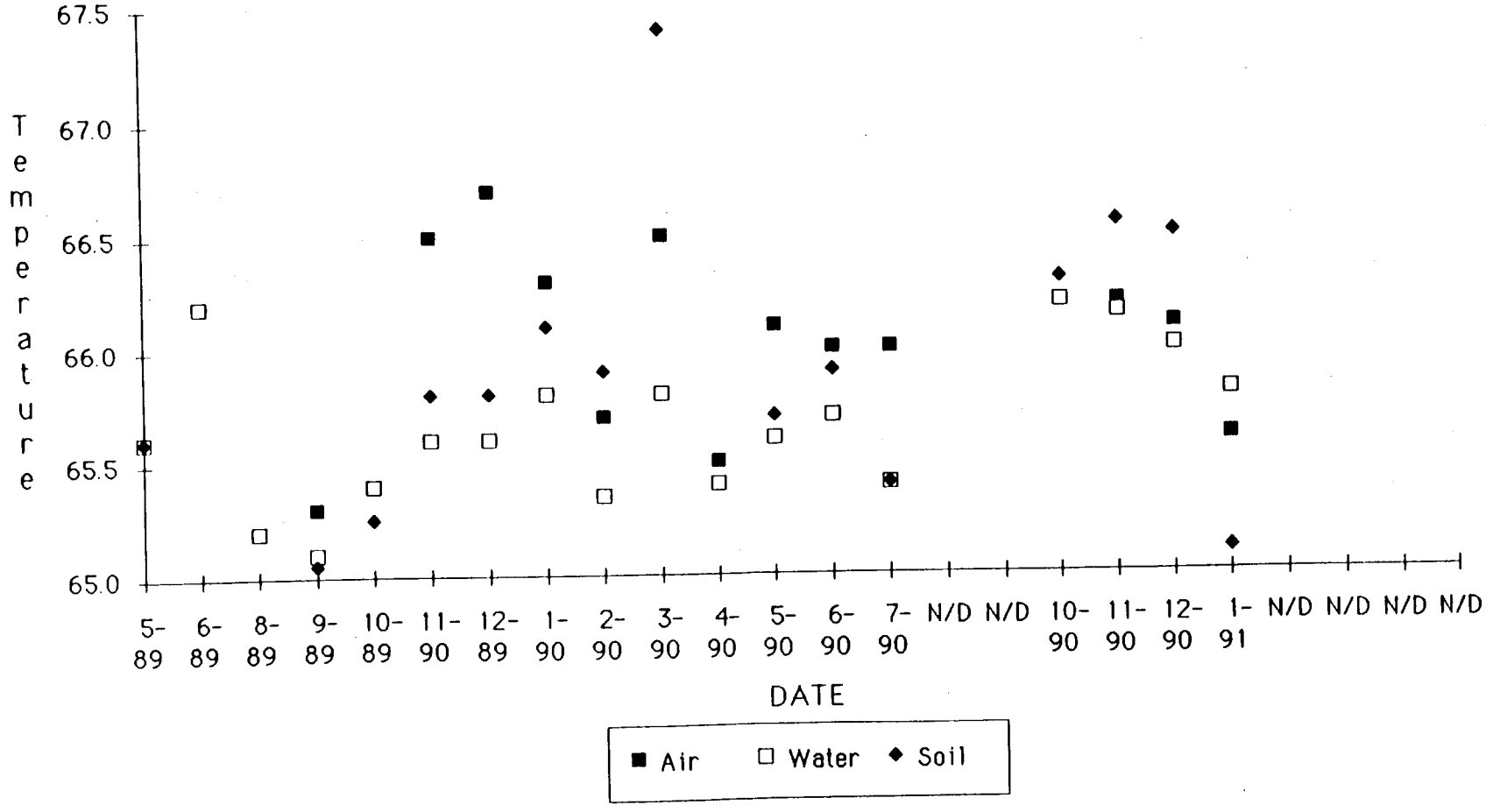
KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
5-Granite Dells	04/15/89	05/06/89	0.05	65.6	65.6	65.6	-	-	-	-	-	-	-	-
5-Granite Dells	05/06/89	06/03/89	0.32	66.2	66.2	-	-	-	-	-	-	-	-	-
5-Granite Dells	06/03/89	08/19/89	0.45	65.2	65.2	-	-	-	-	-	-	-	-	-
5-Granite Dells	08/19/89	09/14/89	0.12	65.1	65.3	65.1	99.00	-	-	-	-	-	-	-
5-Granite Dells	09/14/89	10/15/89	0.08	65.4	65.4	65.3	99.00	10	65.7	65.7	64.8	65.2	65.2	64.8
5-Granite Dells	10/15/89	11/16/90	0.39	65.6	66.5	65.8	99.00	17	67.8	67.0	66.4	64.4	64.6	64.4
5-Granite Dells	11/16/90	12/21/89	0.24	65.6	66.7	65.8	98.06	17	66.8	67.0	66.6	64.6	64.6	64.4
5-Granite Dells	12/21/89	01/16/90	0.00	65.8	66.3	66.1	99.02	17	67.0	67.0	66.6	64.6	64.6	64.4
5-Granite Dells	01/16/90	02/17/90	0.12	65.4	65.7	65.9	99.75	17	67.3	67.3	66.8	64.6	64.6	64.6
5-Granite Dells	02/17/90	03/14/90	0.16	65.8	66.5	67.4	99.20	17	67.3	67.5	67.0	64.6	64.6	64.6
5-Granite Dells	03/14/90	04/23/90	0.14	65.4	65.5	-	100.00	17	67.5	67.7	67.1	64.6	64.7	64.6
5-Granite Dells	04/23/90	05/14/90	0.16	65.6	66.1	65.7	99.40	17	67.5	67.7	67.1	64.6	64.6	64.4
5-Granite Dells	05/14/90	06/23/90	0.13	65.7	66.0	65.9	99.75	17	67.3	67.7	67.0	64.4	64.6	64.4
5-Granite Dells	06/23/90	07/26/90	0.21	65.4	66.0	65.4	99.24	17	67.1	67.3	67.0	64.4	64.6	64.4
5-Granite Dells	07/26/90	N/D	-	-	-	-	-	-	-	-	-	-	-	-
5-Granite Dells	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-
5-Granite Dells	07/26/90	10/25/90	0.03	66.2	66.2	66.3	99.51	17	67.9	68.9	67.1	65.1	66.5	64.4
5-Granite Dells	10/25/90	11/24/90	0.10	66.2	66.2	66.6	100.00	17	67.9	67.9	67.7	65.1	65.1	65.1
5-Granite Dells	11/24/90	12/19/90	0.20	66.0	66.1	66.5	98.97	17	67.9	67.9	67.5	65.1	65.1	64.9
5-Granite Dells	12/19/90	01/11/91	0.13	65.8	65.6	65.1	-	-	-	-	-	-	-	-
5-Granite Dells	01/11/91	N/D	-	-	-	-	-	-	-	-	-	-	-	-
5-Granite Dells	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-
5-Granite Dells	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-
5-Granite Dells	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-

EMS #5 Granite Dells



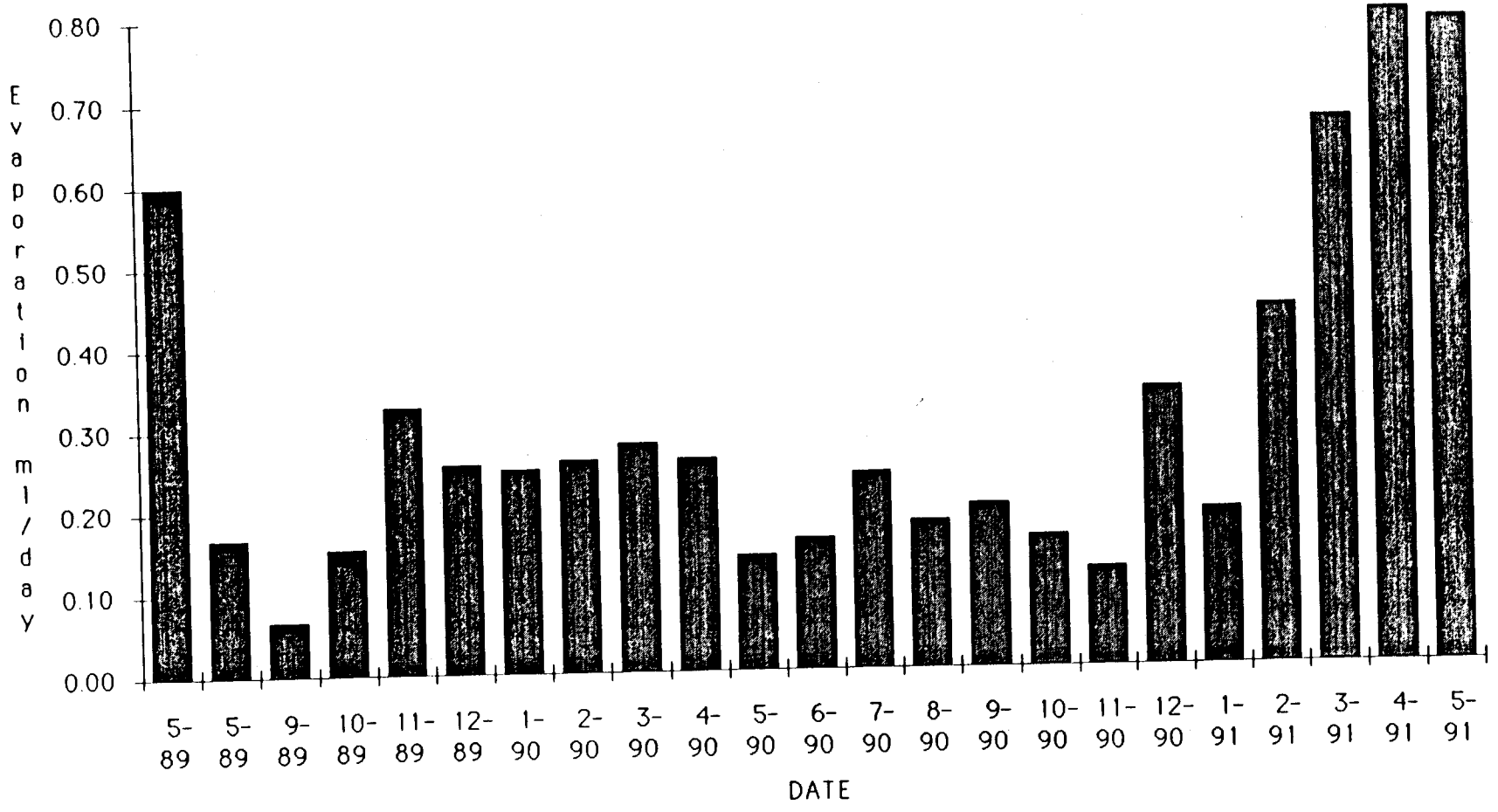
EMS #5 Granite Dells



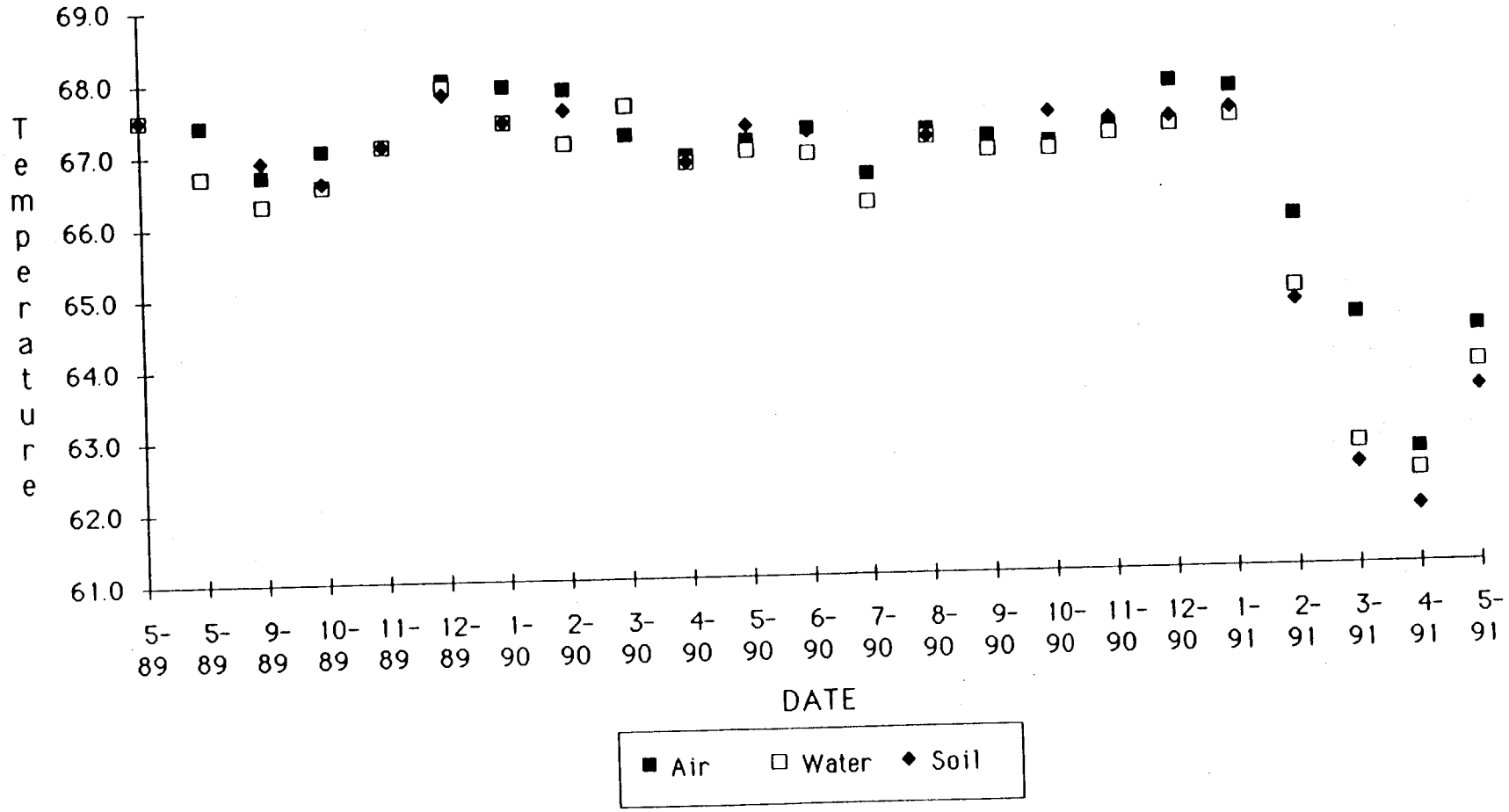
KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
6-Pyramid Room	04/15/89	05/06/89	0.60	67.5	67.5	67.5	-	-	-	-	-	-	-	-
6-Pyramid Room	05/06/89	05/31/89	0.17	66.7	67.4	67.4	98.10	-	-	-	-	-	-	-
6-Pyramid Room	05/31/89	09/14/89	0.07	66.3	66.7	66.9	99.00	-	-	-	-	-	-	-
6-Pyramid Room	09/14/89	10/15/89	0.15	66.6	67.1	66.6	98.60	7	67.2	67.2	66.3	66.4	66.6	66.4
6-Pyramid Room	10/15/89	11/10/89	0.33	67.1	67.1	67.1	100.00	16	66.8	66.4	67.0	65.3	65.1	65.3
6-Pyramid Room	11/10/89	12/21/89	0.26	67.9	68.0	67.8	97.15	16	65.6	68.6	66.8	65.5	65.5	65.3
6-Pyramid Room	12/21/89	01/16/90	0.25	67.4	67.9	67.4	99.52	16	68.0	68.8	68.0	65.7	65.7	65.5
6-Pyramid Room	01/16/90	02/17/90	0.26	67.1	67.9	67.6	99.60	16	68.4	67.9	68.6	65.7	65.7	65.5
6-Pyramid Room	02/17/90	03/14/90	0.28	67.6	67.2	67.2	99.40	16	68.4	68.4	67.9	65.7	65.7	65.7
6-Pyramid Room	03/14/90	04/23/90	0.26	66.8	66.9	66.8	99.65	16	68.0	68.4	67.9	65.7	65.8	65.5
6-Pyramid Room	04/23/90	05/14/90	0.14	67.0	67.1	67.3	99.67	16	67.7	68.6	67.5	65.5	65.7	65.5
6-Pyramid Room	05/14/90	06/23/90	0.16	66.9	67.3	67.2	99.76	16	67.5	67.9	67.5	65.3	65.5	65.3
6-Pyramid Room	06/23/90	07/26/90	0.24	66.2	66.6	66.6	99.62	16	67.5	67.9	67.3	65.3	65.3	65.3
6-Pyramid Room	07/26/90	08/26/90	0.18	67.1	67.2	67.1	99.52	16	67.0	68.4	67.5	65.5	65.8	65.3
6-Pyramid Room	08/26/90	09/27/90	0.20	66.9	67.1	67.1	99.92	16	67.9	68.4	67.9	65.5	65.8	65.5
6-Pyramid Room	09/27/90	10/25/90	0.16	66.9	67.0	67.4	99.47	16	68.0	68.4	67.9	65.5	66.0	65.5
6-Pyramid Room	10/25/90	11/24/90	0.12	67.1	67.2	67.3	100.00	16	68.4	68.6	68.0	65.7	65.7	65.5
6-Pyramid Room	11/24/90	12/19/90	0.34	67.2	67.8	67.3	97.98	16	68.6	68.8	68.0	66.0	66.0	65.5
6-Pyramid Room	12/19/90	01/15/91	0.19	67.3	67.7	67.4	99.92	-	-	-	-	-	-	-
6-Pyramid Room	01/15/91	02/19/91	0.44	64.9	65.9	64.7	100.00	16	67.9	69.1	67.3	62.8	65.7	62.8
6-Pyramid Room	02/19/91	03/24/91	0.67	62.7	64.5	62.4	100.00	16	65.3	67.9	64.4	60.1	62.8	58.1
6-Pyramid Room	03/24/91	04/23/91	0.80	62.3	62.6	61.8	100.00	16	65.2	65.5	63.5	59.7	60.1	57.2
6-Pyramid Room	04/23/91	05/29/91	0.79	63.8	64.3	63.5	98.16	6	66.1	66.1	65.0	63.8	64.0	61.6

EMS #6 Pyramid Room



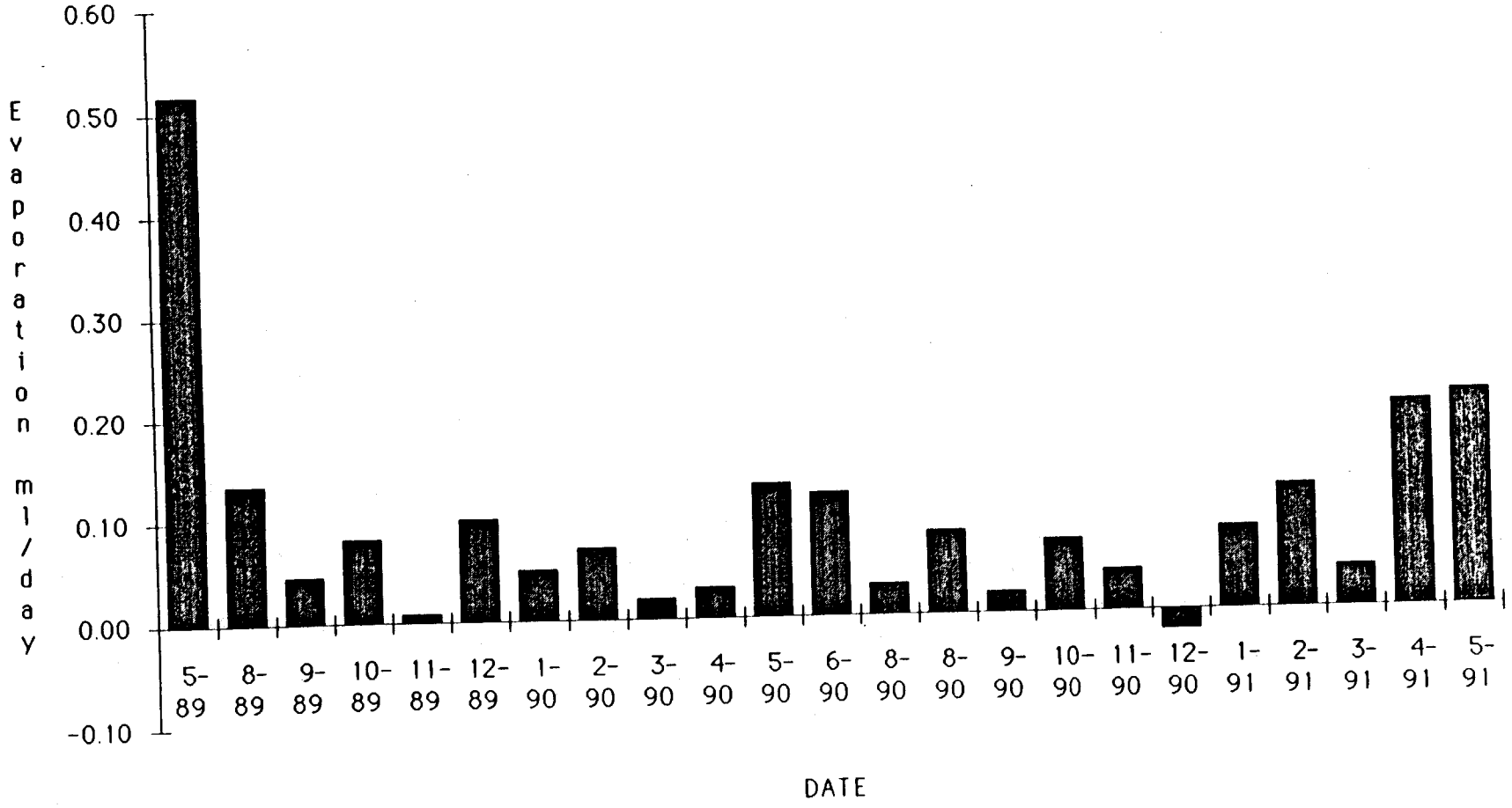
EMS #6 Pyramid Room

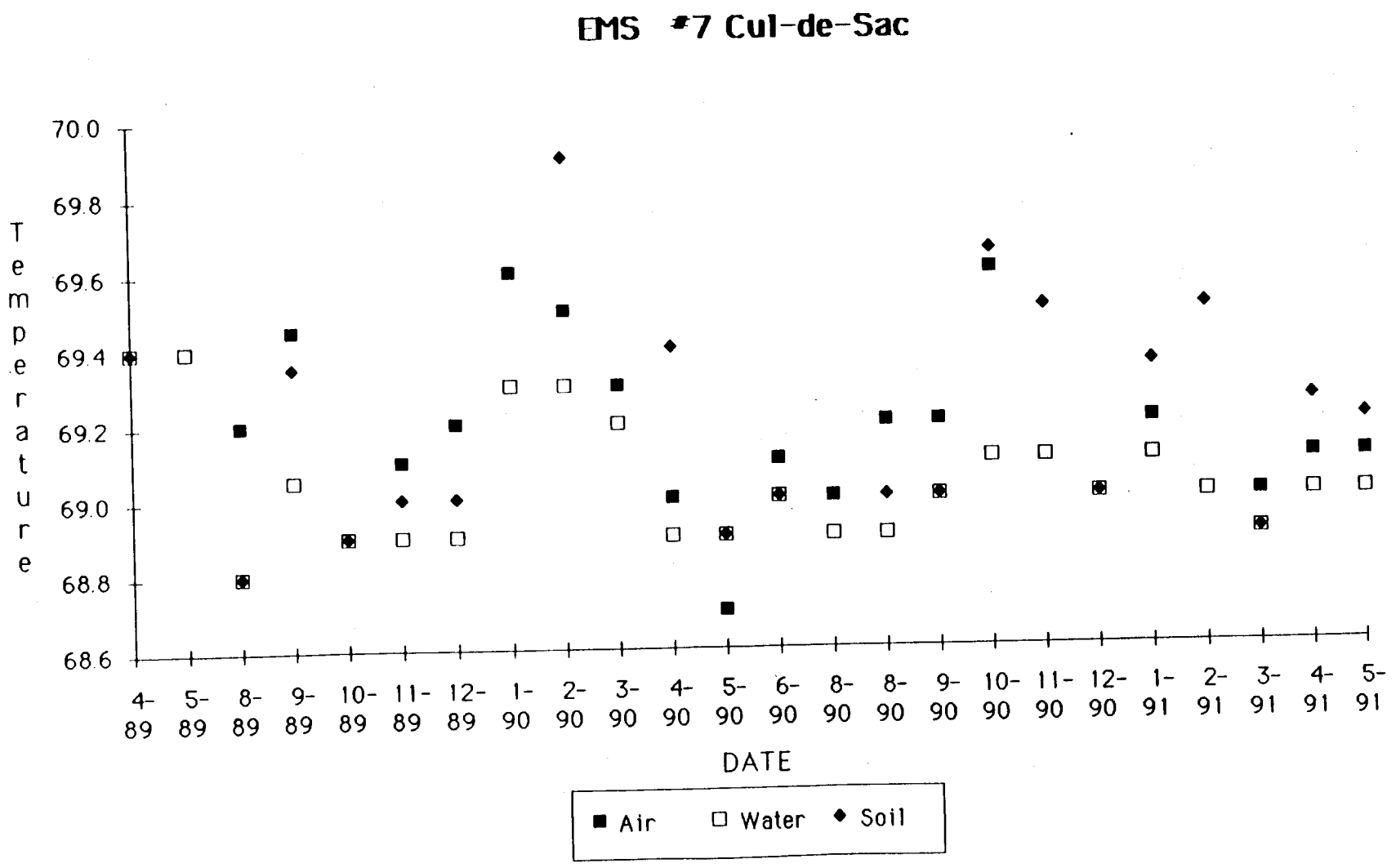


KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
7-Cul-de-Sac	04/23/89	04/29/89	-1.10	69.4	69.4	69.4	100.00	-	-	-	-	-	-	-
7-Cul-de-Sac	04/29/89	05/29/89	0.52	69.4	69.4	-	-	-	-	-	-	-	-	-
7-Cul-de-Sac	05/29/89	08/13/89	0.14	68.8	69.2	68.8	99.10	-	-	-	-	-	-	-
7-Cul-de-Sac	08/13/89	09/15/89	0.05	69.1	69.5	69.4	98.60	-	-	-	-	-	-	-
7-Cul-de-Sac	09/15/89	10/16/89	0.08	68.9	68.9	68.9	100.00	-	-	-	-	-	-	-
7-Cul-de-Sac	10/16/89	11/14/89	0.01	68.9	69.1	69.0	99.50	-	-	-	-	-	-	-
7-Cul-de-Sac	11/14/89	12/19/89	0.10	68.9	69.2	69.0	99.06	-	-	-	-	-	-	-
7-Cul-de-Sac	12/19/89	01/14/90	0.05	69.3	69.6	69.6	99.30	none	-	-	-	-	-	-
7-Cul-de-Sac	01/14/90	02/13/90	0.07	69.3	69.5	69.9	99.00	none	-	-	-	-	-	-
7-Cul-de-Sac	02/14/90	03/16/90	0.02	69.2	69.3	69.3	99.50	-	-	-	-	-	-	-
7-Cul-de-Sac	03/16/90	04/20/90	0.03	68.9	69.0	69.4	99.88	-	-	-	-	-	-	-
7-Cul-de-Sac	04/20/90	05/13/90	0.13	68.9	68.7	68.9	99.94	-	-	-	-	-	-	-
7-Cul-de-Sac	05/13/90	06/20/90	0.12	69.0	69.1	69.0	99.06	-	-	-	-	-	-	-
7-Cul-de-Sac	06/20/90	08/04/90	0.03	68.9	69.0	69.0	99.58	-	-	-	-	-	-	-
7-Cul-de-Sac	08/04/90	08/23/90	0.08	68.9	69.2	69.0	98.84	-	-	-	-	-	-	-
7-Cul-de-Sac	08/23/90	09/27/90	0.02	69.0	69.2	69.0	99.14	-	-	-	-	-	-	-
7-Cul-de-Sac	09/27/90	10/25/90	0.07	69.1	69.6	69.7	99.65	-	-	-	-	-	-	-
7-Cul-de-Sac	10/25/90	11/20/90	0.04	69.1	69.1	69.5	99.76	-	-	-	-	-	-	-
7-Cul-de-Sac	11/20/90	12/18/90	-0.02	69.0	69.0	69.0	-	-	-	-	-	-	-	-
7-Cul-de-Sac	12/18/90	01/17/91	0.08	69.1	69.2	69.4	99.91	-	-	-	-	-	-	-
7-Cul-de-Sac	01/17/91	02/24/91	0.12	69.0	69.0	69.5	100.00	-	-	-	-	-	-	-
7-Cul-de-Sac	02/24/91	03/31/91	0.04	68.9	69.0	68.9	100.00	-	-	-	-	-	-	-
7-Cul-de-Sac	03/31/91	04/23/91	0.20	69.0	69.1	69.3	100.00	-	-	-	-	-	-	-
7-Cul-de-Sac	04/23/91	05/21/91	0.21	69.0	69.1	69.2	100.00	-	-	-	-	-	-	-

EMS #7 Cul-de-sac

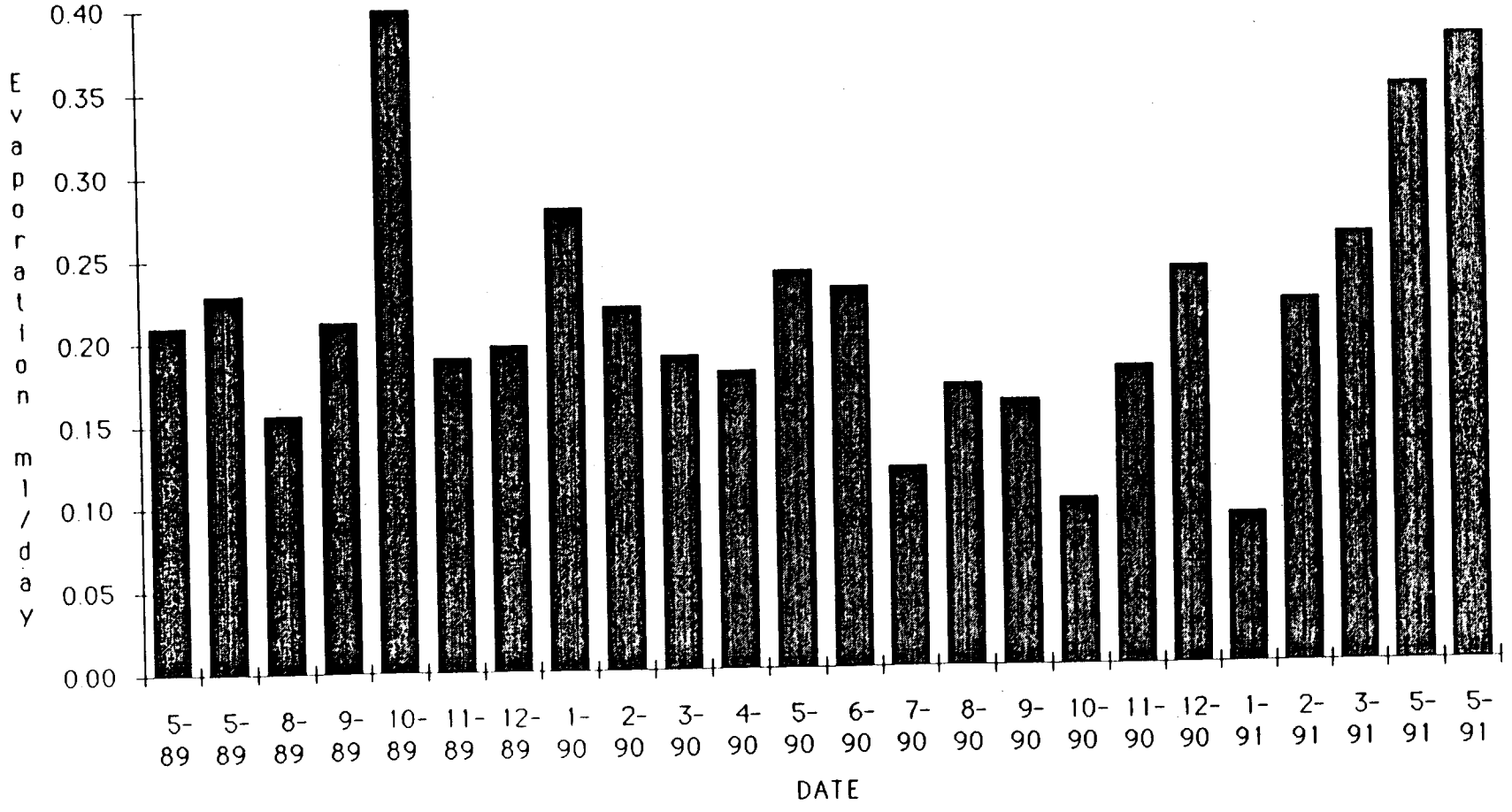


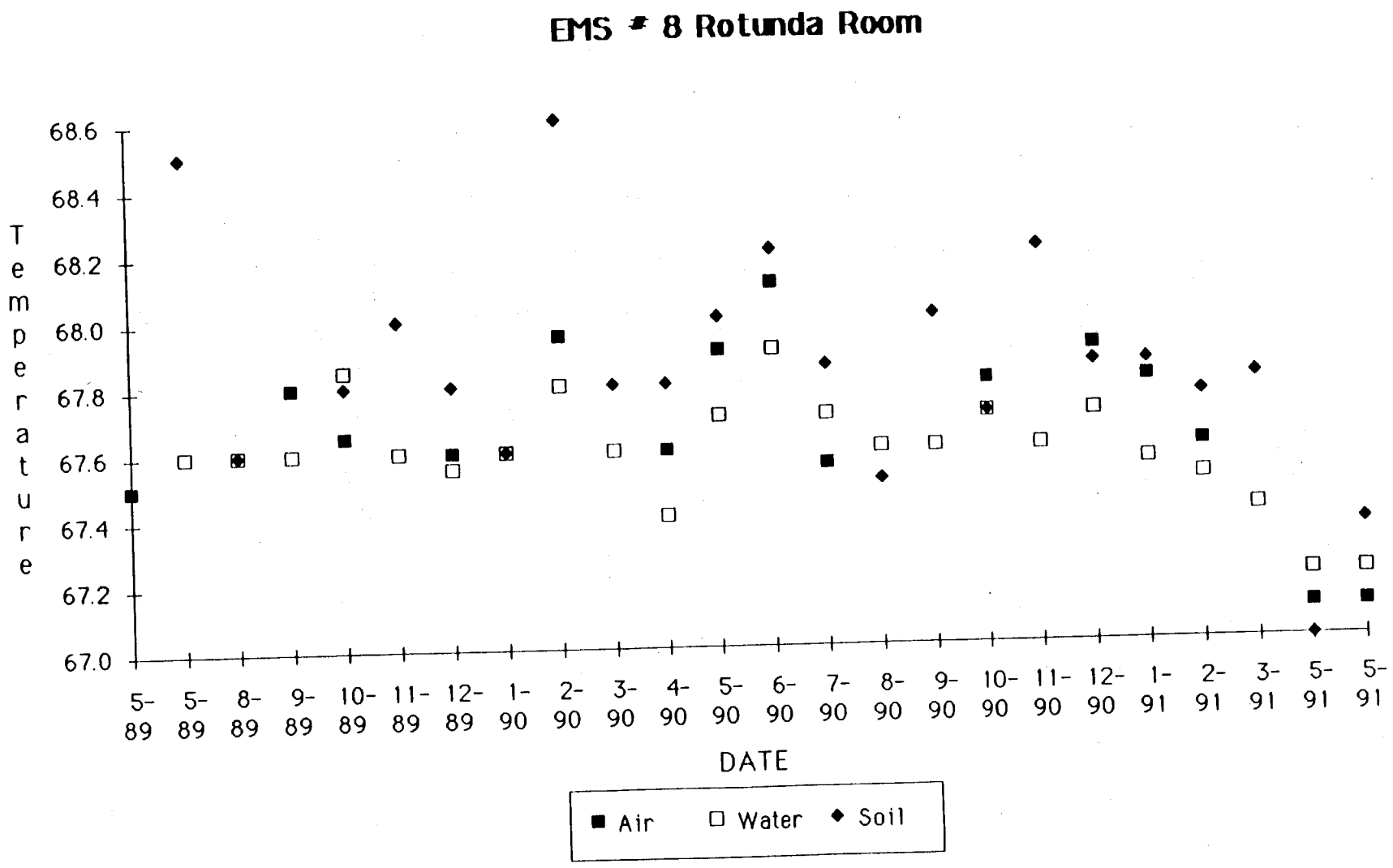

EMS #7 Cul-de-Sac
Temperature
70.0
69.8
69.6
69.4
69.2
69.0
68.8
68.6
4-89
5-89
8-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
8-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
4-91
5-91
DATE
Air
Water
Soil

KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
8-Rotunda Room	04/16/89	05/07/89	0.21	-	67.5	67.5	-	-	-	-	-	-	-	-
8-Rotunda Room	05/07/89	05/31/89	0.23	67.6	67.6	68.5	97.14	-	-	-	-	-	-	-
8-Rotunda Room	05/31/89	08/19/89	0.16	67.6	67.6	67.6	99.00	-	-	-	-	-	-	-
8-Rotunda Room	08/19/89	09/14/89	0.21	67.6	67.8	-	98.10	-	-	-	-	-	-	-
8-Rotunda Room	09/14/89	10/15/89	0.40	67.9	67.7	67.8	99.30	8	69.0	69.0	68.1	68.3	68.3	68.1
8-Rotunda Room	10/15/89	11/10/89	0.19	67.6	67.6	68.0	99.00	8	69.1	69.3	69.0	68.3	68.3	68.1
8-Rotunda Room	11/10/89	12/13/89	0.20	67.6	67.6	67.8	99.76	8	69.3	69.3	69.1	68.3	68.4	68.5
8-Rotunda Room	12/13/89	01/18/90	0.28	67.6	67.6	67.6	99.04	8	69.3	69.3	69.1	68.4	69.5	68.1
8-Rotunda Room	01/18/90	02/17/90	0.22	67.8	68.0	68.6	99.52	8	69.3	69.5	69.3	68.3	68.4	68.1
8-Rotunda Room	02/17/90	03/20/90	0.19	67.6	67.6	67.8	100.00	8	69.3	69.5	69.3	68.3	68.3	68.1
8-Rotunda Room	03/20/90	04/19/90	0.18	67.4	67.6	67.8	100.00	8	69.3	69.5	69.3	68.3	68.3	68.1
8-Rotunda Room	04/19/90	05/16/90	0.24	67.7	67.9	68.0	99.60	8	69.5	69.5	69.3	68.3	68.8	68.1
8-Rotunda Room	05/16/90	06/23/90	0.23	67.9	68.1	68.2	99.04	8	69.5	69.5	69.3	68.3	68.3	68.1
8-Rotunda Room	06/23/90	07/31/90	0.12	67.7	67.6	67.9	99.62	8	69.3	69.5	69.3	68.3	68.3	68.3
8-Rotunda Room	07/31/90	08/26/90	0.17	67.6	67.6	67.5	99.64	-	-	-	-	-	-	-
8-Rotunda Room	08/26/90	09/30/90	0.16	67.6	67.6	68.0	99.85	8	69.7	69.7	69.3	68.3	69.0	68.3
8-Rotunda Room	09/30/90	10/30/90	0.10	67.7	67.8	67.7	99.52	8	69.5	69.7	69.5	68.3	68.4	68.3
8-Rotunda Room	10/30/90	11/24/90	0.18	67.6	67.6	68.2	99.76	8	69.5	69.7	69.5	68.4	68.8	68.3
8-Rotunda Room	11/24/90	12/19/90	0.24	67.7	67.9	67.9	98.48	8	69.3	69.7	69.3	68.4	68.9	68.3
8-Rotunda Room	12/19/90	01/15/91	0.09	67.6	67.8	67.9	99.79	8	69.5	69.7	69.3	68.4	68.4	68.3
8-Rotunda Room	01/15/91	02/14/91	0.22	67.5	67.6	67.8	100.00	8	69.3	69.5	69.3	68.3	68.4	68.3
8-Rotunda Room	02/14/91	03/24/91	0.26	67.4	67.4	67.8	100.00	8	69.3	69.5	69.3	68.3	68.3	68.1
8-Rotunda Room	03/24/91	05/05/91	0.35	67.2	67.1	67.0	99.49	8	69.0	69.3	69.0	67.7	68.3	67.7
8-Rotunda Room	05/05/91	05/29/91	0.38	67.2	67.1	67.4	100.00	8	69.0	69.1	69.0	67.9	67.9	67.7

EMS #8 Rotunda Room

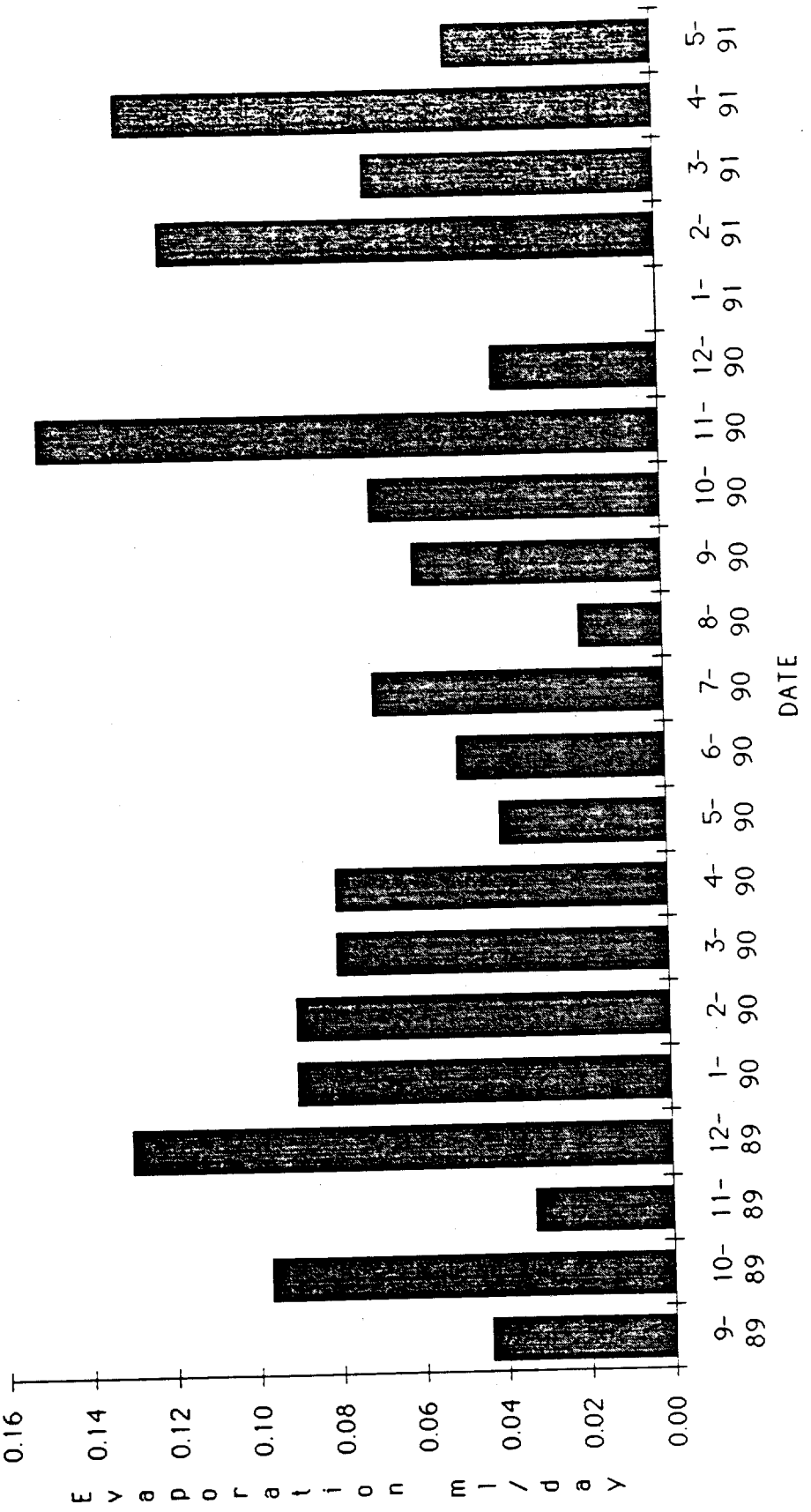


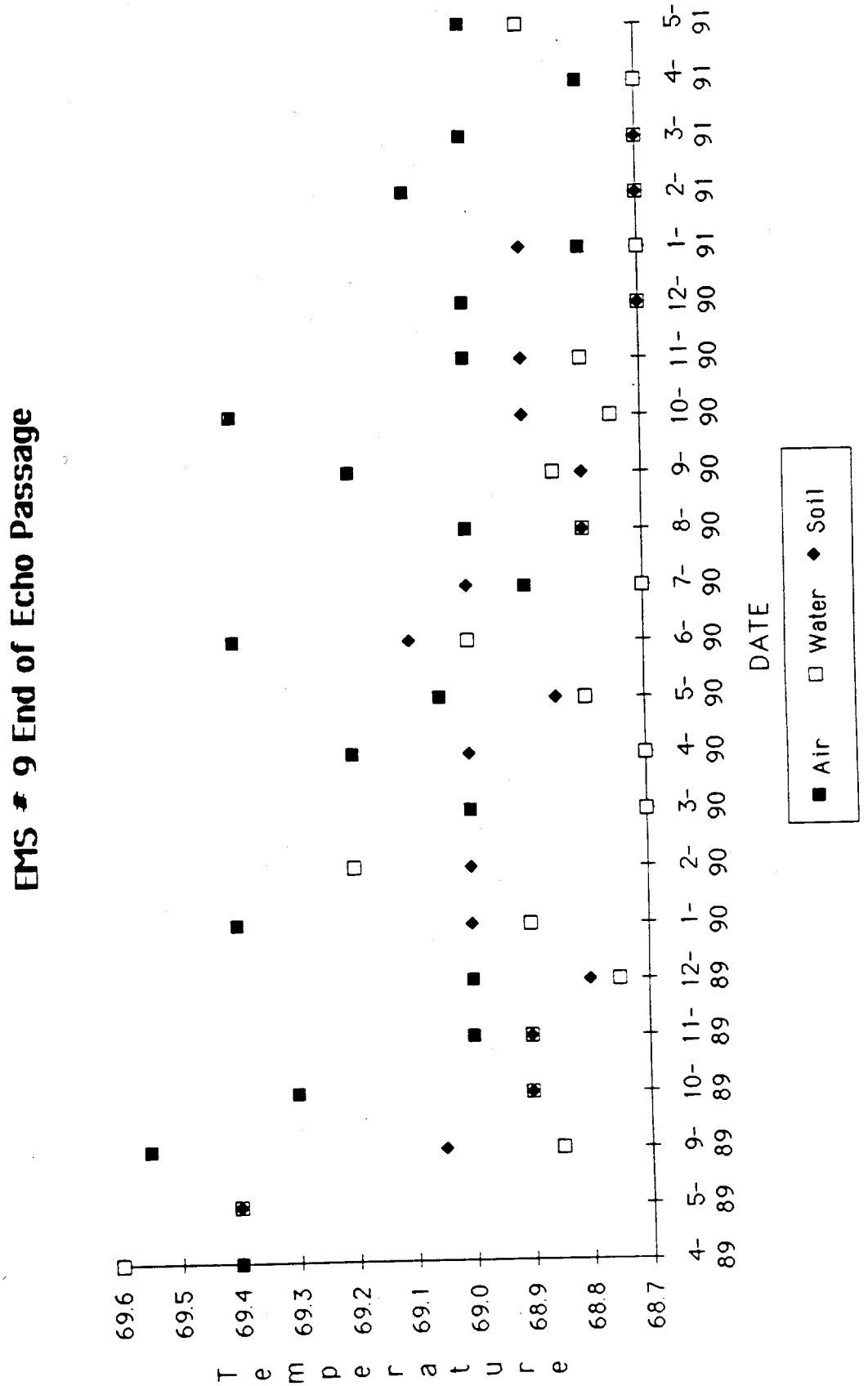

EMS # 8 Rotunda Room
Temperature
68.6
68.4
68.2
68.0
67.8
67.6
67.4
67.2
67.0
5-89
5-89
8-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
7-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
5-91
5-91
DATE
Air
Water
Soil

KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
9-End Echo Passage	04/23/89	04/29/89	-0.67	69.6	69.4	69.4	100.00	-	-	-	-	-	-	-
9-End Echo Passage	04/29/89	05/29/89	0.43	69.4	69.4	69.4	-	-	-	-	-	-	-	-
9-End Echo Passage	05/29/89	09/15/89	0.04	68.9	69.6	69.1	97.90	-	-	-	-	-	-	-
9-End Echo Passage	09/15/89	10/16/89	0.10	68.9	69.3	68.9	98.60	-	-	-	-	-	-	-
9-End Echo Passage	10/16/89	11/14/89	0.03	68.9	69.0	68.9	100.00	-	-	-	-	-	-	-
9-End Echo Passage	11/14/89	12/11/89	0.13	68.8	69.0	68.8	99.53	-	-	-	-	-	-	-
9-End Echo Passage	12/11/89	01/14/90	0.09	68.9	69.4	69.0	98.59	none	-	-	-	-	-	-
9-End Echo Passage	01/14/90	02/13/90	0.09	69.2	69.2	69.0	99.10	none	-	-	-	-	-	-
9-End Echo Passage	02/14/90	03/16/90	0.08	68.7	69.0	69.0	99.06	-	-	-	-	-	-	-
9-End Echo Passage	03/16/90	04/17/90	0.08	68.7	69.2	69.0	99.90	-	-	-	-	-	-	-
9-End Echo Passage	04/17/90	05/13/90	0.04	68.8	69.1	68.9	99.53	-	-	-	-	-	-	-
9-End Echo Passage	05/13/90	06/20/90	0.05	69.0	69.4	69.1	99.06	-	-	-	-	-	-	-
9-End Echo Passage	06/20/90	07/26/90	0.07	68.7	68.9	69.0	99.35	-	-	-	-	-	-	-
9-End Echo Passage	07/26/90	08/23/90	0.02	68.8	69.0	68.8	99.82	-	-	-	-	-	-	-
9-End Echo Passage	08/23/90	09/27/90	0.06	68.9	69.2	68.8	99.78	-	-	-	-	-	-	-
9-End Echo Passage	09/27/90	10/25/90	0.07	68.8	69.4	68.9	99.49	-	-	-	-	-	-	-
9-End Echo Passage	10/25/90	11/20/90	0.15	68.8	69.0	68.9	100.00	-	-	-	-	-	-	-
9-End Echo Passage	11/20/90	12/18/90	0.04	68.7	69.0	68.7	99.00	-	-	-	-	-	-	-
9-End Echo Passage	12/18/90	01/17/91	0.00	68.7	68.8	68.9	99.77	-	-	-	-	-	-	-
9-End Echo Passage	01/17/91	02/24/91	0.12	68.7	69.1	68.7	99.00	-	-	-	-	-	-	-
9-End Echo Passage	02/24/91	03/31/91	0.07	68.7	69.0	68.7	100.00	-	-	-	-	-	-	-
9-End Echo Passage	03/31/91	04/23/91	0.13	68.7	68.8	68.8	98.76	-	-	-	-	-	-	-
9-End Echo Passage	04/23/91	05/21/91	0.05	68.9	69.0	69.0	99.01	-	-	-	-	-	-	-

EMS #9 End of Echo Passage

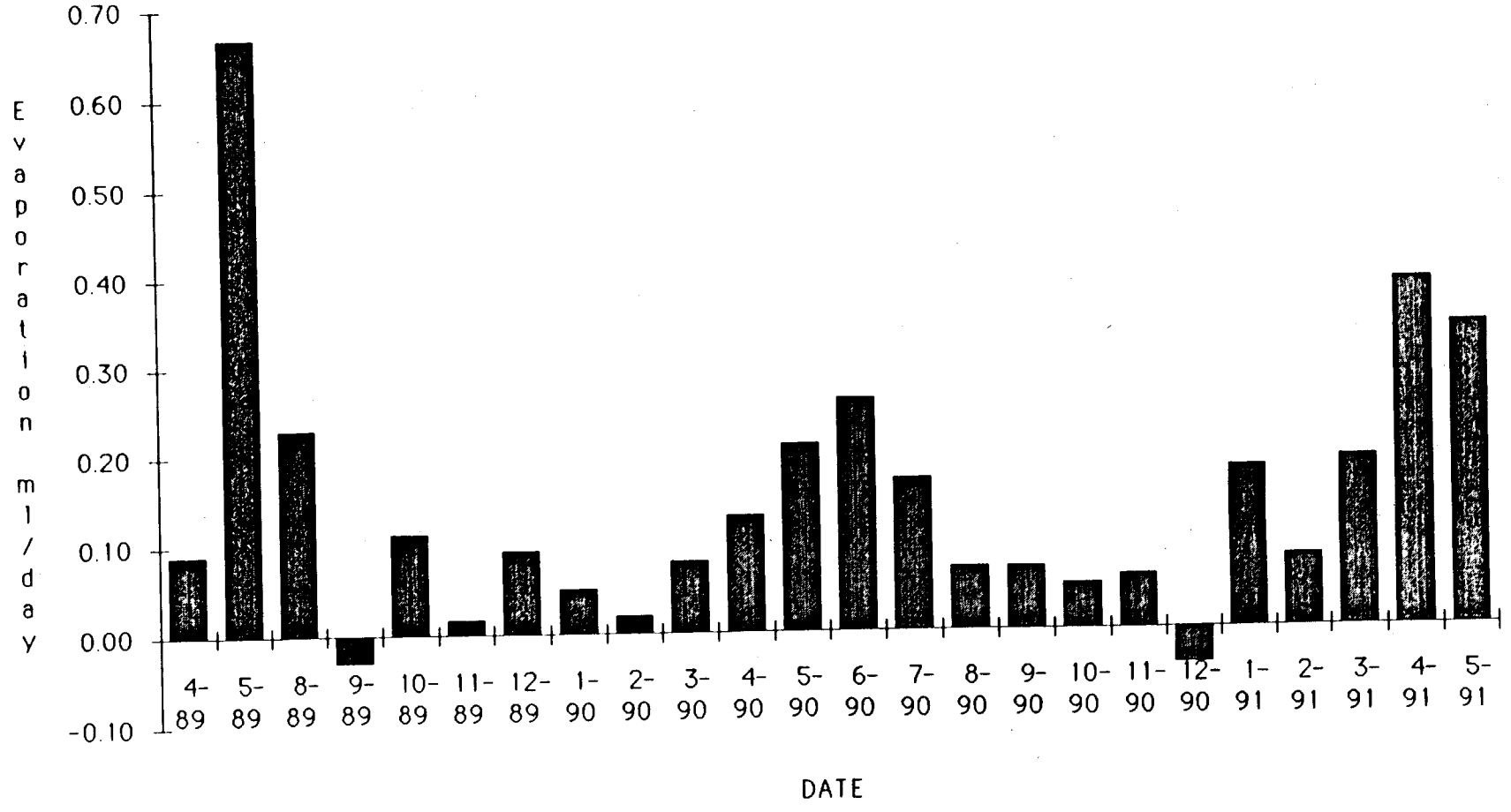



EMS # 9 End of Echo Passage
Temperature
69.6
69.5
69.4
69.3
69.2
69.1
69.0
68.9
68.8
68.7
4- 5- 9- 10- 11- 12- 1- 2- 3- 4- 5- 6- 7- 8- 9- 10- 11- 12- 1- 2- 3- 4- 5-
89 89 89 89 89 89 90 90 90 90 90 90 90 90 90 90 90 90 91 91 91 91 91
DATE
Air
Water
Soil

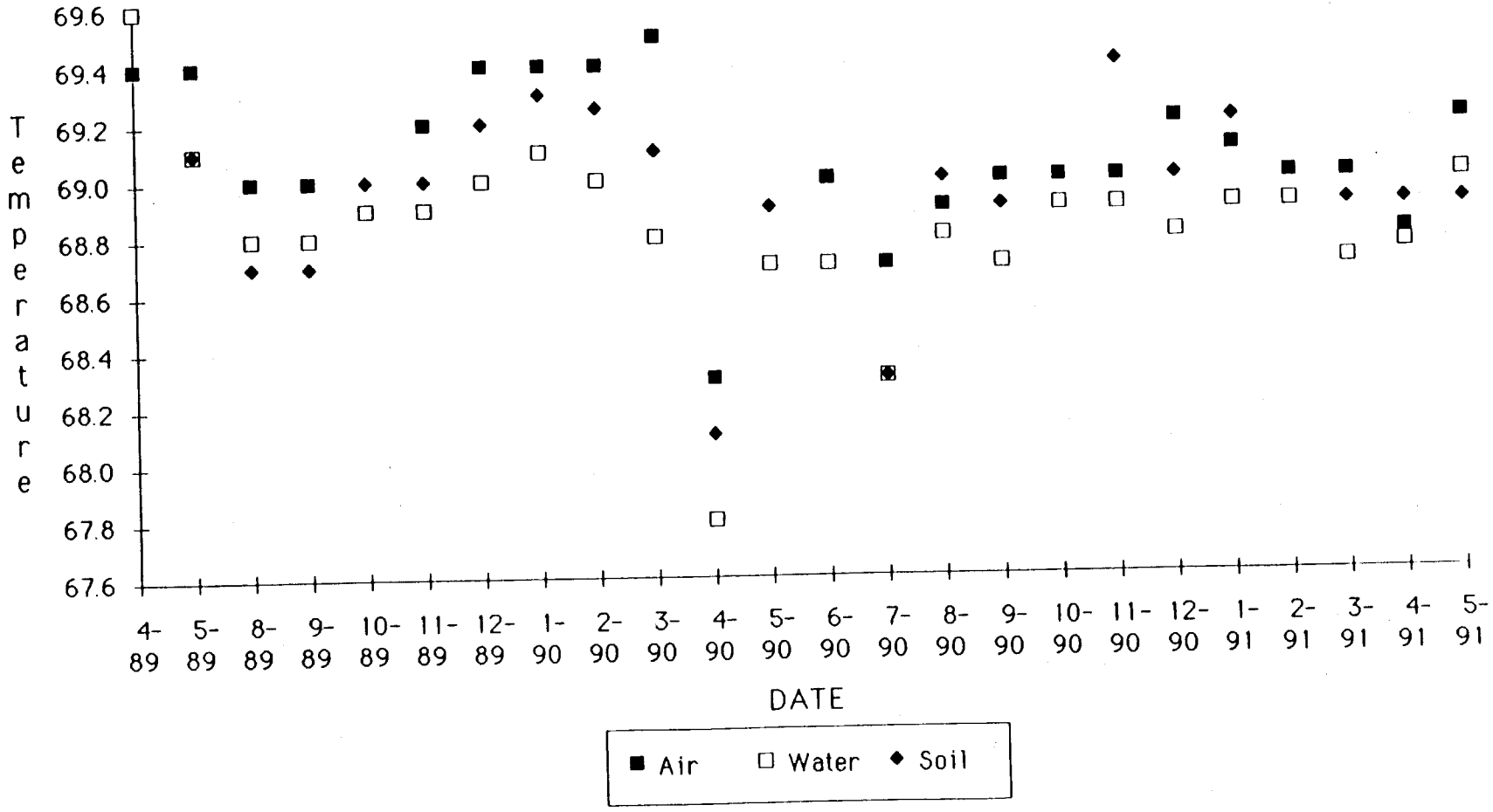
KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
10-Begin Echo Passage	04/02/89	04/29/89	0.09	69.6	69.4	69.4	-	-	-	-	-	-	-	-
10-Begin Echo Passage	04/29/89	05/29/89	0.67	69.1	69.4	69.1	-	-	-	-	-	-	-	-
10-Begin Echo Passage	05/29/89	08/13/89	0.23	68.8	69.0	68.7	99.50	-	-	-	-	-	-	-
10-Begin Echo Passage	08/13/89	09/15/89	-0.03	68.8	69.0	68.7	99.50	-	-	-	-	-	-	-
10-Begin Echo Passage	09/15/89	10/16/89	0.11	68.9	68.9	69.0	99.50	-	-	-	-	-	-	-
10-Begin Echo Passage	10/16/89	11/14/89	0.02	68.9	69.2	69.0	98.10	-	-	-	-	-	-	-
10-Begin Echo Passage	11/14/89	12/11/89	0.09	69.0	69.4	69.2	99.06	-	-	-	-	-	-	-
10-Begin Echo Passage	12/11/89	01/14/90	0.05	69.1	69.4	69.3	99.53	none	-	-	-	-	-	-
10-Begin Echo Passage	01/14/90	02/13/90	0.02	69.0	69.4	69.3	99.00	none	-	-	-	-	-	-
10-Begin Echo Passage	02/13/90	03/16/90	0.08	68.8	69.5	69.1	99.20	-	-	-	-	-	-	-
10-Begin Echo Passage	03/16/90	04/17/90	0.13	67.8	68.3	68.1	99.86	-	-	-	-	-	-	-
10-Begin Echo Passage	04/17/90	05/13/90	0.21	68.7	68.7	68.9	99.70	-	-	-	-	-	-	-
10-Begin Echo Passage	05/13/90	06/20/90	0.26	68.7	69.0	69.0	100.00	-	-	-	-	-	-	-
10-Begin Echo Passage	06/20/90	07/26/90	0.17	68.3	68.7	68.3	99.76	-	-	-	-	-	-	-
10-Begin Echo Passage	07/26/90	08/23/90	0.07	68.8	68.9	69.0	99.56	-	-	-	-	-	-	-
10-Begin Echo Passage	08/23/90	09/27/90	0.07	68.7	69.0	68.9	99.67	-	-	-	-	-	-	-
10-Begin Echo Passage	09/27/90	10/25/90	0.05	68.9	69.0	69.0	99.74	-	-	-	-	-	-	-
10-Begin Echo Passage	10/25/90	11/20/90	0.06	68.9	69.0	69.4	100.00	-	-	-	-	-	-	-
10-Begin Echo Passage	11/20/90	12/18/90	-0.04	68.8	69.2	69.0	99.00	-	-	-	-	-	-	-
10-Begin Echo Passage	12/18/90	01/17/91	0.18	68.9	69.1	69.2	99.68	-	-	-	-	-	-	-
10-Begin Echo Passage	01/17/91	02/24/91	0.08	68.9	69.0	69.0	99.00	-	-	-	-	-	-	-
10-Begin Echo Passage	02/24/91	03/31/91	0.19	68.7	69.0	68.9	100.00	-	-	-	-	-	-	-
10-Begin Echo Passage	03/31/91	04/23/91	0.39	68.8	68.8	68.9	98.51	-	-	-	-	-	-	-
10-Begin Echo Passage	04/23/91	05/21/91	0.34	69.0	69.2	68.9	98.51	-	-	-	-	-	-	-

EMS #10 Start of Echo Passage

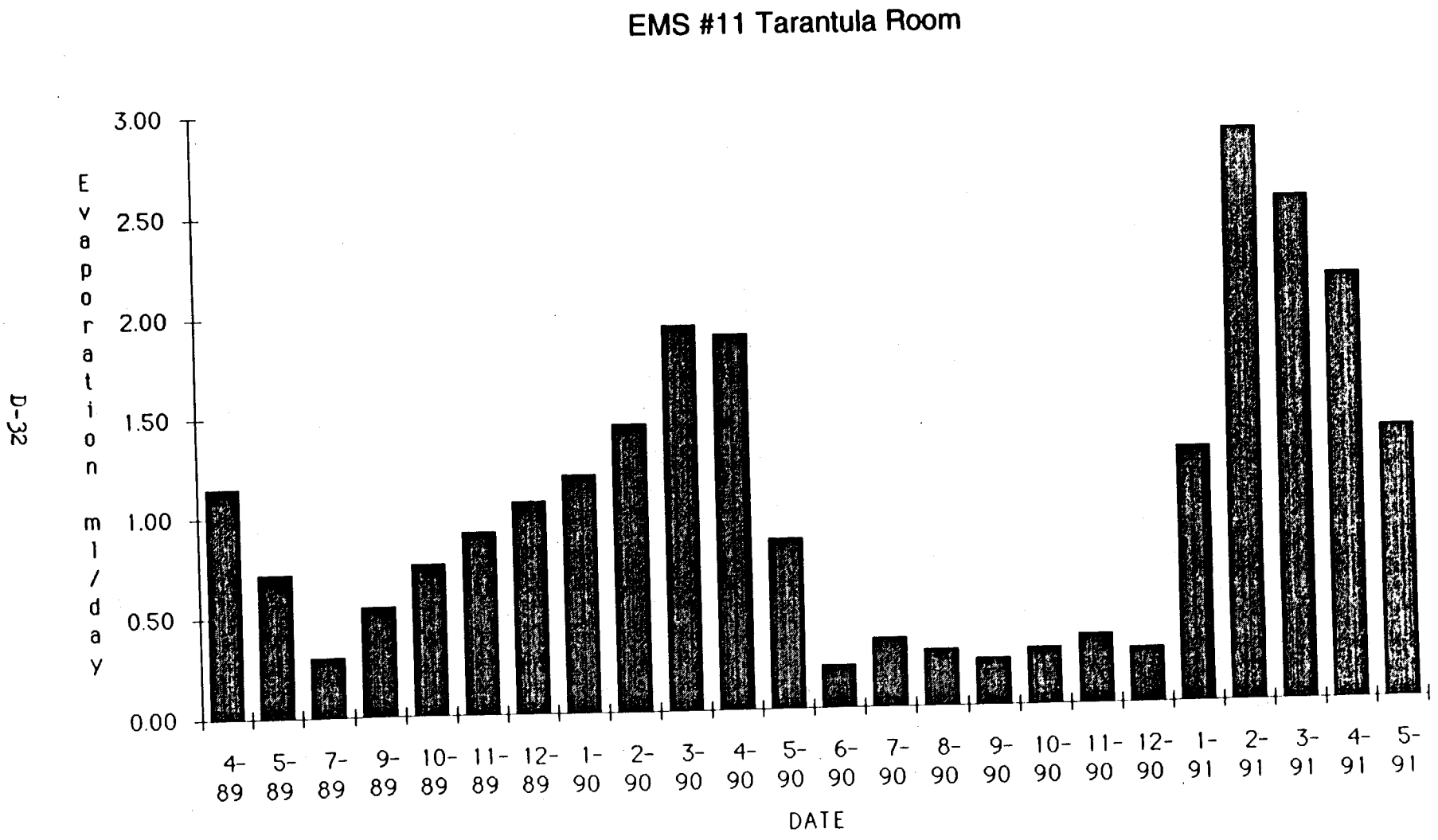


EM #10 End of Echo Passage



KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
11-Tarantula Room	04/02/89	04/29/89	1.15	68.4	68.4	69.4	-	-	-	-	-	-	-	-
11-Tarantula Room	04/29/89	05/29/89	0.72	67.8	68.3	68.1	95.30	-	-	-	-	-	-	-
11-Tarantula Room	05/29/89	07/20/89	0.30	68.3	68.3	68.3	98.10	-	-	-	-	-	-	-
11-Tarantula Room	07/20/89	09/11/89	0.55	68.9	68.7	-	100.00	-	-	-	-	-	-	-
11-Tarantula Room	09/11/89	10/16/89	0.76	69.1	69.5	69.2	98.10	-	-	-	-	-	-	-
11-Tarantula Room	10/16/89	11/08/89	0.91	69.4	69.9	69.7	98.60	-	-	-	-	-	-	-
11-Tarantula Room	11/08/89	12/11/89	1.06	69.9	70.2	70.1	98.14	-	-	-	-	-	-	-
11-Tarantula Room	12/11/89	01/14/90	1.19	69.9	70.2	70.1	98.61	none	-	-	-	-	-	-
11-Tarantula Room	01/14/90	02/16/90	1.44	69.0	69.0	69.0	99.05	none	-	-	-	-	-	-
11-Tarantula Room	02/16/90	03/16/90	1.93	68.7	68.9	69.4	95.79	-	-	-	-	-	-	-
11-Tarantula Room	03/16/90	04/17/90	1.88	68.3	68.9	68.8	99.14	-	-	-	-	-	-	-
11-Tarantula Room	04/17/90	05/13/90	0.85	68.5	68.9	68.9	98.11	-	-	-	-	-	-	-
11-Tarantula Room	05/13/90	06/27/90	0.21	68.7	69.2	69.2	97.88	-	-	-	-	-	-	-
11-Tarantula Room	06/27/90	07/26/90	0.34	68.2	68.6	68.6	98.89	-	-	-	-	-	-	-
11-Tarantula Room	07/26/90	08/23/90	0.28	68.9	69.0	68.9	99.03	-	-	-	-	-	-	-
11-Tarantula Room	08/23/90	09/25/90	0.23	69.2	69.4	69.4	99.07	-	-	-	-	-	-	-
11-Tarantula Room	09/25/90	10/23/90	0.28	69.5	69.4	69.4	99.05	-	-	-	-	-	-	-
11-Tarantula Room	10/23/90	11/20/90	0.34	69.7	70.0	69.9	99.76	-	-	-	-	-	-	-
11-Tarantula Room	11/20/90	12/18/90	0.27	69.8	70.0	70.1	98.85	-	-	-	-	-	-	-
11-Tarantula Room	12/18/90	01/17/91	1.27	69.0	69.6	69.4	98.28	-	-	-	-	-	-	-
11-Tarantula Room	01/17/91	02/24/91	2.86	68.3	69.0	69.2	97.52	-	-	-	-	-	-	-
11-Tarantula Room	02/24/91	03/28/91	2.52	67.8	68.6	68.1	98.00	-	-	-	-	-	-	-
11-Tarantula Room	03/28/91	04/23/91	2.13	67.6	68.0	68.0	97.00	-	-	-	-	-	-	-
11-Tarantula Room	04/23/91	05/21/91	1.36	68.0	68.1	68.5	98.50	-	-	-	-	-	-	-


EMS #11 Tarantula Room
Evaporation ml/day
3.00
2.50
2.00
1.50
1.00
0.50
0.00
4-89
5-89
7-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
7-90
8-90
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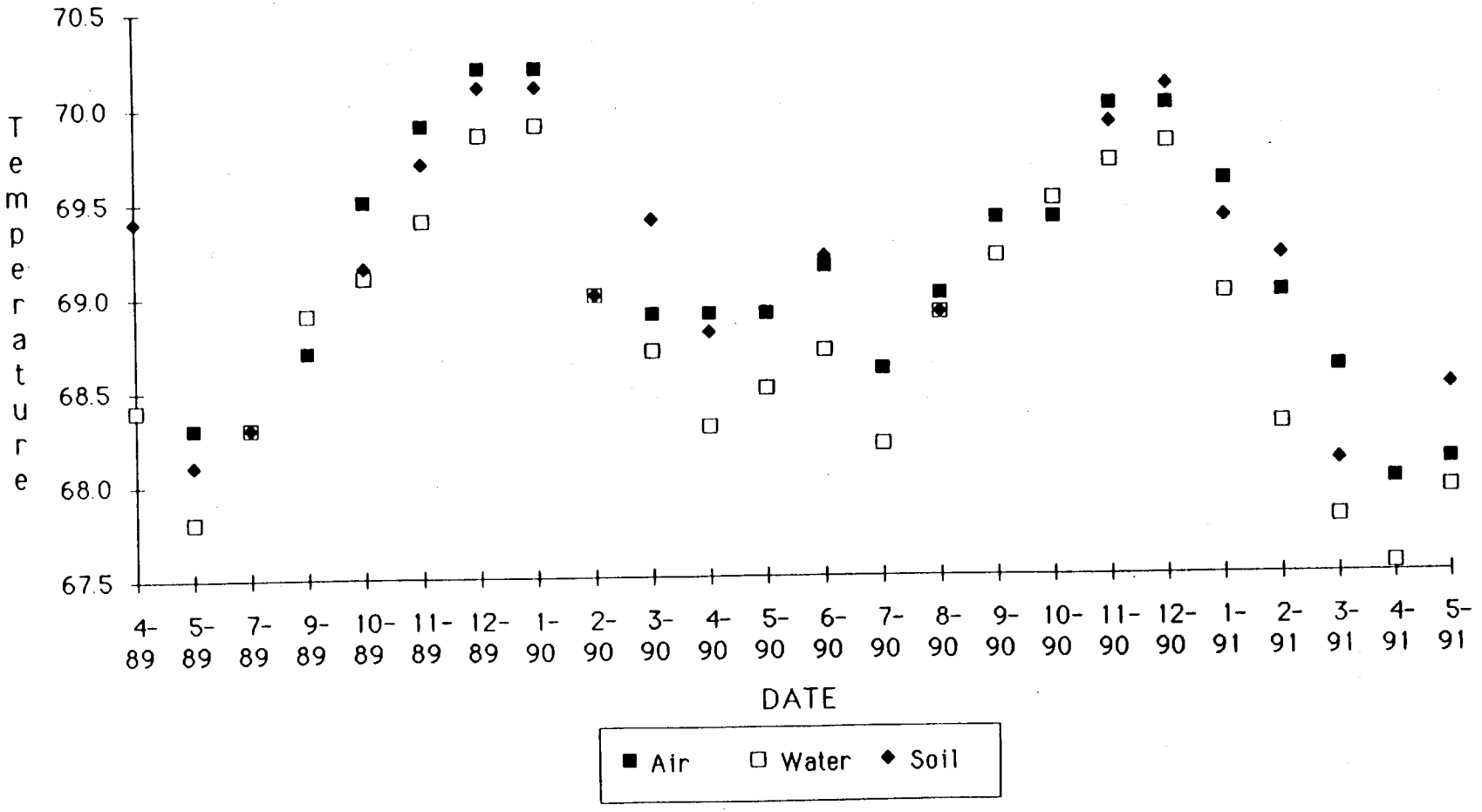
12-90
1-91
2-91
3-91
4-91
5-91
DATE

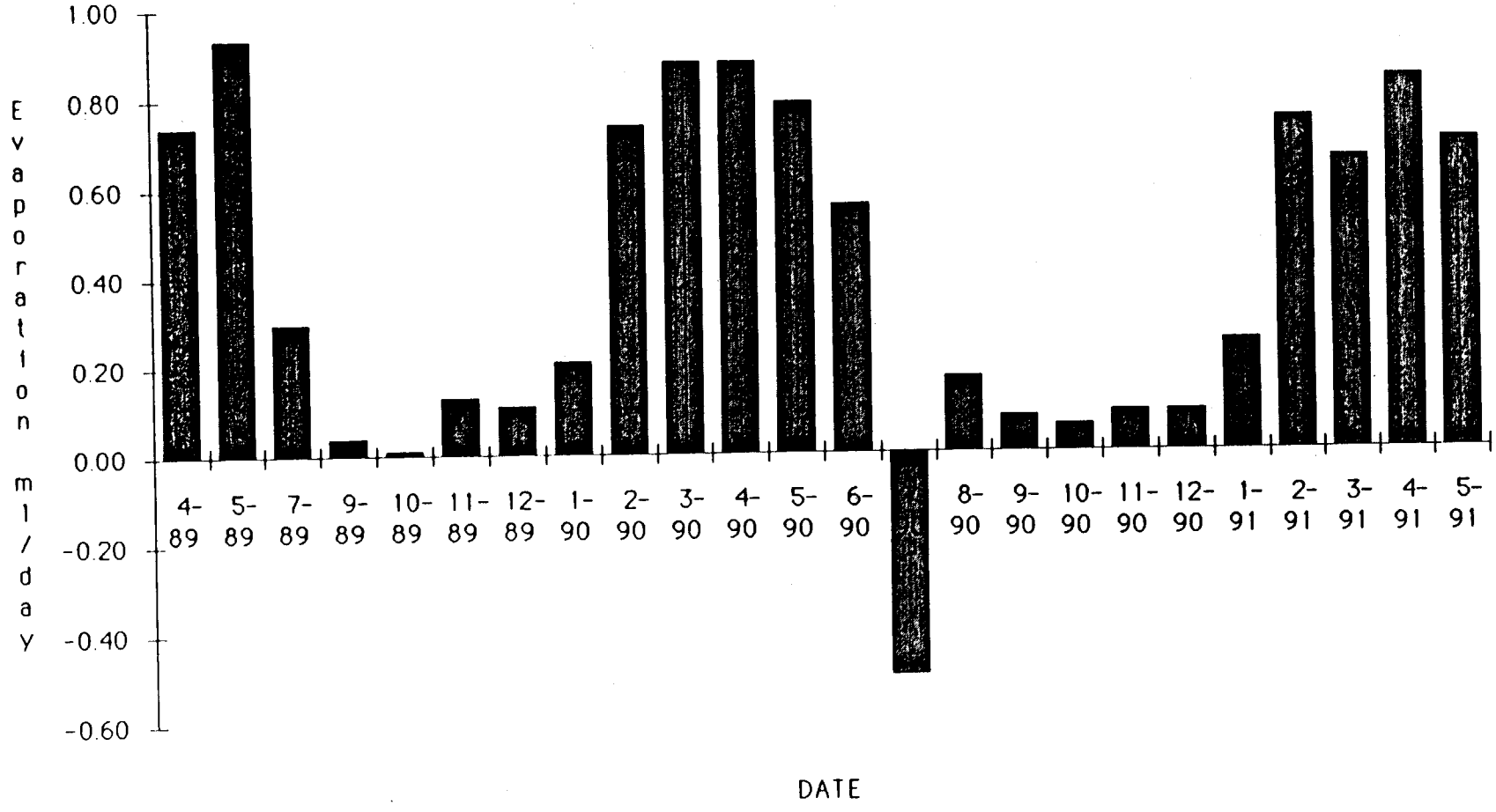
EMS #11 Tarantula Room

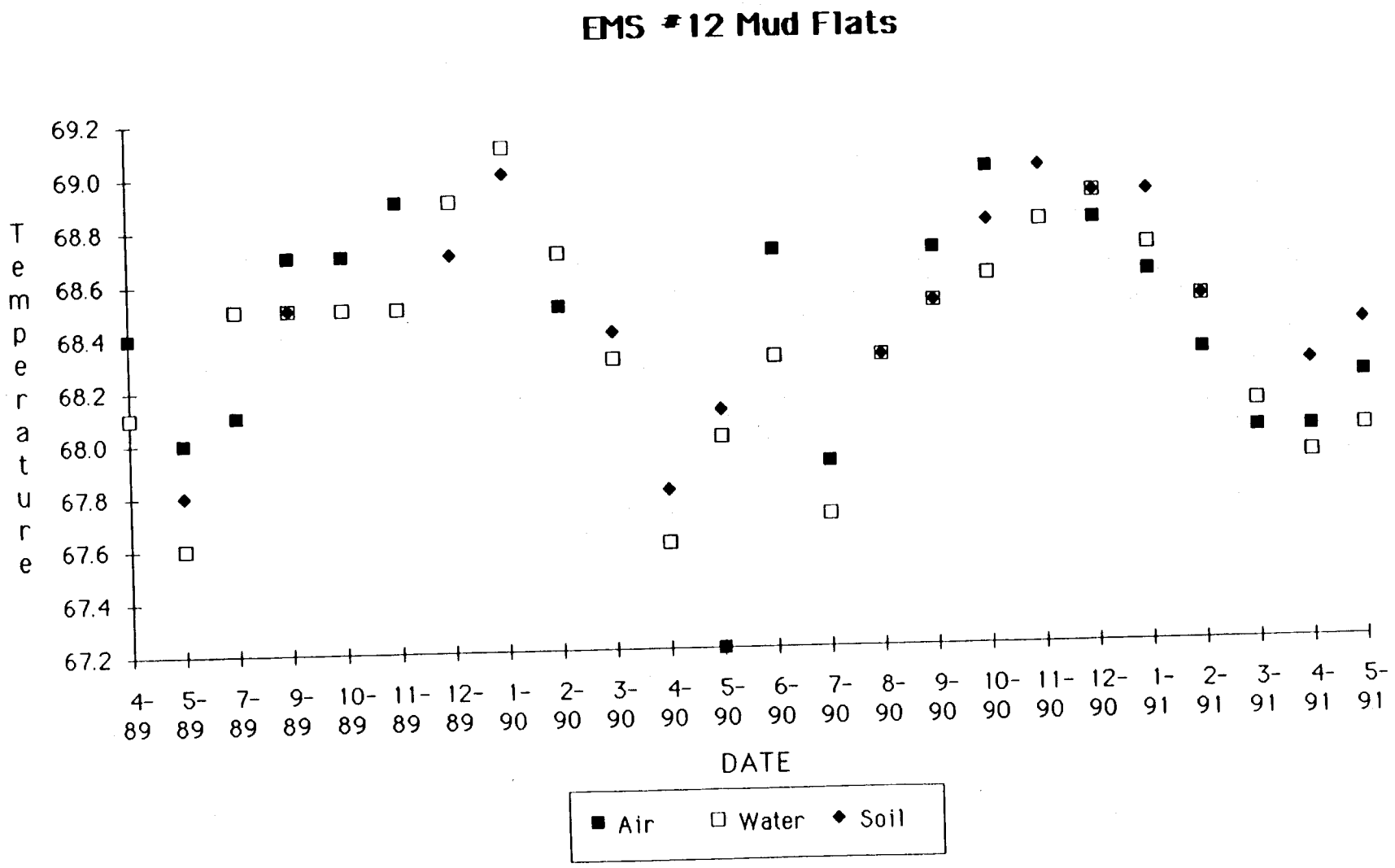


KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
12-Mud Flats	04/02/89	04/29/89	0.74	68.1	68.4	68.4	-	-	-	-	-	-	-	-
12-Mud Flats	04/29/89	05/29/89	0.93	67.6	68.0	67.8	99.00	-	-	-	-	-	-	-
12-Mud Flats	05/29/89	07/20/89	0.30	68.5	68.1	68.1	99.50	-	-	-	-	-	-	-
12-Mud Flats	07/20/89	09/11/89	0.04	68.5	68.7	68.5	99.10	-	-	-	-	-	-	-
12-Mud Flats	09/11/89	10/16/89	0.01	68.5	68.7	68.7	100.00	-	-	-	-	-	-	-
12-Mud Flats	10/16/89	11/08/89	0.13	68.5	68.9	-	99.10	-	-	-	-	-	-	-
12-Mud Flats	11/08/89	12/11/89	0.11	68.9	68.9	68.7	99.05	-	-	-	-	-	-	-
12-Mud Flats	12/11/89	01/14/90	0.21	69.1	69.1	69.0	99.53	none	-	-	-	-	-	-
12-Mud Flats	01/14/90	02/16/90	0.74	68.7	68.5	68.5	98.50	none	-	-	-	-	-	-
12-Mud Flats	02/16/90	03/16/90	0.88	68.3	68.3	68.4	99.05	-	-	-	-	-	-	-
12-Mud Flats	03/16/90	04/17/90	0.88	67.6	67.6	67.8	99.17	-	-	-	-	-	-	-
12-Mud Flats	04/17/90	05/13/90	0.79	68.0	67.2	68.1	99.47	-	-	-	-	-	-	-
12-Mud Flats	05/13/90	06/27/90	0.56	68.3	68.7	68.7	98.58	-	-	-	-	-	-	-
12-Mud Flats	06/27/90	07/24/90	-0.50	67.7	67.9	67.9	99.88	-	-	-	-	-	-	-
12-Mud Flats	07/24/90	08/23/90	0.17	68.3	68.3	68.3	99.62	-	-	-	-	-	-	-
12-Mud Flats	08/23/90	09/25/90	0.08	68.5	68.7	68.5	99.54	-	-	-	-	-	-	-
12-Mud Flats	09/25/90	10/23/90	0.06	68.6	69.0	68.8	99.32	-	-	-	-	-	-	-
12-Mud Flats	10/23/90	11/20/90	0.09	68.8	68.8	69.0	99.29	-	-	-	-	-	-	-
12-Mud Flats	11/20/90	12/18/90	0.09	68.9	68.8	68.9	100.00	-	-	-	-	-	-	-
12-Mud Flats	12/18/90	01/17/91	0.25	68.7	68.6	68.9	99.30	-	-	-	-	-	-	-
12-Mud Flats	01/17/91	02/24/91	0.75	68.5	68.3	68.5	98.99	-	-	-	-	-	-	-
12-Mud Flats	02/24/91	03/28/91	0.66	68.1	68.0	-	97.99	-	-	-	-	-	-	-
12-Mud Flats	03/28/91	04/23/91	0.84	67.9	68.0	68.3	97.99	-	-	-	-	-	-	-
12-Mud Flats	04/23/91	05/21/91	0.70	68.0	68.2	68.4	98.24	-	-	-	-	-	-	-

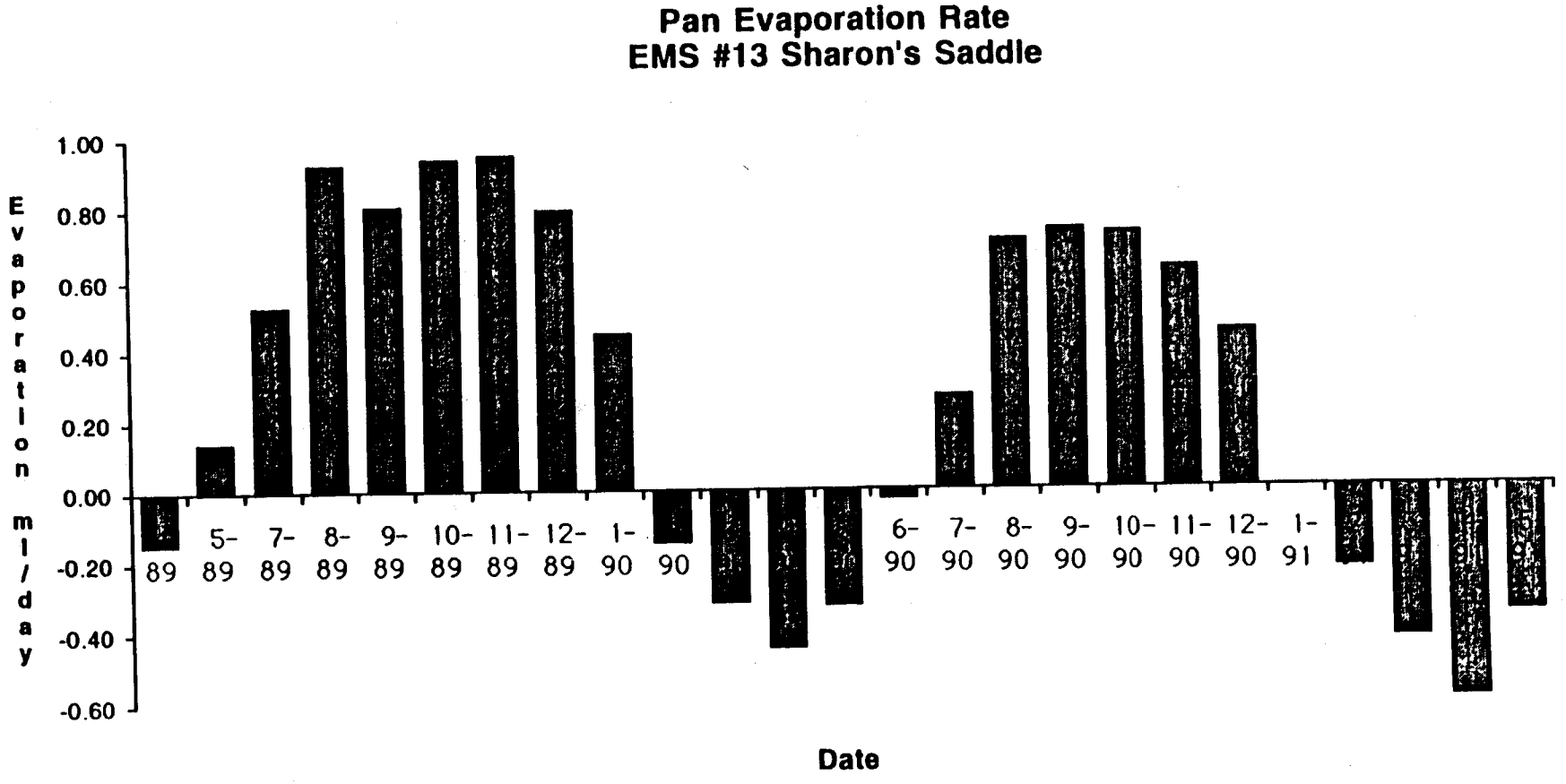
EMS #12 Mud Flats

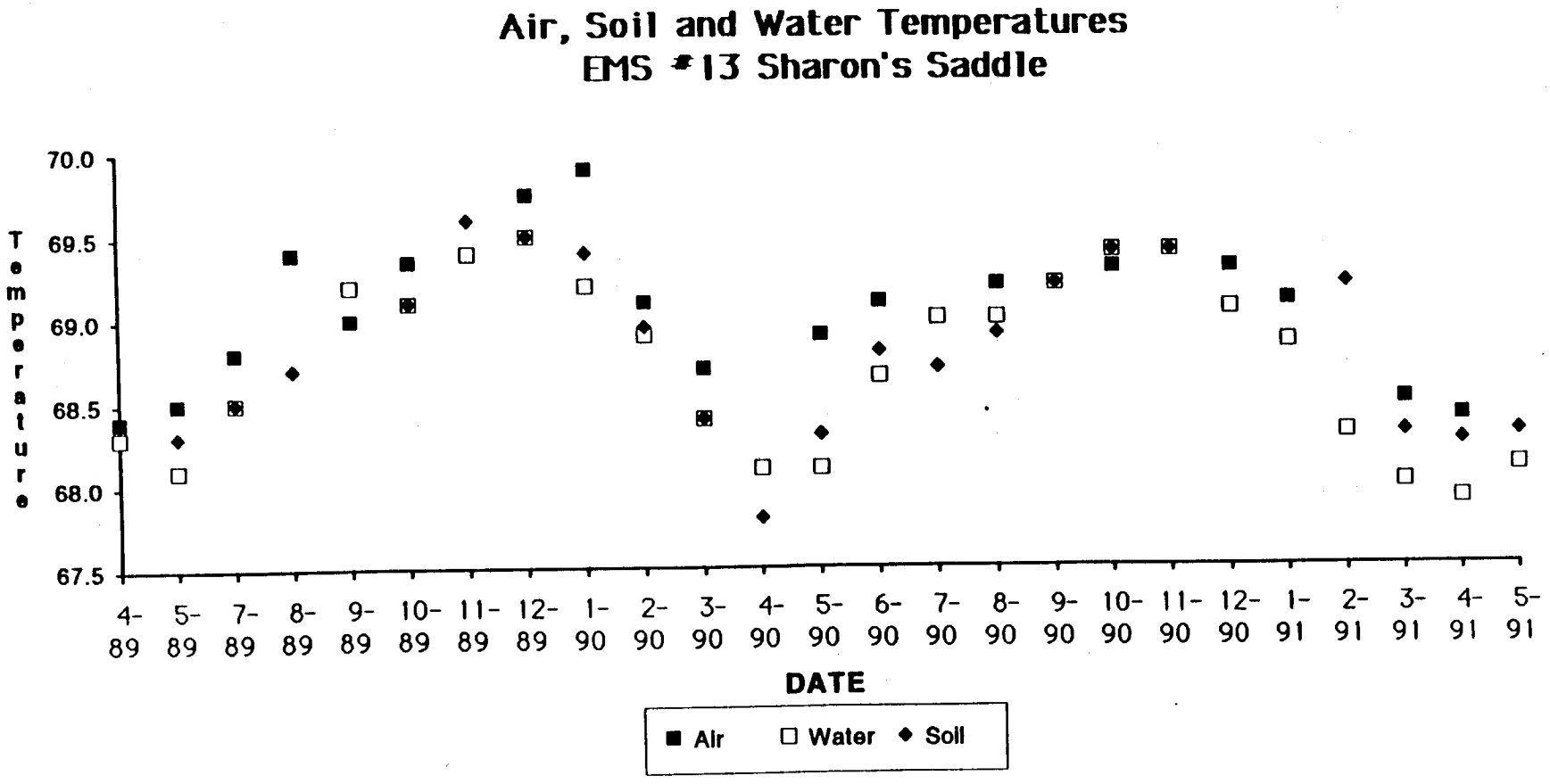



EMS #12 Mud Flats
Temperature
69.2
69.0
68.8
68.6
68.4
68.2
68.0
67.8
67.6
67.4
67.2
4-89
5-89
7-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
7-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
4-91
5-91
DATE
Air
Water
Soil

KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	TEMPERATURES AIR	TEMPERATURES SOIL	RH (%)	RS Therm #	Air Temperature Current	Air Temperature Max	Air Temperature Min	Soil Temperature Current	Soil Temperature Max	Soil Temperature Min
13-Sharon's Saddle	04/02/89	04/29/89	-0.15	68.3	68.4	68.4	-	-	-	-	-	-	-	-
13-Sharon's Saddle	04/29/89	05/29/89	0.14	68.1	68.5	68.3	99.00	-	-	-	-	-	-	-
13-Sharon's Saddle	05/29/89	07/02/89	0.53	68.5	68.8	68.5	99.50	-	-	-	-	-	-	-
13-Sharon's Saddle	07/02/89	08/13/89	0.93	-	69.4	68.7	98.12	-	-	-	-	-	-	-
13-Sharon's Saddle	08/13/89	09/11/89	0.81	69.2	69.0	-	99.50	-	-	-	-	-	-	-
13-Sharon's Saddle	09/11/89	10/15/89	0.94	69.1	69.4	69.1	97.90	-	-	-	-	-	-	-
13-Sharon's Saddle	10/15/89	11/08/89	0.96	69.4	69.4	69.6	99.10	-	-	-	-	-	-	-
13-Sharon's Saddle	11/08/89	12/11/89	0.80	69.5	69.8	69.5	98.13	-	-	-	-	-	-	-
13-Sharon's Saddle	12/11/89	01/16/90	0.45	69.2	69.9	69.4	98.36	none	-	-	-	-	-	-
13-Sharon's Saddle	01/16/90	02/16/90	-0.15	68.9	69.1	69.0	99.80	none	-	-	-	-	-	-
13-Sharon's Saddle	02/16/90	03/16/90	-0.32	68.4	68.7	68.4	100.00	-	-	-	-	-	-	-
13-Sharon's Saddle	03/16/90	04/17/90	-0.45	68.1	68.1	67.8	100.00	-	-	-	-	-	-	-
13-Sharon's Saddle	04/17/90	05/13/90	-0.33	68.1	68.9	68.3	99.96	-	-	-	-	-	-	-
13-Sharon's Saddle	05/13/90	06/21/90	-0.03	68.7	69.1	68.8	99.05	-	-	-	-	-	-	-
13-Sharon's Saddle	06/21/90	07/26/90	0.27	69.0	69.0	68.7	99.70	-	-	-	-	-	-	-
13-Sharon's Saddle	07/26/90	08/23/90	0.71	69.0	69.2	68.9	99.60	-	-	-	-	-	-	-
13-Sharon's Saddle	08/23/90	09/25/90	0.74	69.2	69.2	69.2	99.45	-	-	-	-	-	-	-
13-Sharon's Saddle	09/25/90	10/25/90	0.73	69.4	69.3	69.4	99.46	-	-	-	-	-	-	-
13-Sharon's Saddle	10/25/90	11/20/90	0.63	69.4	69.4	69.4	98.36	-	-	-	-	-	-	-
13-Sharon's Saddle	11/20/90	12/18/90	0.45	69.1	69.3	69.3	99.50	-	-	-	-	-	-	-
13-Sharon's Saddle	12/18/90	01/17/91	0.00	68.9	69.1	69.1	99.95	-	-	-	-	-	-	-
13-Sharon's Saddle	01/17/91	02/21/91	-0.23	68.3	68.3	69.2	99.00	-	-	-	-	-	-	-
13-Sharon's Saddle	02/21/91	03/28/91	-0.43	68.0	68.5	68.3	100.00	-	-	-	-	-	-	-
13-Sharon's Saddle	03/28/91	04/23/91	-0.60	67.9	68.4	68.3	99.50	-	-	-	-	-	-	-
13-Sharon's Saddle	04/23/91	05/21/91	-0.36	68.1	68.1	68.3	100.00	-	-	-	-	-	-	-


Pan Evaporation Rate
EMS #13 Sharon's Saddle
Evaporation ml/day
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-0.40
-0.60
89
5-89
7-89
8-89
9-89
10-89
11-89
12-89
1-90
90
6-90
7-90
8-90
9-90
10-90
11-90
12-90
1-91
Date

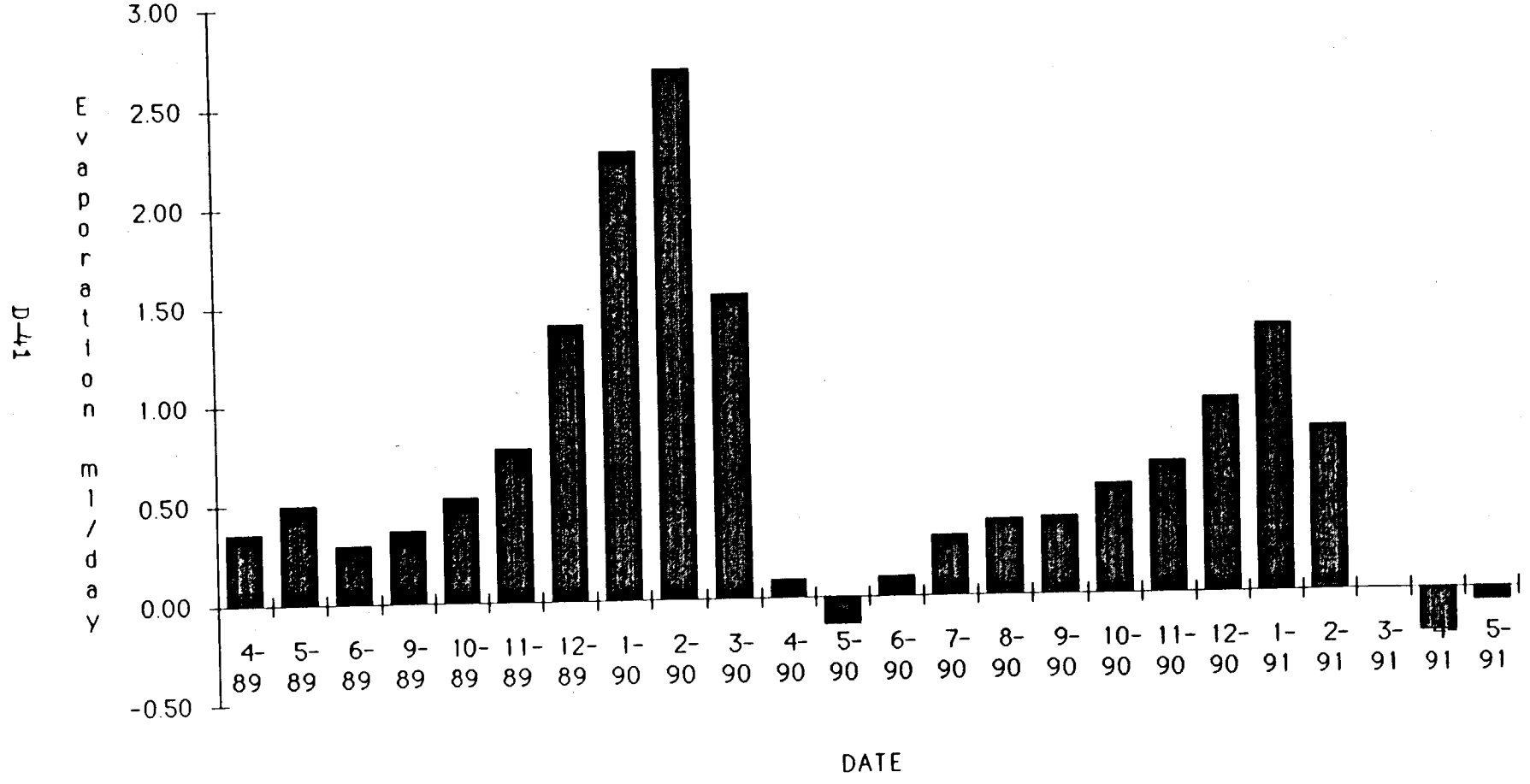

Air, Soil and Water Temperatures
EMS #13 Sharon's Saddle
Temperature
70.0
69.5
69.0
68.5
68.0
67.5
4-89
5-89
7-89
8-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
7-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
4-91
5-91
DATE
Air
Water
Soil

KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
14-Main Corridor	04/08/89	04/29/89	0.36	67.6	68.4	67.5	-	-	-	-	-	-	-	-
14-Main Corridor	04/29/89	05/29/89	0.50	67.1	67.4	67.2	98.10	-	-	-	-	-	-	-
14-Main Corridor	05/29/89	06/30/89	0.30	67.4	67.9	67.4	98.60	-	-	-	-	-	-	-
14-Main Corridor	06/30/89	09/14/89	0.37	68.1	68.5	68.1	98.10	-	-	-	-	-	-	-
14-Main Corridor	09/14/89	10/16/89	0.53	68.5	68.3	68.7	100.00	-	-	-	-	-	-	-
14-Main Corridor	10/16/89	11/14/89	0.78	68.5	68.5	67.2	99.00	-	-	-	-	-	-	-
14-Main Corridor	11/14/89	12/11/89	1.40	68.1	68.2	68.2	97.62	-	-	-	-	-	-	-
14-Main Corridor	12/11/89	01/16/90	2.27	67.8	67.8	67.4	100.00	none	-	-	-	-	-	-
14-Main Corridor	01/16/90	02/16/90	2.68	67.4	67.6	67.6	100.00	none	-	-	-	-	-	-
14-Main Corridor	02/16/90	03/16/90	1.54	67.1	66.2	67.0	91.97	-	-	-	-	-	-	-
14-Main Corridor	03/16/90	04/17/90	0.09	66.9	67.2	66.9	99.57	-	-	-	-	-	-	-
14-Main Corridor	04/17/90	05/13/90	-0.14	67.4	67.8	67.8	98.80	-	-	-	-	-	-	-
14-Main Corridor	05/13/90	06/27/90	0.10	67.8	68.3	68.0	99.04	-	-	-	-	-	-	-
14-Main Corridor	06/27/90	07/24/90	0.30	67.4	67.5	67.5	99.64	-	-	-	-	-	-	-
14-Main Corridor	07/24/90	08/23/90	0.38	68.1	68.4	68.0	99.33	-	-	-	-	-	-	-
14-Main Corridor	08/23/90	09/25/90	0.39	68.4	68.5	68.5	99.76	-	-	-	-	-	-	-
14-Main Corridor	09/25/90	10/23/90	0.55	68.5	68.1	68.2	99.32	-	-	-	-	-	-	-
14-Main Corridor	10/23/90	11/20/90	0.66	68.6	68.5	68.9	98.82	-	-	-	-	-	-	-
14-Main Corridor	11/20/90	12/18/90	0.98	68.1	68.4	68.5	97.75	-	-	-	-	-	-	-
14-Main Corridor	12/18/90	01/17/91	1.35	67.9	68.1	68.1	99.65	-	-	-	-	-	-	-
14-Main Corridor	01/17/91	02/21/91	0.83	67.6	67.5	67.6	99.50	-	-	-	-	-	-	-
14-Main Corridor	02/21/91	03/28/91	0.00	67.4	67.4	67.2	98.98	-	-	-	-	-	-	-
14-Main Corridor	03/28/91	04/23/91	-0.22	67.3	67.4	67.6	98.23	-	-	-	-	-	-	-
14-Main Corridor	04/23/91	05/21/91	-0.07	67.2	67.5	67.4	98.99	-	-	-	-	-	-	-

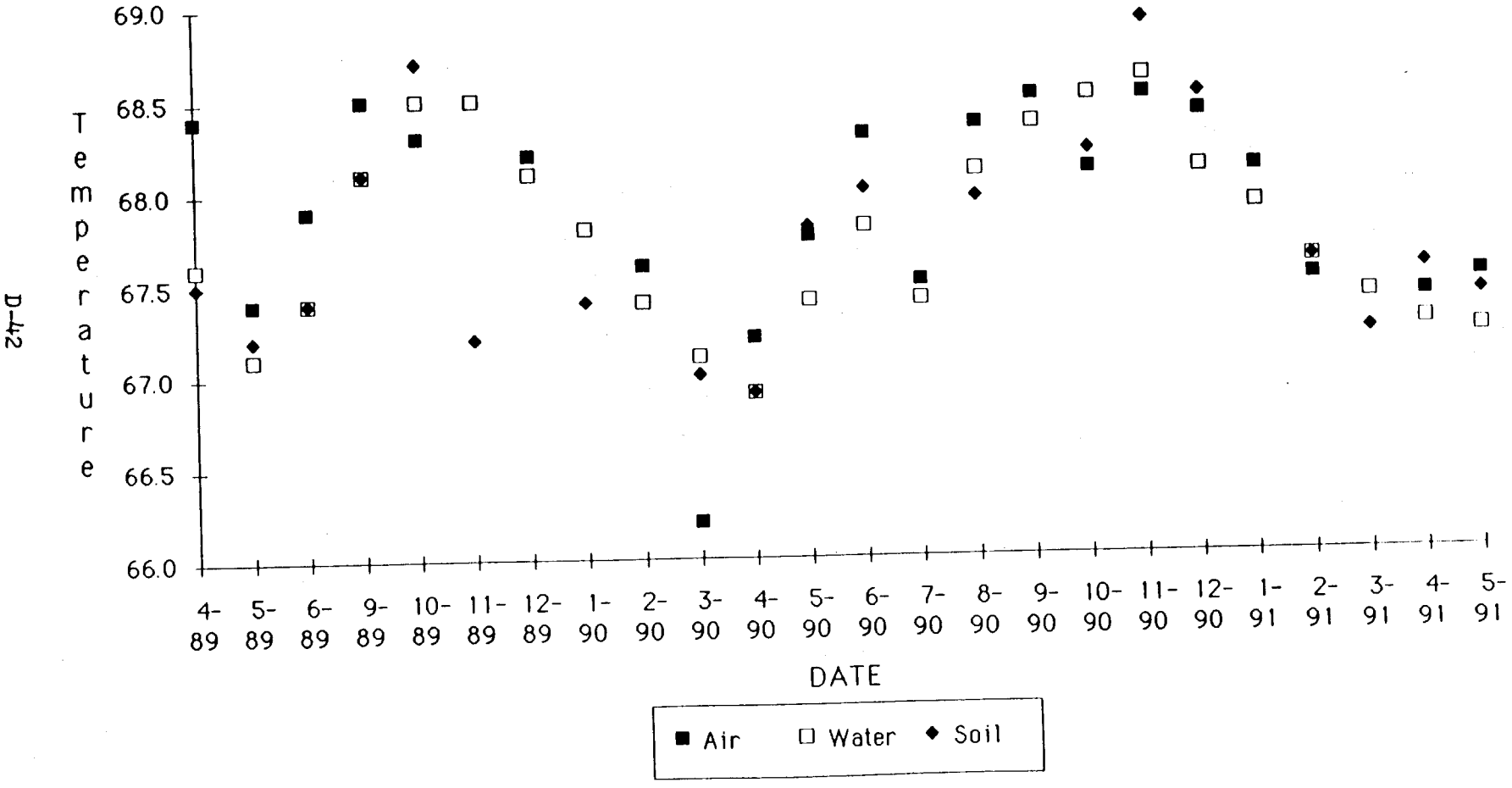
9/4/91

EMS #14 Main Corridor



D-41

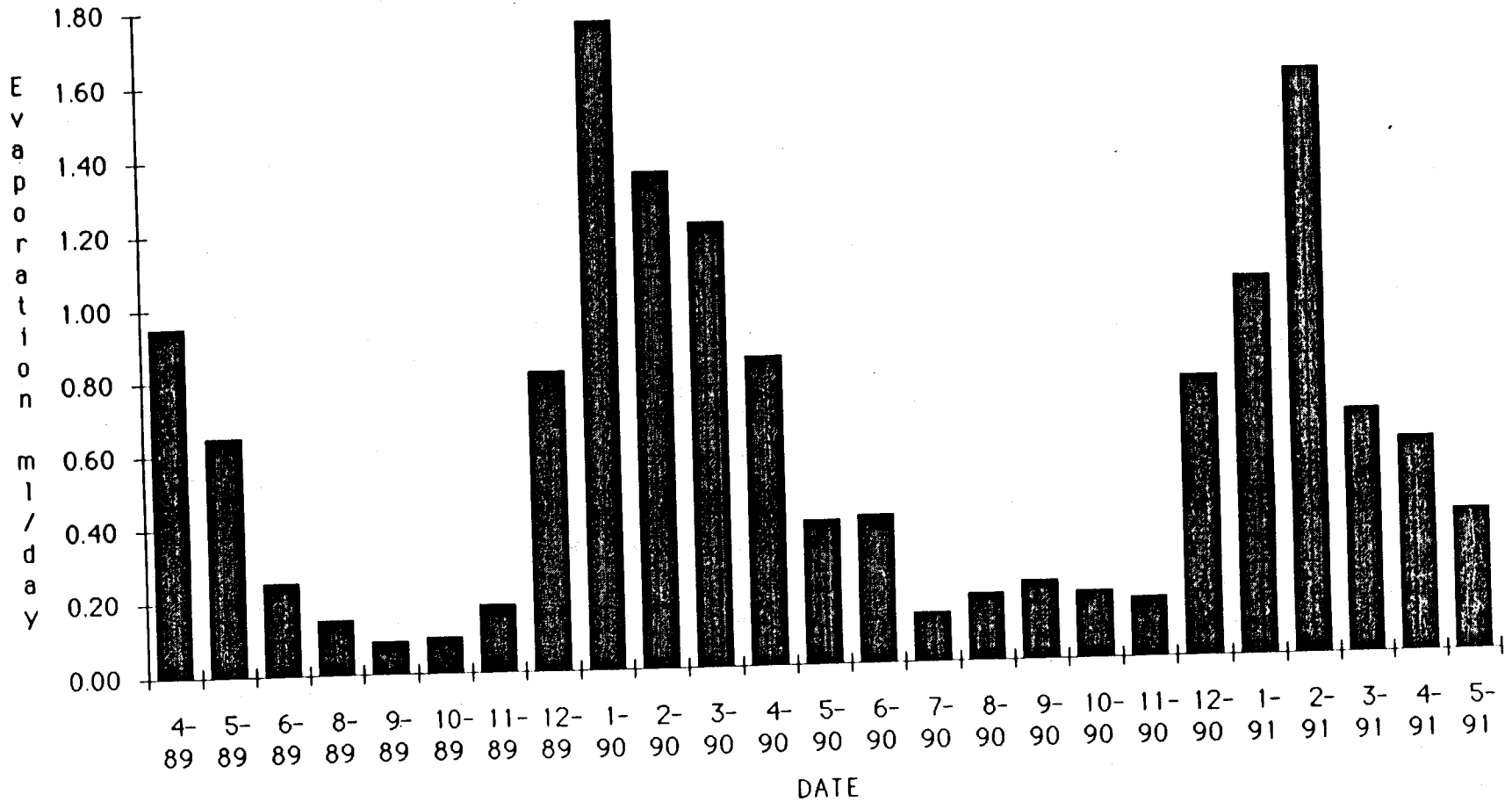
EMS #14 Main Corridor



KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

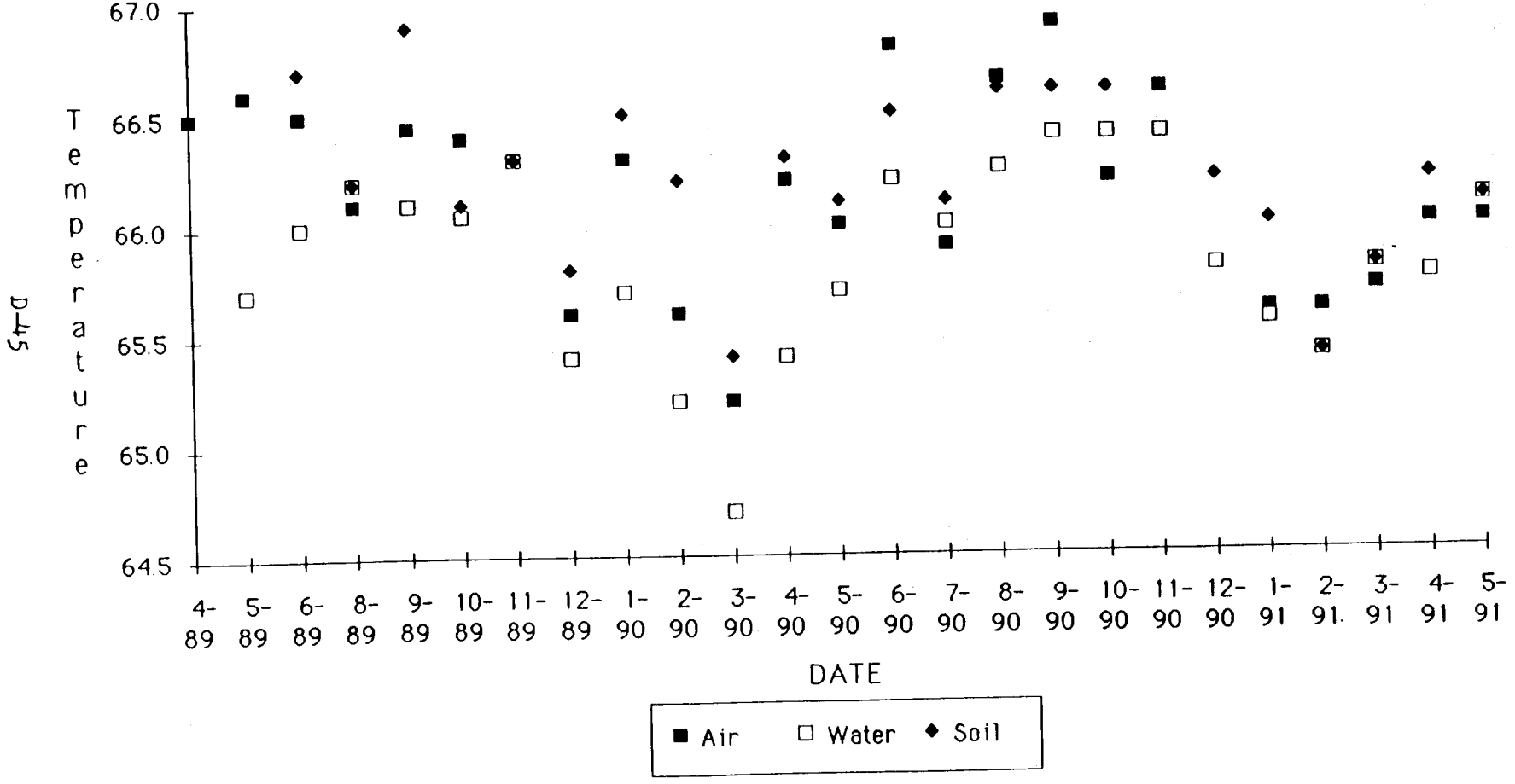
STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
15-Scorpion Passages	04/08/89	04/29/89	0.95	-	66.5	66.5	-	-	-	-	-	-	-	-
15-Scorpion Passages	04/29/89	05/29/89	0.65	65.7	66.6	-	-	-	-	-	-	-	-	-
15-Scorpion Passages	05/29/89	06/30/89	0.25	66.0	66.5	66.7	98.50	-	-	-	-	-	-	-
15-Scorpion Passages	06/30/89	08/23/89	0.15	66.2	66.1	66.2	100.00	-	-	-	-	-	-	-
15-Scorpion Passages	08/23/89	09/15/89	0.09	66.1	66.5	66.9	99.30	-	-	-	-	-	-	-
15-Scorpion Passages	09/15/89	10/16/89	0.10	66.1	66.4	66.1	98.80	3	67.2	67.4	66.7	66.2	66.4	66.0
15-Scorpion Passages	10/16/89	11/14/89	0.18	66.3	66.3	66.3	99.50	10	67.1	67.1	66.4	66.4	66.4	66.1
15-Scorpion Passages	11/14/89	12/11/89	0.82	65.4	65.6	65.8	100.00	-	-	-	-	-	-	-
15-Scorpion Passages	12/11/89	01/16/90	1.76	65.7	66.3	66.5	95.86	10	66.4	66.8	66.0	65.5	65.9	65.3
15-Scorpion Passages	01/16/90	02/16/90	1.35	65.2	65.6	66.2	95.56	10	66.2	66.9	66.0	65.3	65.5	65.3
15-Scorpion Passages	02/16/90	03/16/90	1.21	64.7	65.2	65.4	99.50	10	66.0	66.6	65.9	65.3	65.5	65.3
15-Scorpion Passages	03/16/90	04/17/90	0.84	65.4	66.2	66.3	99.02	10	66.6	66.6	65.9	65.5	65.5	65.3
15-Scorpion Passages	04/17/90	05/13/90	0.39	65.7	66.0	66.1	99.02	10	66.8	67.1	66.6	65.7	65.7	65.5
15-Scorpion Passages	05/13/90	06/27/90	0.40	66.2	66.8	66.5	98.54	10	67.3	67.3	66.8	66.1	66.1	65.7
15-Scorpion Passages	06/27/90	07/24/90	0.13	66.0	65.9	66.1	99.73	-	-	-	-	-	-	-
15-Scorpion Passages	07/24/90	08/23/90	0.18	66.3	66.7	66.6	99.40	10	67.3	67.3	67.1	66.4	66.4	66.1
15-Scorpion Passages	08/23/90	09/25/90	0.21	66.4	66.9	66.6	99.45	10	67.7	67.7	67.3	66.4	66.4	66.1
15-Scorpion Passages	09/25/90	10/23/90	0.18	66.4	66.2	66.6	99.56	10	67.7	67.7	67.5	66.4	66.6	66.4
15-Scorpion Passages	10/23/90	11/20/90	0.16	66.4	66.6	66.6	100.00	10	67.7	67.8	67.5	66.6	66.6	66.4
15-Scorpion Passages	11/20/90	12/18/90	0.76	65.8	65.8	66.2	98.45	10	67.5	67.8	67.3	66.1	66.6	66.1
15-Scorpion Passages	12/18/90	01/17/91	1.03	65.6	65.6	66.0	98.42	10	67.3	67.7	67.1	66.1	66.4	65.9
15-Scorpion Passages	01/17/91	02/21/91	1.59	65.4	65.6	65.4	99.48	10	66.8	67.3	66.6	65.5	65.9	65.5
15-Scorpion Passages	02/21/91	03/28/91	0.66	65.8	65.7	65.8	97.93	-	-	-	-	-	-	-
15-Scorpion Passages	03/28/91	04/23/91	0.58	65.8	66.0	66.2	97.42	10	67.1	67.1	65.8	65.9	65.9	65.7
15-Scorpion Passages	04/23/91	05/23/91	0.38	66.1	66.0	66.1	98.45	10	67.1	67.1	66.8	65.9	65.9	65.9

EMS #15 Scorpion Passages



9/6/91

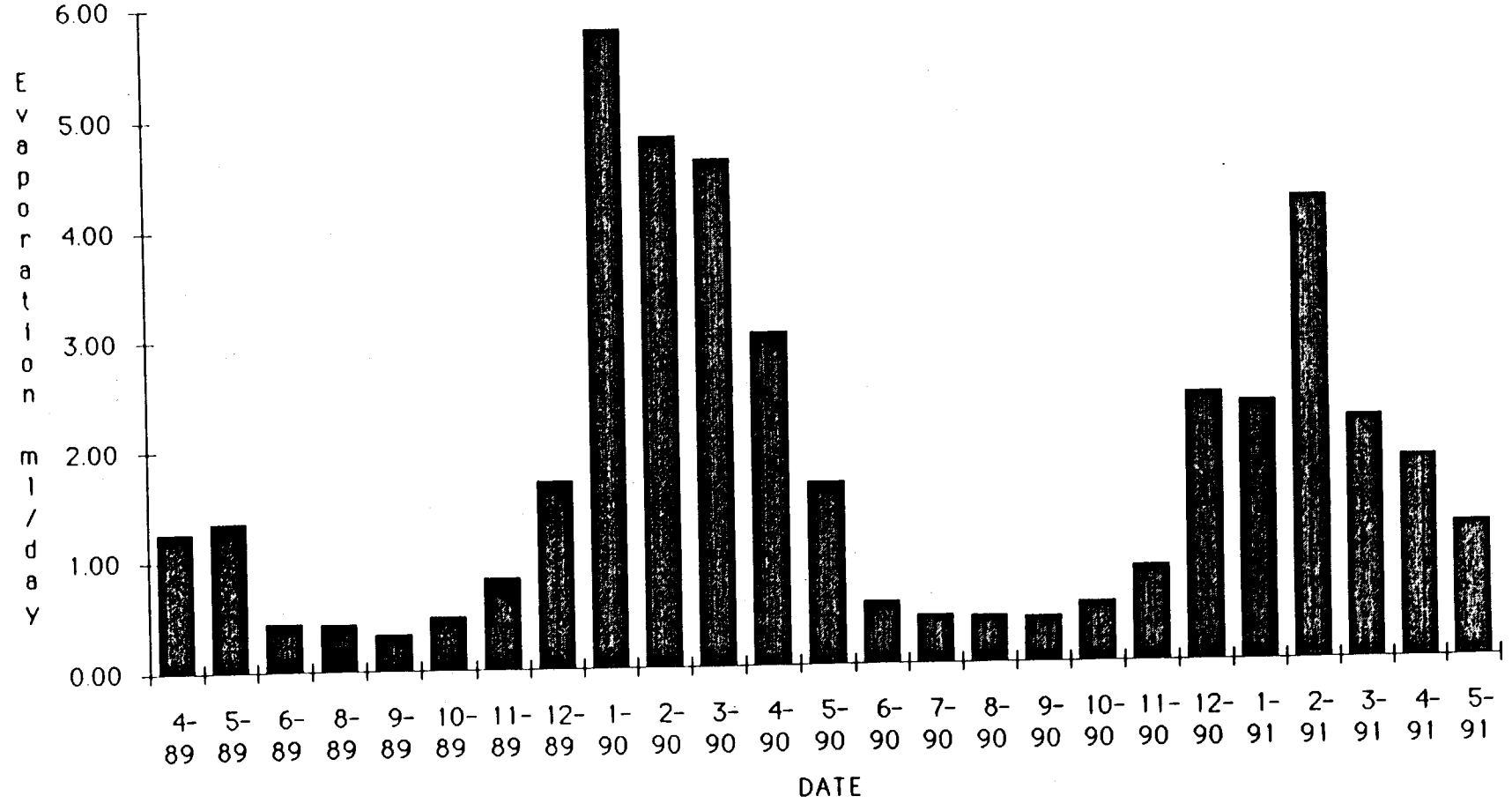
EMS #15 Scorpion Passages

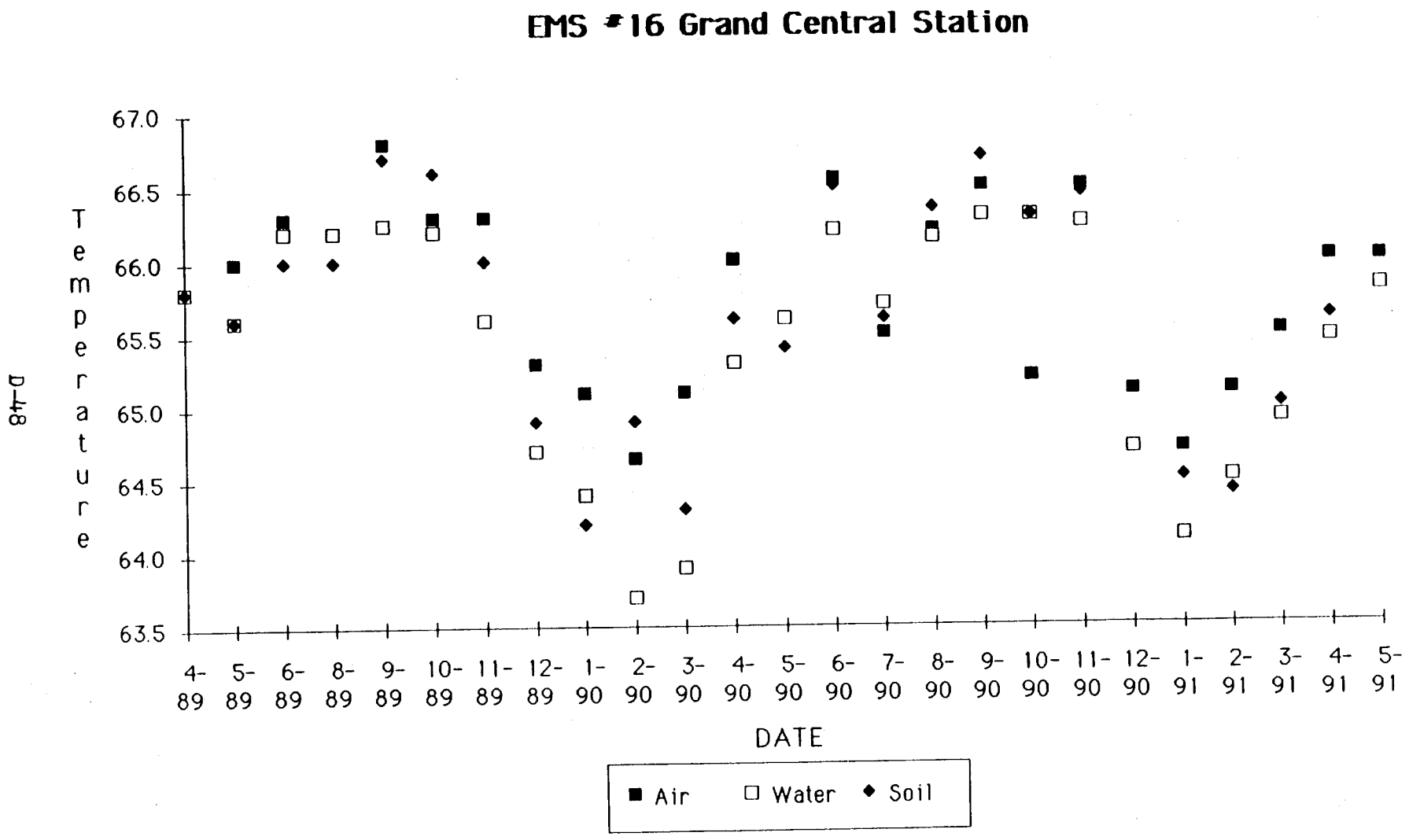


KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
16-Grand Central Statio	04/02/89	04/29/89	1.26	65.8	-	65.8	-	-	-	-	-	-	-	-
16-Grand Central Statio	04/29/89	05/29/89	1.35	65.6	66.0	65.6	98.10	-	-	-	-	-	-	-
16-Grand Central Statio	05/29/89	06/30/89	0.44	66.2	66.3	66.0	97.60	-	-	-	-	-	-	-
16-Grand Central Statio	06/30/89	08/23/89	0.43	66.2	66.2	66.0	100.00	-	-	-	-	-	-	-
16-Grand Central Statio	08/23/89	09/15/89	0.33	66.3	66.8	66.7	98.30	-	-	-	-	-	-	-
16-Grand Central Statio	09/15/89	10/16/89	0.48	66.2	66.3	66.6	98.30	-	-	-	-	-	-	-
16-Grand Central Statio	10/16/89	11/08/89	0.83	65.6	66.3	66.0	99.00	14	66.8	66.8	66.3	65.3	65.5	65.3
16-Grand Central Statio	11/08/89	12/11/89	1.70	64.7	65.3	64.9	95.55	14	-	-	-	64.4	65.3	64.2
16-Grand Central Statio	12/11/89	01/16/90	5.79	64.4	65.1	64.2	98.00	5	65.6	66.1	64.8	64.4	64.4	63.5
16-Grand Central Statio	01/16/90	02/16/90	4.82	63.7	64.7	64.9	85.36	5	65.6	66.2	65.3	64.0	64.7	63.5
16-Grand Central Statio	02/16/90	03/16/90	4.61	63.9	65.1	64.3	87.86	5	65.3	66.2	64.9	62.8	63.5	62.6
16-Grand Central Statio	03/16/90	04/17/90	3.03	65.3	66.0	65.6	98.87	5	66.2	66.2	65.4	64.9	64.9	63.5
16-Grand Central Statio	04/17/90	05/13/90	1.65	65.6	65.6	65.4	99.17	5	66.5	66.5	65.8	65.1	65.5	64.4
16-Grand Central Statio	05/13/90	06/27/90	0.56	66.2	66.6	66.5	98.78	5	66.7	66.7	66.0	65.8	65.8	65.1
16-Grand Central Statio	06/27/90	07/24/90	0.43	65.7	65.5	65.6	99.75	-	-	-	-	-	-	-
16-Grand Central Statio	07/24/90	08/23/90	0.42	66.2	66.2	66.4	99.54	5	66.9	66.9	66.5	66.0	66.2	65.8
16-Grand Central Statio	08/23/90	09/25/90	0.41	66.3	66.5	66.7	99.55	5	66.9	67.1	66.7	66.2	66.2	66.0
16-Grand Central Statio	09/25/90	10/23/90	0.54	66.3	65.2	66.3	99.58	5	67.1	67.1	66.7	66.2	66.4	66.2
16-Grand Central Statio	10/23/90	11/20/90	0.86	66.3	66.5	66.5	99.02	5	67.1	67.1	66.7	66.2	66.4	66.2
16-Grand Central Statio	11/20/90	12/18/90	2.43	64.7	65.1	65.1	91.79	5	65.7	66.6	65.3	65.3	66.6	65.3
16-Grand Central Statio	12/18/90	01/17/91	2.35	64.1	64.7	64.5	97.78	5	66.0	67.1	65.4	64.6	66.4	64.6
16-Grand Central Statio	01/17/91	02/21/91	4.22	64.5	65.1	64.4	96.35	5	64.9	67.1	64.5	-	-	-
16-Grand Central Statio	02/21/91	03/28/91	2.20	64.9	65.5	65.0	96.36	-	-	-	-	-	-	-
16-Grand Central Statio	03/28/91	04/23/91	1.83	65.5	66.0	65.6	95.88	9	67.1	67.1	66.6	-	-	-
16-Grand Central Statio	04/23/91	05/23/91	1.22	65.8	66.0	66.0	99.48	5	66.5	66.5	65.6	64.0	64.9	63.8

EMS #16 Grand Central Station




EMS #16 Grand Central Station
Temperature
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66.5
66.0
65.5
65.0
64.5
64.0
63.5
4-89
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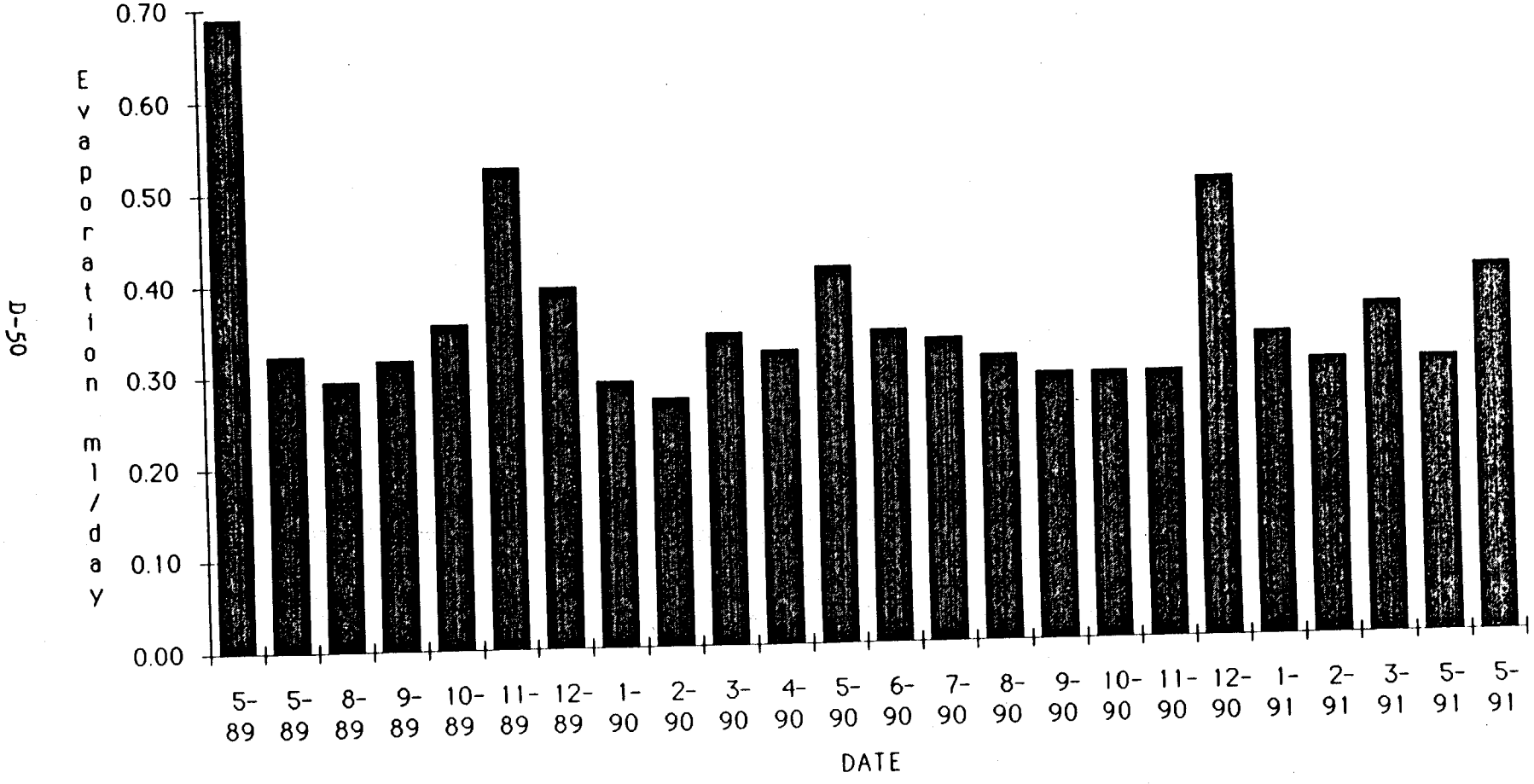
6-89
8-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
7-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
4-91
5-91
DATE
Air
Water
Soil

9/6/91

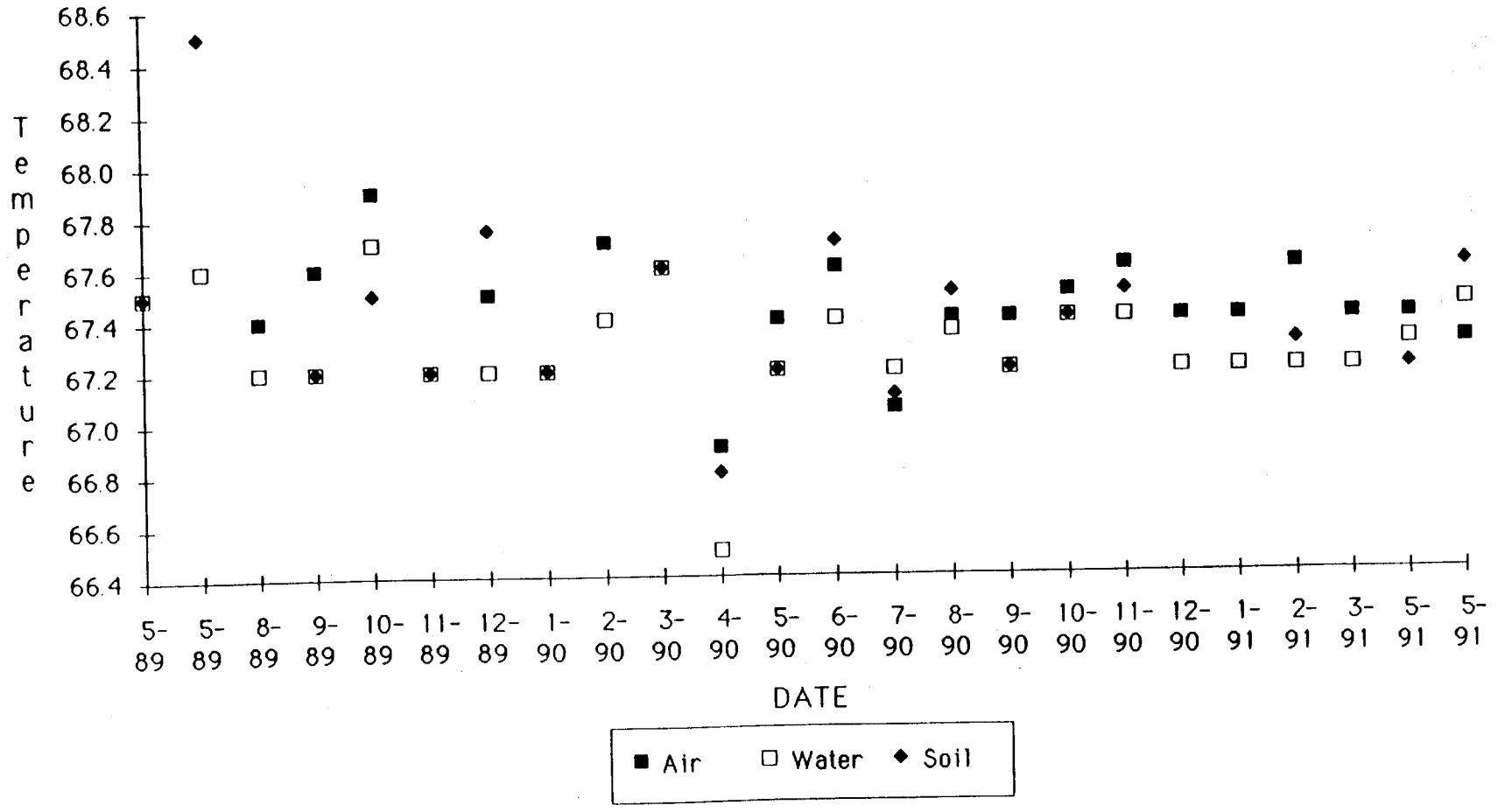
KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
17-Lower Throne Room	04/16/89	05/07/89	0.69	67.5	67.5	67.5	-	-	-	-	-	-	-	-
17-Lower Throne Room	05/07/89	05/31/89	0.32	67.6	67.6	68.5	100.00	-	-	-	-	-	-	-
17-Lower Throne Room	05/31/89	08/19/89	0.29	67.2	67.4	67.4	100.00	-	-	-	-	-	-	-
17-Lower Throne Room	08/19/89	09/14/89	0.32	67.2	67.6	67.2	98.10	-	-	-	-	-	-	-
17-Lower Throne Room	09/14/89	10/15/89	0.36	67.7	67.9	67.5	99.00	5	67.6	67.8	67.8	-	-	-
17-Lower Throne Room	10/15/89	11/10/89	0.53	67.2	67.2	67.2	99.00	13	68.1	67.1	67.3	67.5	67.5	67.3
17-Lower Throne Room	11/10/89	12/11/89	0.39	67.2	67.5	67.8	100.00	13	68.6	68.6	67.9	67.3	67.5	67.3
17-Lower Throne Room	12/11/89	01/18/90	0.29	67.2	67.2	67.2	100.00	13	68.2	68.6	68.2	67.5	67.5	67.3
17-Lower Throne Room	01/18/90	02/17/90	0.27	67.4	67.7	67.7	99.27	13	68.6	68.8	68.2	67.5	67.5	67.3
17-Lower Throne Room	02/17/90	03/20/90	0.34	67.6	67.6	67.6	99.43	13	68.8	68.8	68.6	67.5	67.5	67.3
17-Lower Throne Room	03/20/90	04/19/90	0.32	66.5	66.9	66.8	98.55	13	68.8	68.8	68.6	67.5	67.5	67.3
17-Lower Throne Room	04/19/90	05/16/90	0.41	67.2	67.4	67.2	99.26	13	69.0	69.0	68.8	67.5	67.5	67.3
17-Lower Throne Room	05/16/90	06/17/90	0.34	67.4	67.6	67.7	99.76	13	69.0	69.1	68.8	67.5	67.5	67.3
17-Lower Throne Room	06/17/90	07/31/90	0.33	67.2	67.1	67.1	99.30	13	69.0	69.1	68.8	67.5	67.5	67.3
17-Lower Throne Room	07/31/90	08/26/90	0.31	67.4	67.4	67.5	99.75	13	69.1	69.1	69.0	67.5	67.5	67.3
17-Lower Throne Room	08/26/90	09/30/90	0.29	67.2	67.4	67.2	99.73	13	6931.0	69.1	69.0	67.5	67.5	67.3
17-Lower Throne Room	09/30/90	10/30/90	0.29	67.4	67.5	67.4	99.52	13	69.1	69.3	69.0	67.5	67.5	67.3
17-Lower Throne Room	10/30/90	11/24/90	0.29	67.4	67.6	67.5	99.76	13	69.3	69.3	69.1	67.5	67.5	67.3
17-Lower Throne Room	11/24/90	12/19/90	0.50	67.2	67.4	67.4	99.49	13	69.3	69.3	69.1	67.5	67.5	67.3
17-Lower Throne Room	12/19/90	01/15/91	0.33	67.2	67.4	67.4	99.43	13	69.3	69.3	69.1	67.5	67.5	67.3
17-Lower Throne Room	01/15/91	02/14/91	0.30	67.2	67.6	67.3	100.00	13	69.3	69.5	69.1	67.5	67.5	67.3
17-Lower Throne Room	02/14/91	03/24/91	0.36	67.2	67.4	67.4	100.00	13	69.3	69.3	69.1	67.3	67.5	67.3
17-Lower Throne Room	03/24/91	05/05/91	0.30	67.3	67.4	67.2	98.98	13	69.5	69.5	69.1	67.5	67.5	67.3
17-Lower Throne Room	05/05/91	05/29/91	0.40	67.5	67.3	67.6	98.99	13	69.3	69.5	69.1	67.3	67.5	67.3

EMS #17 Lower Throne Room



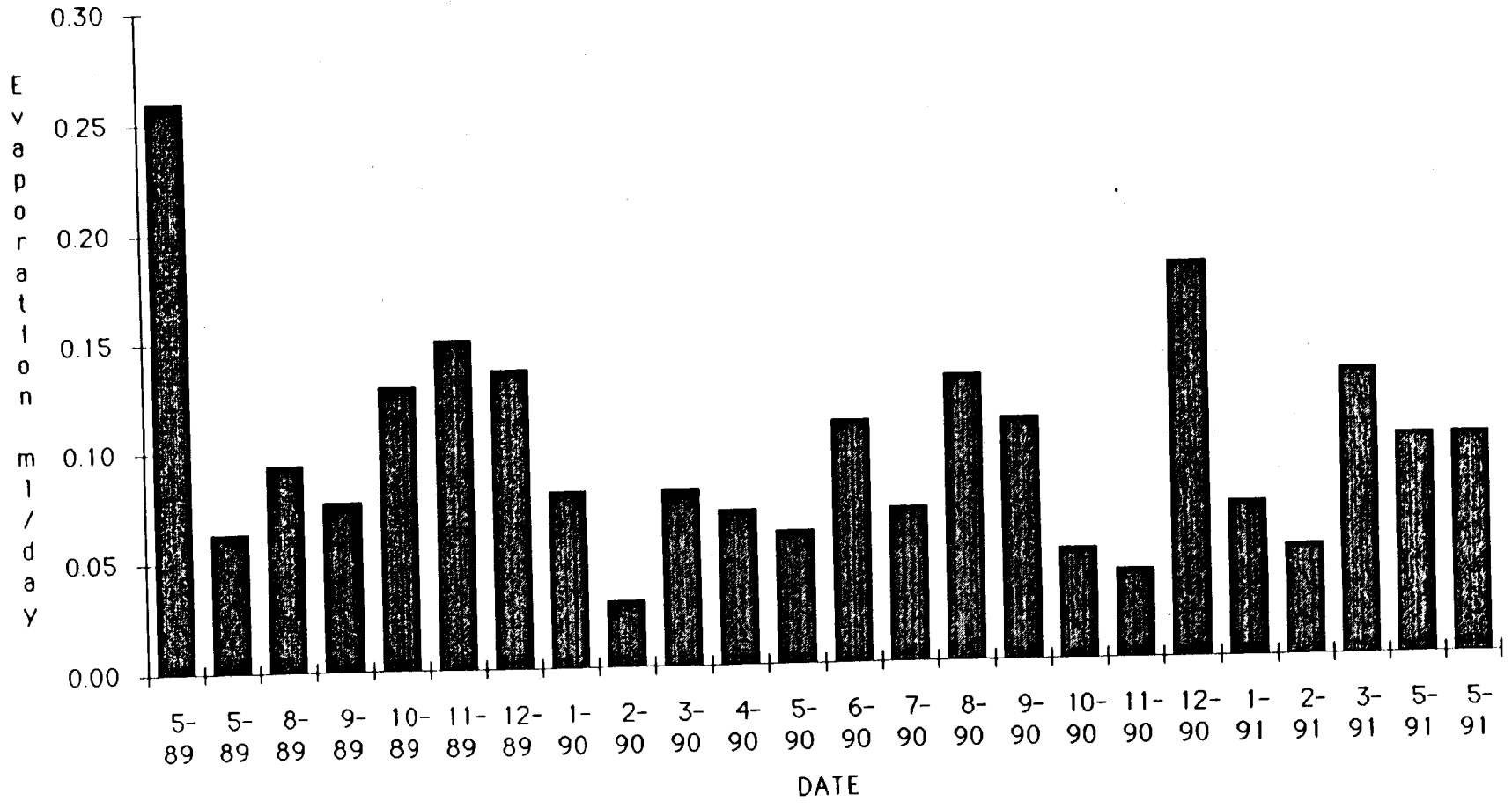
EMS #17 Lower Throne Room



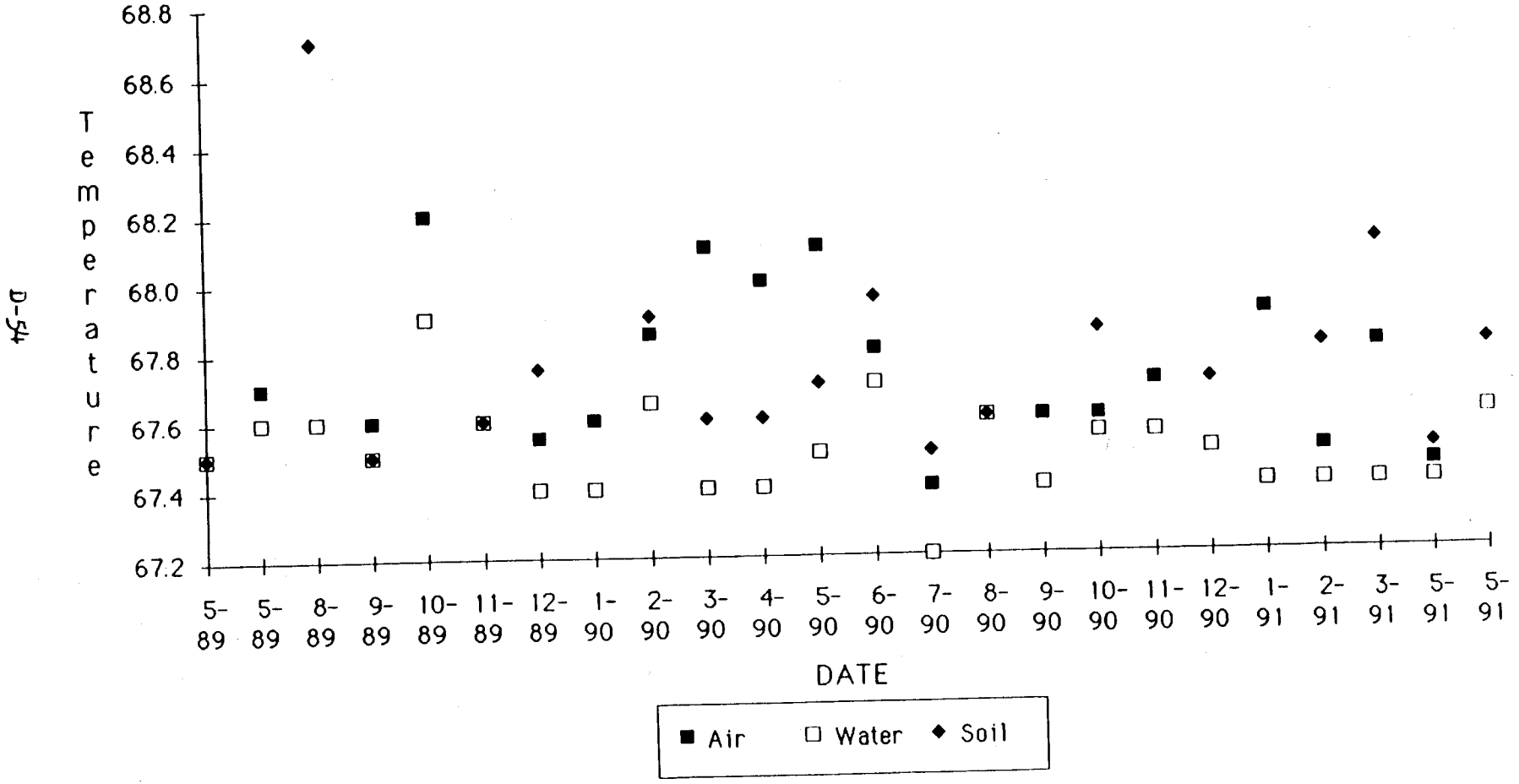
KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
18-Throne Rm. Overlook	04/16/89	05/07/89	0.26	67.5	67.5	67.5	-	-	-	-	-	-	-	-
18-Throne Rm. Overlook	05/07/89	05/31/89	0.06	67.6	67.7	-	100.00	-	-	-	-	-	-	-
18-Throne Rm. Overlook	05/31/89	08/19/89	0.09	67.6	67.6	68.7	100.00	-	-	-	-	-	-	-
18-Throne Rm. Overlook	08/19/89	09/14/89	0.08	67.5	67.6	67.5	100.00	-	-	-	-	-	-	-
18-Throne Rm. Overlook	09/14/89	10/15/89	0.13	67.9	68.2	68.2	98.60	4	68.3	68.3	67.9	67.4	67.4	67.3
18-Throne Rm. Overlook	10/15/89	11/10/89	0.15	67.6	67.6	67.6	99.00	4	68.3	68.5	68.3	67.4	67.4	67.3
18-Throne Rm. Overlook	11/10/89	12/13/89	0.14	67.4	67.6	67.8	99.28	4	68.5	68.7	68.3	67.3	67.8	67.3
18-Throne Rm. Overlook	12/13/89	01/18/90	0.08	67.4	67.6	67.6	100.00	4	68.7	68.7	68.3	67.4	67.8	67.3
18-Throne Rm. Overlook	01/18/90	02/17/90	0.03	67.7	67.9	67.9	99.52	4	68.8	68.8	68.7	67.3	67.4	67.3
18-Throne Rm. Overlook	02/17/90	03/20/90	0.08	67.4	68.1	67.6	99.44	4	68.7	69.0	68.5	67.3	67.4	67.3
18-Throne Rm. Overlook	03/20/90	04/19/90	0.07	67.4	68.0	67.6	99.04	4	68.8	69.0	68.7	67.3	67.4	67.3
18-Throne Rm. Overlook	04/19/90	05/16/90	0.06	67.5	68.1	67.7	99.54	4	68.8	69.0	68.8	67.3	67.4	67.3
18-Throne Rm. Overlook	05/16/90	06/17/90	0.11	67.7	67.8	68.0	99.76	4	69.2	69.2	68.8	67.4	67.4	67.3
18-Throne Rm. Overlook	06/17/90	07/31/90	0.07	67.2	67.4	67.5	99.47	4	69.2	69.4	69.0	67.4	67.4	67.3
18-Throne Rm. Overlook	07/31/90	08/26/90	0.13	67.6	67.6	67.6	99.88	4	69.4	69.4	69.2	67.4	67.4	67.3
18-Throne Rm. Overlook	08/26/90	09/30/90	0.11	67.4	67.6	67.6	99.93	4	69.4	69.6	69.2	67.4	67.4	67.3
18-Throne Rm. Overlook	09/30/90	10/30/90	0.05	67.6	67.6	67.9	99.52	4	69.6	69.6	69.4	67.4	67.8	67.4
18-Throne Rm. Overlook	10/30/90	11/24/90	0.04	67.6	67.7	67.7	100.00	4	69.6	69.6	69.4	67.4	67.4	67.4
18-Throne Rm. Overlook	11/24/90	12/19/90	0.18	67.5	67.5	67.7	99.24	4	69.6	69.7	69.4	67.4	67.4	67.4
18-Throne Rm. Overlook	12/19/90	01/15/91	0.07	67.4	67.9	67.9	99.54	4	69.6	69.7	69.4	67.4	67.4	67.4
18-Throne Rm. Overlook	01/15/91	02/14/91	0.05	67.4	67.5	67.8	98.99	4	69.6	69.7	69.6	67.4	67.4	67.4
18-Throne Rm. Overlook	02/14/91	03/24/91	0.13	67.4	67.8	68.1	100.00	4	69.7	69.7	69.6	67.4	67.4	67.4
18-Throne Rm. Overlook	03/24/91	05/05/91	0.10	67.4	67.5	67.5	99.75	4	69.7	69.9	69.6	67.8	67.8	67.4
18-Throne Rm. Overlook	05/05/91	05/29/91	0.10	67.6	67.6	67.8	99.49	4	69.9	69.9	69.7	67.8	67.8	67.4

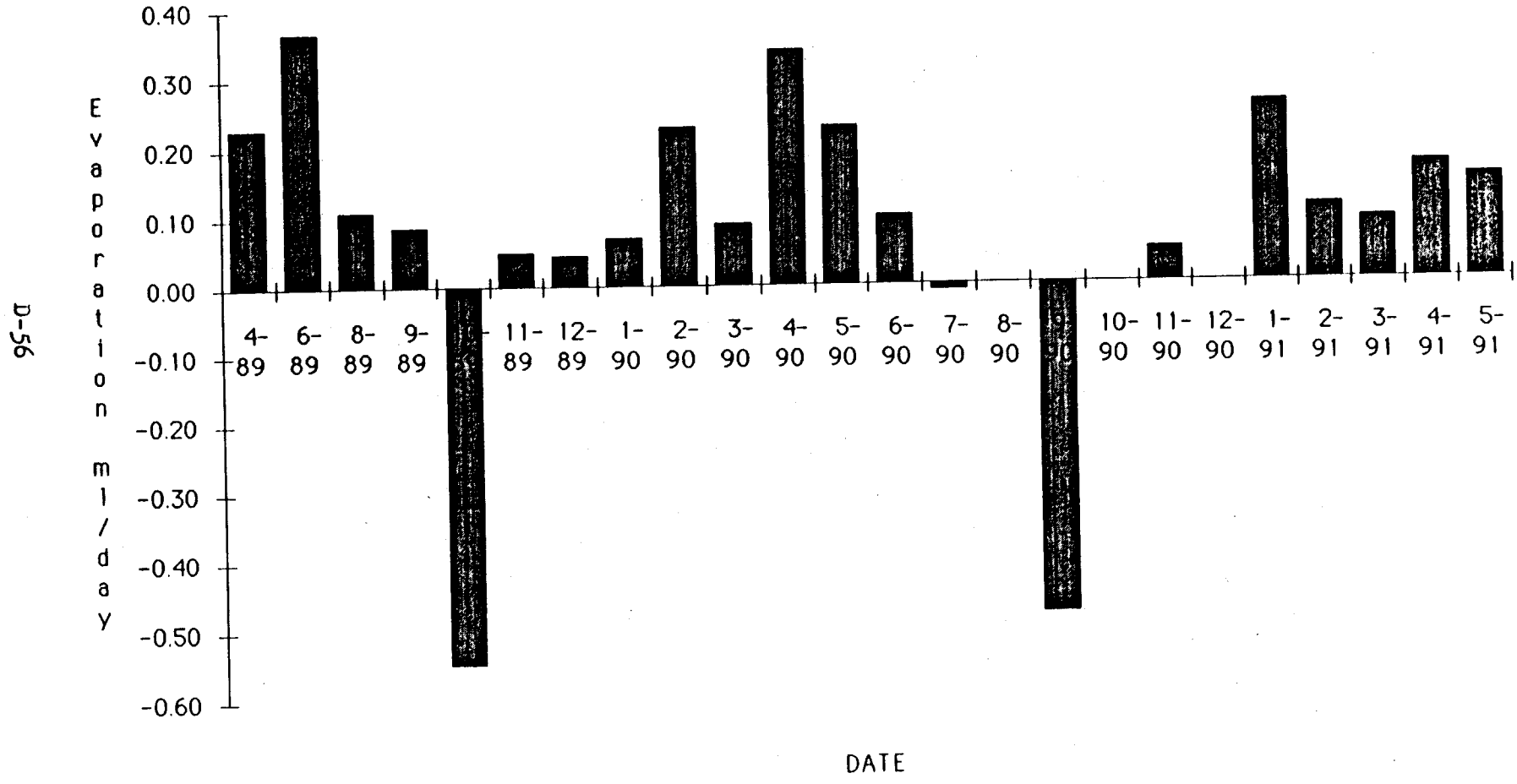
EMS #18 Throne Room Overlook



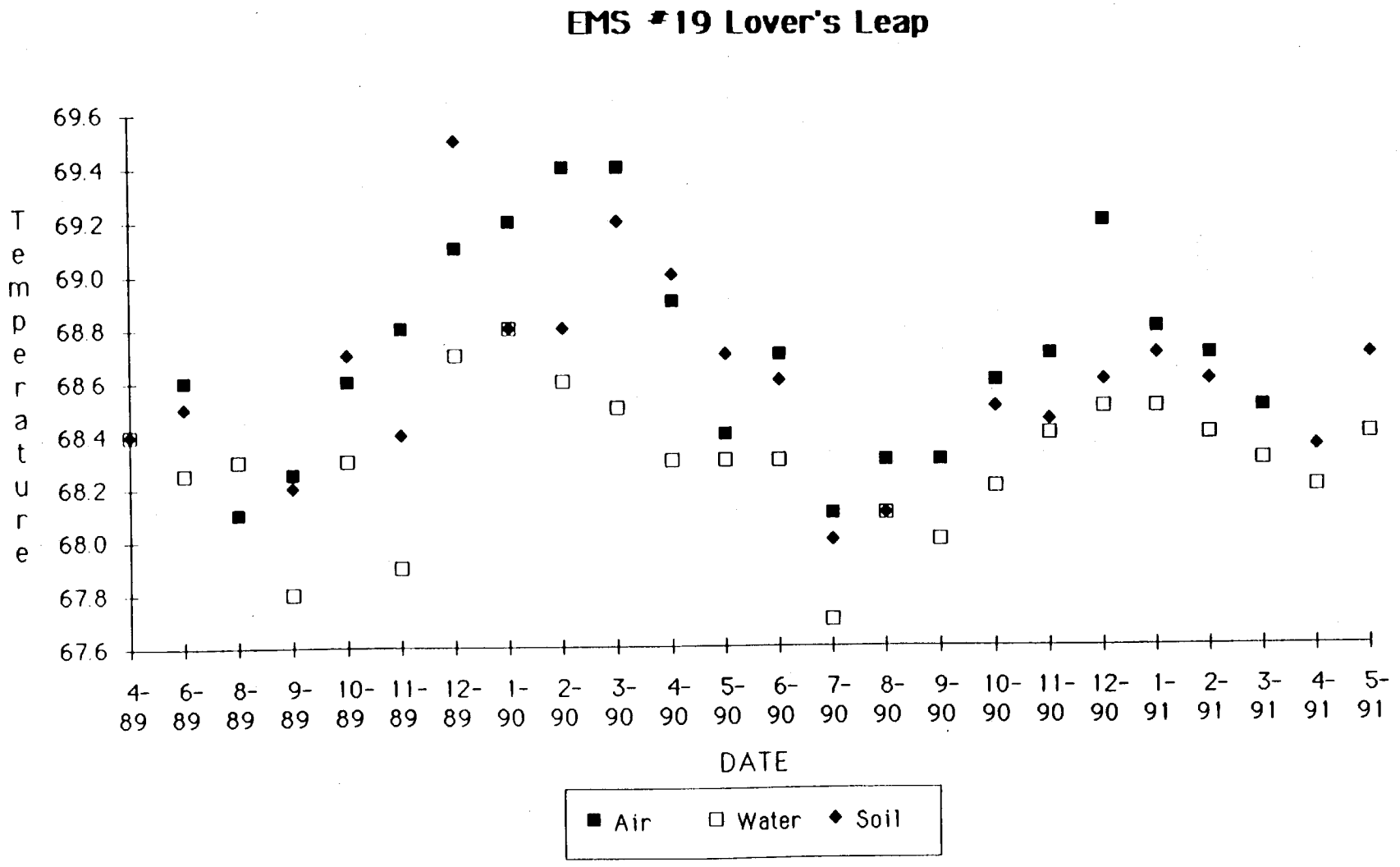
EMS #18 Throne Room Overlook



EMS #19 Lover's Leap



D-56


EMS #19 Lover's Leap
Temperature
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69.4
69.2
69.0
68.8
68.6
68.4
68.2
68.0
67.8
67.6
4-89
6-89
8-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
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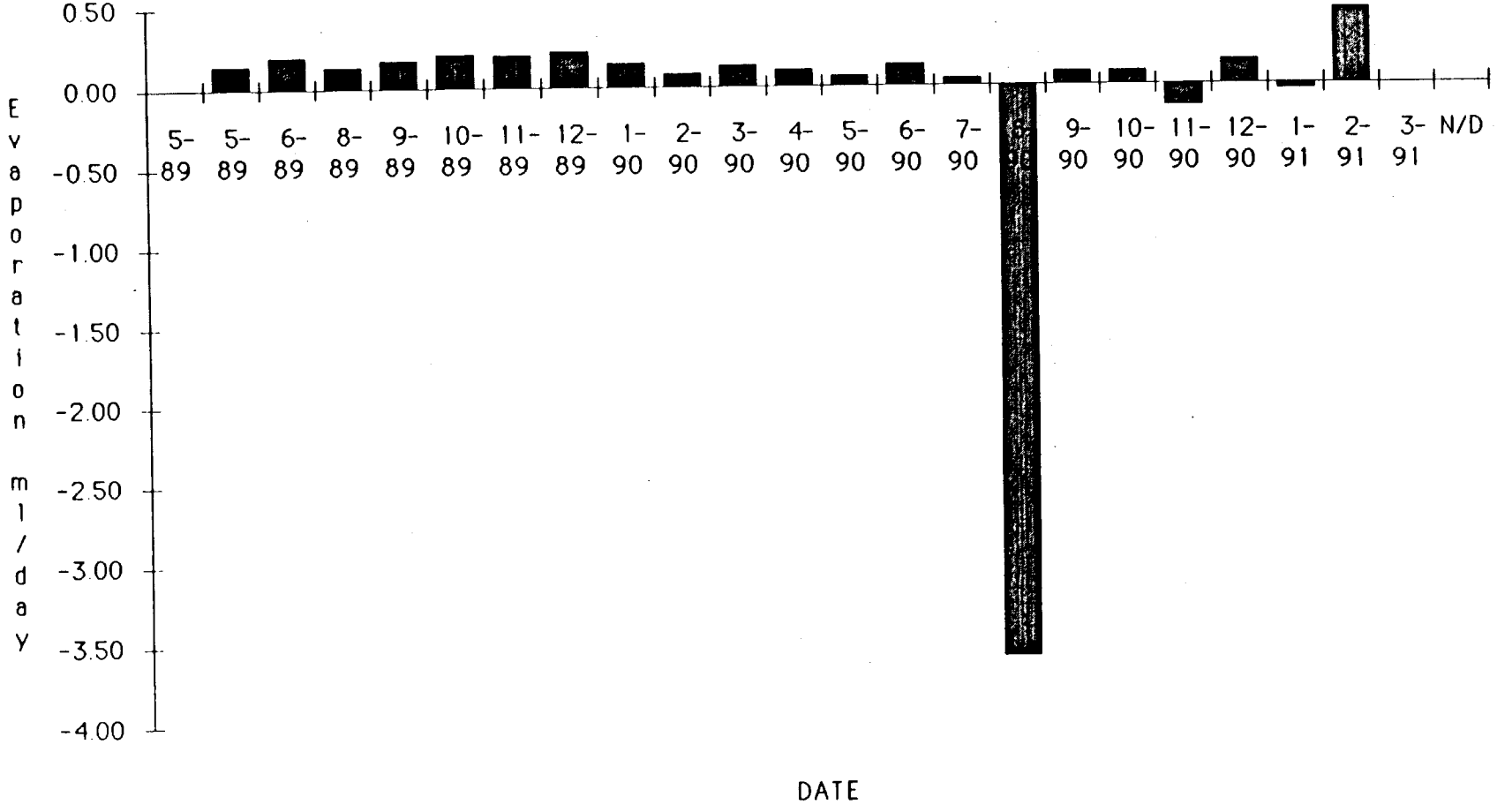
6-90
7-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
4-91
5-91
DATE
Air
Water
Soil

KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

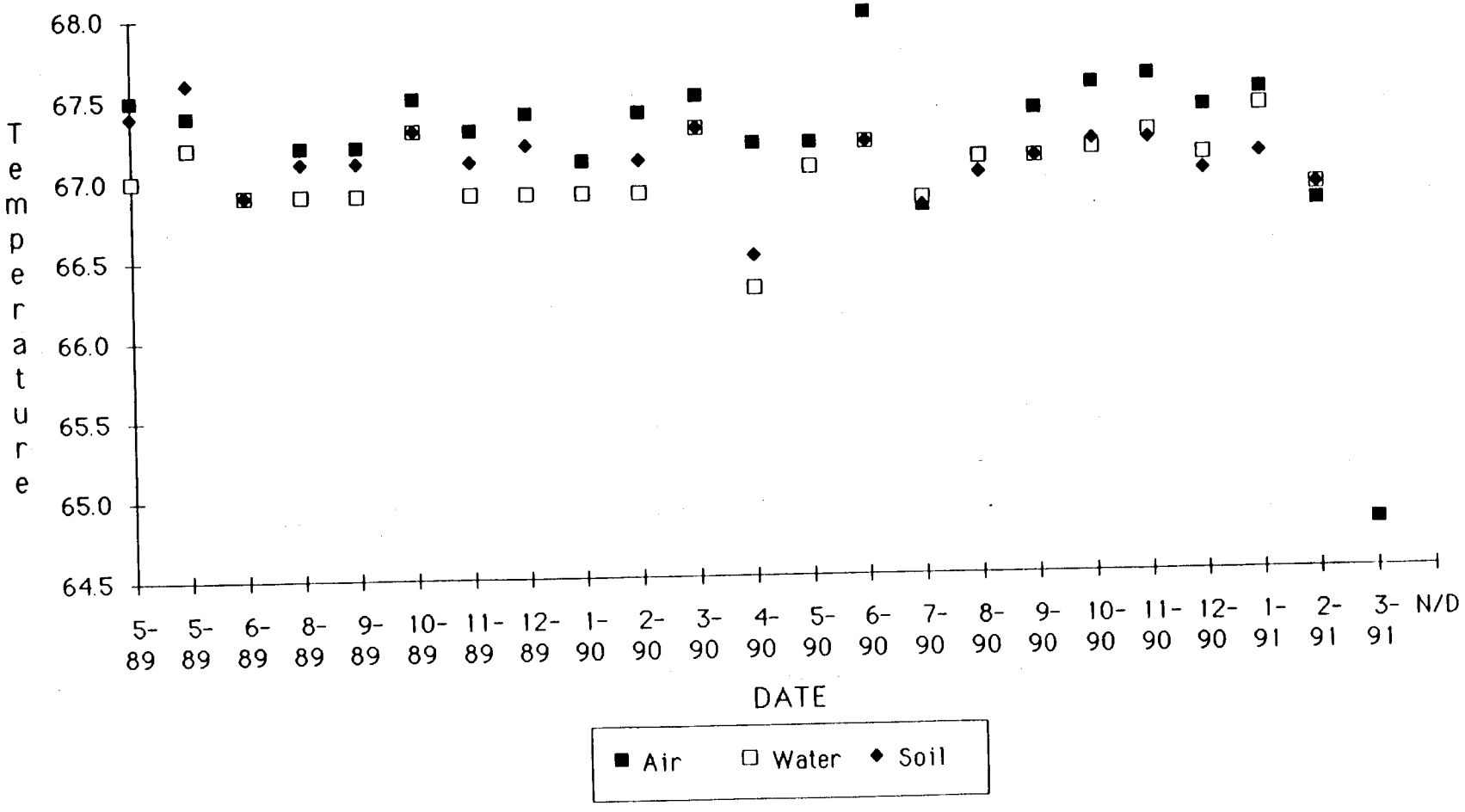
STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
20-Mud Trench	04/16/89	05/07/89	-	67.0	67.5	67.4	-	-	-	-	-	-	-	-
20-Mud Trench	05/07/89	05/31/89	0.15	67.2	67.4	67.6	99.00	-	-	-	-	-	-	-
20-Mud Trench	05/31/89	06/28/89	0.20	66.9	66.9	66.9	100.00	-	-	-	-	-	-	-
20-Mud Trench	06/28/89	08/19/89	0.14	66.9	67.2	67.1	98.55	-	-	-	-	-	-	-
20-Mud Trench	08/19/89	09/14/89	0.17	66.9	67.2	67.1	99.00	-	-	-	-	-	-	-
20-Mud Trench	09/14/89	10/15/89	0.21	67.3	67.5	67.3	99.50	6	67.7	67.7	67.4	67.6	67.7	67.7
20-Mud Trench	10/15/89	11/16/89	0.20	66.9	67.3	67.1	99.50	6	68.1	68.3	67.7	67.6	67.7	67.6
20-Mud Trench	11/16/89	12/13/89	0.22	66.9	67.4	67.2	99.03	6	68.3	68.3	67.9	67.7	67.7	67.6
20-Mud Trench	12/13/89	01/18/90	0.15	66.9	67.1	67.1	99.51	6	68.8	68.8	68.1	67.7	67.7	67.6
20-Mud Trench	01/18/90	02/17/90	0.08	66.9	67.4	67.1	99.03	6	68.8	69.2	68.4	67.7	67.7	67.7
20-Mud Trench	02/17/90	03/20/90	0.13	67.3	67.5	67.3	99.64	6	68.8	69.0	68.4	67.7	67.7	67.7
20-Mud Trench	03/20/90	04/19/90	0.10	66.3	67.2	66.5	100.00	6	68.8	69.0	68.4	67.7	67.7	67.7
20-Mud Trench	04/19/90	05/16/90	0.06	67.1	67.2	67.2	100.00	6	69.0	69.0	68.8	67.7	67.7	67.7
20-Mud Trench	05/16/90	06/23/90	0.13	67.2	68.0	67.2	97.61	6	69.0	69.2	68.8	67.7	67.7	67.7
20-Mud Trench	06/23/90	07/31/90	0.04	66.9	66.8	66.8	99.88	6	69.0	69.2	68.8	67.7	67.7	67.6
20-Mud Trench *	07/31/90	08/26/90	-3.60	67.1	67.1	67.0	99.79	6	69.2	69.2	69.0	67.7	67.9	67.6
20-Mud Trench	08/26/90	09/30/90	0.08	67.1	67.4	67.1	99.64	6	69.3	69.3	69.2	67.7	67.9	67.7
20-Mud Trench	09/30/90	10/30/90	0.08	67.2	67.6	67.2	99.04	6	69.3	69.5	69.2	67.7	67.9	67.7
20-Mud Trench	10/30/90	11/24/90	-0.14	67.3	67.6	67.2	99.76	6	69.3	69.7	69.2	67.7	67.9	67.7
20-Mud Trench	11/24/90	12/19/90	0.15	67.1	67.4	67.0	99.49	6	69.5	69.5	69.3	67.9	67.9	67.7
20-Mud Trench	12/19/90	01/15/91	-0.04	67.4	67.5	67.1	99.73	6	69.5	69.7	69.3	67.7	67.9	67.7
20-Mud Trench	01/15/91	02/14/91	0.47	66.9	66.8	66.9	98.98	6	69.5	69.7	69.2	67.6	67.9	67.4
20-Mud Trench	02/14/91	03/24/91	-	-	64.8	-	100.00	-	-	-	-	-	-	-
20-Mud Trench	03/24/91	N/D	-	-	-	-	-	-	-	-	-	-	-	-
20-Mud Trench	N/D	N/D	-	-	-	-	-	-	-	-	-	-	-	-

9/4/91

EMS #20 Mud Trench

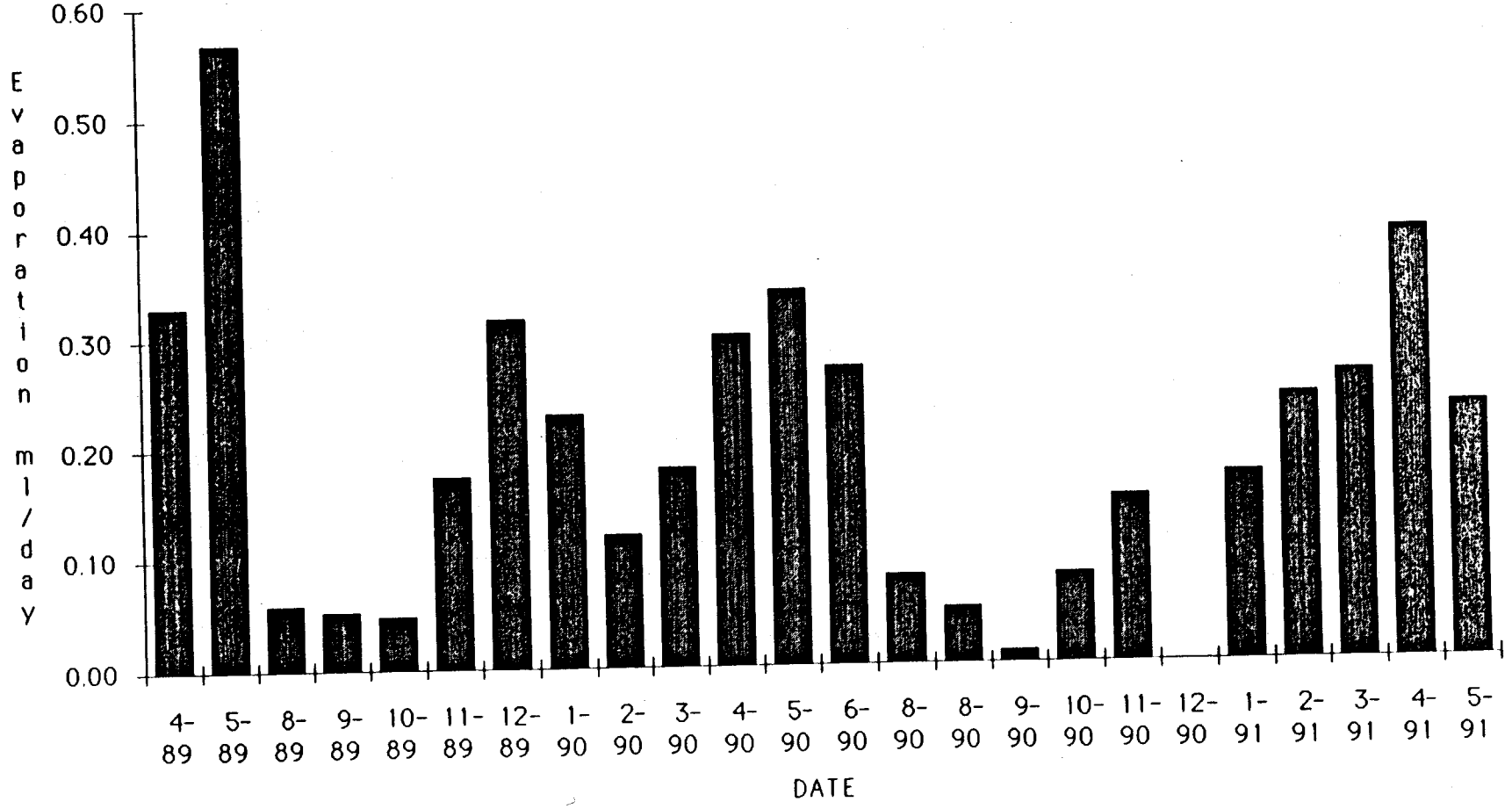


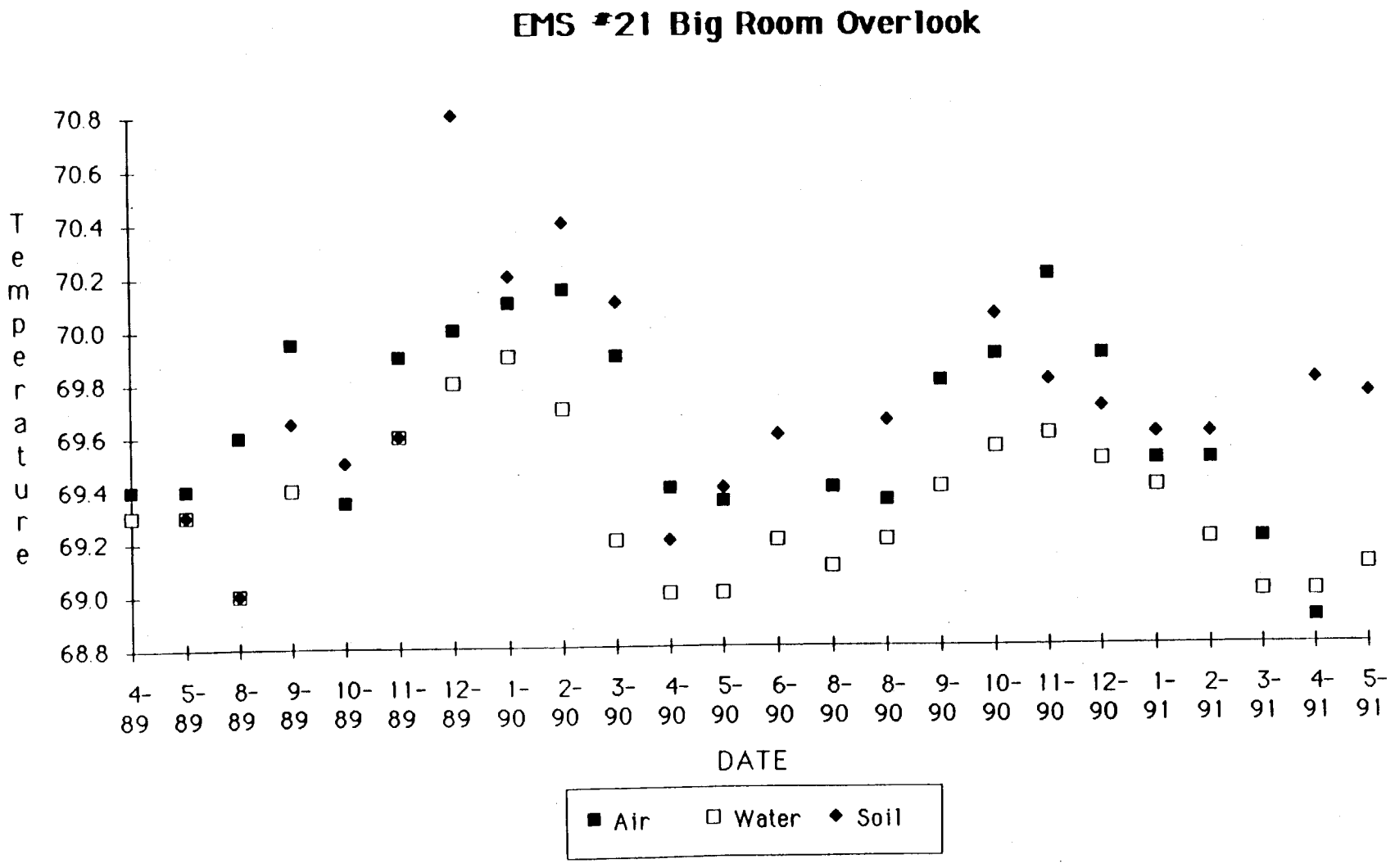
EMS #20 Mud Trench



KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

				TEMPERATURES				RS	Air Temperature			Soil Temperature		
STATION	FROM DATE	TO DATE	Evap(ml/day)	WATER	AIR	SOIL	RH (%)	Therm #	Current	Max	Min	Current	Max	Min
21-Big Room Overlook	04/08/89	04/29/89	0.33	69.3	69.4	69.4	98.83	-	-	-	-	-	-	-
21-Big Room Overlook	04/29/89	05/29/89	0.57	69.3	69.4	69.3	-	-	-	-	-	-	-	-
21-Big Room Overlook	05/29/89	08/13/89	0.06	69.0	69.6	69.0	99.10	-	-	-	-	-	-	-
21-Big Room Overlook	08/13/89	09/15/89	0.05	69.4	70.0	69.7	98.40	-	-	-	-	-	-	-
21-Big Room Overlook	09/15/89	10/16/89	0.05	-	69.4	69.5	99.10	-	-	-	-	-	-	-
21-Big Room Overlook	10/16/89	11/08/89	0.17	69.6	69.9	69.6	99.50	-	-	-	-	-	-	-
21-Big Room Overlook	11/08/89	12/19/89	0.32	69.8	70.0	70.8	100.00	-	-	-	-	-	-	-
21-Big Room Overlook	12/19/89	01/14/90	0.23	69.9	70.1	70.2	99.53	none	-	-	-	-	-	-
21-Big Room Overlook	01/14/90	02/13/90	0.12	69.7	70.2	70.4	99.20	none	-	-	-	-	-	-
21-Big Room Overlook	02/13/90	03/16/90	0.18	69.2	69.9	70.1	99.31	-	-	-	-	-	-	-
21-Big Room Overlook	03/16/90	04/20/90	0.30	69.0	69.4	69.2	99.79	-	-	-	-	-	-	-
21-Big Room Overlook	04/20/90	05/13/90	0.34	69.0	69.4	69.4	99.42	-	-	-	-	-	-	-
21-Big Room Overlook	05/13/90	06/20/90	0.27	69.2	69.2	69.6	100.00	-	-	-	-	-	-	-
21-Big Room Overlook	06/20/90	08/04/90	0.08	69.1	69.4	69.4	99.88	-	-	-	-	-	-	-
21-Big Room Overlook	08/04/90	08/23/90	0.05	69.2	69.4	69.7	99.45	-	-	-	-	-	-	-
21-Big Room Overlook	08/23/90	09/27/90	0.01	69.4	69.8	69.8	99.53	-	-	-	-	-	-	-
21-Big Room Overlook	09/27/90	10/25/90	0.08	69.6	69.9	70.1	99.53	-	-	-	-	-	-	-
21-Big Room Overlook	10/25/90	11/20/90	0.15	69.6	70.2	69.8	99.77	-	-	-	-	-	-	-
21-Big Room Overlook	11/20/90	12/18/90	spilled	69.5	69.9	69.7	99.75	-	-	-	-	-	-	-
21-Big Room Overlook	12/18/90	01/17/91	0.17	69.4	69.5	69.6	99.85	-	-	-	-	-	-	-
21-Big Room Overlook	01/17/91	02/24/91	0.24	69.2	69.5	69.6	100.00	-	-	-	-	-	-	-
21-Big Room Overlook	02/24/91	03/31/91	0.26	69.0	69.2	69.2	100.00	-	-	-	-	-	-	-
21-Big Room Overlook	03/31/91	04/23/91	0.39	69.0	68.9	69.8	97.05	-	-	-	-	-	-	-
21-Big Room Overlook	04/23/91	05/21/91	0.23	69.1	69.1	69.8	98.51	-	-	-	-	-	-	-

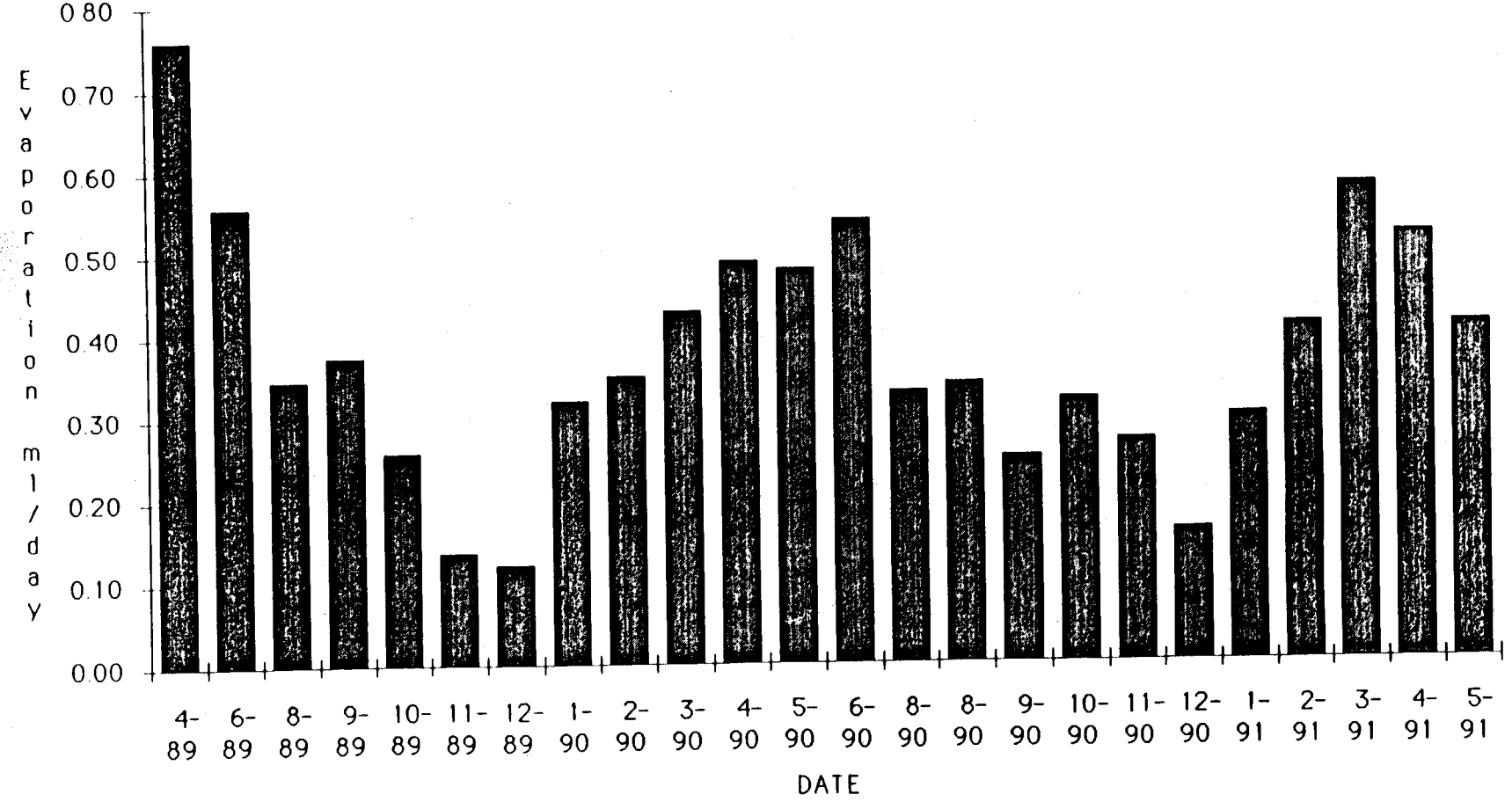

EMS #21 Big Room Overlook
Evaporation ml/day
0.60
0.50
0.40
0.30
0.20
0.10
0.00
4-89
5-89
8-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
8-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
4-91
5-91
DATE

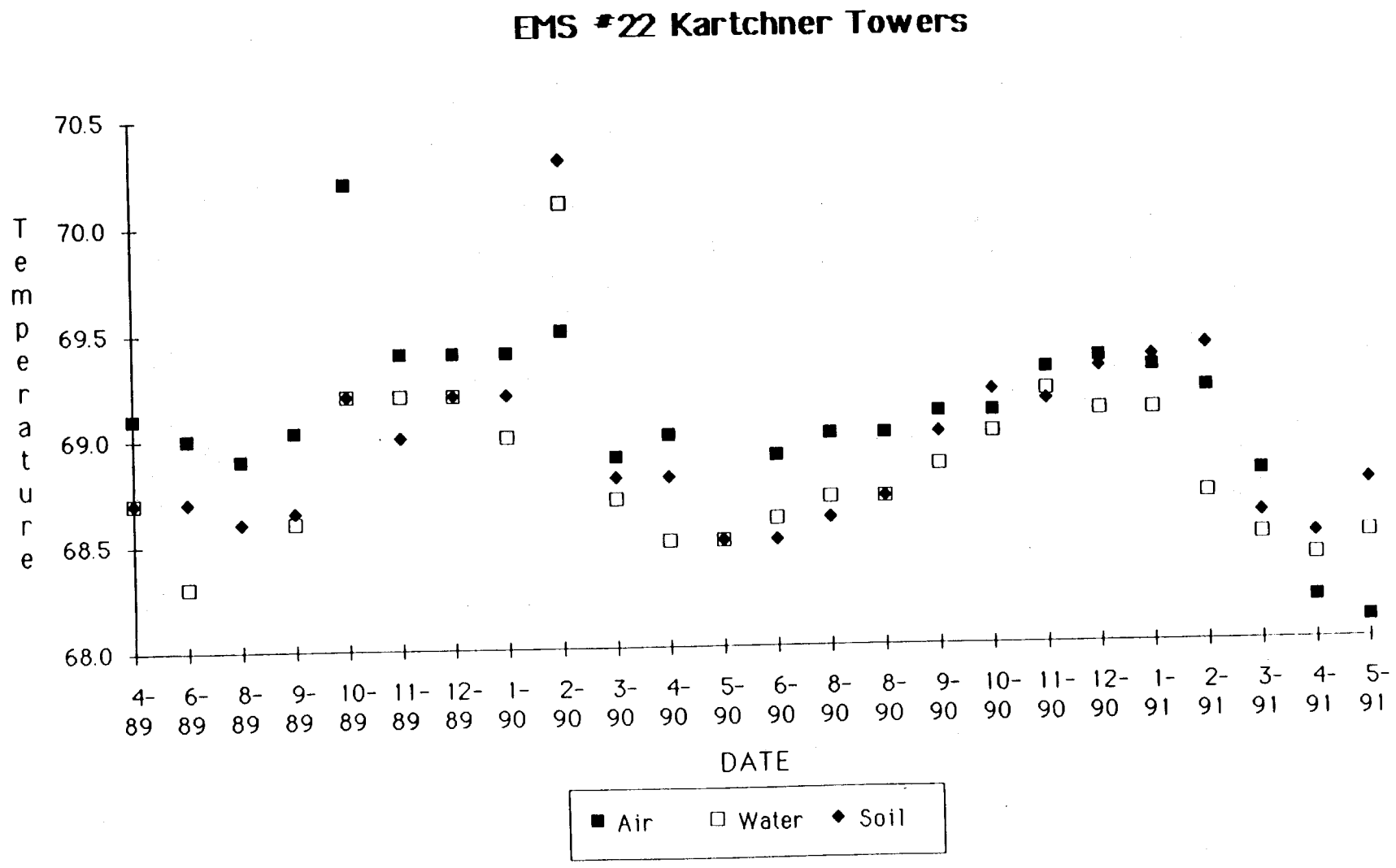

EMS #21 Big Room Overlook
Temperature
70.8
70.6
70.4
70.2
70.0
69.8
69.6
69.4
69.2
69.0
68.8
4-89
5-89
8-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
8-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
4-91
5-91
DATE
Air
Water
Soil

KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

STATION	FROM DATE	TO DATE	Evap(ml/day)	TEMPERATURES WATER	AIR	SOIL	RH (%)	RS Therm #	Air Temperature Current	Max	Min	Soil Temperature Current	Max	Min
22-Kartchner Towers	04/08/89	04/29/89	0.76	68.7	69.1	68.7	-	-	-	-	-	-	-	-
22-Kartchner Towers	04/29/89	06/06/89	0.56	68.3	69.0	68.7	100.00	-	-	-	-	-	-	-
22-Kartchner Towers	06/06/89	08/13/89	0.35	-	68.9	68.6	100.00	-	-	-	-	-	-	-
22-Kartchner Towers	08/13/89	09/14/89	0.38	68.6	69.0	68.7	99.80	-	-	-	-	-	-	-
22-Kartchner Towers	09/14/89	10/15/89	0.26	69.2	70.2	69.2	98.60	-	-	-	-	-	-	-
22-Kartchner Towers	10/15/89	11/08/89	0.14	69.2	69.4	69.0	98.10	-	-	-	-	-	-	-
22-Kartchner Towers	11/08/89	12/11/89	0.12	69.2	69.4	69.2	99.06	-	-	-	-	-	-	-
22-Kartchner Towers	12/11/89	01/16/90	0.32	69.0	69.4	69.2	99.06	none	-	-	-	-	-	-
22-Kartchner Towers	01/16/90	02/16/90	0.35	70.1	69.5	70.3	98.11	none	-	-	-	-	-	-
22-Kartchner Towers	02/16/90	03/16/90	0.43	68.7	68.9	68.8	99.53	-	-	-	-	-	-	-
22-Kartchner Towers	03/16/90	04/20/90	0.49	68.5	69.0	68.8	99.90	-	-	-	-	-	-	-
22-Kartchner Towers	04/20/90	05/14/90	0.48	68.5	68.5	68.5	99.85	-	-	-	-	-	-	-
22-Kartchner Towers	05/14/90	06/21/90	0.54	68.6	68.9	68.5	-	-	-	-	-	-	-	-
22-Kartchner Towers	06/21/90	08/04/90	0.33	68.7	69.0	68.6	99.91	-	-	-	-	-	-	-
22-Kartchner Towers	08/04/90	08/26/90	0.34	68.7	69.0	68.7	99.53	-	-	-	-	-	-	-
22-Kartchner Towers	08/26/90	09/27/90	0.25	68.9	69.1	69.0	99.66	-	-	-	-	-	-	-
22-Kartchner Towers	09/27/90	10/25/90	0.32	69.0	69.1	69.2	99.57	-	-	-	-	-	-	-
22-Kartchner Towers	10/25/90	11/20/90	0.27	69.2	69.3	69.2	99.53	-	-	-	-	-	-	-
22-Kartchner Towers	11/20/90	12/18/90	0.16	69.1	69.4	69.3	99.75	-	-	-	-	-	-	-
22-Kartchner Towers	12/18/90	01/17/91	0.30	69.1	69.3	69.4	99.83	-	-	-	-	-	-	-
22-Kartchner Towers	01/17/91	02/19/91	0.41	68.7	69.2	69.4	98.02	-	-	-	-	-	-	-
22-Kartchner Towers	02/19/91	03/28/91	0.58	68.5	68.8	68.6	100.00	-	-	-	-	-	-	-
22-Kartchner Towers	03/28/91	04/23/91	0.52	68.4	68.2	68.5	99.00	-	-	-	-	-	-	-
22-Kartchner Towers	04/23/91	05/21/91	0.41	68.5	68.1	68.8	98.50	-	-	-	-	-	-	-

EMS #22 Kartchner Towers




EMS #22 Kartchner Towers
Temperature
70.5
70.0
69.5
69.0
68.5
68.0
4-89
6-89
8-89
9-89
10-89
11-89
12-89
1-90
2-90
3-90
4-90
5-90
6-90
8-90
8-90
9-90
10-90
11-90
12-90
1-91
2-91
3-91
4-91
5-91
DATE
Air
Water
Soil

KARTCHNER CAVERNS STATE PARK - Environmental Station Data April 1989-May 1991

Combined, Indexed Evaporation Data

FROM DATE	TO DATE	Stations 1&2	FROM DATE	TO DATE	Stations 3&4	FROM DATE	TO DATE	Stations 8&20	FROM DATE	TO DATE	Stations 17&18
05/31/89	06/28/89	0.34	05/31/89	06/28/89	0.74	05/31/89	08/19/89	1.02	05/31/89	08/19/89	0.93
06/28/89	08/19/89	0.35	06/28/89	09/14/89	0.48	08/19/89	09/14/89	1.11	08/19/89	09/14/89	0.88
08/19/89	09/14/89	0.94	09/14/89	10/15/89	0.74	09/14/89	10/15/89	1.66	09/14/89	10/15/89	1.21
09/14/89	10/15/89	0.90	10/15/89	11/16/90	0.74	10/15/89	11/10/89	1.15	10/15/89	11/10/89	1.57
10/15/89	11/16/89	1.03	11/16/90	12/23/89	0.89	11/10/89	12/13/89	1.24	11/10/89	12/11/89	1.30
11/16/89	12/23/89	1.25	12/23/89	01/18/90	1.16	12/13/89	01/18/90	1.18	12/11/89	01/18/90	0.85
12/23/89	01/18/90	1.06	01/18/90	02/17/90	1.24	01/18/90	02/17/90	0.79	01/18/90	02/17/90	0.55
01/18/90	02/17/90	0.57	02/17/90	03/22/90	0.78	02/17/90	03/20/90	0.90	02/17/90	03/20/90	0.93
02/17/90	03/22/90	0.36	03/22/90	04/23/90	0.90	03/20/90	04/19/90	0.77	03/20/90	04/19/90	0.84
03/22/90	04/19/90	0.50	04/23/90	05/18/90	0.72	04/19/90	05/16/90	0.76	04/19/90	05/16/90	0.92
04/19/90	05/18/90	0.28	05/18/90	06/23/90	0.46	05/16/90	06/23/90	0.99	05/16/90	06/17/90	1.09
05/18/90	06/23/90	0.37	06/23/90	08/02/90	0.98	06/23/90	07/31/90	0.42	06/17/90	07/31/90	0.86
06/23/90	08/02/90	0.30							07/31/90	08/26/90	1.15
									08/26/90	09/30/90	1.01
									09/30/90	10/30/90	0.69
									10/30/90	11/24/90	0.64
									11/24/90	12/19/90	1.70
									12/19/90	01/15/91	0.86
									01/15/91	02/14/91	0.71
									02/14/91	03/24/91	1.22
									03/24/91	05/05/91	0.97
									05/05/91	05/29/91	1.12

KARTCHNER CAVERNS STATE PARK - Environmental Station Data June 1989-May 1991

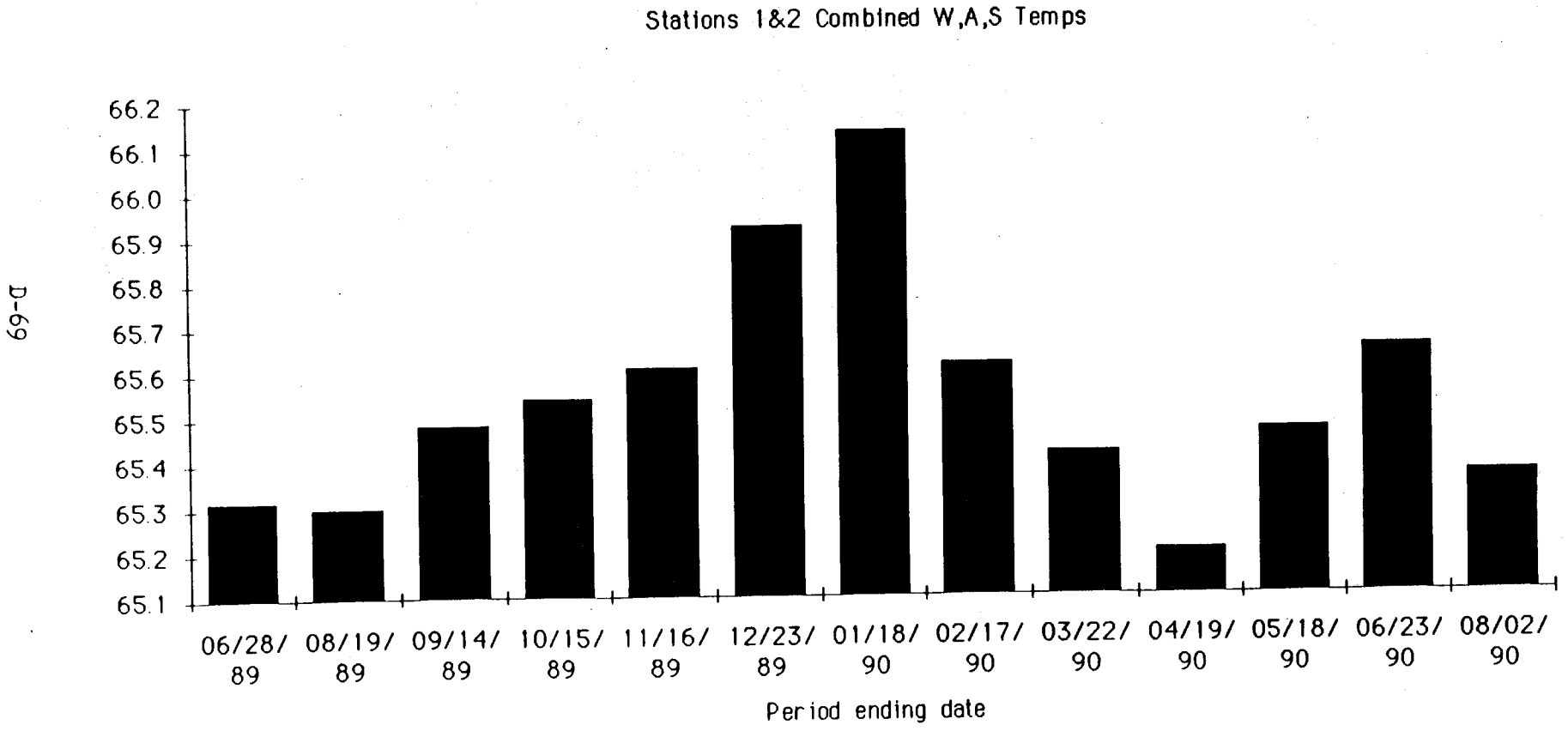
Combined Water, Air, Soil Temperatures

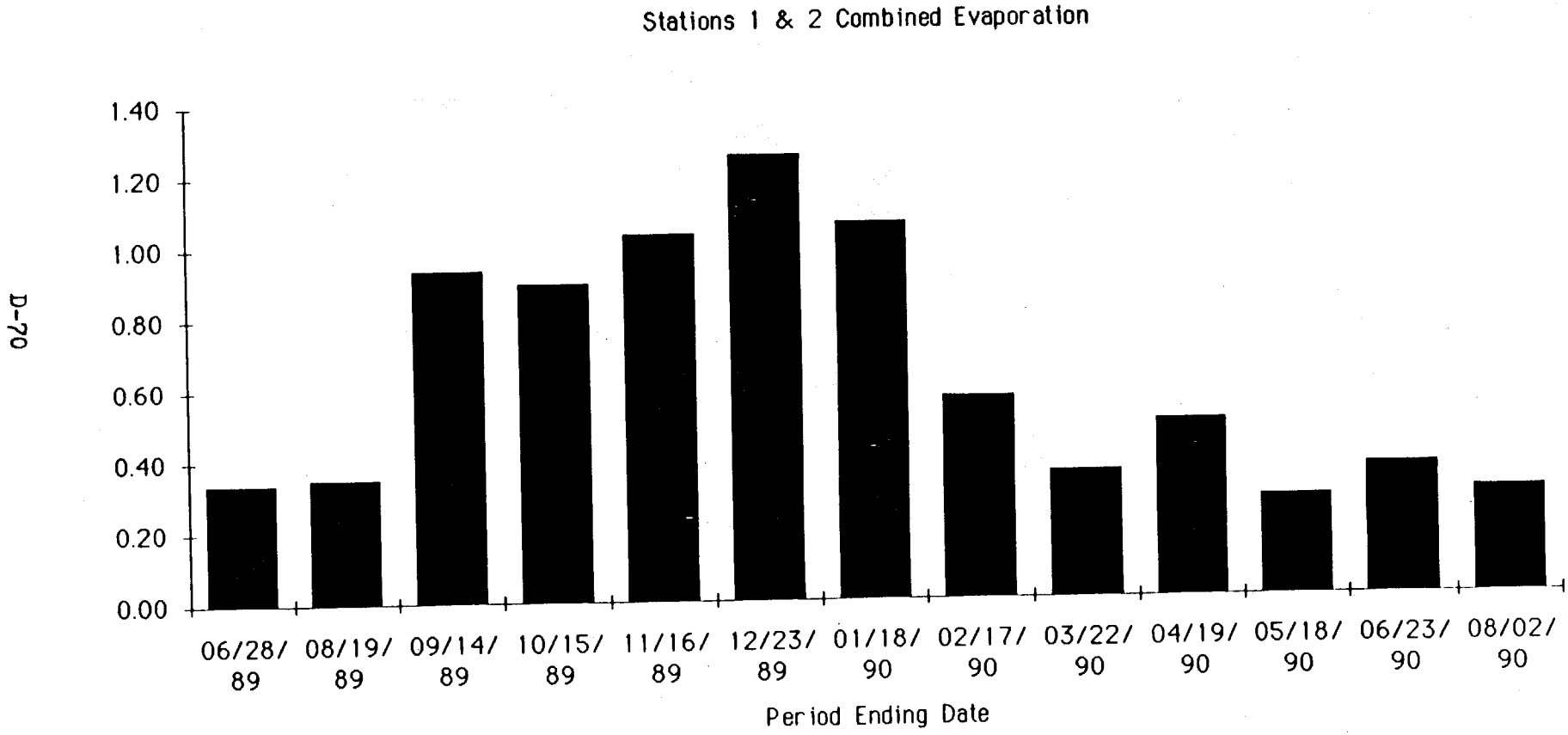
FROM DATE	TO DATE	Stations 1&2
05/31/89	06/28/89	65.3
06/28/89	08/19/89	65.3
08/19/89	09/14/89	65.5
09/14/89	10/15/89	65.5
10/15/89	11/16/89	65.6
11/16/89	12/23/89	65.9
12/23/89	01/18/90	66.1
01/18/90	02/17/90	65.6
02/17/90	03/22/90	65.4
03/22/90	04/19/90	65.2
04/19/90	05/18/90	65.5
05/18/90	06/23/90	65.7
06/23/90	08/02/90	65.4

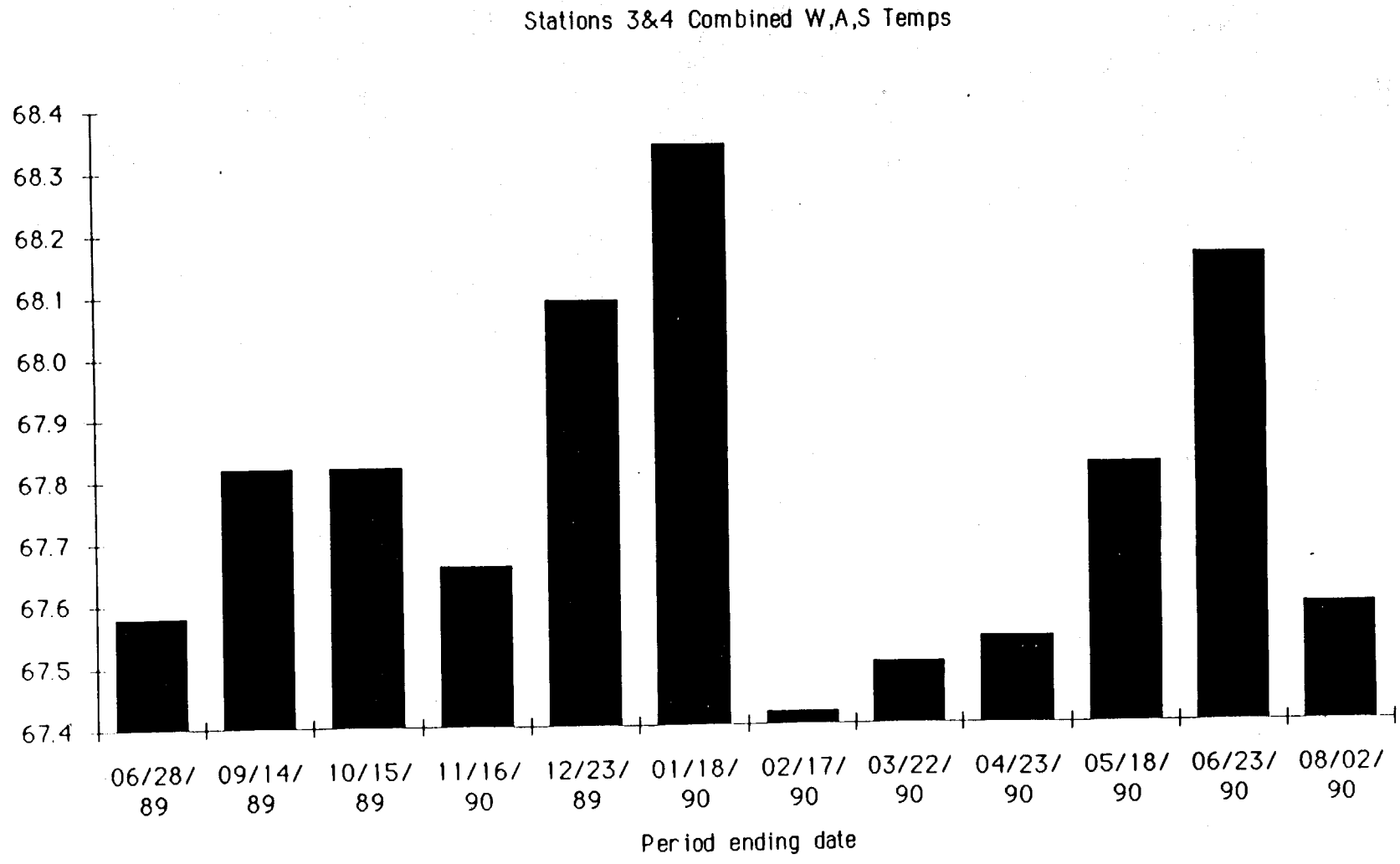
FROM DATE	TO DATE	Stations 3&4
05/31/89	06/28/89	67.6
06/28/89	09/14/89	67.8
09/14/89	10/15/89	67.8
10/15/89	11/16/90	67.7
11/16/90	12/23/89	68.1
12/23/89	01/18/90	68.3
01/18/90	02/17/90	67.4
02/17/90	03/22/90	67.5
03/22/90	04/23/90	67.5
04/23/90	05/18/90	67.8
05/18/90	06/23/90	68.2
06/23/90	08/02/90	67.6

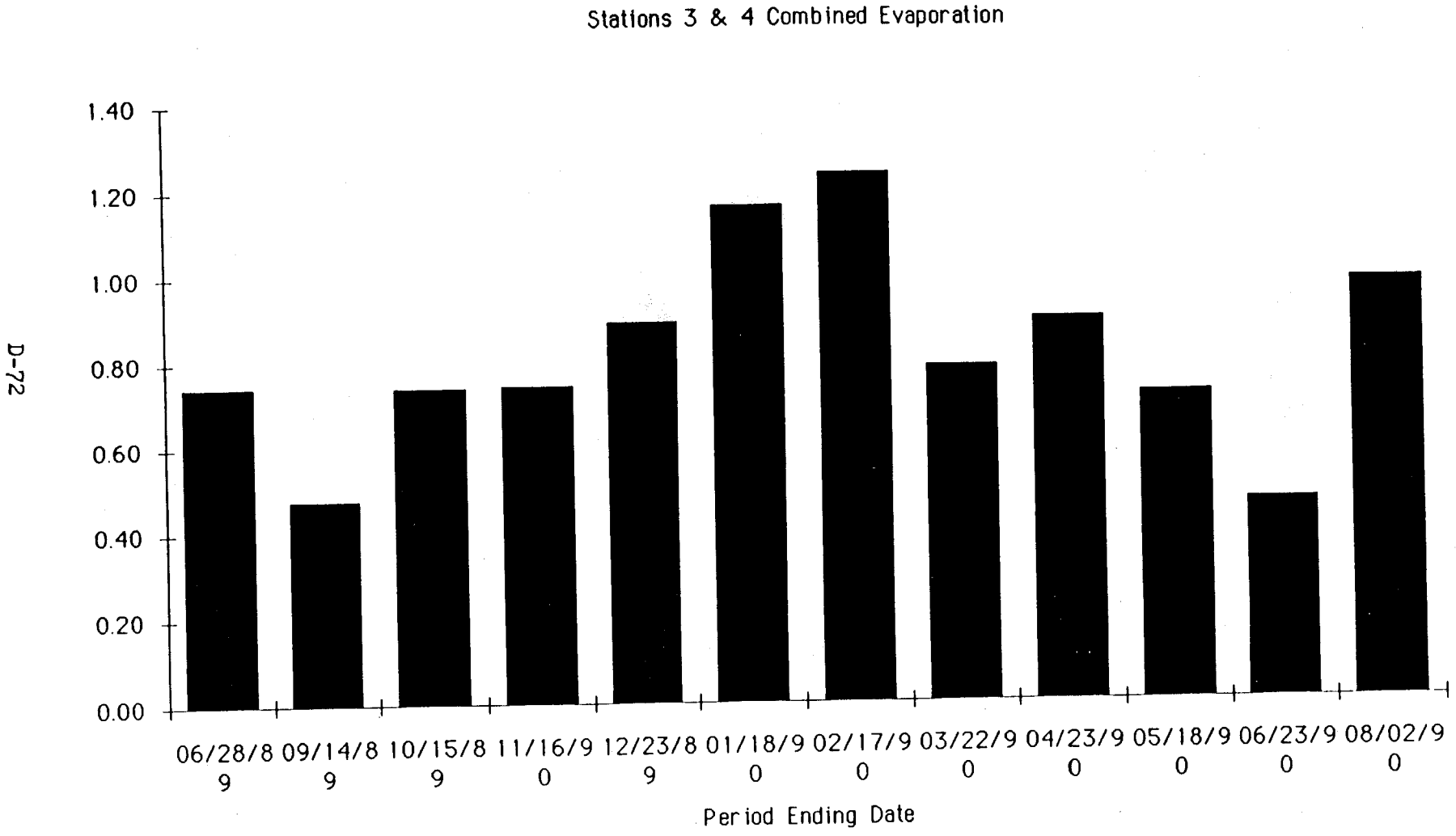
FROM DATE	TO DATE	Stations 8&20
05/31/89	08/19/89	67.2
08/19/89	09/14/89	67.3
09/14/89	10/15/89	67.6
10/15/89	11/10/89	67.4
11/10/89	12/13/89	67.4
12/13/89	01/18/90	67.3
01/18/90	02/17/90	67.6
02/17/90	03/20/90	67.5
03/20/90	04/19/90	67.1
04/19/90	05/16/90	67.5
05/16/90	06/23/90	67.8
06/23/90	07/31/90	67.3

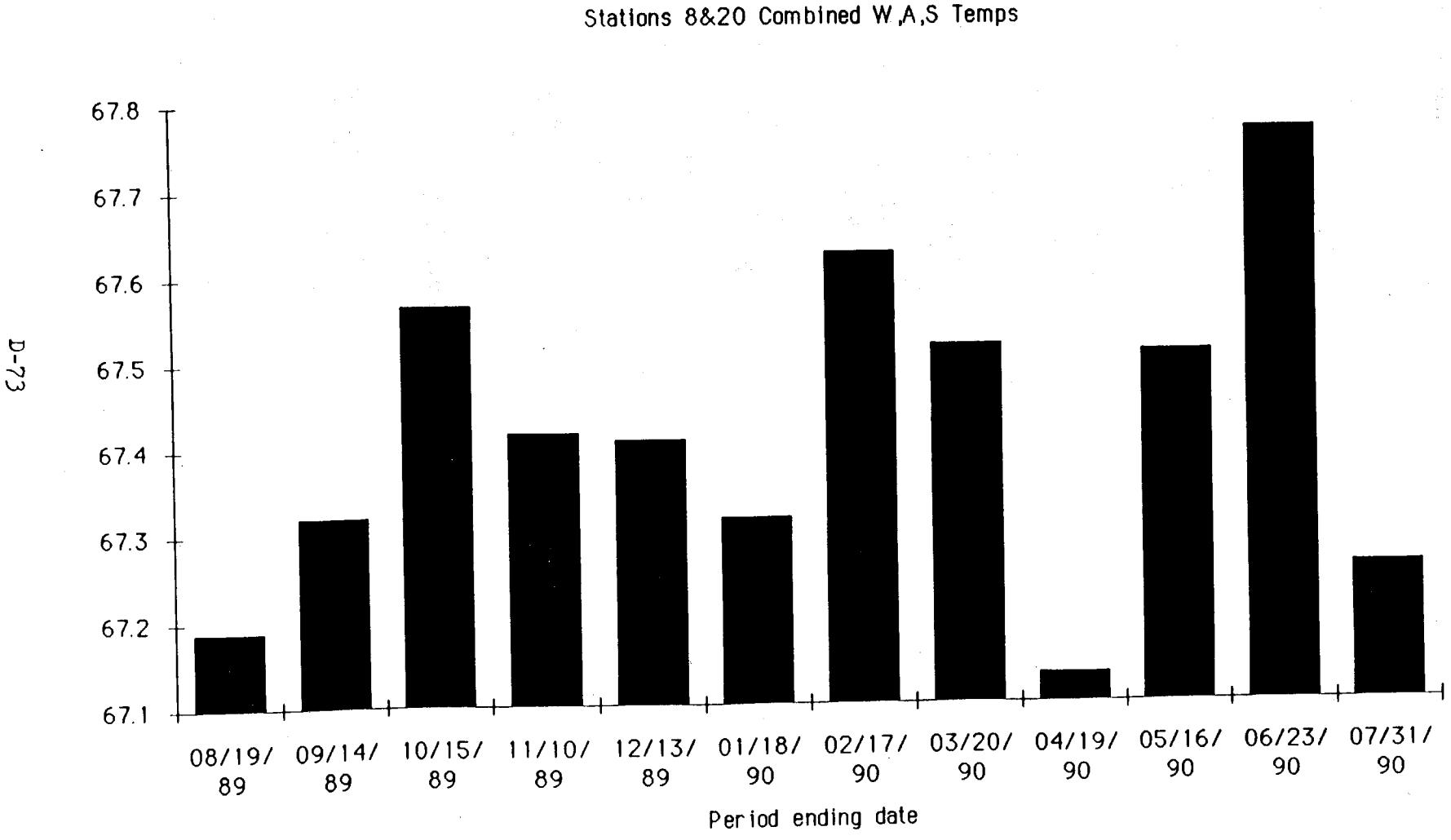
FROM DATE	TO DATE	Stations 17&18
05/31/89	08/19/89	67.7
08/19/89	09/14/89	67.4
09/14/89	10/15/89	67.8
10/15/89	11/10/89	67.4
11/10/89	12/11/89	67.5
12/11/89	01/18/90	67.3
01/18/90	02/17/90	67.7
02/17/90	03/20/90	67.6
03/20/90	04/19/90	67.0
04/19/90	05/16/90	67.4
05/16/90	06/17/90	67.7
06/17/90	07/31/90	67.2
07/31/90	08/26/90	67.5
08/26/90	09/30/90	67.4
09/30/90	10/30/90	67.5
10/30/90	11/24/90	67.6
11/24/90	12/19/90	67.4
12/19/90	01/15/91	67.5
01/15/91	02/14/91	67.5
02/14/91	03/24/91	67.5
03/24/91	05/05/91	67.4
05/05/91	05/29/91	67.6


Stations 1&2 Combined W,A,S Temps
66.2
66.1
66.0
65.9
65.8
65.7
65.6
65.5
65.4
65.3
65.2
65.1
06/28/ 89
08/19/ 89
09/14/ 89
10/15/ 89
11/16/ 89
12/23/ 89
01/18/ 90
02/17/ 90
03/22/ 90
04/19/ 90
05/18/ 90
06/23/ 90
08/02/ 90
Period ending date

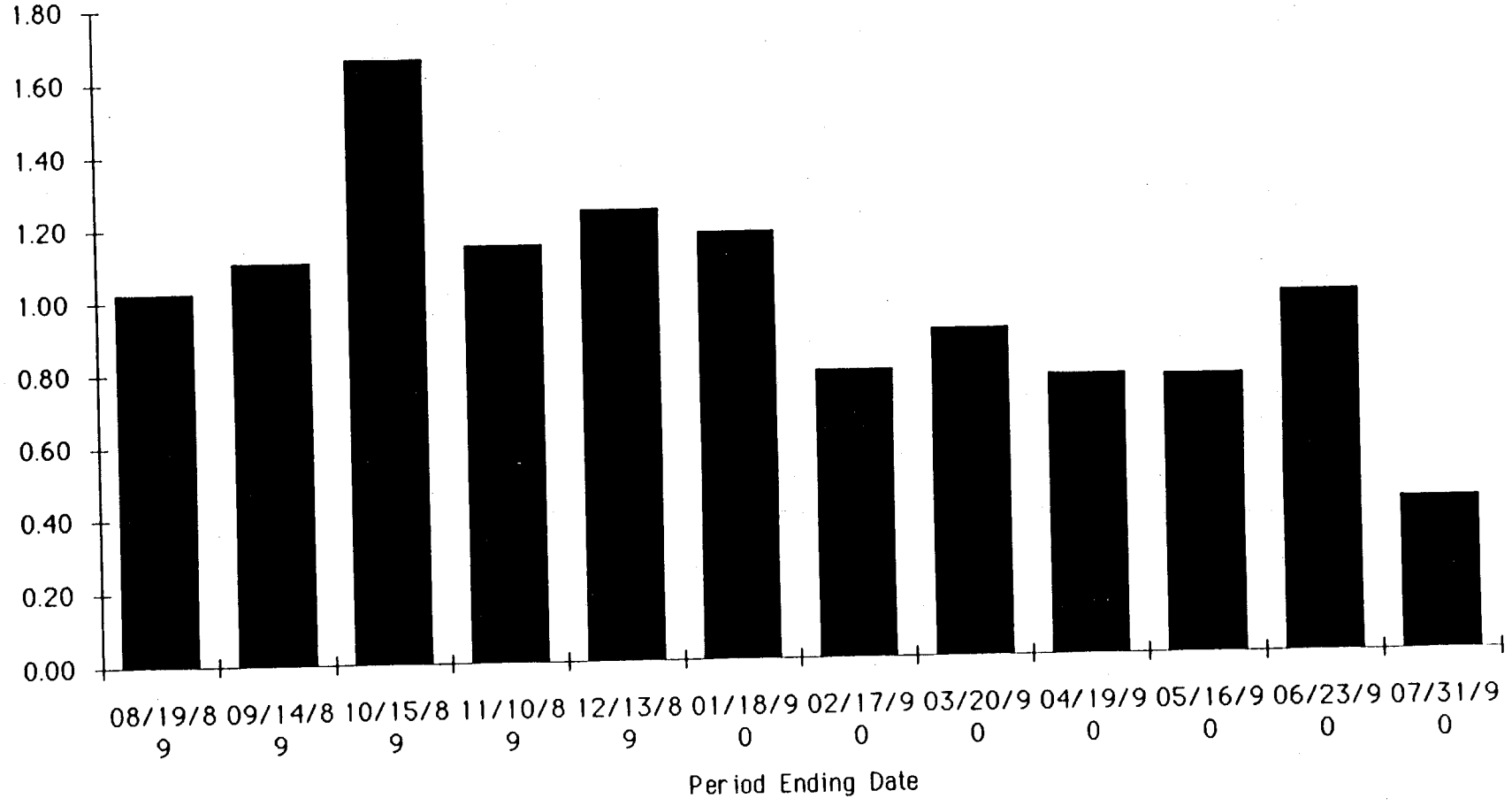

Stations 1 & 2 Combined Evaporation
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
06/28/ 89
08/19/ 89
09/14/ 89
10/15/ 89
11/16/ 89
12/23/ 89
01/18/ 90
02/17/ 90
03/22/ 90
04/19/ 90
05/18/ 90
06/23/ 90
08/02/ 90
Period Ending Date

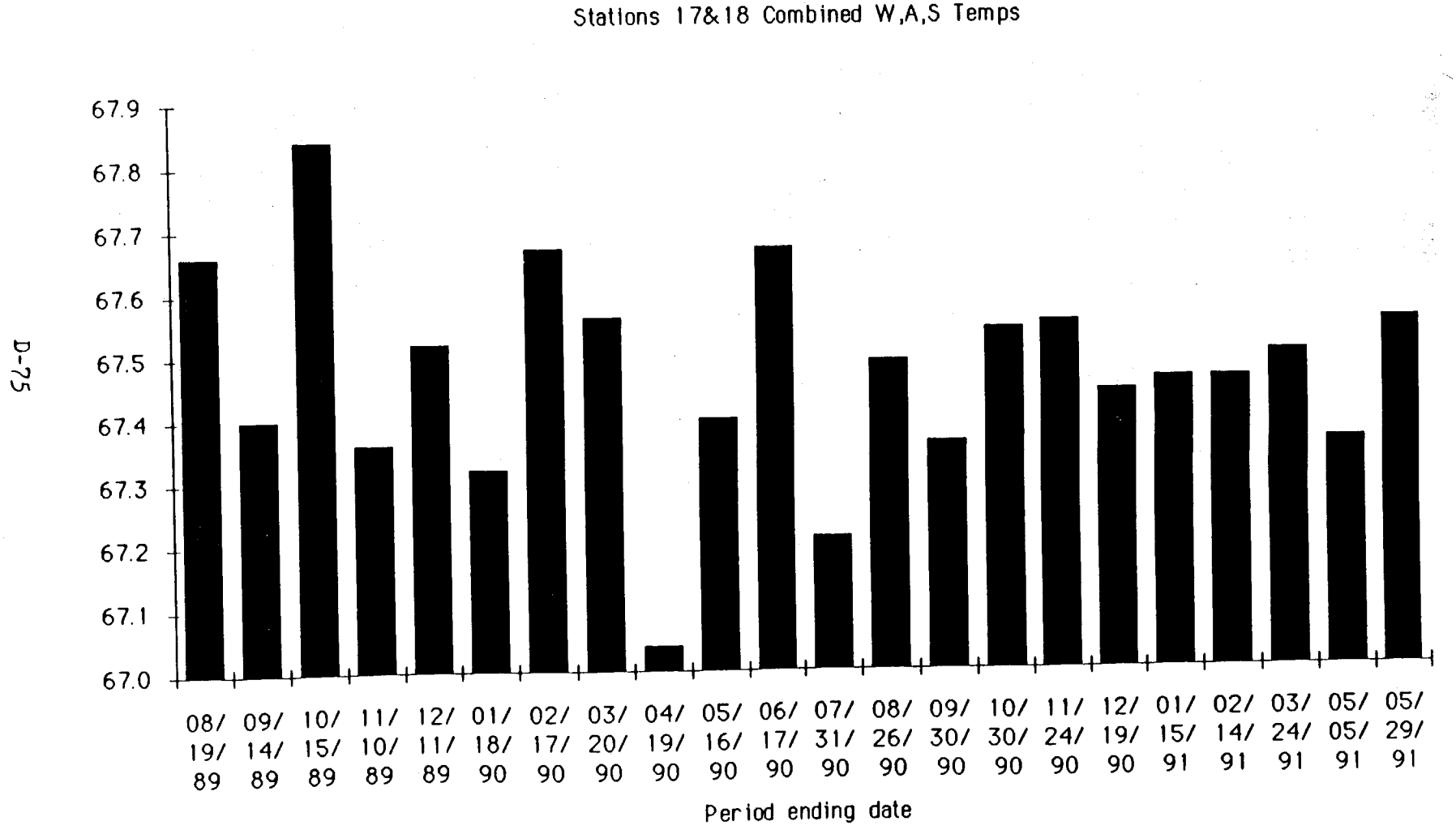

Stations 3&4 Combined W,A,S Temps
68.4
68.3
68.2
68.1
68.0
67.9
67.8
67.7
67.6
67.5
67.4
06/28/ 89
09/14/ 89
10/15/ 89
11/16/ 90
12/23/ 89
01/18/ 90
02/17/ 90
03/22/ 90
04/23/ 90
05/18/ 90
06/23/ 90
08/02/ 90
Period ending date

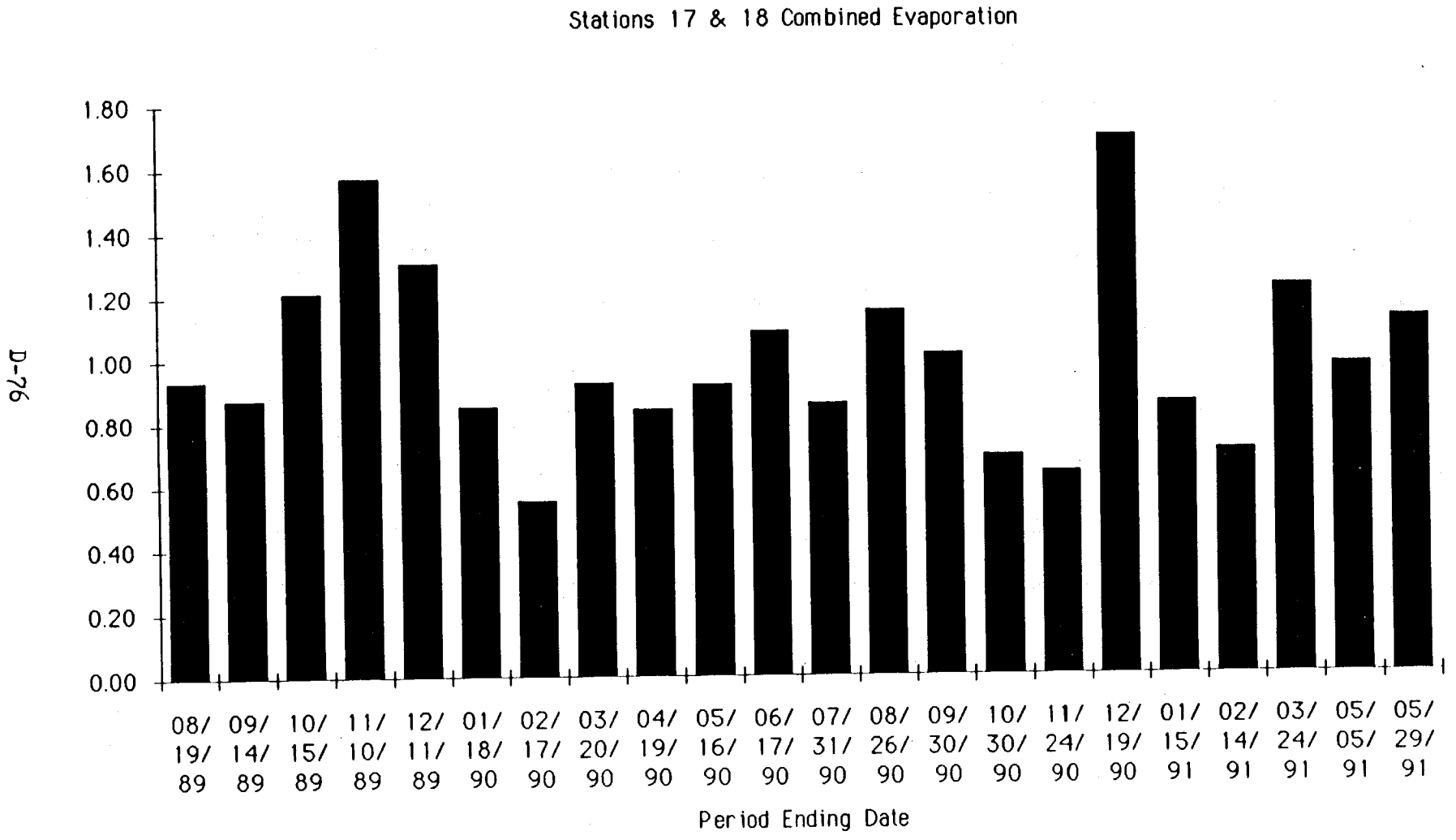

Stations 3 & 4 Combined Evaporation
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
D-72
06/28/89
09/14/89
10/15/89
11/16/90
12/23/89
01/18/90
02/17/90
03/22/90
04/23/90
05/18/90
06/23/90
08/02/90
Period Ending Date


Stations 8&20 Combined W,A,S Temps
67.8
67.7
67.6
67.5
67.4
67.3
67.2
67.1
08/19/ 89
09/14/ 89
10/15/ 89
11/10/ 89
12/13/ 89
01/18/ 90
02/17/ 90
03/20/ 90
04/19/ 90
05/16/ 90
06/23/ 90
07/31/ 90
Period ending date

Stations 8 & 20 Combined Evaporation




Stations 17&18 Combined W,A,S Temps
67.9
67.8
67.7
67.6
67.5
67.4
67.3
67.2
67.1
67.0
08/ 19/ 89
09/ 14/ 89
10/ 15/ 89
11/ 10/ 89
12/ 11/ 89
01/ 18/ 90
02/ 17/ 90
03/ 20/ 90
04/ 19/ 90
05/ 16/ 90
06/ 17/ 90
07/ 31/ 90
08/ 26/ 90
09/ 30/ 90
10/ 30/ 90
11/ 24/ 90
12/ 19/ 90
01/ 15/ 91
02/ 14/ 91
03/ 24/ 91
05/ 05/ 91
05/ 29/ 91
Period ending date


Stations 17 & 18 Combined Evaporation
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
08/ 19/ 89
09/ 14/ 89
10/ 15/ 89
11/ 10/ 89
12/ 11/ 89
01/ 18/ 90
02/ 17/ 90
03/ 20/ 90
04/ 19/ 90
05/ 16/ 90
06/ 17/ 90
07/ 31/ 90
08/ 26/ 90
09/ 30/ 90
10/ 30/ 90
11/ 24/ 90
12/ 19/ 90
01/ 15/ 91
02/ 14/ 91
03/ 24/ 91
05/ 05/ 91
05/ 29/ 91
Period Ending Date

APPENDIX E

Summary of Airflow Measurements

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Summary of Airflow Measurements E-1
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Blow Hole 12/21/89 ..... E-3
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Blow Hole 1/14/90 ..... E-9
Blow Hole 1/16/90 ..... E-10
River Passage 1/22/90 ..... E-11
River Passage 1/24/90 ..... E-12
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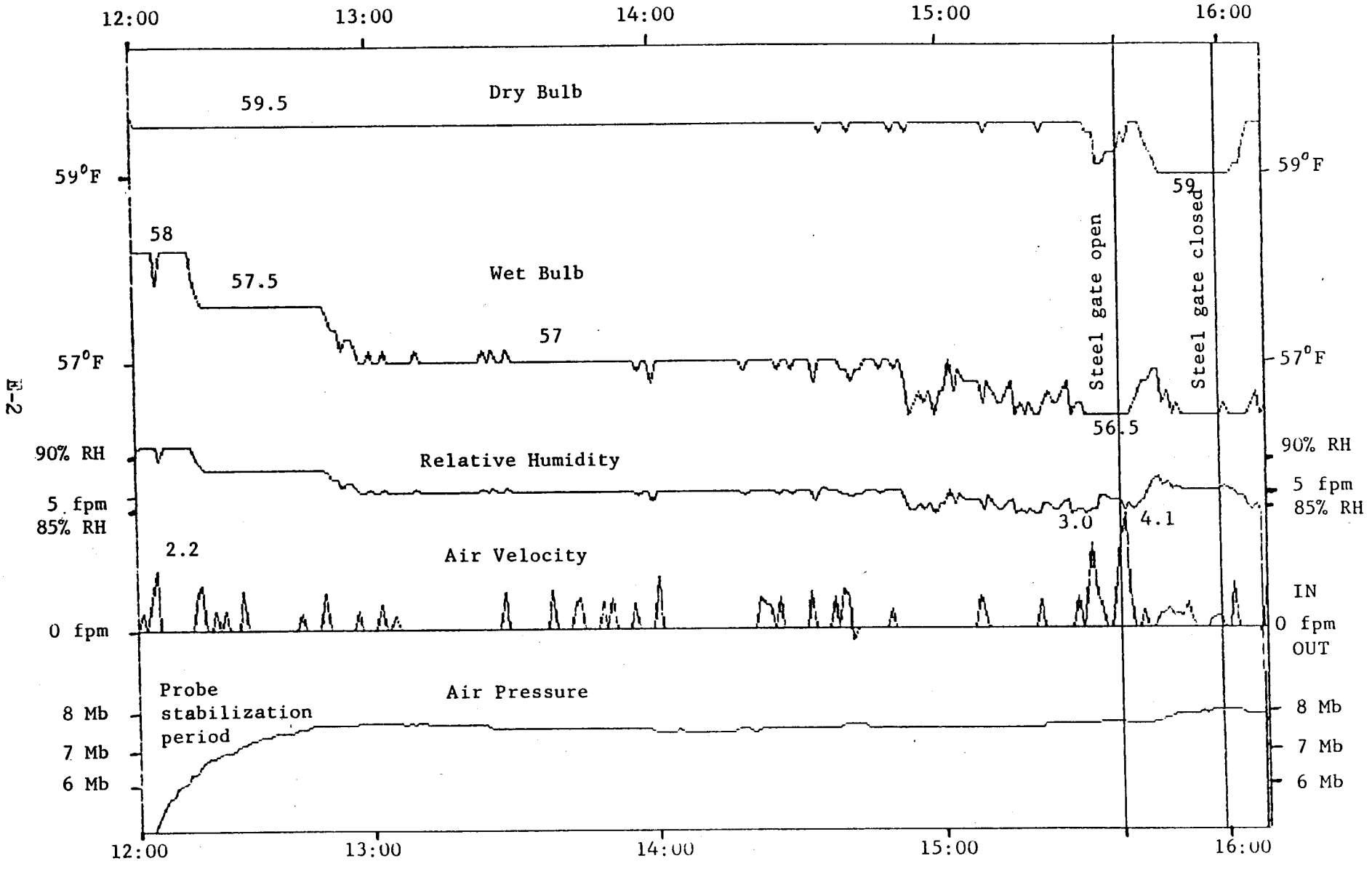
Kartchner Caverns State Park
Airflow Measurements

Location	Start	End	Duration (days)	Air IN (feet)	Air OUT (feet)
Babbitt Hole	08/29/89 10:13	08/30/89 07:08	0.87	2138*	-
Babbitt Hole	09/01/89 09:49	09/01/89 20:32	0.45	890*	-
Babbitt Hole	09/06/89 09:38	09/07/89 07:13	0.90	2639*	-
Blow Hole	12/21/89 12:00	12/21/89 17:47	0.24	29823	0
Blow Hole	12/23/89 10:53	12/23/89 21:30	0.44	10784	0
Blow Hole	12/27/89 10:50	12/27/89 17:11	0.26	6787	2
Blow Hole	12/29/89 10:44	12/29/89 19:15	0.35	11099	52
Blow Hole	12/31/89 12:40	12/31/89 17:04	0.18	11330	0
Blow Hole	01/03/90 10:25	01/03/90 16:53	0.27	16460	18
Blow Hole	01/12/90 12:08	01/12/90 16:53	0.20	3999	38
Blow Hole	01/12/90 16:55	01/14/90 10:39	1.74	47743	1070
Blow Hole	01/14/90 11:46	01/15/90 21:08	1.39	30383	2459
Blow Hole	01/16/90 16:38	01/18/90 09:35	1.71	51219	2281
River Passage	01/22/90 16:16	01/24/90 09:45	1.73	26881	275
River Passage	01/24/90 14:49	01/26/90 02:45	1.50	22808	106
Blow Hole	04/06/90 12:25	04/08/90 10:05	1.90	45875	2700
Blow Hole	08/09/90 12:08	08/09/90 15:42	0.15	3111	976
Blow Hole	10/09/90 14:28	10/11/90 12:56	1.94	32500	0
Mud Flats	04/04/91 14:02	04/05/91 18:17	1.18	24800**	-
Mud Flats	04/07/91 11:03	04/09/91 15:05	2.17	43267	-
Blow Hole	04/09/91 16:17	04/11/91 15:45	1.98	**	-
Blow Hole	04/17/91 12:10	04/18/91 15:30	1.14	4721	27107
		Total # of days	22.68		

*Air direction not measured.
**Problem with the air velocity meter.

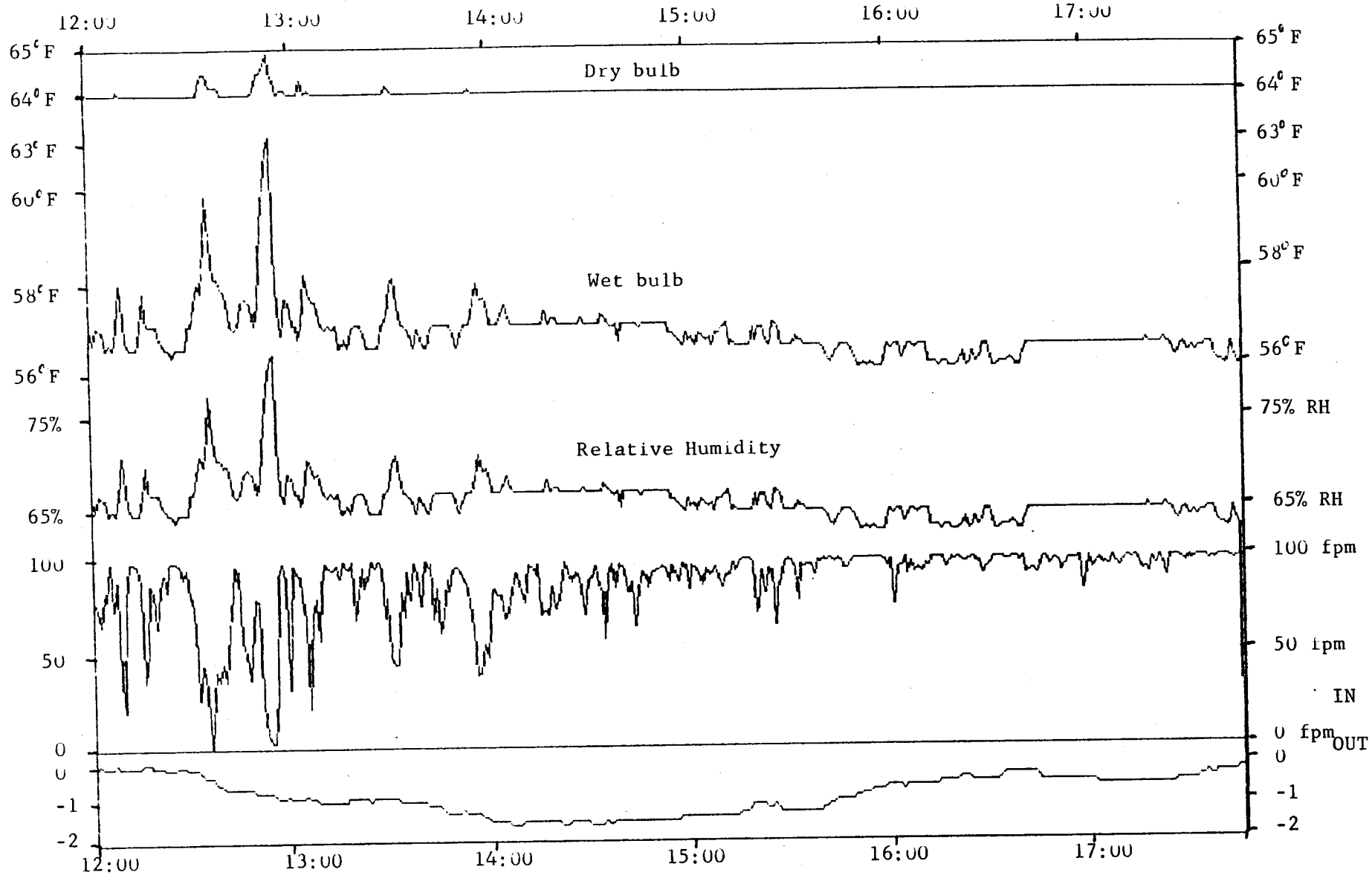
IN indicates airflow into cave
OUT indicates airflow out of cave



12/19/89

Entrance to LEM Room 12:10 to 16:09

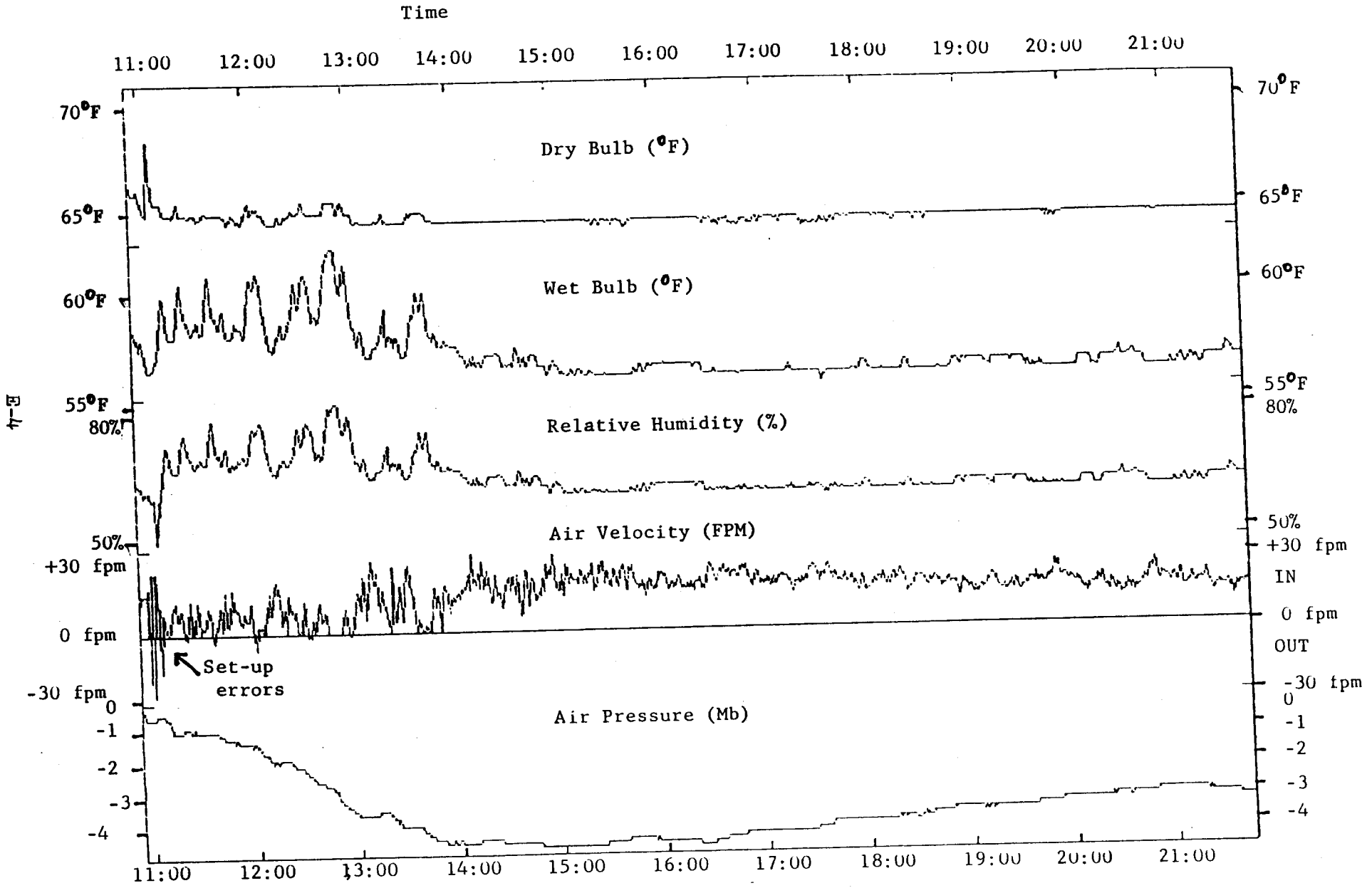
(one minute averages of 12 readings)



12/21/89

At Blow Hole 12:00 to 17:47

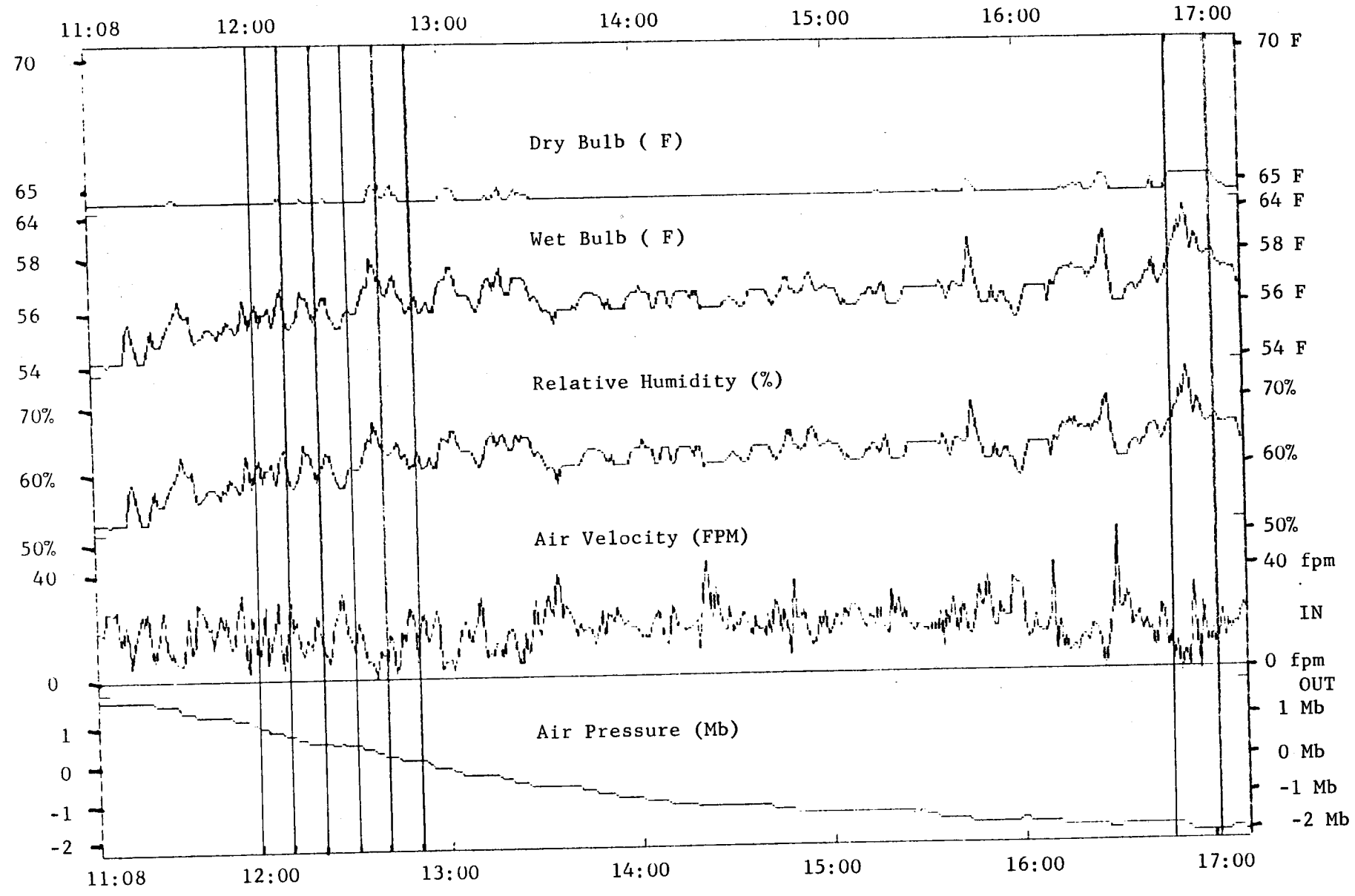
(one minute averages of 12 readings)



12/23/89

Blow Hole Gate

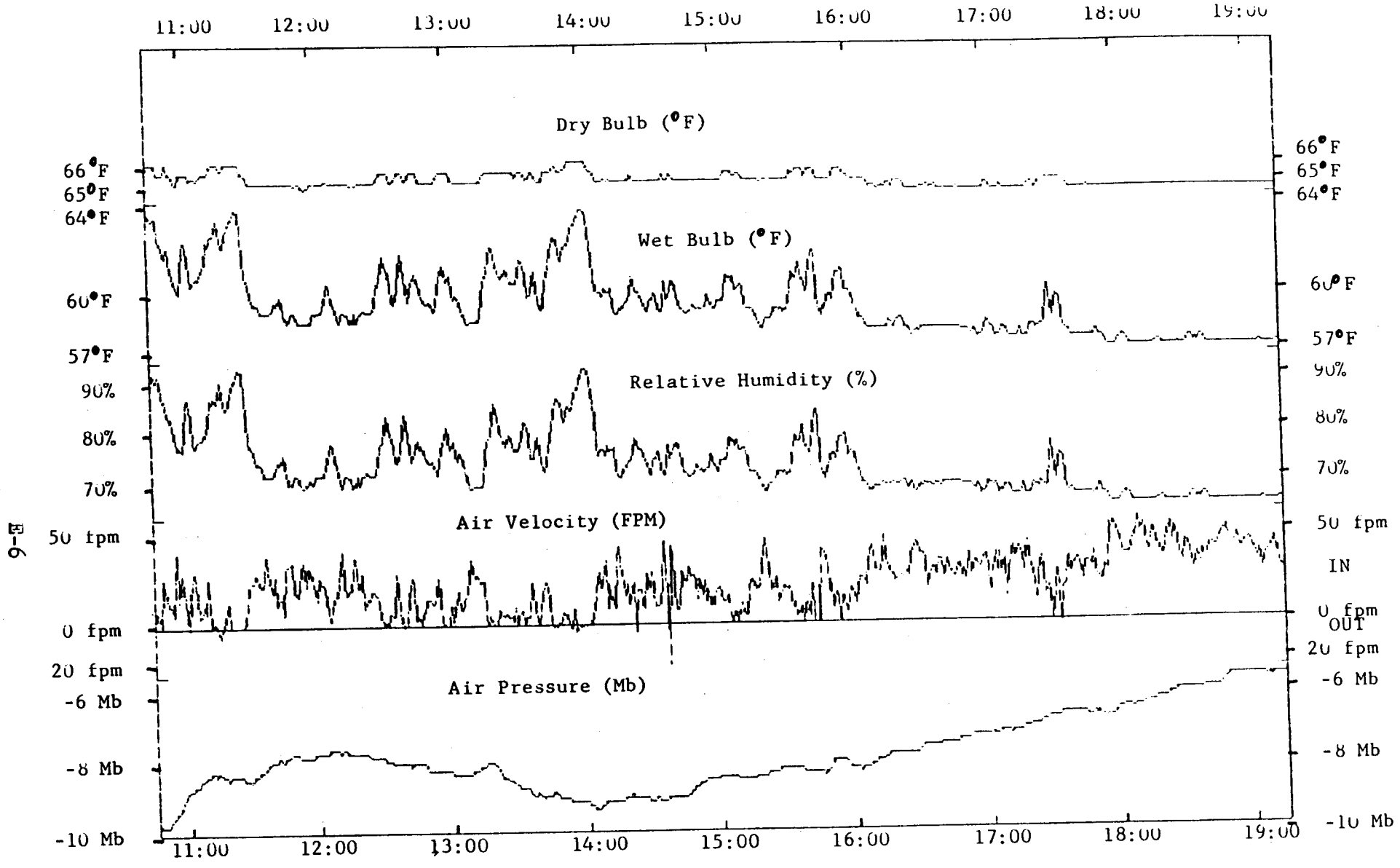
Effective Area 4 square feet, Total Air Movement 10,784 feet



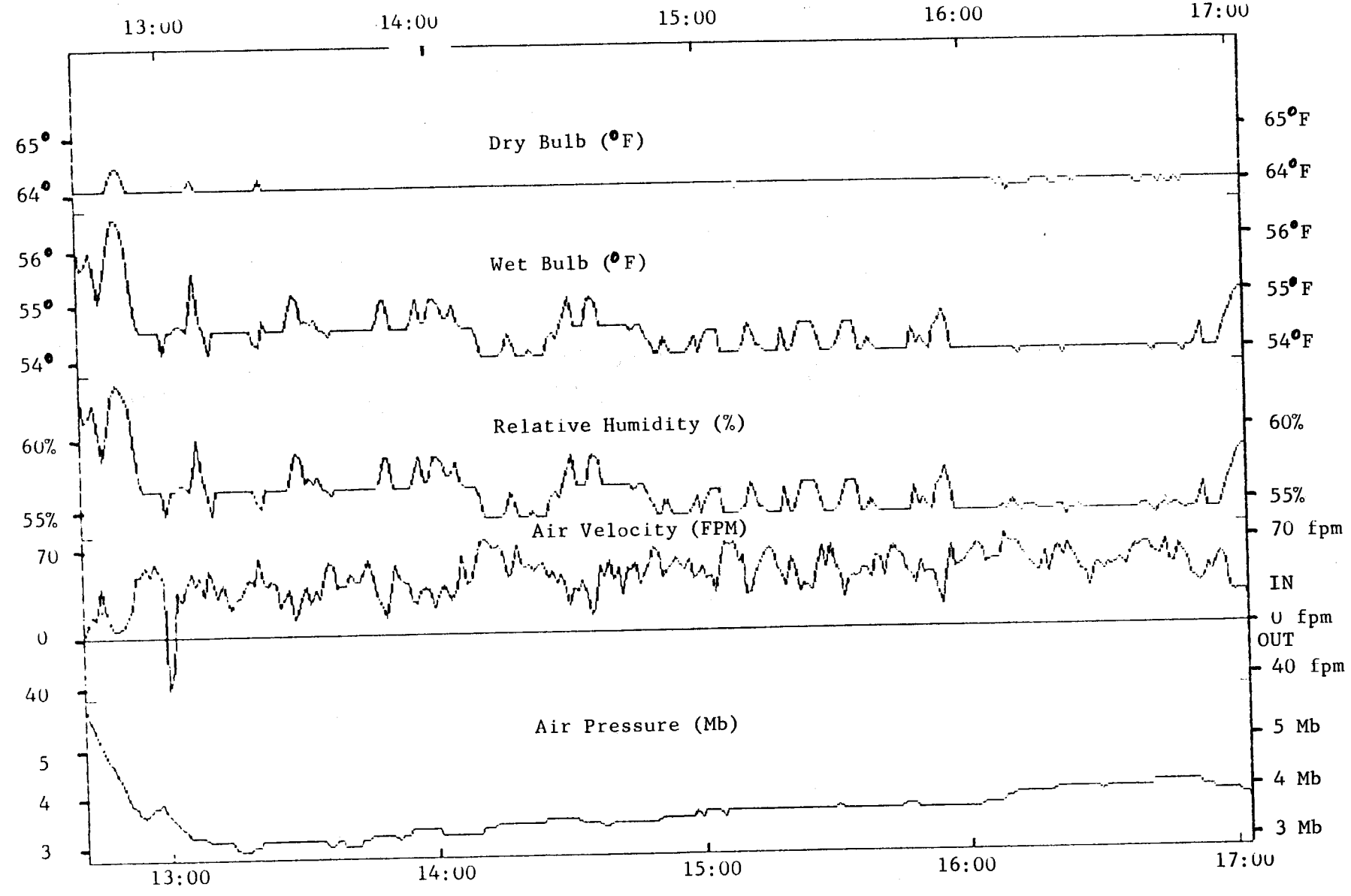
E-5

Steel Gate Open

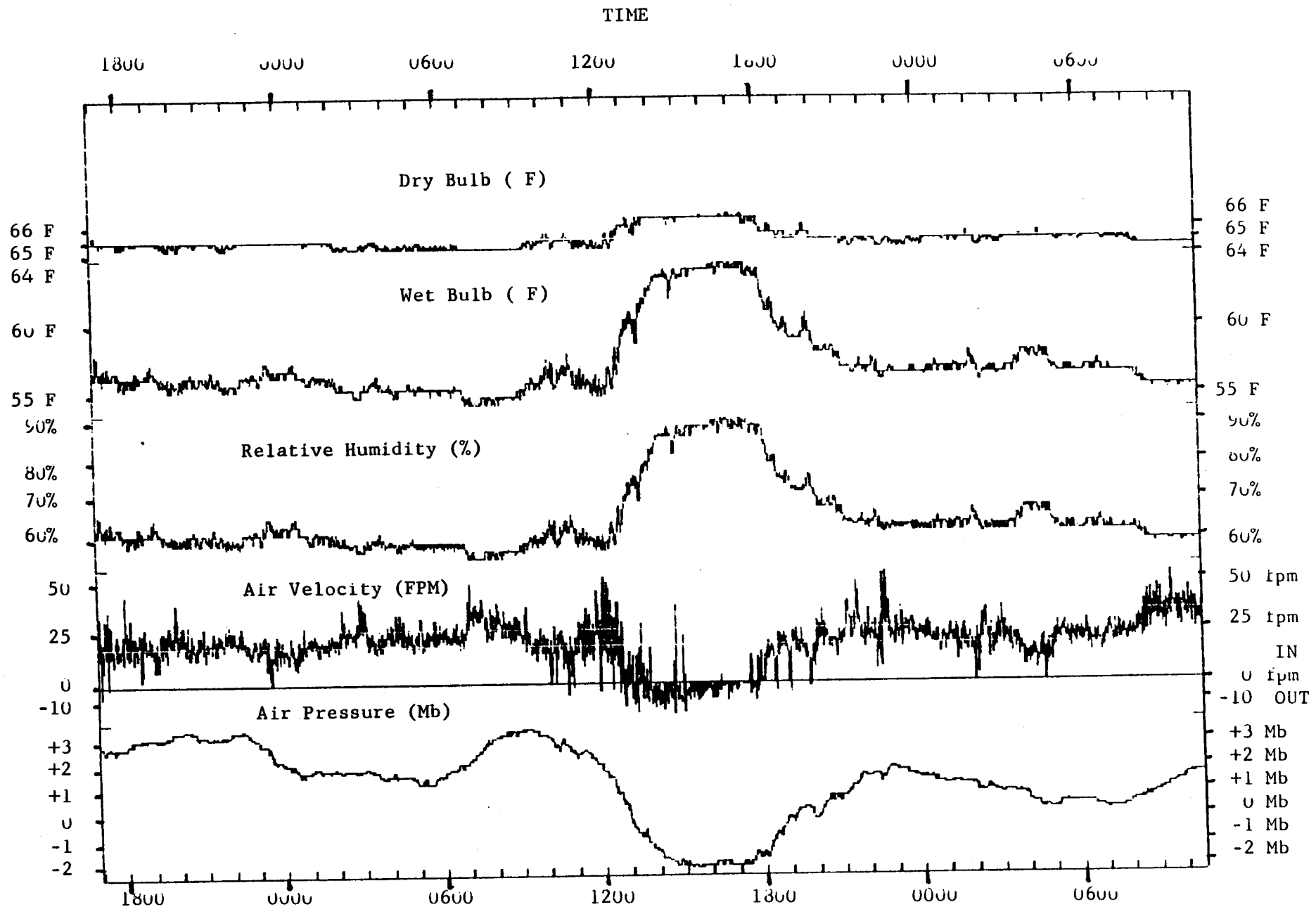
Air Flow Blow Hole
12/27/89 11:08 to 17:11
(1 minute average of 10 readings)
Air Flow IN = 6,787 feet
OUT = 2 feet



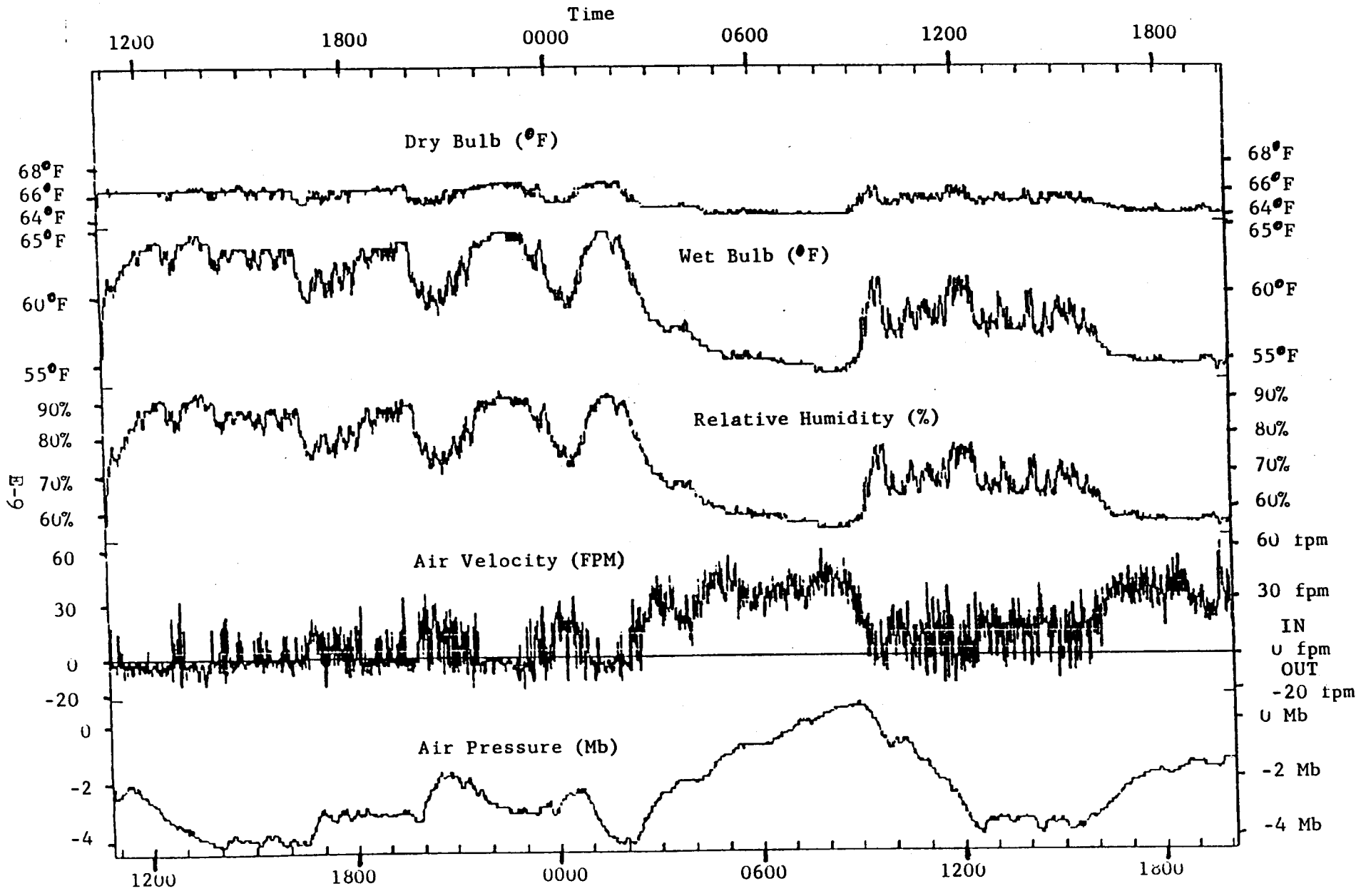
Air Flow at Blow Hole
12/29/89 10:44 to 19:15
(1 minute averages of 10 readings)
Air Flow In = 11,099 feet
Out = 52 feet



Air Flow at Blow Hole
12/31/89 12:40 to 17:04
(1 minute averages of 10 readings)
Air flow In = 11,330 feet
Out = 69 feet

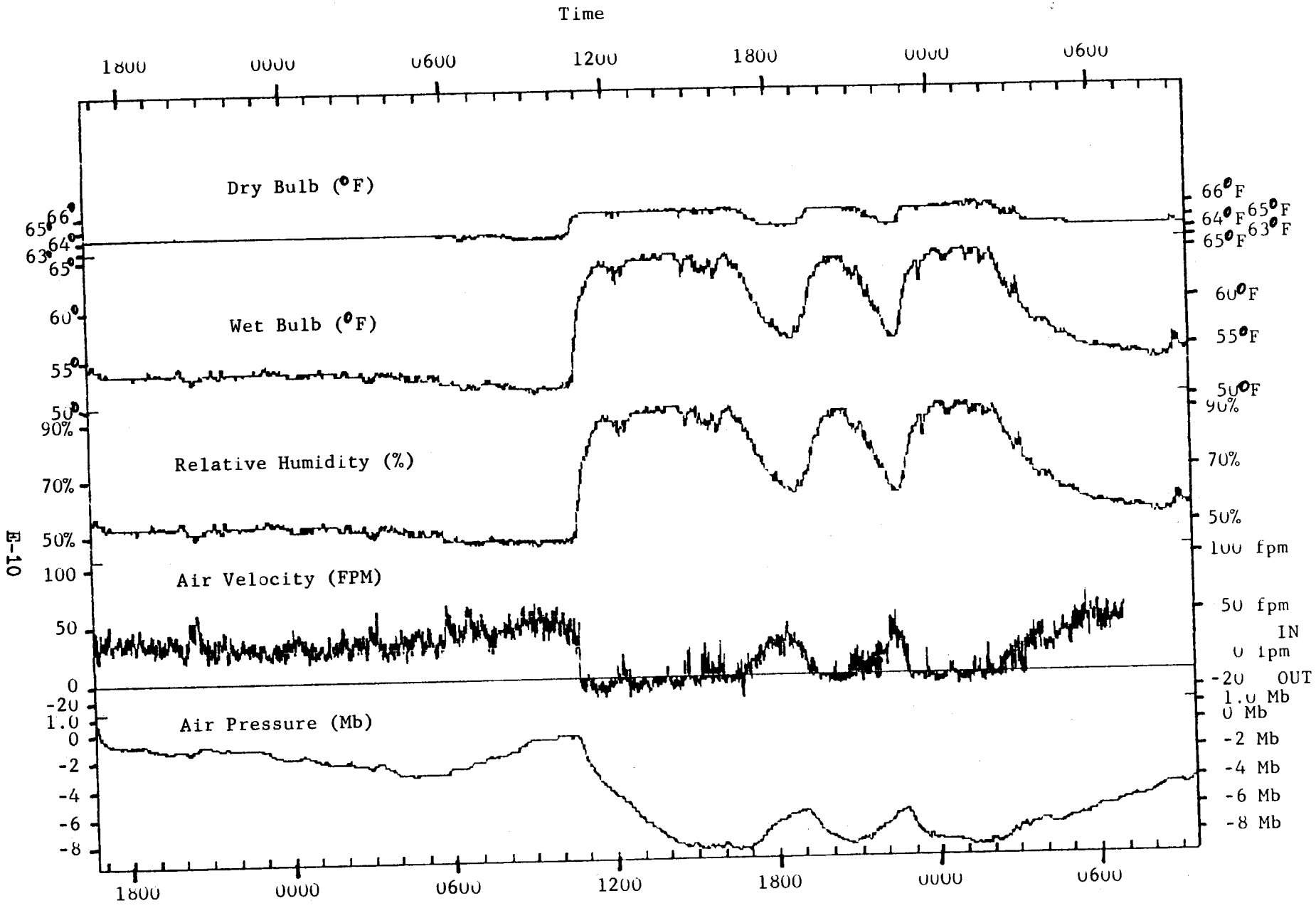


Air Flow at Blow Hole
01/12/90 16:55 to 01/14/90 10:39
(1 minute averages of 10 readings)
Air flow In = 47,743 feet
Out = 1,070 feet

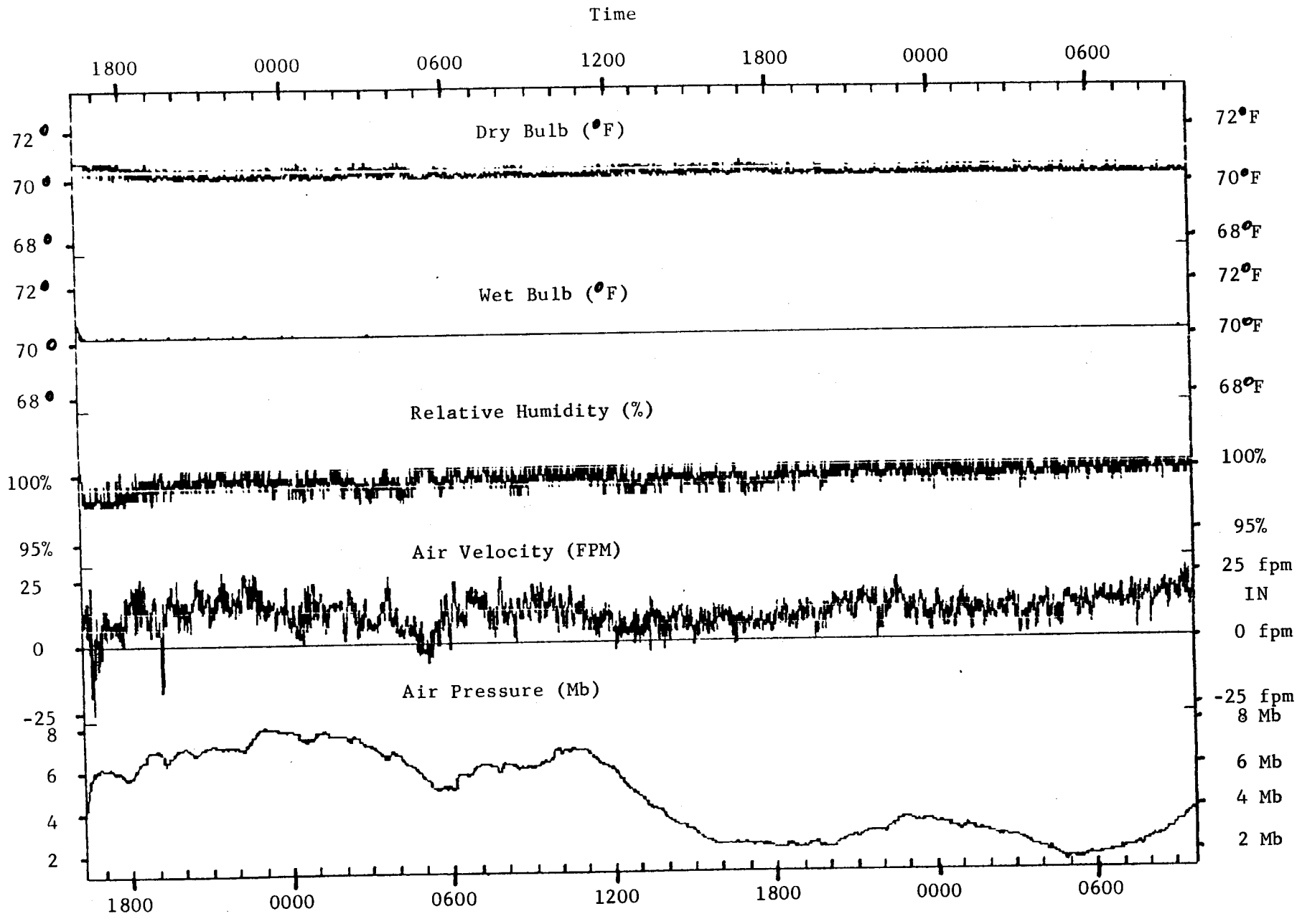


E-9

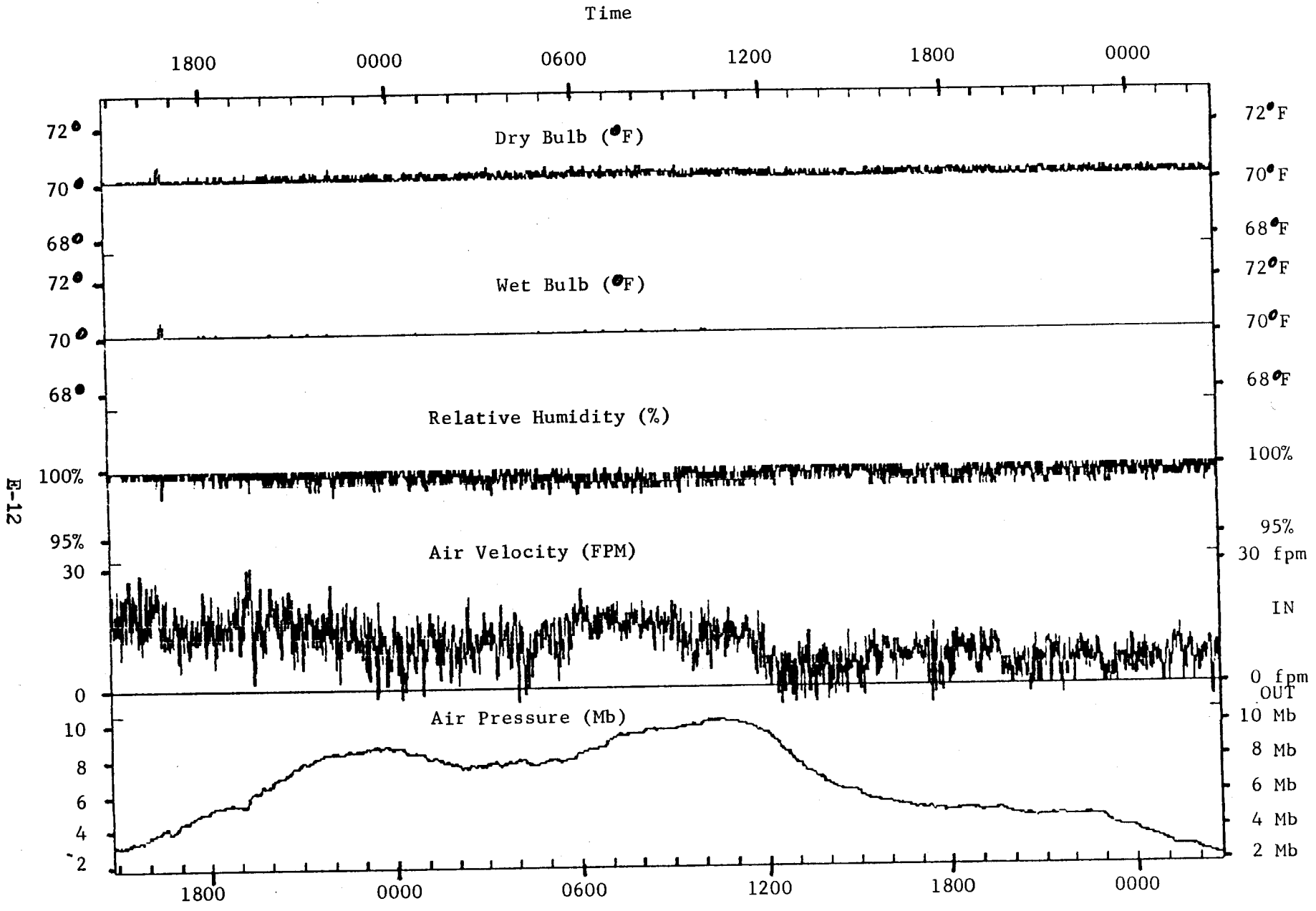
Air Flow at Blow Hole
01/14/90 11:46 to 01/15/90 21:08
(1 minute averages of 10 readings)
Air Flow In = 30,383 feet
Out = 2,459 feet



Air Flow at Blow Hole
01/16/90 16:38 to 01/18/90 9:35
(1 minute averages of 10 readings)
Air Flow In = 51,219 feet
Out = 2,281 feet



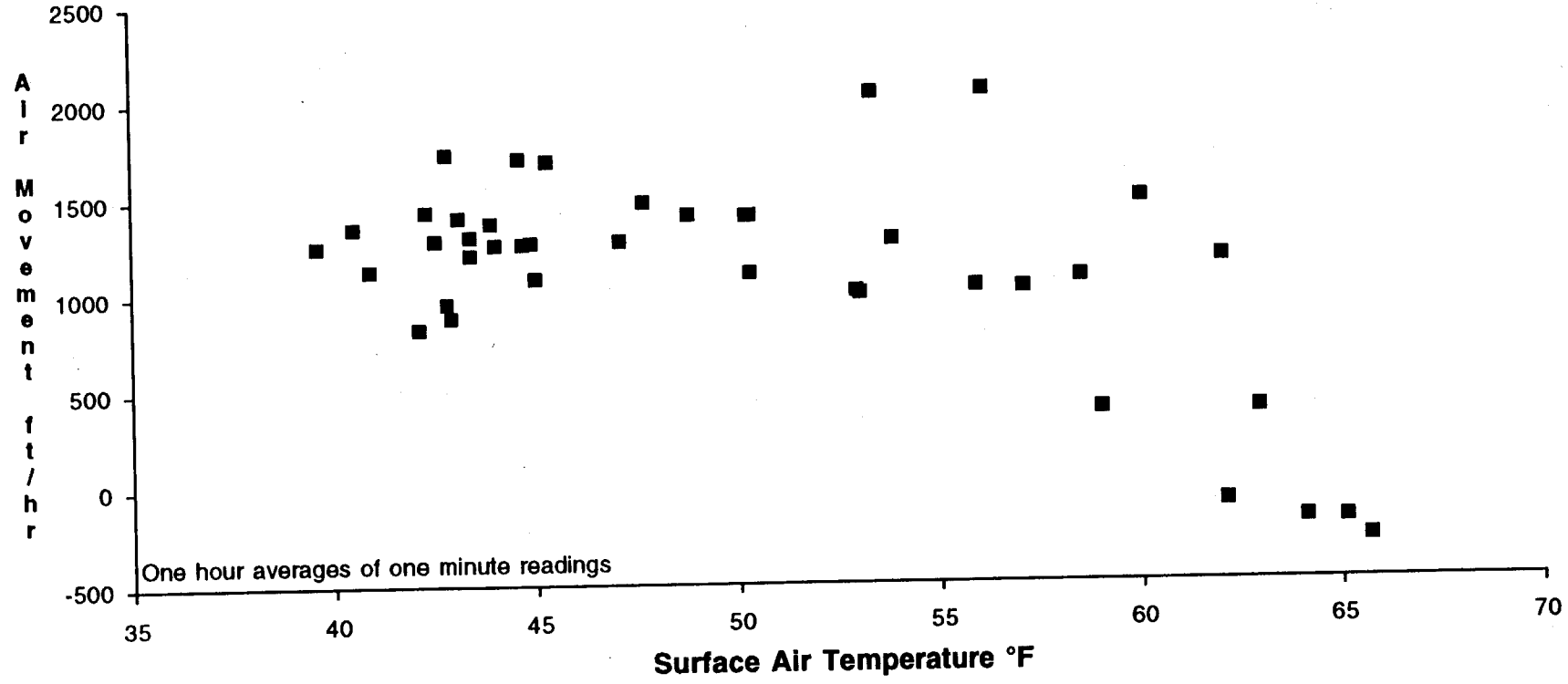
Air Flow at River Passage
01/22/90 16:16 to 01/24/90 09:45
(1 minute averages of 10 readings)
Air Flow In = 26,881 feet
Out = 275 feet

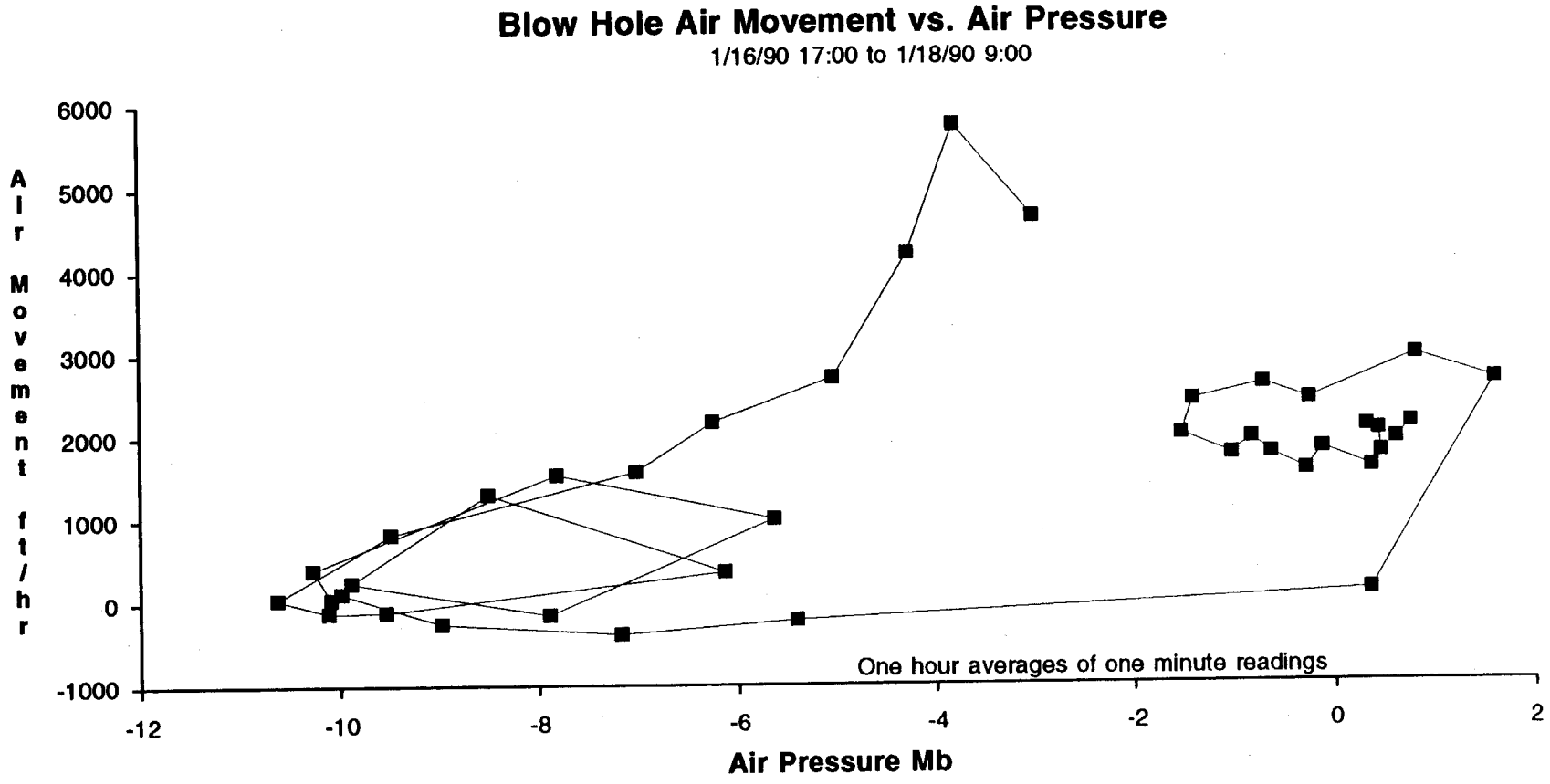


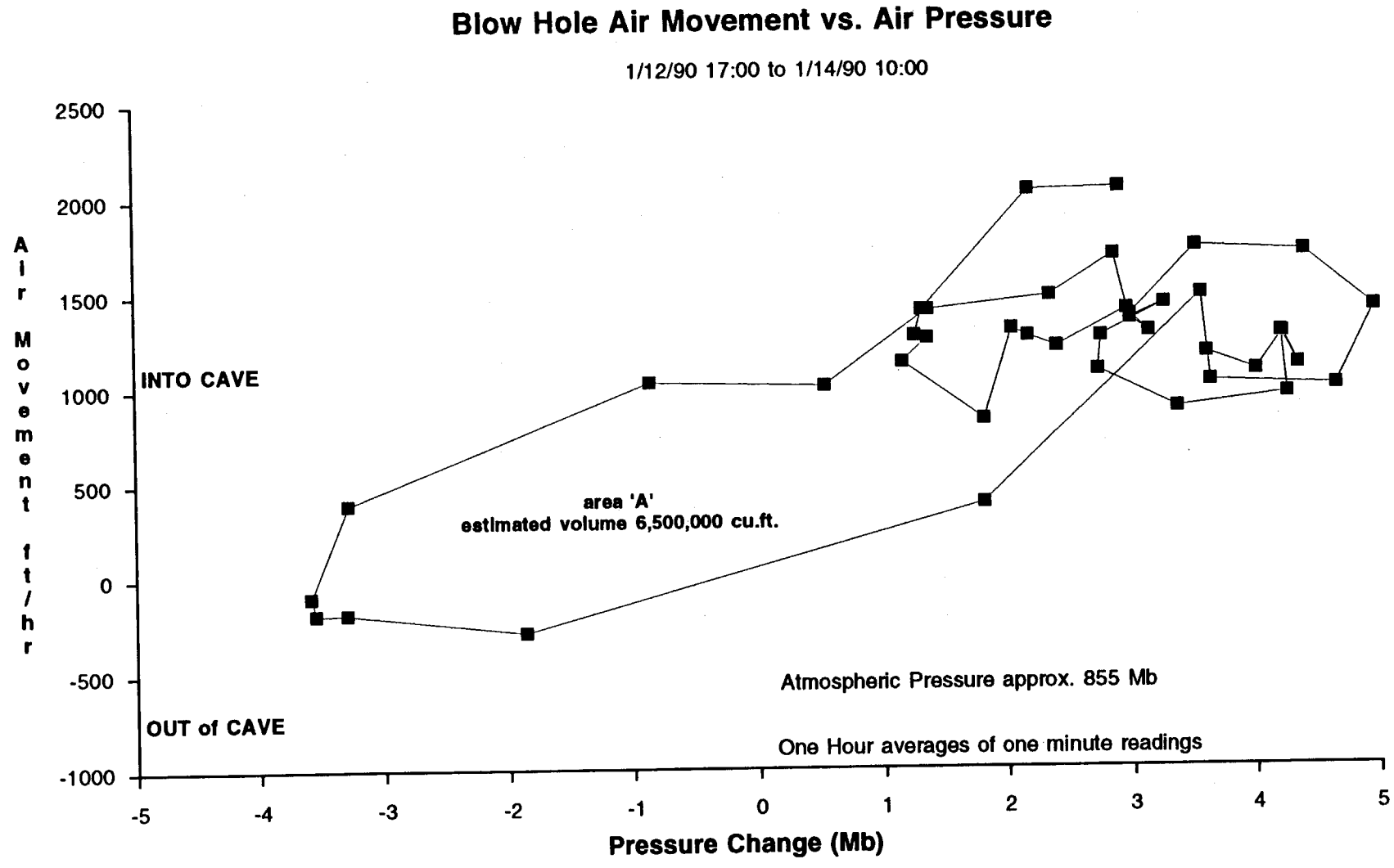
Air Flow at River Passage
01/24/90 14:49 to 01/26/90 02:45
(1 minute averages of 10 readings)
Air Flow In = 22,808 feet
Out = 106 feet

Blow Hole Air Movements vs. Surface Temperature

1/12/90 17:00 to 1/14/90 10:00




Blow Hole Air Movement vs. Air Pressure
1/16/90 17:00 to 1/18/90 9:00
Air Movement ft/hr
6000
5000
4000
3000
2000
1000
0
-1000
-12
-10
-8
-6
-4
-2
0
2
Air Pressure Mb
One hour averages of one minute readings


Blow Hole Air Movement vs. Air Pressure
1/12/90 17:00 to 1/14/90 10:00
Air Movement ft/hr
2500
2000
1500
1000
500
0
-500
-1000
INTO CAVE
OUT of CAVE
area 'A'
estimated volume 6,500,000 cu.ft.
Atmospheric Pressure approx. 855 Mb
One Hour averages of one minute readings
-5
-4
-3
-2
-1
0
1
2
3
4
5
Pressure Change (Mb)

Regression of Velocity from Temperature and Pressure
1/12/90 17:00 to 1/14/90 10:00

DEP VAR: V N: 41 MULTIPLE R: .771 SQUARED MULTIPLE R: .594
ADJUSTED SQUARED MULTIPLE R: .573 STANDARD ERROR OF ESTIMATE: 356.424

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	1835.139	448.430	0.000	.	4.092	0.000
Temperature	-20.030	8.233	-0.291	0.7452190	-2.433	0.020
Pressure	137.763	28.333	0.582	0.7452190	4.862	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	7075213.856	2	3537606.928	27.847	0.000
RESIDUAL	4827452.989	38	127038.237		

Regression of Velocity from Temperature
1/12/90 17:00 to 1/14/90 10:00

DEP VAR: V N: 41 MULTIPLE R: .585 SQUARED MULTIPLE R: .342
ADJUSTED SQUARED MULTIPLE R: .325 STANDARD ERROR OF ESTIMATE: 448.100

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	3132.031	453.205	0.000	.	6.911	0.000
Temperature	-40.237	8.935	-0.585	.100E+01	-4.503	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	4071716.942	1	4071716.942	20.278	0.000
RESIDUAL	7830949.903	39	200793.587		

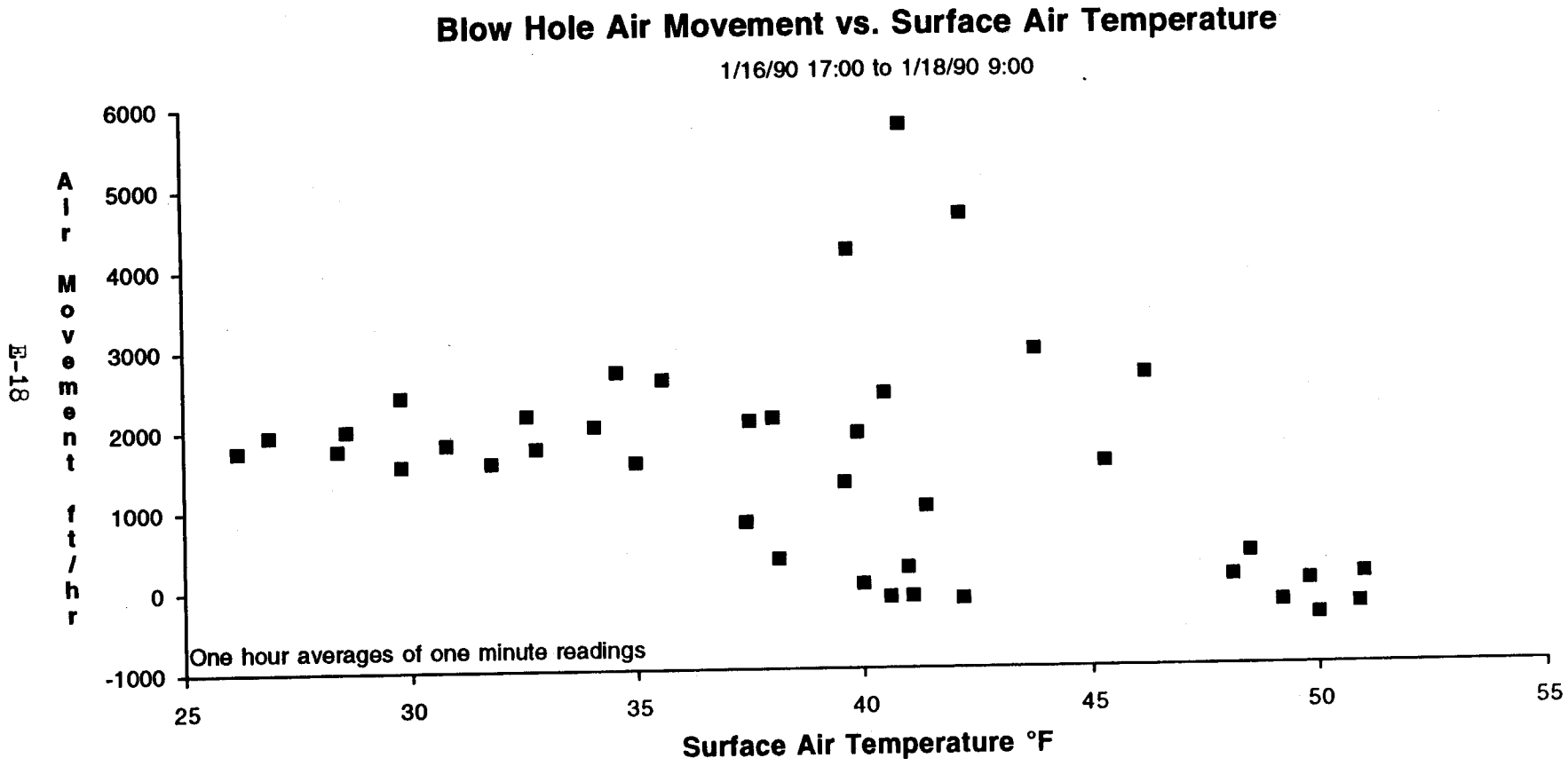
Regression of Velocity from Pressure
1/12/90 17:00 to 1/14/90 10:00

DEP VAR: V N: 41 MULTIPLE R: .729 SQUARED MULTIPLE R: .531
ADJUSTED SQUARED MULTIPLE R: .519 STANDARD ERROR OF ESTIMATE: 378.235

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	759.568	79.739	0.000	.	9.526	0.000
Pressure	172.557	25.955	0.729	.100E+01	6.648	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	6323258.116	1	6323258.116	44.199	0.000
RESIDUAL	5579408.729	39	143061.762		


Blow Hole Air Movement vs. Surface Air Temperature
1/16/90 17:00 to 1/18/90 9:00
Air Movement ft/hr
6000
5000
4000
3000
2000
1000
0
-1000
One hour averages of one minute readings
25
30
35
40
45
50
55
Surface Air Temperature °F

REGRESSION ANALYSIS of Airflow Measurements
Regression of Velocity from Temperature and Pressure
1/16/90 17:00 to 1/18/90 9:00

DEP VAR: V N: 40 MULTIPLE R: .560 SQUARED MULTIPLE R: .314
ADJUSTED SQUARED MULTIPLE R: .276 STANDARD ERROR OF ESTIMATE: 1184.326

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	3201.305	1127.292	0.000		2.840	0.007
Temperature (T)	-25.630	30.789	-0.130	0.7639659	-0.832	0.411
Pressure (P)	160.682	51.598	0.485	0.7639659	3.114	0.004

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	.237018E+08	2	.118509E+08	8.449	0.001
RESIDUAL	.518973E+08	37	1402628.608		

Regression of Velocity from Temperature
1/16/90 17:00 to 1/18/90 9:00

DEP VAR: V N: 40 MULTIPLE R: .366 SQUARED MULTIPLE R: .134
ADJUSTED SQUARED MULTIPLE R: .111 STANDARD ERROR OF ESTIMATE: 1312.888

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	4342.604	1181.777	0.000		3.675	0.001
Temperature (T)	-72.213	29.833	-0.366	.100E+01	-2.421	0.020

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	.100994E+08	1	.100994E+08	5.859	0.020
RESIDUAL	.654997E+08	38	1723675.164		

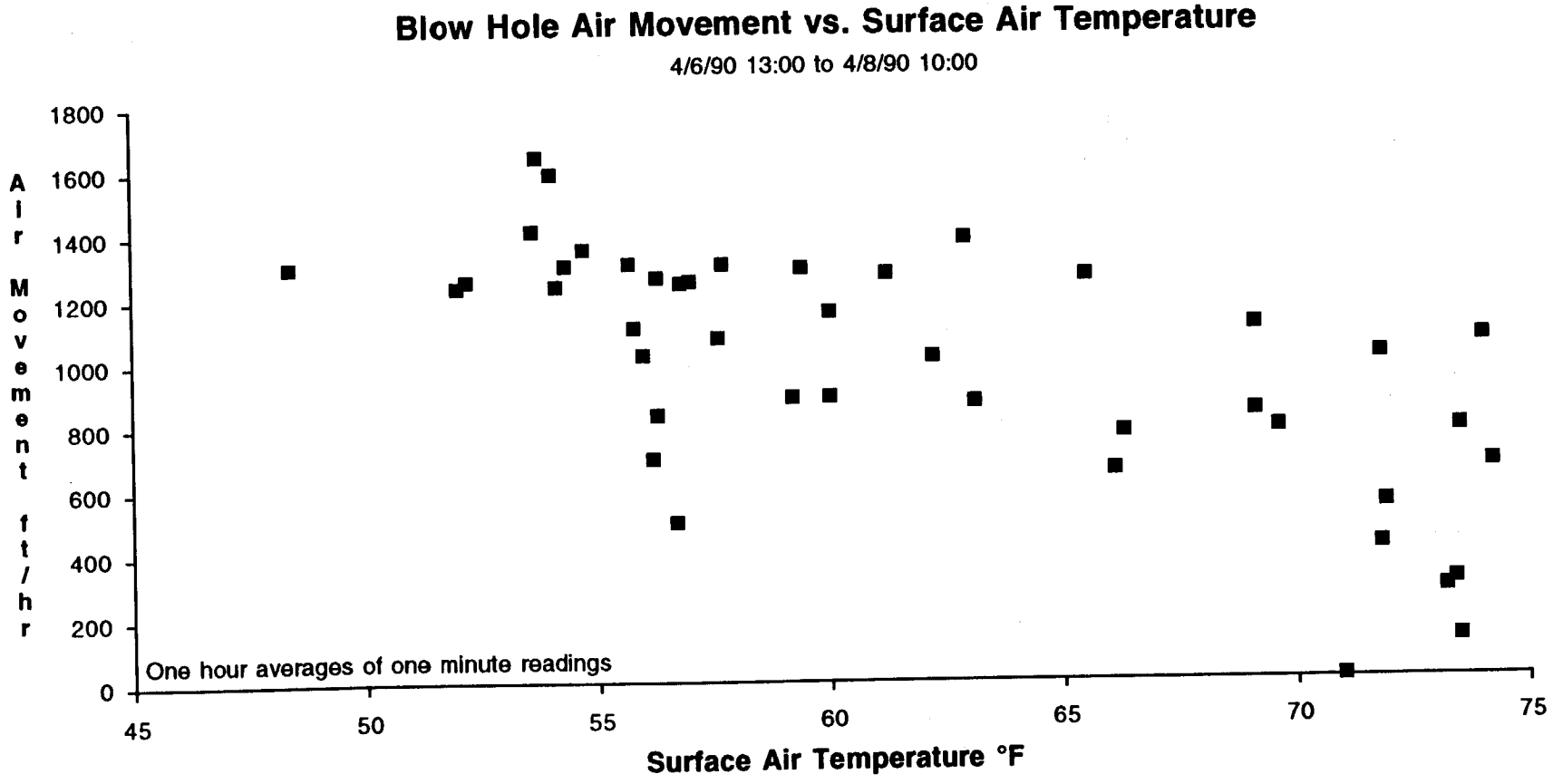
Regression of Velocity from Pressure
1/16/90 17:00 to 1/18/90 9:00

DEP VAR: V N: 40 MULTIPLE R: .548 SQUARED MULTIPLE R: .301
ADJUSTED SQUARED MULTIPLE R: .282 STANDARD ERROR OF ESTIMATE: 1179.532

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	2289.493	265.363	0.000	.	8.628	0.000
Pressure (P)	181.549	44.916	0.548	.100E+01	4.042	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	.227299E+08	1	.227299E+08	16.337	0.000
RESIDUAL	.528692E+08	38	1391295.047		


Blow Hole Air Movement vs. Surface Air Temperature
4/6/90 13:00 to 4/8/90 10:00
Air Movement ft/hr
1800
1600
1400
1200
1000
800
600
400
200
0
One hour averages of one minute readings
45
50
55
60
65
70
75
Surface Air Temperature °F

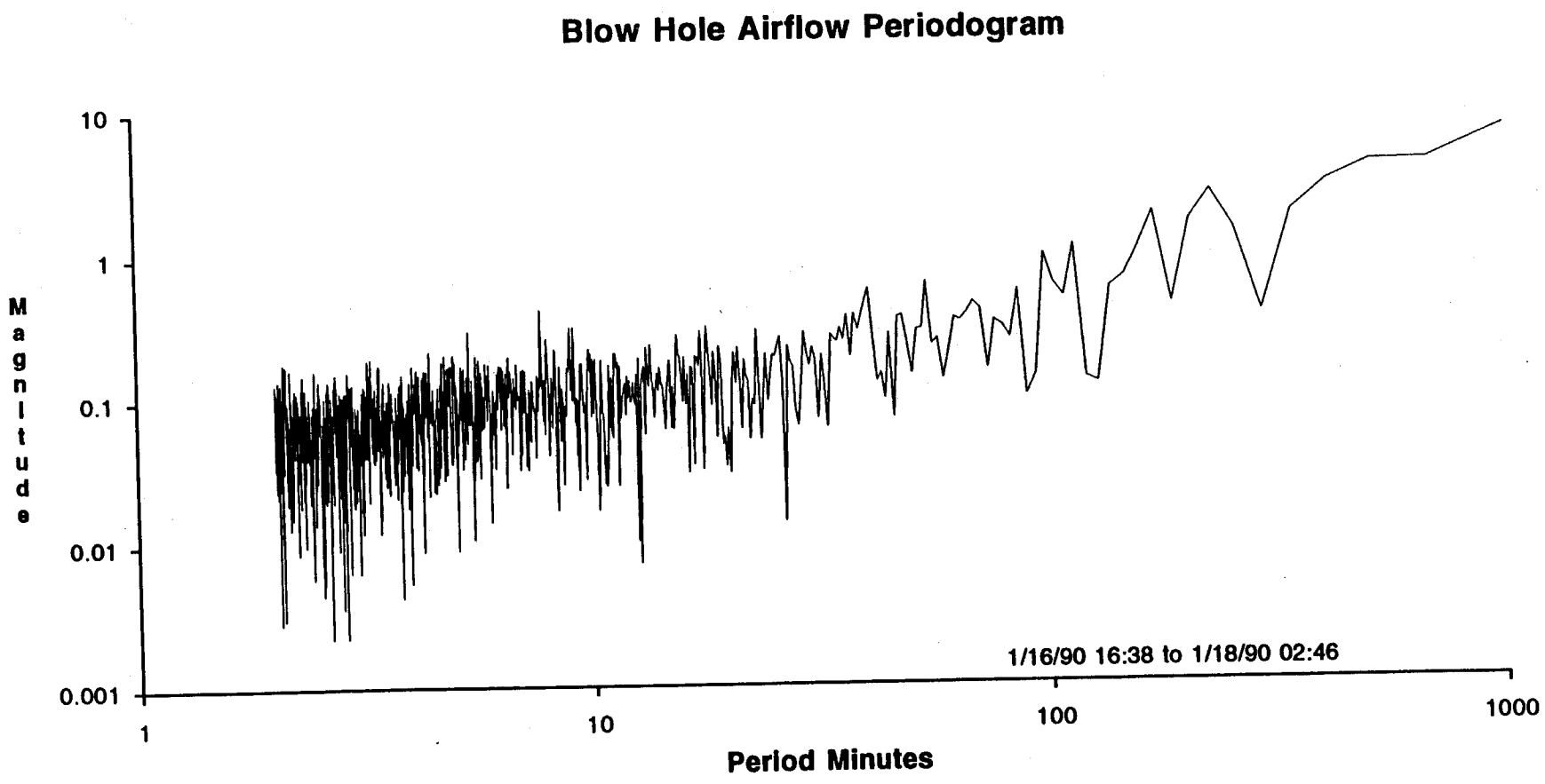
REGRESSION of Airflow Measurements
Regression of Air Velocity with Pressure
4/6/90 13:00 to 4/8/90 10:00

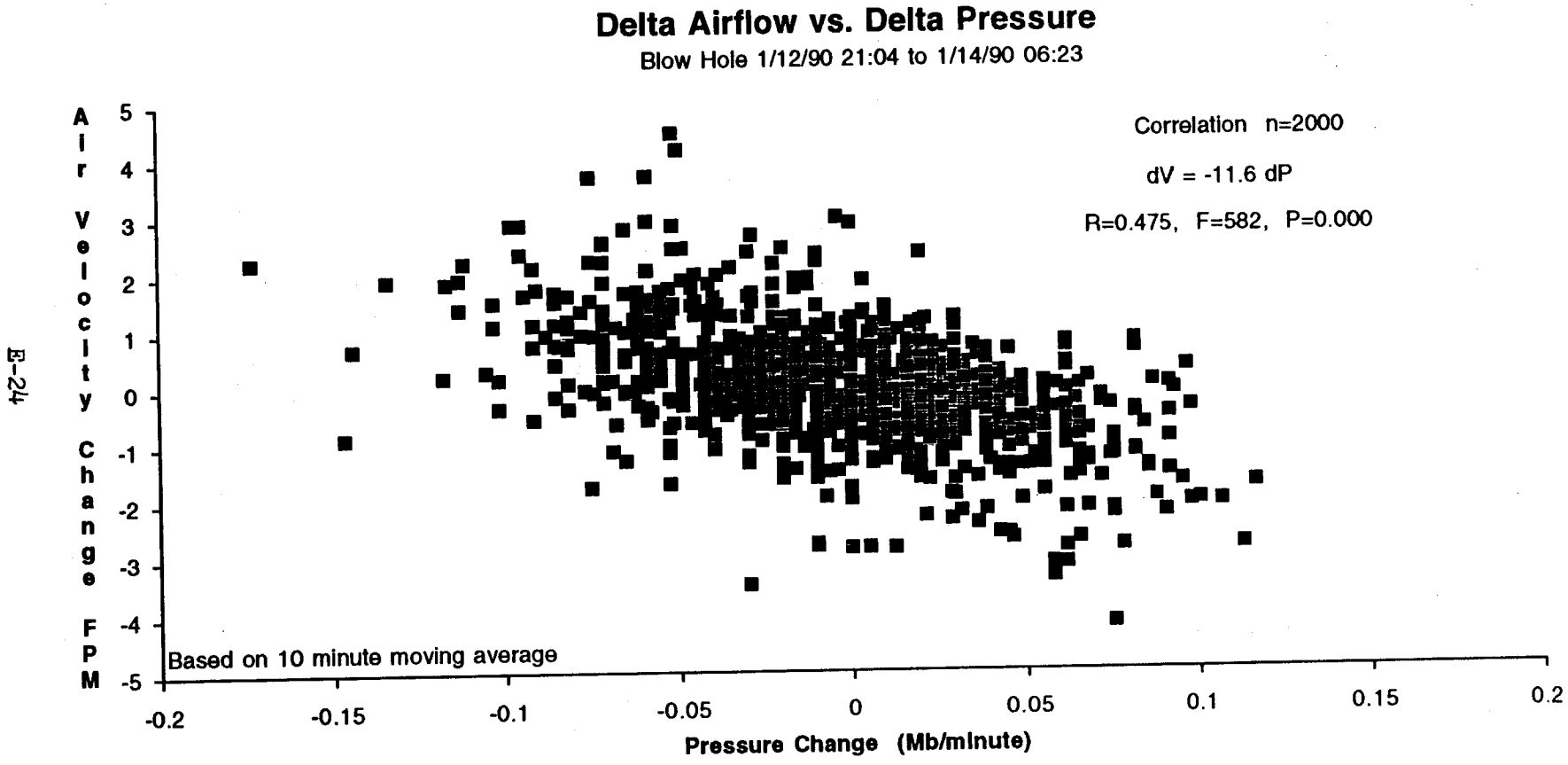
DEP VAR: Velocity(V) N: 44 MULTIPLE R: .694 SQUARED MULTIPLE R: .481
ADJUSTED SQUARED MULTIPLE R: .469 STANDARD ERROR OF ESTIMATE: 279.945

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	3142.321	348.517	0.000	.	9.016	0.000
Temperature(T)	-34.898	5.594	-0.694	.100E+01	-6.238	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	3049963.853	1	3049963.853	38.918	0.000
RESIDUAL	3291496.299	42	78368.959		


Blow Hole Airflow Periodogram
10
1
0.1
0.01
0.001
Magnitude
1
10
100
1000
Period Minutes
1/16/90 16:38 to 1/18/90 02:46


Delta Airflow vs. Delta Pressure
Blow Hole 1/12/90 21:04 to 1/14/90 06:23
Correlation n=2000
dV = -11.6 dP
R=0.475, F=582, P=0.000
Air Velocity Change FPM
5
4
3
2
1
0
-1
-2
-3
-4
-5
Based on 10 minute moving average
-0.2
-0.15
-0.1
-0.05
0
0.05
0.1
0.15
0.2
Pressure Change (Mb/minute)

Air Flow Correlation January 12, 1990, 17:00 to January 14, 1990, 10:00

DEP VAR: Velocity N: 41 MULTIPLE R: 0.998 SQUARED MULTIPLE R: 0.996
ADJ. SQUARED MULTIPLE R: 0.995 STANDARD ERROR OF ESTIMATE: 37.986

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	3453.210	55.678	0.000	62.021	0.000	
Temperature	0.325	0.947	0.005	0.640	0.343	0.734
Pressure	-1162.288	22.827	-4.931	0.012	-50.916	0.000
Storage	0.198	0.003	5.704	0.012	57.454	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	.118493E+08	3	3949759.841	2737.375	0.000
RESIDUAL	53387.323	37	1442.901		

Airflow Correlation: January 16, 1990, 17:00 to January 18, 1990, 9:00

DEP VAR: Velocity N: 40 MULTIPLE R: 1.000 SQUARED MULTIPLE R: 1.000
ADJ. SQUARED MULTIPLE R: 1.000 STANDARD ERROR OF ESTIMATE: 19.175

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	3266.363	18.252	0.000	178.963	0.000	
Temperature	2.020	0.504	0.010	0.747	4.010	0.000
Pressure	-1136.115	3.551	-3.432	0.042	-319.923	0.000
Storage	0.191	0.001	4.072	0.041	375.684	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	.755858E+08	3	.251953E+08	68523.001	0.000
RESIDUAL	13236.871	36	367.691		

Observed Airflow in Kartchner Caverns

3/29/90	Bathtub Room, airflow toward back of cave, estimated 40fpm.
2/28/90	Main Corridor, condensation fog 3 ft. above PP#12
3/9/90	Sharon's Saddle, Condensation of EMS#13 evaporation pan
3/9/90	River passage blowing out toward Big Room.
3/11/90	River Passage, air blowing into cave (toward back section) at start of River Passage, Bath Tub Room and Shelf Passage.
3/14/90	River Passage, air blowing into cave, Bath Tub Room estimated 30fpm.
1/16/90,	15:00, Triangle Passage, airflow toward back section, estimated 50 fpm, area 4 sq. ft. = 200 cu. ft. min.. Weak airflow into Pyramid Room from Grand Canyon. Airflow out of passage to left of Water Room,South Passage. (See other observations!)
1/18/90	Rotunda Room, noticeable airflow up toward Throne Room.
1/21/90	River Passage, airflow into cave at Lover's Leap.
1/24/90	River Passage, airflow into cave at Lover's Leap.
2/27/90	Sharon's Saddle, heavy condensation, top & bottom of pan cover.
2/27/90	River Passage, condensation on bottom of frame, Lover's Leap.
10/26/90	Blockade Room, 16:20, airflow is into cave.
10/29/90	Kartchner Towers, heavy condensation on bottom of pan cover.
12/29/90	Grand Central Station, breakdown block starting to show dry line.
11/8/89	Kartchner Towers, condensation on top & bottom of pan cover.
11/8/89	Mud Flats, light condensation on bottom of frame.
9/23/89	River passage, air blowing into cave, toward back.
4/23/90	Airflow out at Babbit Hole and River Passage.
1/10/91	Grand Canyon, lots of condensation in air. Strong airflow toward Pyramid Room, estimated 30 fpm. At pp79 in Rotunda Room, airflow is toward Throne Room, estimate 20 fpm, area 25 sq. ft. = 500 cu. ft. min.. Condensation fog in Throne Room. Airflow in Triangle Passage is toward Mud Trench, estimate 20fpm, area 10 sq. ft. = 200 cu. ft. min. Thunder Room, 15:00, airflow is toward Shelf Passage, estimated 12 fpm, area 10 sq. ft. = 120 cu. ft. min.. Bathtub Room, slight airflow toward Thunder Room, estimated 10 fpm, area 20 sq. ft. = 200 cu. ft. min. Start of River Passage, 15:20, airflow into cave toward back, estimated 20 fpm, area 20 sq. ft. = 400 cu. ft. min.
1/17/91	Big Room Overlook, airflow coming from direction of Kartchner Towers, less than 10 fpm. Condensation fog droplets fall at 1.5"/second.
2/10/91	River Passage, 11:30, Bathtub Room, steady airflow toward back of cave. 12:30, Grand Canyon, slight airflow from Pyramid Room toward Shelf Passage. Condensation fog estimated to be 30 droplets per cubic inch.
3/5/91	River Passage, Lover's Leap, 14:15, airflow is toward back of cave. Main Corridor, airflow is into cave.

3/24/91 Thunder Room, 11:30, very slight airflow into Thunder Room from Shelf Passage. None to perhaps a slight amount of airflow out into Big Room at start of River Passage. Grand Canyon, 12:30, steady airflow into Grand Canyon from Pyramid Room, estimate 12 fpm, area 30 sq. ft. = 360 cu. ft. min. Airflow stops every 10 to 15 minutes, but does not reverse. Airflow is into Throne Room from Rotunda Room, 14:00, very slight, estimated 5 fpm, area 30 sq. ft. = 150 cu. ft. min. Airflow is out of Triangle Passage toward Mud Trench, estimated 30 fpm, area 6 sq. ft. = 180 cu. ft. min. End of Grand Canyon, 16:05, airflow is out of Pyramid Room into Grand Canyon, estimate 5 fpm, falls to 0 fpm 5ft. above floor, area 36 sq. ft. = 180 cu. ft. min. X 0.5 = 90 cu. ft. min.. Slight airflow out at Shelf Passage, Thunder Room, out at start of River Passage? All these spots seem less than at Grand Canyon.

3/28/91 Main Corridor, steady airflow into cave. Mud Flats, steady airflow into cave, toward rope traverse, estimated 40 fpm, 150 sq. ft. = 600 cu. ft. min..

3/31/91 Follow airflow at Mud Flats, (air blowing into cave from entrance) airflow does not go by Red River but goes up over breakdown, across the spur trail at the bottom of the rope traverse. Airflow estimated to be 12 fpm. Airflow goes up rope traverse and heads toward Lunch Spot. Airflow at the entrance to the Echo Passage oscillates. Most of air goes through the Pool Room. Opening at the end of Pool Room, estimate 45 fpm, area 16 sq. ft. = 720 cu. ft. min.. Airflow can be followed to Strawberry Room and up breakdown to Big Room Overlook. There is some airflow from Strawberry Room toward Cul-de-Sac, estimated 10 fpm. Airflow in back of Cul-de-Sac at EMS#7 is toward back of Cul-de-Sac at less than 5 fpm.. At 17:10 at bottom of ladder up to Sharon's Saddle at "Y" junction, airflow is into cave, estimated 35 fpm, area 35 sq. ft. = 1225 cu. ft. min.

Condensation Fog

Fog caused by a slight cooling of cave air and formation of a fog of condensation droplets has been observed many times in the cave. During the winter it frequently forms a layer of fog about three feet above the floor along Main Corridor. Late in the winter it is frequently seen in Grand Canyon, Throne Room and from the Big Room Overlook.

The fog has been estimated to fall at approximately 1.5 inches per second and have a concentration of approximately 30 particles per cubic inch. The size of the fog droplets can be estimated from the rate of fall to be 10μm to 30μm in diameter. At a concentration of 30 droplets per cubic inch the air contains 0.0077 milligrams of condensation fog per cubic meter of air. Considering the observed rate of fall this is equivalent to 25.2 milliliters per day per square meter reaching the surface. One of the evaporation pans used at each monitoring station has a surface area of 383 square centimeters. Such a pan would collect approximately 0.96 milliliters of condensation per day. This agrees well with the maximum of 0.6 milliliters per day collected by the evaporation pan at Sharon's Saddle.

The condensation fog has frequently been observed in the beam of headlamps. In high concentrations the fog can limit the visibility in the cave. From the observed particle concentration we can estimate that the condensation fog would totally block the line of sight in a distance of 5700 feet. Because in a cave the light may come from the same direction as the observer, the suspended droplets will also be illuminated and practical visibility may be only one tenth, or 500 feet.

Changes in the cave microclimate due to development is likely to increase the amount of condensation fog observed in the cave. Cave lighting systems should be designed to take advantage of the unusual effects that fogging will create.

In the Interim Report it was hypothesized that perhaps the condensation fog was a means of removing radon daughter particles from the air. The time required to "sweep" an entire volume of air is approximately 13 hours at the particle concentrations observed. This is much longer than the half-life of the radon daughter decay products and so filtering the air with condensation is likely to be an unimportant mechanism for removing radon daughters.

APPENDIX F

Alpha Radiation Measurements

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ALPHA RADIATION MEASUREMENTS

Date	Location	Sample #	Time	Walk Stnry	Radalert 5 min	Radon WL	Thoron WL	Radon Daughters (pCi/l) Rad-A	Rad-B	Rad-C
08/30/89	At entry into Echo Psg	-	19:10	S	-	1.53	-	-	-	-
08/30/89	Sinkhole bottom of ladder	-	9:56	S	-	0.03	-	-	-	-
08/30/89	Blockade Rm-gate closed	-	10:08	S	-	0.31	-	-	-	-
08/30/89	Blockade Rm-gate open-air	-	10:23	S	-	0.25	-	-	-	-
08/30/89	Crinoid Rm	-	10:34	S	-	0.34	-	-	-	-
08/30/89	Low Point in Crinoid Rm	-	10:41	S	-	0.58	-	-	-	-
08/30/89	LEM Room	-	16:54	S	-	0.22	-	-	-	-
08/30/89	Anticipation Room	-	17:13	S	-	0.20	-	-	-	-
08/30/89	Grand Central EMS 16	-	17:30	S	-	1.44	-	-	-	-
08/30/89	Pop-Up Junction	-	17:37	S	-	1.10	-	-	-	-
08/30/89	Main Corridor EMS 14	-	17:49	S	-	1.04	-	-	-	-
08/30/89	Sharon's Saddle EMS 13	-	18:06	S	-	1.12	-	-	-	-
08/30/89	EchoPsg-30'past to Strawbry	-	19:00	S	-	1.11	-	-	-	-
08/30/89	Lunch Spot	-	19:22	S	-	1.14	-	-	-	-
08/30/89	Entrance to River Psg	-	18:18	S	-	0.45	-	-	-	-
08/31/89	Crinoid Room	-	10:42	S	-	0.07	-	-	-	-
08/31/89	Past Babbitt-open-air	-	10:58	S	-	0.24	-	-	-	-
08/31/89	Kartchner Towers EMS22	-	12:18	S	-	1.28	-	-	-	-
08/31/89	Base of Bishop,Big Rm	-	12:49	S	-	1.64	-	-	-	-
08/31/89	Sharon's Saddle Junction	-	13:02	S	-	1.74	-	-	-	-
08/31/89	Sharon's Saddle EMS 13	-	13:13	S	-	2.00	-	-	-	-
08/31/89	Cul-de-Sac EMS 7	-	14:14	S	-	1.66	-	-	-	-
08/31/89	Cul-de-Sac-sharp turn	-	14:23	S	-	1.82	-	-	-	-
08/31/89	Cul-de-Sac-bott.of rubble	-	14:32	S	-	1.69	-	-	-	-
08/31/89	StrawberryRm junction	-	14:42	S	-	1.75	-	-	-	-
08/31/89	Big Room Overlook	-	14:53	S	-	1.77	-	-	-	-
08/31/89	Entrance to River Psg	-	12:29	S	-	0.52	-	-	-	-
08/31/89	Pyramid Room	-	17:02	W	-	1.43	-	-	-	-
08/31/89	Grand Canyon	-	17:11	W	-	1.48	-	-	-	-
08/31/89	Shelf Passage	-	17:24	W	-	1.94	-	-	-	-
08/31/89	Thunder Rm & Bath Tub	-	17:33	W	-	2.09	-	-	-	-
08/31/89	Outer River Passage	-	17:47	W	-	1.60	-	-	-	-
09/01/89	Crow's Nest Rock EMS 1	-	15:32	S	-	1.31	-	-	-	-
09/01/89	CptHook Pirate's to C-80	-	15:46	W	-	1.65	-	-	-	-
09/01/89	Jct Pirate's & Sue's Rm	-	15:59	S	-	1.60	-	-	-	-
09/01/89	Hill Room at H-51	-	16:11	S	-	1.43	-	-	-	-

ALPHA RADIATION MEASUREMENTS

		Sample		Walk	Radalert	Radon	Thoron	Radon Daughters (pCi/l)		
Date	Location	#	Time	Stnry	5 min	WL	WL	Rad-A	Rad-B	Rad-C
09/01/89	Mushroom Psg EMS 4	-	16:38	S	-	0.99	-	-	-	-
09/01/89	Sue's Room EMS 3	-	16:58	S	-	0.70	-	-	-	-
09/01/89	Subway Tunnel H48-H49	-	17:33	W	-	2.31	-	-	-	-
09/01/89	Angel Wing Junction	-	17:45	S	-	2.29	-	-	-	-
09/01/89	Sharon's Saddle EMS 13	-	20:15	S	-	1.69	-	-	-	-
09/01/89	Tarantula Room EMS 11	-	20:32	S	-	1.69	-	-	-	-
09/01/89	Upper Rotunda Room	-	13:33	S	-	0.89	-	-	-	-
09/01/89	Throne Room Overlook	-	13:49	S	-	0.79	-	-	-	-
09/01/89	Lower Throne Rm EMS17	-	14:04	S	-	0.65	-	-	-	-
09/01/89	Throne Rm below Overlook	-	14:20	W	-	0.62	-	-	-	-
09/01/89	Mud Trench EMS 20	-	14:43	S	-	1.66	-	-	-	-
12/11/89	Echo 3' into	-	16:56	S	293	4.25	-	-	-	-
12/11/89	Crinoid Room	-	11:37	S	36	0.01	-	-	-	-
12/11/89	LEM Room	-	11:52	S	25	0.01	-	-	-	-
12/11/89	30 ft. past Babbitt Hole	-	12:20	S	16	0.01	-	-	-	-
12/11/89	Pop-up	-	12:34	S	17	0.07	-	-	-	-
12/11/89	Grand Central EMS16	-	12:43	S	61	0.09	-	-	-	-
12/11/89	Main Corridor EMS14	-	13:29	S	38	0.21	-	-	-	-
12/11/89	Sharon's Saddle EMS13	-	13:39	S	45	0.35	-	-	-	-
12/11/89	Kartchner Towers EMS22	-	13:50	S	100	0.55	-	-	-	-
12/11/89	Mud Flats EMS12	-	14:06	S	136	1.08	-	-	-	-
12/11/89	Tarantula Room EMS11	-	14:14	S	59	0.56	-	-	-	-
12/11/89	Cul-de-sac EMS7	-	15:42	S	143	0.91	-	-	-	-
12/11/89	Cul-de-sac trail bend	-	15:52	S	186	1.04	-	-	-	-
12/11/89	Cul-de-sac portal	-	16:01	S	125	0.97	-	-	-	-
12/11/89	Strawberry Room	-	16:11	S	113	0.87	-	-	-	-
12/11/89	Big Room Overlook	-	16:29	S	77	0.13	-	-	-	-
12/11/89	Pool Room	-	16:45	S	230	4.15	-	-	-	-
12/11/89	Lunch Spot	-	17:07	S	197	1.41	-	-	-	-
12/12/89	Grand Central EMS 16	-	14:22	S	71	0.10	-	-	-	-
12/12/89	Babbitt Hole 30' inside	-	14:37	S	31	0.01	-	-	-	-
12/12/89	Pop-up	-	14:50	S	43	0.17	-	-	-	-
12/12/89	Bishop/Kartchner Towers	-	13:03	S	88	0.51	-	-	-	-
12/12/89	Kartchner Towers EMS22	-	13:14	S	90	0.49	-	-	-	-
12/12/89	Sharon's Saddle EMS 13	-	13:42	S	79	0.33	-	-	-	-
12/12/89	Main Corridor EMS 14	-	13:54	S	70	0.20	-	-	-	-

ALPHA RADIATION MEASUREMENTS

Date	Location	Sample #	Time	Walk Stnry	Radalert 5 min	Radon WL	Thoron WL	Radon Daughters (pCi/l) Rad-A	Rad-B	Rad-C
12/12/89	StrawberryRm Junction	-	15:28	S	88	0.81	-	-	-	-
12/12/89	Big Room Overlook	-	15:38	S	81	0.53	-	-	-	-
12/12/89	EchoPsg-30'past toStraw	-	16:01	S	171	4.04	-	-	-	-
12/12/89	Lunch Spot	-	16:13	S	166	1.60	-	-	-	-
12/12/89	Tarantula Rm EMS 11	-	16:28	S	98	0.49	-	-	-	-
12/12/89	Pyramid Room	-	11:15	W	57	0.42	-	-	-	-
12/12/89	Grand Canyon	-	11:24	W	102	0.52	-	-	-	-
12/12/89	Shelf Passage	-	11:37	W	102	0.47	-	-	-	-
12/12/89	Thunder to Bathtub	-	11:48	W	87	0.39	-	-	-	-
12/12/89	Lover's Leap EMS19	-	12:01	S	70	0.38	-	-	-	-
12/12/89	Ent.to River Passage	-	13:28	S	59	0.47	-	-	-	-
12/13/89	Crow's Nest at Pirate's Den	-	15:13	S	159	1.52	-	-	-	-
12/13/89	CptHook Pirate's to C-80	-	15:35	W	179	1.50	-	-	-	-
12/13/89	Jct Pirate's & Sue's Rm	-	15:59	S	170	0.97	-	-	-	-
12/13/89	Sue's Room EMS 3	-	16:33	S	151	1.14	-	-	-	-
12/13/89	Mushroom Psg EMS 4	-	16:49	S	183	1.13	-	-	-	-
12/13/89	Near Hill Room	-	17:05	S	186	1.00	-	-	-	-
12/13/89	Subway Tunnel	-	17:27	W	160	1.01	-	-	-	-
12/13/89	Angel Wing Junction	-	17:41	S	160	1.03	-	-	-	-
12/13/89	Throne Room Overlook	-	13:09	W	95	0.51	-	-	-	-
12/13/89	Lower Throne Room EMS17	-	13:29	S	79	0.52	-	-	-	-
12/13/89	Throne Rm below overlook	-	13:44	W	126	0.45	-	-	-	-
12/13/89	Upper Rotunda Room	-	14:01	W	103	0.53	-	-	-	-
12/13/89	Mud Trench EMS 20	-	14:34	S	104	0.61	-	-	-	-
12/14/89	Grand Central EMS 16	-	13:19	S	54	0.18	-	-	-	-
12/14/89	Pop-up	-	13:30	S	22	0.21	-	-	-	-
12/14/89	Kartchner Towers EMS22	-	13:48	S	73	0.45	-	-	-	-
12/14/89	Tarantula Room EMS 11	-	14:15	S	59	0.54	-	-	-	-
12/14/89	Lunch Spot	-	14:33	S	118	0.65	-	-	-	-
12/11/90	Angel Wing Junction	5	15:42	S	223	0.88	0.050	-	-	-
12/11/90	Lover's Leap	1	13:10	S	40	0.38	-	-	-	-
12/11/90	Thunder Room	2	13:32	W	73	0.61	0.055	-	-	-
12/11/90	Throne Room	3	15:06	W	109	0.37	0.009	-	-	-
12/11/90	Rotunda Room	4	15:22	W	163	0.42	0.012	-	-	-
12/11/90	Mud Trench	1A	15:58	W	199	0.74	0.026	-	-	-
12/13/90	Echo Passage - Start	4	11:28	S	407	4.42	-	-	-	-

ALPHA RADIATION MEASUREMENTS

Date	Location	Sample #	Time	Walk Stnry	Radalert 5 min	Radon WL	Thoron WL	Radon Daughters (pCi/l) Rad-A	Rad-B	Rad-C
12/13/90	Cul-de-Sac	1	10:43	S	165	1.00	-	-	-	-
12/13/90	Big Room Overlook	2	11:02	W	71	0.59	-	-	-	-
12/13/90	Strawberry to Pool	3	11:16	W	103	0.71	-	-	-	-
12/13/90	Echo Psg-Rope Traverse	5	11:37	W	184	0.68	-	-	-	-
12/13/90	Rope Traverse-Ladder	1A	11:55	W	132	0.34	-	-	-	-
12/13/90	Ladder-Grand Central	2A	13:01	W	71	0.27	-	-	-	-
12/13/90	Ladder-Sharon's Saddle	3A	13:09	W	82	0.42	-	-	-	-
12/13/90	Kartchner T. to Bishop	4A	13:20	W	125	0.53	-	-	-	-
12/30/90	Echo Passage-End EMS9	1	12:54	S	406	1.04	0.037	-	-	-
12/30/90	Echo Passage-PP44	2	13:04	S	657	3.85	0.041	-	-	-
12/30/90	Echo Passage-PP43	3	13:12	S	699	3.73	0.032	-	-	-
12/30/90	Echo Passage-Start	4	13:21	S	806	3.54	0.031	-	-	-
12/30/90	Outside Echo Psg-T97	5	13:33	S	744	2.16	0.037	-	-	-
12/30/90	Outside Echo Psg-T97	4A	15:13	S	-	2.16	0.041	-	-	-
12/30/90	Surv.St.0-57(PoolRm)	1A	14:45	S	-	0.60	0.027	-	-	-
12/30/90	Pool Rm - PP46	2A	14:54	S	-	0.87	0.030	-	-	-
12/30/90	Pool Rm.G62(before shield)	3A	15:05	S	-	2.25	-	-	-	-
12/30/90	Lunch Spot-PP40	5A	15:21	S	-	1.07	0.059	-	-	-
01/02/91	Echo Passage PP44	1	15:28	S	-	3.56	-	-	-	-
01/02/91	Echo Passage-End EMS9	2	15:38	S	-	1.31	-	-	-	-
01/02/91	Echo Passage - Start	3	15:57	S	-	2.49	-	-	-	-
01/02/91	5' outside Echo Psg	4	16:15	S	-	2.01	-	-	-	-
01/02/91	PP40 - near Lunch Spot	5	16:29	S	-	0.46	-	-	-	-
01/05/91	Echo Passage - Start	1	13:12	S	-	3.05	0.031	-	-	-
01/05/91	PP24 (River Passage)	2	13:48	S	-	0.51	0.043	-	-	-
01/05/91	Lover's Leap EMS 19	4	14:11	S	-	0.40	-	-	-	-
01/05/91	Rubble Room 1	5	14:20	S	-	0.32	-	-	-	-
01/05/91	Bath Tub Room PP54	1A	14:48	S	-	0.24	0.038	-	-	-
01/05/91	Pyramid Room	2A	15:24	S	-	0.39	0.027	-	-	-
01/05/91	Grand Canyon PP60	3A	15:36	S	-	0.66	-	-	-	-
01/05/91	Grand Canyon PP58	4A	15:47	S	-	0.72	0.032	-	-	-
01/05/91	Shelf Passage PP56	5A	15:58	S	-	0.43	-	-	-	-
01/05/91	Thunder Room	1B	16:11	S	-	0.51	-	-	-	-
01/05/91	Inside River Passage	3	14:01	S	-	0.38	-	-	-	-
01/08/91	Echo Passage-Start	5	14:47	S	486	5.06	0.041	-	-	-
01/08/91	Big Room Overlook	1	13:44	W	71	0.55	0.037	-	-	-

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ALPHA RADIATION MEASUREMENTS

Date	Location	Sample #	Time	Walk Stnry	Radalert 5 min	Radon WL	Thoron WL	Radon Daughters (pCi/l) Rad-A	Rad-B	Rad-C
01/08/91	Cul-de-Sac	2	14:11	S	161	1.16	0.049	-	-	-
01/08/91	StrawberryRm to Pool	4	14:34	W	123	0.87	-	-	-	-
01/08/91	Echo Psg-Rope Traverse	3A	14:59	W	268	0.54	-	-	-	-
01/08/91	Rope Traverse-Ladder	1A	15:16	W	211	0.49	-	-	-	-
01/08/91	Ladder-Grand Central	2A	15:27	W	186	0.41	0.037	-	-	-
01/08/91	Ladder-Sharon's Saddle	4A	15:38	W	176	0.59	-	-	-	-
01/08/91	Kartchner-River Psg	5A	15:52	W	201	0.55	-	-	-	-
01/10/91	Angel Wing Junction	5	13:03	S	219	1.00	0.039	-	-	-
01/10/91	Kartchner Towers	1	10:24	S	-	0.56	-	-	-	-
01/10/91	Grand Canyon	2A	13:55	W	173	0.67	-	-	-	-
01/10/91	Bath Tub Room-PP54	3A	15:07	S	87	0.34	0.045	-	-	-
01/10/91	Lower Throne-PP87	2	11:59	S	-	0.47	0.013	-	-	-
01/10/91	Upper Throne-Dot Trail	3	12:19	W	132	0.22	0.015	-	-	-
01/10/91	Rotunda Room	4	12:40	W	165	0.55	-	-	-	-
01/10/91	Mud Trench	1A	13:21	W	166	0.51	0.034	-	-	-
01/31/91	Echo Passage-Start	1	10:59	S	-	4.48	-	-	-	-
01/31/91	Echo Psg-behind Sta.10	2	11:09	S	-	3.97	-	-	-	-
01/31/91	End Gr.Cent.-Surv.I68	1A	13:26	S	-	0.20	-	-	-	-
01/31/91	Entrance to Red River	5	12:16	S	-	0.26	-	-	-	-
01/31/91	Australia	2A	13:44	S	-	0.22	-	-	-	-
01/31/91	Top of climb to Australia	3A	13:54	S	-	0.21	-	-	-	-
01/31/91	Red River-bottom climb	3	11:51	S	-	3.44	-	-	-	-
01/31/91	Red River- Top of climb	4	12:00	S	-	1.74	-	-	-	-
01/31/91	1/2 way down Red River	5A	14:34	S	-	0.21	-	-	-	-
01/31/91	Squeeze left of River Psg	4A	14:14	S	-	0.19	-	-	-	-
02/10/91	Angel Wing Junction	4A	15:55	S	-	0.46	-	-	-	-
02/10/91	Lover's Leap	1	11:18	S	-	0.43	-	-	-	-
02/10/91	ZigZag Room	2	11:30	S	-	0.36	-	-	-	-
02/10/91	1/2bet.ZigZag&BathTub	3	11:40	S	-	0.31	-	-	-	-
02/10/91	Bath Tub Room PP54	4	11:49	S	-	0.28	-	-	-	-
02/10/91	Thunder Room	5	11:59	S	-	0.45	-	-	-	-
02/10/91	Lower Throne Rm	1A	15:17	S	-	0.57	-	-	-	-
02/10/91	Upper Throne Rm Trail	2A	15:28	W	-	0.48	-	-	-	-
02/10/91	Rotunda Room	3A	15:39	W	-	0.49	-	-	-	-
02/10/91	Mud Trench	5A	16:16	W	-	0.39	-	-	-	-
02/12/91	Start of Echo Passage	4	11:39	S	-	2.48	0.042	-	-	-

ALPHA RADIATION MEASUREMENTS

Date	Location	Sample #	Time	Walk Stnry	Radalert 5 min	Radon WL	Thoron WL	Radon Daughters (pCi/l) Rad-A	Rad-B	Rad-C
02/12/91	Big Room Overlook	1	10:50	W	-	0.60	0.038	-	-	-
02/12/91	Cul-de-Sac	2	11:11	S	-	0.98	0.044	-	-	-
02/12/91	StrawberryRm to Pool	3	11:27	W	-	0.63	-	-	-	-
02/12/91	Echo Psg-Rope Traverse	5	11:50	W	-	0.45	-	-	-	-
02/12/91	Rope Traverse-Ladder	1A	12:48	W	-	0.44	-	-	-	-
02/12/91	Ladder-Sharon's Saddle	2A	12:56	W	-	0.55	-	-	-	-
02/12/91	Ladder-Grand Central	4A	13:39	W	-	0.29	0.030	-	-	-
02/12/91	Kartchner T.-Bishop	5A	13:52	W	-	0.51	0.032	-	-	-
02/24/91	Start of Echo Passage	2	13:17	S	-	2.19	0.042	208	219	210
02/24/91	Mud Flats	1	12:04	S	-	0.60	0.038	61	62	64
02/24/91	Kartchner Towers	3	15:27	S	-	0.63	0.031	66	61	61
03/24/91	Thunder Room	1	11:35	S	109	0.74	0.048	-	-	-
03/24/91	Grand Canyon	2	11:58	S	121	0.53	0.028	99	61	42
03/24/91	Lower Throne Room	1A	14:50	S	189	0.50	0.007	-	-	-
03/24/91	Throne Rm PP91-PP81	2A	15:05	W	132	0.57	0.005	-	-	-
03/24/91	Rotunda Room	3	15:21	W	171	0.59	0.005	-	-	-
03/24/91	Mud Trench	4	15:36	W	-	0.24	0.011	-	-	-
03/31/91	Echo Psg - Start	4	14:56	S	-	0.59	-	-	-	-
03/31/91	Big Rm.Overlook	1	12:15	W	101	0.49	-	59	48	51
03/31/91	Cul-de-Sac	2	13:10	S	148	0.99	-	59	70	71
03/31/91	Strawberry to Pool Rm.	3	14:44	W	-	0.43	-	-	-	-
03/31/91	Echo to Traverse	5	15:31	W	-	0.46	-	83	51	36
03/31/91	Traverse to Ladder	1A	16:47	W	-	0.45	-	62	43	38
03/31/91	Ladder to Sharon's Saddle	2A	17:25	W	-	0.56	-	-	-	-
03/31/91	Kartchner to River Psg	4A	18:09	W	-	0.52	-	-	-	-
03/31/91	Ladder to Gr.Central	5A	18:23	W	-	0.40	-	39	32	40
04/18/91	Echo Psg-Start	4	11:50	S	191	0.84	-	-	-	-
04/18/91	Big Rm.Overlook	1	11:00	W	94	0.68	0.016	-	-	-
04/18/91	Cul-de-Sac	2	11:21	S	239	0.84	0.019	-	-	-
04/18/91	Strawberry to Pool	3	11:38	W	158	0.55	-	-	-	-
04/18/91	Echo to Traverse	5	11:59	W	206	0.53	-	-	-	-
04/18/91	Traverse to Ladder	4B	14:13	W	182	0.41	0.020	-	-	-
04/18/91	Ladder to Gr.Central	5B	14:20	W	223	0.43	0.017	-	-	-
04/18/91	Ladder to Sharon's	1C	14:33	W	253	0.68	0.036	-	-	-
04/18/91	Kartchner to River Psg	3C	14:57	W	351	0.73	0.012	-	-	-
04/29/91	Echo Passage #10	2	13:55	S	113	-	0.023	-	-	-

ALPHA RADIATION MEASUREMENTS

Date	Location	Sample #	Time	Walk Stnry	Radalert 5 min	Radon WL	Thoron WL	Radon Daughters (pCi/l) Rad-A	Rad-B	Rad-C
04/29/91	Sharon's Saddle	1	12:35	S	89	-	0.011	-	-	-
04/29/91	Cul-de-Sac	3	14:40	S	146	-	0.017	-	-	-
04/29/91	Mud Flats	4	15:40	S	77	-	0.015	-	-	-
05/05/91	Thunder Rm	1	11:17	S	87	0.66	0.110	-	-	-
05/05/91	Grand Canyon	2	11:43	S	138	0.58	0.059	84	60	49
05/05/91	Grand Canyon	2A	17:25	S	-	-	0.011	-	-	-
05/05/91	Lower Throne	3	15:21	S	151	0.36	0.002	-	-	-
05/05/91	Upper Throne	4	15:35	W	224	0.60	0.007	-	-	-
05/05/91	Rotunda Room	5	15:50	W	245	0.51	0.006	-	-	-
05/05/91	Mud Trench	1A	16:24	W	-	0.42	0.002	-	-	-
05/16/91	Grand Central	1	11:01	S	75	0.51	0.024	66	53	43
05/16/91	Bat House floor	2	12:39	S	155	1.08	0.008	143	118	97
05/16/91	Bat House Ceiling	3	12:53	S	152	0.83	0.011	-	-	-
05/16/91	River Entrance	4	14:04	S	102	0.35	0.018	46	35	33
05/23/91	Echo start	3A	15:29	S	252	1.14	-	-	-	-
05/23/91	Grand C to ladder	1	12:32	W	73	0.51	-	-	-	-
05/23/91	Rope to ladder	2	13:13	W	140	0.50	-	-	-	-
05/23/91	ladder to Sharon's	3	13:23	W	267	1.01	-	-	-	-
05/23/91	Kartchner to River	4	13:33	W	236	0.71	-	-	-	-
05/23/91	Big Rm overlook	5	14:44	W	219	0.89	-	-	-	-
05/23/91	Cul-de-sac	1A	14:59	S	275	1.30	-	-	-	-
05/23/91	Strawberry to Pool	2A	15:18	W	176	0.71	-	-	-	-
05/23/91	Echo to Rope	4A	15:54	W	237	0.67	-	-	-	-
05/29/91	Thunder Room	1	11:13	S	-	1.39	0.011	-	-	-
05/29/91	Grand Canyon	2	11:38	S	225	0.58	0.008	175	66	33
05/29/91	Mud Trench	3	13:13	W	118	0.80	-	-	-	-
05/29/91	Rotunda Room	4	13:34	W	179	0.86	-	-	-	-
05/29/91	Upper Throne	1A	14:21	W	259	0.45	0.003	57	53	40
05/29/91	Lower Throne	2A & 3A	15:24	S	199	0.61	0.002	84	58	50
06/10/91	Echo Start	5	17:45	S	154	0.93	-	-	-	-
06/10/91	Pool Room	1	16:19	S	98	0.47	-	-	-	-
06/10/91	Pool Room	2	16:29	S	89	0.36	-	-	-	-
06/10/91	Pool Room	3	17:16	S	113	0.41	-	-	-	-
06/10/91	Pool Room	4	17:30	S	138	0.45	-	-	-	-
06/21/91	Echo EMS10	4	15:07	S	313	1.00	-	-	-	-
06/21/91	Pop-up	5A	17:46	S	236	0.62	-	147	63	34

ALPHA RADIATION MEASUREMENTS

Date	Location	Sample #	Time	Walk Stnry	Radalert 5 min	Radon WL	Thoron WL	Radon Daughters (pCi/l) Rad-A	Rad-B	Rad-C
06/21/91	Big Rm Overlook	1	14:12	W	142	0.94	-	-	-	-
06/21/91	Cul-de-sac	2	14:29	S	267	1.33	-	-	-	-
06/21/91	Strawberry to Pool Rm	3	14:55	W	238	0.73	-	-	-	-
06/21/91	Echo to Rope Traverse	5	15:30	W	373	1.07	-	-	-	-
06/21/91	Rope Traverse to Ladder	1A	17:12	W	206	0.67	-	-	-	-
06/21/91	Ladder to Grand Central	2A	17:21	W	223	0.77	-	-	-	-
06/21/91	Kartchner Towers to River	3B	21:23	W	233	1.25	0.008	-	-	-
06/21/91	Ladder to Sharon's	2B	21:35	W	237	0.72	-	-	-	-
06/21/91	Thunder Room	3A	19:23	S	259	1.30	0.007	-	-	-
06/21/91	Bathtub Room	4A	19:36	S	179	0.77	-	-	-	-
06/21/91	Lover's Leap	1B	19:50	S	221	0.58	-	-	-	-
06/25/91	Thunder Room	1	10:33	S	212	1.24	0.014	241	153	93
06/25/91	Grand Canyon	2	11:24	S	272	0.94	-	-	-	-
06/25/91	Pyramid Room	2A	14:03	S	254	0.91	0.005	-	-	-
06/25/91	Lover's Leap	3A	15:26	S	124	0.35	-	-	-	-
06/25/91	Lower Throne	3	13:01	S	150	0.68	0.000	-	-	-
06/25/91	Upper Throne	4	13:14	W	182	0.75	-	-	-	-
06/25/91	Rotunda	5	13:28	W	182	0.84	0.002	-	-	-
06/25/91	Mud Trench	1A	13:45	W	224	0.74	-	-	-	-
07/07/91	Echo EMS10	4A	13:41	S	-	1.10	0.009	-	-	-
07/07/91	LEM Room	1	10:39	S	-	0.36	-	-	-	-
07/07/91	Anticipation Room	2	10:53	S	-	0.36	-	-	-	-
07/07/91	Ladder to Grand Central	3	11:20	W	-	0.64	-	-	-	-
07/07/91	Rope Traverse to Ladder	4	11:30	W	-	0.63	-	-	-	-
07/07/91	Ladder to Sharon's	5	11:40	W	-	0.83	0.004	-	-	-
07/07/91	Big Room Overlook	1A	13:00	W	-	0.95	0.005	-	-	-
07/07/91	Cul-de-Sac	2A	13:15	S	-	1.29	0.017	-	-	-
07/07/91	Strawberry to Pool Rm	3A	13:30	W	-	0.59	0.008	-	-	-
07/07/91	Echo to Rope Traverse	5A	13:50	W	-	1.00	-	-	-	-

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ALPHA RADIATION MEASUREMENTS

Date	Location	Daily Surface Temps			Monthly Surface Temps			5 Day	Section of	Measured
		Max	Min	Mean	Mean Max	Mean Min	Mean	Mean Temp	Cave	By
08/30/89	At entry into Echo Psg	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Echo	OUL
08/30/89	Sinkhole bottom of ladder	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/30/89	Blockade Rm-gate closed	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/30/89	Blockade Rm-gate open-air	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/30/89	Crinoid Rm	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/30/89	Low Point in Crinoid Rm	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/30/89	LEM Room	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/30/89	Anticipation Room	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/30/89	Grand Central EMS 16	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/30/89	Pop-Up Junction	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/30/89	Main Corridor EMS 14	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/30/89	Sharon's Saddle EMS 13	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/30/89	EchoPsg-30'past to Strawbry	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/30/89	Lunch Spot	85.7	64.2	75.0	88.3	63.8	76.0	76.2	River	OUL
08/30/89	Entrance to River Psg	85.7	64.2	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/31/89	Crinoid Room	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Entrance	OUL
08/31/89	Past Babbitt-open-air	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	Kartchner Towers EMS22	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	Base of Bishop,Big Rm	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	Sharon's Saddle Junction	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	Sharon's Saddle EMS 13	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	Cul-de-Sac EMS 7	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	Cul-de-Sac-sharp turn	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	Cul-de-Sac-bott.of rubble	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	StrawberryRm junction	89.9	60.0	75.0	88.3	63.8	76.0	76.2	Big Room	OUL
08/31/89	Big Room Overlook	89.9	60.0	75.0	88.3	63.8	76.0	76.2	River	OUL
08/31/89	Entrance to River Psg	89.9	60.0	75.0	88.3	63.8	76.0	76.2	River	OUL
08/31/89	Pyramid Room	89.9	60.0	75.0	88.3	63.8	76.0	76.2	River	OUL
08/31/89	Grand Canyon	89.9	60.0	75.0	88.3	63.8	76.0	76.2	River	OUL
08/31/89	Shelf Passage	89.9	60.0	75.0	88.3	63.8	76.0	76.2	River	OUL
08/31/89	Thunder Rm & Bath Tub	89.9	60.0	75.0	88.3	63.8	76.0	76.2	River	OUL
08/31/89	Outer River Passage	89.9	60.0	75.0	88.3	63.8	76.0	76.2	River	OUL
09/01/89	Crow's Nest Rock EMS 1	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Back	OUL
09/01/89	CptHook Pirate's to C-80	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Back	OUL
09/01/89	Jct Pirate's & Sue's Rm	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Back	OUL
09/01/89	Hill Room at H-51	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Back	OUL

ALPHA RADIATION MEASUREMENTS

		Daily Surface Temps			Monthly Surface Temps			5 Day	Section of	Measured
Date	Location	Max	Min	Mean	Mean Max	Mean Min	Mean	Mean Temp	Cave	By
09/01/89	Mushroom Psg EMS 4	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Back	OUL
09/01/89	Sue's Room EMS 3	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Back	OUL
09/01/89	Subway Tunnel H48-H49	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Back	OUL
09/01/89	Angel Wing Junction	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Back	OUL
09/01/89	Sharon's Saddle EMS 13	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Big Room	OUL
09/01/89	Tarantula Room EMS 11	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Big Room	OUL
09/01/89	Upper Rotunda Room	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Throne/Rotunda	OUL
09/01/89	Throne Room Overlook	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Throne/Rotunda	OUL
09/01/89	Lower Throne Rm EMS17	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Throne/Rotunda	OUL
09/01/89	Throne Rm below Overlook	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Throne/Rotunda	OUL
09/01/89	Mud Trench EMS 20	94.3	64.3	79.3	88.7	61.6	75.1	77.1	Throne/Rotunda	OUL
12/11/89	Echo 3' into	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Echo	OUL
12/11/89	Crinoid Room	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Entrance	OUL
12/11/89	LEM Room	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Entrance	OUL
12/11/89	30 ft. past Babbitt Hole	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Entrance	OUL
12/11/89	Pop-up	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Entrance	OUL
12/11/89	Grand Central EMS16	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Entrance	OUL
12/11/89	Main Corridor EMS14	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Sharon's Saddle EMS13	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Kartchner Towers EMS22	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Mud Flats EMS12	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Tarantula Room EMS11	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Cul-de-sac EMS7	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Cul-de-sac trail bend	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Cul-de-sac portal	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Strawberry Room	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Big Room Overlook	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Pool Room	46.5	33.9	40.2	60.1	35.2	47.6	49.8	Big Room	OUL
12/11/89	Lunch Spot	46.5	33.9	40.2	60.1	35.2	47.6	47.4	Entrance	OUL
12/12/89	Grand Central EMS 16	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Entrance	OUL
12/12/89	Babbitt Hole 30' inside	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Entrance	OUL
12/12/89	Pop-up	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	Bishop/Kartchner Towers	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	Kartchner Towers EMS22	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	Sharon's Saddle EMS 13	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	Main Corridor EMS 14	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL

ALPHA RADIATION MEASUREMENTS

Date	Location	Daily Surface Temps			Monthly Surface Temps			5 Day	Section of	Measured
		Max	Min	Mean	Mean Max	Mean Min	Mean	Mean Temp	Cave	By
12/12/89	StrawberryRm junction	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	Big Room Overlook	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	EchoPsg-30'past toStraw	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	Lunch Spot	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	Tarantula Rm EMS 11	51.8	23.5	37.7	60.1	35.2	47.6	47.4	Big Room	OUL
12/12/89	Pyramid Room	51.8	23.5	37.7	60.1	35.2	47.6	47.4	River	OUL
12/12/89	Grand Canyon	51.8	23.5	37.7	60.1	35.2	47.6	47.4	River	OUL
12/12/89	Shelf Passage	51.8	23.5	37.7	60.1	35.2	47.6	47.4	River	OUL
12/12/89	Thunder to Bathtub	51.8	23.5	37.7	60.1	35.2	47.6	47.4	River	OUL
12/12/89	Lover's Leap EMS19	51.8	23.5	37.7	60.1	35.2	47.6	47.4	River	OUL
12/12/89	Ent.to River Passage	51.8	23.5	37.7	60.1	35.2	47.6	47.4	River	OUL
12/13/89	Crow's Nest at Pirate's Den	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Back	OUL
12/13/89	CptHook Pirate's to C-80	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Back	OUL
12/13/89	Jct Pirate's & Sue's Rm	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Back	OUL
12/13/89	Sue's Room EMS 3	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Back	OUL
12/13/89	Mushroom Psg EMS 4	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Back	OUL
12/13/89	Near Hill Room	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Back	OUL
12/13/89	Subway Tunnel	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Back	OUL
12/13/89	Angel Wing Junction	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Throne/Rotunda	OUL
12/13/89	Throne Room Overlook	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Throne/Rotunda	OUL
12/13/89	Lower Throne Room EMS17	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Throne/Rotunda	OUL
12/13/89	Throne Rm below overlook	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Throne/Rotunda	OUL
12/13/89	Upper Rotunda Room	59.6	28.8	44.2	60.1	35.2	47.6	46.4	Throne/Rotunda	OUL
12/13/89	Mud Trench EMS 20	59.6	28.8	44.2	60.1	35.2	47.6	45.3	Entrance	OUL
12/14/89	Grand Central EMS 16	64.0	34.6	49.3	60.1	35.2	47.6	45.3	Entrance	OUL
12/14/89	Pop-up	64.0	34.6	49.3	60.1	35.2	47.6	45.3	Big Room	OUL
12/14/89	Kartchner Towers EMS22	64.0	34.6	49.3	60.1	35.2	47.6	45.3	Big Room	OUL
12/14/89	Tarantula Room EMS 11	64.0	34.6	49.3	60.1	35.2	47.6	45.3	Big Room	OUL
12/14/89	Lunch Spot	64.0	34.6	49.3	60.1	35.2	47.6	45.3	Back	ACPI
12/11/90	Angel Wing Junction	68.5	47.0	57.8	57.3	36.6	46.9	53.1	River	ACPI
12/11/90	Lover's Leap	68.5	47.0	57.8	57.3	36.6	46.9	53.1	River	ACPI
12/11/90	Thunder Room	68.5	47.0	57.8	57.3	36.6	46.9	53.1	Throne/Rotunda	ACPI
12/11/90	Throne Room	68.5	47.0	57.8	57.3	36.6	46.9	53.1	Throne/Rotunda	ACPI
12/11/90	Rotunda Room	68.5	47.0	57.8	57.3	36.6	46.9	53.1	Throne/Rotunda	ACPI
12/11/90	Mud Trench	68.5	47.0	57.8	57.3	36.6	46.9	53.1	Throne/Rotunda	ACPI
12/13/90	Echo Passage - Start	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Echo	ACPI

ALPHA RADIATION MEASUREMENTS

		Daily Surface Temps			Monthly Surface Temps			5 Day	Section of	Measured
Date	Location	Max	Min	Mean	Mean Max	Mean Min	Mean	Mean Temp	Cave	By
12/13/90	Cul-de-Sac	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Big Room	ACPI
12/13/90	Big Room Overlook	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Big Room	ACPI
12/13/90	Strawberry to Pool	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Big Room	ACPI
12/13/90	Echo Psg-Rope Traverse	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Big Room	ACPI
12/13/90	Rope Traverse-Ladder	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Big Room	ACPI
12/13/90	Ladder-Grand Central	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Big Room	ACPI
12/13/90	Ladder-Sharon's Saddle	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Big Room	ACPI
12/13/90	Kartchner T. to Bishop	61.0	48.5	54.8	57.3	36.6	46.9	56.2	Big Room	ACPI
12/30/90	Echo Passage-End EMS9	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Echo	ACPI
12/30/90	Echo Passage-PP44	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Echo	ACPI
12/30/90	Echo Passage-PP43	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Echo	ACPI
12/30/90	Echo Passage-Start	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Echo	ACPI
12/30/90	Outside Echo Psg-T97	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Echo	ACPI
12/30/90	Outside Echo Psg-T97	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Echo	ACPI
12/30/90	Surv.St.0-57(PoolRm)	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Big Room	ACPI
12/30/90	Pool Rm - PP46	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Big Room	ACPI
12/30/90	Pool Rm.G62(before shield)	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Big Room	ACPI
12/30/90	Lunch Spot-PP40	58.5	37.0	47.8	57.3	36.6	46.9	48.2	Big Room	ACPI
01/02/91	Echo Passage PP44	66.0	49.0	57.5	57.5	36.2	46.9	51.4	Echo	ACPI
01/02/91	Echo Passage-End EMS9	66.0	49.0	57.5	57.5	36.2	46.9	51.4	Echo	ACPI
01/02/91	Echo Passage - Start	66.0	49.0	57.5	57.5	36.2	46.9	51.4	Echo	ACPI
01/02/91	5' outside Echo Psg	66.0	49.0	57.5	57.5	36.2	46.9	51.4	Echo	ACPI
01/02/91	PP40 - near Lunch Spot	66.0	49.0	57.5	57.5	36.2	46.9	51.4	Big Room	ACPI
01/05/91	Echo Passage - Start	53.0	44.0	48.5	57.5	36.2	46.9	53.1	Echo	ACPI
01/05/91	PP24 (River Passage)	53.0	44.0	48.5	57.5	36.2	46.9	53.1	Big Room	ACPI
01/05/91	Lover's Leap EMS 19	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/05/91	Rubble Room 1	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/05/91	Bath Tub Room PP54	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/05/91	Pyramid Room	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/05/91	Grand Canyon PP60	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/05/91	Grand Canyon PP58	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/05/91	Shelf Passage PP56	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/05/91	Thunder Room	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/05/91	Inside River Passage	53.0	44.0	48.5	57.5	36.2	46.9	53.1	River	ACPI
01/08/91	Echo Passage-Start	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Echo	ACPI
01/08/91	Big Room Overlook	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Big Room	ACPI

ALPHA RADIATION MEASUREMENTS

Date	Location	Daily Surface Temps			Monthly Surface Temps			5 Day	Section of	Measured
		Max	Min	Mean	Mean Max	Mean Min	Mean	Mean Temp	Cave	By
01/08/91	Cul-de-Sac	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Big Room	ACPI
01/08/91	StrawberryRm to Pool	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Big Room	ACPI
01/08/91	Echo Psg-Rope Traverse	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Big Room	ACPI
01/08/91	Rope Traverse-Ladder	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Big Room	ACPI
01/08/91	Ladder-Grand Central	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Big Room	ACPI
01/08/91	Ladder-Sharon's Saddle	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Big Room	ACPI
01/08/91	Kartchner-River Psg	59.0	39.0	49.0	57.5	36.2	46.9	49.7	Big Room	ACPI
01/10/91	Angel Wing Junction	55.0	33.5	44.3	57.5	36.2	46.9	48.1	Back	ACPI
01/10/91	Kartchner Towers	55.0	33.5	44.3	57.5	36.2	46.9	48.1	Big Room	ACPI
01/10/91	Grand Canyon	55.0	33.5	44.3	57.5	36.2	46.9	48.1	River	ACPI
01/10/91	Bath Tub Room-PP54	55.0	33.5	44.3	57.5	36.2	46.9	48.1	River	ACPI
01/10/91	Lower Throne-PP87	55.0	33.5	44.3	57.5	36.2	46.9	48.1	Throne/Rotunda	ACPI
01/10/91	Upper Throne-Dot Trail	55.0	33.5	44.3	57.5	36.2	46.9	48.1	Throne/Rotunda	ACPI
01/10/91	Rotunda Room	55.0	33.5	44.3	57.5	36.2	46.9	48.1	Throne/Rotunda	ACPI
01/10/91	Mud Trench	55.0	33.5	44.3	57.5	36.2	46.9	48.1	Throne/Rotunda	ACPI
01/31/91	Echo Passage-Start	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Echo	ACPI
01/31/91	Echo Psg-behind Sta.10	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Echo	ACPI
01/31/91	End Gr.Cent.-Surv.168	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Entrance	ACPI
01/31/91	Entrance to Red River	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Big Room	ACPI
01/31/91	Australia	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Big Room	ACPI
01/31/91	Top of climb to Australia	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Big Room	ACPI
01/31/91	Red River-bottom climb	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Red River	ACPI
01/31/91	Red River- Top of climb	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Red River	ACPI
01/31/91	1/2 way down Red River	63.0	36.0	49.5	57.5	36.2	46.9	44.4	Red River	ACPI
01/31/91	Squeeze left of River Psg	63.0	36.0	49.5	57.5	36.2	46.9	44.4	River	ACPI
02/10/91	Angel Wing Junction	65.0	42.5	53.8	63.6	41.8	52.7	53.6	Back	ACPI
02/10/91	Lover's Leap	65.0	42.5	53.8	63.6	41.8	52.7	53.6	River	ACPI
02/10/91	ZigZag Room	65.0	42.5	53.8	63.6	41.8	52.7	53.6	River	ACPI
02/10/91	1/2bet.ZigZag&BathTub	65.0	42.5	53.8	63.6	41.8	52.7	53.6	River	ACPI
02/10/91	Bath Tub Room PP54	65.0	42.5	53.8	63.6	41.8	52.7	53.6	River	ACPI
02/10/91	Thunder Room	65.0	42.5	53.8	63.6	41.8	52.7	53.6	River	ACPI
02/10/91	Lower Throne Rm	65.0	42.5	53.8	63.6	41.8	52.7	53.6	Throne/Rotunda	ACPI
02/10/91	Upper Throne Rm Trail	65.0	42.5	53.8	63.6	41.8	52.7	53.6	Throne/Rotunda	ACPI
02/10/91	Rotunda Room	65.0	42.5	53.8	63.6	41.8	52.7	53.6	Throne/Rotunda	ACPI
02/10/91	Mud Trench	65.0	42.5	53.8	63.6	41.8	52.7	53.6	Throne/Rotunda	ACPI
02/12/91	Start of Echo Passage	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Echo	ACPI

ALPHA RADIATION MEASUREMENTS

		Daily Surface Temps			Monthly Surface Temps			5 Day	Section of	Measured
Date	Location	Max	Min	Mean	Mean Max	Mean Min	Mean	Mean Temp	Cave	By
02/12/91	Big Room Overlook	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Big Room	ACPI
02/12/91	Cul-de-Sac	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Big Room	ACPI
02/12/91	StrawberryRm to Pool	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Big Room	ACPI
02/12/91	Echo Psg-Rope Traverse	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Big Room	ACPI
02/12/91	Rope Traverse-Ladder	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Big Room	ACPI
02/12/91	Ladder-Sharon's Saddle	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Big Room	ACPI
02/12/91	Ladder-Grand Central	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Big Room	ACPI
02/12/91	Kartchner T.-Bishop	58.5	42.0	50.3	63.6	41.8	52.7	51.8	Big Room	ACPI
02/24/91	Start of Echo Passage	69.0	42.0	55.5	63.6	41.8	52.7	55.5	Echo	ACPI
02/24/91	Mud Flats	69.0	42.0	55.5	63.6	41.8	52.7	55.5	Big Room	ACPI
02/24/91	Kartchner Towers	69.0	42.0	55.5	63.6	41.8	52.7	55.5	Big Room	ACPI
03/24/91	Thunder Room	73.0	51.5	62.3	61.1	38.5	49.8	49.4	River	ACPI
03/24/91	Grand Canyon	73.0	51.5	62.3	61.1	38.5	49.8	49.4	River	ACPI
03/24/91	Lower Throne Room	73.0	51.5	62.3	61.1	38.5	49.8	49.4	Throne/Rotunda	ACPI
03/24/91	Throne Rm PP91-PP81	73.0	51.5	62.3	61.1	38.5	49.8	49.4	Throne/Rotunda	ACPI
03/24/91	Rotunda Room	73.0	51.5	62.3	61.1	38.5	49.8	49.4	Throne/Rotunda	ACPI
03/24/91	Mud Trench	73.0	51.5	62.3	61.1	38.5	49.8	49.4	Throne/Rotunda	ACPI
03/31/91	Echo Psg - Start	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Echo	ACPI
03/31/91	Big Rm.Overlook	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Big Room	ACPI
03/31/91	Cul-de-Sac	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Big Room	ACPI
03/31/91	Strawberry to Pool Rm.	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Big Room	ACPI
03/31/91	Echo to Traverse	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Big Room	ACPI
03/31/91	Traverse to Ladder	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Big Room	ACPI
03/31/91	Ladder to Sharon's Saddle	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Big Room	ACPI
03/31/91	Kartchner to River Psg	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Big Room	ACPI
03/31/91	Ladder to Gr.Central	72.0	48.0	60.0	61.1	38.5	49.8	48.4	Big Room	ACPI
04/18/91	Echo Psg-Start	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Echo	ACPI
04/18/91	Big Rm.Overlook	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Big Room	ACPI
04/18/91	Cul-de-Sac	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Big Room	ACPI
04/18/91	Strawberry to Pool	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Big Room	ACPI
04/18/91	Echo to Traverse	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Big Room	ACPI
04/18/91	Traverse to Ladder	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Big Room	ACPI
04/18/91	Ladder to Gr.Central	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Big Room	ACPI
04/18/91	Ladder to Sharon's	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Big Room	ACPI
04/18/91	Kartchner to River Psg	72.0	47.0	59.5	73.0	45.2	59.1	59.6	Big Room	ACPI
04/29/91	Echo Passage #10	70.5	40.5	55.5	73.0	45.2	59.1	56.0	Echo	ACPI

ALPHA RADIATION MEASUREMENTS

Date	Location	Daily Surface Temps			Monthly Surface Temps			5 Day	Section of	Measured
		Max	Min	Mean	Mean Max	Mean Min	Mean	Mean Temp	Cave	By
04/29/91	Sharon's Saddle	70.5	40.5	55.5	73.0	45.2	59.1	56.0	Big Room	ACPI
04/29/91	Cul-de-Sac	70.5	40.5	55.5	73.0	45.2	59.1	56.0	Big Room	ACPI
04/29/91	Mud Flats	70.5	40.5	55.5	73.0	45.2	59.1	56.0	Big Room	ACPI
05/05/91	Thunder Rm	79.5	49.5	64.5	80.9	49.7	65.3	60.5	River	ACPI
05/05/91	Grand Canyon	79.5	49.5	64.5	80.9	49.7	65.3	60.5	River	ACPI
05/05/91	Grand Canyon	79.5	49.5	64.5	80.9	49.7	65.3	60.5	River	ACPI
05/05/91	Lower Throne	79.5	49.5	64.5	80.9	49.7	65.3	60.5	Throne/Rotunda	ACPI
05/05/91	Upper Throne	79.5	49.5	64.5	80.9	49.7	65.3	60.5	Throne/Rotunda	ACPI
05/05/91	Rotunda Room	79.5	49.5	64.5	80.9	49.7	65.3	60.5	Throne/Rotunda	ACPI
05/05/91	Mud Trench	79.5	49.5	64.5	80.9	49.7	65.3	60.5	Throne/Rotunda	ACPI
05/16/91	Grand Central	83.0	48.5	65.8	80.9	49.7	65.3	63.6	Entrance	ACPI
05/16/91	Bat House floor	83.0	48.5	65.8	80.9	49.7	65.3	63.6	Big Room	ACPI
05/16/91	Bat House Ceiling	83.0	48.5	65.8	80.9	49.7	65.3	63.6	Big Room	ACPI
05/16/91	River Entrance	83.0	48.5	65.8	80.9	49.7	65.3	63.6	River	ACPI
05/23/91	Echo start	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Echo	ACPI
05/23/91	Grand C to ladder	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Big Room	ACPI
05/23/91	Rope to ladder	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Big Room	ACPI
05/23/91	ladder to Sharon's	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Big Room	ACPI
05/23/91	Kartchner to River	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Big Room	ACPI
05/23/91	Big Rm overlook	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Big Room	ACPI
05/23/91	Cul-de-sac	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Big Room	ACPI
05/23/91	Strawberry to Pool	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Big Room	ACPI
05/23/91	Echo to Rope	81.0	52.0	66.5	80.9	49.7	65.3	65.5	Big Room	ACPI
05/29/91	Thunder Room	84.0	54.5	69.3	80.9	49.7	65.3	69.0	River	ACPI
05/29/91	Grand Canyon	84.0	54.5	69.3	80.9	49.7	65.3	69.0	River	ACPI
05/29/91	Mud Trench	84.0	54.5	69.3	80.9	49.7	65.3	69.0	Throne/Rotunda	ACPI
05/29/91	Rotunda Room	84.0	54.5	69.3	80.9	49.7	65.3	69.0	Throne/Rotunda	ACPI
05/29/91	Upper Throne	84.0	54.5	69.3	80.9	49.7	65.3	69.0	Throne/Rotunda	ACPI
05/29/91	Lower Throne	84.0	54.5	69.3	80.9	49.7	65.3	69.0	Throne/Rotunda	ACPI
06/10/91	Echo Start	83.0	53.5	68.3	88.6	58.1	73.3	72.9	Echo	ACPI
06/10/91	Pool Room	83.0	53.5	68.3	88.6	58.1	73.3	72.9	Big Room	ACPI
06/10/91	Pool Room	83.0	53.5	68.3	88.6	58.1	73.3	72.9	Big Room	ACPI
06/10/91	Pool Room	83.0	53.5	68.3	88.6	58.1	73.3	72.9	Big Room	ACPI
06/10/91	Pool Room	83.0	53.5	68.3	88.6	58.1	73.3	72.9	Big Room	ACPI
06/21/91	Echo EMS10	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Echo	ACPI
06/21/91	Pop-up	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Entrance	ACPI

ALPHA RADIATION MEASUREMENTS

		Daily Surface Temps			Monthly Surface Temps			5 Day	Section of	Measured
Date	Location	Max	Min	Mean	Mean Max	Mean Min	Mean	Mean Temp	Cave	By
06/21/91	Big Rm Overlook	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Big Room	ACPI
06/21/91	Cul-de-sac	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Big Room	ACPI
06/21/91	Strawberry to Pool Rm	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Big Room	ACPI
06/21/91	Echo to Rope Traverse	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Big Room	ACPI
06/21/91	Rope Traverse to Ladder	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Big Room	ACPI
06/21/91	Ladder to Grand Central	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Big Room	ACPI
06/21/91	Kartchner Towers to River	92.0	55.0	73.5	88.6	58.1	73.3	77.5	Big Room	ACPI
06/21/91	Ladder to Sharon's	92.0	55.0	73.5	88.6	58.1	73.3	77.5	River	ACPI
06/21/91	Thunder Room	92.0	55.0	73.5	88.6	58.1	73.3	77.5	River	ACPI
06/21/91	Bathtub Room	92.0	55.0	73.5	88.6	58.1	73.3	77.5	River	ACPI
06/21/91	Lover's Leap	92.0	55.0	73.5	88.6	58.1	73.3	75.9	River	ACPI
06/25/91	Thunder Room	98.0	57.0	77.5	88.6	58.1	73.3	75.9	River	ACPI
06/25/91	Grand Canyon	98.0	57.0	77.5	88.6	58.1	73.3	75.9	River	ACPI
06/25/91	Pyramid Room	98.0	57.0	77.5	88.6	58.1	73.3	75.9	River	ACPI
06/25/91	Lover's Leap	98.0	57.0	77.5	88.6	58.1	73.3	75.9	Throne/Rotunda	ACPI
06/25/91	Lower Throne	98.0	57.0	77.5	88.6	58.1	73.3	75.9	Throne/Rotunda	ACPI
06/25/91	Upper Throne	98.0	57.0	77.5	88.6	58.1	73.3	75.9	Throne/Rotunda	ACPI
06/25/91	Rotunda	98.0	57.0	77.5	88.6	58.1	73.3	75.9	Throne/Rotunda	ACPI
06/25/91	Mud Trench	98.0	57.0	77.5	88.6	58.1	73.3	75.9	Echo	ACPI
07/07/91	Echo EMS10	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Entrance	ACPI
07/07/91	LEM Room	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Entrance	ACPI
07/07/91	Anticipation Room	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Big Room	ACPI
07/07/91	Ladder to Grand Central	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Big Room	ACPI
07/07/91	Rope Traverse to Ladder	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Big Room	ACPI
07/07/91	Ladder to Sharon's	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Big Room	ACPI
07/07/91	Big Room Overlook	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Big Room	ACPI
07/07/91	Cul-de-Sac	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Big Room	ACPI
07/07/91	Strawberry to Pool Rm	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Big Room	ACPI
07/07/91	Echo to Rope Traverse	87.0	64.0	75.5	90.2	65.1	77.7	78.3	Big Room	ACPI

Alpha Radiation WL vs. Surface Temperature Above 62°F

Correlation of measured alpha radiation levels throughout the cave (excluding Echo Passage and vicinity) with 5 day mean surface temperatures.

DEP VAR: WL N: 97 MULTIPLE R: 0.205 SQUARED MULTIPLE R: 0.042
ADJUSTED SQUARED MULTIPLE R: 0.032 STANDARD ERROR OF ESTIMATE: 0.518

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	-0.918	0.925	0.000	-0.992	0.324	
TEMP	0.025	0.012	0.205	.100E+01	2.038	0.044

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	1.116	1	1.116	4.154	0.044
RESIDUAL	25.526	95	0.269		

Alpha Radiation WL vs. Surface Temperature Below 62°F

Correlation of measured alpha radiation levels throughout the cave (excluding Echo Passage and vicinity) with 5 day mean surface temperatures.

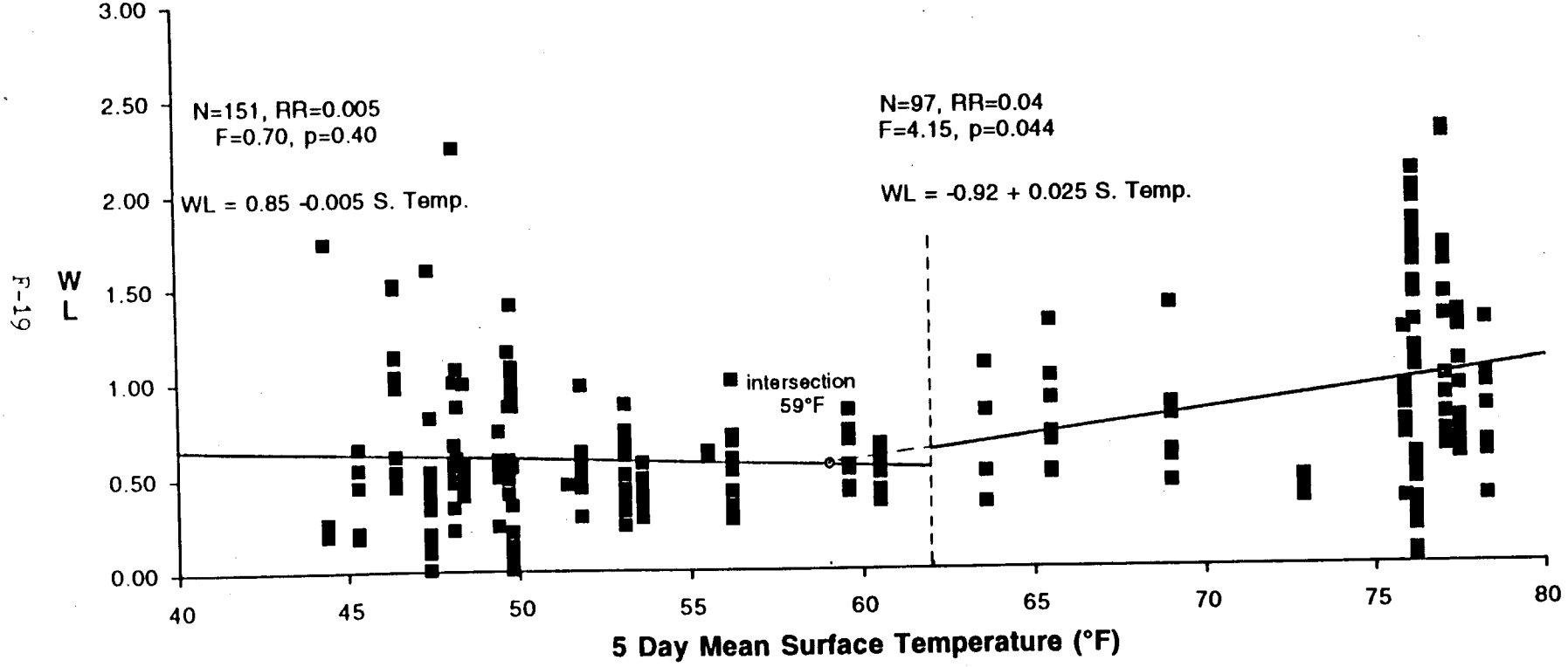
DEP VAR: WL N: 151 MULTIPLE R: 0.068 SQUARED MULTIPLE R: 0.005
ADJUSTED SQUARED MULTIPLE R: 0.000 STANDARD ERROR OF ESTIMATE: 0.340

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	0.846	0.334	0.000	2.537	0.012	
TEMP	-0.005	0.007	-0.068	.100E+01	-0.838	0.404

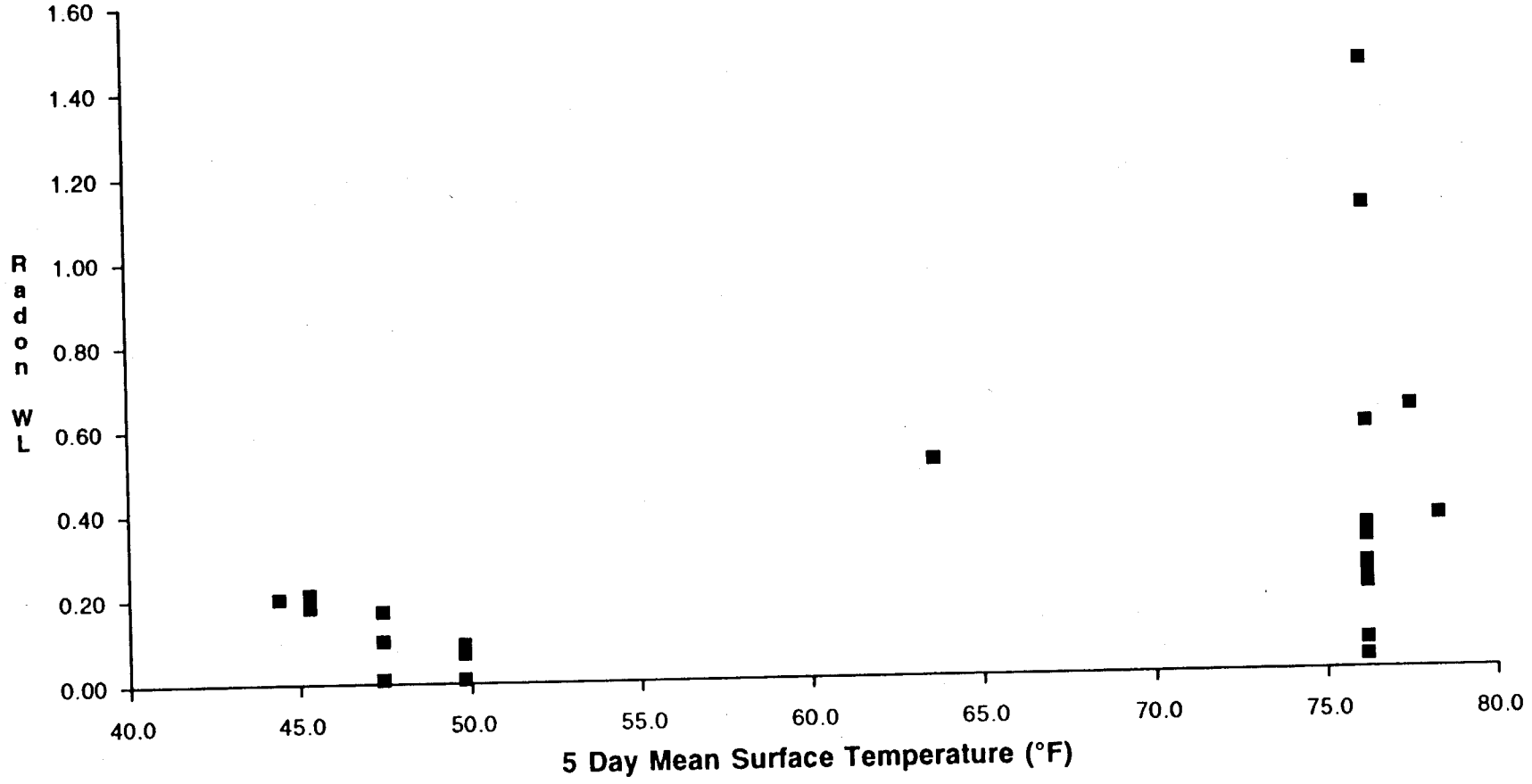
ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	0.081	1	0.081	0.702	0.404
RESIDUAL	17.215	149	0.116		

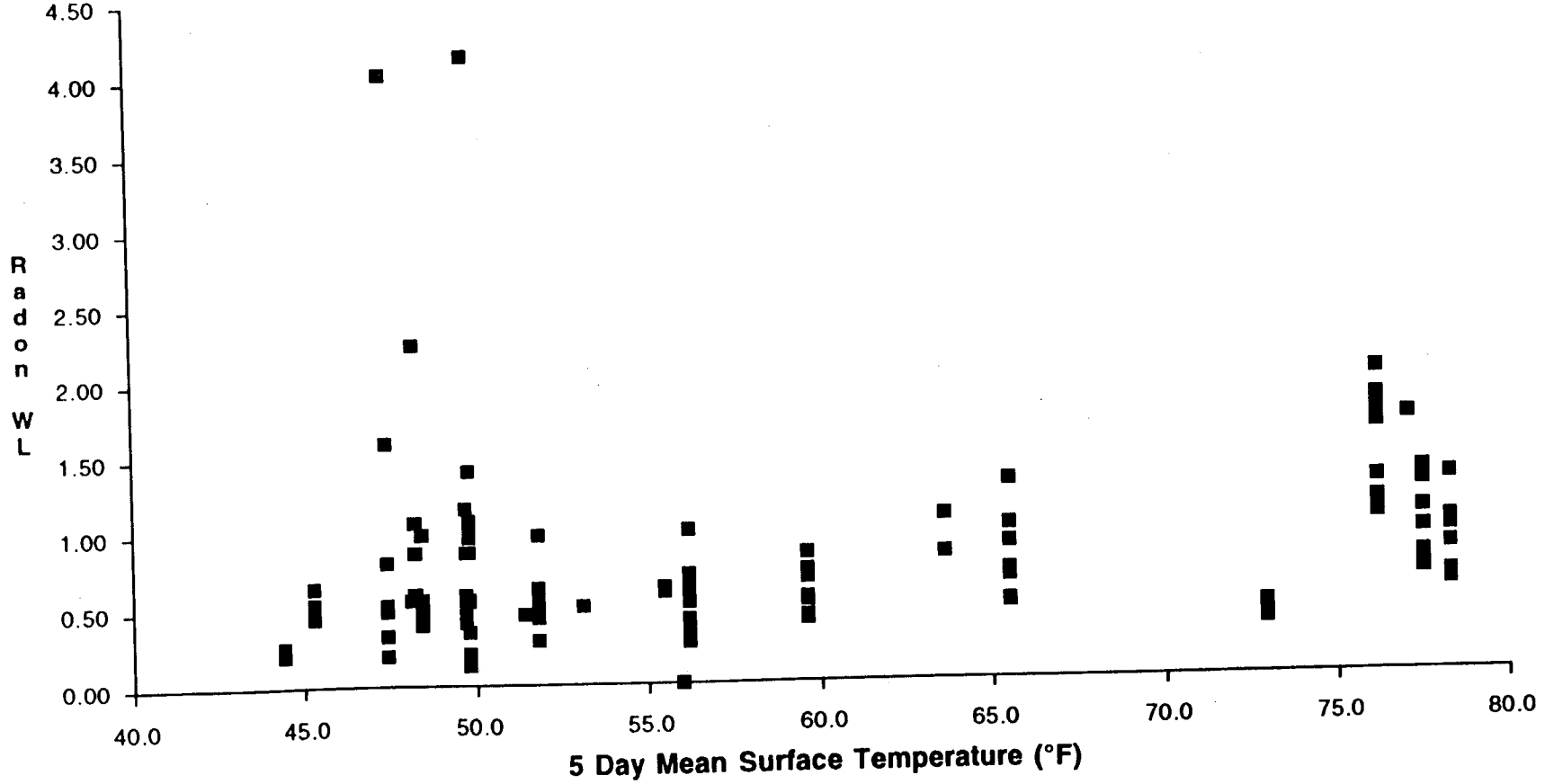
Alpha Radiation vs. Surface Temperature (without Echo Passage)

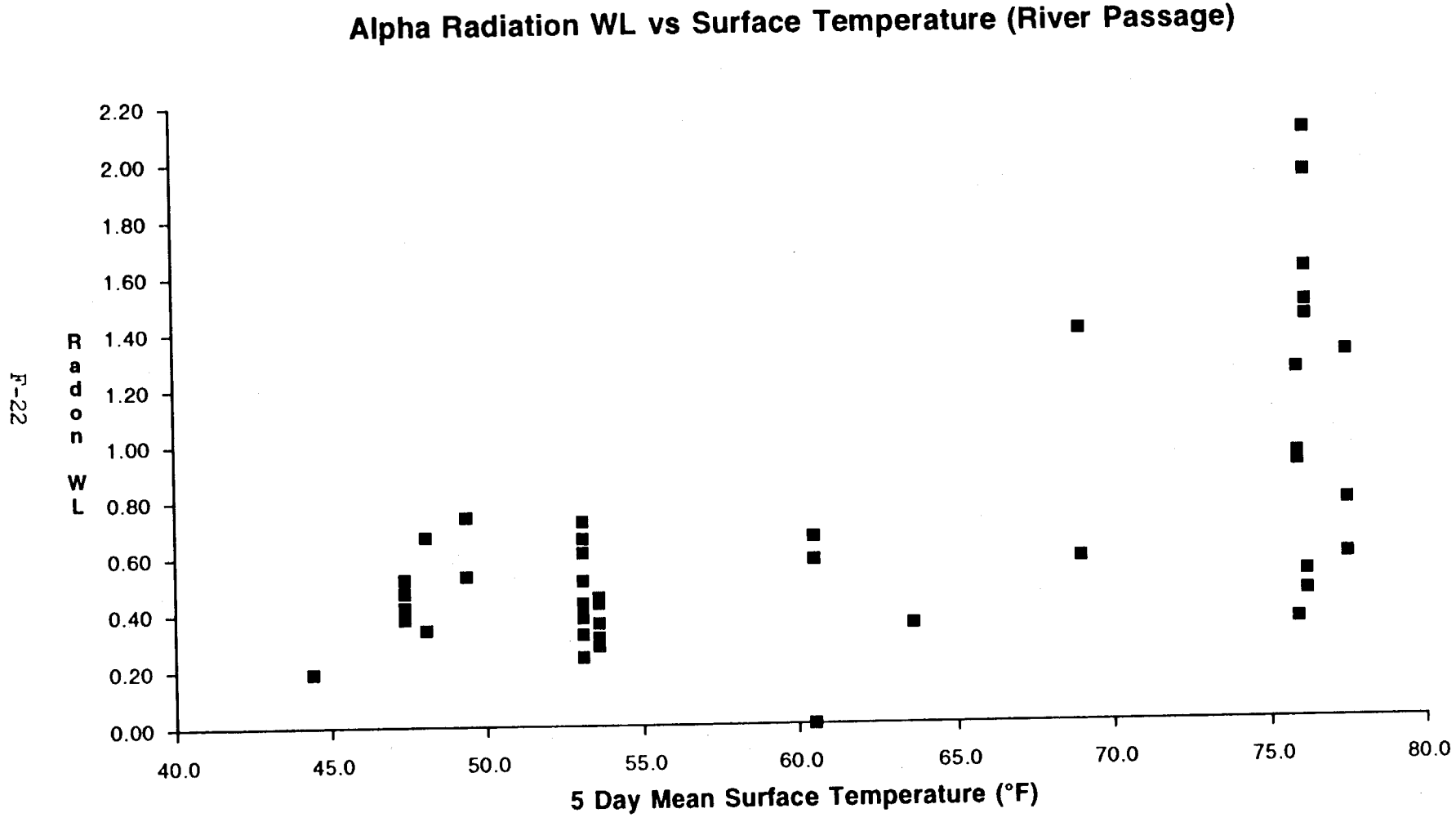


Alpha Radiation WL vs Surface Temperature (Entrance Passages)

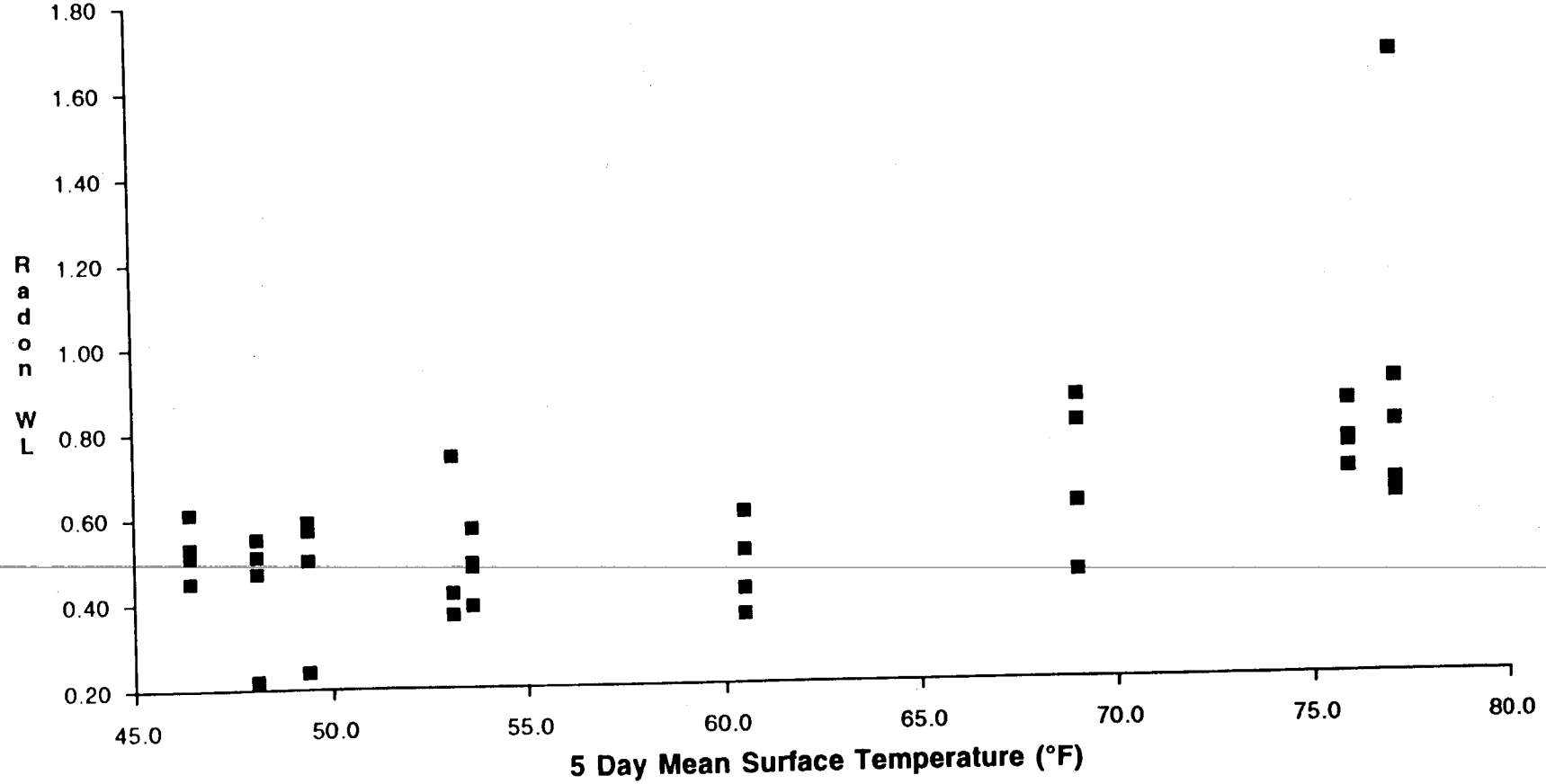


Alpha Radiation WL vs Surface Temperature (Big Room)

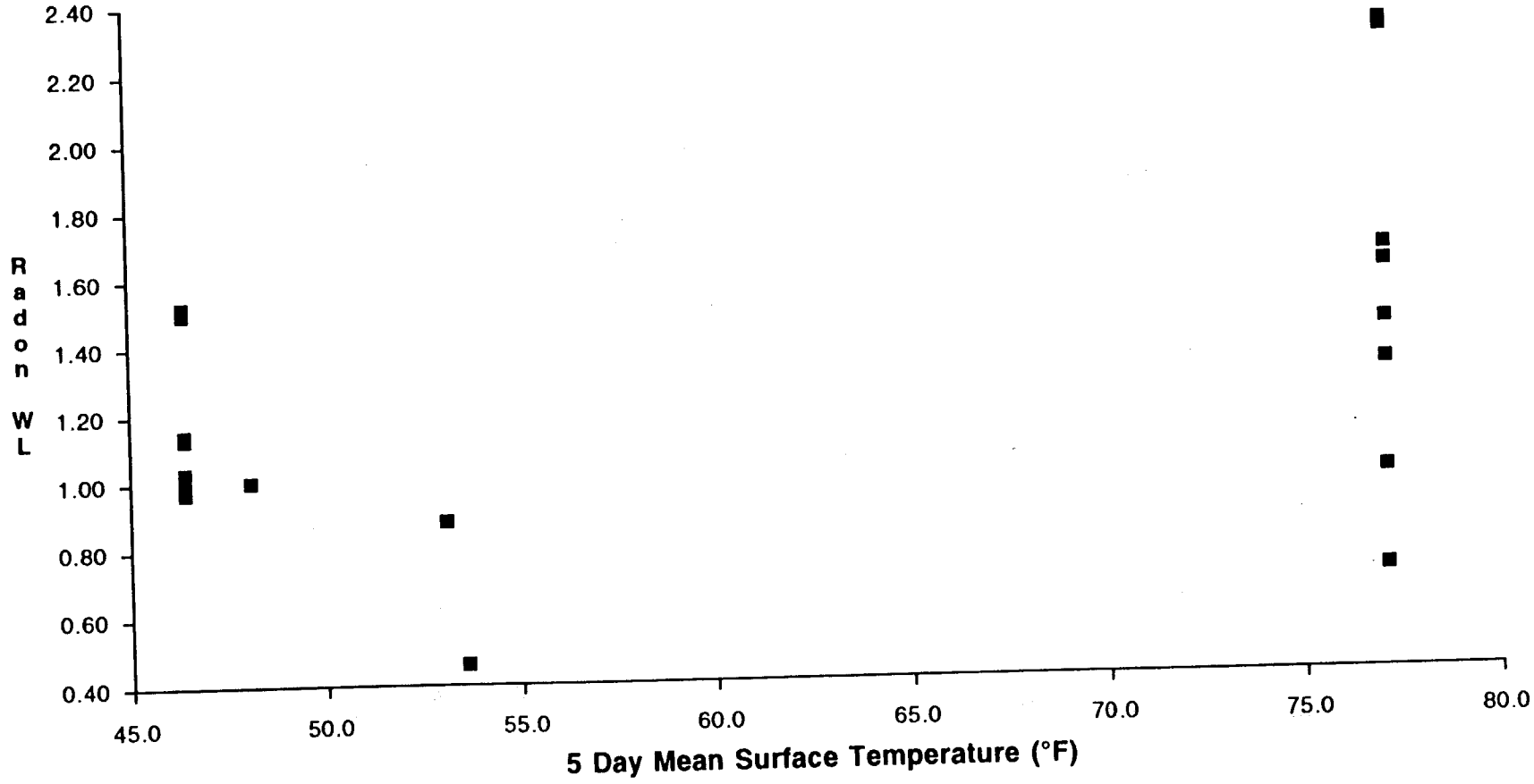



Alpha Radiation WL vs Surface Temperature (River Passage)
Radon WL
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
5 Day Mean Surface Temperature (°F)

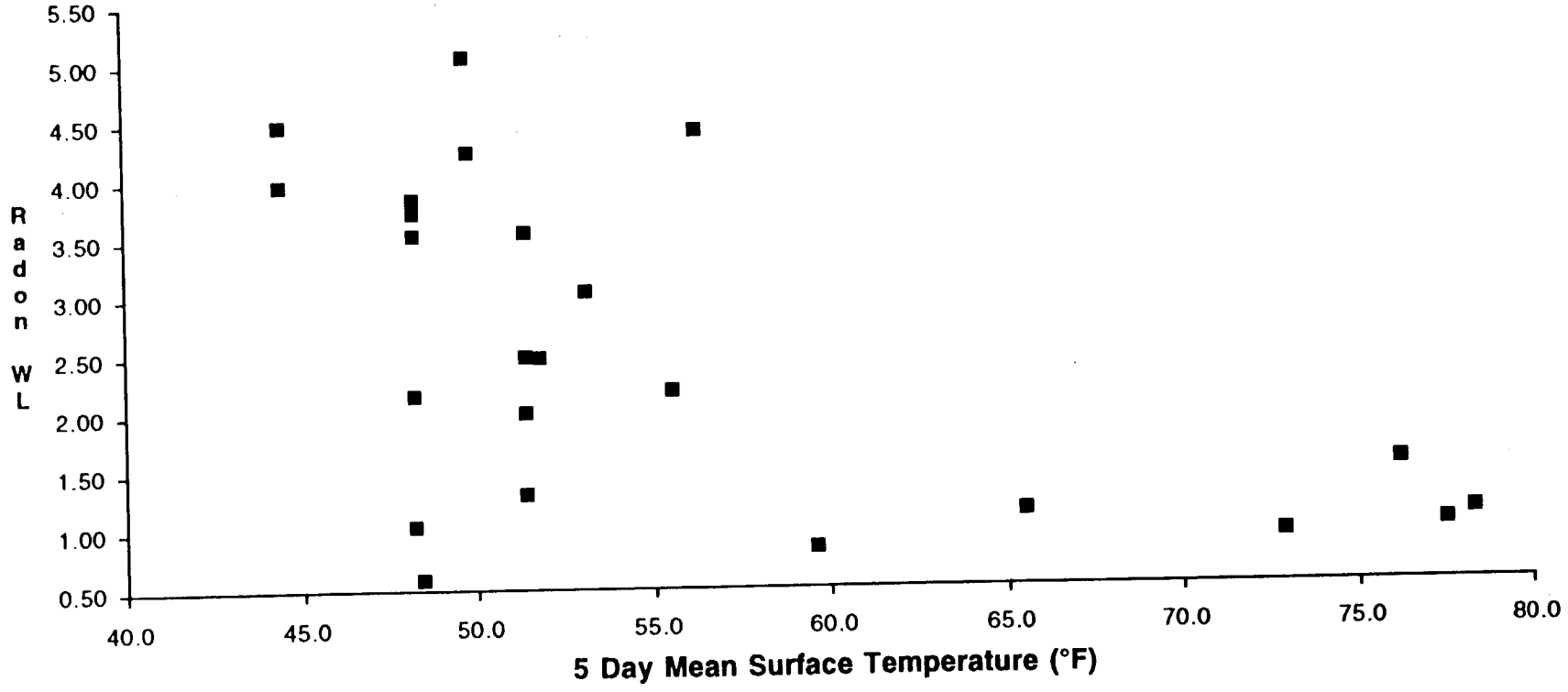
Alpha Radiation WL vs Surface Temperature (Throne/Rotunda Rooms)



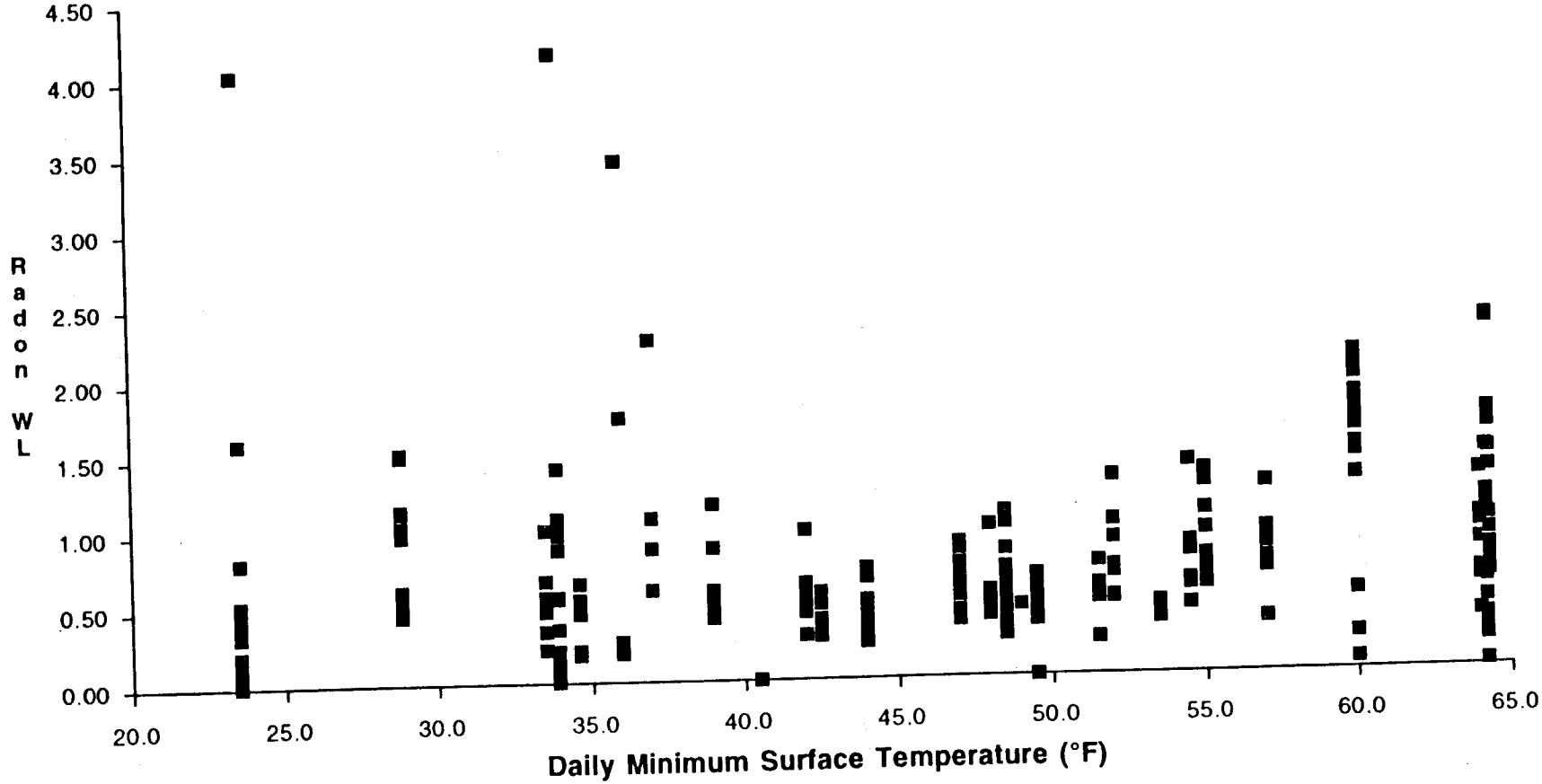
Alpha Radiation WL vs Surface Temperature (Back Sections)

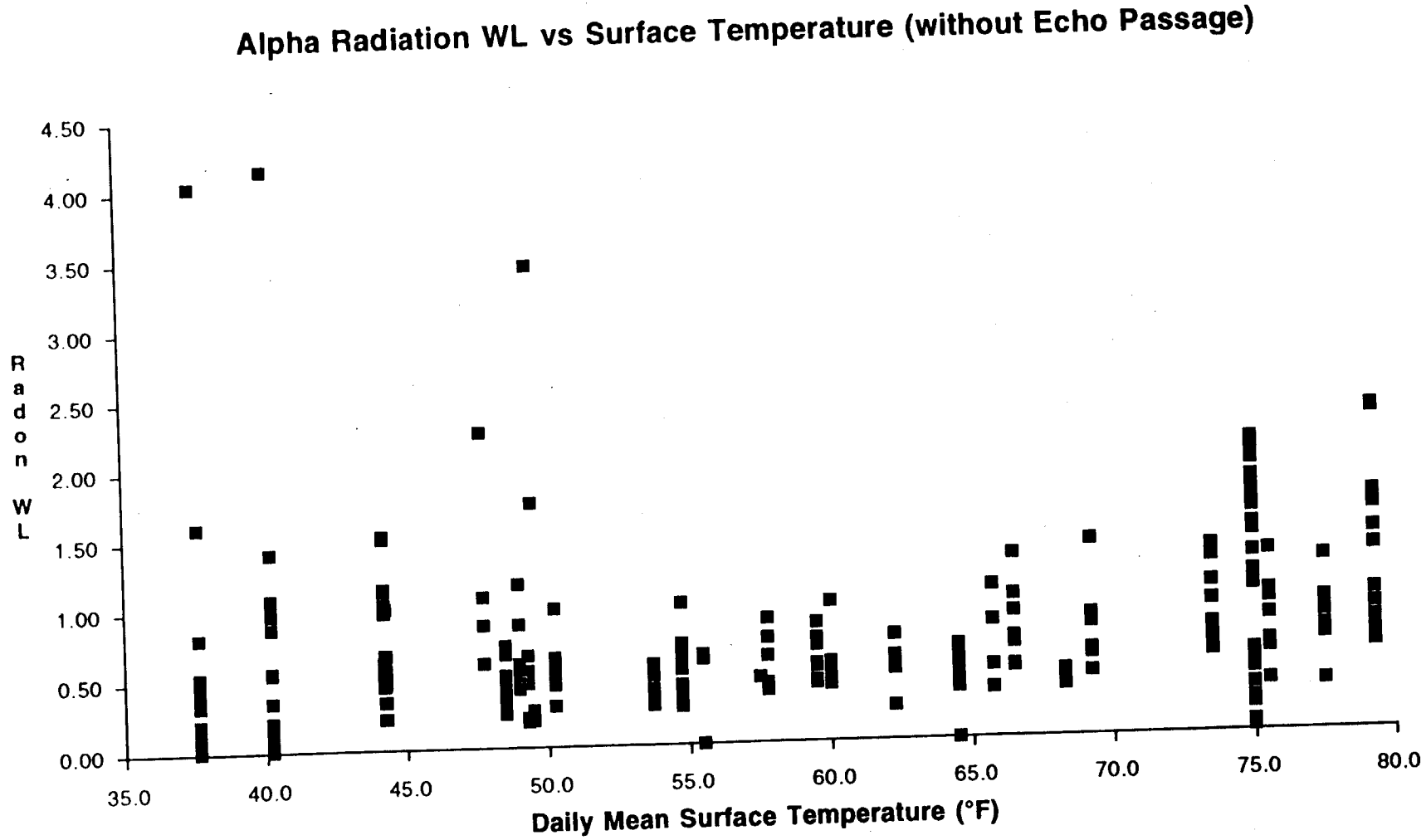


Alpha Radiation WL vs Surface Temperature (Echo Passage)

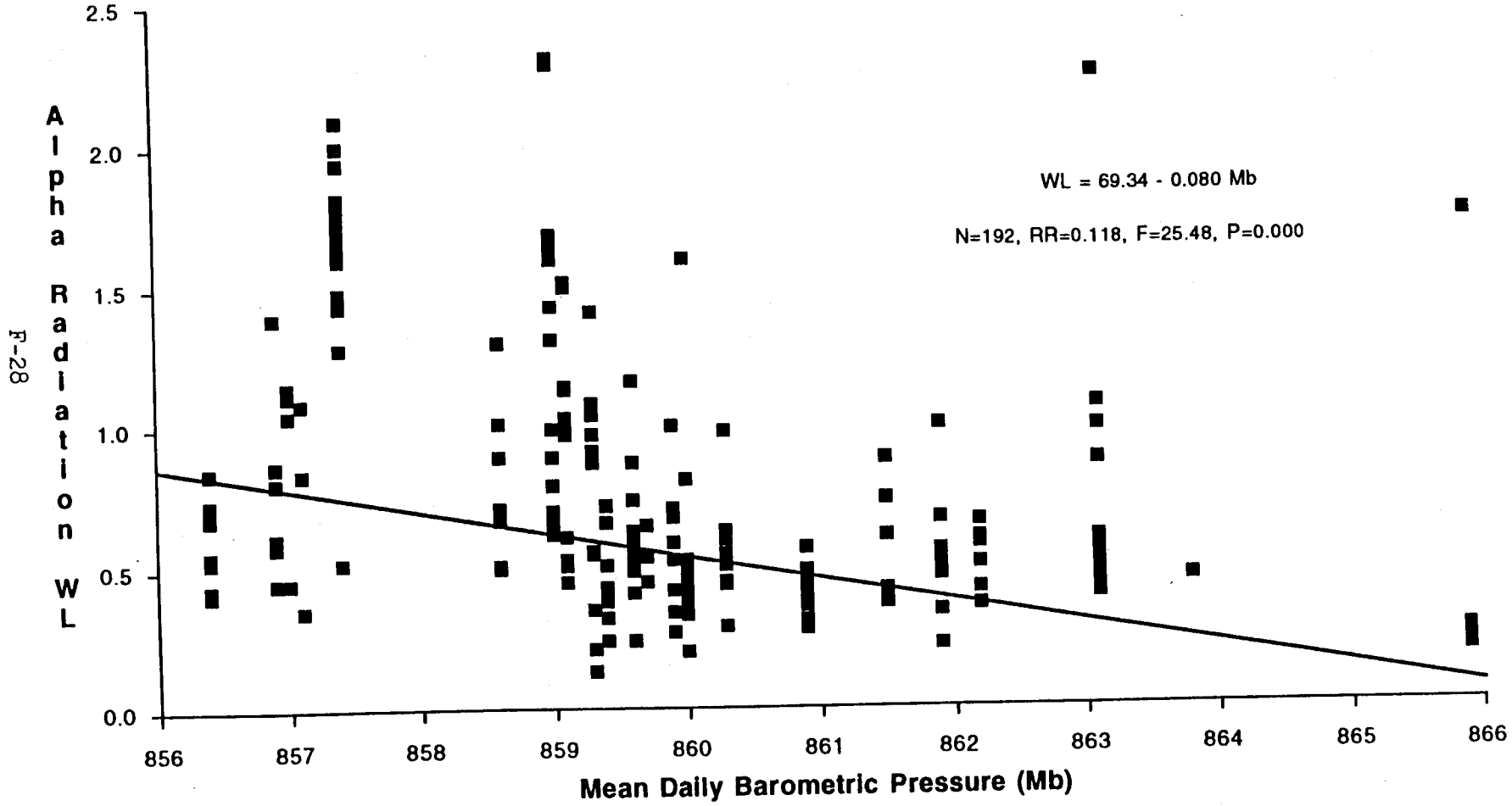


Alpha Radiation WL vs Surface Temperature (without Echo Passage)

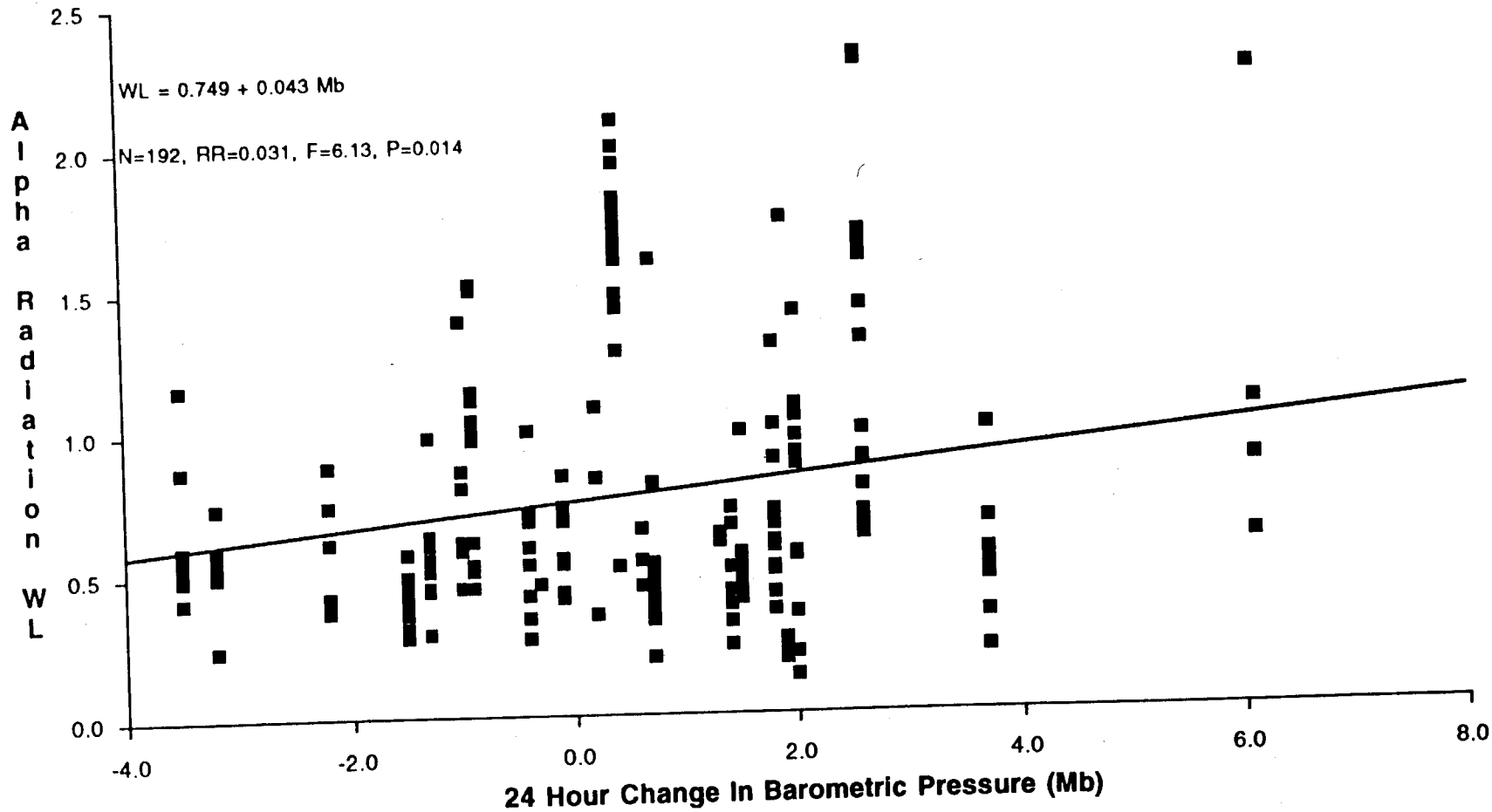



Alpha Radiation WL vs Surface Temperature (without Echo Passage)
Radon WL
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
35.0
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
Daily Mean Surface Temperature (°F)

Alpha Radiation vs. Barometric Pressure

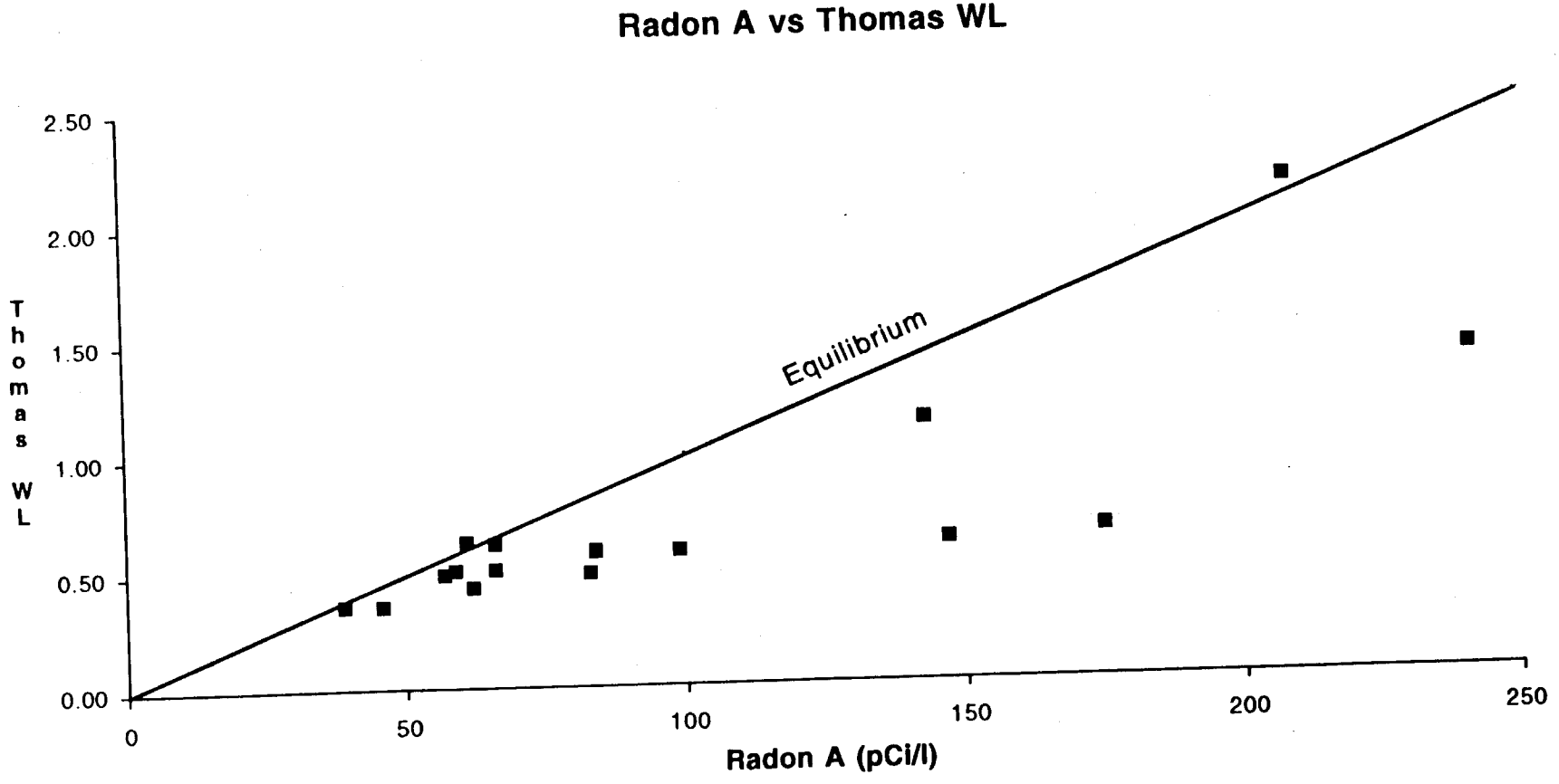


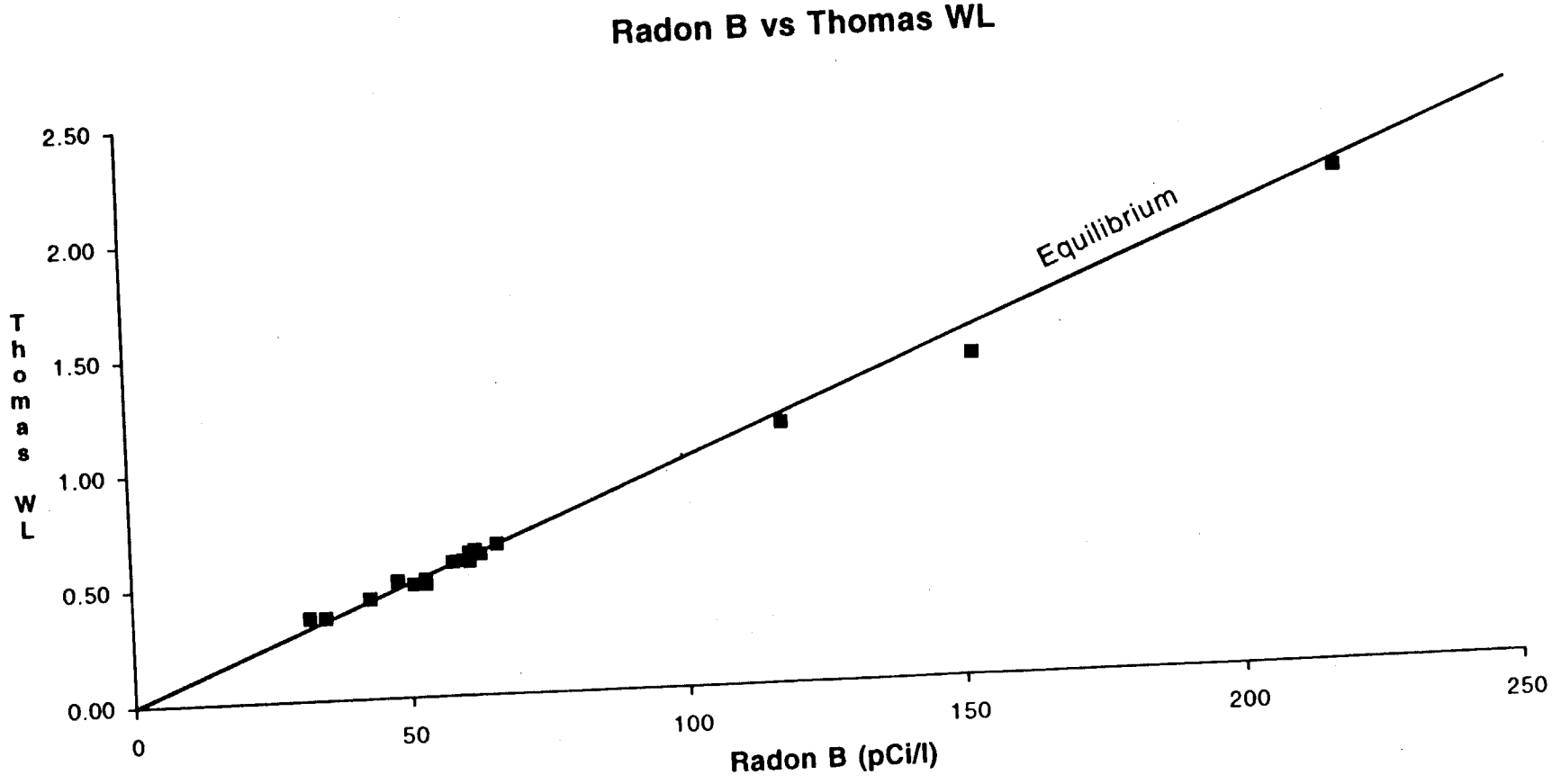
Alpha Radiation vs. Change In Barometric Pressure

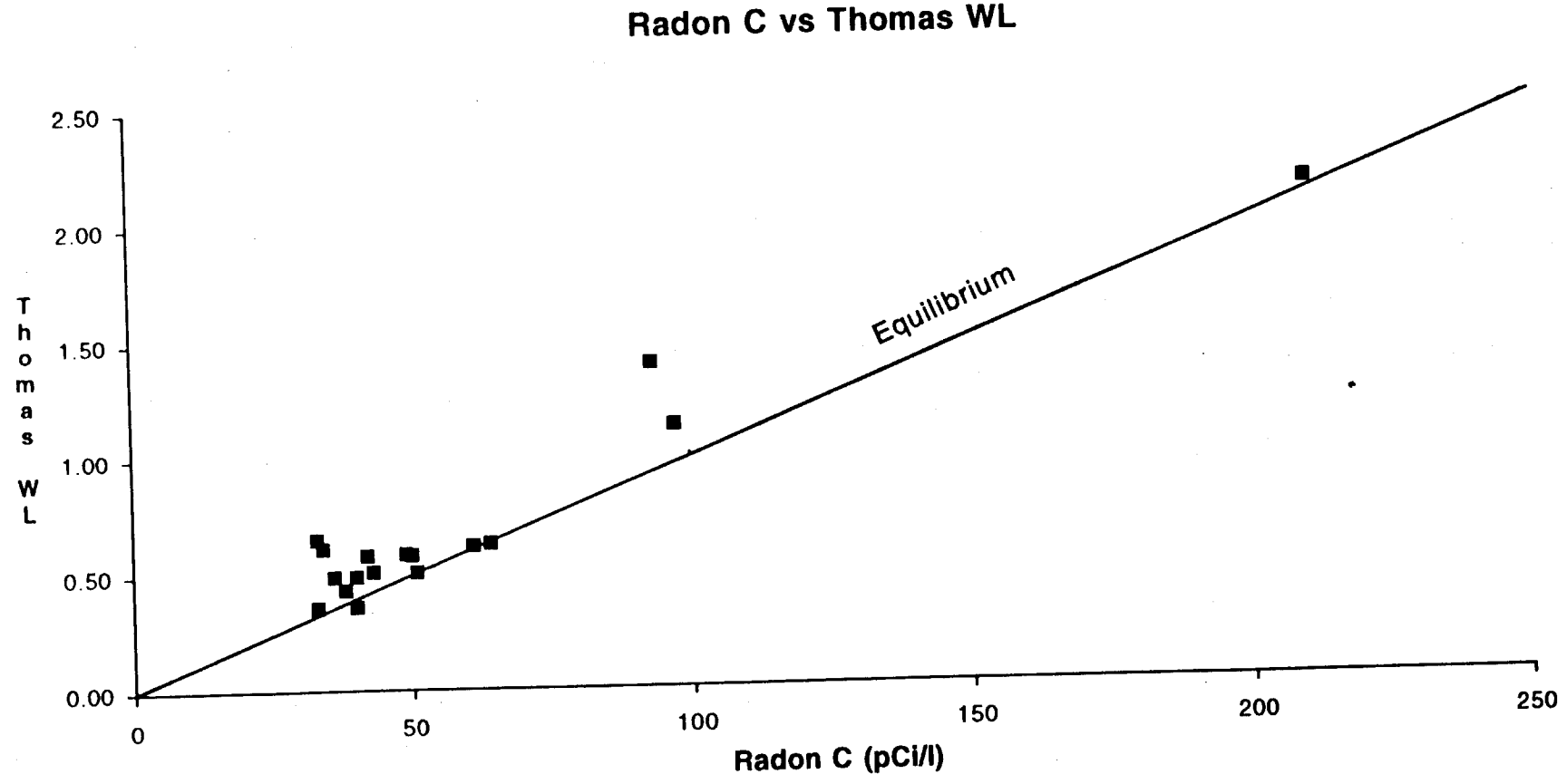


Individual Radon Daughter Measurements

Date	Location	Sample #	Time	WL Kusnetz	Walking Standing	Radon-A pCi/l	Radon-B pCi/l	Radon-C pCi/l	WL Thomas
02/24/91	Mud Flats	1	12:04	0.60	S	61	62	64	0.63
02/24/91	Kartchner Towers	3	15:27	0.63	S	66	61	61	0.62
02/24/91	Start Echo Passage	2	13:17	2.19	S	208	219	210	2.14
03/24/91	Grand Canyon	2	11:58	0.53	S	99	61	42	0.58
03/31/91	Ladder to Gr.Central	5A	18:23	0.40	W	39	32	40	0.36
03/31/91	Big Rm.Overlook	1	12:15	0.49	W	59	48	51	0.50
03/31/91	Traverse to Ladder	1A	16:47	0.45	W	62	43	38	0.43
03/31/91	Echo to Traverse	5	15:31	0.46	W	83	51	36	0.49
05/05/91	Grand Canyon	2	11:43	0.58	S	84	60	49	0.58
05/16/91	River Entrance	4	14:04	0.35	S	46	35	33	0.35
05/16/91	Grand Central	1	11:01	0.51	S	66	53	43	0.51
05/16/91	Bat House floor	2	12:39	1.08	S	143	118	97	1.13
05/29/91	Upper Throne	1A	14:21	0.45	W	57	53	40	0.48
05/29/91	Lower Throne	2A & 3A	15:24	0.61	S	84	58	50	0.58
05/29/91	Grand Canyon	2	11:38	0.58	S	175	66	33	0.65
06/21/91	Pop-up	5A	17:46	0.62	S	147	63	34	0.61
06/25/91	Thunder Room	1	10:33	1.24	S	241	153	93	1.40
					Average	101	73	60	0.71
				Standard	Deviation	±60	±48	±43	±0.45


Radon A vs Thomas WL
Equilibrium
Thomas WL
2.50
2.00
1.50
1.00
0.50
0.00
0
50
100
150
200
250
Radon A (pCi/l)


Radon B vs Thomas WL
Thomas WL
2.50
2.00
1.50
1.00
0.50
0.00
0
50
100
150
200
250
Radon B (pCi/l)
Equilibrium


Radon C vs Thomas WL
Thomas WL
2.50
2.00
1.50
1.00
0.50
0.00
0
50
100
150
200
250
Radon C (pCi/l)
Equilibrium

Unattached Fraction of Radon Daughters in Kartchner Caverns

Measurements were made in September, 1991 to estimate the unattached fraction of radon daughters in Kartchner Caverns.

At Sharon's Saddle in the Big Room.

Sample #1	1.01WL (check sample)
Sample #2	0.45WL (attached fraction
	0.66 WL (unattached fraction)
Total	1.11 WL (unattached fraction f=0.59)
Sample #3	1.10 WL (check sample)

At Mud Flats in the Big Room.

Sample #1	0.89 WL (check sample)
Sample #2	0.50 WL (attached fraction)
	0.45 WL (unattached fraction)
	(^{218}Po=110 pCi/l, ^{214}Pb=45 pCi/l, ^{214}Po=26 pCi/l)
Total	0.95 WL (unattached fraction f=0.47)
Sample #3	0.42 WL (attached fraction)
	(^{218}Po=20 pCi/l, ^{214}Pb=44 pCi/l, ^{214}Po=44 pCi/l)
	0.38 WL (unattached fraction)
Total	0.80 WL (unattached fraction f=0.48)
Sample #4	0.40 WL (attached fraction)
	0.47 WL (unattached fraction)
Total	0.87 WL (unattached fraction f=0.54)

Average Unattached fraction f=0.52 ±0.06

Approximate unattached fractions of the individual daughters are:

^{218}Po	**f=0.84**
^{214}Pb	**f=0.50**
^{214}Po	**f=0.37**

Jacobi Radon Model
(Undeveloped Conditions, Run #1)

Model Data:
Ventilation Rate 25.0 days per Air Exchange
Radon Concentration 100.0 pCi/l
Attachment Rate Constant 3.00/Hr
Unattached Deposition rate constant 0.50/Hr
Attached deposition rate constant .10/Hr
Probability of recoil detachment from aerosol 0.83

Results

	Free	Attached	Surface	TOTAL
^{218}Po	2932.1	652.9	114.5	5086.3 Bq/m^3
^{214}Pb	1066.9	2039.7	589.7	3696.2 Bq/m^3
^{214}Bi	401.3	2490.0	802.7	3693.9 Bq/m^3
PAEC	35106.5	71445.1	21467.4	128019.0 GeV/m^3

	Free	Attached	Surface	Free+Attached
^{218}Po	79.2	17.6	3.1	96.9 pCi/l
^{214}Pb	28.8	55.1	15.9	84.0 pCi/l
^{214}Bi	10.8	67.3	21.7	78.1 pCi/l

Working Level = 0.83
Equilibrium Ratio= 0.83
Unattached Fraction (fp) PAEC = 0.33
^{218}Po Unattached Fraction (f) = 0.82
Total Unattached Fraction (f) = 0.49

Jacobi Radon Model
(Undeveloped Conditions, Run #2)

Model Data:
Ventilation Rate 25.0 days per Air Exchange
Radon Concentration 100.0 pCi/l
Attachment Rate Constant 10.00/Hr
Unattached Deposition rate constant 2.50/Hr
Attached deposition rate constant .10/Hr
Probability of recoil detachment from aerosol 0.83

Results

	Free	Attached	Surface	TOTAL
^{218}Po	1912.1	1419.3	368.1	4570.3 Bq/m^3
^{214}Pb	341.3	2290.1	1065.4	3696.8 Bq/m^3
^{214}Bi	49.3	2407.7	1237.8	3694.8 Bq/m^3
PAEC	13787.0	77658.1	36595.3	128040.5 GeV/m^3

	Free	Attached	Surface	Free+Attached
^{218}Po	51.7	38.4	9.9	90.0 pCi/l
^{214}Pb	9.2	61.9	28.8	71.1 pCi/l
^{214}Bi	1.3	65.1	33.5	66.4 pCi/l

Working Level = 0.71
Equilibrium Ratio= 0.71
Unattached Fraction (fp) PAEC = 0.15
^{218}Po Unattached Fraction (f) = 0.57
Total Unattached Fraction (f) = 0.18

Jacobi Radon Model
(Undeveloped Conditions, Run #3)

Model Data:
Ventilation Rate 25.0 days per Air Exchange
Radon Concentration 100.0 pCi/l
Attachment Rate Constant 10.00/Hr
Unattached Deposition rate constant 0.50/Hr
Attached deposition rate constant .10/Hr
Probability of recoil detachment from aerosol 0.83

Results

	Free	Attached	Surface	TOTAL
^{218}Po	2072.3	1538.3	89.0	5014.3 Bq/m^3
^{214}Pb	431.2	2853.0	411.8	3696.0 Bq/m^3
^{214}Bi	72.2	3048.1	573.2	3693.5 Bq/m^3
PAEC	16282.2	96537.4	15191.0	128010.6 GeV/m^3

	Free	Attached	Surface	Free+Attached
^{218}Po	56.0	41.6	2.4	97.6 pCi/l
^{214}Pb	11.7	77.1	11.1	88.8 pCi/l
^{214}Bi	2.0	82.4	15.5	84.3 pCi/l

Working Level = 0.88
Equilibrium Ratio= 0.88
Unattached Fraction (fp) PAEC = 0.14
^{218}Po Unattached Fraction (f) = 0.57
Total Unattached Fraction (f) = 0.17

Jacobi Radon Model

(Developed Conditions, Run #1)

Model Data:

Ventilation Rate 25.0 days per Air Exchange
Radon Concentration 100.0 pCi/l
Attachment Rate Constant 10.00/Hr
Unattached Deposition rate constant 2.00/Hr
Attached deposition rate constant .20/Hr
Probability of recoil detachment from aerosol 0.83

Results

	Free	Attached	Surface	TOTAL
^{218}Po	1949.8	1436.6	313.2	4530.8 Bq/m^3
^{214}Pb	359.8	2267.9	1069.1	3696.7 Bq/m^3
^{214}Bi	53.8	2302.8	1338.2	3694.9 Bq/m^3
PAEC	14316.1	75950.5	37774.8	128041.4 GeV/m^3

	Free	Attached	Surface	Free+Attached
^{218}Po	52.7	38.8	8.5	91.5 pCi/l
^{214}Pb	9.7	61.3	28.9	71.0 pCi/l
^{214}Bi	1.5	62.2	36.2	63.7 pCi/l

Working Level = 0.70
Equilibrium Ratio= 0.70
Unattached Fraction (fp) PAEC = 0.16
^{218}Po Unattached Fraction (f) = 0.58
Total Unattached Fraction (f) = 0.19

Jacobi Radon Model
(Developed Conditions, Run #2)

Model Data:
Ventilation Rate 25.0 days per Air Exchange
Radon Concentration 100.0 pCi/l
Attachment Rate Constant 50.00/Hr
Unattached Deposition rate constant 8.00/Hr
Attached deposition rate constant .20/Hr
Probability of recoil detachment from aerosol 0.83

Results

	Free	Attached	Surface	TOTAL
^{218}Po	693.1	2553.5	452.9	3620.0 Bq/m^3
^{214}Pb	73.3	2474.0	1149.6	3696.9 Bq/m^3
^{214}Bi	2.6	2313.9	1378.5	3695.0 Bq/m^3
PAEC	3898.3	83892.4	40254.4	128045.1 GeV/m^3

	Free	Attached	Surface	Free+Attached
^{218}Po	18.7	69.0	12.2	87.7 pCi/l
^{214}Pb	2.0	66.9	31.1	68.8 pCi/l
^{214}Bi	0.1	62.5	37.3	62.6 pCi/l

Working Level = 0.68
Equilibrium Ratio= 0.69
Unattached Fraction (fp) PAEC = 0.04
^{218}Po Unattached Fraction (f) = 0.21
Total Unattached Fraction (f) = 0.05

Jacobi Radon Model

(Developed Conditions, Run #3)
(Large amounts of Condensation Fog)

Model Data:

Ventilation Rate 25.0 days per Air Exchange
Radon Concentration 100.0 pCi/l
Attachment Rate Constant 200.00/Hr
Unattached Deposition rate constant 8.00/Hr
Attached deposition rate constant .20/Hr
Probability of recoil detachment from aerosol 0.83

Results

	Free	Attached	Surface	TOTAL
^{218}Po	223.5	3293.1	183.0	3399.3 Bq/m^3
^{214}Pb	21.9	2992.9	681.5	3696.3 Bq/m^3
^{214}Bi	0.2	2750.9	943.0	3694.1 Bq/m^3
PAEC	1217.9	101606.9	25199.0	128023.8 GeV/m^3

	Free	Attached	Surface	Free+Attached
^{218}Po	6.0	89.0	4.9	95.0 pCi/l
^{214}Pb	0.6	80.9	18.4	81.5 pCi/l
^{214}Bi	0.0	74.3	25.5	74.4 pCi/l

Working Level = 0.80
Equilibrium Ratio= 080
Unattached Fraction (fp) PAEC = 0.01
^{218}Po Unattached Fraction (f) = 0.06
Total Unattached Fraction (f) = 0.01

Radon Daughter Reduction Experiment With A Negative Ion Generator

April 2, 1991

By Bob Buecher

A experiment was carried out to test the effectiveness of a small negative ion generator in reducing the level of radon daughters in the cave air.

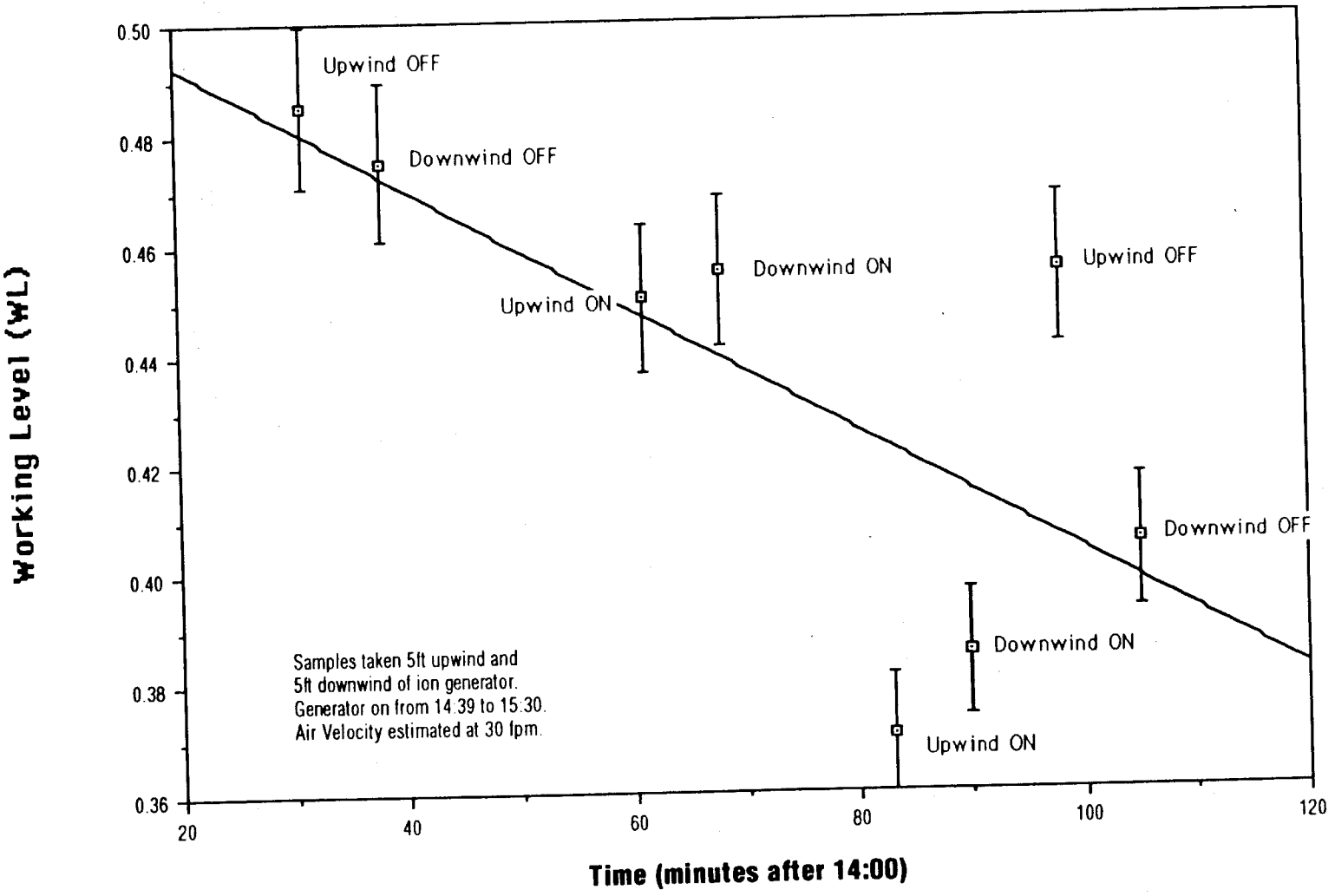
An ion generator produces a large number of ions by corona discharge. These ions diffuse into the room air and place charges on airborne particulates and other surfaces. The charged particulates will then have a tendency to migrate toward the walls and floor and become attached to those surfaces. Ion generators come with different polarities, producing positive ions or negative ions.

The negative ion generator used is sold by DAK Industries for use in cars. The principle advantage of this ionizer is that it will operate off a 12 volt battery. Specifications for the ionizer state that it will cover an area of 350 cubic feet.

For the experiment in Kartchner Caverns, the ionizer was mounted on a tripod in the Mud Flats section of the Big Room. At this time of year there is a steady flow of air along this section of passage from the entrance toward the rope traverse. Air velocities are very steady and average 15 to 30 feet per minute. Air flow could be readily observed by watching the flow of fog droplets in the air.

A piece of hardware cloth was connected to the negative terminal of the battery to form a negative collection surface for the ionized particles. Measurements of radon daughters were alternately taken immediately upwind and downwind of the generator, both with the ion generator on and off. The graph on the next page shows the results. During approximately 90 minutes of testing the ambient radon daughter levels decreased from 0.48 WL to 0.40 WL. There appears to be no decrease in the radon daughter levels downwind of the ion generator.

Radon WL with Negative Ion Generator
April 2, 1990 at Mud Flats



Radon Daughter Air Filtration Experiment

4/18/91

by Bob Buecher

This was an experiment to determine the effectiveness of a simple furnace filter on removing radon daughters from cave air.

A small 12volt fan was installed in a hole in the bottom of a plastic 5 gallon bucket. The bucket was mounted horizontally, approximately 3 feet above the ground on a tripod. The cross-sectional area of the bucket is 0.69 square feet. The capacity of the fan was estimated to be 23CFM from the time it took to fill a large plastic bag. The flow rate was measurably different for operation with no filter, one filter or two filters. The rated capacity of the fan is 25CFM.

The equipment was set up near the Mud Flats section of the cave next to the datalogger computer. This portion of the cave experiences a steady wind of about 15 FPM from the entrance and flowing toward the rope traverse. The equipment was oriented so that the fan intake on the bottom of the bucket was upwind. When the fan was in operation, airflow through the bucket was in the same direction as airflow along the passage. Measurements were taken approximately 6" upwind from the fan intake and 6" downwind of the open end of the bucket.

Four sets of measurements were taken.

Set 1
No filter and fan turned off.
Upwind Radon Working Level measured to be 0.45
Downwind Radon Working Level measured to be 0.40
The slight drop of 0.05 WL is most likely to be the result of random errors. It is also possible that it is the result of "plate out" of radon daughters on the plastic bucket.

Set 2
Single furnace filter and fan turned on.
Upwind Radon Working Level measured to be 0.43WL
Downstream Radon Working Level measured to be 0.18WL
The single furnace filter was apparently responsible for a reduction 0.25WL. Downwind levels were 42% of the upwind level.

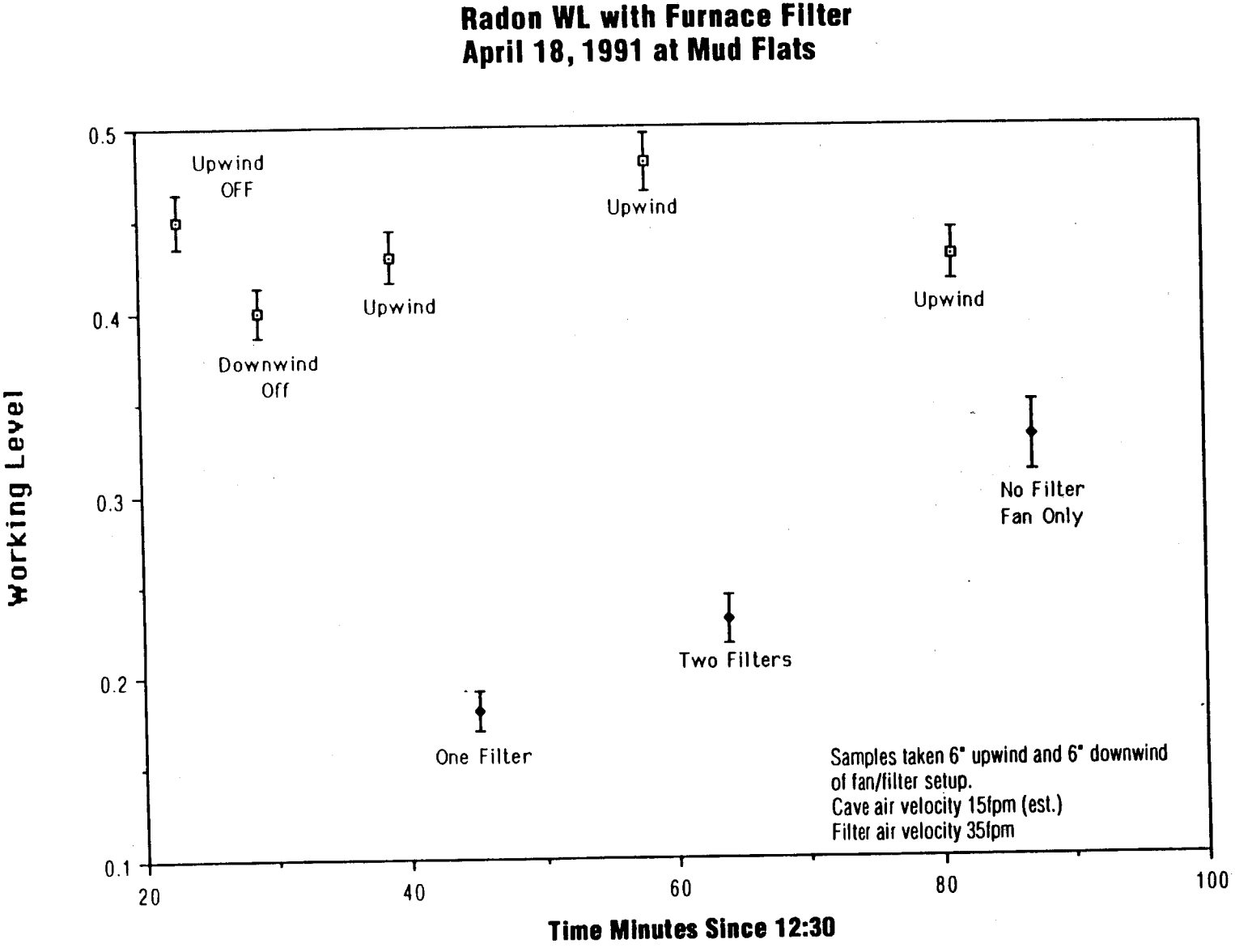
Set 3
Two layers of furnace filters and fan turned on.
Upwind Radon Working Level measured to be 0.48WL.
Downwind Radon Working Level measured to be 0.23WL.
Two layers of furnace filter was apparently responsible for a reduction of 0.25WL. Downwind levels were 48% of upwind levels.

Set 4
No filter was installed and the fan was turned on.
Upwind Radon Working Level was measured to be 0.43WL.
Downwind Working Level was measured to be 0.33WL.
The fan alone was apparently responsible for a reduction on 0.10WL. Downwind levels were 77% of upwind levels.

CONCLUSIONS

A furnace filter operated at low velocity will remove a large fraction of the radon daughters present in the cave air. A single layer of filter appears to be as effective as two layers. The operation of the fan without a filter appears to remove a significant amount of the radon daughters.

A recirculating filtration system such as this will remove a significant fraction of the radon daughter products but will not remove the parent radon gas. The radon daughter levels will recover within 30 minutes to 3 hours by mixing with untreated air and decay of radon gas. A filtration system may be effective in lowering the radon daughter levels for a distance of 200' downwind from the filter. The effectiveness will depend on the amount of air treated and how steady the airflow is within the cave.


Radon WL with Furnace Filter
April 18, 1991 at Mud Flats
Working Level
0.5
0.4
0.3
0.2
0.1
20
40
60
80
100
Time Minutes Since 12:30
Upwind
OFF
Downwind
Off
Upwind
Upwind
Upwind
No Filter
Fan Only
Two Filters
One Filter
Samples taken 6" upwind and 6" downwind
of fan/filter setup.
Cave air velocity 15fpm (est.)
Filter air velocity 35fpm

Alpha Activity of Cave Materials

An experiment was performed in the ACPI office to look at the alpha activity of various samples that have been collected during the 24-month study. The main goal of the experiment was to identify those samples which have high alpha activity and could therefore be contributing to the radon levels in the cave. The same radon monitoring equipment used in the cave was used to obtain the counts per minute for each sample. The counts may be related to the uranium content of the sample but the correlation is unknown at this time. Samples were ground up and placed in the scintillation counting chamber. Counts were made for periods of 99 minutes, alternating with the sample and a blank cell to obtain a background count. Counts per minute for each sample were determined by subtracting the background count from the sample count and dividing by the count time.

Sample	Counts per Minute
Surface Samples	
Sandy Limestone from top of hill over Throne Room	0.05±0.02
Granitic sand from Guindani Wash	0.08±0.02
Pyrite Fault Gouge (above Quartz Divide)	0.26±0.03
Pinal Schist	0.39±0.04
Brown Clay	0.39±0.06
Uranium prospect in Guindani Canyon (Brown rock sample)	1.06±0.11
Uranium prospect in Guindani Canyon (Green rock sample)	5.76±0.24
Cave Samples	
Limestone from Crinoid Room	0.02±0.02
Limestone from Granite Dells (Sta C274A)	0.10±0.02
Speleothem Calcite	0.16±0.04
Babbitt Hole Silt/sand	0.22±0.05
Boxwork from Crinoid Room	0.23±0.03
Main Corridor Fault Gouge	0.26±0.05

Sample	Counts per Minute
Mud Flats Silt (Sample SS-2)	0.38±0.06
Red River Claystone	0.43±0.07
Bathtub Room Granitic Sand (Sample SS-4)	0.60±0.06
Nontronite/manganese clay from Echo Passage	0.62±0.06
Thunder Room Blocky Clay	0.66±0.07
Nontronite Clay from Echo Passage	0.67±0.06
Mud Trench Clay (Sample SS-5)	1.12±0.11
Hill Room Clay (Sample SS-6)	1.17±0.08
Subway Passage Clay (Sample SS-7)	1.32±0.08

{The cave samples appear to fall into three groups:
less than 0.50
0.60 to 0.70
1.10 to 1.40
Also the highest values are for the mud found in the back part of the cave}

Radalert Instrument

The Radalert is a small, handheld, digital geiger counter that is capable of detecting alpha, beta, gamma and X-rays. When used in a cave, the readings in counts per minute are roughly proportional to the radon daughter concentrations. The correlation is only approximate. This has been surprising as one would expect the two methods to agree more closely. Inside a cave the surrounding bedrock shields the Radalert from external sources of gamma and X-rays. The largest remaining source is from the decay series which produces radon daughters.

There are several possible explanations for the poor correlation. First the Radalert is continually exposed to the ambient air and this will allow radon decay products to accumulate on the case and contribute to a higher count. Second, the Radalert may be more sensitive to one or more of the radon daughters and thus be sensitive to different ventilation rates.

Several tests have been performed in order to better understand the performance of the Radalert. In the first, the Radalert was connected to a separate computer which recorded the number of counts each minute. The Radalert was placed in a plastic box of approximately one gallon capacity. The box was then sealed with tape. The computer recorded the decay in activity of the radon daughters in the air. Within two to three hours the radon daughter activity will have decayed off to near zero. The plastic box has sufficiently thick walls to prevent outside alpha particles from penetrating. Surprisingly the computer recorded a drop of only about one third of the initial activity and then activity remained relatively constant at about 2/3 of the initial levels.

A second experiment involved blocking the alpha window with a metal coin. A nickel is sufficiently dense enough to block all alpha and beta particles. However, counts taken with the alpha window blocked and unblocked appear to show no significant differences.

From these experiments it is apparent that the Radalert does not respond well to alpha particles and that the radiation which is being measured in the cave does not enter the detector through the alpha window.

Approximate calculations were made to determine the anticipated number of counts that the Radalert would experience in an atmosphere containing one Working Level. Alpha particles were assumed to have a mean free path of approximately 6 centimeters. Based on the area of the alpha window (1 cm diameter) a count of 1.05 counts per minute was anticipated at one Working Level. Counts in the cave are generally much higher at 30 to 60 counts per minute.

The number of beta particles was also estimated based on a mean free path of 1.8 meters in air. A rate of 67 counts per minute would be expected on the Radalert. The actual number would be somewhat lower as some beta particles would be absorbed by the Radalert case and walls of the geiger tube. This agrees well with the number of counts measured in the cave.

The conclusion is that the Radalert is primarily counting beta particles in the cave air. The Radalert appears to be relatively insensitive to alpha particles in the air. This explains the source of the remaining 2/3 of counts experienced in the sealed box experiment. The plastic walls of the box will block external alpha particles but do not block beta particles. When the alpha window is blocked with a nickel all alpha radiation is blocked, but this amounts to an insignificant number of counts. Beta particles still penetrate the case of the Radalert.

As the Radalert is primarily measuring only beta particles it is sensitive to Radon B and Radon C which are beta emitters. It is not sensitive to Radon gas itself or to Radon A, both of which are alpha emitters.

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	September, 1989					MONTHLY SUMMARY		
	11-Sep	14-Sep	23-Sep	24-Sep	26-Sep	#	AVE.	S.D.
Surface	23.8	21.8	-	-	-	2	22.8	1.4
Crow's Nest #1	-	86.1	95.4	-	-	2	90.8	6.6
Pirate's Den #2	-	-	-	-	-	0	---	---
Sue's Room #3	-	64.8	62.5	-	-	2	63.7	1.6
Mushroom #4	-	76.6	85.4	-	-	2	81.0	6.2
Granite Dells #5	-	35.2	-	-	-	1	35.2	---
Pyramid Room #6	-	-	-	-	-	0	---	---
Cul-de-Sac #7	48.9	-	-	40.5	-	2	44.7	5.9
Rotunda Room #8	-	-	39.8	-	-	1	39.8	---
End of Echo #9	31.8	-	-	30.9	-	2	31.4	0.6
Begin Echo #10	42.6	-	-	-	-	1	42.6	---
Tarantula Room #11	29.6	-	-	-	-	1	29.6	---
Mud Flats #12	42.3	-	-	-	-	1	42.3	---
Sharon's Saddle #13	50.7	36.1	30.4	28.3	36.7	5	36.4	8.7
Main Corridor #14	-	-	-	-	-	0	---	---
Scorpion Passages #15	32.8	-	-	-	-	1	32.8	---
Grand Central #16	36.2	-	-	-	45.1	2	40.7	6.3
Lower Throne #17	-	-	53.5	-	-	1	53.5	---
Throne Rm. Overlook #18	-	38.0	33.5	-	-	2	35.8	3.2
Lovers' Leap #19	-	-	16.9	-	-	1	16.9	---
Mud Trench #20	-	48.2	48.2	-	-	2	48.2	0.0
Big Room Overlook #21	-	39.8	-	30.9	-	2	35.4	6.3
Kartchner Towers #22	-	-	-	33.6	-	1	33.6	---
Throne Room Guano pile	-	-	55.6	-	-	1	55.6	---
Subway 1 to 5 minutes	-	77.0	69.6	-	-	2	73.3	5.2
Subway 6 to 10 minutes	-	108.0	88.8	-	-	2	98.4	13.6
Crinoid Room	-	17.5	-	-	-	1	17.5	---
Blockade Room	-	14.9	-	-	-	1	14.9	---
Grand Canyon	-	60.7	58.6	-	56.7	3	58.7	2.0
Bathtub Room	-	-	-	-	24.8	1	24.8	---
Thunder Room	-	-	-	-	53.8	1	53.8	---
Strawberry Room	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	44	48.57	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	October, 1989							MONTHLY SUMMARY		
	15-Oct	16-Oct	19-Oct	22-Oct	24-Oct	29-Oct	31-Oct	#	AVE.	S.D.
Surface	-	-	21.7	-	-	-	-	1	21.7	---
Crow's Nest #1	81.5	-	-	-	-	-	-	1	81.5	---
Pirate's Den #2	-	-	-	-	-	-	-	0	---	---
Sue's Room #3	-	-	-	-	-	-	-	0	---	---
Mushroom #4	69.6	-	-	-	-	-	-	1	69.6	---
Granite Dells #5	-	-	-	-	-	19.9	-	1	19.9	---
Pyramid Room #6	52.7	-	-	-	-	14.7	-	2	33.7	26.9
Cul-de-Sac #7	-	-	-	-	-	-	-	0	---	---
Rotunda Room #8	38.4	-	-	-	-	-	-	1	38.4	---
End of Echo #9	-	26.7	-	-	-	-	-	1	26.7	---
Begin Echo #10	-	-	-	-	-	-	-	0	---	---
Tarantula Room #11	-	21.6	-	-	-	-	-	1	21.6	---
Mud Flats #12	-	-	-	18.4	-	-	-	1	18.4	---
Sharon's Saddle #13	35.8	33.4	-	15.0	16.4	15.3	13.5	6	21.6	10.2
Main Corridor #14	-	-	-	11.5	17.5	-	-	2	14.5	4.2
Scorpion Passages #15	-	-	-	-	21.0	-	-	1	21.0	---
Grand Central #16	-	31.1	-	16.3	23.8	11.7	-	4	20.7	8.5
Lower Throne #17	-	-	-	-	-	-	-	0	---	---
Throne Rm. Overlook #18	37.2	-	-	-	-	-	-	1	37.2	---
Lovers' Leap #19	-	-	-	-	-	13.2	-	1	13.2	---
Mud Trench #20	-	-	-	-	-	-	-	0	---	---
Big Room Overlook #21	-	34.1	-	21.1	-	-	-	2	27.6	9.2
Kartchner Towers #22	-	-	-	-	25.2	16.8	-	2	21.0	5.9
Throne Room Guano pile	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	60.2	-	-	-	-	-	-	1	60.2	---
Subway 6 to 10 minutes	76.4	-	-	-	-	-	-	1	76.4	---
Crinoid Room	-	-	-	-	5.5	-	-	1	5.5	---
Blockade Room	-	-	-	6.7	5.5	-	-	2	6.1	0.8
Grand Canyon	63.9	-	-	-	-	20.6	-	2	42.3	30.6
Bathtub Room	-	-	-	-	-	11.5	-	1	11.5	---
Thunder Room	-	-	-	-	-	17.0	-	1	17.0	---
Strawberry Room	-	-	-	-	-	-	-	0	-	---
Lunch Spot	-	-	-	-	-	-	-	0	-	---
Echo Passage-Entrance	-	-	-	-	-	-	-	0	-	---
Echo Passage at Shield	-	-	-	-	-	-	-	0	-	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	37	27.58	
Total	-	-	-	-	-	-	-			

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	November, 1989													MONTHLY SUMMARY		
	2-Nov	7-Nov	8-Nov	10-Nov	12-Nov	14-Nov	16-Nov	18-Nov	19-Nov	24-Nov	26-Nov	28-Nov	30-Nov	#	AVE.	S.D.
Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Crow's Nest #1	-	-	-	-	-	-	50.7	-	-	-	-	-	-	1	50.7	---
Pirate's Den #2	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Sue's Room #3	-	-	-	-	-	-	42.8	-	-	-	-	-	-	1	42.8	---
Mushroom #4	-	-	-	-	-	-	50.6	-	-	-	-	-	-	1	50.6	---
Granite Dells #5	-	-	-	-	-	-	20.3	-	-	-	-	-	-	1	20.3	---
Pyramid Room #6	-	-	-	13.8	-	-	13.5	-	-	-	-	-	-	2	13.7	0.2
Cul-de-Sac #7	-	-	-	-	-	27.1	-	-	-	-	-	-	-	1	27.1	---
Rotunda Room #8	-	-	-	22.9	-	-	-	-	-	-	-	-	-	1	22.9	---
End of Echo #9	-	-	-	-	-	29.2	-	-	-	-	-	-	-	1	29.2	---
Begin Echo #10	-	-	-	-	-	55.5	-	-	-	-	-	-	-	1	55.5	---
Tarantula Room #11	-	-	13.3	-	-	-	-	-	-	-	-	-	-	1	13.3	---
Mud Flats #12	-	-	19.9	-	-	20.9	-	-	-	-	-	-	22.7	3	21.2	1.4
Sharon's Saddle #13	11.7	14.8	12.7	-	-	14.7	-	-	10.6	12.2	-	9.5	8.8	8	11.9	2.2
Main Corridor #14	7.6	-	-	-	-	10.1	-	-	-	-	-	-	-	2	8.9	1.8
Scorpion Passages #15	-	-	-	-	-	22.1	-	-	-	-	-	-	-	1	22.1	---
Grand Central #16	9.9	13.5	12.5	-	-	17.8	-	11.9	-	16.6	-	12.5	-	7	13.5	2.8
Lower Throne #17	-	-	-	23.1	-	-	-	-	-	-	-	-	-	1	23.1	---
Throne Rm. Overlook #18	-	-	-	17.9	-	-	-	-	-	-	-	-	-	1	17.9	---
Lovers' Leap #19	11.8	-	-	-	-	-	12.2	-	-	13.2	12.6	-	-	4	12.5	0.6
Mud Trench #20	-	-	-	-	-	-	29.7	-	-	-	-	-	-	1	29.7	---
Big Room Overlook #21	-	-	15.0	-	-	-	-	-	-	-	-	-	-	1	15.0	---
Kartchner Towers #22	15.4	-	21.2	-	-	-	-	-	-	20.3	-	-	15.7	4	18.2	3.0
Throne Room Guano pile	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	40.6	-	-	-	-	-	-	1	40.6	---
Subway 6 to 10 minutes	-	-	-	-	-	-	49.8	-	-	-	-	-	-	1	49.8	---
Crinoid Room	-	-	-	-	5.1	-	-	-	-	-	-	-	-	1	5.1	---
Blockade Room	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	-	21.7	-	-	22.5	-	-	-	-	-	-	2	22.1	0.6
Bathtub Room	9.3	-	-	-	-	-	-	-	-	-	12.4	-	-	2	10.9	2.2
Thunder Room	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Strawberry Room	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	51	19.65	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	December, 1989 B.G.open 2-Dec	B.G.closed 2-Dec	3-Dec	13-Dec	19-Dec	21-Dec	23-Dec	27-Dec	29-Dec	31-Dec	MONTHLY SUMMARY #	AVE.	S.D.
Surface	-	-	-	-	-	-	-	-	-	-	0	---	---
Crow's Nest #1	-	-	-	-	-	-	23.0	-	-	-	1	23.0	---
Pirate's Den #2	-	-	-	-	-	-	22.8	-	-	-	1	22.8	---
Sue's Room #3	-	-	-	-	-	-	16.5	-	-	-	1	16.5	---
Mushroom #4	-	-	-	-	-	-	25.4	-	-	-	1	25.4	---
Granite Dells #5	-	-	-	-	-	-	-	-	-	-	0	---	---
Pyramid Room #6	-	-	-	-	-	11.0	-	-	14.7	-	2	12.9	2.6
Cul-de-Sac #7	31.3	-	-	-	-	-	-	-	-	-	1	31.3	---
Rotunda Room #8	-	-	-	-	-	-	-	-	-	-	0	---	---
End of Echo #9	172.0	83.7	-	-	-	-	-	-	-	-	2	127.9	62.4
Begin Echo #10	149.5	92.1	-	-	-	-	-	-	-	-	2	120.8	40.6
Tarantula Room #11	-	-	-	-	-	-	-	-	-	-	0	---	---
Mud Flats #12	12.7	-	-	-	-	-	-	-	-	-	1	12.7	---
Sharon's Saddle #13	9.0	-	9.1	-	11.4	11.3	-	10.7	13.7	11.3	7	10.9	1.6
Main Corridor #14	-	-	-	-	-	-	-	-	-	-	0	---	---
Scorpion Passages #15	-	-	-	-	-	-	-	-	-	-	0	---	---
Grand Central #16	24.9	-	-	-	-	-	-	-	-	11.7	2	18.3	9.3
Lower Throne #17	-	-	-	15.8	-	-	-	-	-	-	1	15.8	---
Throne Rm. Overlook #18	-	-	-	19.0	-	-	-	-	-	-	1	19.0	---
Lovers' Leap #19	-	-	11.4	-	13.0	12.0	-	-	-	-	3	12.1	0.8
Mud Trench #20	-	-	-	20.8	-	-	-	-	-	-	1	20.8	---
Big Room Overlook #21	13.3	-	-	-	9.6	-	-	-	-	-	2	11.5	2.6
Kartchner Towers #22	-	-	13.8	-	-	-	-	-	17.6	14.9	3	15.4	2.0
Throne Room Guano pile	-	-	-	25.2	-	-	-	-	-	-	1	25.2	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	-	-	-	-	-	-	-	0	---	---
Blockade Room	-	-	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	16.8	-	-	-	-	-	-	-	1	16.8	---
Bathtub Room	-	-	-	-	-	-	-	-	11.7	-	1	11.7	---
Thunder Room	-	-	14.4	-	-	-	-	-	-	-	1	14.4	---
Strawberry Room	16.8	-	-	-	-	-	-	-	-	-	1	16.8	---
Lunch Spot	33.9	-	-	-	-	-	-	-	-	-	1	33.9	---
Echo Passage-Entrance	49.6	-	-	-	-	-	-	-	-	-	1	49.6	---
Echo Passage at Shield	125.0	-	-	-	-	-	-	-	-	-	1	125.0	---
Echo Pass.-1/2 to Evap.	156.0	-	-	-	-	-	-	-	-	-	1	156.0	---
Total	-	-	-	-	-	-	-	-	-	-	41	33.62	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	January, 1990									Monthly Summary		
	3-Jan	4-Jan	12-Jan	14-Jan	16-Jan	18-Jan	24-Jan	26-Jan	28-Jan	#	AVE.	S.D.
Surface	-	-	-	-	-	-	26.7	-	-	1	26.7	---
Crow's Nest #1	-	-	-	-	-	23.7	-	-	-	1	23.7	---
Pirate's Den #2	-	-	-	-	-	21.2	-	-	-	1	21.2	---
Sue's Room #3	-	-	-	-	-	20.1	-	-	-	1	20.1	---
Mushroom #4	-	-	-	-	-	27.5	-	-	-	1	27.5	---
Granite Dells #5	-	-	-	-	19.7	-	-	-	-	1	19.7	---
Pyramid Room #6	-	-	-	-	14.8	-	12.1	-	-	2	13.5	1.9
Cul-de-Sac #7	-	-	31.1	38.4	-	-	-	-	-	2	34.8	5.2
Rotunda Room #8	-	-	-	-	-	-	-	-	-	0	---	---
End of Echo #9	-	-	-	29.1	-	-	-	-	-	1	29.1	---
Begin Echo #10	-	-	71.0	-	-	-	-	-	-	1	71.0	---
Tarantula Room #11	-	-	-	-	-	-	-	13.1	-	1	13.1	---
Mud Flats #12	15.3	-	-	-	-	-	-	-	-	1	15.3	---
Sharon's Saddle #13	-	12.1	-	13.9	14.9	-	15.8	14.6	-	5	14.3	1.4
Main Corridor #14	-	-	-	-	12.3	-	-	-	-	1	12.3	---
Scorpion Passages #15	-	-	-	-	-	-	-	15.1	-	1	15.1	---
Grand Central #16	-	11.3	-	-	12.7	-	-	10.2	-	3	11.4	1.3
Lower Throne #17	-	-	-	-	-	-	-	-	-	0	---	---
Throne Rm. Overlook #18	-	-	-	-	-	-	-	-	-	0	---	---
Lovers' Leap #19	-	-	-	-	12.5	-	6.2	-	-	2	9.4	4.5
Mud Trench #20	-	-	-	-	-	-	-	-	18.6	1	18.6	---
Big Room Overlook #21	-	-	12.0	13.6	-	-	-	-	-	2	12.8	1.1
Kartchner Towers #22	-	-	-	-	19.9	-	15.9	16.6	-	3	17.5	2.1
Throne Room Guano pile	-	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	24.2	1	24.2	---
Crinoid Room	-	-	-	-	-	-	-	-	-	0	---	---
Blockade Room	-	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	-	-	-	-	-	-	-	0	---	---
Bathtub Room	-	-	-	-	-	-	11.9	-	-	1	11.9	---
Thunder Room	-	-	-	-	-	-	-	17.3	-	1	17.3	---
Strawberry Room	-	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	-	-	34	18.79	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	February, 1990										Monthly Summary		
	1-Feb	4-Feb	6-Feb	7-Feb	8-Feb	13-Feb	16-Feb	17-Feb	26-Feb	28-Feb	#	AVE.	S.D.
Surface	-	-	-	-	-	22.3	-	-	22.2	-	2	22.3	0.1
Crow's Nest #1	-	-	-	-	-	-	-	-	-	-	0	---	---
Pirate's Den #2	-	-	-	-	-	-	-	-	-	-	0	---	---
Sue's Room #3	-	-	-	-	-	-	-	-	-	-	0	---	---
Mushroom #4	-	-	-	-	-	-	-	-	-	-	0	---	---
Granite Dells #5	-	-	-	-	-	-	-	15.6	-	-	1	15.6	---
Pyramid Room #6	-	-	-	-	-	-	-	12.5	-	-	1	12.5	---
Cul-de-Sac #7	-	-	-	-	-	34.7	-	-	-	-	1	34.7	---
Rotunda Room #8	-	-	-	-	-	-	-	23.7	-	-	1	23.7	---
End of Echo #9	-	-	-	-	-	22.2	-	-	-	-	1	22.2	---
Begin Echo #10	-	-	-	-	-	61.8	-	-	-	-	1	61.8	---
Tarantula Room #11	-	-	-	-	-	-	-	-	11.5	-	1	11.5	---
Mud Flats #12	-	-	-	-	-	-	-	-	12.7	-	1	12.7	---
Sharon's Saddle #13	19.1	11.2	12.9	14.2	-	-	15.6	-	15.8	15.5	7	14.9	2.5
Main Corridor #14	11.6	14.3	11.5	-	-	-	-	-	11.4	-	4	12.2	1.4
Scorpion Passages #15	-	-	-	-	-	-	14.5	-	-	-	1	14.5	---
Grand Central #16	12.5	-	11.7	-	-	-	12.7	-	-	13.3	4	12.6	0.7
Lower Throne #17	-	-	-	-	-	-	-	25.6	-	-	1	25.6	---
Throne Rm. Overlook #18	-	-	-	-	-	-	-	29.5	-	-	1	29.5	---
Lovers' Leap #19	-	-	-	-	11.2	-	12.5	-	-	-	2	11.9	0.9
Mud Trench #20	-	-	-	-	-	-	-	-	-	-	0	---	---
Big Room Overlook #21	-	-	-	-	-	19.0	-	-	-	-	1	19.0	---
Kartchner Towers #22	-	-	-	-	19.8	-	18.9	-	17.7	20.7	4	19.3	1.3
Throne Room Guano pile	-	-	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	-	-	-	-	-	-	-	0	---	---
Blockade Room	-	-	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	-	-	-	-	-	-	-	-	0	---	---
Bathtub Room	-	-	-	-	13.0	-	-	-	8.5	-	2	10.8	3.2
Thunder Room	-	-	-	-	26.9	-	-	-	-	-	1	26.9	---
Strawberry Room	-	-	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	-	-	-	36	17.66	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	March, 1990												Monthly Summary		
	1-Mar	7-Mar	9-Mar	11-Mar	14-Mar	16-Mar	18-Mar	20-Mar	22-Mar	25-Mar	26-Mar	27-Mar	#	AVE.	S.D.
Surface	-	21.7	-	-	-	-	-	-	-	-	-	-	1	21.7	---
Crow's Nest #1	-	-	-	51.4	-	-	-	-	36.9	-	-	-	2	44.2	10.3
Pirate's Den #2	-	-	-	-	-	-	-	-	32.9	-	-	-	1	32.9	---
Sue's Room #3	-	-	-	-	-	-	-	-	26.3	27.4	-	-	2	26.9	0.8
Mushroom #4	32.7	-	-	-	-	-	52.4	-	44.5	42.3	-	-	4	43.0	8.1
Granite Dells #5	-	-	-	-	16.5	-	-	-	-	-	-	-	1	16.5	---
Pyramid Room #6	-	-	-	-	13.4	-	11.7	17.8	23.5	22.7	-	-	5	17.8	5.3
Cul-de-Sac #7	-	-	-	-	-	25.7	-	-	-	-	-	-	1	25.7	---
Rotunda Room #8	-	-	-	-	-	-	-	20.5	-	-	-	-	1	20.5	---
End of Echo #9	-	32.7	-	-	-	-	-	-	-	-	-	-	1	32.7	---
Begin Echo #10	-	57.3	-	-	-	46.7	-	-	-	-	-	-	2	52.0	7.5
Tarantula Room #11	-	11.9	-	-	-	19.0	-	-	-	-	-	18.3	3	16.4	3.9
Mud Flats #12	-	-	-	-	-	-	-	-	-	-	-	25.3	1	25.3	---
Sharon's Saddle #13	-	17.1	17.7	-	-	14.8	-	-	-	20.9	-	-	4	17.6	2.5
Main Corridor #14	-	11.3	15.2	-	-	10.4	-	-	-	-	16.7	19.8	5	14.7	3.9
Scorpion Passages #15	-	-	-	-	-	13.6	-	-	-	-	24.0	-	2	18.8	7.4
Grand Central #16	-	15.1	15.9	-	-	14.8	-	-	-	-	24.5	25.7	5	19.2	5.4
Lower Throne #17	-	-	-	-	-	-	-	41.2	-	-	-	-	1	41.2	---
Throne Rm. Overlook #18	-	-	-	-	-	-	-	20.5	-	-	-	-	1	20.5	---
Lovers' Leap #19	-	-	-	-	-	-	-	9.9	-	-	-	-	1	9.9	---
Mud Trench #20	21.8	-	-	-	-	-	-	26.8	-	-	-	-	2	24.3	3.5
Big Room Overlook #21	-	-	-	-	-	11.9	-	-	-	-	-	-	1	11.9	---
Kartchner Towers #22	14.6	-	21.8	-	-	22.0	18.3	-	18.9	-	-	-	5	19.1	3.0
Throne Room Guano pile	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	5.4	-	-	-	-	-	-	-	-	-	-	1	5.4	---
Blockade Room	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	19.0	-	-	-	-	-	-	-	-	-	-	-	1	19.0	---
Bathtub Room	-	-	-	-	9.8	-	-	-	-	-	-	-	1	9.8	---
Thunder Room	16.6	-	-	-	-	-	-	-	-	-	-	-	1	16.6	---
Strawberry Room	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	-	-	-	-	-	55	23.01	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	April, 1990	MONTHLY SUMMARY		
	No data for April 1990 - Radalert was broken	#	AVE.	S.D.
Surface	- - - - -	-	-	-
Crow's Nest #1	- - - - -	-	-	-
Pirate's Den #2	- - - - -	-	-	-
Sue's Room #3	- - - - -	-	-	-
Mushroom #4	- - - - -	-	-	-
Granite Dells #5	- - - - -	-	-	-
Pyramid Room #6	- - - - -	-	-	-
Cul-de-Sac #7	- - - - -	-	-	-
Rotunda Room #8	- - - - -	-	-	-
End of Echo #9	- - - - -	-	-	-
Begin Echo #10	- - - - -	-	-	-
Tarantula Room #11	- - - - -	-	-	-
Mud Flats #12	- - - - -	-	-	-
Sharon's Saddle #13	- - - - -	-	-	-
Main Corridor #14	- - - - -	-	-	-
Scorpion Passages #15	- - - - -	-	-	-
Grand Central #16	- - - - -	-	-	-
Lower Throne #17	- - - - -	-	-	-
Throne Rm. Overlook #18	- - - - -	-	-	-
Lovers' Leap #19	- - - - -	-	-	-
Mud Trench #20	- - - - -	-	-	-
Big Room Overlook #21	- - - - -	-	-	-
Kartchner Towers #22	- - - - -	-	-	-
Throne Room Guano pile	- - - - -	-	-	-
Subway 1 to 5 minutes	- - - - -	-	-	-
Subway 6 to 10 minutes	- - - - -	-	-	-
Crinoid Room	- - - - -	-	-	-
Blockade Room	- - - - -	-	-	-
Grand Canyon	- - - - -	-	-	-
Bathtub Room	- - - - -	-	-	-
Thunder Room	- - - - -	-	-	-
Strawberry Room	- - - - -	-	-	-
Lunch Spot	- - - - -	-	-	-
Echo Passage-Entrance	- - - - -	-	-	-
Echo Passage at Shield	- - - - -	-	-	-
Echo Pass.-1/2 to Evap.	- - - - -	-	-	-
Total	- - - - -	-	-	-

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	May, 1990									Monthly Summary		
	8-May	10-May	13-May	14-May	16-May	18-May	23-May	24-May	30-May	#	AVE.	S.D.
Surface	21.3	-	-	-	-	20.4	-	-	-	2	20.9	0.6
Crow's Nest #1	-	-	-	-	-	42.4	-	-	-	1	42.4	---
Pirate's Den #2	-	-	-	-	-	37.0	-	-	-	1	37.0	---
Sue's Room #3	-	-	-	-	-	45.0	-	-	-	1	45.0	---
Mushroom #4	-	-	-	-	-	48.8	-	-	-	1	48.8	---
Granite Dells #5	-	-	-	34.2	-	-	-	-	-	1	34.2	---
Pyramid Room #6	-	-	-	54.1	-	32.3	-	-	-	2	43.2	15.4
Cul-de-Sac #7	-	-	48.6	-	-	-	-	-	-	1	48.6	---
Rotunda Room #8	-	-	-	-	43.2	-	-	-	-	1	43.2	---
End of Echo #9	-	-	33.7	-	-	-	40.6	32.0	-	3	35.4	4.6
Begin Echo #10	-	-	47.9	-	-	-	-	41.7	-	2	44.8	4.4
Tarantula Room #11	-	27.6	22.9	-	-	-	-	-	-	2	25.3	3.3
Mud Flats #12	18.8	24.2	33.5	-	-	-	42.0	37.1	26.2	6	30.3	8.7
Sharon's Saddle #13	29.8	41.6	41.4	-	-	-	35.3	42.9	41.5	6	38.8	5.1
Main Corridor #14	-	56.6	24.9	-	-	-	-	-	-	2	40.8	22.4
Scorpion Passages #15	-	-	23.2	-	-	-	-	-	-	1	23.2	---
Grand Central #16	39.3	-	23.8	-	-	-	-	-	24.6	3	29.2	8.7
Lower Throne #17	-	-	-	-	48.1	-	-	-	-	1	48.1	---
Throne Rm. Overlook #18	-	-	-	-	38.4	-	-	-	-	1	38.4	---
Lovers' Leap #19	-	-	-	27.0	-	-	-	-	-	1	27.0	---
Mud Trench #20	-	-	-	-	40.6	-	-	-	-	1	40.6	---
Big Room Overlook #21	-	-	28.1	-	-	-	-	-	-	1	28.1	---
Kartchner Towers #22	41.6	43.5	-	36.9	-	34.6	43.1	-	38.2	6	39.7	3.6
Throne Room Guano pile	-	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	23.2	-	11.0	-	-	-	-	-	2	17.1	8.6
Blockade Room	-	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	-	51.7	50.7	52.6	-	-	-	3	51.7	1.0
Bathtub Room	-	-	-	29.0	-	-	-	-	-	1	29.0	---
Thunder Room	-	-	-	-	39.1	-	-	-	-	1	39.1	---
Strawberry Room	-	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	-	-	52	36.85	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	June, 1990										Monthly Summary		
	1-Jun	6-Jun	8-Jun	11-Jun	13-Jun	17-Jun	20-Jun	21-Jun	23-Jun	27-Jun	#	AVE.	S.D.
Surface	-	21.9	-	-	22.3	-	22.0	-	-	-	3	22.1	0.2
Crow's Nest #1	-	-	-	-	-	-	-	-	43.2	-	1	43.2	---
Pirate's Den #2	-	-	-	-	-	-	-	-	47.7	-	1	47.7	---
Sue's Room #3	-	-	-	-	-	-	-	-	41.0	-	1	41.0	---
Mushroom #4	-	-	-	-	-	-	-	-	54.2	-	1	54.2	---
Granite Dells #5	-	-	-	-	-	-	-	-	29.0	-	1	29.0	---
Pyramid Room #6	-	-	-	-	-	72.0	-	-	32.5	-	2	52.3	27.9
Cul-de-Sac #7	-	-	-	-	-	-	58.5	-	-	-	1	58.5	---
Rotunda Room #8	-	-	-	-	-	-	-	-	34.3	-	1	34.3	---
End of Echo #9	-	-	-	-	-	-	43.7	-	-	-	1	43.7	---
Begin Echo #10	-	-	-	-	-	-	52.3	-	-	-	1	52.3	---
Tarantula Room #11	-	30.6	-	-	-	-	-	-	-	24.1	2	27.4	4.6
Mud Flats #12	30.7	42.5	-	-	28.3	-	30.1	41.5	-	28.2	6	33.6	6.6
Sharon's Saddle #13	39.9	50.4	-	-	-	-	-	61.4	-	-	3	50.6	10.8
Main Corridor #14	31.2	35.7	-	-	-	-	39.6	-	-	30.1	4	34.2	4.4
Scorpion Passages #15	-	47.8	-	-	-	-	-	-	-	48.3	2	48.1	0.4
Grand Central #16	25.1	34.5	-	-	39.1	-	-	-	-	45.1	4	36.0	8.4
Lower Throne #17	-	-	-	-	-	44.3	-	-	-	-	1	44.3	---
Throne Rm. Overlook #18	-	-	-	-	-	45.5	-	-	-	-	1	45.5	---
Lovers' Leap #19	-	-	-	-	-	23.0	-	-	-	-	1	23.0	---
Mud Trench #20	-	-	-	-	-	-	-	-	37.0	-	1	37.0	---
Big Room Overlook #21	-	-	-	-	-	-	-	55.5	-	-	1	55.5	---
Kartchner Towers #22	-	-	-	-	-	-	-	47.1	-	-	1	47.1	---
Throne Room Guano pile	-	-	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	77.7	-	-	1	77.7	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	13.4	25.0	10.4	18.3	-	-	-	-	-	-	4	16.8	6.4
Blockade Room	-	-	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	-	-	-	-	-	-	-	-	0	---	---
Bathtub Room	-	-	-	-	-	-	-	21.3	-	-	1	21.3	---
Thunder Room	-	-	-	-	-	-	-	-	-	-	0	---	---
Strawberry Room	-	-	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	-	-	44	38.89	
Total	-	-	-	-	-	-	-	-	-	-			

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KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	July, 1990							Monthly Summary		
	1-Jul	3-Jul	16-Jul	18-Jul	24-Jul	26-Jul	31-Jul	#	AVE.	S.D.
Surface	-	21.8	20.7	21.2	-	-	21.8	4	21.4	0.5
Crow's Nest #1	-	-	-	-	-	-	-	0	---	---
Pirate's Den #2	-	-	-	-	-	-	-	0	---	---
Sue's Room #3	-	-	-	-	-	-	-	0	---	---
Mushroom #4	-	-	-	-	-	-	-	0	---	---
Granite Dells #5	-	-	-	-	-	43.3	-	1	43.3	---
Pyramid Room #6	-	-	-	46.7	-	56.6	43.8	3	49.0	6.7
Cul-de-Sac #7	-	-	-	-	-	-	-	0	---	---
Rotunda Room #8	-	-	-	-	-	-	47.0	1	47.0	---
End of Echo #9	-	-	-	-	-	-	27.4	1	27.4	---
Begin Echo #10	-	-	-	-	-	-	46.4	1	46.4	---
Tarantula Room #11	-	-	-	-	-	26.4	-	1	26.4	---
Mud Flats #12	56.9	-	-	-	27.7	34.4	-	3	39.7	15.3
Sharon's Saddle #13	48.5	-	24.6	-	-	-	30.0	3	34.4	12.5
Main Corridor #14	-	-	-	-	25.8	-	-	1	25.8	---
Scorpion Passages #15	-	-	-	-	25.7	-	-	1	25.7	---
Grand Central #16	-	-	27.6	-	29.2	-	-	2	28.4	1.1
Lower Throne #17	-	-	-	43.7	-	-	51.7	2	47.7	5.7
Throne Rm. Overlook #18	-	-	-	46.7	-	-	39.3	2	43.0	5.2
Lovers' Leap #19	-	-	-	-	-	33.2	-	1	33.2	---
Mud Trench #20	-	-	-	-	-	-	44.9	1	44.9	---
Big Room Overlook #21	-	-	-	-	-	-	-	0	---	---
Kartchner Towers #22	-	-	-	-	-	-	-	0	---	---
Throne Room Guano pile	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	-	-	-	-	0	---	---
Blockade Room	-	-	-	-	-	60.0	-	1	60.0	---
Grand Canyon	-	-	-	-	-	22.2	-	1	22.2	---
Bathtub Room	-	-	-	-	-	48.0	-	1	48.0	---
Thunder Room	-	-	-	-	-	-	-	0	---	---
Strawberry Room	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	27	39.17	
Total	-	-	-	-	-	-	-			

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	August, 1990								Monthly Summary		
	2-Aug	4-Aug	9-Aug	14-Aug	15-Aug	21-Aug	23-Aug	26-Aug	#	AVE.	S.D.
Surface	-	-	-	20.8	-	-	-	-	1	20.8	---
Crow's Nest #1	38.5	-	-	-	-	-	-	36.2	2	37.4	1.6
Pirate's Den #2	36.3	-	-	-	-	-	-	27.3	2	31.8	6.4
Sue's Room #3	35.7	-	-	-	-	-	-	33.7	2	34.7	1.4
Mushroom #4	48.4	-	-	-	-	-	-	43.4	2	45.9	3.5
Granite Dells #5	-	-	-	-	-	-	-	-	0	---	---
Pyramid Room #6	-	-	-	-	-	-	-	-	0	---	---
Cul-de-Sac #7	-	40.4	-	-	-	-	50.3	-	2	45.4	7.0
Rotunda Room #8	32.2	-	-	-	-	-	-	-	1	32.2	---
End of Echo #9	-	-	-	-	-	-	40.3	-	1	40.3	---
Begin Echo #10	-	-	-	-	-	-	54.5	-	1	54.5	---
Tarantula Room #11	-	-	21.5	-	-	-	39.2	-	2	30.4	12.5
Mud Flats #12	-	-	21.9	-	27.3	-	43.7	-	3	31.0	11.4
Sharon's Saddle #13	-	-	-	-	23.0	-	48.0	-	2	35.5	17.7
Main Corridor #14	-	30.9	20.5	-	29.9	-	47.6	-	4	32.2	11.3
Scorpion Passages #15	-	-	-	-	-	-	47.4	-	1	47.4	---
Grand Central #16	-	-	24.8	-	-	-	59.3	-	2	42.1	24.4
Lower Throne #17	-	-	-	-	-	-	-	-	0	---	---
Throne Rm. Overlook #18	-	-	-	-	-	-	-	-	0	---	---
Lovers' Leap #19	-	-	-	-	-	-	-	-	0	---	---
Mud Trench #20	-	-	-	-	-	-	-	-	0	---	---
Big Room Overlook #21	-	38.7	28.2	-	-	-	43.9	-	3	36.9	8.0
Kartchner Towers #22	-	43.1	-	-	-	-	-	-	1	43.1	---
Throne Room Guano pile	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	7.0	-	-	-	-	-	-	1	7.0	---
Blockade Room	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	50.3	-	-	-	-	-	-	-	1	50.3	---
Bathtub Room	-	-	-	-	-	-	-	-	0	---	---
Thunder Room	-	-	-	-	-	-	-	-	0	---	---
Strawberry Room	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	-	33	36.77	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	September, 1990					Monthly Summary		
	4-Sep	11-Sep	25-Sep	27-Sep	30-Sep	#	AVE.	S.D.
Surface	20.8	-	21.4	-	-	2	21.1	0.4
Crow's Nest #1	-	-	-	-	31.7	1	31.7	---
Pirate's Den #2	-	-	-	-	34.5	1	34.5	---
Sue's Room #3	-	-	-	-	29.9	1	29.9	---
Mushroom #4	-	-	-	-	45.4	1	45.4	---
Granite Dells #5	-	-	-	-	-	0	---	---
Pyramid Room #6	37.0	44.4	-	-	27.8	3	36.4	8.3
Cul-de-Sac #7	-	-	-	45.2	-	1	45.2	---
Rotunda Room #8	30.8	-	-	-	-	1	30.8	---
End of Echo #9	-	-	-	32.0	-	1	32.0	---
Begin Echo #10	-	-	-	40.4	-	1	40.4	---
Tarantula Room #11	-	-	22.7	-	-	1	22.7	---
Mud Flats #12	-	-	27.2	-	-	1	27.2	---
Sharon's Saddle #13	-	32.4	31.1	33.8	-	3	32.4	1.4
Main Corridor #14	-	37.1	15.8	27.0	-	3	26.6	10.7
Scorpion Passages #15	-	-	22.5	-	-	1	22.5	---
Grand Central #16	-	-	25.5	25.4	-	2	25.5	0.1
Lower Throne #17	30.8	-	-	-	-	1	30.8	---
Throne Rm. Overlook #18	27.9	-	-	-	-	1	27.9	---
Lovers' Leap #19	15.0	32.0	-	29.1	-	3	25.4	9.1
Mud Trench #20	39.5	-	-	-	-	1	39.5	---
Big Room Overlook #21	-	-	-	35.1	-	1	35.1	---
Kartchner Towers #22	-	51.8	-	45.4	-	2	48.6	4.5
Throne Room Guano pile	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	-	-	0	---	---
Blockade Room	-	-	-	-	-	0	---	---
Grand Canyon	41.1	61.2	-	-	42.0	3	48.1	11.4
Bathtub Room	17.5	26.8	-	23.4	-	3	22.6	4.7
Thunder Room	47.1	55.5	-	47.7	-	3	50.1	4.7
Strawberry Room	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	40	34.2	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	October, 1990									Monthly Summary		
	2-Oct	4-Oct	9-Oct	10-Oct	16-Oct	18-Oct	23-Oct	25-Oct	30-Oct	#	AVE.	S.D.
Surface	21.2	-	-	-	22.2	-	22.4	-	22.3	4	22.0	0.6
Crow's Nest #1	-	-	-	-	-	-	-	-	-	0	---	---
Pirate's Den #2	-	-	-	-	-	-	-	-	-	0	---	---
Sue's Room #3	-	-	-	-	-	-	-	-	-	0	---	---
Mushroom #4	-	-	-	-	-	-	-	-	-	0	---	---
Granite Dells #5	-	-	-	-	-	-	-	24.5	-	1	24.5	---
Pyramid Room #6	-	-	-	-	-	28.0	-	30.9	24.3	3	27.7	3.3
Cul-de-Sac #7	-	-	-	-	-	-	-	32.7	-	1	32.7	---
Rotunda Room #8	29.5	-	-	-	-	-	-	-	38.3	2	33.9	6.2
End of Echo #9	-	-	-	-	-	-	-	-	-	0	---	---
Begin Echo #10	-	-	-	-	-	-	-	54.4	-	1	54.4	---
Tarantula Room #11	-	-	-	-	-	-	-	10.6	-	1	10.6	---
Mud Flats #12	-	-	-	-	-	-	17.8	21.1	-	2	19.5	2.3
Sharon's Saddle #13	-	15.3	-	16.6	-	-	-	17.0	-	3	16.3	0.9
Main Corridor #14	-	-	-	12.8	-	-	11.9	13.2	-	3	12.6	0.7
Scorpion Passages #15	-	-	-	-	-	-	15.7	-	-	1	15.7	---
Grand Central #16	-	-	-	16.3	-	-	17.1	17.5	-	3	17.0	0.6
Lower Throne #17	46.4	-	-	-	-	-	-	-	29.9	2	38.2	11.7
Throne Rm. Overlook #18	38.2	-	-	-	-	-	-	-	36.9	2	37.6	0.9
Lovers' Leap #19	-	-	-	-	-	-	-	19.8	-	1	19.8	---
Mud Trench #20	42.3	-	-	-	-	29.0	-	-	43.7	3	38.3	8.1
Big Room Overlook #21	-	17.6	-	-	-	-	-	20.4	-	2	19.0	2.0
Kartchner Towers #22	-	-	-	-	-	-	22.6	25.5	-	2	24.1	2.1
Throne Room Guano pile	-	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	-	4.6	-	5.5	-	-	-	-	2	5.1	0.6
Blockade Room	-	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	-	-	-	34.6	-	-	41.5	2	38.1	4.9
Bathtub Room	-	-	-	-	-	13.7	-	24.6	14.3	3	17.5	6.1
Thunder Room	25.7	-	-	-	-	35.9	-	-	-	2	30.8	7.2
Strawberry Room	-	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	-	-	42	24.7	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	November, 1990								Monthly Summary		
	1-Nov	2-Nov	6-Nov	8-Nov	13-Nov	20-Nov	24-Nov	27-Nov	#	AVE.	S.D.
Surface	-	-	22.6	-	22.2	-	-	21.7	3	22.2	0.5
Crow's Nest #1	28.5	-	-	-	-	-	-	-	1	28.5	---
Pirate's Den #2	37.5	-	-	-	-	-	-	-	1	37.5	---
Sue's Room #3	30.5	-	-	-	-	-	-	-	1	30.5	---
Mushroom #4	36.3	-	-	-	-	-	-	-	1	36.3	---
Granite Dells #5	-	-	-	-	-	-	21.8	-	1	21.8	---
Pyramid Room #6	-	-	-	-	-	-	21.9	-	1	21.9	---
Cul-de-Sac #7	-	-	-	-	-	42.9	-	-	1	42.9	---
Rotunda Room #8	-	-	-	-	-	-	28.1	-	1	28.1	---
End of Echo #9	-	-	-	43.4	-	32.3	-	-	2	37.9	7.8
Begin Echo #10	-	-	-	78.1	-	59.0	-	-	2	68.6	13.5
Tarantula Room #11	-	-	-	-	-	19.5	-	-	1	19.5	---
Mud Flats #12	-	31.4	-	17.6	-	27.6	-	-	3	25.5	7.1
Sharon's Saddle #13	-	29.2	-	18.7	-	26.6	-	11.8	4	21.6	7.9
Main Corridor #14	-	24.2	-	6.6	-	18.4	-	-	3	16.4	9.0
Scorpion Passages #15	-	-	-	-	-	21.6	-	-	1	21.6	---
Grand Central #16	-	-	-	13.0	-	19.3	-	14.2	3	15.5	3.3
Lower Throne #17	-	-	-	-	-	-	38.7	-	1	38.7	---
Throne Rm. Overlook #18	-	-	-	-	-	-	29.0	-	1	29.0	---
Lovers' Leap #19	-	-	-	-	-	-	12.7	-	1	12.7	---
Mud Trench #20	-	-	-	-	-	-	31.9	-	1	31.9	---
Big Room Overlook #21	-	-	-	-	-	34.4	-	-	1	34.4	---
Kartchner Towers #22	-	51.6	-	-	-	43.5	-	-	2	47.6	5.7
Throne Room Guano pile	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	4.7	-	-	-	5.9	2	5.3	0.8
Blockade Room	-	-	-	8.7	-	-	-	-	1	8.7	---
Grand Canyon	45.9	-	-	-	-	-	-	-	1	45.9	---
Bathtub Room	-	-	-	-	-	-	13.9	-	1	13.9	---
Thunder Room	-	-	-	-	-	-	15.1	-	1	15.1	---
Strawberry Room	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	-	40	27.4	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	December, 1990					Monthly Summary		
	5-Dec	11-Dec	13-Dec	18-Dec	19-Dec	#	AVE.	S.D.
Surface	21.1	22.3	-	20.5	-	3	21.3	0.9
Crow's Nest #1	-	-	-	-	25.8	1	25.8	---
Pirate's Den #2	-	-	-	-	24.1	1	24.1	---
Sue's Room #3	-	-	-	-	16.7	1	16.7	---
Mushroom #4	-	-	-	-	31.2	1	31.2	---
Granite Dells #5	-	-	-	-	-	0	---	---
Pyramid Room #6	-	-	-	-	11.0	1	11.0	---
Cul-de-Sac #7	-	-	-	-	-	0	---	---
Rotunda Room #8	-	32.6	-	-	-	1	32.6	---
End of Echo #9	-	-	-	35.0	-	1	35.0	---
Begin Echo #10	82.9	-	-	89.6	-	2	86.3	4.7
Tarantula Room #11	-	-	-	10.9	-	1	10.9	---
Mud Flats #12	28.0	-	-	16.7	-	2	22.4	8.0
Sharon's Saddle #13	11.1	-	14.9	-	-	2	13.0	2.7
Main Corridor #14	17.3	9.8	-	-	-	2	13.6	5.3
Scorpion Passages #15	-	-	-	13.4	-	1	13.4	---
Grand Central #16	12.8	-	-	-	-	1	12.8	---
Lower Throne #17	-	-	-	-	-	0	---	---
Throne Rm. Overlook #18	-	21.8	-	-	-	1	21.8	---
Lovers' Leap #19	-	8.0	-	-	12.3	2	10.2	3.0
Mud Trench #20	-	39.8	-	-	23.3	2	31.6	11.7
Big Room Overlook #21	-	-	-	13.9	-	1	13.9	---
Kartchner Towers #22	15.4	19.5	-	-	-	2	17.5	2.9
Throne Room Guano pile	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	44.6	-	-	-	1	44.6	---
Subway 6 to 10 minutes	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	-	-	0	---	---
Blockade Room	-	-	-	-	-	0	---	---
Grand Canyon	-	19.1	-	-	-	1	19.1	---
Bathtub Room	-	-	-	-	10.5	1	10.5	---
Thunder Room	-	14.6	-	-	-	1	14.6	---
Strawberry Room	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	30	24.2	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	January, 1991			Monthly Summary		
	2-Jan	5-Jan	8-Jan	#	AVE.	S.D.
Surface	21.0	-	21.3	2	21.2	0.2
Crow's Nest #1	-	-	-	0	---	---
Pirate's Den #2	-	-	-	0	---	---
Sue's Room #3	-	-	-	0	---	---
Mushroom #4	-	-	-	0	---	---
Granite Dells #5	-	-	-	0	---	---
Pyramid Room #6	-	-	-	0	---	---
Cul-de-Sac #7	-	-	-	0	---	---
Rotunda Room #8	-	-	-	0	---	---
End of Echo #9	-	-	-	0	---	---
Begin Echo #10	-	77.1	-	1	77.1	---
Tarantula Room #11	-	-	-	0	---	---
Mud Flats #12	-	14.2	-	1	14.2	---
Sharon's Saddle #13	-	16.9	-	1	16.9	---
Main Corridor #14	-	11.6	-	1	11.6	---
Scorpion Passages #15	-	-	-	0	---	---
Grand Central #16	-	-	-	0	---	---
Lower Throne #17	-	-	-	0	---	---
Throne Rm. Overlook #18	-	-	-	0	---	---
Lovers' Leap #19	-	-	-	0	---	---
Mud Trench #20	-	-	-	0	---	---
Big Room Overlook #21	-	-	-	0	---	---
Kartchner Towers #22	-	-	-	0	---	---
Throne Room Guano pile	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	0	---	---
Crinoid Room	-	-	-	0	---	---
Blockade Room	-	-	-	0	---	---
Grand Canyon	-	-	-	0	---	---
Bathtub Room	-	-	-	0	---	---
Thunder Room	-	-	-	0	---	---
Strawberry Room	-	-	-	0	---	---
Lunch Spot	-	-	-	0	---	---
Echo Passage-Entrance	-	36.4	-	1	36.4	---
Echo Passage at Shield	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	0	---	---
Total	-	-	-	5	31.2	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	February, 1991					MONTHLY SUMMARY		
	No data for April 1990 - Radalert was broken					#	AVE.	S.D.
Surface	-	-	-	-	-	-	-	-
Crow's Nest #1	-	-	-	-	-	-	-	-
Pirate's Den #2	-	-	-	-	-	-	-	-
Sue's Room #3	-	-	-	-	-	-	-	-
Mushroom #4	-	-	-	-	-	-	-	-
Granite Dells #5	-	-	-	-	-	-	-	-
Pyramid Room #6	-	-	-	-	-	-	-	-
Cul-de-Sac #7	-	-	-	-	-	-	-	-
Rotunda Room #8	-	-	-	-	-	-	-	-
End of Echo #9	-	-	-	-	-	-	-	-
Begin Echo #10	-	-	-	-	-	-	-	-
Tarantula Room #11	-	-	-	-	-	-	-	-
Mud Flats #12	-	-	-	-	-	-	-	-
Sharon's Saddle #13	-	-	-	-	-	-	-	-
Main Corridor #14	-	-	-	-	-	-	-	-
Scorpion Passages #15	-	-	-	-	-	-	-	-
Grand Central #16	-	-	-	-	-	-	-	-
Lower Throne #17	-	-	-	-	-	-	-	-
Throne Rm. Overlook #18	-	-	-	-	-	-	-	-
Lovers' Leap #19	-	-	-	-	-	-	-	-
Mud Trench #20	-	-	-	-	-	-	-	-
Big Room Overlook #21	-	-	-	-	-	-	-	-
Kartchner Towers #22	-	-	-	-	-	-	-	-
Throne Room Guano pile	-	-	-	-	-	-	-	-
Subway 1 to 5 minutes	-	-	-	-	-	-	-	-
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-
Crinoid Room	-	-	-	-	-	-	-	-
Blockade Room	-	-	-	-	-	-	-	-
Grand Canyon	-	-	-	-	-	-	-	-
Bathtub Room	-	-	-	-	-	-	-	-
Thunder Room	-	-	-	-	-	-	-	-
Strawberry Room	-	-	-	-	-	-	-	-
Lunch Spot	-	-	-	-	-	-	-	-
Echo Passage-Entrance	-	-	-	-	-	-	-	-
Echo Passage at Shield	-	-	-	-	-	-	-	-
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	March, 1991							Monthly Summary		
	10-Mar	12-Mar	19-Mar	24-Mar	26-Mar	28-Mar	31-Mar	#	AVE.	S.D.
Surface	-	21.0	21.4	-	20.6	-	-	3	21.0	0.4
Crow's Nest #1	41.7	-	-	-	-	-	-	1	41.7	---
Pirate's Den #2	29.0	-	-	-	-	-	-	1	29.0	---
Sue's Room #3	31.7	-	-	-	-	-	-	1	31.7	---
Mushroom #4	-	-	-	-	-	-	-	0	---	---
Granite Dells #5	-	-	-	-	-	-	-	0	---	---
Pyramid Room #6	-	-	-	19.0	-	-	-	1	19.0	---
Cul-de-Sac #7	-	-	-	-	-	-	29.6	1	29.6	---
Rotunda Room #8	-	-	-	34.2	-	-	-	1	34.2	---
End of Echo #9	-	-	-	-	-	-	18.3	1	18.3	---
Begin Echo #10	-	-	-	-	-	-	25.8	1	25.8	---
Tarantula Room #11	-	-	-	-	-	-	-	0	---	---
Mud Flats #12	-	-	-	-	-	19.4	-	1	19.4	---
Sharon's Saddle #13	-	-	-	-	-	28.6	-	1	28.6	---
Main Corridor #14	-	-	-	-	-	12.1	-	1	12.1	---
Scorpion Passages #15	-	-	-	-	-	13.6	-	1	13.6	---
Grand Central #16	-	-	-	-	-	-	-	0	---	---
Lower Throne #17	-	-	-	40.0	-	-	-	1	40.0	---
Throne Rm. Overlook #18	-	-	-	26.5	-	-	-	1	26.5	---
Lovers' Leap #19	-	-	-	-	-	-	14.0	1	14.0	---
Mud Trench #20	-	-	-	-	-	-	-	0	---	---
Big Room Overlook #21	-	-	-	-	-	-	15.4	1	15.4	---
Kartchner Towers #22	-	-	-	-	-	27.6	-	1	27.6	---
Throne Room Guano pile	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	-	-	-	-	0	---	---
Blockade Room	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	-	-	-	-	-	0	---	---
Bathtub Room	-	-	-	-	-	-	11.8	1	11.8	---
Thunder Room	-	-	-	-	-	-	-	0	---	---
Strawberry Room	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	-	18	24.4	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	April, 1991						Monthly Summary		
	2-Apr	7-Apr	9-Apr	16-Apr	23-Apr	30-Apr	#	AVE.	S.D.
Surface	20.5	-	20.4	20.9	21.3	-	4	20.8	0.4
Crow's Nest #1	-	-	-	-	-	-	0	---	---
Pirate's Den #2	-	-	-	-	-	-	0	---	---
Sue's Room #3	-	-	-	-	-	-	0	---	---
Mushroom #4	-	-	-	-	-	-	0	---	---
Granite Dells #5	-	-	-	-	-	-	0	---	---
Pyramid Room #6	-	-	-	-	20.5	-	1	20.5	---
Cul-de-Sac #7	-	-	-	-	29.4	-	1	29.4	---
Rotunda Room #8	-	-	-	-	-	-	0	---	---
End of Echo #9	-	-	-	-	21.7	-	1	21.7	---
Begin Echo #10	-	-	-	-	31.7	-	1	31.7	---
Tarantula Room #11	14.0	-	-	-	15.1	-	2	14.6	0.8
Mud Flats #12	-	18.6	-	-	19.9	-	2	19.3	0.9
Sharon's Saddle #13	26.3	-	26.1	-	26.8	-	3	26.4	0.4
Main Corridor #14	-	-	-	-	21.1	-	1	21.1	---
Scorpion Passages #15	-	-	-	-	22.5	-	1	22.5	---
Grand Central #16	16.0	-	-	-	19.8	-	2	17.9	2.7
Lower Throne #17	-	-	-	-	-	-	0	---	---
Throne Rm. Overlook #18	-	-	-	-	-	-	0	---	---
Lovers' Leap #19	-	-	-	-	15.3	-	1	15.3	---
Mud Trench #20	-	-	-	-	-	-	0	---	---
Big Room Overlook #21	-	-	-	-	13.8	-	1	13.8	---
Kartchner Towers #22	-	22.3	-	-	19.2	-	2	20.8	2.2
Throne Room Guano pile	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minutes	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	-	-	5.6	1	5.6	---
Blockade Room	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	-	-	-	-	0	---	---
Bathtub Room	-	-	-	-	15.6	-	1	15.6	---
Thunder Room	-	-	-	-	-	-	0	---	---
Strawberry Room	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	0	---	---
Total	-	-	-	-	-	-	21	20.1	

KARTCHNER CAVERNS RADALERT

Counts per minute

LOCATION	May, 1991								Monthly Summary		
	5-May	9-May	10-May	14-May	16-May	21-May	23-May	29-May	#	AVE.	S.D.
Surface	-	-	-	-	-	-	21.0	-	1	21.0	---
Crow's Nest #1	-	-	-	-	-	-	-	-	0	---	---
Pirate's Den #2	-	-	-	-	-	-	-	-	0	---	---
Sue's Room #3	-	-	-	-	-	-	-	-	0	---	---
Mushroom #4	-	-	-	-	-	-	-	-	0	---	---
Granite Dells #5	-	-	-	-	-	-	-	-	0	---	---
Pyramid Room #6	-	-	40.4	-	-	-	-	28.1	2	34.3	8.7
Cul-de-sac #7	-	-	-	-	-	42.4	-	-	1	42.4	---
Rotunda Room #8	44.7	-	-	-	-	-	-	-	1	44.7	---
End of Echo #9	-	-	-	-	-	24.7	-	-	1	24.7	---
Begin Echo #10	-	-	-	-	-	35.1	-	-	1	35.1	---
Tarantula Room #11	-	-	-	-	-	18.2	-	-	1	18.2	---
Mud Flats #12	-	-	-	-	19.9	23.3	51.1	-	3	31.4	17.1
Sharon's Saddle #13	21.8	26.3	-	-	-	-	-	-	2	24.1	3.2
Main Corridor #14	-	-	-	-	-	-	-	-	0	---	---
Scorpion Passages #15	-	-	-	-	20.8	-	19.3	-	2	20.1	1.1
Grand Central #16	-	-	-	-	-	-	17.2	-	1	17.2	---
Lower Throne #17	32.1	-	-	-	-	-	-	66.6	2	49.4	24.4
Throne Rm. Overlook #18	29.5	-	-	-	-	-	-	34.3	2	31.9	3.4
Lovers Leap #19	-	-	17.1	-	-	-	-	11.8	2	14.5	3.7
Mud Trench #20	-	-	-	-	-	-	-	-	0	---	---
Big Room Overlook #21	-	-	-	-	-	21.5	-	-	1	21.5	---
Kartchner Towers #22	-	31.1	-	-	28.6	27.5	-	-	3	29.1	1.8
Throne Room Guano pile	-	-	-	-	-	-	-	-	0	---	---
Subway 1 to 5 minues	-	-	-	-	-	-	-	-	0	---	---
Subway 6 to 10 minutes	-	-	-	-	-	-	-	-	0	---	---
Crinoid Room	-	-	-	-	-	-	-	-	0	---	---
Blockade Room	-	-	-	-	-	-	-	-	0	---	---
Grand Canyon	-	-	48.0	-	-	-	-	-	1	48.0	---
Bathtub Room	-	-	-	-	-	-	-	13.1	1	13.1	---
Thunder Room	-	-	41.7	-	-	-	-	-	1	41.7	---
Strawberry Room	-	-	-	-	-	-	-	-	0	---	---
Lunch Spot	-	-	-	-	-	-	-	-	0	---	---
Echo Passage-Entrance	-	-	-	-	-	-	-	-	0	---	---
Echo Passage at Shield	-	-	-	-	-	-	-	-	0	---	---
Echo Pass.-1/2 to Evap.	-	-	-	-	-	-	-	-	0	---	---
Shelf Passage	-	-	42.1	-	-	-	-	-	1	42.1	---
Water Room	-	-	47.8	-	-	-	-	-	1	47.8	---
Start of Triangle Crawl	-	-	36.8	-	-	-	-	-	1	36.8	---
Bat House - Ceiling	-	53.3	-	56.6	-	-	-	-	2	55.0	2.3
Bat House - Floor	-	37.9	-	-	-	-	-	-	1	37.9	---
Total	-	-	-	-	-	-	-	-	34	32.7	

Big Room Radalert vs. Surface Temperatures Below 60°F

Average Monthly Radalert Readings correlated to Mean Monthly Surface Temperatures

DEP VAR: Radalert N: 10 MULTIPLE R: 0.660 SQUARED MULTIPLE R: 0.436
ADJUSTED SQUARED MULTIPLE R: 0.366 STANDARD ERROR OF ESTIMATE: 3.164

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	-11.370	11.451	0.000	-0.993	0.350	
Surface Temp	0.557	0.224	0.660	100E+01	2.488	0.038

CORRELATION MATRIX OF REGRESSION COEFFICIENTS

CONSTANT	1.000	
Surface Temp	-0.996	1.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	61.961	1	61.961	6.189	0.038
RESIDUAL	80.088	8	10.011		

Big Room Radalert vs. Surface Temperatures Above 60°F

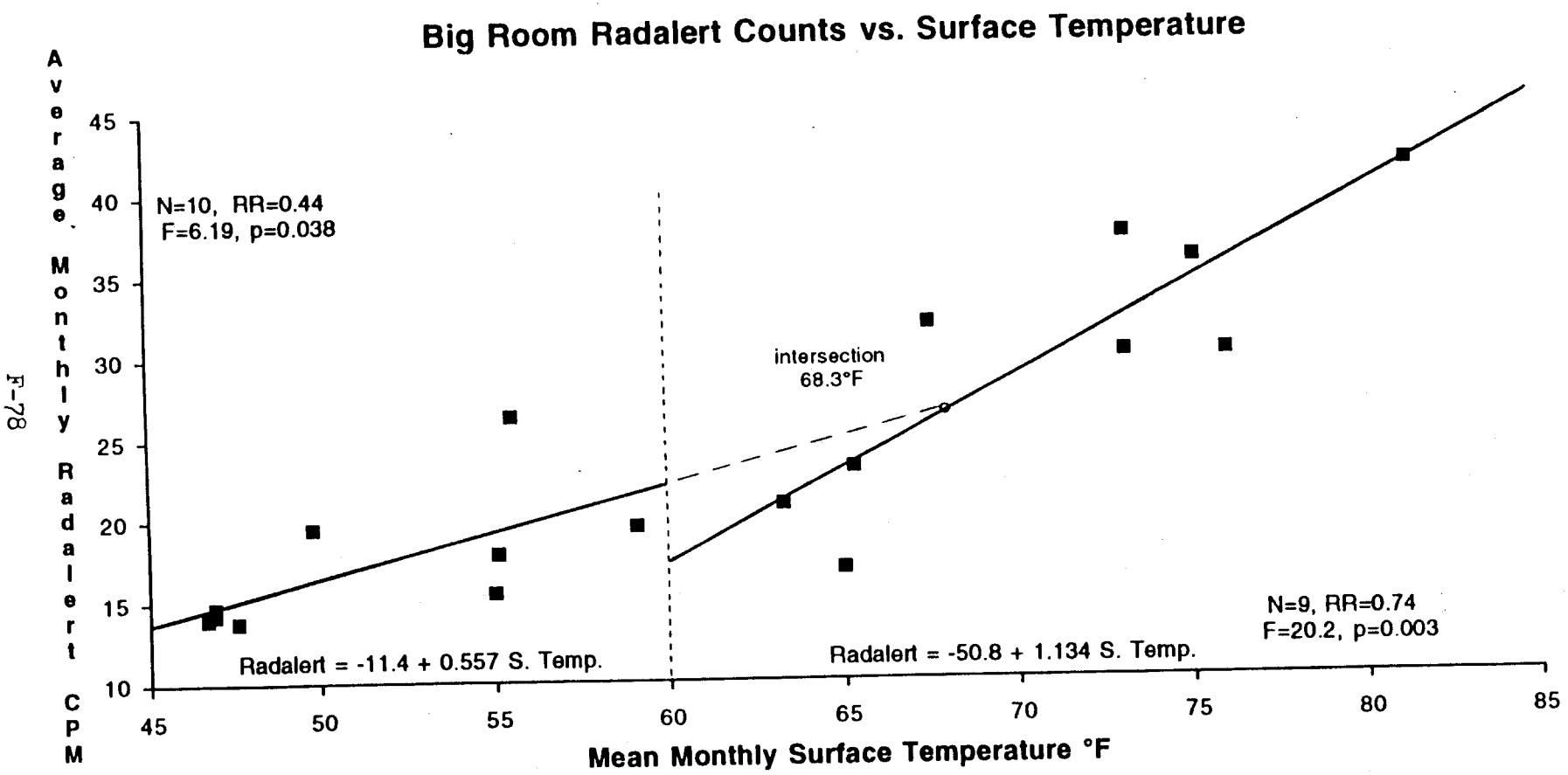
Average Monthly Radalert Counts correlated to Mean Montly Surface Temperatures

DEP VAR: Radalert N: 9 MULTIPLE R: 0.862 SQUARED MULTIPLE R: 0.743
ADJUSTED SQUARED MULTIPLE R: 0.706 STANDARD ERROR OF ESTIMATE: 4.406

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	-50.760	17.962	0.000	-2.826	0.026	
Surface Temp	1.134	0.252	0.862	.100E+01	4.496	0.003

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	392.463	1	392.463	20.219	0.003
RESIDUAL	135.877	7	19.411		


Big Room Radalert Counts vs. Surface Temperature
Average Monthly Radalert CPM
45
40
35
30
25
20
15
10
N=10, RR=0.44
F=6.19, p=0.038
intersection
68.3°F
N=9, RR=0.74
F=20.2, p=0.003
Radalert = -11.4 + 0.557 S. Temp.
Radalert = -50.8 + 1.134 S. Temp.
45
50
55
60
65
70
75
80
85
Mean Monthly Surface Temperature °F

River Passage Radalert vs. Surface Temperatures Above 60°F

Average Monthly Radalert Counts correlated to Mean Surface Temperature

DEP VAR: Radalert N: 8 MULTIPLE R: 0.817 SQUARED MULTIPLE R: 0.667
ADJUSTED SQUARED MULTIPLE R: 0.611 STANDARD ERROR OF ESTIMATE: 5.428

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	-59.940	27.690	0.000	-2.165	0.074	
Surface Temp	1.374	0.396	0.817	.100E+01	3.466	0.013

CORRELATION MATRIX OF REGRESSION COEFFICIENTS

CONSTANT	1.000	
Surface Temp	-0.998	1.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	354.049	1	354.049	12.015	0.013
RESIDUAL	176.800	6	29.467		

River Passage Radalert vs. Surface Temperatures Below 60°F

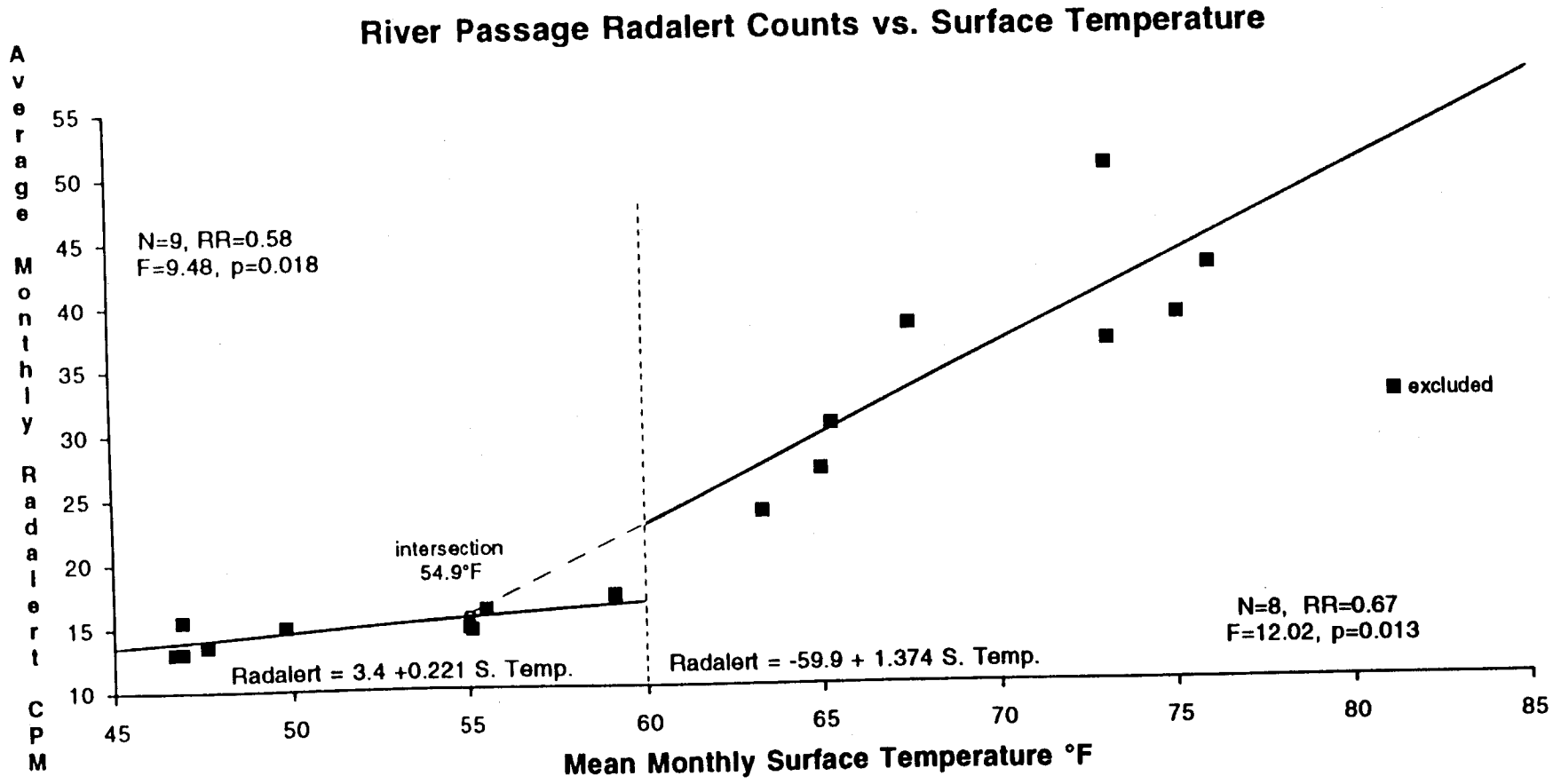
Average Monthly Radalert Counts correlated to Mean Monthly Surface Temperature

DEP VAR: Radalert N: 9 MULTIPLE R: 0.758 SQUARED MULTIPLE R: 0.575
ADJUSTED SQUARED MULTIPLE R: 0.514 STANDARD ERROR OF ESTIMATE: 0.965

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	3.413	3.699	0.000	0.923	0.387	
Surface Temp	0.221	0.072	0.758	.100E+01	3.078	0.018

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	8.824	1	8.824	9.477	0.018
RESIDUAL	6.518	7	0.931		


River Passage Radalert Counts vs. Surface Temperature
Average Monthly Radalert CPM
55
50
45
40
35
30
25
20
15
10
N=9, RR=0.58
F=9.48, p=0.018
intersection
54.9°F
Radalert = 3.4 +0.221 S. Temp.
Radalert = -59.9 + 1.374 S. Temp.
N=8, RR=0.67
F=12.02, p=0.013
excluded
45
50
55
60
65
70
75
80
85
Mean Monthly Surface Temperature °F

Throne/Rotunda Room Radalert vs. Surface Temperature

Average Monthly Radalert Counts correlated to Mean Monthly Surface Temperatures

DEP VAR: Radalert N: 15 MULTIPLE R: 0.720 SQUARED MULTIPLE R: 0.519
ADJUSTED SQUARED MULTIPLE R: 0.482 STANDARD ERROR OF ESTIMATE: 6.127

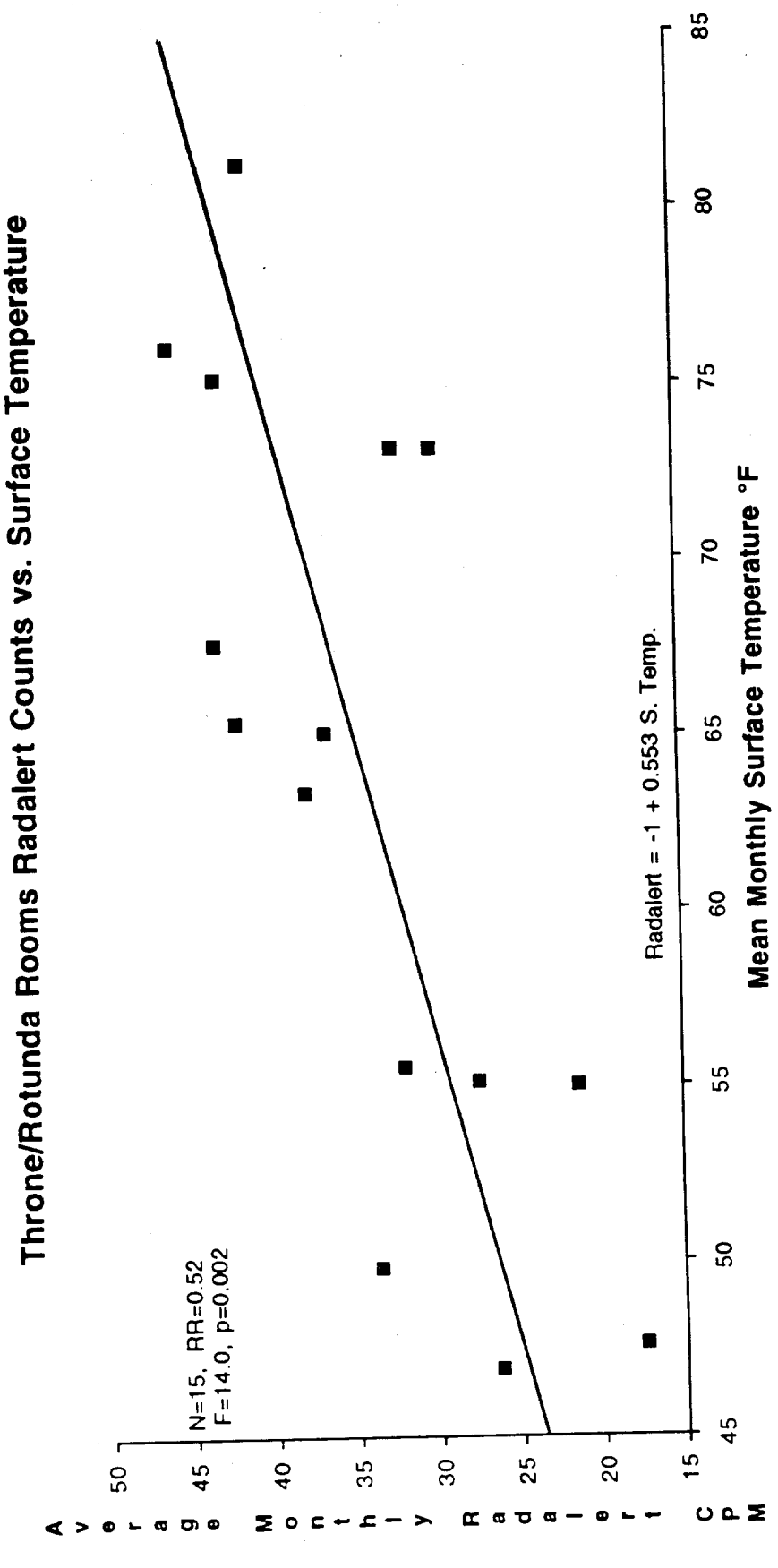
VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	-0.978	9.473	0.000	-0.103	0.919	
Surface Temperature	0.553	0.148	0.720	.100E+01	3.744	0.002

CORRELATION MATRIX OF REGRESSION COEFFICIENTS

CONSTANT	1.000	
Surface Temp	-0.986	1.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	526.243	1	526.243	14.020	0.002
RESIDUAL	487.967	13	37.536		


Throne/Rotunda Rooms Radalert Counts vs. Surface Temperature
Average Monthly Radalert CPM
N=15, RR=0.52
F=14.0, p=0.002
Radalert = -1 + 0.553 S. Temp.
Mean Monthly Surface Temperature °F
45
50
55
60
65
70
75
80
85
15
20
25
30
35
40
45
50

Back Section Radalert vs. Surface Temperature

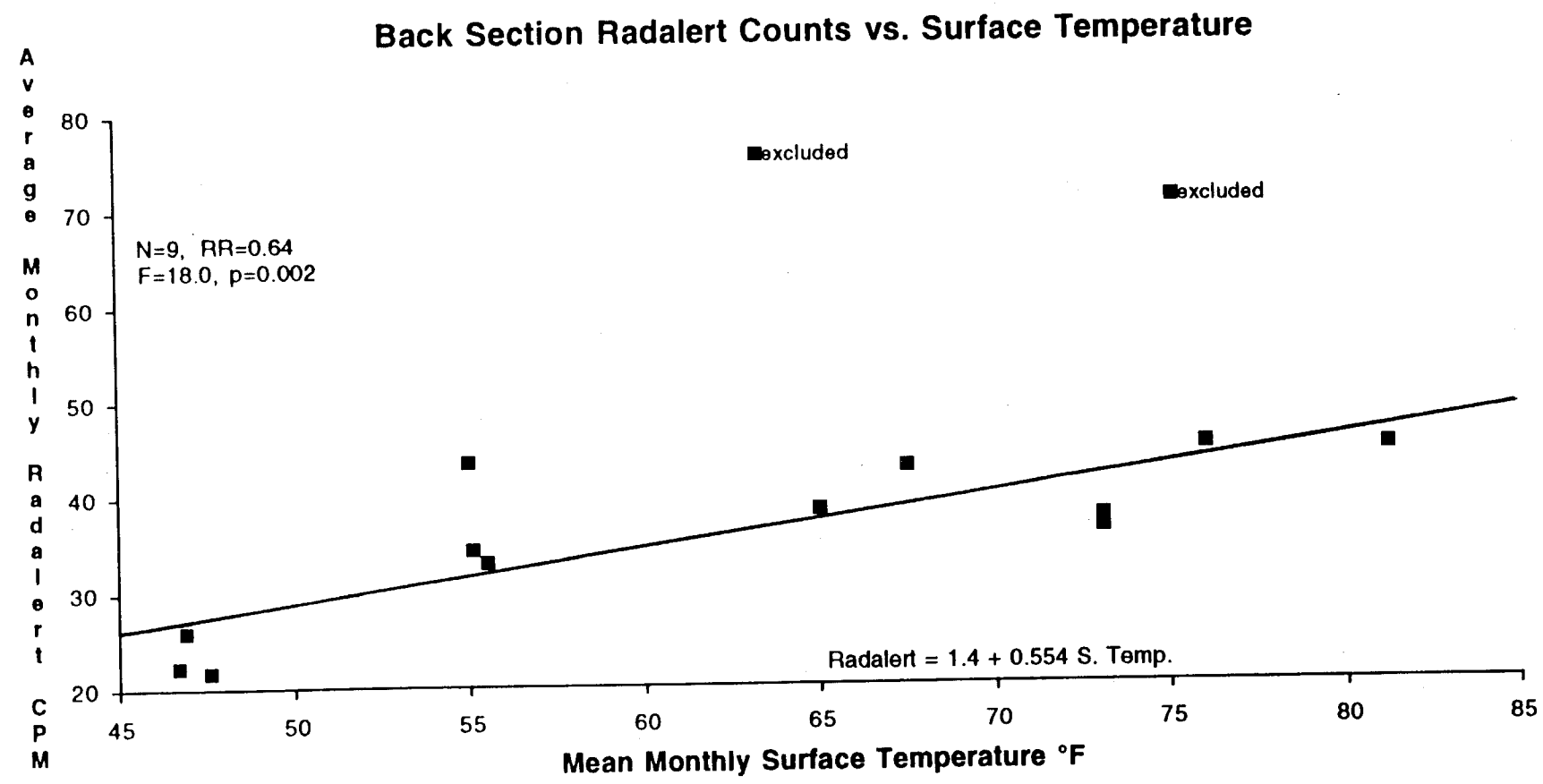
Average Monthly Radalert Counts correlated to Mean Monthly Surface Temperature

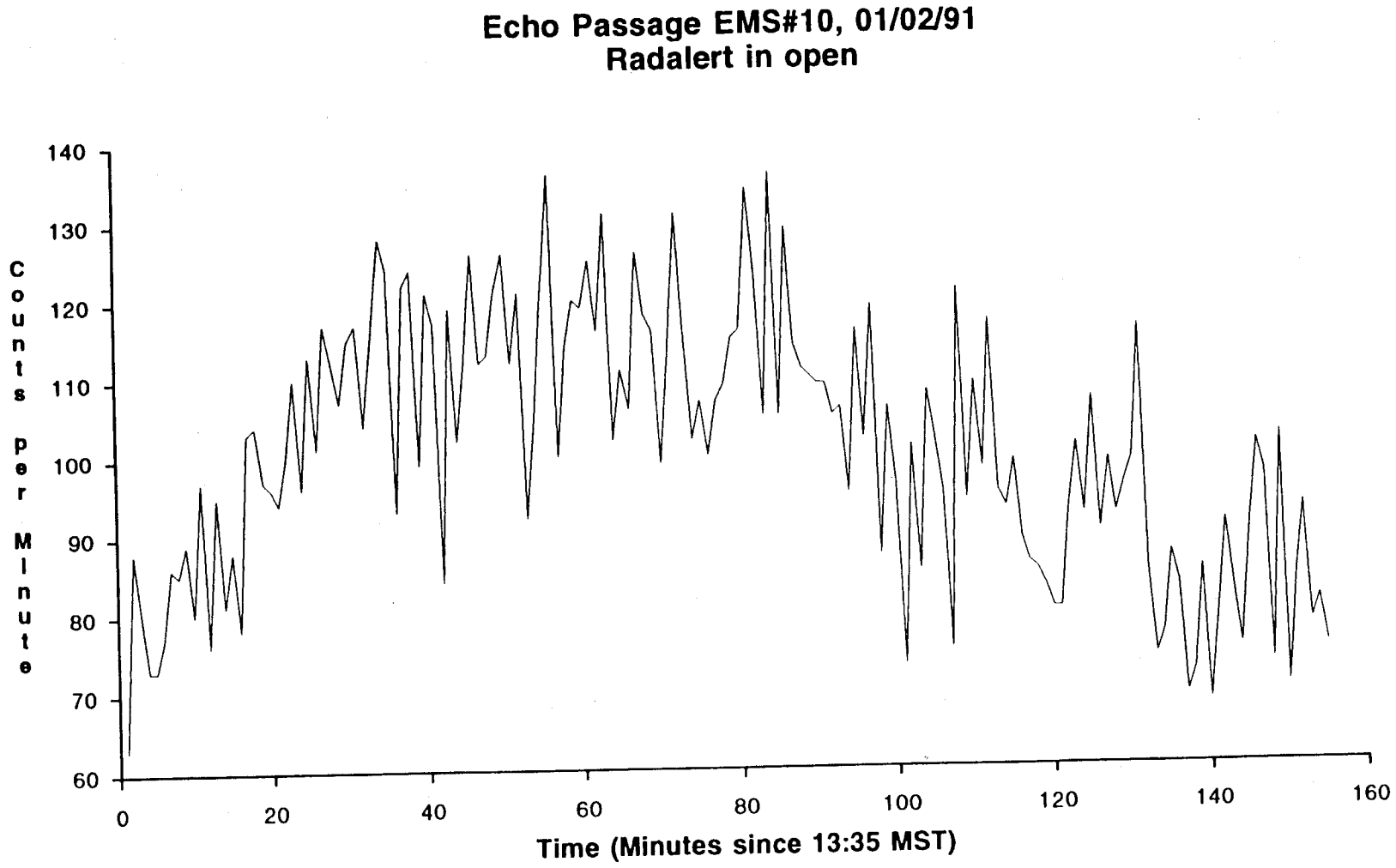
DEP VAR: Radalert N: 12 MULTIPLE R: 0.802 SQUARED MULTIPLE R: 0.643
ADJUSTED SQUARED MULTIPLE R: 0.607 STANDARD ERROR OF ESTIMATE: 5.309

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	1.379	8.225	0.000	0.168	0.870	
Surface Temp	0.554	0.131	0.802	.100E+01	4.243	0.002

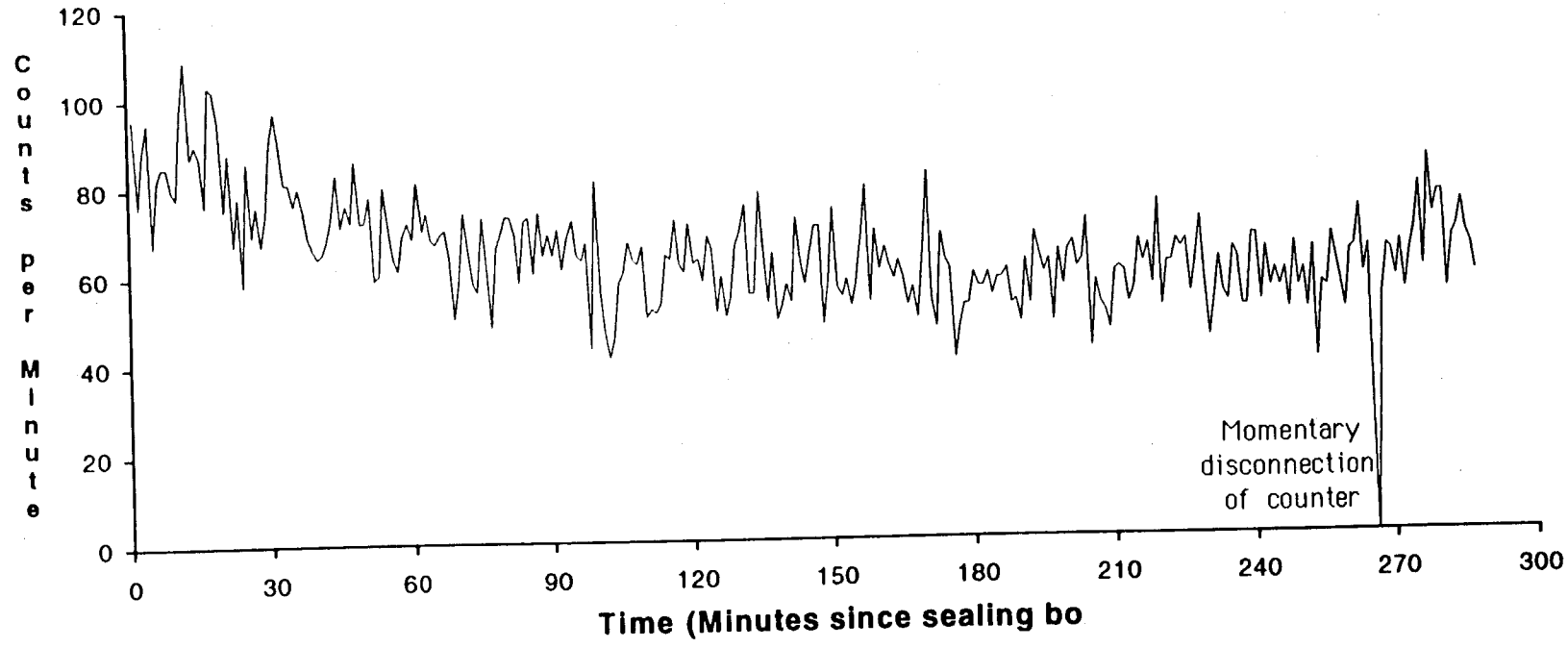
ANALYSIS OF VARIANCE

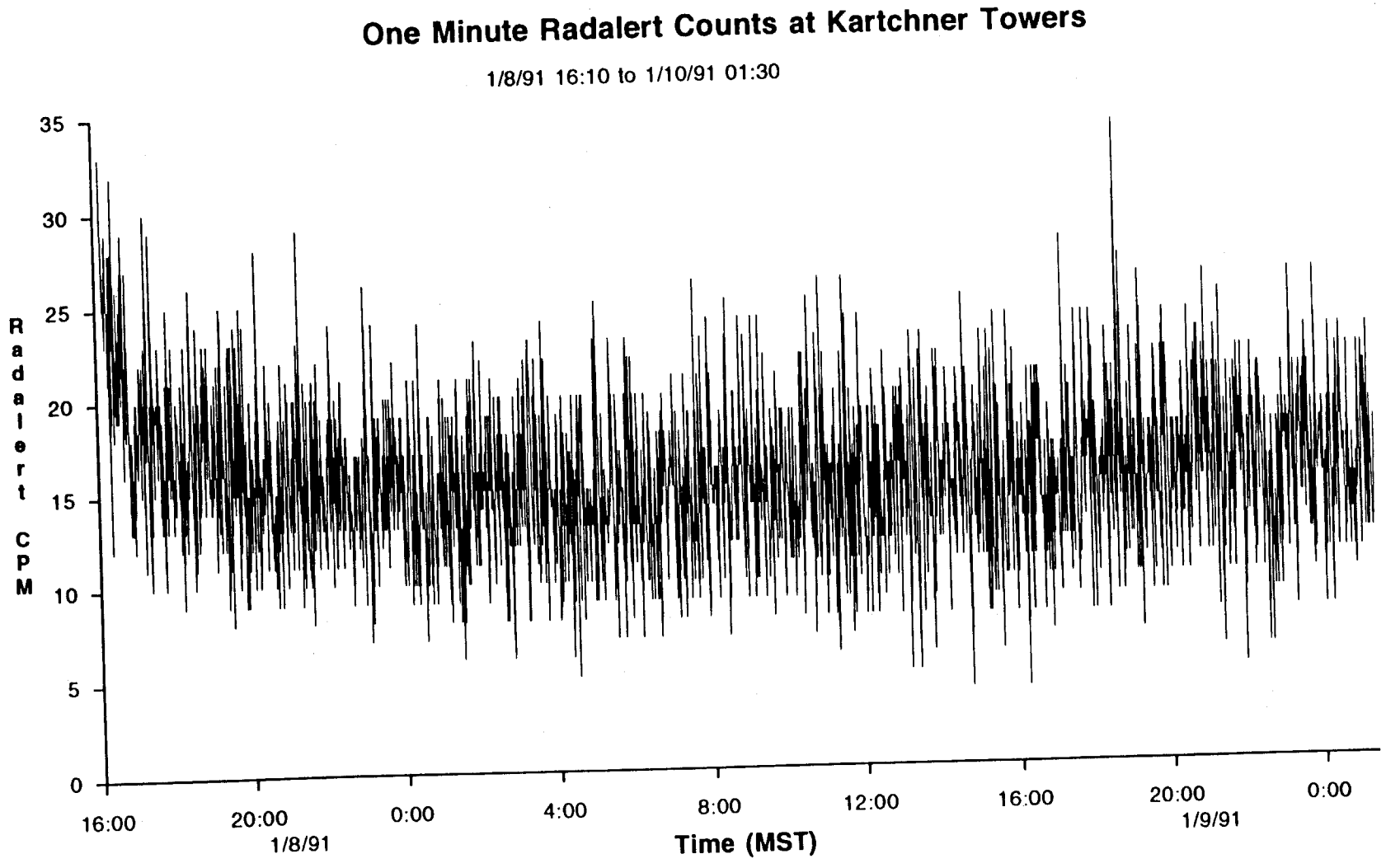
SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	507.437	1	507.437	18.003	0.002
RESIDUAL	281.870	10	28.187		


Back Section Radalert Counts vs. Surface Temperature
Average Monthly Radalert CPM
80
70
60
50
40
30
20
45
50
55
60
65
70
75
80
85
Mean Monthly Surface Temperature °F
excluded
excluded
N=9, RR=0.64
F=18.0, p=0.002
Radalert = 1.4 + 0.554 S. Temp.

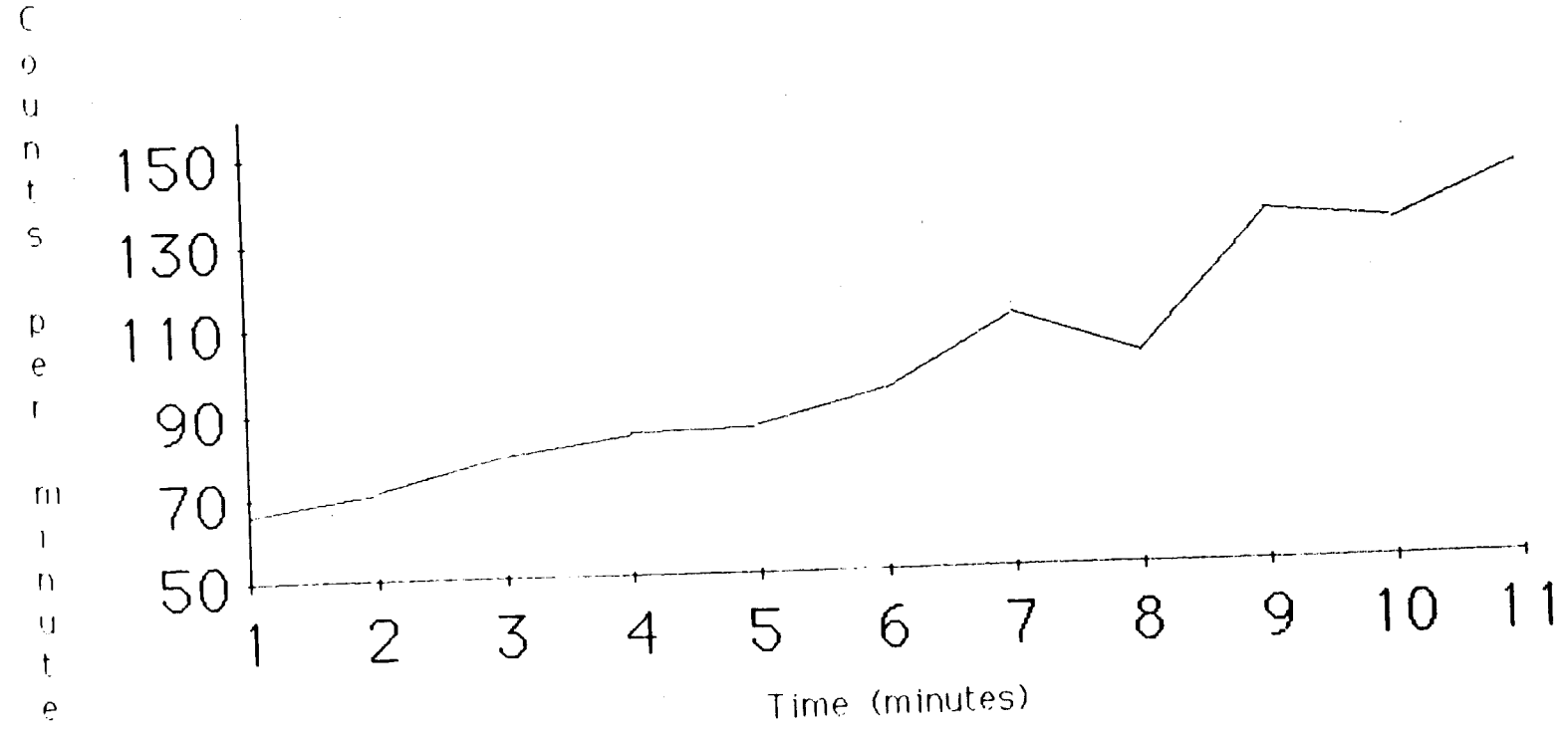

Echo Passage EMS#10, 01/02/91
Radalert in open
Counts per Minute
140
130
120
110
100
90
80
70
60
0
20
40
60
80
100
120
140
160
Time (Minutes since 13:35 MST)

Echo Passage EMS#10, 01/05/91
Radalert Counts in a sealed box

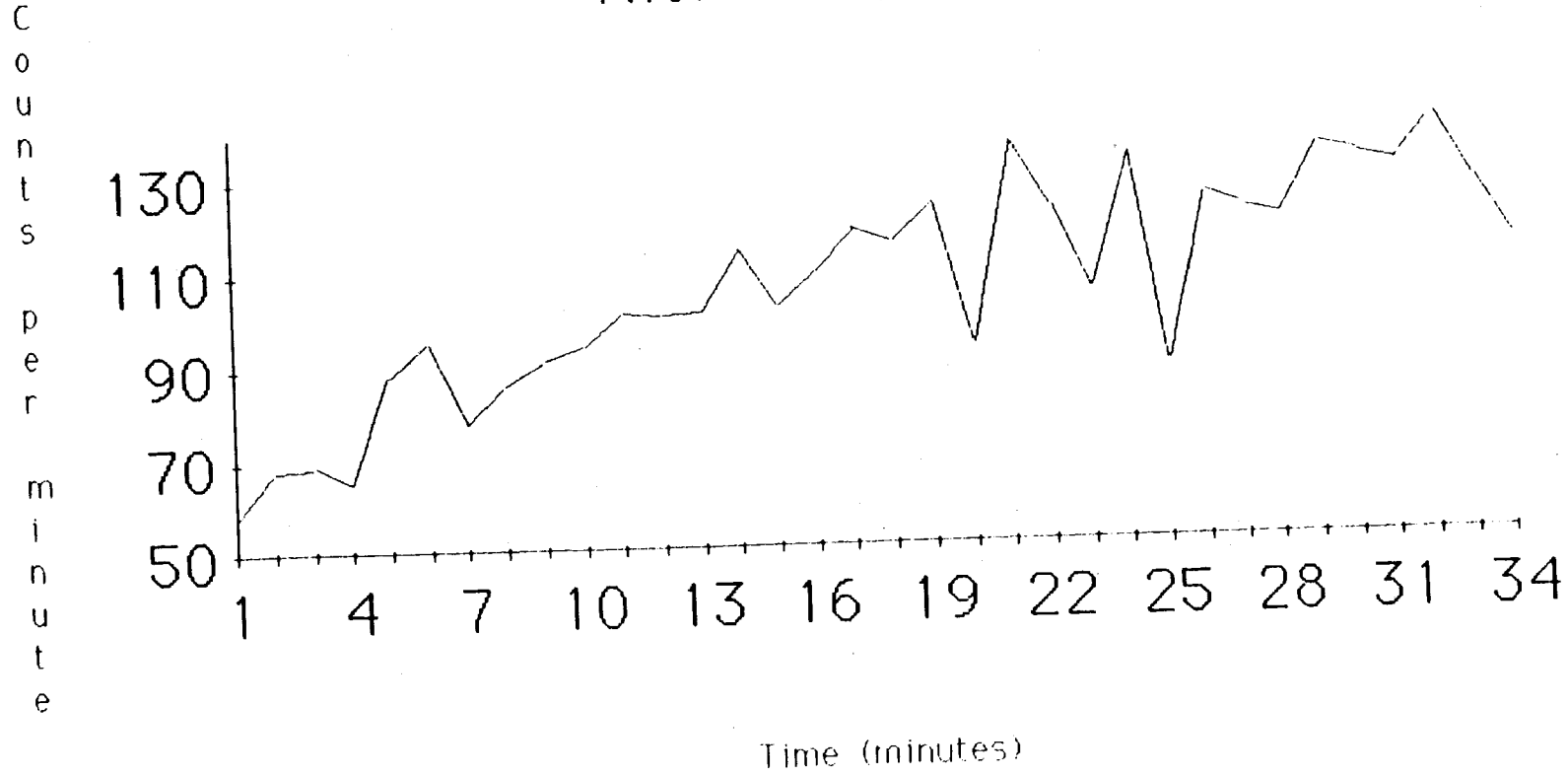


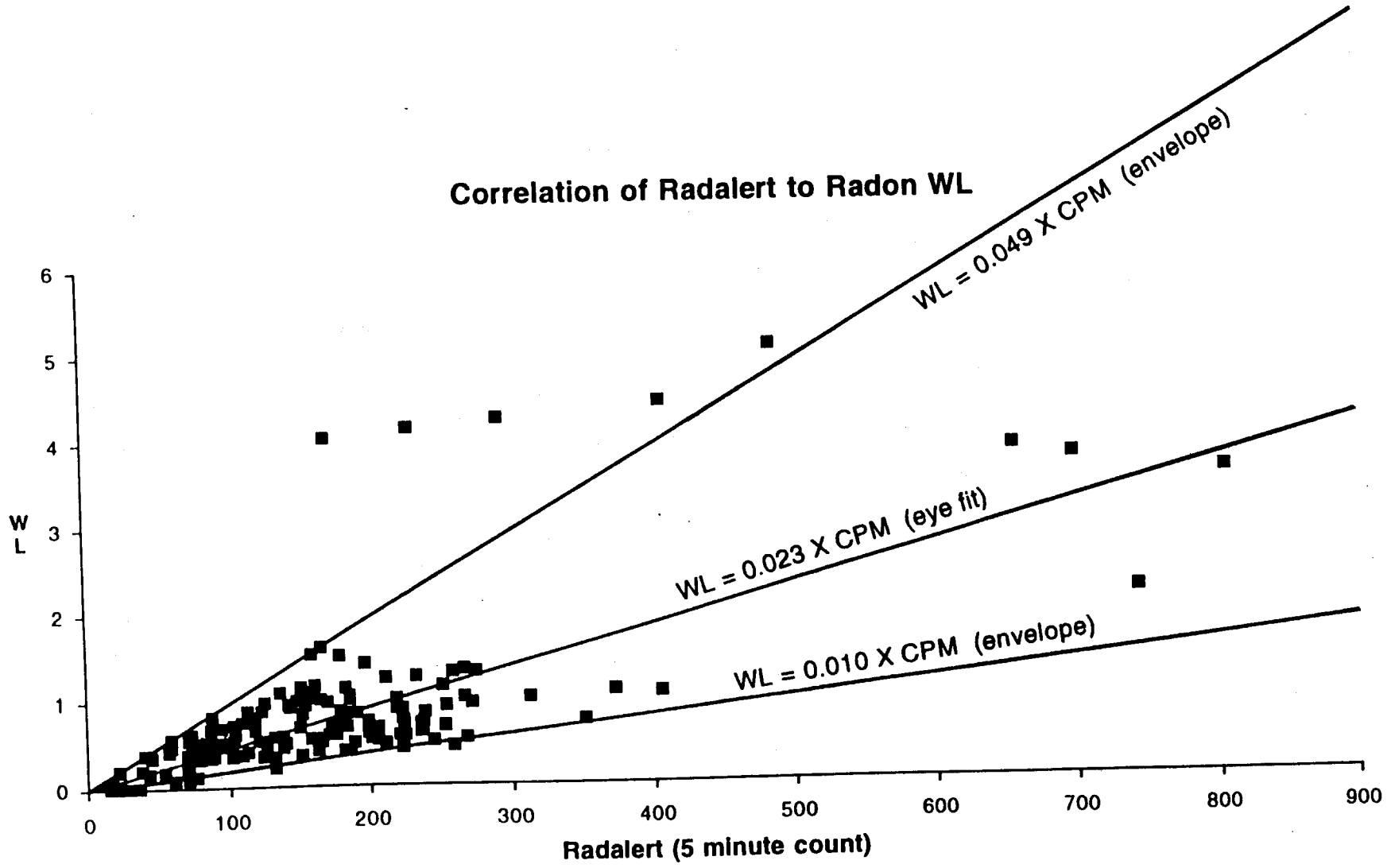

One Minute Radalert Counts at Kartchner Towers
1/8/91 16:10 to 1/10/91 01:30
Radalert CPM
35
30
25
20
15
10
5
0
16:00
20:00
1/8/91
0:00
4:00
8:00
12:00
16:00
20:00
1/9/91
0:00
Time (MST)

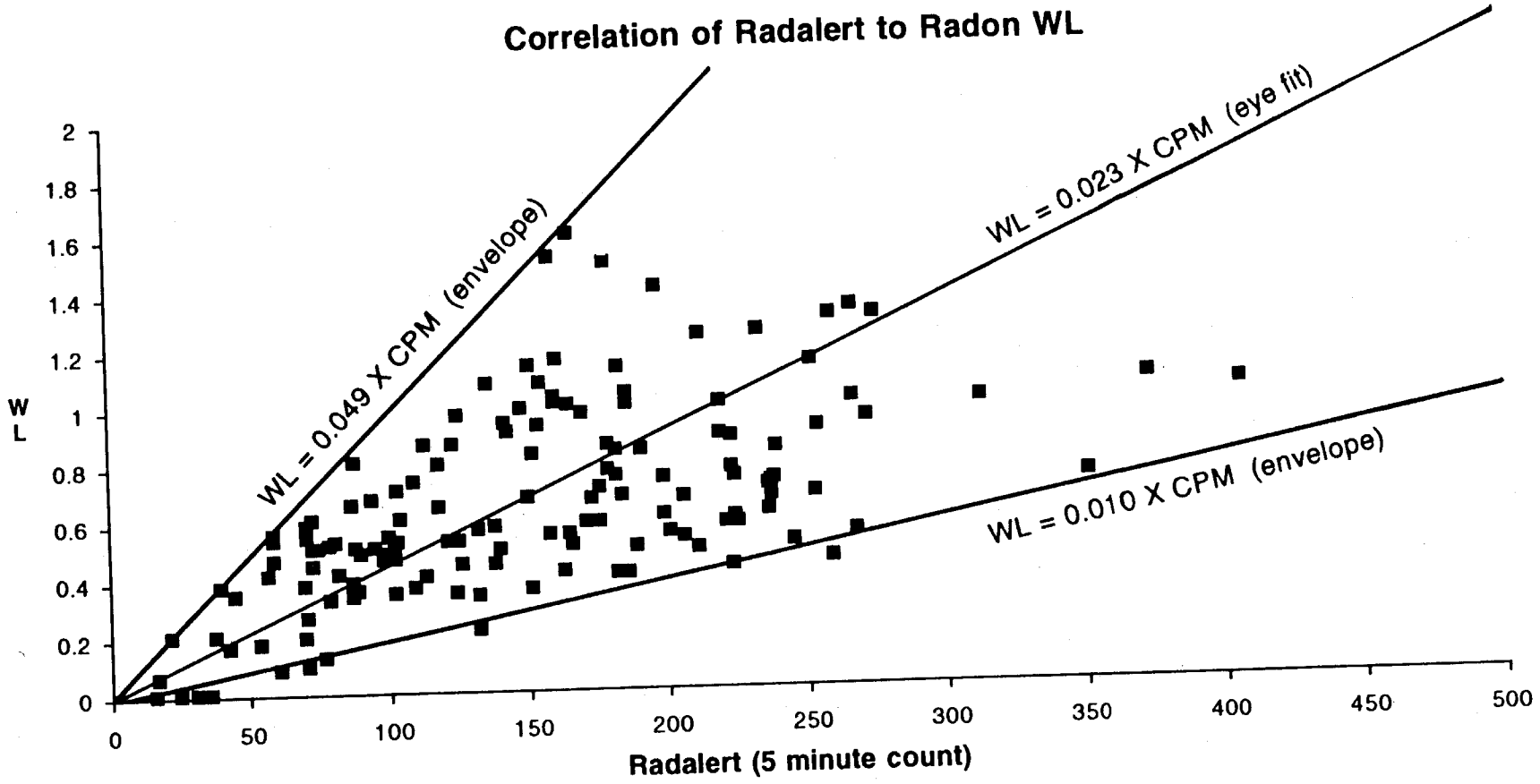
Subway 9/14/89
Walking Radalert H45 to C31
Ave.=99.5, S.D.=26.3



Subway 9/23/89
Walking Radalert H45 to C31
Ave.=105.6, S.D.=22.2




Correlation of Radalert to Radon WL
WL = 0.049 X CPM (envelope)
WL = 0.023 X CPM (eye fit)
WL = 0.010 X CPM (envelope)
W
L
0
1
2
3
4
5
6
0
100
200
300
400
500
600
700
800
900
Radalert (5 minute count)


Correlation of Radalert to Radon WL
WL = 0.049 X CPM (envelope)
WL = 0.023 X CPM (eye fit)
WL = 0.010 X CPM (envelope)
WL
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
50
100
150
200
250
300
350
400
450
500
Radalert (5 minute count)

APPENDIX G

Evaporation Pan Measurements

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KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1989 21-Dec	23-Dec	27-Dec	29-Dec	31-Dec	1990 3-Jan	12-Jan	14-Jan	18-Jan
#1 Crow's Nest Rock	-	-	-	-	-	-	-	-	-
#2 Pirate's Den	-	-	-	-	-	-	-	-	-
#3 Sue's Room	-	-	-	-	-	-	-	-	-
#4 Mushroom Passage	-	-	-	-	-	-	-	-	-
#5 Granite Dells	99.05	-	-	-	-	-	-	-	-
#6 Pyramid Room	99.67	-	-	99.86	-	-	-	-	-
#7 Cul-de-sac	-	-	-	-	-	-	99.43	99.65	-
#8 Rotunda Room	-	-	-	-	-	-	-	-	99.52
#9 End Echo Passage	-	-	-	-	-	-	99.19	99.66	-
#10 Start Echo Passage	-	-	-	-	-	-	99.34	-	-
#11 Tarantula Room	-	-	99.12	-	-	-	-	-	-
#12 Mud Flats	98.93	-	98.92	-	98.61	98.56	-	-	-
#13 Sharon's Saddle	99.09	-	99.32	99.94	99.48	99.71	-	99.79	-
#14 Main Corridor	-	97.39	97.18	-	-	-	-	-	-
#15 Scorpion Passages	-	-	-	-	-	-	-	-	-
#16 Grand Central Station	-	97.67	96.32	-	-	-	-	-	-
#17 Lower Throne Room	-	-	-	-	-	-	-	-	99.24
#18 Upper Throne Room	-	-	-	-	-	-	-	-	99.61
#19 Lovers Leap	99.06	-	-	99.85	-	-	-	-	-
#20 Mud Trench	-	-	-	-	-	-	-	-	99.31
#21 Big Room Overlook	-	-	-	-	-	-	99.59	99.66	-
#22 Kartchner Towers	98.74	-	99.22	99.86	99.54	-	-	-	-
Bath Tub Room	-	-	-	99.73	-	-	-	-	-
Subway	-	-	-	-	-	-	-	-	-

KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1990 21-Jan	22-Jan	24-Jan	26-Jan	1-Feb	4-Feb	13-Feb	16-Feb	17-Feb
#1 Crow's Nest Rock	-	-	-	-	-	-	-	-	99.36
#2 Pirate's Den	-	-	-	-	-	-	-	-	99.57
#3 Sue's Room	-	-	-	-	-	-	-	-	99.26
#4 Mushroom Passage	-	-	-	-	-	-	-	-	99.55
#5 Granite Dells	-	-	-	-	-	-	-	-	-
#6 Pyramid Room	99.74	-	99.62	-	-	-	-	-	99.64
#7 Cul-de-sac	-	-	-	-	-	-	99.06	-	-
#8 Rotunda Room	-	-	-	-	-	-	-	-	-
#9 End Echo Passage	-	-	-	-	-	-	99.15	-	-
#10 Start Echo Passage	-	99.59	-	-	-	-	99.06	-	-
#11 Tarantula Room	-	-	-	98.35	-	98.46	-	-	-
#12 Mud Flats	-	98.54	-	98.58	-	98.59	-	98.58	-
#13 Sharon's Saddle	-	99.56	-	99.85	-	-	-	99.80	-
#14 Main Corridor	-	-	-	-	98.49	-	-	-	-
#15 Scorpion Passages	-	-	-	98.11	-	-	-	-	-
#16 Grand Central Station	-	-	-	97.96	99.25	-	-	-	-
#17 Lower Throne Room	-	-	-	-	-	-	-	-	-
#18 Upper Throne Room	-	-	-	-	-	-	-	-	-
#19 Lovers Leap	99.78	-	99.68	-	-	-	-	-	-
#20 Mud Trench	-	-	-	-	-	-	-	-	99.52
#21 Big Room Overlook	-	-	-	-	-	-	99.23	-	-
#22 Kartchner Towers	99.72	-	99.53	99.48	-	-	-	99.57	-
Bath Tub Room	-	-	-	-	-	-	-	-	-
Subway	-	-	-	-	-	-	-	-	-

KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1990 27-Feb	1-Mar	7-Mar	9-Mar	14-Mar	16-Mar	20-Mar	22-Mar	29-Mar
#1 Crow's Nest Rock	-	-	-	-	-	-	-	99.89	-
#2 Pirate's Den	-	99.52	-	-	-	-	-	99.70	-
#3 Sue's Room	-	-	-	-	-	-	-	99.54	-
#4 Mushroom Passage	-	99.89	-	-	-	-	-	99.81	-
#5 Granite Dells	-	-	-	-	99.27	-	-	-	-
#6 Pyramid Room	-	-	-	-	99.67	-	-	-	-
#7 Cul-de-sac	-	-	-	-	-	99.58	-	-	-
#8 Rotunda Room	-	-	-	-	-	-	99.65	-	-
#9 End Echo Passage	-	-	99.56	-	-	-	-	-	-
#10 Start Echo Passage	-	-	99.63	-	-	99.39	-	-	-
#11 Tarantula Room	98.32	-	98.45	-	-	98.53	-	-	98.86
#12 Mud Flats	98.62	-	98.58	-	-	98.57	-	-	98.97
#13 Sharon's Saddle	99.85	99.91	-	99.91	-	99.90	-	-	-
#14 Main Corridor	-	98.70	-	98.93	-	-	-	-	99.62
#15 Scorpion Passages	-	-	-	-	-	99.51	-	-	-
#16 Grand Central Station	-	-	-	96.32	-	-	-	-	-
#17 Lower Throne Room	-	-	-	-	-	-	99.42	-	-
#18 Upper Throne Room	-	-	-	-	-	-	99.44	-	-
#19 Lovers Leap	99.26	-	-	-	99.80	-	-	-	-
#20 Mud Trench	-	99.74	-	-	-	-	-	99.89	-
#21 Big Room Overlook	-	-	-	-	-	99.32	-	-	-
#22 Kartchner Towers	99.32	99.74	-	99.64	-	-	-	-	99.67
Bath Tub Room	-	-	-	-	-	-	-	-	-
Subway	-	-	-	-	-	-	-	-	-

KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1990 3-Apr	8-Apr	17-Apr	19-Apr	20-Apr	22-Apr	23-Apr	30-Apr	10-May
#1 Crow's Nest Rock	-	-	-	-	-	-	-	-	-
#2 Pirate's Den	-	-	-	-	-	-	-	-	-
#3 Sue's Room	-	-	-	-	-	-	-	-	-
#4 Mushroom Passage	-	-	-	-	-	-	-	-	-
#5 Granite Dells	-	-	-	-	-	-	-	-	-
#6 Pyramid Room	-	-	-	-	-	-	99.65	-	-
#7 Cul-de-sac	-	-	-	-	99.88	-	-	-	-
#8 Rotunda Room	-	-	-	-	-	-	-	-	-
#9 End Echo Passage	-	-	-	-	99.90	-	-	-	-
#10 Start Echo Passage	-	99.85	-	-	99.86	-	-	-	-
#11 Tarantula Room	-	-	99.14	-	-	99.59	-	-	99.33
#12 Mud Flats	-	-	99.17	-	-	99.25	-	99.26	99.30
#13 Sharon's Saddle	-	-	-	100.00	-	-	-	-	99.80
#14 Main Corridor	-	-	99.57	-	-	99.97	-	99.77	-
#15 Scorpion Passages	-	-	-	-	-	-	-	-	-
#16 Grand Central Station	-	-	98.87	-	-	99.09	-	99.30	-
#17 Lower Throne Room	-	-	-	-	-	-	-	-	-
#18 Upper Throne Room	99.26	-	-	-	-	-	-	-	-
#19 Lovers Leap	-	-	-	-	-	-	99.84	-	-
#20 Mud Trench	-	-	-	-	-	-	-	-	-
#21 Big Room Overlook	-	99.92	-	-	99.79	-	-	-	-
#22 Kartchner Towers	-	99.86	-	-	99.90	-	-	-	-
Bath Tub Room	-	-	-	-	-	-	-	-	-
Subway	-	-	-	-	-	-	-	-	-

KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1990 13-May	14-May	16-May	18-May	24-May	6-Jun	20-Jun	21-Jun	5-Jul
#1 Crow's Nest Rock	-	-	-	99.77	-	-	-	-	-
#2 Pirate's Den	-	-	-	99.85	-	-	-	-	-
#3 Sue's Room	-	-	-	99.61	-	-	-	-	-
#4 Mushroom Passage	-	-	-	99.83	-	-	-	-	-
#5 Granite Dells	-	99.40	-	-	-	-	-	-	-
#6 Pyramid Room	-	99.67	-	-	-	-	-	-	-
#7 Cul-de-sac	99.94	-	-	-	-	-	-	-	-
#8 Rotunda Room	-	-	99.60	-	-	-	-	-	-
#9 End Echo Passage	-	-	-	-	99.78	-	99.64	-	-
#10 Start Echo Passage	99.70	-	-	-	99.85	-	99.52	-	-
#11 Tarantula Room	99.43	-	-	-	-	-	-	-	99.12
#12 Mud Flats	99.47	-	-	-	99.63	-	-	-	99.75
#13 Sharon's Saddle	99.96	-	-	-	-	-	-	99.90	100.00
#14 Main Corridor	99.77	-	-	-	-	99.29	-	99.81	-
#15 Scorpion Passages	-	-	-	-	-	99.22	-	-	-
#16 Grand Central Station	99.17	-	-	-	-	99.19	-	-	-
#17 Lower Throne Room	-	-	99.26	-	-	-	-	-	-
#18 Upper Throne Room	-	-	99.54	-	-	-	-	-	-
#19 Lovers Leap	-	99.77	-	-	-	-	-	-	-
#20 Mud Trench	-	-	-	99.93	-	-	-	-	-
#21 Big Room Overlook	99.42	-	-	-	-	-	99.24	-	-
#22 Kartchner Towers	-	99.85	-	-	99.93	-	-	99.34	-
Bath Tub Room	-	-	-	-	-	-	-	-	-
Subway	-	-	-	99.95	-	-	-	-	-

KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1990 24-Jul	26-Jul	31-Jul	2-Aug	4-Aug	9-Aug	23-Aug	26-Aug	11-Sep
#1 Crow's Nest Rock	-	-	-	99.81	-	-	-	-	-
#2 Pirate's Den	-	-	-	99.87	-	-	-	-	-
#3 Sue's Room	-	-	-	99.82	-	-	-	-	-
#4 Mushroom Passage	-	-	-	99.70	-	-	-	-	-
#5 Granite Dells	-	99.24	-	-	-	-	-	-	-
#6 Pyramid Room	-	99.62	-	-	-	-	-	-	99.57
#7 Cul-de-sac	-	-	-	-	99.58	-	98.84	-	-
#8 Rotunda Room	-	-	99.62	-	-	-	-	99.64	-
#9 End Echo Passage	-	99.35	-	-	-	-	99.82	-	-
#10 Start Echo Passage	-	99.76	-	-	-	-	99.56	-	-
#11 Tarantula Room	-	98.89	-	-	-	98.91	99.03	-	-
#12 Mud Flats	-	99.88	-	-	-	99.62	99.62	-	-
#13 Sharon's Saddle	-	99.70	-	-	-	-	99.60	-	99.45
#14 Main Corridor	99.66	-	-	-	-	-	99.33	-	-
#15 Scorpion Passages	99.73	-	-	-	-	-	99.40	-	-
#16 Grand Central Station	99.76	-	-	-	-	99.49	99.54	-	-
#17 Lower Throne Room	-	-	99.30	-	-	-	-	99.75	-
#18 Upper Throne Room	-	-	99.47	-	-	-	-	99.88	-
#19 Lovers Leap	-	99.52	-	-	-	-	-	-	99.56
#20 Mud Trench	-	-	-	99.88	-	-	-	99.79	-
#21 Big Room Overlook	-	-	-	-	99.88	-	99.45	-	-
#22 Kartchner Towers	-	-	-	-	99.91	-	-	-	99.75
Bath Tub Room	-	-	-	-	-	-	-	-	99.68
Subway	-	-	-	-	-	-	-	-	-

KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1990 25-Sep	27-Sep	30-Sep	2-Oct	5-Dec	11-Dec	18-Dec	19-Dec
#1 Crow's Nest Rock	-	-	99.64	-	-	-	-	99.56
#2 Pirate's Den	-	-	99.83	-	-	-	-	99.69
#3 Sue's Room	-	-	99.36	-	-	-	-	99.08
#4 Mushroom Passage	-	-	99.76	-	-	-	-	99.51
#5 Granite Dells	-	-	-	-	-	-	-	-
#6 Pyramid Room	-	99.92	-	-	-	-	-	99.72
#7 Cul-de-sac	-	99.14	-	-	-	-	99.46	-
#8 Rotunda Room	-	-	-	99.85	-	-	-	-
#9 End Echo Passage	-	99.78	-	-	-	-	99.42	-
#10 Start Echo Passage	-	99.67	-	-	-	-	99.59	-
#11 Tarantula Room	99.07	-	-	-	-	-	98.80	-
#12 Mud Flats	99.54	-	-	-	99.32	99.52	99.20	-
#13 Sharon's Saddle	-	99.45	-	-	99.56	99.91	-	99.87
#14 Main Corridor	99.27	99.76	-	-	-	99.53	-	-
#15 Scorpion Passages	99.45	-	-	-	-	-	97.65	-
#16 Grand Central Station	99.55	99.77	-	-	96.89	97.36	-	-
#17 Lower Throne Room	-	-	-	99.73	-	-	-	-
#18 Upper Throne Room	-	-	-	99.93	-	-	-	-
#19 Lovers Leap	-	99.58	-	-	-	99.80	-	-
#20 Mud Trench	-	-	-	99.64	-	-	-	99.75
#21 Big Room Overlook	-	99.53	-	-	-	-	99.48	-
#22 Kartchner Towers	-	99.66	-	-	-	99.69	-	99.85
Bath Tub Room	-	-	-	-	-	-	-	-
Subway	-	-	-	-	-	-	-	-

KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1991 5-Jan	8-Jan	11-Jan	15-Jan	31-Jan	5-Feb	14-Feb	26-Feb	5-Mar
#1 Crow's Nest Rock	-	-	-	-	-	-	-	-	-
#2 Pirate's Den	-	-	-	-	-	-	-	-	-
#3 Sue's Room	-	-	-	-	-	-	-	-	-
#4 Mushroom Passage	-	-	-	-	-	-	-	-	-
#5 Granite Dells	-	-	-	-	-	-	-	-	-
#6 Pyramid Room	-	-	99.92	99.70	-	-	-	-	-
#7 Cul-de-sac	-	99.91	-	-	-	-	-	99.88	-
#8 Rotunda Room	-	-	-	99.79	-	-	99.38	-	-
#9 End Echo Passage	99.77	-	-	-	-	-	-	99.91	-
#10 Start Echo Passage	99.68	-	-	-	-	-	-	99.92	-
#11 Tarantula Room	98.28	-	-	-	98.44	98.52	-	-	-
#12 Mud Flats	99.30	-	-	-	99.13	99.13	-	-	-
#13 Sharon's Saddle	100.00	-	-	-	-	-	-	-	99.79
#14 Main Corridor	98.99	99.65	-	-	-	99.51	-	-	99.75
#15 Scorpion Passages	98.42	-	-	-	-	-	-	-	-
#16 Grand Central Station	97.50	97.78	-	-	97.24	97.74	-	98.37	98.54
#17 Lower Throne Room	-	-	-	99.43	-	-	-	-	-
#18 Upper Throne Room	-	-	-	99.55	-	-	99.60	-	-
#19 Lovers Leap	-	-	99.92	-	-	-	-	-	99.54
#20 Mud Trench	-	-	-	99.73	-	-	99.57	-	-
#21 Big Room Overlook	-	99.85	-	-	-	-	-	99.89	-
#22 Kartchner Towers	-	99.92	99.83	-	99.91	99.90	-	-	99.61
Bath Tub Room	-	-	-	-	-	-	-	-	-
Subway	-	-	-	-	-	-	-	-	-

KARTCHNER CAVERNS
PRECISE RELATIVE HUMIDITIES
(%)

LOCATION	1991 16-May	21-May	10-Jun	#	Average RH	Std. Deviation
#1 Crow's Nest Rock	-	-	-	6	99.67	0.19
#2 Pirate's Den	-	-	-	7	99.72	0.14
#3 Sue's Room	-	-	-	6	99.45	0.27
#4 Mushroom Passage	-	-	-	7	99.72	0.14
#5 Granite Dells	-	-	-	4	99.24	0.14
#6 Pyramid Room	-	-	-	14	99.71	0.11
#7 Cul-de-sac	-	99.37	-	13	99.52	0.35
#8 Rotunda Room	-	-	-	8	99.63	0.15
#9 End Echo Passage	-	99.45	-	14	99.60	0.25
#10 Start Echo Passage	-	99.56	-	17	99.62	0.22
#11 Tarantula Room	99.27	98.69	-	22	98.85	0.39
#12 Mud Flats	99.63	98.06	-	31	99.09	0.46
#13 Sharon's Saddle	99.83	-	-	28	99.75	0.23
#14 Main Corridor	-	99.76	-	22	99.26	0.75
#15 Scorpion Passages	-	-	-	8	98.94	0.77
#16 Grand Central Station	99.26	-	99.25	25	98.45	1.08
#17 Lower Throne Room	-	-	-	7	99.45	0.21
#18 Upper Throne Room	-	-	-	9	99.59	0.21
#19 Lovers Leap	-	-	-	14	99.64	0.24
#20 Mud Trench	-	-	-	11	99.70	0.18
#21 Big Room Overlook	-	99.37	-	15	99.57	0.24
#22 Kartchner Towers	-	99.19	-	28	99.65	0.28
Bath Tub Room	-	-	-	2	99.71	0.04
Subway	-	-	-	1	99.95	-
				318	99.42	-

KARTCHNER CAVERNS

Precise Relative Humidities and Measured Evaporation Rates

EMS Station	Start Date	End Date	Evap. (ml/day)	Average Precise RH (%)
11-Tarantula Room	12/11/89	1/14/90	1.19	98.88
11-Tarantula Room	1/14/90	2/16/90	1.44	98.45
11-Tarantula Room	2/16/90	3/16/90	1.93	98.41
11-Tarantula Room	3/16/90	4/17/90	1.88	98.87
11-Tarantula Room	4/17/90	5/13/90	0.85	99.43
11-Tarantula Room	5/13/90	6/27/90	0.21	99.30
11-Tarantula Room	6/27/90	7/26/90	0.34	99.04
11-Tarantula Room	7/26/90	8/23/90	0.28	98.94
11-Tarantula Room	8/23/90	9/25/90	0.23	99.05
11-Tarantula Room	9/25/90	10/23/90	0.28	99.03
11-Tarantula Room	10/23/90	11/20/90	0.34	98.94
11-Tarantula Room	11/20/90	12/18/90	0.27	98.85
11-Tarantula Room	12/18/90	1/17/91	1.27	98.45
11-Tarantula Room	1/17/91	2/24/91	2.86	98.51
11-Tarantula Room	2/24/91	3/28/91	2.52	98.78
11-Tarantula Room	3/28/91	4/23/91	2.13	99.00
11-Tarantula Room	4/23/91	5/21/91	1.36	99.14
12-Mud Flats	12/11/89	1/14/90	0.21	98.68
12-Mud Flats	1/14/90	2/16/90	0.74	98.58
12-Mud Flats	2/16/90	3/16/90	0.88	98.59
12-Mud Flats	3/16/90	4/17/90	0.88	98.95
12-Mud Flats	4/17/90	5/13/90	0.83	99.27
12-Mud Flats	5/13/90	6/27/90	0.56	99.65
12-Mud Flats	6/27/90	7/24/90	-0.50	99.79
12-Mud Flats	7/24/90	8/23/90	0.17	99.69
12-Mud Flats	8/23/90	9/25/90	0.08	99.58
12-Mud Flats	9/25/90	10/23/90	0.06	99.50
12-Mud Flats	10/23/90	11/20/90	0.09	99.41
12-Mud Flats	11/20/90	12/18/90	0.09	99.36
12-Mud Flats	12/18/90	1/17/91	0.25	99.25
12-Mud Flats	1/17/91	2/24/91	0.75	99.17
12-Mud Flats	2/24/91	3/28/91	0.66	99.31
12-Mud Flats	3/28/91	4/23/91	0.84	99.45
12-Mud Flats	4/23/91	5/21/91	0.70	99.42
13-Sharon's Saddle	12/11/89	1/16/90	0.45	99.61
13-Sharon's Saddle	1/16/90	2/16/90	-0.15	99.77
13-Sharon's Saddle	2/16/90	3/16/90	-0.32	99.87
13-Sharon's Saddle	3/16/90	4/17/90	-0.45	99.95
13-Sharon's Saddle	4/17/90	5/13/90	-0.33	99.91
13-Sharon's Saddle	5/13/90	6/21/90	-0.03	99.93
13-Sharon's Saddle	6/21/90	7/26/90	0.27	99.89
13-Sharon's Saddle	7/26/90	8/23/90	0.71	99.65
13-Sharon's Saddle	8/23/90	9/25/90	0.74	99.49

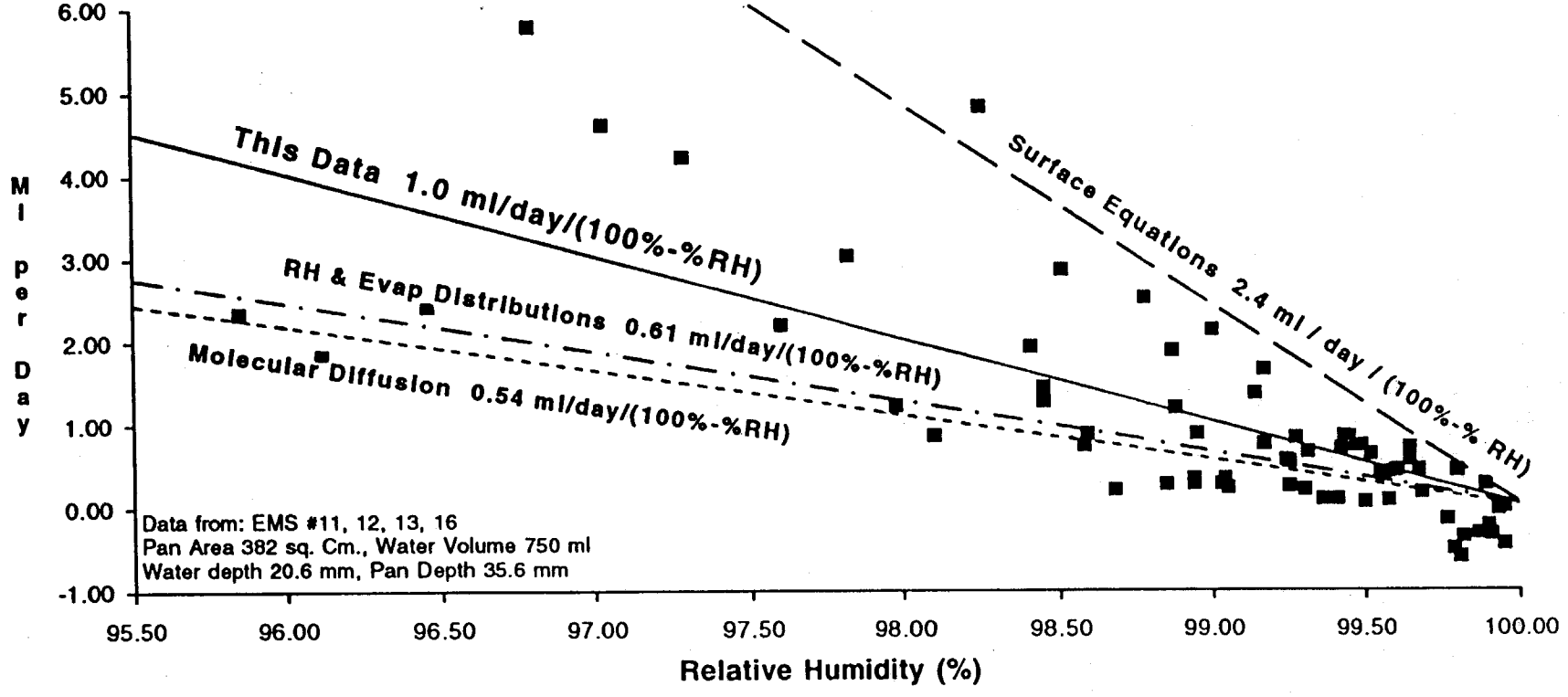
KARTCHNER CAVERNS

Precise Relative Humidities and Measured Evaporation Rates

EMS Station	Start Date	End Date	Evap. (ml/day)	Average Precise RH (%)
13-Sharon's Saddle	9/25/90	10/25/90	0.73	99.47
13-Sharon's Saddle	10/25/90	11/20/90	0.63	99.52
13-Sharon's Saddle	11/20/90	12/18/90	0.45	99.68
13-Sharon's Saddle	12/18/90	1/17/91	0.00	99.95
13-Sharon's Saddle	1/17/91	2/21/91	-0.23	99.90
13-Sharon's Saddle	2/21/91	3/28/91	0.43	99.80
13-Sharon's Saddle	3/28/91	4/23/91	-0.60	99.81
13-Sharon's Saddle	4/23/91	5/21/91	-0.36	99.82
16-Grand Central Station	12/11/89	1/16/90	5.79	96.79
16-Grand Central Station	1/16/90	2/16/90	4.82	98.25
16-Grand Central Station	2/16/90	3/16/90	4.61	97.03
16-Grand Central Station	3/16/90	4/17/90	3.03	97.82
16-Grand Central Station	4/17/90	5/13/90	1.65	99.17
16-Grand Central Station	5/13/90	6/27/90	0.56	99.24
16-Grand Central Station	6/27/90	7/24/90	0.43	99.60
16-Grand Central Station	7/24/90	8/23/90	0.42	99.58
16-Grand Central Station	8/23/90	9/25/90	0.41	99.55
16-Grand Central Station	9/25/90	10/23/90	0.54	99.25
16-Grand Central Station	10/23/90	11/20/90	0.86	98.10
16-Grand Central Station	11/20/90	12/18/90	2.43	96.46
16-Grand Central Station	12/18/90	1/17/91	2.35	95.85
16-Grand Central Station	1/17/91	2/21/91	4.22	97.29
16-Grand Central Station	2/21/91	3/28/91	2.20	97.60
16-Grand Central Station	3/28/91	4/23/91	1.83	96.12
16-Grand Central Station	4/23/91	5/23/91	1.22	97.98

Kartchner Caverns

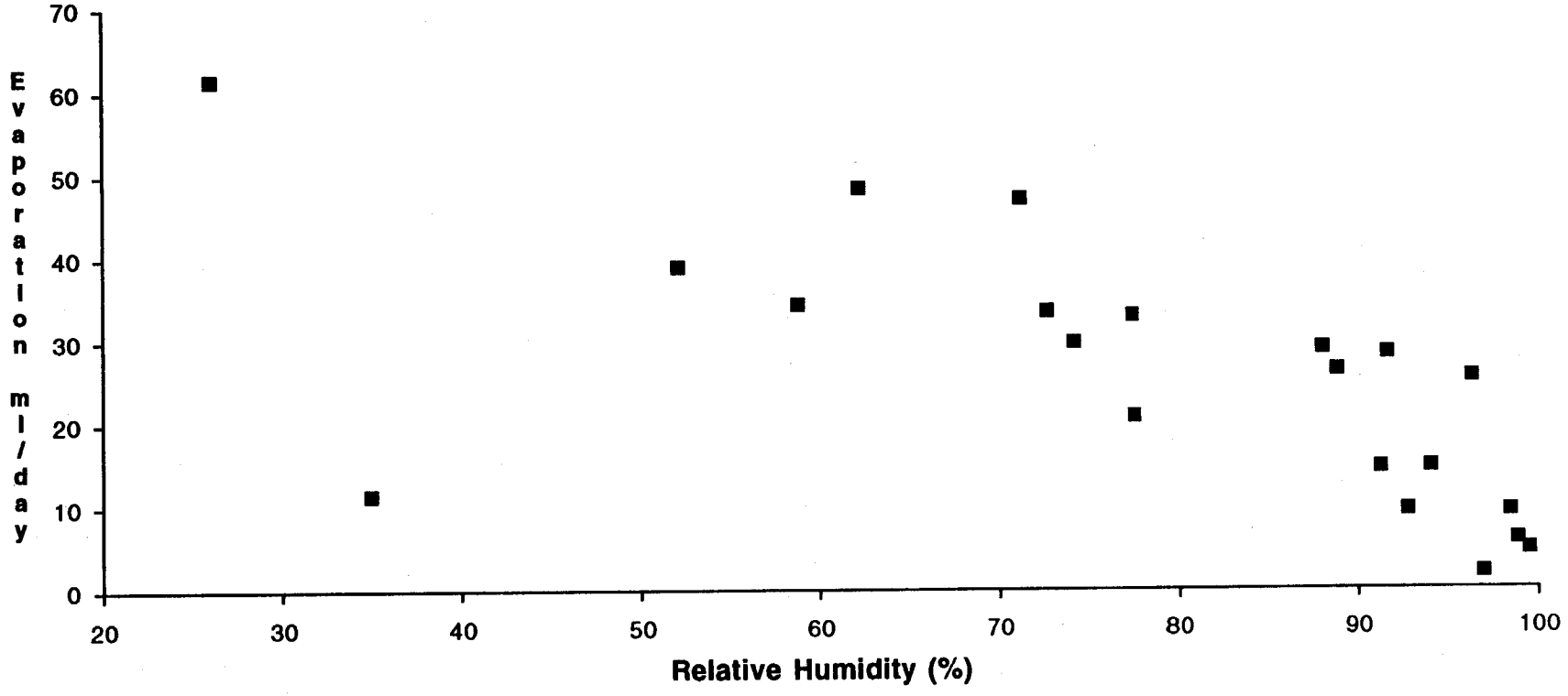
Pan Evaporation Rate vs. Average Precise Relative Humidity



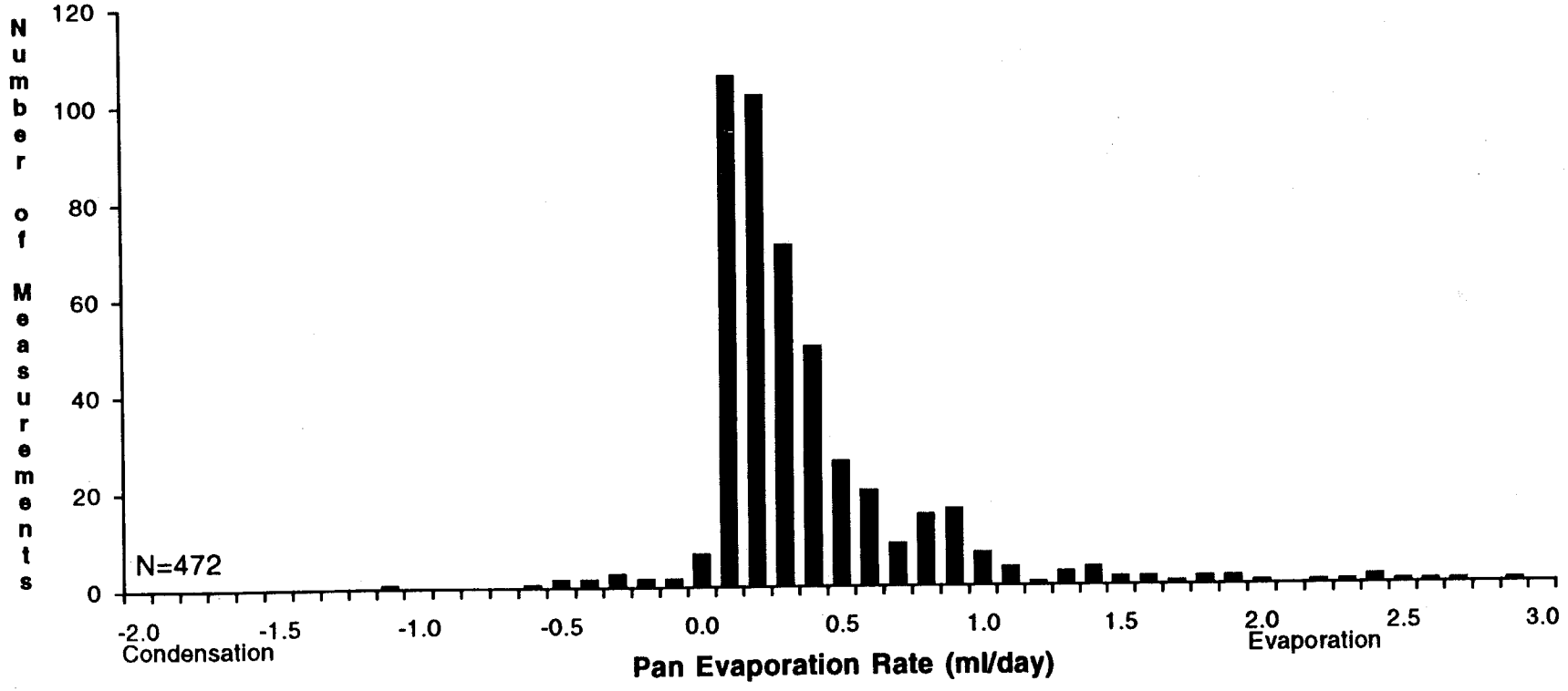
Entrance Evaporation Pans

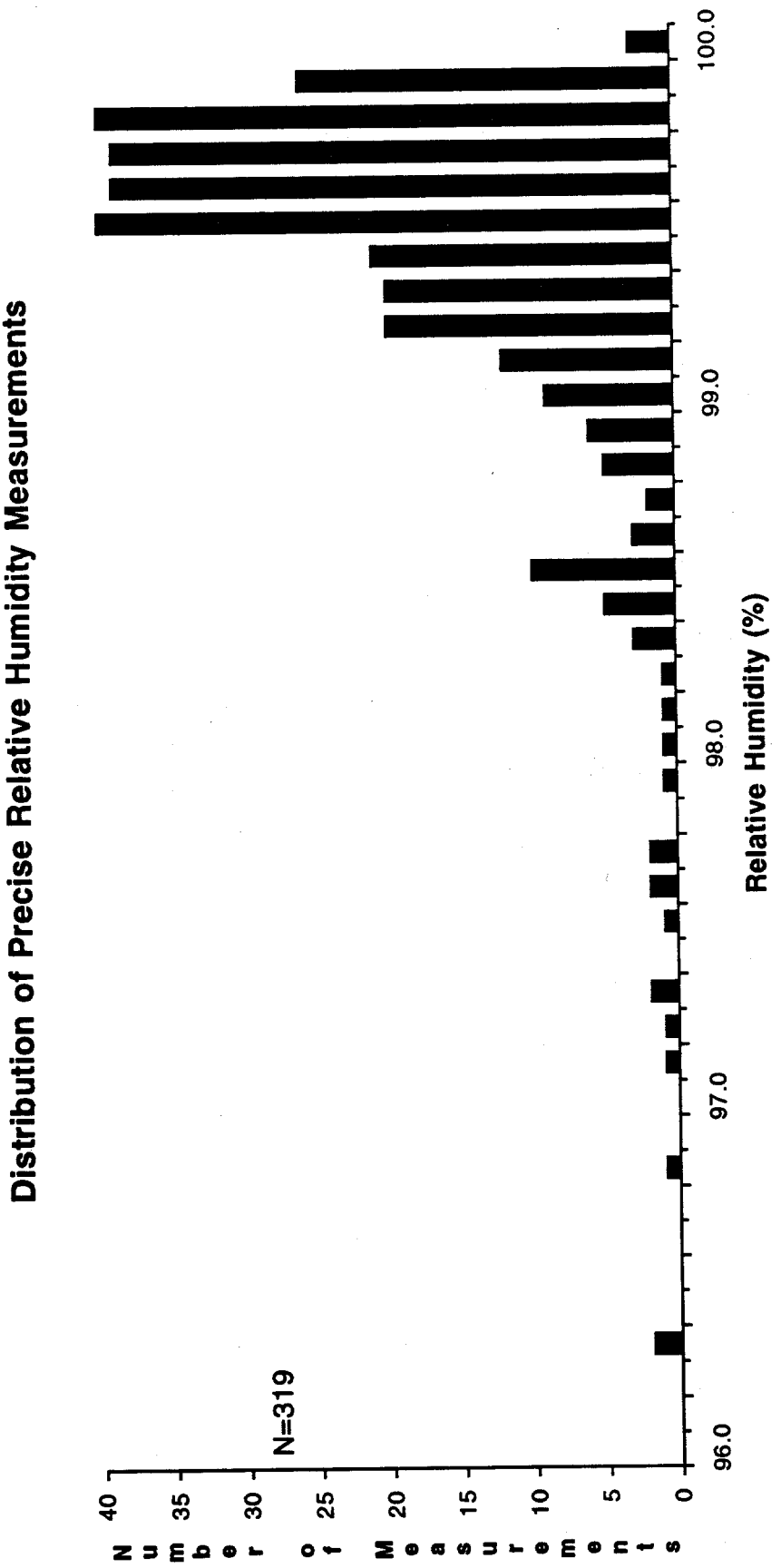
STATION	From Date	To Date	Evap. (ml/day)	TEMPERATURES (°F) WATER	AIR	SOIL	RH (%)	RH - Datalogger Period Average	Use
Office in Tucson - 6/23/89	11:20	16:30	128.0						
Office in Tucson	6/23/89	6/26/89	94.0						
Surface Pan - 11/30/89	9:00	16:00	257.1	43.6	48.7		31.9		31.9
LEM Room	12/6/89	12/11/89	29.8	55.1	60.0		39.3	74.2	74.2
Crinoid Room	12/11/89	12/14/89	11.4		58.2		35.0		35.0
Anticipation Room	12/19/89	12/21/89	38.9	60.8	65.3		52.1	100.0	52.1
Main Corridor	12/21/89	12/29/89	1.9				97.0		97.0
Pop-up Junction	12/27/89	12/31/89	28.3				91.7		91.7
Pop-up Junction	12/31/89	1/3/90	26.3	62.0			88.9		88.9
LEM Room	1/3/90	1/10/90	34.3				48.8	68.8	58.8
Crinoid Room	6/8/90	6/13/90	14.6				91.3		91.3
Office in Tucson	6/12/90	6/14/90	61.5				26.1		26.1
Blockade Room	1/21/91	1/29/91	48.4	45.6			62.2		62.2
Crinoid Room	1/21/91	1/29/91	47.1	51.2	54.1	54.8	71.2		71.2
LEM Room - PP4	1/21/91	1/29/91	20.8	54.6		55.8	78.5	76.6	77.6
Babbitt Gate	1/21/91	1/29/91	33.5	55.7	58.0	58.0	72.7		72.7
Anticipation-T4 &5, 0-16	1/21/91	1/29/91	33.0	60.1		63.2	80.1	74.9	77.5
PP7 in crawl at probe	1/21/91	1/29/91	28.9	62.0	63.9		88.1		88.1
Pop-Up, G-29	1/21/91	1/29/91	25.4	63.5		64.7	96.4		96.4
PP12	1/21/91	1/29/91	9.3	65.3	65.3		98.5		98.5
Grand Central-30' ds PP8	1/21/91	1/29/91	5.9	64.3		64.4	98.9		98.9
Main Corridor	1/21/91	1/29/91	4.7	67.7	68.2		99.5		99.5
Crinoid Room	4/11/91	4/23/91	22.1	53.5	55.8				
LEM Room	4/11/91	4/23/91	9.4	56.2	56.6	57.1		92.8	92.8
Babbitt Gate	4/11/91	4/23/91	15.5	56.1	58.6	57.0			
Anticipation Room	4/11/91	4/23/91	14.6	60.2	63.2	62.8		94.1	94.1

Entrance Passages - Pan Evaporation Rates



Distribution of Measured Pan Evaporation Rates



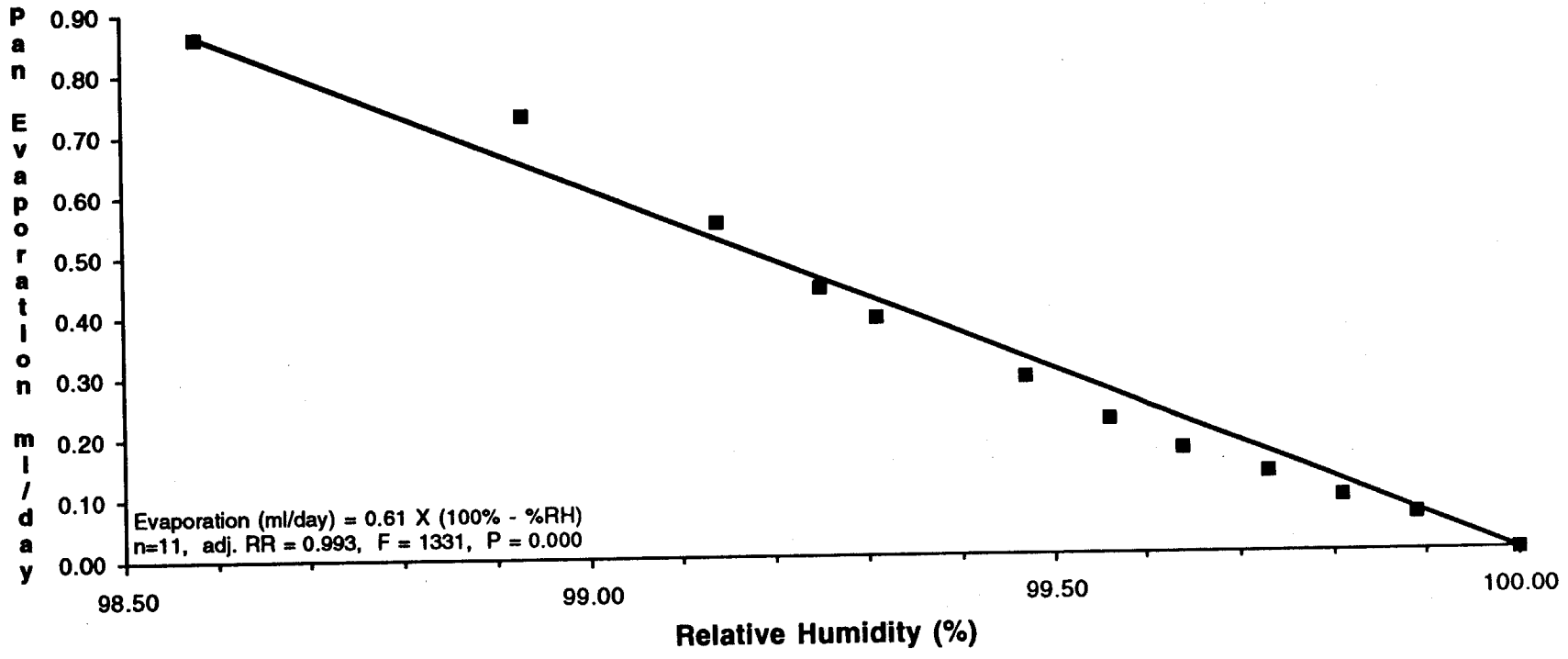

Distribution of Precise Relative Humidity Measurements
N=319
Number of Measurements
0
5
10
15
20
25
30
35
40
96.0
97.0
98.0
99.0
100.0
Relative Humidity (%)

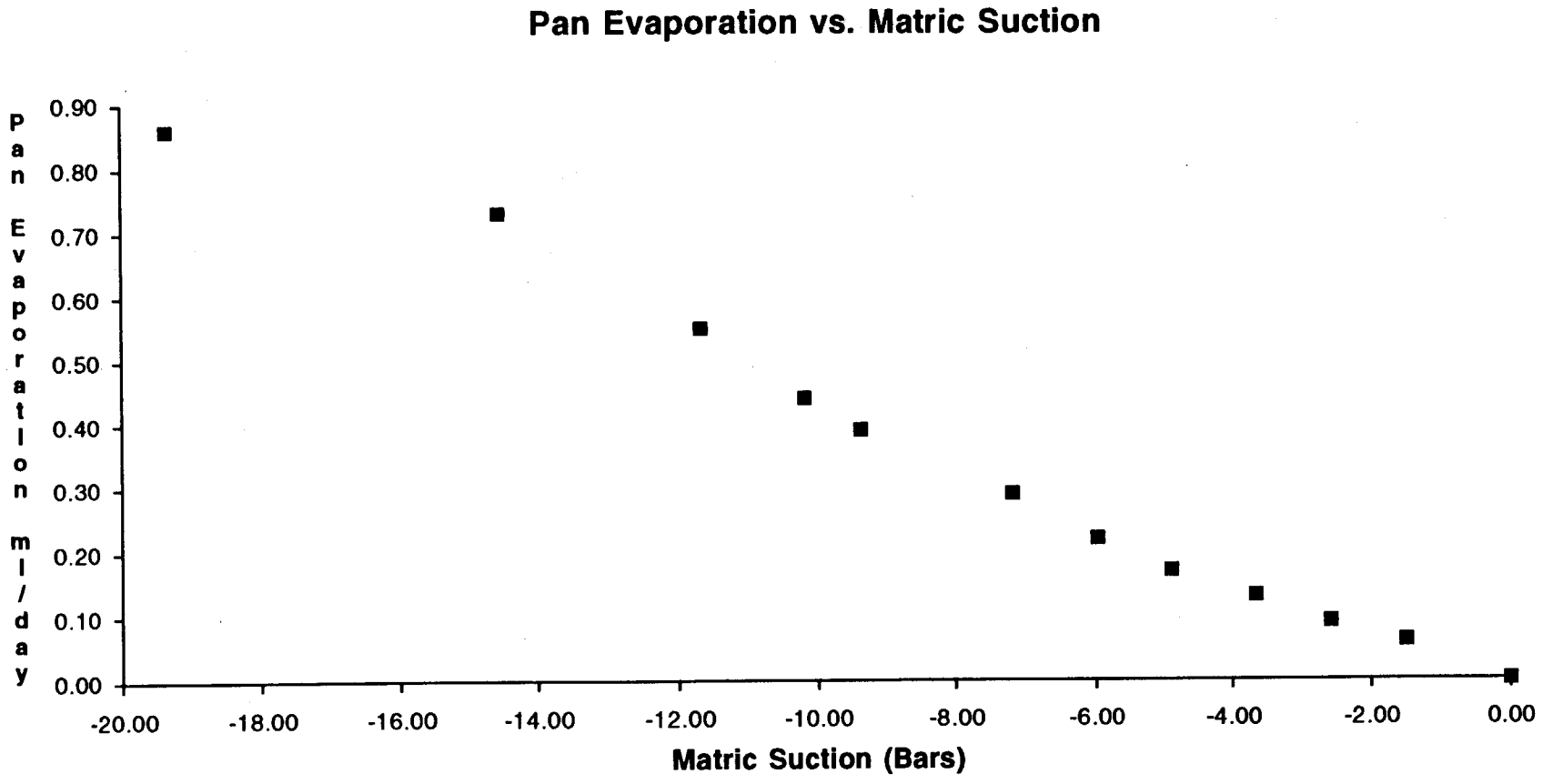
Indexed Correlation of Distribution of Pan Evaporation to Precise Relative Humidities

Index %	Evaporation (ml/day)	RH (%)	Matric Suction Bars	Est. Evap ml/day
90	0.86	98.58	-19.35	0.86
85	0.73	98.93	-14.56	0.65
80	0.55	99.14	-11.69	0.52
75	0.44	99.25	-10.19	0.46
70	0.39	99.31	-9.37	0.42
60	0.29	99.47	-7.19	0.32
50	0.22	99.56	-5.97	0.27
40	0.17	99.64	-4.88	0.22
30	0.13	99.73	-3.66	0.16
20	0.09	99.81	-2.57	0.12
10	0.06	99.89	-1.49	0.07
0	0.00	100.00	0.00	0.00

Evaporation = 0.61 X (100%-%RH)

Pan Evaporation vs. Relative Humidity from Distributions of Measurements




Pan Evaporation vs. Matric Suction
Pan Evaporation ml/day
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-20.00
-18.00
-16.00
-14.00
-12.00
-10.00
-8.00
-6.00
-4.00
-2.00
0.00
Matric Suction (Bars)

APPENDIX H

Drip Water Measurements

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KARTCHNER CAVERNS
Drip Water Conductivity

GRAND CENTRAL STATION			
DATE	Bulk uMHOS	Rate Ml/day	pH
10/15/89	208	88.0	-
10/22/89	161	63.0	-
10/24/89	168	75.0	-
10/26/89	163	75.0	-
10/29/89	141	67.0	-
10/31/89	136	67.0	-
11/2/89	122	70.0	-
11/7/89	151	74.0	-
11/8/89	142	-	-
11/14/89	136	75.0	-
11/24/89	131	72.0	-
11/28/89	128	75.2	-
12/6/89	126	68.0	-
12/15/89	128	72.0	-
12/27/89	115	30?	-
12/31/89	130	79.6	-
1/3/90	145	78.3	-
1/10/90	127	71.7	-
1/14/90	138	122.5	-
1/16/90	128	79.8	-
1/21/90	128	82.5	-
2/1/90	130	73.5	-
2/13/90	137	77.3	-
2/20/90	150	83.3	-
2/28/90	133	76.9	-
3/16/90	140	-	-
3/27/90	151	72.5	-
4/6/90	175	71.5	-
4/15/90	156	71.4	-
4/20/90	170	44? tilted	-
4/26/90	162	63.3	-
4/30/90	-	65.3	-
5/8/90	160	67.5	-
5/13/90	168	60.4	-
5/24/90	187	64.5	-
6/1/90	186	61.0	-
6/6/90	202	62.0	-
6/13/90	197	67.0	-
6/20/90	219	70.7	-
6/27/90	222	65.0	-
7/1/90	212	71.8	-

KARTCHNER CAVERNS
Drip Water Conductivity

GRAND CENTRAL STATION			
DATE	Bulk uMHOS	Rate Ml/day	pH
7/5/90	233	67.8	-
7/16/90	201	61.2	-
7/24/90	220	60.0	-
8/2/90	205	61.9	-
8/9/90	209	62.5	-
8/23/90	237	62.1	7.7
9/4/90	235	72.1	-
9/18/90	245	68.6	-
9/25/90	239	72.9	-
10/10/90	205	61.9	-
10/20/90	182	66.5	-
10/25/90	174	66.6	-
11/8/90	170	67.8	-
11/20/90	155	64.2	-
11/27/90	158	71.4	-
12/3/90	142	82.0	-
12/13/90	150	63.5	8.2
12/18/90	163	68.0	8.9
1/2/91	153	69.0	8.5
1/8/91	151	73.3	8.4
1/17/91	146	65.6	8.3
1/29/91	152	60.4	8.4
2/5/91	149	81.7	8.4
2/19/91	153	68.6	8.2
2/26/91	151	70.0	8.3
3/24/91	159	41.5+	8.3
4/2/91	156	62.2	-
4/9/91	159	61.4	8.3
4/17/91	162	58.8	-
4/23/91	162	60.8	8.3
5/9/91	154	49.7	-
5/16/91	180	47.5	8.2
5/23/91	187	-	-
6/4/91	186	51.7	8.2
6/10/91	190	53.3	8.1

KARTCHNER CAVERNS
Drip Water Conductivity

LOWER THRONE ROOM			
DATE	uMHOS	Ml/minute	pH
10/16/89	455	20	-
11/10/89	401	6	-
12/13/89	330	6	-
12/23/89	420	6.2	-
1/18/90	382	4.5	-
2/17/90	380	6.8	-
3/20/90	388	3.8	-
4/11/90	410	3.5	-
4/19/90	399	3.05	-
5/16/90	444	3.36	-
6/17/90	450	2.5	-
7/18/90	580	12.5	-
7/31/90	500	13.3	-
8/26/90	520	38.4	-
9/4/90	475	33.4	-
9/30/90	473	-	-
10/30/90	485	10.3	-
11/4/90	485	11.0	-
11/24/90	442	12.6	-
12/19/90	456	7.2	8.0
1/15/91	468	10.3	8.2
2/14/91	469	19.5	8.2
3/24/91	444	20.8	8.1
5/5/91	431	12.8	-
5/29/91	452	9.2	8.1

KARTCHNER CAVERNS
Drip Water Conductivity

WATER ROOM				
DATE	Bulk uMHOS	Drip uMHOS	Rate ml/hr	pH
10/15/89	-	327	-	-
10/29/89	292	298	30	-
11/16/89	295	-	6drips/min	-
12/3/89	249	-	-	-
12/21/89	228	-	14	-
1/16/90	292	-	-	-
1/21/90	268	-	-	-
2/17/90	-	265	9	-
3/14/90	278	-	5.5	-
4/3/90	290	-	1drip/47sec	-
4/15/90	318	-	6.7	-
4/19/90	322	-	6.7	-
4/23/90	310	-	6	-
5/14/90	-	-	7.3	-
5/16/90	331	-	6	-
6/23/90	331	-	-	-
7/26/90	-	335	25.7	-
8/26/90	-	371	37.9	-
8/30/90	-	380	33	-
9/4/90	-	382	35.2	-
9/30/90	370	-	-	-
10/18/90	-	383	24.5	-
10/25/90	-	327	16.4	-
11/4/90	370	-	-	-
11/24/90	368	-	-	-
12/19/90	304	363	12.7	7.9
1/10/91	326	-	-	8.3
1/11/91	-	316	16.6	8.3
2/10/91	-	310	-	8.1
2/14/91	-	330	24.6	-

KARTCHNER CAVERNS
Drip Water Conductivity

MUD TRENCH				
DATE	Bulk uMHOS	Drip uMHOS	Rate ml/hr	pH
9/23/89	-	493	50drips/min	-
10/16/89	436	477	1800	-
11/10/89	415	443	960	-
11/16/89	-	414	780	-
12/13/89	394	412	660	-
12/23/89	395	-	-	-
12/29/89	385	-	-	-
1/18/90	367	-	-	-
1/21/90	373	-	-	-
1/28/90	385	-	-	-
2/17/90	-	325	360	-
3/1/90	-	390	240	-
3/11/90	-	400	35drips/min	-
3/20/90	-	422	250	-
4/11/90	-	420	120+	-
4/15/90	-	432	138	-
4/19/90	-	425	217	-
4/23/90	-	458	127	-
5/16/90	-	459	137	-
5/18/90	-	-	105	-
6/17/90	-	442	68	-
7/18/90	-	610	6000	-
7/31/90	580	-	-	-
7/31/90	-	520	1600	-
8/2/90	-	492	1900	-
8/30/90	-	550	2600	-
9/4/90	-	520	2600	-
9/11/90	-	580	3900	-
9/30/90	-	531	2280	-
10/18/90	-	531	2127	-
10/30/90	-	530	1800	-
11/4/90	-	495	1714	-
11/24/90	-	488	975	-
12/11/90	-	504	813+	8.1
12/19/90	-	467	1080	8.0
1/10/91	-	482	900	8.1
1/15/91	-	497	1300	8.2
1/23/91	-	489	1235	-
2/10/91	-	490	975	8.1
2/14/91	-	485	1200	-
3/5/91	-	522	3545	7.9
3/10/91	-	511	3250	-
3/24/91	-	513	2640	8.0
4/4/91	-	475	1843	-
5/5/91	-	491	1388	8.0
5/29/91	666	647	1200	8.1

KARTCHNER CAVERNS
Drip Water Conductivity

UPPER THRONE ROOM			
DATE	Bulk uMHOS	Rate ml/day	pH
11/10/89	298	31	-
12/13/89	267	28	-
12/23/89	215	35	-
1/18/90	245	31	-
1/28/90	245	32	-
2/17/90	265	22	-
3/20/90	240	29	-
4/3/90	298	23	-
4/15/90	298	25	-
4/19/90	298	23	-
5/16/90	309	22	-
6/17/90	302	22.5	-
7/17/90	370	19.8	-
7/31/90	340	20.1	-
8/26/90	322	23.8	-
9/4/90	328	37.2	-
9/30/90	332	35.4	-
10/30/90	320	33.2	-
11/24/90	330	25.4	-
12/19/90	326	28.8	7.9
1/15/91	319	25.2	8.2
2/10/91	317	25.8	8.3
2/14/91	296	30	8.2
3/24/91	298	23.9	8.1
5/5/91	303	23.2	8.0
5/29/91	326	9.2	8.1

KARTCHNER CAVERNS
Drip Water Conductivity

MUSHROOM PASSAGE			
DATE	uMHOS	Rate ml/hr	pH
10/16/89	612	450	-
11/16/89	207	10drips/min	-
12/13/89	171	-	-
12/23/89	390	50.7	-
1/18/90	450	44	-
2/17/90	470	54	-
3/1/90	480	22	-
3/18/90	440	2.5drips/min	-
3/22/90	470	24.5	-
4/3/90	440	-	-
4/23/90	468	19.8	-
6/23/90	376	47.5	-
8/2/90	580	404	-
8/26/90	700	1178	7.7
8/30/90	620	-	7.7
9/4/90	600	433	8.0
9/30/90	606	374	-
11/1/90	574	235	-
12/19/90	528	96.5	-
3/10/91	605	757.5	8.0

KARTCHNER CAVERNS
Drip Water Conductivity

BIG ROOM (near Bishop)			
DATE	uMHOS	Rate ml/hr	pH
12/19/89	301	76.0	-
12/21/89	266	45?	-
12/29/89	320	48.0	-
1/3/90	312	60.0	-
1/10/90	330	60.0	-
1/14/90	330	41.8	-
1/16/90	302	46.0	-
1/22/90	330	47.5	-
2/7/90	318	27.0	-
2/16/90	315	40.5	-
2/27/90	320	17.0	-
3/1/90	320	27.4	-
3/9/90	308	16.7	-
3/14/90	302	23.4	-
4/1/90	328	16.5	-
4/8/90	320	15.0	-
4/20/90	312	13.2	-
4/26/90	330	18.6	-
4/28/90	338	27.7	-
4/30/90	341	19.7	-
5/13/90	315	10.8	-
5/24/90	350	19.5	-
7/17/90	442	20.5	-
7/26/90	360	48.4	-
8/2/90	370	45.5	-
8/4/90	375	52.5	-
8/26/90	382	109.6	-
9/11/90	390	100.5	-
9/27/90	381	96.6	-
10/11/90	278	52.3	-
10/20/90	374	75.8	-
10/25/90	320	79.6	-
11/8/90	359	bulk	-
11/8/90	359	71.7	-
11/20/90	373	60.8	-
12/5/90	354	76.7	-
12/11/90	347	61.2	-
12/13/90	377	59.6	8.0
12/18/90	375	58.0	8.2
1/2/91	343	47.3	8.3
1/5/91	340	53.8	8.2
1/8/91	361	45.0	8.2
1/10/91	351	60.8	8.1

KARTCHNER CAVERNS
Drip Water Conductivity

BIG ROOM (near Bishop)			
DATE	uMHOS	Rate ml/hr	pH
1/11/91	351	41.2	8.2
1/17/91	349	60.0	8.0
1/31/91	354	17.5	8.3
2/10/91	337	44.9	8.2
2/12/91	346	53.6	8.2
2/21/91	379	71.0	8.1
2/24/91	342	55.5	8.1
3/5/91	356	67.2	8.1
3/24/91	343	91.9	8.1
3/31/91	343	101.1	8.1
4/23/91	354	107.4	8.2
5/10/91	355	71.5	-
5/14/91	358	69.3	-
5/21/91	359	66.3	8.0

KARTCHNER CAVERNS
Drip Water Conductivity

CUL-DE-SAC			
DATE	uMHOS	Rate ml/hr	pH
9/27/90	512	-	-
11/20/90	363	-	-
12/3/90	361	71.2ml/day	-
12/13/90	338	60.0ml/day	8.1
12/18/90	354	48.2ml/day	8.1
1/8/91	376	30.9ml/day	8.2
1/17/91	372	35.0ml/hr	7.9
2/12/91	329	38.5+ml/day	8.2
2/24/91	352	bulk	8.1
2/26/91	342	59.3ml/hr	8.1
3/31/91	342	28.8ml/hr	8.2
4/18/91	354	bulk	-
4/23/91	358	41.3ml/hr	8.4
5/21/91	345	13.8ml/hr	8.3

KARTCHNER CAVERNS
Water Conductivity

Guindani Wash-C-35		
DATE	uMHOS	pH
1/10/91	234	8.3
1/11/91	243	8.1
1/17/91	243	8.3
1/21/91	227	8.2
1/29/91	249	8.2
2/14/91	219	8.2
2/19/91	211	8.1
2/24/91	213	-
2/26/91	229	8.3
3/5/91	178	8.0
3/12/91	224	-

KARTCHNER CAVERNS
Water Conductivity

Guindani Wash-Trail		
DATE	uMHOS	pH
8/9/90	198	-
8/14/90	143	-
8/21/90	240	-
8/23/90	243	-
3/24/91	180	-
3/28/91	174	8.4

KARTCHNER CAVERNS
Water Conductivity

Guindani Wash-W. PL		
DATE	uMHOS	pH
1/8/91	205	-
2/14/91	210	-
2/19/91	206	8.4
3/12/91	226	-
4/2/91	177	8.1

KARTCHNER CAVERNS
Water Conductivity

Saddle Wash		
DATE	uMHOS	pH
8/14/90	290	-
8/28/90	357	-
9/4/90	322	-
3/12/91	324	-
3/19/91	314	8.6
3/26/91	343	7.9
4/9/91	316	-

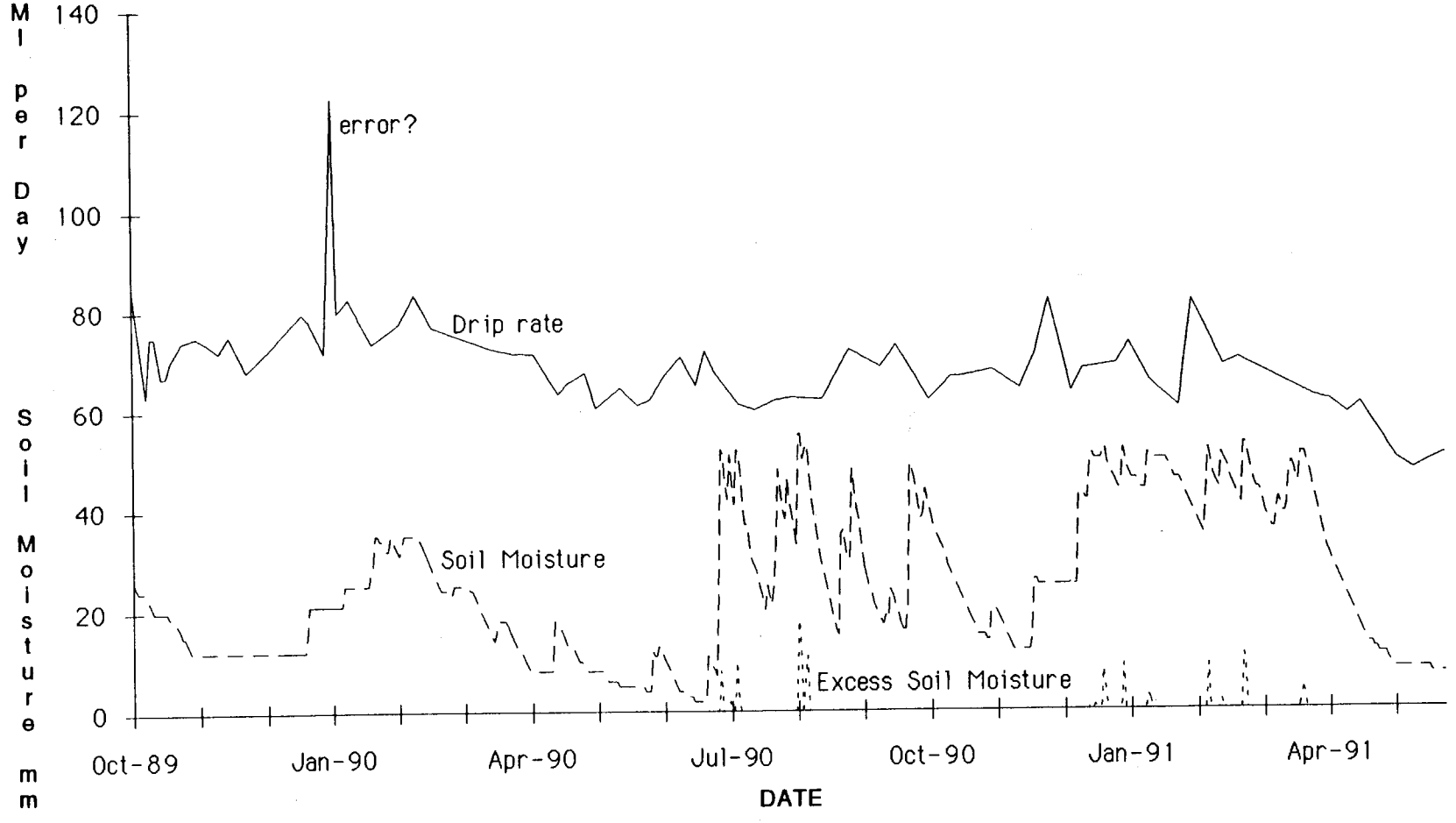
KARTCHNER CAVERNS
Water Conductivity

LOCATION	DATE	uMHOS	pH
Rainwater	8/14/90	18	-
Saddle Wash W. PL	8/28/90	417	-
Saddle Wash W. Pl	8/30/90	305	-
Pirate's Junction Pool	8/26/90	265	-
Subway Tunnel Pool	8/26/90	270	-
Mushroom Pool	8/26/90	490	-
Mushroom Pool	8/30/90	441	-
Pirate/Sue's Junct.	10/2/90	269	-
Granite Dells	1/11/91	251	-
Pyramid Rm.Pool	1/21/91	265	7.5
Subway/Angel Wing J	1/21/91	261	-
Subway/Angel Wing J	1/23/91	271	-
Pyramid Rm. Pool	1/23/91	270	-
Guindani Wash	1/23/91	237	-
Pyramid Rm. Pool	2/24/91	224	7.6
Pyramid Rm. Pool	3/5/91	195	-
Subway/Angel Wing J	3/5/91	210	7.8
Grand Canyon-Entrance	3/10/91	209	7.9
Pyramid Rm.Stream	3/24/91	259	7.8
Pyramid Rm.Stream	3/31/91	196	7.8
Pyramid Rm.Stream	4/4/91	209	-
Guindani Cyn at Spring	4/9/91	227	8.1
Pyramid Rm. Pool	4/23/91	248	8.2
Mud Trench Pool	5/5/91	235	8.1

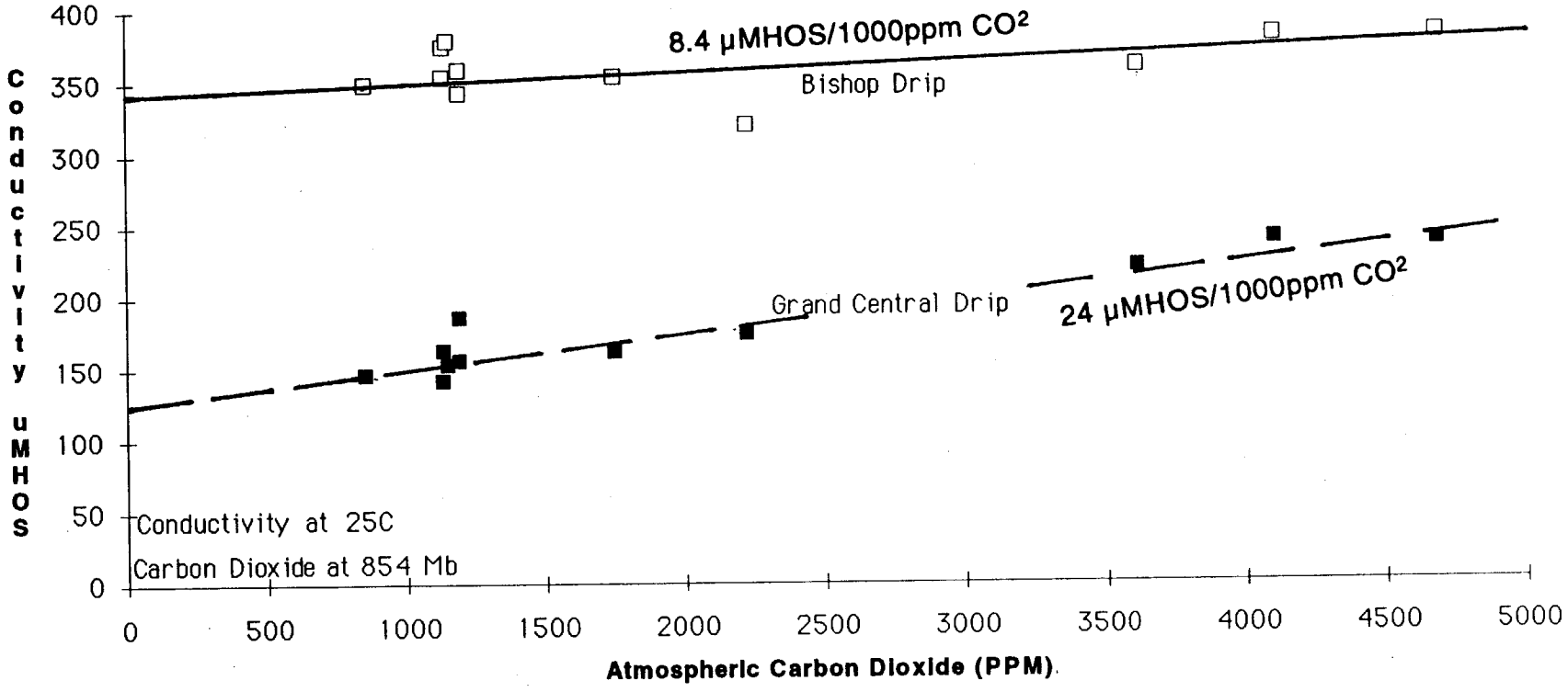
KARTCHNER CAVERNS
Water Conductivity

Water Room Pool		
8/26/90	271	-
9/11/90	272	-
1/10/91	279	7.7
1/11/91	280	7.8
1/15/91	278	7.8
1/21/91	268	7.4
1/29/91	263	7.7
2/19/91	240	7.7

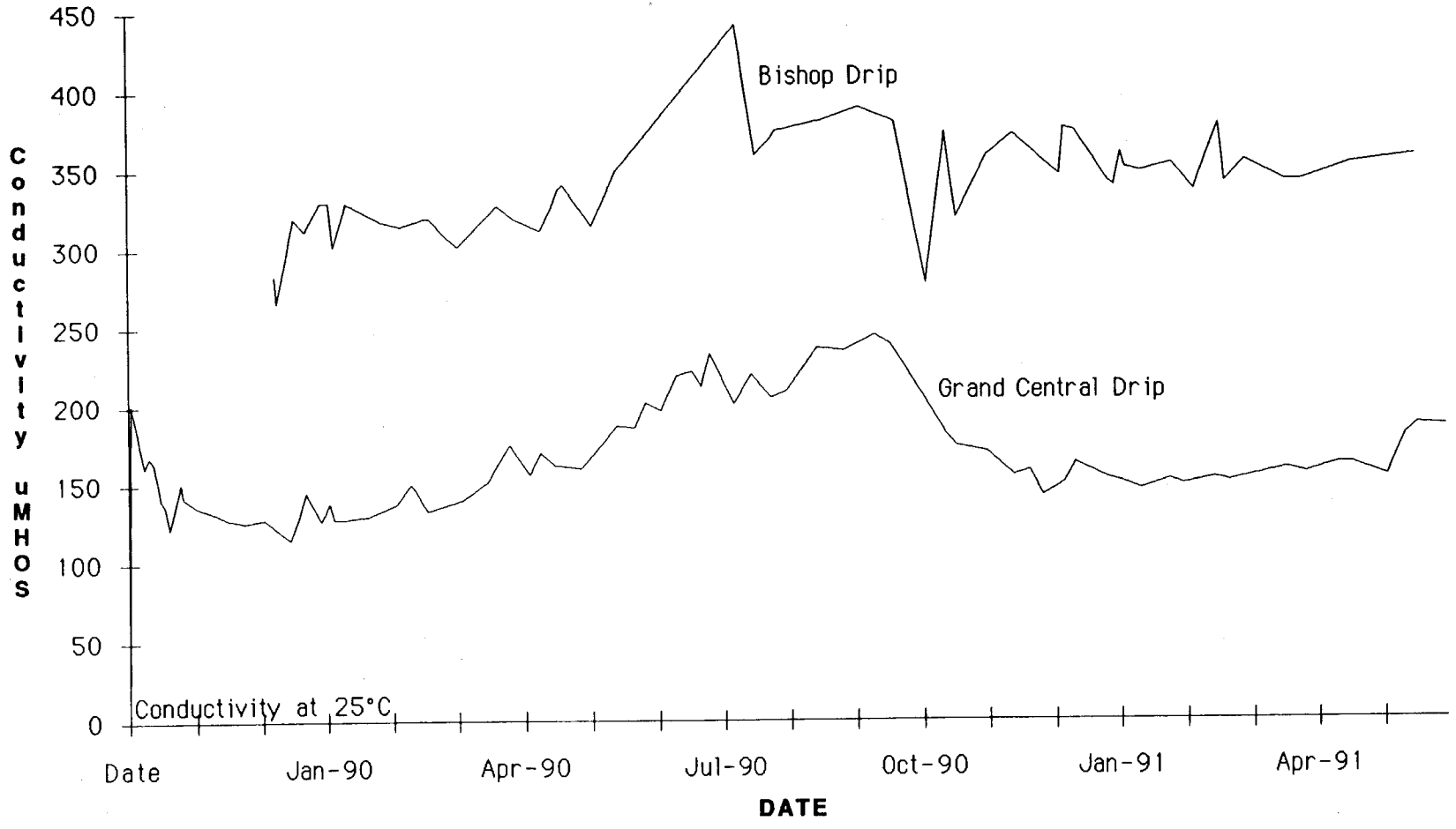
Grand Central Drip - Flow Rate & Soil Moisture



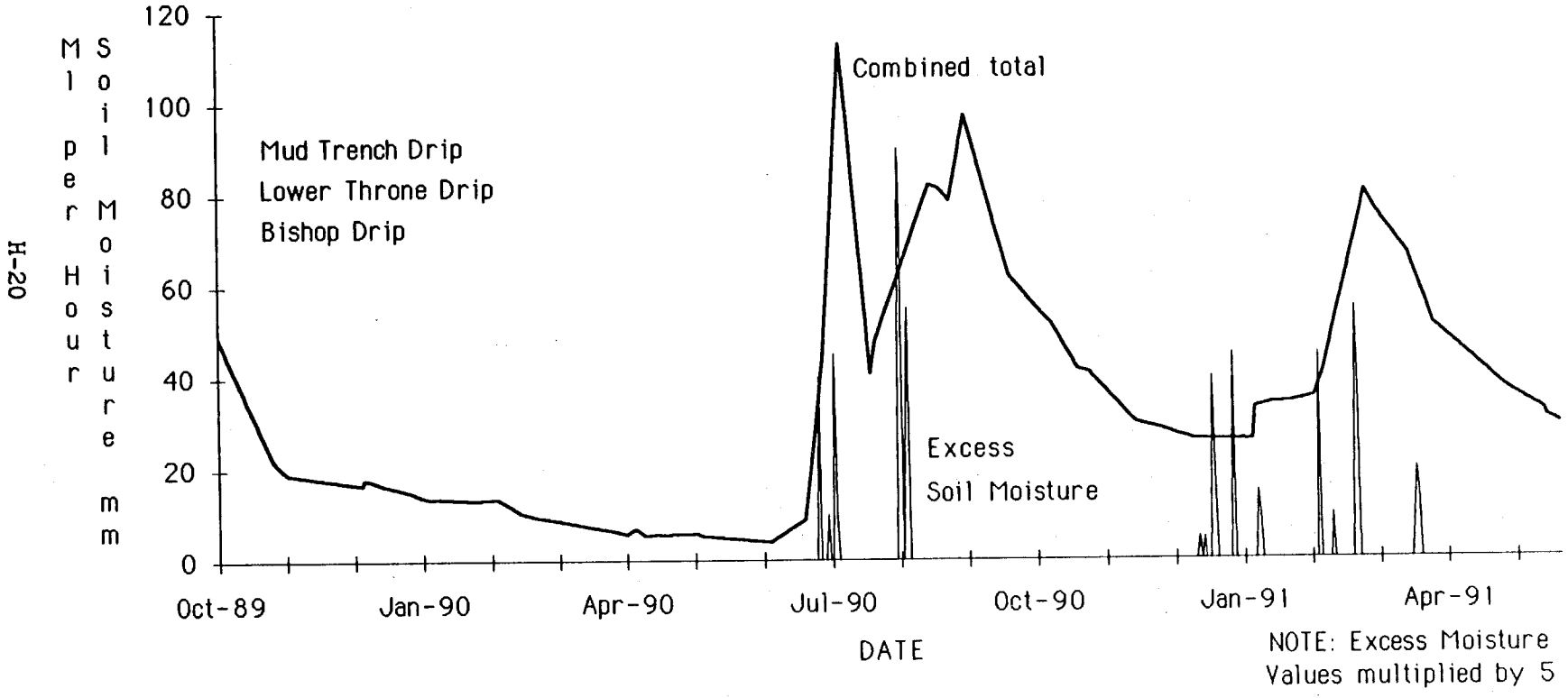
BIG ROOM - Carbon Dioxide & Dripwater Conductivity



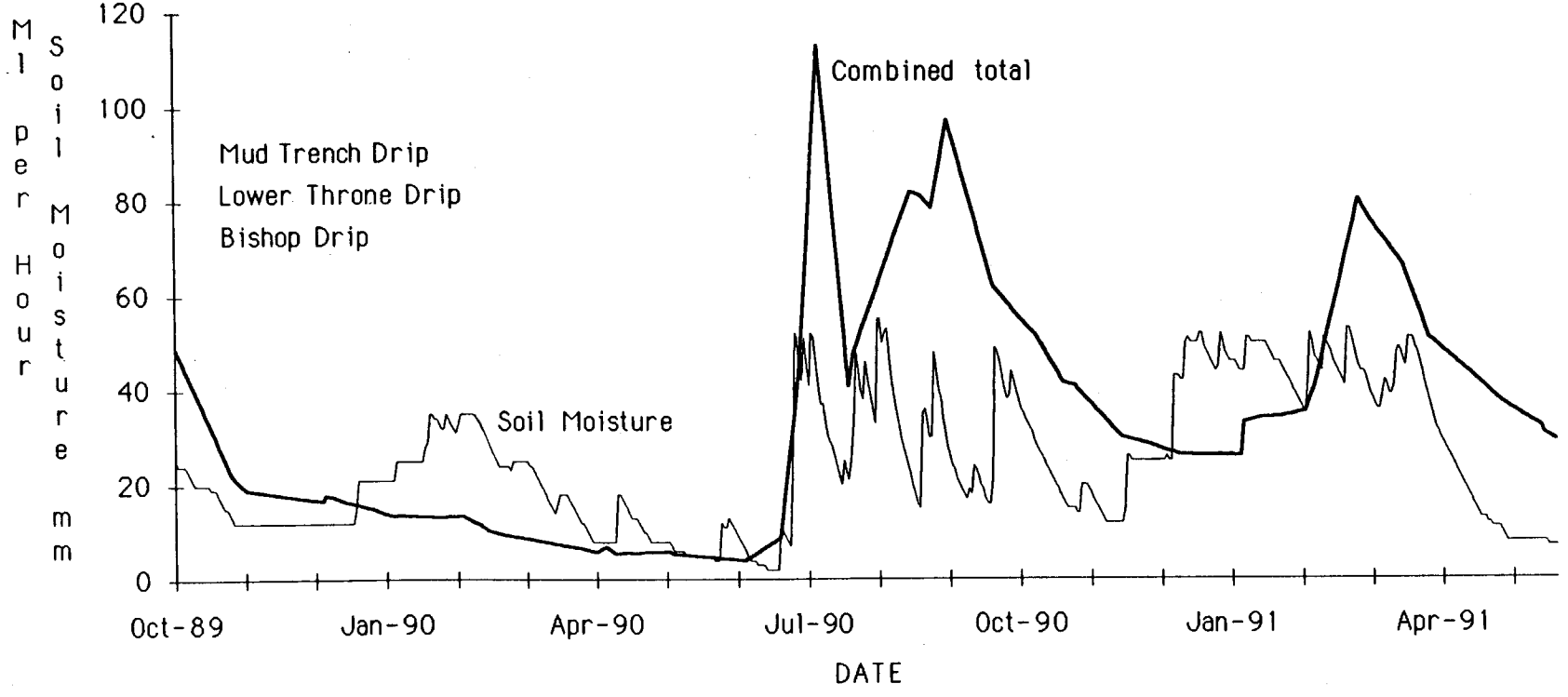
BIG ROOM - Dripwater Conductivity



Combined Drip Rates & Excess Soil Moisture



Combined Drip Rates & Soil Moisture



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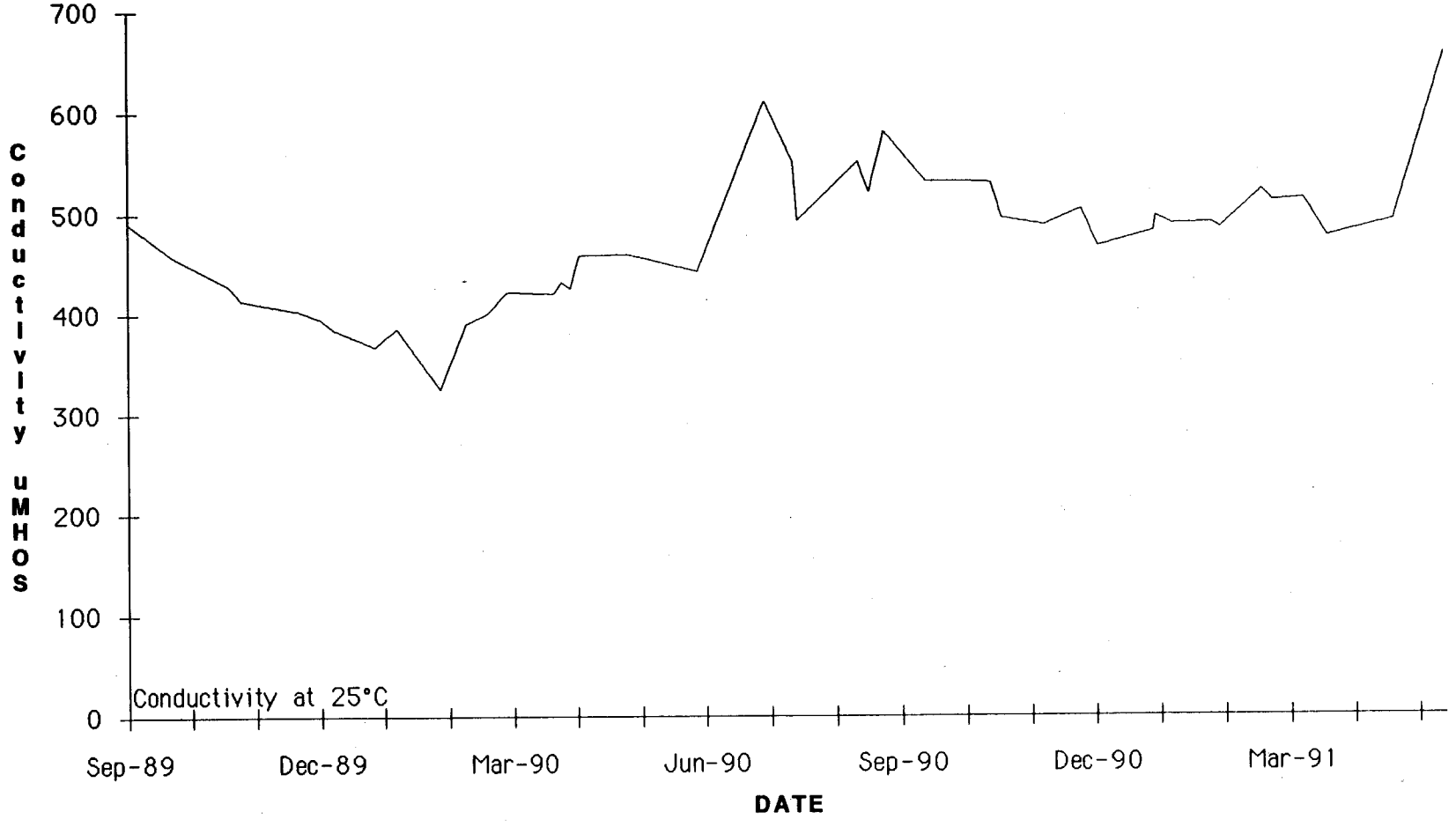
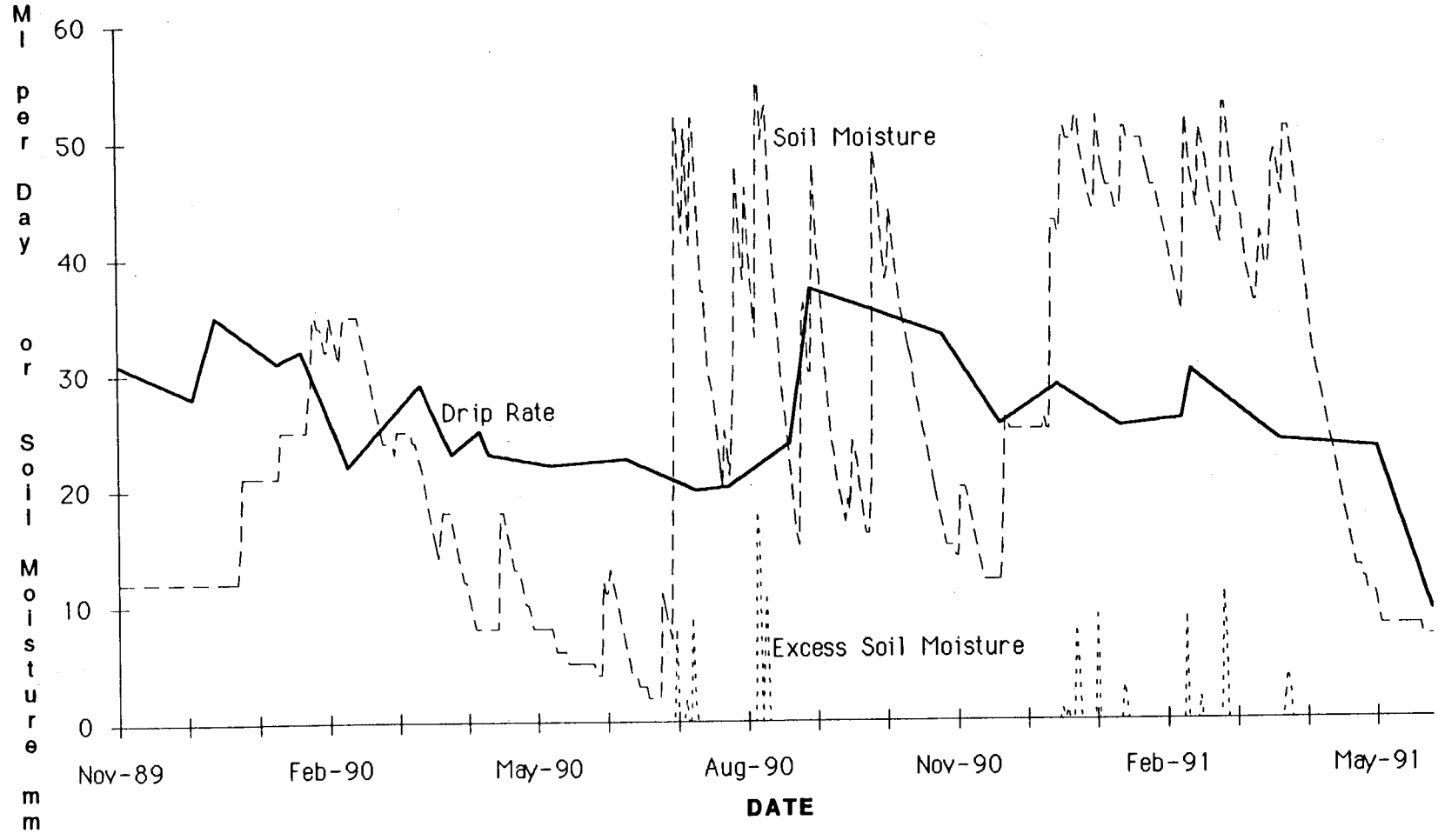
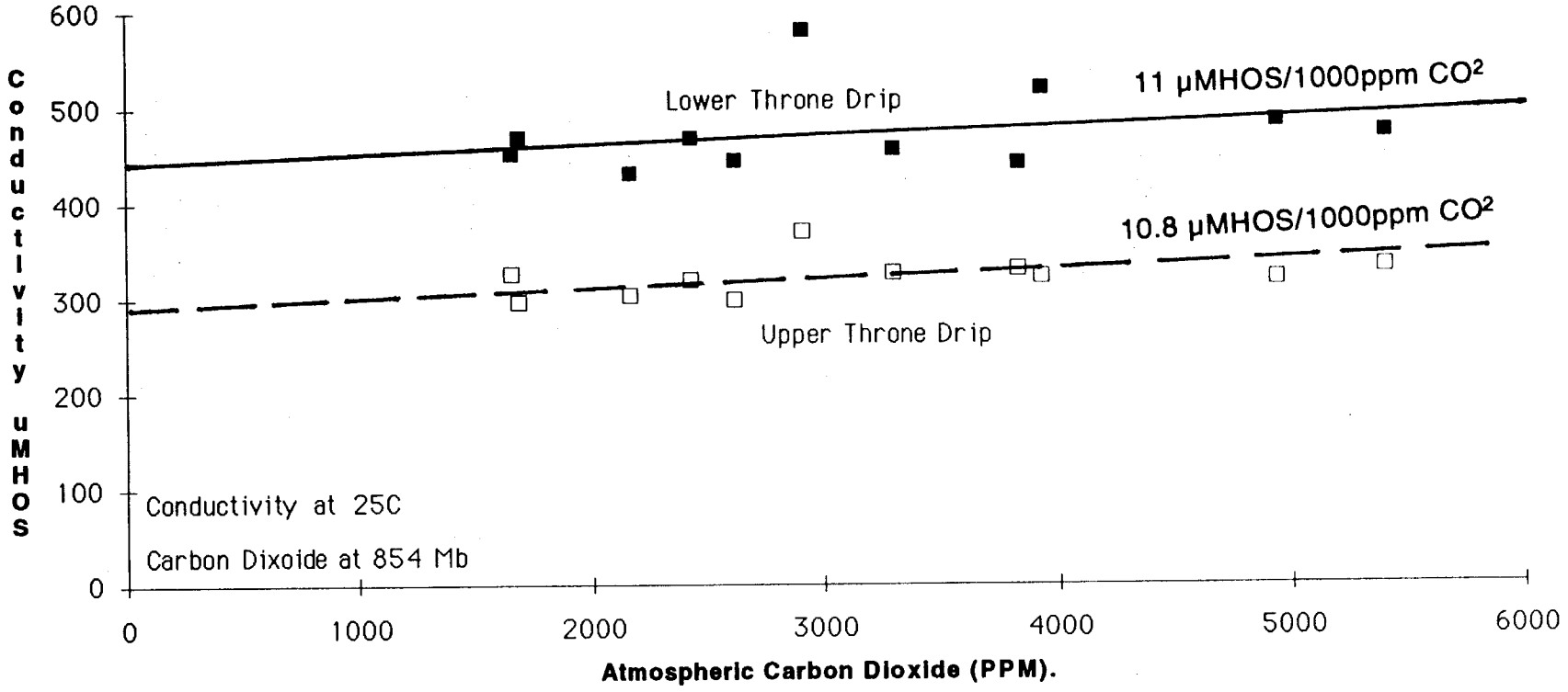
MUD TRENCH - Drip Water Conductivity



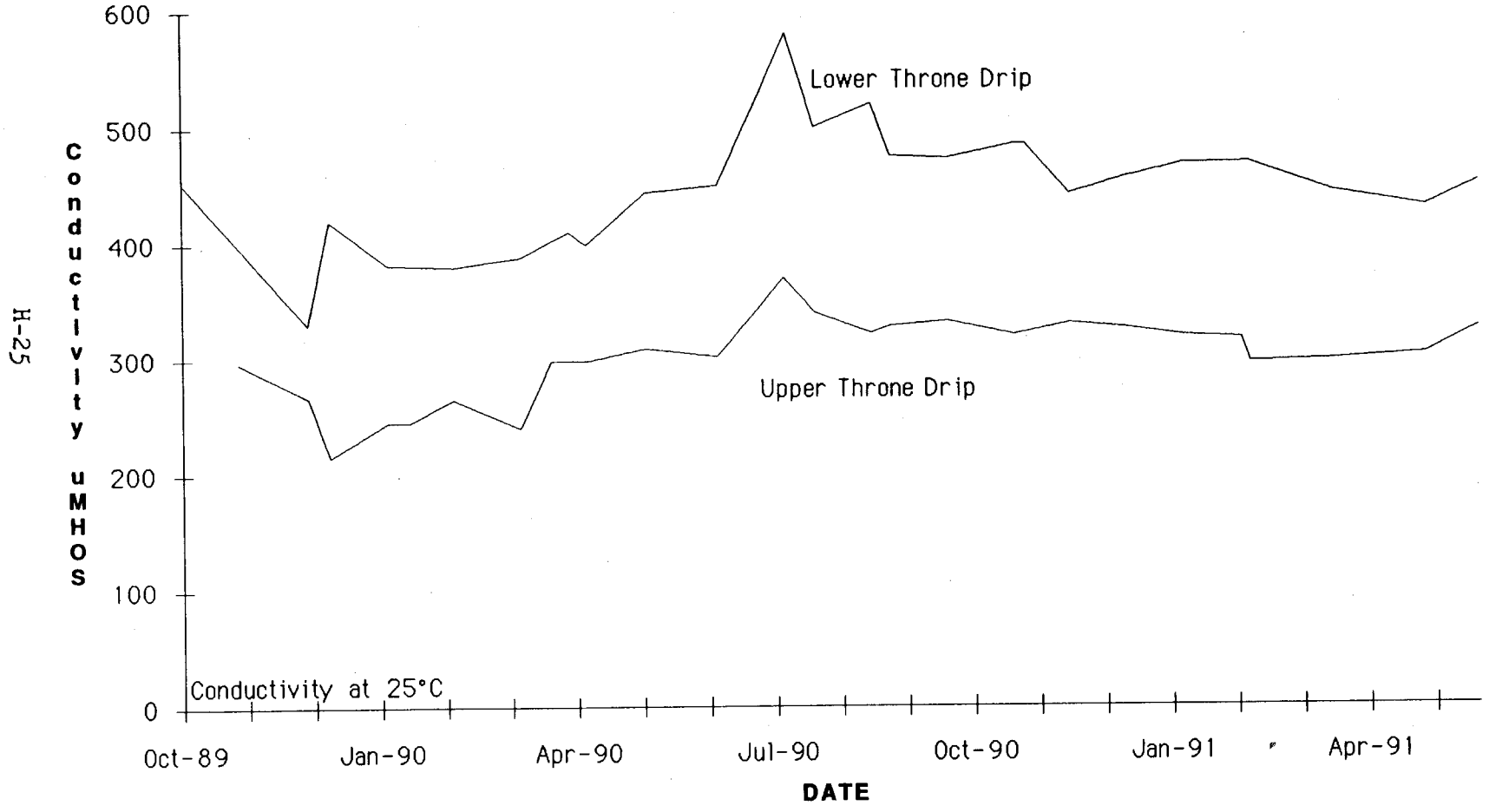
Upper Throne Room Drip - Flow Rate & Soil Moisture



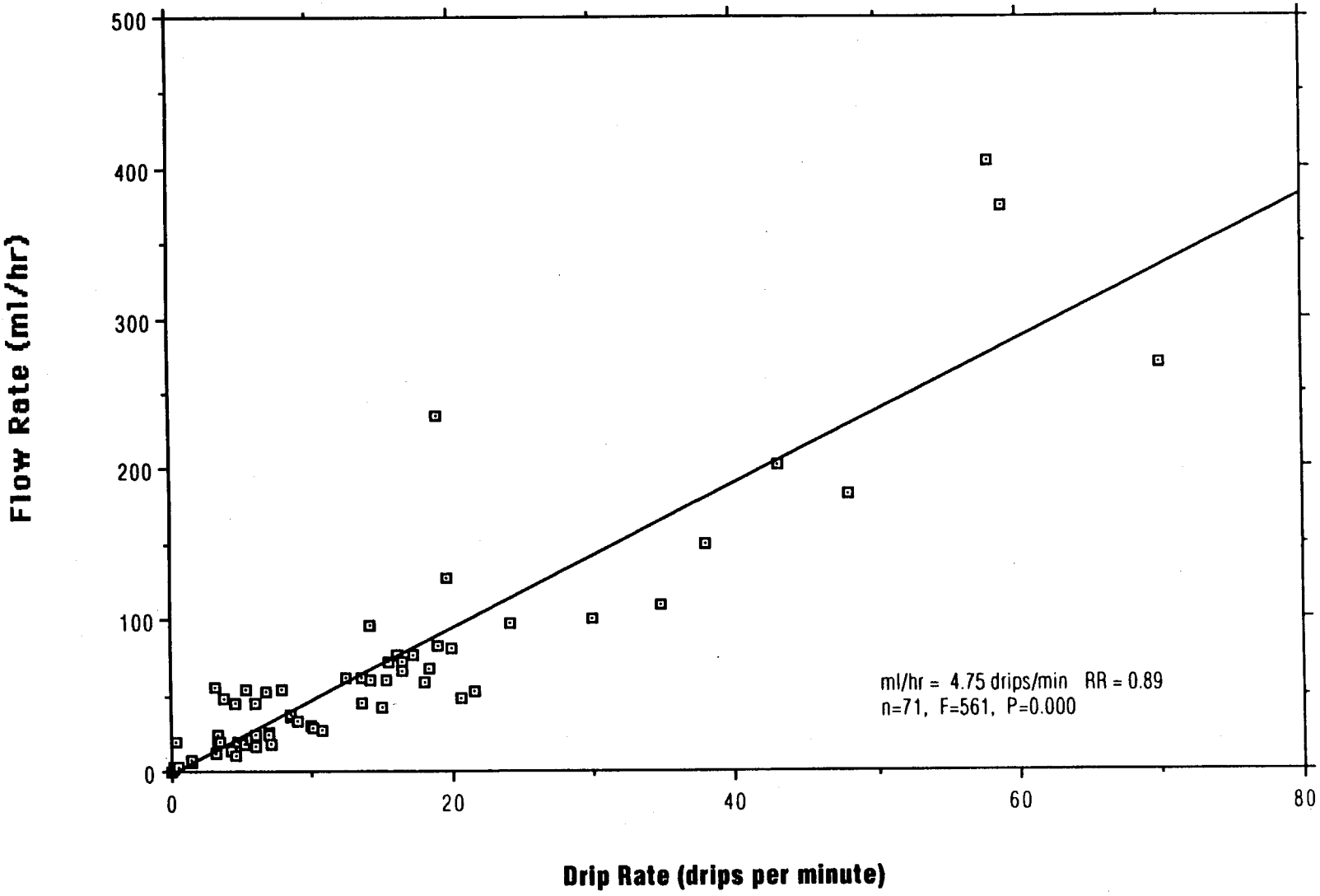
THRONE ROOM - Carbon Dioxide & Dripwater Conductivity

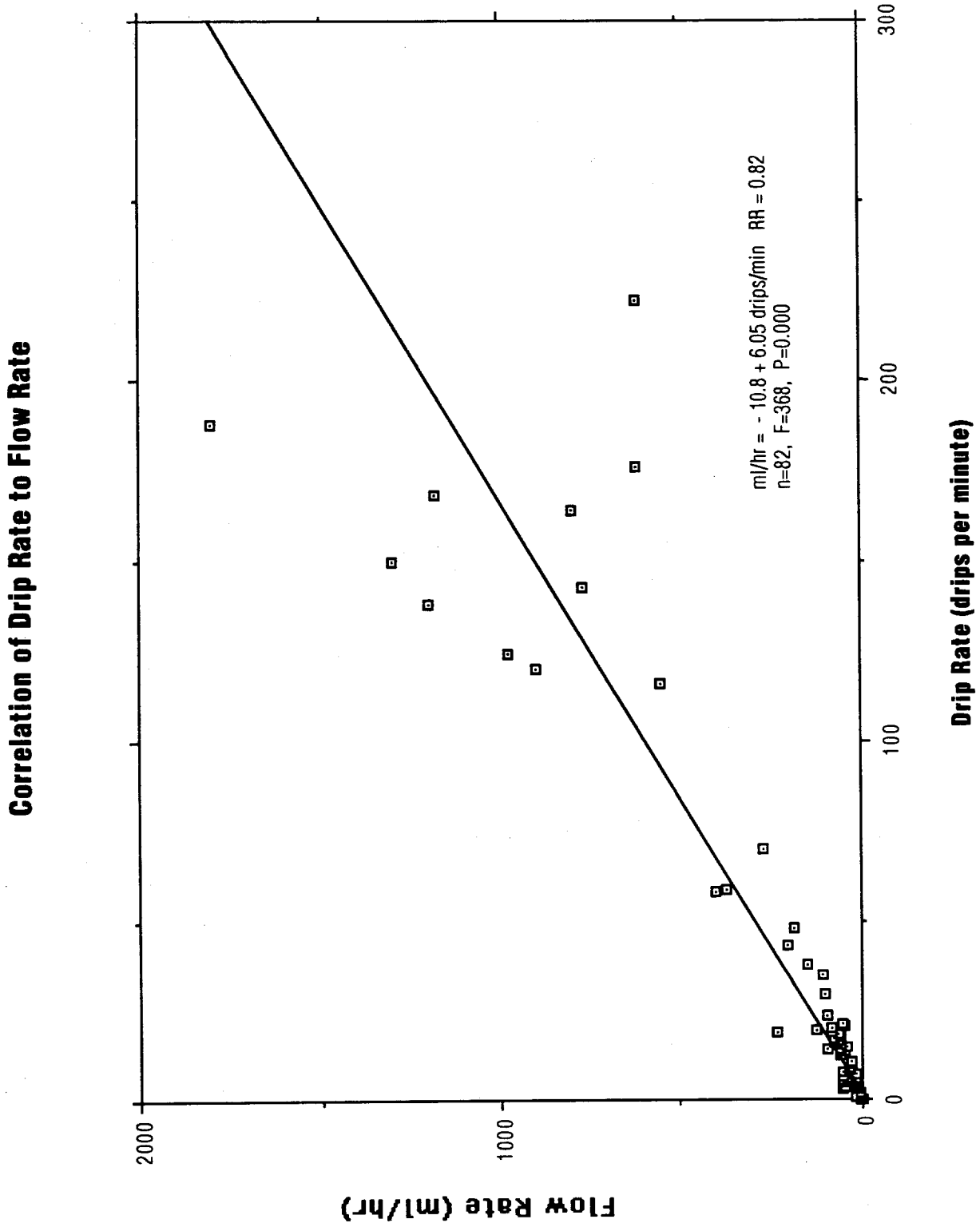


THRONE ROOM - Drip Water Conductivity



Correlation of Drip Rate to Flow Rate
(for drip rates less than 70 drips per minute)




Correlation of Drip Rate to Flow Rate
ml/hr = - 10.8 + 6.05 drips/min RR = 0.82
n=82, F=368, P=0.000
Flow Rate (ml/hr)
2000
1000
0
0
100
200
300
Drip Rate (drips per minute)

Counts of Drips by Area

AREA DRIP	Drips/minute	Ctr.	Est. Area	in/sq ft/yr	Bishop Drip	Indexed
Gr.Central			70'x30'		est.	in/sq ft/yr
11/27/90	10.00	B		0.11	68	0.08
	8.33	A		0.09	68	0.07
	10.10			0.11	68	0.08
	9.20			0.10	68	0.07
Kar.Towers			70'x60'			
2/5/91	37.50	B		0.20	31	0.34
	34.30	B		0.18	31	0.31
Gr.Canyon			80'X40'			
2/10/91	31.25	B		0.22	45	0.25
Gr.Central			70'x30'			
2/5/91	10.20	A		0.11	31	0.18
Gr.Central			70'x30'			
2/21/91	15.17	A		0.16	71	0.12
					Average=	**0.17**

Drip Collection Pans (randomly placed)

Set in Big Room 12/5/90

NO.	LOCATION	2/5/91	2/26/91	4/29/91	Totals
1	Sharon'sSaddle	18.00	325.50	19.50	364.00
2	Bat House	7.00	14.00	14.00	37.00
3	River Psg.	8.25	78.00	24.50	113.75
4	Bishop	0.00	0.00	0.00	4.00
5	Fried Egg	0.00	62.50	0.00	67.50
6	W.of LunchSpot	0.00	0.00	0.00	6.00
7	E.of LunchSpot	0.00	0.00	0.00	7.00
8	NearEcho Psg.	17.00	0.00	0.00	25.00
9	E.of AzSunset	0.00	0.00	2.50	11.50
10	Rope Traverse	0.00	0.00	8.00	18.00
	Totals	50.25	480.00	68.50	598.75
	Total w/o Sharon's	32.25	154.50	49.00	289.75

				Indexed
In/ft sq/yr	**0.08**	**w/o Sharon's Saddle**		**0.07**
In/sq ft/yr	**0.16**	**with Sharon's Saddle**		**0.13**

APPENDIX I

Water Well Measurements

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North Well
- Summary of Measurements I-1
- Hydrograph I-5

South Well
- Summary of Measurements I-6
- Hydrograph I-12

Middle Canyon Well
- Summary of Measurements I-13
- Hydrograph I-19

Kartchner Well
- Summary of Measurements I-20
- Hydrograph I-25

West Well
- Summary of Measurements I-26
- Hydrograph I-30

Highway Well
- Summary of Measurements I-31

North Well
(D-18-19)25 dbb

MP = Sawed slot on top of casing North side, 4.4' a.l.s.
Water level recorder installed 6-18-88

August 15, 1991

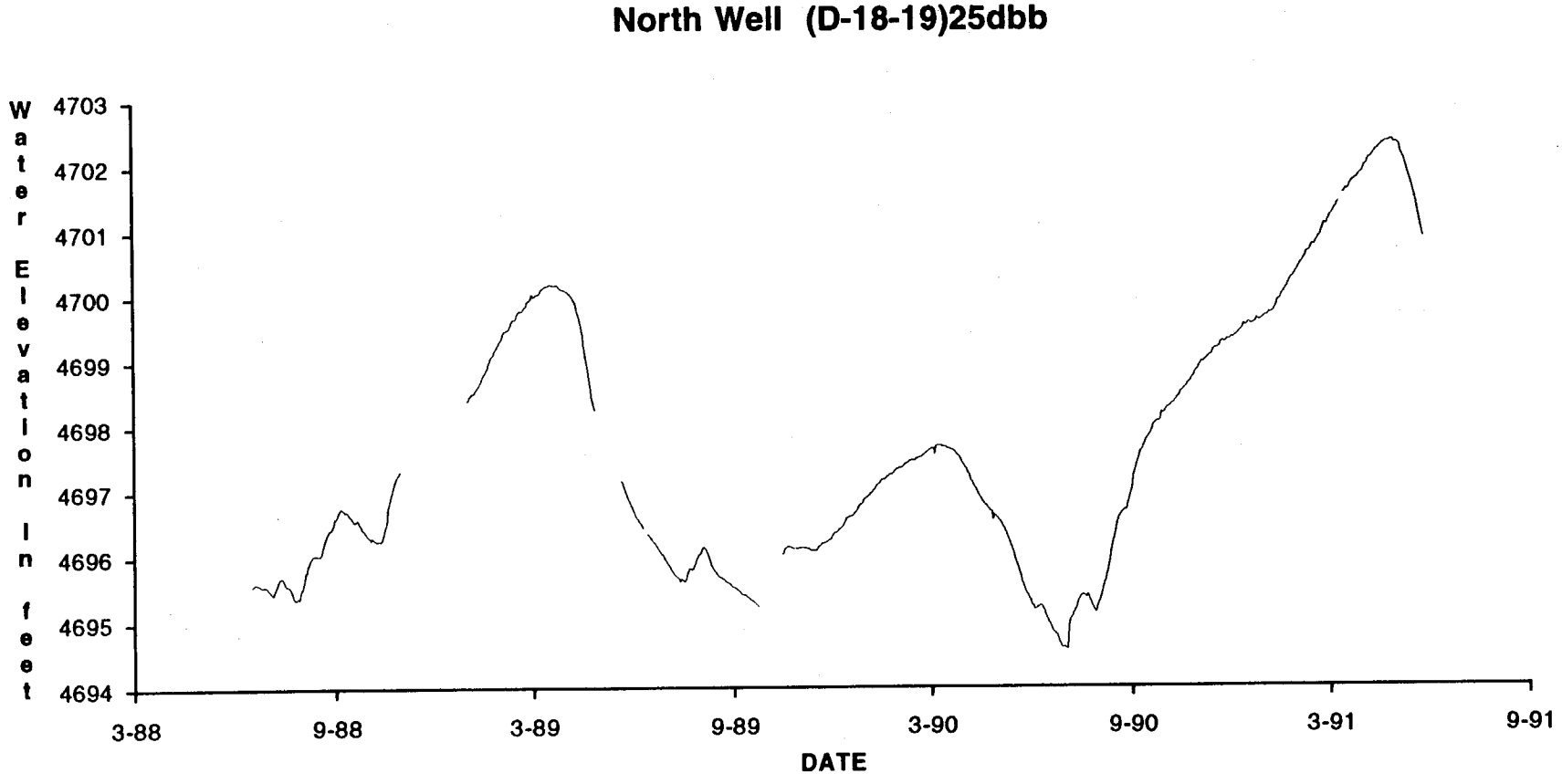
Elev. MP = 4724.76
Elev. LS = 4720.7

Date	Time	Held	Cut	DTW	WT Elev.	Method	Meas. By	Other Comments
10/27/85				25.5	4699.26	Tape	BB	
02/01/87				25.5	4699.26	Tape	BB	
11/15/87				28.7	4696.06	Tape	BB	
04/24/88				26.95	4697.81	Tape	BB	
06/04/88				28.95	4695.81	Tape	DB	
06/18/88	1200			29.2	4695.56	Tape	CG	T=18 deg C, EC=464 at 25 deg C; bailed.
07/10/88	1545	30.00	0.83	29.17	4695.59	Tape	CG	
08/06/88	1330	31.00	2.00	29.00	4695.76	Tape	CG	Guidani Cyn to S. running approx. 7 cfs after 0.2" rain at trailer / has been running since 8/1.
08/25/88	1750	33.00	4.62	28.38	4696.38	K.Tape	BB	Guidani began running again 8/21; chart 28.40
09/03/88	1215	31.50	3.32	28.18	4696.58	Tape	CG	Guidani flowing.
10/06/88	1730	29.00	0.55	28.46	4696.30	K.Tape	BB	Chart changed.
11/01/88	1630			27.40	4697.36	K.Tape	BB	Chart changed.
01/03/89				26.35	4698.41	Tape	BB	
01/24/89	1400			25.71	4699.05	Tape	BB	

02/10/89	1220	26.00	0.78	25.22	4699.54	Tape	BB
02/18/89	1135	29.50	4.47	25.03	4699.73	Tape	CG Chart changed.
03/11/89	1152	26.00	1.32	24.68	4700.08	Tape	CG Chart changed.
04/08/89	1240	26.00	1.28	24.72	4700.04	Tape	JJ/CG Chart changed.
04/30/89	1150	28.00	1.48	26.52	4698.24	Tape	BB Chart changed.
		28.50	1.98	26.52	4698.24	Tape	BB
06/16/89	1030	30.00	1.60	28.40	4696.36	Tape	BB
06/22/89	1130	31.00	2.48	28.52	4696.24	Tape	AP
				28.538	4696.22	Chart	AP
06/24/89							SC=358 at 20.5 deg C; SC=393 at 25 deg C.
07/12/89	0950	31.00	1.95	29.05	4695.71	Tape	AP
				29.04	4695.72	Chart	AP Chart changed.
07/18/89	0930	29.80	0.70	29.10	4695.66	Tape	AP
				29.10	4695.66	Chart	AP
08/03/89	1030	31.00	2.30	28.70	4696.06	Tape	AP Chart changed.
08/30/89	1517	31.00	1.82	29.18	4695.58	Tape	AP
				29.15	4695.61	Chart	AP Chart changed.
09/20/89	1342	31.00	1.58	29.42	4695.34	Tape	BB/AP
				29.42	4695.34	Chart	BB/AP Change chart before 10/17
10/16/89	0928	31.00	2.23	28.77	4695.99	Tape	BB/AP
				28.74	4696.02	Chart	Clock stopped on 9/27.
11/07/89	1000	29.50	0.89	28.61	4696.15	Tape	BB
				28.62	4696.14	Chart	BB Change chart before 12/5.
11/30/89	1000			28.53	4696.23	Tape	BB
				28.53	4696.23	Chart	BB
12/21/89	1000	30.00	1.85	28.15	4696.61	Tape	AP
				28.14	4696.62	Chart	AP Change chart before 1/20.

01/16/90	0930	29.00	1.34	27.66	4696.10	Tape	BB
				27.65	4696.11	Chart	BB Change chart before 2/13.
02/13/90	0945	30.00	2.68	27.32	4697.44	Tape	BB/AP
				27.30	4697.46	Chart	Change chart before 3/11.
03/07/90	1040	28.00	0.90	27.10	4697.66	Tape	BB/AP
				27.10	4697.66	Chart	Change chart before 4/5.
04/04/90	1200	28.50	1.12	27.38	4697.38	Tape	BB/AP
				27.38	4697.38	Chart	Change chart before 5/3.
05/02/90	1100	29.00	0.87	28.13	4696.63	Tape	BB/AP
				28.12	4696.64	Chart	Change chart before 5/31.
05/30/90	0953	30.00	0.70	29.30	4695.46	Tape	BB/AP
				28.48		Chart	Chart had slipped on drum.
							Change chart before 6/27.
06/27/90	0915	32.00	1.97	30.03	4694.73	Tape	AP/JD
				29.96	4694.80	Chart	Change chart before 7/25.
07/03/90	0950	32.00	1.86	30.14	4694.62	Tape	AP/JD
				30.14	4694.62	Chart	
07/24/90	1300	30.00	0.65	29.35	4695.41	Tape	BB/AP
				29.40	4695.36	Chart	Change chart before 8/20.
08/14/90	1121	30.00	1.13	28.87	4695.89	Tape	BB/AP
				28.88	4695.88	Chart	Change chart before 9/10.
08/28/90	1150	29.00	0.94	28.06	4696.70	Tape	BB/AP
				28.05	4696.71	Chart	
09/10/90	1200	28.00	0.74	27.26	4697.50	Tape	BB/AP
				27.28	4697.48	Chart	Change chart before 10/7.
10/04/90	0955	27.00	0.44	26.56	4698.20	Tape	BB/AP
				26.57	4698.19	Chart	Change chart before 11/1.
10/30/90	1043	27.00	0.98	26.02	4698.74	Tape	BB/AP
				26.04	4698.72	Chart	Change chart before 11/27.

11/27/90	1058	27.00	1.55	25.45	4699.31	Tape	BB/AP
				25.47	4699.29	Chart	Change chart before 12/25.
12/18/90	1024	26.00	0.77	25.23	4699.53	Tape	BB/AP
				25.22	4699.54	Chart	Change chart before 1/15/91.
01/02/91	1030	26.00	0.90	25.10	4699.66	Tape	BB/AP
01/15/91	0923	25.50	0.58	24.92	4699.84	Tape	BB/AP
				24.95	4699.81	Chart	Change chart before 2/12/91
01/21/91	0925	25.50	0.76	24.74	4700.02	Tape	BB/AP
02/14/91	1000	25.00	0.89	24.11	4700.65	Tape	BB
				24.09	4700.67	Chart	Change chart before 3/15/91.
02/19/91	1015	25.00	1.01	23.99	4700.77	Tape	AP
03/05/91	0936	25.00	1.40	23.60	4701.16	Tape	BB/AP
03/12/91	1007	24.00	0.59	23.41	4701.35	Tape	AP
				23.41	4701.35	Chart	Change chart before 4/10/91.
03/19/91	1050	24.00	0.77	23.23	4701.53	Tape	AP
03/26/91	1010	24.00	0.98	23.02	4701.74	Tape	BB
04/02/91	1009	23.50	0.58	22.92	4701.84	Tape	BB/AP
04/09/91	1103	24.00	1.24	22.76	4702.00	Tape	BB/AP Water temp. 59.7° RS/20(1)
				22.76	4702.00	Chart	Change chart before 5/8/91
05/07/91	1045	23.00	0.60	22.40	4702.36	Tape	BB/AP
				22.42	4702.34	Chart	Change chart before 6/5/91.
06/02/91	1143	25.00	0.97	24.03	4700.73	Tape	JER
07/01/91	0829	27.00	0.75	26.25	4698.51	Tape	JER


North Well (D-18-19)25dbb
Water Elevation in feet
4703
4702
4701
4700
4699
4698
4697
4696
4695
4694
3-88
9-88
3-89
9-89
3-90
9-90
3-91
9-91
DATE

South Well Data
(South of corral)
(D-18-19)25 dc

MP = Top of 36" corrugated metal pipe, W. side, 0.8 ft. a.l.s. May 31, 1991

Elev. MP = 4684.46
Elev. LS = 4683.7

Date	Time	Held	Cut	DTW	WT Elev.	Method	Meas. By	Other Comments
07/10/88	1500			26.45	4658.01	Sounder	CG	T=19.5 deg C.,EC=918 at 25 deg., bailed.
07/28/88	1730	28.00	4.50	23.50	4660.96	Tape	CG	
08/02/88	1900			23.4	4661.06	Tape	BB	
08/06/88	1300			23.49	4660.97	Sounder	BB/CG	Ravine running with water from ~0.2 in. rain.
	1930			23.35	4661.11	Sounder	CG	Ravine no longer flowing.
08/14/88				24.1	4660.36	Tape	BB	
08/25/88	1733	24.50	1.28	23.22	4661.24	K.Tape	BB	
09/03/88	1148			23.18	4661.28	Sounder	CG	
09/14/88	1712	24.00	0.74	23.26	4661.20	K.Tape	BB	
09/16/88	2000	24.00	0.74	23.26	4661.20	K.Tape	BB	
11/01/88	1717			23.22	4661.24		BB	
01/24/89	1300			22.08	4662.38	Tape	BB	
02/10/89	1120	24.50	2.22	22.28	4662.18	Tape	BB	
02/18/89	1050	24.00	1.86	22.14	4662.32	Tape	CG	
02/24/89	1100			22.12	4662.34	Tape	BB	

South Well (Page 2)

03/03/89	1100			21.88	4662.58	Tape	CG	
03/11/89	1112	27.00	5.03	21.97	4662.49	Tape	CG	
03/16/89	1400	23.00	1.13	21.87	4662.59	Tape	BB	
03/26/89	1000	23.00	1.28	21.72	4662.74	Tape	BB	
04/01/89	1026	24.00	2.28	21.72	4662.74	Tape	BB	
04/08/89	1206	23.00	1.30	21.70	4662.76	Tape	JJ/CG	
04/15/89	1749	27.00	5.26	21.74	4662.72	Tape	CG	
04/23/89	1000	25.00	3.09	21.91	4662.55	Tape	RB	
04/30/89	1100	23.00	0.90	22.10	4662.36	Tape	BB	
		23.50	1.39	22.11	4662.35	Tape	BB	
05/06/89	0945	24.00	1.68	22.32	4662.14	Tape	CG	WL Rechecked and ok.
05/15/89	1425	23.50	0.95	22.55	4661.91	Tape	BB	
05/24/89	0920	24.00	1.22	22.78	4661.68	Tape	BB	
		25.00	2.24	22.76	4661.70	Tape	BB	
05/31/89	1915	25.00	1.92	23.08	4661.38	Tape	CG	WL Rechecked and ok.
06/03/89	2000	24.00	0.85	23.15	4661.31	Tape	BB	
06/08/89	1040	24.00	0.75	23.25	4661.21	Tape	BB	
		24.50	1.26	23.24	4661.22	Tape	BB	
06/16/89	1030	25.00	1.54	23.46	4661.00	Tape	BB	
		25.50	2.02	23.48	4660.98	Tape	BB	
06/22/89	1045	25.00	1.47	23.53	4660.93	Tape	AP	
		26.00	2.47	23.53	4660.93	Tape	AP	
06/24/89	1638	26.99	3.35	23.64	4660.82	Tape	CG	T=21 deg. C; SC=790 at 21 deg C; SC=859 at 25 deg C; bailed from about 15' below water surface.
06/29/89	1536	26.50	2.94	23.56	4660.90	Tape	BB	
07/06/89	0930	25.00	1.25	23.75	4660.71	Tape	AP	
07/12/89	1032	26.00	2.26	23.74	4660.72	Tape	AP	

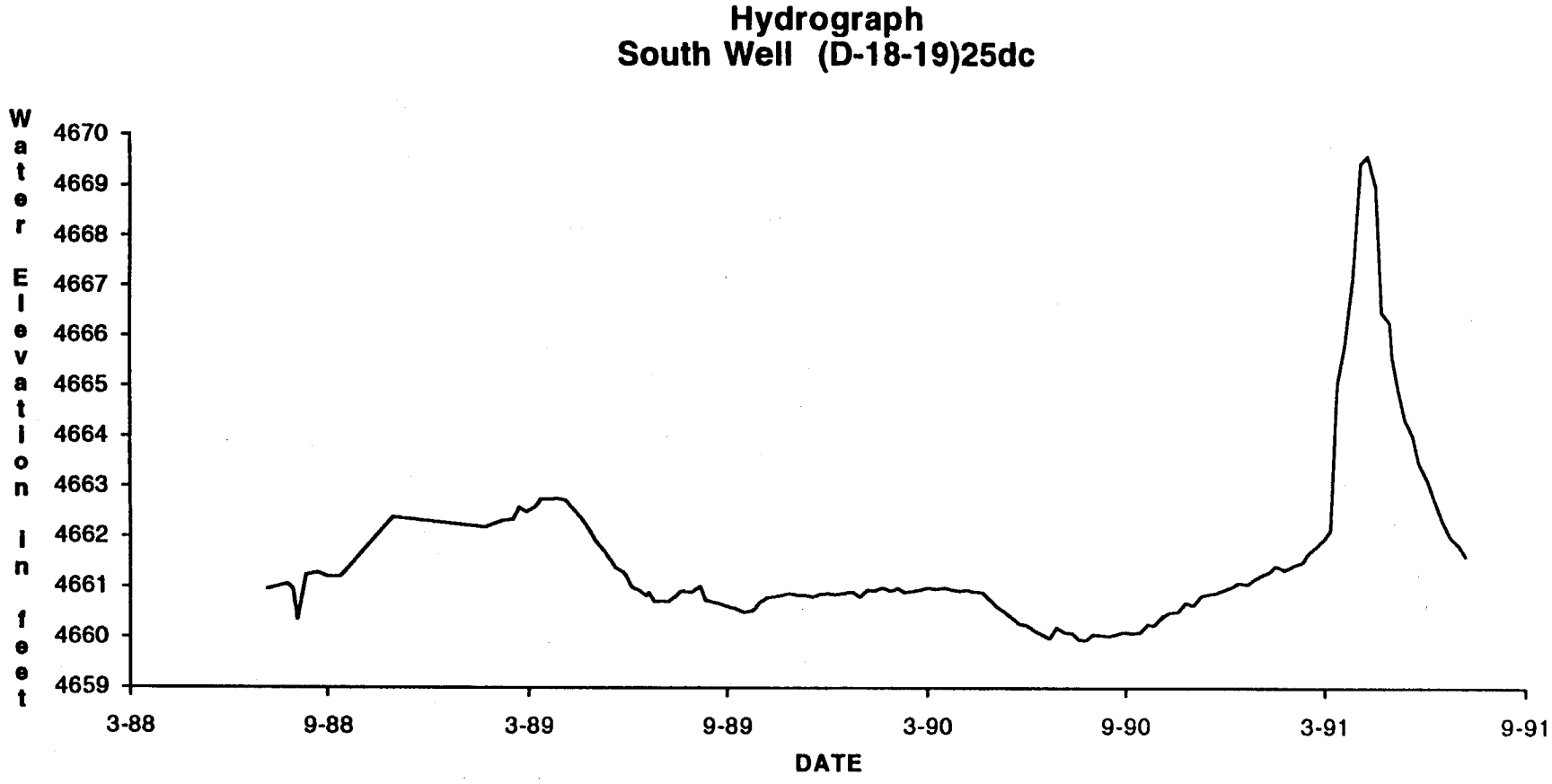
07/18/89	0919	26.50	2.75	23.75	4660.71	Tape	AP
07/24/89	2000	24.00	0.34	23.66	4660.80	Tape	BB
08/03/89	0955	26.50	2.96	23.54	4660.92	Tape	AP
08/10/89	0859	26.00	2.43	23.57	4660.89	Tape	AP
08/15/89	1629	25.00	1.55	23.45	4661.01	Tape	AP
08/23/89	1223	25.00	1.28	23.72	4660.74	Tape	AP
08/30/89	1552	25.00	1.24	23.76	4660.70	Tape	AP
09/06/89	1019	25.00	1.20	23.80	4660.66	Tape	AP
09/13/89		25.00	1.14	23.86	4660.60	Tape	BB
09/20/89	1420	25.00	1.11	23.89	4660.57	Tape	BB/AP
09/27/89	1400	25.00	1.04	23.96	4660.50	Tape	BB
10/03/89	1052	25.00	1.07	23.93	4660.53	Tape	AP
10/11/89	0915	25.00	1.22	23.78	4660.68	Tape	BB
10/16/89	1020	25.00	1.33	23.67	4660.79	Tape	BB/AP
10/24/89	1019	25.00	1.34	23.66	4660.80	Tape	AP
10/31/89	0920	25.00	1.38	23.62	4660.84	Tape	AP/BB
11/07/89	0900	25.00	1.41	23.59	4660.87	Tape	BB
11/14/89	0940	25.00	1.38	23.62	4660.84	Tape	BB/AP
11/21/89	1340	25.00	1.36	23.64	4660.84	Tape	BB
11/28/89	1520	25.00	1.34	23.66	4660.80	Tape	BB/AP
12/05/89	0950	25.00	1.42	23.58	4660.86	Tape	BB/AP
12/11/89	1100	25.00	1.41	23.59	4660.87	Tape	BB/AP
12/19/89	0912	25.00	1.39	23.61	4660.85	Tape	BB/AP
12/27/89	1356	25.00	1.41	23.59	4660.87	Tape	BB/AP
01/03/90	0947	25.00	1.45	23.55	4660.91	Tape	AP
01/10/90	1230	25.00	1.45	23.66	4660.80	Tape	AP
01/16/90	0922	25.00	1.48	23.52	4660.94	Tape	AP
01/24/90	1015	25.00	1.46	23.54	4660.92	Tape	BB/AP
01/31/90	0942	25.00	1.53	23.47	4660.99	Tape	AP

02/07/90	1338	25.00	1.46	23.54	4660.92	Tape	AP
02/13/90	0910	25.00	1.52	23.48	4660.98	Tape	BB/AP
02/21/90	0908	25.00	1.43	23.57	4660.89	Tape	AP
02/27/90	1027	25.00	1.46	23.54	4660.92	Tape	BB/AP
03/07/90	1003	25.00	1.48	23.52	4660.94	Tape	BB/AP
03/14/90	0940	25.00	1.53	23.47	4660.99	Tape	BB/AP
03/22/90	0920	25.00	1.50	23.50	4660.96	Tape	BB
03/27/90	0930	25.00	1.53	23.47	4660.99	Tape	BB
04/04/90	1300	25.00	1.50	23.50	4660.96	Tape	BB/AP
04/11/90	0910	25.00	1.46	23.54	4660.92	Tape	BB/AP
04/17/90	0918	25.00	1.48	23.52	4660.94	Tape	BB/AP
04/25/90	1045	25.00	1.45	23.55	4660.91	Tape	BB
05/02/90	1030	25.00	1.43	23.57	4660.89	Tape	BB/AP
05/08/90	0951	25.00	1.30	23.70	4660.76	Tape	BB/AP
05/16/90	0858	25.00	1.17	23.83	4660.63	Tape	BB/AP
05/24/90	1251	25.00	1.05	23.95	4660.51	Tape	BB/AP
05/30/90	0902	25.00	0.92	24.08	4660.38	Tape	BB/AP
06/06/90	0954	25.00	0.81	24.19	4660.27	Tape	BB/AP
06/13/90	0912	25.00	0.78	24.22	4660.24	Tape	BB/AP
06/20/90	1022	25.00	0.68	24.32	4660.14	Tape	BB/AP
06/27/90	0835	25.00	0.60	24.40	4660.06	Tape	AP/JD
07/03/90	0905	25.00	0.52	24.48	4659.98	Tape	AP/JD
07/11/90	0830	25.00	0.54	24.26	4660.20	Tape	JD
07/18/90	0920	25.00	0.64	24.36	4660.10	Tape	BB
07/24/90	1341	25.00	0.63	24.37	4660.09	Tape	BB/AP
07/31/90	0857	25.00	0.50	24.50	4659.96	Tape	BB/AP
08/07/90	1109	27.00	2.49	24.51	4659.95	Tape	AP
08/14/90	1022	25.00	0.60	24.40	4660.06	Tape	BB/AP
08/21/90	1810	25.00	0.58	24.42	4660.04	Tape	BB

08/28/90	1115	25.00	0.57	24.43	4660.03	Tape	BB/AP
09/04/90	0937	25.00	0.61	24.39	4660.07	Tape	AP
09/10/90	1117	25.00	0.65	24.35	4660.11	Tape	BB/AP
09/18/90	1141	25.00	0.63	24.37	4660.09	Tape	AP
09/25/90	1059	25.00	0.64	24.36	4660.10	Tape	BB/AP
10/02/90	0952	25.00	0.80	24.20	4660.26	Tape	BB/AP
10/09/90	0929	25.00	0.78	24.22	4660.24	Tape	BB/AP
10/16/90	0917	25.00	0.96	24.04	4660.42	Tape	BB/AP
10/23/90	1525	25.00	1.04	23.96	4660.50	Tape	BB
10/30/90	1003	25.00	1.05	23.95	4660.51	Tape	BB/AP
11/06/90	0908	25.00	1.24	23.76	4660.70	Tape	BB/AP
11/13/90	1008	25.00	1.18	23.82	4660.64	Tape	BB/AP
11/20/90	0911	25.00	1.37	23.63	4660.83	Tape	AP/JG
11/27/90	1000	25.00	1.40	23.60	4660.86	Tape	BB/AP
12/05/90	1120	25.00	1.42	23.58	4660.88	Tape	BB/AP
12/11/90	0948	25.00	1.50	23.50	4660.96	Tape	BB/AP
12/18/90	0937	25.00	1.54	23.46	4661.00	Tape	BB/AP
12/26/90	1530	25.00	1.62	23.38	4661.08	Tape	BB
01/02/91	0951	25.00	1.60	23.40	4661.06	Tape	BB/AP
01/08/91	0920	24.00	0.71	23.29	4661.17	Tape	BB/AP
01/15/91	0846	24.00	0.77	23.23	4661.23	Tape	BB/AP
01/21/91	0859	24.00	0.85	23.15	4661.31	Tape	BB/AP
01/29/91	0913	24.00	0.96	23.04	4661.42	Tape	BB/AP
02/08/91	0927	24.00	0.88	23.12	4661.34	Tape	BB/AP
02/14/91	0941	24.00	0.99	23.01	4661.45	Tape	AP
02/19/91	0937	24.00	1.03	22.97	4661.49	Tape	AP
02/26/91	0939	24.00	1.20	22.80	4661.66	Tape	AP/BB
03/05/91	0911	24.00	1.32	22.68	4661.78	Tape	BB/AP
03/12/91	0921	24.00	1.46	22.54	4661.92	Tape	AP

South Well (page 6)

03/19/91	1013	24.00	1.68	22.32	4662.14	Tape	AP
03/26/91	0950	23.00	3.59	19.41	4665.05	Tape	BB
04/02/91	0938	19.00	0.37	18.63	4665.83	Tape	BB/AP
04/09/91	1001	20.00	2.69	17.31	4667.15	Tape	BB/AP Water temp.61.7° RS/20(1)
04/16/91	1002	18.00	2.99	15.01	4669.45	Tape	AP Water dripping vigorously from sid
04/23/91	0847	17.00	2.14	14.86	4669.60	Tape	AP/JR Water still dripping from sides.
04/29/91	1637	18.00	2.53	15.47	4668.99	Tape	AP Water not dripping from sides.
05/07/91	0945	19.00	1.02	17.98	4666.48	Tape	BB/AP
05/09/91	0940	20.00	1.81	18.19	4666.27	Tape	BB
05/14/91	0959	19.00	0.14	18.86	4665.60	Tape	BB/AP
05/21/91	0919	21.00	1.54	19.46	4665.00	Tape	AP
05/28/91	0959	21.00	0.88	20.12	4664.34	Tape	BB/AP/JR
06/02/91	1108	22.00	1.56	20.44	4664.02	Tape	JER
06/10/91	0749	22.00	1.02	20.98	4663.48	Tape	JER
06/17/91	0754	23.00	1.67	21.33	4663.13	Tape	JER
06/24/91	0748	23.00	1.27	21.73	4662.73	Tape	JER
07/01/91	0920	23.00	0.85	22.15	4662.31	Tape	JER
07/08/91	0752	23.00	0.53	22.47	4661.99	Tape	JER
07/15/91	0800	23.00	0.39	22.61	4661.85	Tape	JER
07/22/91	0942	23.00	0.15	22.85	4661.61	Tape	JD


Hydrograph
South Well (D-18-19)25dc
Water Elevation in feet
4670
4669
4668
4667
4666
4665
4664
4663
4662
4661
4660
4659
3-88
9-88
3-89
9-89
3-90
9-90
3-91
9-91
DATE

Middle Canyon Well
(Windmill)
(D-18-19)25 dcb

MP = Top of horizontal plate at hole, north side, 1.1 ft. a.l.s. May 31, 1991

Elev. MP = 4714.33
Elev. LS = 4713.3

Date	Time	Held	Cut	DTW	WT Elev.	Method	Meas. By	Other Comments
06/18/88	1540			67.41	4646.92	Sounder	CG	T=23 deg. C, EC=324 at 25 deg.; sporadically pumping.
07/10/88	1600			63.85	4650.48	Sounder	CG	Had pumped fairly vigorously earlier.
07/28/88	1740	72.00	7.9	64.1	4650.23	Tape	CG	Pumping vigorously.
08/06/88	1410			62.62	4651.71	Sounder	BB/CG	Pumping moderately, had pumped vigorously earlier.
08/25/88	1745	65.00	3.65	61.35	4652.98	K.Tape	BB	Not pumping.
09/03/88	1200			61.60	4652.73	Sounder	CG	Had been pumping previously.
09/14/88	1712	65.00	0.47	64.53	4649.80	K.Tape	BB	Not pumping.
09/16/88	2000	65.00	1.79	63.21	4651.12	K.Tape	BB	Slowly pumping.
		65.00	1.71	63.29	4651.04	K.Tape	BB	Better measurement. Slowly pumping.
11/01/88	1717	70.00	5.26	67.74	4646.59	K.Tape	BB	Pumping.
01/24/89	1320			68.22	4646.11	Tape	BB	Windy, pumping hard.
02/10/89	1200	65.00	4.12	60.88	4653.45	Tape	BB	Light wind, no pumping.
02/18/89	1102	65.00	4.57	60.43	4653.90	Tape	CG	Pumping on and off lightly to moderately.

Middle Canyon Well (page 2)

02/24/89	1100			60.24	4654.09	Tape	BB	Not pumping.
03/03/89	1100			80.47	4633.86	Tape	BB	Pumping hard; very windy.
03/05/89	1400			63.05	4651.28	Tape	BB	
03/11/89	1129	65.00	4.42	60.58	4653.75	Tape	CG	Not pumping.
03/16/89	1400	65.00	4.93	60.07	4654.26	Tape	BB	Slight pumping.
03/26/89	1000	75.00	3.57	71.43	4642.90	Tape	BB	Water tank overflowing, drum overflowing; heavy wind.
04/01/89	1026	65.00	3.90	61.10	4653.23	Tape	BB	Sporadic breeeze & slight pumping. Only 1" deep water in drum; running down pipe.
04/08/89	1357	70.00	8.03	61.97	4652.36	Tape	JJ/CG	Pumping moderately.
		71.00	9.00	62.00	4652.33	Tape	JJ/CG	This measurement perhaps drawdown /pumping increased.
04/15/89	1806	66.00	5.07	60.93	4653.40	Tape	CG	Pumping lightly.
04/23/89	1000	70.00	9.26	60.74	4653.59	Tape	RB	
04/30/89	1100	63.00	3.32	59.68	4654.65	Tape	BB	Slow pumping.
05/06/89	0930	64.00	4.71	59.29	4655.04	Tape	CG	Not pumping; very still air.
05/15/89	1425	69.00	4.09	64.91	4649.42	Tape	BB	Windy; pumping hard.
05/24/89	0940	62.00	2.31	59.69	4654.64	Tape	BB	Slow pumping.
05/31/89	1930	63.00	1.51	61.49	4652.84	Tape	CG	Slowly pumping.
06/03/89	1930	64.00	3.27	60.73	4653.60	Tape	BB	Very lightly turning intermittently
06/08/89	1110	64.00	2.67	61.33	4653.00	Tape	BB	Windy; pumping hard.
06/16/89	1100	63.00	2.36	60.64	4653.69	Tape	BB	
		64.00	3.36	60.64	4653.69	Tape	BB	
06/22/89	1105	62.00	1.37	60.63	4652.70	Tape	AP	Breezy; pumping slowly.
06/24/89	1557	73.00	7.26	65.74	4648.59	Tape	CG	T=24 deg C; SC=312 at 24 deg C; SC=318 at 25 deg C; pumping vigorously but intermittently (gusty).

Middle Canyon Well (page 3)

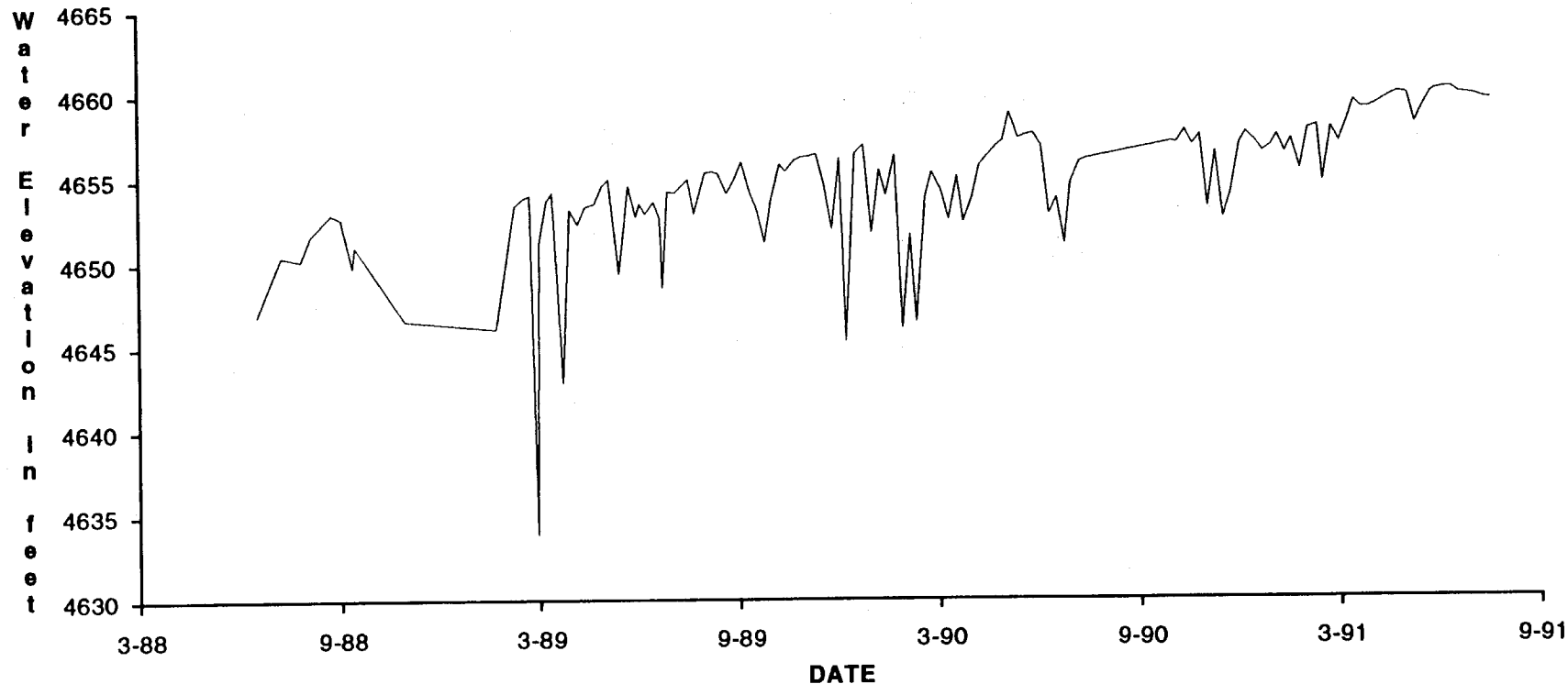
06/29/89	1555	62.00	1.98	60.02	4654.31	Tape	BB	Slight breeze, not pumping.
07/06/89	0957	64.00	3.93	60.07	4654.26	Tape	AP	Still air, not pumping.
07/12/89	0938	62.00	2.31	59.69	4654.64	Tape	AP	Still air, not pumping.
07/18/89	0934	62.00	2.69	59.31	4655.02	Tape	AP	Slight breeze, not pumping.
07/24/89	2015	62.00	0.67	61.33	4653.00	Tape	BB	Not pumping.
08/03/89	1017	62.00	3.08	58.92	4655.41	Tape	AP	Not pumping, storm approaching.
08/10/89	0932	61.00	2.17	58.83	4655.50	Tape	AP	Not pumping.
08/15/89	1612	61.00	2.07	58.93	4655.40	Tape	AP	Not pumping.
08/23/89	1237	61.00	0.87	60.13	4654.20	Tape	AP	
08/30/89	1544	62.00	2.66	59.34	4654.99	Tape	AP	Pumping.
09/06/89	1035	61.00	2.73	58.27	4656.06	Tape	AP	Not pumping.
09/13/89		62.00	2.05	59.95	4654.38	Tape	BB	Not pumping.
09/20/89	1400	63.00	1.86	61.14	4653.19	Tape	BB/AP	Pumping.
09/27/89	1417	65.00	1.96	63.04	4651.29	Tape	BB	Steady pumping.
10/03/89	1110	61.00	0.45	60.55	4653.78	Tape	AP	Pumping.
10/11/89	0930	62.00	3.57	58.43	4655.90	Tape	BB	Not pumping.
10/16/89	1010	62.00	3.16	58.84	4655.49	Tape	BB/AP	Not pumping.
10/24/89	1031	61.00	2.79	58.21	4656.12	Tape	AP	Not pumping.
10/31/89	0930	61.00	3.00	58.00	4656.33	Tape	BB/AP	Not pumping.
11/07/89	0945	59.00	1.05	57.95	4656.38	Tape	BB	Not pumping.
		59.50	1.55	57.95	4656.38	Tape	BB	
11/14/89	0950	59.50	1.67	57.83	4656.50	Tape	BB/AP	
11/21/89	1400	63.00	3.35	59.65	4654.68	Tape	BB	Windy, pumping.
11/28/89	1540	65.00	2.72	62.28	4652.05	Tape	BB/AP	Slow pumping.
12/05/89	1015	59.00	0.92	58.08	4656.25	Tape	BB/AP	Slow pumping.
12/11/89	1120	71.00	2.02	68.98	4645.35	Tape	BB/AP	Very windy. Stock tank overflowing.
12/19/89	0926	61.00	3.22	57.78	4656.55	Tape	BB/AP	Still air. Not pumping.
12/27/89	1410	58.00	0.71	57.29	4657.04	Tape	BB/AP	

01/03/90	1015	64.00	1.49	62.51	4651.82	Tape	AP
01/10/90	1250	60.00	1.21	58.79	4655.54	Tape	AP
01/16/90	0936	62.00	1.73	60.27	4654.06	Tape	AP Barely pumping.
01/24/90	1030	62.00	4.10	57.90	4656.43	Tape	BB/AP
01/31/90	1004	70.00	1.78	68.22	4646.11	Tape	AP Windy/pumping hard.
02/07/90	1359	65.00	2.36	62.64	4651.69	Tape	AP Windy/pumping hard.
02/13/90	0925	70.00	2.18	67.82	4646.51	Tape	BB/AP Windy/pumping hard. Tank overfl Barrell overflowing.
02/21/90	0928	62.00	1.62	60.38	4653.95	Tape	AP Still/not pumping.
02/27/90	1042	61.00	2.10	58.90	4655.43	Tape	BB/AP Still/not pumping.
03/07/90	1017	61.00	1.01	59.99	4654.34	Tape	BB/AP Still/not pumping.
03/14/90	1000	63.00	1.29	61.71	4652.62	Tape	BB/AP Still/not pumping.
03/22/90	0940	60.00	0.83	59.17	4655.16	Tape	BB Very slow pumping.
03/27/90	0950	64.00	2.15	61.85	4652.48	Tape	BB Steady pumping.
04/04/90	1320	62.00	1.57	60.43	4653.90	Tape	BB/AP Steady pumping.
04/11/90	0925	63.00	4.48	58.52	4655.81	Tape	BB/AP Still/not pumping.
04/17/90	0940	60.00	1.97	58.03	4656.30	Tape	BB/AP
04/25/90	1110	60.00	2.56	57.44	4656.89	Tape	BB Windmill turned off.
05/02/90	1049	60.00	2.90	57.10	4657.23	Tape	BB/AP Windmill turned off.
05/08/90	1009	59.00	1.60	55.40	4658.93	Tape	BB/AP Windmill turned off.
05/16/90	0917	58.00	1.10	56.90	4657.43	Tape	BB/AP Windmill turned off.
05/24/90	1307	58.00	1.31	56.69	4657.64	Tape	BB/AP Windmill turned off.
05/30/90	0918	58.00	1.37	56.63	4657.70	Tape	BB/AP Windmill turned off.
06/06/90	1005	58.00	0.60	57.40	4656.93	Tape	BB/AP Windmill turned back on.
06/13/90	0929	65.00	3.59	61.41	4652.92	Tape	BB/AP Pumping vigorously.
06/20/90	1051	63.00	2.56	60.44	4653.89	Tape	BB/AP Pumping very slowly.
06/27/90	0851	65.00	1.82	63.18	4651.15	Tape	AP/JD Not pumping.
07/03/90	0922	61.00	1.46	59.54	4654.79	Tape	AP/JD Not pumping.
07/11/90	0857	61.00	2.68	58.32	4656.01	Tape	JD Not pumping.

07/18/90	0940	59.00	0.85	58.15	4656.18	Tape	BB	Not pumping.
08/21/90	1825							No access to well since 7/18. Windmill pumping barrel 1/4 full.
09/04/90								Windmill pumping.
09/10/90	1134							Still air / not pumping.
09/18/90	1200							Windmill pumping / water tank filling / approx. 2/3" of water.
10/04/90	1036	60.00	2.85	57.15	4657.18	Tape	BB/AP	Hole drilled in top plate.
10/09/90	0945	59.00	1.79	57.21	4657.12	Tape	BB/AP	Not pumping.
10/16/90	0937	58.00	1.53	56.47	4657.86	Tape	BB/AP	Not pumping.
10/23/90	1540	60.00	2.67	57.33	4657.00	Tape	BB	Slow pumping.
10/30/90	1020	59.00	2.25	56.75	4657.58	Tape	BB/AP	Not pumping.
11/06/90	0928	62.00	0.97	61.03	4653.30	Tape	AP	Windy, pumping vigorously.
11/13/90	1024	62.00	4.26	57.74	4656.59	Tape	BB/AP	Barely moving.
11/20/90	0928	62.00	0.36	61.64	4652.69	Tape	AP/JG	Pumping vigorously.
11/27/90	1014	65.00	4.82	60.18	4654.15	Tape	BB/AP	Not pumping.
12/05/90	1136	61.00	3.74	57.26	4657.07	Tape	BB/AP	Pumping very slowly.
12/11/90	1007	59.00	2.39	56.61	4657.72	Tape	BB/AP	Not pumping.
12/18/90	0953	58.00	0.98	57.02	4657.31	Tape	BB/AP	Not pumping.
12/26/90	1545	58.00	0.24	57.76	4656.57	Tape	BB	Not pumping.
01/02/91	1006	60.00	2.57	57.43	4656.90	Tape	BB/AP	Not pumping.
01/08/91	0935	59.00	2.23	56.77	4657.56	Tape	BB/AP	Not pumping.
01/15/91	0900	58.00	0.22	57.78	4656.55	Tape	BB/AP	Not pumping.
01/21/91	1001	59.00	1.99	57.01	4657.32	Tape	BB/AP	Pumping.
01/29/91	0938	60.00	1.18	58.82	4655.51	Tape	BB/AP	Pumping.
02/05/91	0952	60.00	3.57	56.43	4657.90	Tape	BB/AP	Not pumping.
02/14/91	0950	58.00	1.79	56.21	4658.12	Tape	AP	Not pumping.
02/19/91	1037	60.00	0.49	59.51	4654.82	Tape	AP	Very slow pumping.
02/26/91	1015	58.00	1.69	56.31	4658.02	Tape	BB/AP	Not pumping.

03/05/91	0956	58.00	0.79	57.21	4657.12	Tape	BB/AP Blades broken/not pumping
03/12/91	1044	58.00	1.92	56.08	4658.25	Tape	AP Blades still broken.
03/19/91	1026	57.00	2.27	54.73	4659.60	Tape	AP Blades still broken.
03/26/91	1030	56.00	0.83	55.17	4659.16	Tape	BB Blades still broken.
04/02/91	1058	58.00	2.84	55.16	4659.17	Tape	BB/AP Blades still broken.
04/09/91	1023	57.00	2.04	54.96	4659.37	Tape	BB/AP Air temp.25' down 65.1° RS/20(1)
04/16/91	1017	57.00	2.34	54.66	4659.67	Tape	AP
04/23/91	0907	56.00	1.58	54.42	4659.91	Tape	AP/JR
04/29/91	1656	58.00	3.75	54.25	4660.08	Tape	AP
05/07/91	1011	57.00	2.64	54.36	4659.97	Tape	BB/AP Windmill replaced & on/not pump
05/14/91	1018	60.00	3.92	56.08	4658.25	Tape	BB/AP Pumping.
05/21/91	0945	57.00	1.86	55.14	4659.19	Tape	AP Pumping but not filling water tank.
05/28/91	1028	58.00	3.70	54.30	4660.03	Tape	BB/AP/JR Spinning, but not pumping.
06/02/91	1159	56.00	1.90	54.10	4660.23	Tape	JER
06/10/91	0723	56.00	2.00	54.00	4660.33	Tape	JER
06/17/91	0733	56.00	2.01	53.99	4660.34	Tape	JER
06/24/91	0725	56.00	1.70	54.30	4660.03	Tape	JER
07/01/91	0726	56.00	1.65	54.35	4659.98	Tape	JER
07/08/91	0732	56.00	1.59	54.41	4659.92	Tape	JER
07/15/91	0731	57.00	2.42	54.58	4659.75	Tape	JER
07/22/91	0921	57.00	2.33	54.67	4659.66	Tape	JER

Middle Canyon Well (D-18-19)25dcb



Kartchner (Middle) Well
(D-18-19) 25dcb2
(About 300' ESE of Middle Canyon Windmill)

MP = Top of 6.5" O.D. Casing, E. side, 1.3' a.l.s.

August 15, 1991

Elev. MP = 4699.91
Elev. LS = 4698.55

5-7-91 M.P. 4700.07 (1" casing added on top)

Date	Time	Held	Cut	DTW	WT Elev.	Method	Meas. By	Other Comments
06/03/89	1933	60.00	4.96	55.04	4644.87	Tape	BB/CG	
		61.00	5.96	55.04	4644.87	Tape	BB/CG	
06/08/89	1100	57.00	1.99	55.01	4644.90	Tape	BB	
06/16/89	1043	56.00	0.78	55.22	4644.69	Tape	BB	
06/22/89	1055	56.00	0.87	55.13	4644.78	Tape	AP	
06/24/89	1652	59.00	3.76	55.24	4644.67	Tape	CG	
06/29/89	1545	57.50	2.16	55.34	4644.57	Tape	BB	
		56.50	1.15	55.35	4644.56	Tape	BB	
07/06/89	0949	57.00	1.53	55.47	4644.44	Tape	AP	
07/12/89	1045	57.00	1.42	55.58	4644.33	Tape	AP	
07/18/89	0927	57.00	1.47	55.53	4644.38	Tape	AP	
07/24/89	2000	56.00	0.47	55.53	4644.38	Tape	BB	
08/03/89	1010	57.00	1.44	55.56	4644.35	Tape	AP	
08/10/89	0922	57.00	1.45	55.55	4644.36	Tape	AP	
08/15/89	1622	57.00	1.55	55.45	4644.46	Tape	AP	
08/23/89	1230	57.00	1.47	55.53	4644.38	Tape	AP	
08/30/89	1558	57.00	1.48	55.52	4644.39	Tape	AP	
09/06/89	1029	57.00	1.38	55.62	4644.29	Tape	AP	

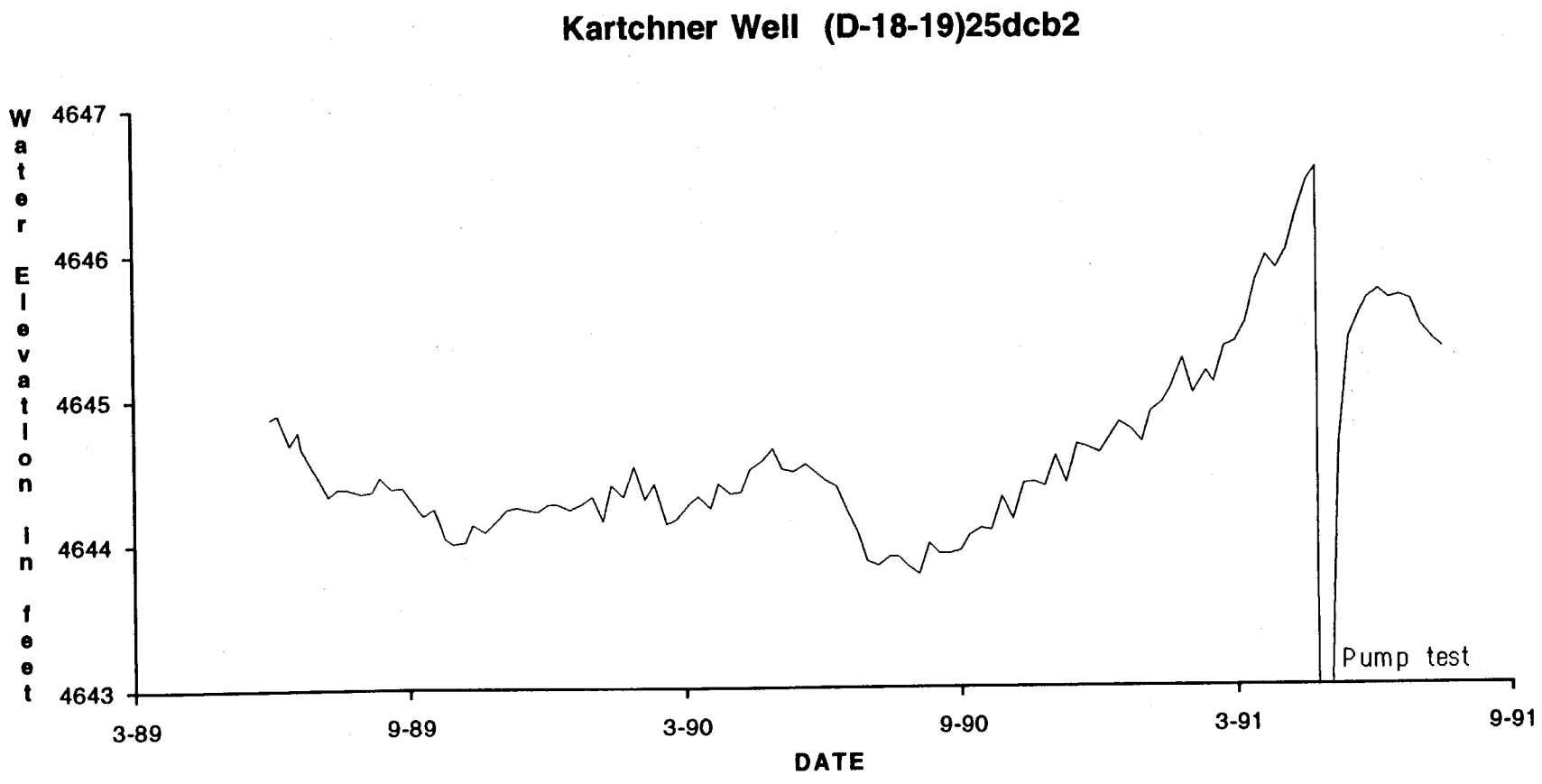
Kartchner Well (page 2)

09/13/89		57.00	1.28	55.72	4644.19	Tape	BB
09/20/89	1427	57.00	1.33	55.67	4644.24	Tape	BB/AP
09/27/89	1408	57.00	1.13	55.87	4644.04	Tape	BB
10/03/89	1100	57.00	1.09	55.91	4644.00	Tape	AP
10/11/89	0925	57.00	1.10	55.90	4644.01	Tape	BB
10/16/89	1030	57.00	1.22	55.78	4644.13	Tape	BB/AP
10/24/89	1026	57.00	1.17	55.83	4644.08	Tape	AP
10/31/89	0925	57.00	1.24	55.76	4644.15	Tape	AP/BB
11/07/89	0930	57.00	1.32	55.68	4644.23	Tape	BB
11/14/89	0945	57.00	1.34	55.66	4644.25	Tape	BB/AP
11/21/89	1400	57.00	1.32	55.68	4644.23	Tape	BB
11/28/89	1545	57.50	1.81	55.69	4644.22	Tape	BB/AP
12/05/89	1020	57.00	1.36	55.64	4644.27	Tape	BB/AP
12/11/89	1130	57.00	1.36	55.64	4644.27	Tape	BB/AP
12/19/89	0933	58.00	2.32	55.68	4644.23	Tape	BB/AP
12/27/89	1423	57.00	1.36	55.64	4644.27	Tape	BB/AP
01/03/90	1023	57.00	1.41	55.59	4644.32	Tape	AP
01/10/90	1257	57.00	1.24	55.76	4644.15	Tape	AP
01/16/90	0944	57.00	1.49	55.51	4644.40	Tape	AP
01/24/90	1035	57.00	1.41	55.59	4644.32	Tape	BB/AP
01/31/90	1008	57.00	1.62	55.38	4644.53	Tape	AP
02/07/90	1404	57.00	1.39	55.61	4644.30	Tape	AP
02/13/90	0930	57.00	1.50	55.50	4644.41	Tape	BB/AP
02/21/90	0935	57.00	1.22	55.78	4644.13	Tape	AP
02/27/90	1045	57.00	1.25	55.75	4644.16	Tape	BB/AP
033/07/90	1022	57.00	1.35	55.65	4644.26	Tape	BB/AP
03/14/90	1006	57.00	1.41	55.59	4644.32	Tape	BB/AP
03/22/90	0945	57.00	1.33	55.67	4644.24	Tape	BB
03/27/90	1000	57.00	1.50	55.50	4644.41	Tape	BB

04/04/90	1325	57.00	1.43	55.57	4644.34	Tape	BB/AP
04/11/90	0935	57.00	1.44	55.56	4644.35	Tape	BB/AP
04/17/90	0945	57.00	1.59	55.41	4644.50	Tape	BB/AP
04/25/90	1120	57.00	1.65	55.35	4644.56	Tape	BB
05/02/90	1128	57.00	1.74	55.26	4644.65	Tape	BB/AP
05/08/90	1020	57.00	1.60	55.40	4644.51	Tape	BB/AP
05/16/90	0921	57.00	1.58	55.42	4644.49	Tape	BB/AP
05/24/90	1313	57.00	1.63	55.37	4644.54	Tape	BB/AP
05/30/90	0925	57.00	1.58	55.42	4644.49	Tape	BB/AP
06/06/90	1012	57.00	1.52	55.48	4644.43	Tape	BB/AP
06/13/90	0937	57.00	1.48	55.52	4644.39	Tape	BB/AP
06/20/90	1100	57.00	1.31	55.69	4644.22	Tape	BB/AP
06/27/90	0900	57.00	1.16	55.84	4644.07	Tape	AP/JD
07/03/90	0930	57.50	1.46	56.04	4643.87	Tape	AP/JD
07/11/90	0904	57.50	1.43	56.07	4643.84	Tape	JD
07/18/90	0945	57.50	1.49	56.01	4643.90	Tape	BB
07/24/90	1349	57.50	1.49	56.01	4643.90	Tape	BB/AP
07/31/90	0923	57.00	0.92	56.08	4643.83	Tape	BB/AP
08/07/90	1129	57.00	0.87	56.13	4643.78	Tape	AP
08/14/90	1050	57.00	1.08	55.92	4643.99	Tape	BB/AP
08/21/90	1830	57.00	1.01	55.99	4643.92	Tape	BB
08/28/90	1136	57.00	1.01	55.99	4643.92	Tape	BB/AP
09/04/90	0956	57.00	1.03	55.97	4643.94	Tape	AP
09/10/90	1140	57.00	1.13	55.87	4644.04	Tape	BB/AP
09/18/90	1201	57.00	1.18	55.82	4644.09	Tape	AP
09/25/90	1118	57.00	1.17	55.83	4644.08	Tape	BB/AP
10/02/90	1011	57.00	1.40	55.60	4644.31	Tape	BB/AP
10/09/90	0952	57.00	1.24	55.76	4644.15	Tape	BB/AP
10/16/90	0943	58.00	2.49	55.51	4644.40	Tape	BB/AP

10/23/90	1550	57.00	1.50	55.50	4644.41	Tape	BB	
10/30/90	1026	57.00	1.47	55.53	4644.38	Tape	BB/AP	
11/06/90	0934	57.00	1.68	55.32	4644.59	Tape	AP	
11/13/90	1035	57.00	1.49	55.51	4644.40	Tape	BB/AP	
11/20/90	0935	57.00	1.76	55.24	4644.67	Tape	AP/JG	
11/27/90	1020	57.00	1.74	55.26	4644.65	Tape	BB/AP	
12/05/90	1142	56.00	0.70	55.30	4644.61	Tape	BB/AP	
12/11/90	1013	56.00	0.80	55.20	4644.71	Tape	BB/AP	
12/18/90	1002	56.00	0.91	55.09	4644.82	Tape	BB/AP	
12/26/90	1550	56.00	0.86	55.14	4644.77	Tape	BB	
01/02/91	1011	56.00	0.77	55.23	4644.68	Tape	BB/AP	
01/08/91	0940	56.00	0.98	55.02	4644.89	Tape	BB/AP	
01/15/91	0905	56.00	1.04	54.96	4644.95	Tape	BB/AP	
01/21/91	1009	56.00	1.14	54.86	4645.05	Tape	BB/AP	
01/29/91	0944	56.00	1.35	54.65	4645.26	Tape	BB/AP	
02/05/91	0958	55.00	0.11	54.89	4645.02	Tape	BB/AP	
02/14/91	1006	55.00	0.26	54.74	4645.17	Tape	AP	
02/19/91	1048	56.00	1.18	54.82	4645.09	Tape	AP	
02/26/91	1020	56.00	1.43	54.57	4645.34	Tape	BB/AP	
03/05/91	1001	56.50	1.96	54.54	4645.37	Tape	BB/AP	
03/12/91	1051	56.00	1.60	54.40	4645.51	Tape	AP	
03/19/91	1031	56.00	1.89	54.11	4645.80	Tape	AP	
03/26/91	1035	55.00	1.06	53.94	4645.97	Tape	BB	
04/02/91	1103	54.50	0.47	54.03	4645.88	Tape	BB/AP	
04/09/91	1044	55.00	1.10	53.90	4646.01	Tape	BB/AP	Air temp.25' down 64.6º RS/20(1)
04/16/91	1023	55.00	1.36	53.64	4646.27	Tape	AP	
04/23/91	0914	55.00	1.58	53.42	4646.49	Tape	AP/JR	
04/29/91	1702	56.00	2.67	53.33	4646.58	Tape	AP	
05/07/91	1019	75.00	3.51	71.49	4628.58	Tape	BB/AP	ASP tried to pump dry 5/6/91 (1600).

05/09/91	0950	60.00	1.80	58.20	4641.87	Tape	BB/AP
05/10/91		58.00	0.97	57.03	4643.04	Tape	BB
05/14/91	1028	58.00	2.59	55.41	4644.66	Tape	BB/AP
05/21/91	0959	57.00	2.33	54.67	4645.40	Tape	AP
05/28/91	1041	56.00	1.50	54.50	4645.57	Tape	BB/AP/JR
06/02/91	1211	56.00	1.60	54.40	4645.67	Tape	JER
06/10/91	0709	56.00	1.66	54.34	4645.73	Tape	JER
06/17/91	0722	56.00	1.60	54.40	4645.67	Tape	JER
06/24/91	0710	56.00	1.62	54.38	4645.69	Tape	JER
07/01/91	0714	56.00	1.59	54.41	4645.66	Tape	JER
07/08/91	0719	56.00	1.41	54.59	4645.48	Tape	JER
07/15/91	0715	56.00	1.32	54.68	4645.39	Tape	JER
07/22/91	0909	56.00	1.26	54.74	4645.33	Tape	JD


Kartchner Well (D-18-19)25dcb2
Water Elevation in feet
4647
4646
4645
4644
4643
3-89
9-89
3-90
9-90
3-91
9-91
DATE
Pump test

West Well
(D-18-20) 25cdc

MP = Top of 6"x8" post (ST9 engraved on it)
Elev. MP = 4714.71
Elev. LS =

August 15, 1991

Date	Time	Held	Cut	DTW	WT Elev.	Method	Meas. By	Other Comments
11/14/89	1015	20.00	2.73	17.27	4697.44	Tape	BB/AP	
11/21/89	1345	19.00	1.81	17.19	4697.52	Tape	BB	
11/28/89	1530	18.00	0.80	17.20	4697.51	Tape	BB	
12/05/89	1000	18.00	0.92	17.08	4697.63	Tape	BB/AP	
12/11/89	1110	18.00	0.89	17.11	4697.60	Tape	BB/AP	
12/19/89	0918	20.00	2.99	17.01	4697.70	Tape	BB/AP	
12/27/89	1403	18.00	0.91	17.09	4697.62	Tape	BB/AP	
01/03/90	0959	19.00	1.93	17.07	4697.64	Tape	AP	
01/10/90	1235	19.00	1.88	17.12	4697.59	Tape	AP	
01/16/90	0929	19.00	1.96	17.04	4697.67	Tape	AP	
01/24/90	1020	19.00	1.95	17.05	4697.66	Tape	BB/AP	
01/31/90	0950	19.00	1.97	17.03	4697.68	Tape	AP	
02/07/90	1345	19.00	1.97	17.03	4697.68	Tape	AP	
02/13/90	0915	19.00	1.95	17.05	4697.66	Tape	BB/AP	
02/21/90	0916	19.00	1.89	17.11	4697.60	Tape	AP	
02/27/90	1032	19.00	1.92	17.08	4697.63	Tape	BB/AP	
03/07/90	1009	19.00	1.88	17.12	4697.59	Tape	BB/AP	
03/14/90	0945	19.00	1.89	17.11	4697.60	Tape	BB/AP	
03/22/90	0925	19.00	1.86	17.14	4697.57	Tape	BB	
03/27/90	0940	18.00	0.83	17.17	4697.54	Tape	BB	

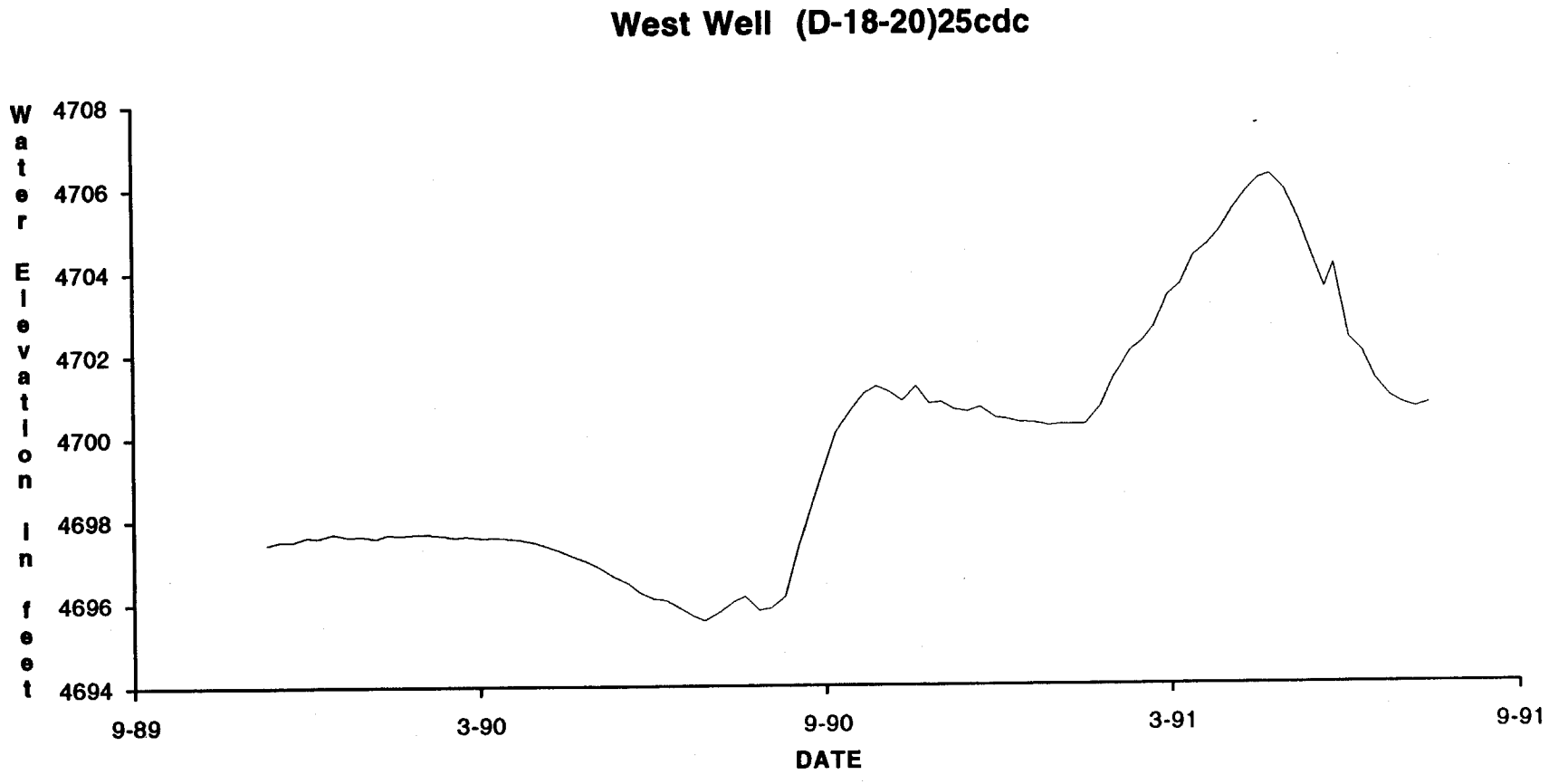
West Well (page 2)

04/04/90	1312	19.00	1.76	17.24	4697.47	Tape	BB/AP
04/11/90	0917	19.00	1.66	17.34	4697.37	Tape	BB/AP
04/17/90	0929	19.50	2.07	17.43	4697.28	Tape	BB/AP
04/25/90	1055	19.50	1.91	17.59	4697.12	Tape	BB
05/02/90	1042	19.00	1.30	17.70	4697.01	Tape	BB/AP
05/08/90	1001	19.00	1.16	17.84	4696.87	Tape	BB/AP
05/16/90	0906	19.00	0.93	18.07	4696.64	Tape	BB/AP
05/24/90	1259	19.00	0.77	18.23	4696.48	Tape	BB/AP
05/30/90	0909	19.00	0.55	18.45	4696.26	Tape	BB/AP
06/06/90	1000	19.00	0.40	18.60	4696.11	Tape	BB/AP
06/13/90	0918	19.50	0.85	18.65	4696.06	Tape	BB/AP
06/20/90	1041	19.50	0.68	18.82	4695.89	Tape	BB/AP
06/27/90	0844	19.50	0.48	19.02	4695.69	Tape	AP/JD
07/03/90	0915	19.50	0.37	19.13	4695.58	Tape	AP/JD
07/11/90	0840	19.50	0.57	18.93	4695.78	Tape	JD
07/18/90	0930	19.50	0.81	18.69	4696.02	Tape	BB
07/24/90	1329	20.50	1.94	18.56	4696.15	Tape	BB/AP
07/31/90	0905	19.50	0.60	18.90	4695.81	Tape	BB/AP
08/07/90	1117	19.50	0.66	18.84	4695.87	Tape	AP
08/14/90	1035	19.50	0.93	18.57	4696.14	Tape	BB/AP
08/21/90	1815	19.50	2.10	17.40	4697.31	Tape	BB
08/28/90	1124	18.00	1.60	16.40	4698.31	Tape	BB/AP
09/04/90	0945	18.00	2.53	15.47	4699.24	Tape	AP
09/10/90	1125	16.00	1.38	14.62	4700.09	Tape	BB/AP
09/18/90	1151	15.50	1.40	14.10	4700.61	Tape	AP
09/25/90	1107	16.50	2.81	13.69	4701.02	Tape	BB/AP
10/02/90	1001	15.00	1.49	13.51	4701.20	Tape	BB/AP
10/09/90	0936	15.00	1.36	13.64	4701.07	Tape	BB/AP
10/16/90	0925	14.00	0.14	13.86	4700.85	Tape	BB/AP

10/23/90	1530	14.00	0.50	13.50	4701.21	Tape	BB	
10/30/90	1010	14.50	0.57	13.93	4700.78	Tape	BB/AP	
11/06/90	0916	14.50	0.60	13.90	4700.81	Tape	BB/AP	
11/13/90	1016	14.50	0.42	14.08	4700.63	Tape	BB/AP	
11/20/90	0919	14.50	0.38	14.12	4700.59	Tape	AP/JG	
11/27/90	1007	16.00	1.98	14.02	4700.69	Tape	BB/AP	
12/05/90	1128	14.50	0.22	14.28	4700.43	Tape	BB/AP	
12/11/90	0954	14.50	0.18	14.32	4700.39	Tape	BB/AP	
12/18/90	0945	14.50	1.54	14.39	4700.32	Tape	BB/AP	
12/26/90	0958	15.00	0.60	14.40	4700.31	Tape	BB	
01/02/91	0958	15.50	1.03	14.47	4700.24	Tape	BB/AP	
01/08/91	0927	15.00	0.56	14.44	4700.27	Tape	BB/AP	
01/15/91	0853	15.00	0.55	14.45	4700.26	Tape	BB/AP	
01/21/91	0910	15.00	0.55	14.45	4700.26	Tape	BB/AP	
01/29/91	0921	15.00	1.01	13.99	4700.72	Tape	BB/AP	
02/05/91	0933	14.50	1.22	13.28	4701.43	Tape	BB/AP	
02/14/91	0951	14.50	1.81	12.69	4702.02	Tape	AP	
02/19/91	0952	13.50	1.03	12.47	4702.24	Tape	AP	
02/26/91	0946	12.50	0.41	12.09	4702.62	Tape	BB/AP	
03/05/91	0918	12.00	0.65	11.35	4703.36	Tape	BB/AP	
03/12/91	0930	12.00	0.91	11.08	4703.63	Tape	AP	
03/19/91	1019	12.00	1.61	10.39	4704.32	Tape	AP	
03/26/91	1000	11.00	0.87	10.13	4704.58	Tape	BB	
04/02/91	0951	10.50	0.71	9.79	4704.92	Tape	BB/AP	
04/09/91	1011	10.00	0.74	9.26	4705.45	Tape	BB/AP	Water temp.61.3º RS/20(I)
04/16/91	1009	10.00	1.16	8.84	4705.87	Tape	AP	
04/23/91	0859	10.00	1.47	8.53	4706.18	Tape	AP/JR	
04/29/91	1647	9.00	0.57	8.43	4706.28	Tape	AP	
05/07/91	1000	9.50	0.69	8.81	4705.90	Tape	BB/AP	

West Well (page 4)

05/14/91	1006	10.50	0.99	9.51	4705.20	Tape	BB/AP
05/21/91	0935	11.00	0.67	10.33	4704.38	Tape	AP
05/28/91	1013	12.00	0.83	11.17	4703.54	Tape	BB/AP/JR
06/02/91	1120	12.00	1.40	10.60	4704.11	Tape	JER
06/10/91	0735	13.00	0.61	12.39	4702.32	Tape	JER
06/17/91	0741	14.00	1.27	12.73	4701.98	Tape	JER
06/24/91	0737	15.00	1.59	13.41	4701.30	Tape	JER
07/01/91	0905	15.00	1.20	13.80	4700.91	Tape	JER
07/08/91	0742	15.00	1.01	13.99	4700.72	Tape	JER
07/15/91	0742	15.00	0.91	14.09	4700.62	Tape	JER
07/22/91	0928	15.00	1.01	13.99	4700.72	Tape	JD


West Well (D-18-20)25cdc
Water Elevation in feet
4708
4706
4704
4702
4700
4698
4696
4694
9-89
3-90
9-90
3-91
9-91
DATE

Highway Well
(D-18-20) 30 cdc

MP = Top of Casing, N. side, 0.61' a.l.s.

April 27, 1990

Elev. MP = 4568.47
Elev. LS = 4567.86

Date	Time	Held	Cut	DTW	WT Elev.	Method	Meas. By	Other Comments
06-24-89	1730			741.5	3826.97	Sounder	CG	

APPENDIX J

Cave Hydrology Observations

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KARTCHNER CAVERNS
NOTES ON CAVE HYDROLOGY
Updated 8/15/91

1 Throne Room Collapse - Thick beds in ceiling. Small chips on SE side of room. There must be pieces of large breakdown under the smaller pieces that now cover the slope.

2 Upstream continuation at Sue's Room. Connection to surface at "float" area? Continues along fault trend? Water from Saddle Wash has been dye traced and comes out along the north side of Sue's Room. There is no evidence that very large amounts of water have entered the cave from this area in recent times.

3 Pit & drains along edge of Triangle Passage. December 1978 flowing. Bottom of Triangle pit is a bit lower than 4617.0. Small fissures along the east side are caused by water enlarging joints. Portions of the Triangle Passage are hydraulically quite steep and water seeks a more efficient route through these joints. Water which enters these cracks usually emerges a few feet to the north at a lower level. The active breakdown pile along the west side of the Triangle Passage has forced the active solutioning of the Triangle Passage. The breakdown pile creates a high point which water has to back up to flow over into the Subway.

The capacity of the drain at the bottom of the Triangle Pit must be exceeded and the pit filled before water can flow north to the Mud Trench. The back wall of the pit is quite thin for the top 2 feet. This has been broken (by cavers?) which allows the overflow from the pit to occur at a lower elevation. This may have happened fairly recently, in which case the front part of the Triangle Passage may not sump unless the Back Section of the cave fills up to an elevation of 4631. It is possible then that recent changes in the Triangle Pit overflow point prevent water from backing up and over-flowing into the River Passage before the Back Section fills up with water.

The Triangle Pit fills to an elevation which is much higher than the concurrent water level in the Subway. For instance the level in the Triangle Pit can be 4630 while the water level in the Subway is 4624. Additionally the water level in the Triangle Pit will drop much faster than the water level in the Subway. The Triangle Pit will drain completely, below 4617, while the water level in the Subway remains above 4625.

This shows that the Triangle Pit drain and the Subway drains operate independently of each other. The most likely reason for this would be the water following a near vertical path out the drains.

4 The low point in the Water Room is at an elevation of 4615.0+/-

5 There are cracks in the streambed which act as drains in Granite Dells past monitoring station. The capacity of these must be exceeded before Granite Dells and the Water Room flood.

6 A Past flooding event is recorded in the Rotunda Room. Rapid rise/fall flood in Rotunda & Subway, floated guano on soda straws, staining of formations & soda straws. Recent? Cannot be too old as there is guano on soda straws.

7 Thickness of mud & rapid flooding of Cul-de-Sac. Lowest intact floor in cave (4601.9). Etching of ceiling. Drains in low area on the northwest side of the Room.

When there is water in the North Passage there is still no water in the Cul-de-Sac Passage. This is true for an elevation differential of approximately 25 feet over a horizontal distance of 250 feet. This indicates that there is no direct connection between the Throne Room and Cul-de-Sac below the elevation of 4628.

Conditions in the Cul-de-Sac have not been observed at times when there has been water in the Thunder Room. However the floor of the Cul-de-Sac in the lowest areas has a thin coating of what appears to be weathered wall rock covering the mud. This would indicate that there has been no flooding in a considerable length of time. The known high water level of approximately 4617 in the Thunder Room is 15 feet above the lower areas of the Cul-de-Sac and 250 feet away horizontally.

Surprisingly the Thunder Room does not appear to be hydraulically connected to the Cul-de-Sac.

The mud found in the Cul-de-Sac does not appear to be very thick; in most places it is less than one foot. Below the mud are pieces of breakdown. All of the mud could have come from a single flooding event. The lack of any pieces of breakdown on top of the mud may be an indication that the ceiling is very stable in this area.

8 Stream which enters from south at Crinoid room (4621) and flows into Grand Central Station. Elevation relationship to surface stream. Alignment of surface fracture in entrance sink.

The fact that the natural entrance exists. The sinkhole is not located in an area which is undergoing significant surface erosion. The most likely cause of the sinkhole collapse is that the stream in the Crinoid Room has undermined the area.

9 Outflow in Snail Trail & channels in mud. Area drained? (Flow line of channel in mud at trail crossing is 4621.8)

10 Low points and drains in Subway (4620.7+/-), start of Angel Wing Passage, sump in Angel Wing Passage just before Pirate's Den/Sue's Room junction, start of Subway, Entrance to Marble Canyon (solution pit similar to Triangle pit.).

11 Echo Passage (lower passage 4609). Inflow from Strawberry?, outflow to Red River via Bison Burial ground.

12 Red River. Fault termination. New drain caused by collapse at Tarantula Room. Lowest point in cave (4593.7). Sudden drop of 10' at end of passage. Elevation at start (4609.9)

13 Drain at end of stream in Grand Central, elevation (several feet lower than 4616.7) flow or overflow to Australia? Sediments in Grand Central have been downcut by 10 feet or so. This appears to be recent downcutting. (check the stream gradient from Crinoid Room to end of Red River)

14 Low point in Australia, sump? (elevation 4608+/-) stream channels that enter in pit at start. Stream channels that enter from west (River Passage stream?). Airflow path to river passage.

15 Low points in start of River Passage (several feet below 4617). Travertine layer.

16 Depressions and water sounds along Main Corridor and near Mud Flats Computer. Temperature of the water at the start of Red River was 55°F in March, 1985. This is colder than would be expected if it were flowing from the Thunder Room, which also had a water temperature of 55°F. The quantity of flow observed at the start of Red River was also approximately the same as in Grand Central Station. This indicates that water from the Thunder Room does not reach the Big Room and must flow north.

17 Large breakdown block in Grand Canyon, stream diversion into wall at start of Shelf Passage. Shelf passage washed out recently? Is the large block in Grand Canyon what caused rapid flooding in back of cave until the stream tunneled under it & rapidly lowered the water level? (Spillover elevation at block is 4641.8)

18 Cave inflow points.

A. Junction of Guindani Wash and Saddle Wash. (elevation 4670, 40 feet above cave at end of Granite Dells, horizontal distance is 160 feet, 25% slope)

B. Saddle Wash downstream from North Well (elevation 4704, 74 feet above cave at Sue's Room, horizontal distance is 360 feet, 20.5% slope)

C. Guindani Wash ??? feet upstream of trail. Inflow point for Crinoid Room/Grand Central Stream. Elevation 4656 (at intersection with entrance fault) 35 feet higher than Crinoid Room, horizontal distance is 570 feet (6.1% slope).

19 Resurgent points. Archeo site?

Must be below 4625 to 4620 (low points in Back Section of cave.)

None found after several searches. Outflow is only 20-30gmp so it may not be visible on surface.

20 Surface stream vs. cave inlet points. Water enters cave at two (or more) discrete points. Flooding is <u>not</u> due to a general raising of the local groundwater.

21 What is saturated capacity of water with respect to calcite? Don't know but pH is always around 7.8 to 8.1 for floodwaters.

22 Potential evaporation on surface places limits on when there is excess water available to flood cave. Only when there is at least 1.2" of excess moisture in a single month.

23 Pit in Marble canyon upstream of Onyx Passage. Similar to Triangle pit.

24 Thunder Room sump, elevation (4611.7). Steep drop into Thunder Room, (elevation of upstream start of room at top of 'falls' is 4623.1). Overflow to Bathtub Room (lip of overflow into bathtub is 4624.3), cracks 7 drain in wall of Bathtub room. Low area in south end of Thunder Room (elevation?). Breakdown pile blocks flow path?

25 Pyramid Room, south pool first drains to Triangle Passage. Water enters Pyramid Room as overflow from Water Room through the connecting crawlway. Pyramid Room pool overflows toward Grand Canyon but a slight rise at PP60 diverts the flow back toward Triangle Passage. A change in floor elevation of only a couple of inches at PP60 would cause water to flow into Grand Canyon.

26 North Passage - Must be connected to water in Rotunda Room and Subway. North Passage was flooded almost to the base of the "Soda Straw" in April 1991. Water elevations appear to be the same as in the Subway & Rotunda Rooms. Pool is shown on the original survey done in May 1979.

27 Marble Canyon is it still an active inflow point? Apparently no water entered the cave here in August 1990 or winter 1991. The active breakdown to the west of the Triangle Passage may have blocked inflow at Marble Canyon. Also a shift in the alignment of Guindani Wash may have moved the intake point over to Granite Dells.

28 Pirate's Den - pool shown off boxwork maze - elevation 4621.3. This pool would have been the remains of the winter 1978/79 floods. How does it connect to the Subway?

In the winter of 1991, portions of the north and east side of the Pirate's Den had pools of water. There must be connections which we do not know about. Is there a connection from the Hill Room to the north end of the Pirate's Den?

29 What are the possibilities of the water table in the limestone block and the adjacent alluvium? Water level in the North Well is 60 to 70 higher than water

levels in the cave. Water levels in the North Well did not rise very rapidly when the adjacent Saddle Wash was flowing. This seems to indicate that ground water movement may be northeasterly. At the contact with the limestone the water table drops sharply.

30 Migration of Guindani Wash and impact on water entering the cave.

31 Rotunda Room sump. Same elevation as Subway sump? Did collapse at start of Throne Room block flow to the northeast?

32 Colluvium in entrance sink. Does this indicate that it once was a spring? Are there scallops in Crinoid Room that show flow in this direction?

33 Change in floor elevation from LEM Room (4625.5) to Anticipation Room (4623). Water flow from Anticipation Room through Babbitt Hole & Blow Hole? Silts slope down to Babbitt Hole. Scallops in wall above Babbitt Hole, or just condensation corrosion?

34 Numerous water levels etched onto walls throughout the cave. Do they correlate? Some are very young since they cut across formations (Cul-de-Sac and Subway/Mushroom). Some must be very old as they are on fallen pieces of breakdown (entrance to Red River).

REPORT ON FLOODING IN KARTCHNER CAVERNS
AUGUST 1990

CHRONOLOGY and MEASUREMENTS

8/2/90 During a trip to collect data in the back of the cave, no unusual amounts of water were noticed. Upon leaving the cave we found that Guindani Wash near the cave entrance was flowing.

8/14/90 While changing the chart on the North Well, I noticed that it appeared that a small amount of water had flowed along the adjacent wash. Going upstream a small trickle was found about 250' upstream. A sample collected had a conductivity of 290 uMHOS.

8/26/90 Flooding in back portion of cave discovered. Water Room pool is full and almost to level of crawl into Pyramid Room. Water level is 6" below top scotchlite marker on PVC pole. Crawl to Granite Dells is half full of water. A sample of the water has a conductivity of 271uMHOS and a temperature of 67.9°F.

In the Pyramid Room a small, almost imperceptible trickle of water is flowing into the Triangle Passage. There is no definite indication of any flow into the Grand Canyon, but a deep footprint at the low connecting crawl had water in it. The Triangle Passage has had a small channel cut through the footprints in the mud; it is perhaps one foot wide and 6" deep. The pit in the Triangle Passage is full of clear water and is about 3' below the flat ceiling. The small drains along the right side of the Triangle Passage show signs of having taken some water recently.

The Mud Trench has little water in it. It too has a small channel cut through the mud, 12" wide and 4-6" deep. The smooth flowline has allowed most of the usual standing water to drain.

In the Subway, water is encountered 70' past the Quartz divide. The sign at the Angel Wing junction has only the top 1/2" out of the water. The deepest point along the trail in the Subway is 5' deep, about 100' past the Angel Wing Junction. Water temperature is 67.4°F (T2 thermometer) and water conductivity is 270uMHOS. Station H47 is at water level and H48 is approximately 1' under water. The evaporation pan for the Subway station has been floated north about 70' before sinking.

At the Pirate's Den/Sue's Room Junction the water is 1' to 2' deep. Water temperature is 66.7°F (T2) and a water sample in bottle #10 has a conductivity of 265uMHOS. Several small pools are seen in the front part of the Pirate's Den.

The Hill Room area has 2' to 3' of water. Just beyond the Hill Room is a stretch of low ceiling about 10' long with about 15" of airspace.

In the Mushroom Passage there is a pool near the PVC environmental stand, which is draining into a lower level. Flow out of the pool is estimated to be 10 gpm. Water temperature is 68.2°F (T2). Conductivity of the water is 490 uMHOS. PP#70 is approximately 0.1 underwater. The Mushroom pool ends at SU6. From there to just before Sue's Room there is a small stream along the north side of the passage. The stream enters from the breakdown along the north side of Sue's Room.

8/30/90 08:50AM Introduce 1/2 pound of Fluorescein dye in surface stream at stream junction 250' west of the North Well. Water temperature 70.6°F (T3 thermometer). Take water sample in bottle #3.

10:30AM Placed activated charcoal packet at entrance to Red River near PP27. No flow but there are small drip puddles in stream bottom.

11:00AM Placed activated charcoal packet in Thunder Room near O-96. No flow in stream bed.

12:00AM Placed activated charcoal packet in Water Room near start of crawl to Granite Dells. Standing water level is down 2.5 feet from 8/26/90. Take water sample in bottle 'C' 65ml.

Triangle Pit, water level is down 5.7 below flat ceiling. Water level on 8/26/90 was 3.0' below ceiling.

01:45PM Place activated charcoal packet in Marble Canyon near C-113. No flow in streambed or evidence of past flow (footprints in the mud are still quite distinct from 2 yrs. ago, small pools of drip water.). Take water sample from drip water pool in bottle 'F'.

02:00PM Water level in Subway Tunnel is down approximately 8" from 8/26/90.

02:40PM Mushroom Passage. Set activated charcoal packets, one in pool and other 5' away in stream that cascades to lower level. Take water samples in bottles #8 (for ACPI)[441uMHOS] and bottle 'D' (for Aley). Water level is down 0.02' from 8/26/90, flow is estimated to be 6gpm. Water temperature 67.9°F (T2 thermometer), pH 7.7. Fluorescein dye visible in pool with flashlight.

04:00PM Collect dripwater (not pool water!) sample from Water Room in bottle #10 [380uMHOS]. 132ml in 4hrs.= 33ml/hr. Water level has dropped an estimated 0.12' in four hours.

9/4/90 09:45AM Recover upstream surface charcoal packet and cotton packet from West Property line stream. Water flow estimated to be less than 5 gpm. No flow entering from side stream. Take water sample in bottle #7 [322uMHOS].

Charcoal packets left in Red River and Thunder Room as there has been no flow at these sites.

01:30PM Water Room. Remove charcoal packet 'B'. Water level has dropped another 3' leaving the packet stranded 1.5' above the water level. Set a new charcoal packet in the pool at the south end of the Pyramid Room (which is adjacent to the Water Room pool). Water level 2.83' below major flat ceiling.

02:00PM Triangle Pit. Water level is 9.9' below flat ceiling.

02:15PM Marble Canyon. Recover charcoal packet 'C' and set new one. No evidence of any flow in streambed.

03:30PM Mushroom Passage. Recover charcoal packet 'D1' from pool, and packet 'D2' from overflow stream. Install one new charcoal packet in pool. Take water sample in bottle 'H'. Pool level is down 0.06' from 8/26/90 and flow is estimated to be less than 1 gpm. Water temperature is 67.8°F (T2 thermometer), pH in pool 7.6. Fluorescein dye visible in pool. Place crest gauge above pool, to extend 6" into pool.

04:00PM Pirate's Den/Sue's Room junction. Take water sample in bottle 'J'. Water temperature is 66.0°F (T2). Water level at junction and in Hill Room has dropped 0.50' (measured) since 8/30/90.

04:30PM Angel Wing Junction in Subway. Water temperature 67.6°F (T3).

9/10/90 Change Chart in North well recorder. Surface stream at base of hill and at point where we put dye in is dry.
Recent North well water levels

7/24/90	29.35' bleow meas. pt.	4695.41 WSE
8/14/90	28.87' below meas. pt.	4695.89 WSE
8/28/90	28.06' below meas. pt.	4696.70 WSE
9/10/90	27.26' below meas. pt.	4697.50 WSE

9/11/90 04:00PM Measure water level in Triangle Pit to be 16.1 ft. below flat ceiling. Check water level in start of Subway, water is

now 1.5 to 1.4 ft. below level of 8/26/90. Take sample of water in bottle #7. Fluorescein visible in water?

04:30PM Measure water level in south Pyramid Room pool as being 5.1 ft. below a major flat ceiling level. Water temperature is 66.5°F (T2 thermometer). Water sample collected in bottle #11 [272uMHOS].

OBSERVATIONS

Flooding in the back occurred during the summer months. The two previously known events both occurred during the winter. Flooding may occur more frequently than we had thought. Rainfall this summer was 5.6" in July and 6.0" in August. This is only slightly above average rainfall for the area (we think). In 1988 the August rainfall was 5.7". We didn't go into the cave until January so we can't be sure that there was no flooding then. The visitation record is too sparse to be able to say that no flooding occurred in any year.

Guindani Wash flowed almost continuously from 8/2 to 8/21 where the trail to the cave crosses it. Highest flow noted was on the night of 8/12/90. Flow in the small wash adjacent to the hill and the North well is not known for sure. Flow may have started prior to 8/14 and continued until 9/10.

The elevation of water in the North Well is not at an unusually high level, it has been several feet higher. The well water level has risen only 1.9 feet in a month and a half. Currently the well water level is 70 above the floor level in Sue's Room 500' away. However the water level in the North Well appears to be rising faster than previously recorded.

Water entered from Sue's Room and also from Granite Dells/Triangle Passage. Little or no water entered from Marble Canyon.

Water did not flow into Grand Canyon from overflow into the Triangle Passage. Therefore the amount of water entering the Triangle Passage could not have been large.

The water levels measured on 8/26 are either the highest water level or only slightly lower.

Flooding was fairly slow as evidenced from the floated evaporation pan, intact trail flagging and clear water.

The back flooded between 8/2 and 8/26, most likely between 8/12/90 and 8/26/90. If we assume it takes 10 days to flood then the peak infow was probably about 100 gpm. If we use the channel cut into the Mud Trench to compute a flow we get 450 gpm. Assuming 500 gpm peak flow the back section could have flooded in about 8 hours. Since there were no unusually large rainfall events between 8/12 and 8/26 and since the level observed on 8/26 appears to be close to the highest level. it seems most likely that the back took several days to fill.

The Water Room and Triangle pit drains operate independently of the Subway water level. (Water level in Triangle pit went from 6' above the Subway water level to 6' below.)

The water level in the Rotunda Room appears to be the same level as the Subway and is likely connected beneath the mud.

The water in the Subway is at the same level all the way to Pirate's Den/Sue's Room junction and is likely to be one continuous pool. The pool of water in the Hill Room is slightly higher. This may indicate that it is a separate pool or that there is a small error in the survey elevations. Since the Snail Trail appears to be the drain for this area it is likely that the Hill Room is a separate pool. The conductivity of the Mushroom pool is also much higher than the conductivity of the Subway and Water Room pools. No conductivity measurement was taken of the Hill Room pool. The differences may be from the Mushroom samples being taken from the tail end of the flooding or they may confirm that the water in the Hill Room is separate from the Subway.

The rate of drop in the Subway water level indicates that this area drains at about 25 gpm. At this rate it will take about 30 days for the back to drain.

No indication of a resurgence of water draining from the cave has been found on the surface. The resurgence must be located below the 4625 contour line.

Dye tracing (preliminary results) confirmed that the water entering at Sue's Room comes from the wash near the North Well.

I have marked up a copy of the cave map showing the approximate limits of the flooding in the back of the cave on 8/26/90, the elevations of the water, temperatures and conductivity. A second map shows the locations of the surface dye introduction, upstream sampling location and limits of surface flowing water on 8/28/90.

CONCLUSIONS

Flooding of the back may be more frequent than we had thought and may occur more often than once every 5 years.

It apparently requires at least 6" of rain in the preceding month for the cave to flood.

Filling of the back is most likely not a rapid event. It probably takes one to two weeks.

Separate pools of standing water drain at different rates. This indicates that they either have different drainage paths or that the pools are perched with very inefficient drains.

One segment of the surface wash which drains into the cave has been identified. This is the small wash along the south side of the hill near the North Well.

Water elevations in the North Well appear to be a poor predictor of flood conditions in the cave.

Back Section Flooding 1991

Notes on flooding in the back and on surface stream activity since 1 January 1991.

1-2-91 No water in Saddle Wash.

1-8-91 North Wash has not flowed in last week (drag mark across wash is undisturbed.)

Guindani Wash joins Saddle Wash ~500' upstream of main junction. P1 = 48.7, P2 = 49.1, diff = 0.1

1-10-91 Water Room Pool 1' below bottom of PVC. Water temp. 66.2

Condensation fog in Throne Room

Set charcoal packet in Subway 13:00. No water in Subway.

No water from Marble Canyon.

No water in Triangle Pit.

Surface stream 100' upstream of junction: 1.5 fps, avg. flow 143 gpm, temp. = 48.5 P1, 48.7 P2, diff 0.0, pH = 8.3

1-11-91 Place dye (1 quart) Rhodamine WT in Gunidani Canyon at geophysics station C-35 at 11:40. Stream flowing at same rate as yesterday. Flow disappears 30' before junction with Saddle Wash. Stream temp. = 49.5 T2, pH = 8.1

Water Room up 0.08' at 16:20, 35' x 30'

Granite Dells up 0.04' in 45 min., 10' x 40' (Rising at 0.06'/hr =11 gpm, stream 5-10 gpm. Water rise of 2.65' since 11:30 1-10-91 = 13 gpm.

End of Water Room/Granite Dells crawl. Water level is ~24" below flat ceiling, ~8" below level of crawl. Water temp. = 62.6 T2.

Water Room pool at 14:46 temp. = 66.2 T2, 66.6 T3, pH = 7.8. Flat ceiling to water = 1.9'. Water Room pool level is up 2.65' since 11:30 1-10-91. No water at dye packet in Pyramid Room pool.

At C239 just before EMS #7, water temp. = 60.0 T2 (running stream) 16:00. Passages beyond EMS#7 are sumped to ceiling!

1-15-91 No water flowing in Guindani Wash at west PL or in Saddle Wash.

(no time given) Water Room High 1.5' below flat ceiling, 8" below 8/30/90, remove packet. Water temp. = 65.8 T2, pH = 7.8. 21" above 1/10/91 at 11 a.m.

At 15:20 Water Room water level down 1.5", high water 19" above current level.

1-17-91 Surface stream flowing downstream of main Guindani junction, 0.56 cfs. Remove charcoal packet.

1-21-91 Triangle Passage weir 0.9'w x 0.24 h. Temp. of water at start of Triangle Passage = 60.4 T2. Water flowing into Triangle Passage; 1' w x 0.22 deep. Triangle Pit water level at 14:29 2.0' below flat ceiling.

Pyramid Room pool - water starts ~ 3' from bottom of breakdown pile at furthest point. Charcoal packet ~30' away in ~2-3' of water. Water temp. = 61.8 T3, pH = 7.5.

Water Room - trail under water. Water temp. = 59.3 T3, pH = 7.4. Water level 0.1" below flat ceiling. Peanuts in bag are 0.6" below top of bag. Replaced charcoal packet.

Mud Trench 2.6' w x 0.3 deep, 0.55 cfs, weir 1.4' x 0.07' deep.

Rotunda Room depth gauge set with charcoal packet. Small amount of water in bottom of room.

Set Subway depth gauge 5.1' to water from end of arm. Set charcoal packet. Water temp. 65.7 T2. Recover Subway charcoal packet; water 4.5' below H45.

Guindani Wash at West PL - 0.85 cfs at 09:47.

Guindani Wash at C-35 - 0.39 cfs, water temp. = 47.8 P1, 48.2 P2, diff. 0.1, pH = 8.2.

Guindani Wash past first junction - 0.10 cfs (0.29 cfs lost).

1-23-91 Triangle Passage - water temp. at beginning = 58.5 T3 at 11:19. Triangle pit 2.1' from flat ceiling.

Pyramid Room Pool - water temp. = 58.2 T3. Water level 0.27' below flat ceiling; 3.18' below another flat ceiling. Replaced charcoal packet.

Mud Trench, 0.48 cfs, 2' wide x 0.27' deep, 1.9' x 0.32' deep, temp. = 59.8 T2.

Subway water level station at 12:00 3.4' below end of arm. Same level as 8/30/90 marker. temp. = 63.4 T2. Remove charcoal packet.

1-29-91 Surface stream ends 150' upstream from junction, ~ 50' downstream of C35., temp. = 47.3 T2, pH = 8.2, 0.13 cfs.

Water Room at 15:00 water level down 0.50' from high mark; 1.21' above 1-11-91 marker, 1.30' above 8-30-90 marker. Water temp. = 60.8 T2, pH = 7.7. Replace charcoal packet. Water level 0.81 below flat ceiling. Reset styrofoam balls in float gauge. 0.23' down to water from 8/26/90 marker. Water level 1.99' above 1-15-91 marker, 3.68' above 1-11?-91 marker, 10' below top PVC joint.

Triangle pit down 3.3' from flat ceiling.

Guindani Wash West Pl - ~.3 cfs estimated flow.

2-10-91 Triangle pit 13.8 to water.

Angel Wing junction - water temp. = 65.3 T2, pH = 7.9. Replaced charcoal packet. Depth of water from PVC arm = 4.75' (never went above 2.8' from arm). Water level = 0.32' above water level of 1-21-91 marker.

Water Room at 16:47 - pool at end of room = 17-20' below flat ceiling. Styrofoam balls in sock were 1.70' below flat ceiling. Two juvenile crickets on netting tube. Replaced charcoal packet but pool well below packet.

Pyramid Room at 17:18. Pool water temp. = 63.2 T2, pH = 7.8. Water level = 4.25' below flat ceiling. Replaced charcoal packet - water level well below packet.

2-14-91 Water Rm pool at 13:05 down 10.5' below flat ceiling, ~500 ft^2. Up 0.45' at 16:15.

Triangle pit 17.2' below flat ceiling.

Angel Wing junction water level 5.2' below arm; 0.07' below 1-21-91 marker.

Guindani Wash near C-35 - 1.20 cfs, water temp. = 53.1 T2.

Guindani Wash past first junction - 0.91 cfs (0.31 cfs lost), water temp. = 53.5 T2.

Guindani Wash West Pl - approx. 1 cfs estimated, clear flow.

2-19-91 Guindani Wash West PL - 1.65 cfs, water temp. = 48.4 T2, pH = 8.4.

Guindani Wash near C-35 - 1.49 cfs, Water temp. = 52.5 T2, pH = 8.1.

Guindani Wash past first junction - 1.03 cfs (0.46 cfs lost), water temp. = 52.8 T2, pH = 8.2.

2-24-91 Surface stream (a.m.) flows ~ 0.3 cfs, ends in pool at junction. At least half of flow is lost at pool.

Surface stream above junction at 17:30 - 0.18 cfs;temp = 53.6 Barnant.

Saddle Wash - no evidence of flow.

Guindani Wash West Pl - ~1 cfs estimated, clear flow.

2-26-91 Guindani Wash West Pl - at 10:00, 0.31 cfs, water temp. = 51.9 T3.

Guindani Wash at C-35 - at 11:54, 0.04 cfs, water temp. = 54.2 T2, pH = 8.3.

3-5-91 Grand Canyon - water level is 0.07' above 2-24-91 marker at end of Grand Canyon.

Slight trickle of water into Thunder Room. This is probably drip water as pools have a calcite scum.

Triangle Passage - water temp. at entrance = 53.3 T2, pH = 8.0. Water flowing into Triangle Passage from Pyramid Room. Triangle pit water level is 1.85' below flat ceiling.

Subway Tunnel - Water is backed up in Subway to end of Mud Trench. Level is 1.0' above 8-26-90 marker. Top of Angel Wing sign is 1.0' under water. Water temp. at Angel Wing junction = 55.6 T2, pH = 7.8. 0.62 cfs. Water level is 2.0' below PVC arm. Water level just past Quartz Divide is 8.3' below flat ceiling. Flat ceiling is 5.25' above PP63. Survey station H44 is 1.0' above water. There is lots of condensation in the air at Angel Wing junction.

Rotunda Room - water level is 3-4' below water level gauge.

Mud Trench water flow average is 0.72 cfs.

Guindani Wash West PL - at 09:46, 3.8 cfs.

Guindani Wash at C-35 - at 16:30, avg. 3.7 cfs, water temp. = 58.5 T2, pH = 8.0.

Guindani Wash past first junction - avg. 1.32 cfs

Guindani Wash past main junction - at 16:59, 2.04 cfs.

Guindani Wash ~50' upstream of trail - 1.87 cfs.

Saddle Wash - slight trickle.

3-12-91 Saddle Wash - at 09:47, stream trickling, water temp. = 49.1 T3.

Guindani Wash West PL - at 10:29, water running, temp. = 53.5 T3.

Guindani Wash near C-35 - water running, temp. = 57.4 T3

3-19-91 Saddle Wash - at 10:47, stream trickling, temp. = 49.9 T3.

3-24-91 Surface stream at trail at 10:30 is ~2 cfs, clear; temp. = 55.9 P1, 56.1 P3, diff 0.0, pH = 8.3.

Triangle Passage - water temp. at start = 56.3 T3, pH = 7.8, 0.38 cfs.

Mud Trench water level at end is 0.11 below PP63. Estimated flow is 0.5 cfs. Water level up 0.01' from 13:50 to 15:28.

Rotunda Room - water level on gauge is ~4" above current water level.

3-26-91 Saddle Wash - flowing ~1 gpm, water temp. = 49.1 T3, pH = 7.9.

Guindani Wash West PL = 3 cfs estimated flow, water temp. = 51.4 T3, pH = 8.3.

3-28-91 Guindani at trail at 16:00 ~3.5 cfs. temp. = 52.9 T3, pH = 8.4.

3-31-91 Guindani at trail ~ 2 cfs; temp. = 53.0 T3, pH = 8.3.

4-2-91 Guindani Wash West PL - water temp. = 55.1 T4, pH = 8.1.

4-4-91 Triangle Passage - entrance water temp. = 53.6 T4.

Triangle pit - 1.95'; 1.52 PP61.

Rotunda Room - -1.05', temp. = 65.8 T4

4-9-91 South Wash - puddle ~100' east of West Well.

Guindani Canyon at spring - at 11:43, water temp. = 63.0 T5, pH = 8.1.

4-23-91 Pyramid Rm. Pool at 16:14 - Water level is 4.85' below flat ceiling., water temp. = 60.0 T3 and 59.8 T5.

Grand Canyon at 16:34 - temp = 65.4 T3 and 65.5 T5

5-5-91 Mud Trench - water level is 2.47' below PP61. Temp. = 64.1 T4.

Lower Throne Room - Water level is approx. 7' below PP87. Truncated formation if approx. 6' above PP87. Flat-bottomed ledge is approx. 4' higher. Both are near the longest soda straw.

End of Mud Trench - water level is 3.65' below flat ceiling. Temp. = 64.2 T4.

Triangle Pit - Water level is down 14.6' from flat ceiling. Temp. of soil (mud) at start of Triangle Passage/Pyramid Room = 63.2 T4.

Known Flooding Events

December 1978 - Water flowing into Triangle Passage from Pyramid Room.

April 1979 - Water flowing into Triangle Passage from Pyramid Room.

May 1979 - Pool of water remaining in North Passage.

June 1979 - Pool of water remaining in Subway near Angel Wing Junction.

January 1985 - Water flowing in Crinoid Room.

February 1985 - Water flowing into Thunder Room from Shelf Passage.

March 1985 - Triangle Passage is sumped. Back of cave is inaccessible.

August 1990 - Back of cave flooded to an elevation of 4624.5. Slowly recedes, mostly gone by the end of October, 1990.

January to August 1991 - Back of cave flooded by water entering from Pyramid Room. Maximum flood elevation of 4628.2 reached in early April 1991.

Conditions Which Indicate Cave is Flooding.

1 Guindani Wash or Saddle Wash is flowing on the surface. Prolonged flow of a week or more appears to be necessary before water begins to enter the cave. If the preceding weather has been dry for a long period of time then a longer period of surface flow is needed before water enters the cave.

2 Excess of soil moisture for a single month exceeds 1.2".

3 Excess of soil moisture for two consecutive months totals more than 1.5"

4 Water level in the North Well is above 4699 for a month or more.

1991 Winter Flood Precipitation and Streamflow Measurements

Date		
December 1990	Precipitation	1.69"
1/4/91	Precipitation	0.09"
1/5/91	Precipitation	0.60"
1/10/91	Guindani Wash at C-35 (geophysics sta.)	0.32 cfs
1/11/91	Granite Dells	0.02 cfs
1/16/91	Precipitation	0.36"
1/17/91	Precipitation	0.06"
	Guindani Wash at C-35(geophysics sta.)	0.56 cfs
1/21/91	Guindani Wash at:	
	West P/L	0.85cfs
	C-35(geophysics sta.)	0.39 cfs
	Saddle Wash Junction	0.10 cfs
	Mud Trench	0.55 cfs
1/23/91	Mud Trench	0.48 cfs
1/29/91	Guindani Wash C-35(geophysics sta.)	0.13 cfs
2/11/91	Precipitation	0.32"
2/12/91	Precipitation	0.72"
2/14/91	Guindani Wash at:	
	C-35(geophysics sta.)	1.22 cfs
	Saddle Wash Junction	0.91 cfs
	Water Room (rise)	0.03 cfs
2/18/91	Precipitation	0.33"
2/19/91	Guindani Wash at:	
	West P/L	1.65 cfs
	C-35(geophysics sta.)	1.49 cfs
	Saddle Wash Junction	1.03 cfs

2/24/91	Guindani Wash at C-35(geophysics sta.)	0.18 cfs
2/26/91	Guindani Wash at:	
	West P/L	0.31 cfs
	C-35(geophysics sta.)	0.04 cfs
	Saddle Wash Junction	0 cfs
2/28/91	Precipitation	0.84"
3/1/91	Precipitation	0.30"
3/15/91	Precipitation	0.12"
3/16/91	Precipitation	0.11"
3/20/91	Precipitation	0.13"
3/21/91	Precipitation	0.29"
3/22/91	Precipitation	0.02"
3/26/91	Precipitation	0.26"
3/27/91	Precipitation	0.17"
3/28/91	Precipitation	0.10"

Probable Prior Flooding Events of Kartchner Caverns

Kartchner Caverns was discovered in 1974. Since that time portions of the cave have been observed to flood approximately 4 times. Because the trips were infrequent during the early years, floods may have occurred between trips.

In order for the cave to flood, water must enter from the surface stream. This only happens when there is sufficient excess moisture available to produce the runoff in Guindani and Saddle Washes.

We would like to be able to determine how frequently the flooding events are. We can extend the Kartchner surface weather records by comparing them to other nearby weather stations. By determining the excess moisture available at other stations with the known flooding events at Kartchner Caverns a predictive relationship can be developed. This can be used to infer the likely dates of past floods prior to the discovery of the cave. The weather records for Fort Huachuca/Sierra Vista will be used to develop the relationship. The records for this station span the period from September 1954 to February 1991, a total of 37 years and 5 months of record. The Sierra Vista station has been chosen because the elevation and proximity to mountains is most similar to Kartchner Caverns of all the nearby weather stations.

Excess moisture is determined by the Thornthwaite method for determining potential evapotranspiration. This method requires a knowledge of the mean monthly temperature and precipitation for a given geographic location. Excess moisture is the amount by which precipitation exceeds the potential evapotranspiration. The excess moisture was calculated for each month of record. Additionally, because flooding events are dependent not only on the excess moisture for that month but also on the previous soil moisture conditions, the total excess moisture for each month and the preceding month was determined.

A comparison of monthly excess moisture at Sierra Vista with known flood events at Kartchner Caverns indicates that two criteria must be met to predict a flood event. The excess moisture in the month of the flooding must exceed 0.7 inches and the total excess moisture for the current and preceding month must be greater than 1.3". However, this criteria does not predict all of the known flood events. It does not predict the Summer 1990 flood. This appears to be due to the difference between winter and summer flooding events.

Winter floods are caused by large area storms of low intensity. Flooding of the cave is most likely the result of several storms occurring over a period of a month or two. Summer flooding is apparently caused by a single intense thunderstorm on the watershed of the cave. Because these storms cover a small area there is little correspondence between precipitation at Kartchner Caverns and Sierra Vista. Therefore predicted summer flooding events from Sierra Vista weather records is not likely to be successful. The number of summer events predicted is likely to be similar for the two sites.

Based on the above criteria, 25 flooding events were identified in the 37 years of Sierra Vista weather records. Of these 15 probable flooding events occurred during the winter months, one during the fall and 9 during summer

months. In total, 21 years out of 37 are thought to have experienced a flooding episode in either the summer, winter or both.

The winter flood of 1985 was caused by one of the greatest amounts of excess moisture. During this flood a small stream entered the cave at the Crinoid Room, flowed through Grand Central Station and out of the cave at Red River. If we assume that such flooding requires a minimum of 4" of excess moisture then streams flowing into the front part of the cave has occurred on only 5 occasions in the last 37 years.

Flooding of the back sections of the cave and actively flowing streams have only been observed on four occasions from 1974 to the present. This has led to the belief that such flooding is an uncommon occurrence in the cave. However, a comparison of excess moisture at Kartchner Caverns with a longer record at Sierra Vista indicates that flooding is a relatively common occurrence. From past records, it appears that there is a 67% chance of a flooding event in any year. Larger floods which may cause normally dry streams in the front sections of the cave to run have a 15% chance of occurring in any given year.

A similar approach can be used to determine the conditions necessary for flooding of the cave to occur based on the two years of surface climate data gathered at Kartchner Caverns. Monthly excess soil moisture was computed by the Thornthwaite Method. A comparison of the monthly excess moisture with known flooding events leads to the following indications of flooding in the cave.

- Guindani Wash or Saddle Wash flowing for several days.
- Excess soil moisture of >1.2 inches for a single month.
- Total excess soil moisture of >1.5 inches in 2 consecutive months.

It is also possible to estimate the yearly precipitation that would support year-round inflow of surface water into the cave. Using the Thornthwaite method, the monthly potential evapotranspiration can be calculated based on mean monthly temperatures. It has already been shown that a month with an excess moisture of 0.7" will cause water to enter the cave. Therefore adding 0.7" to the potential monthly evapotranspiration gives an estimate of the precipitation required to keep water flowing into the cave all year. Calculations indicate that a total yearly precipitaion of 42 inches is required. This is approximately four times the present precipitation.

APPENDIX K

Cave Volume and Area

TABLE OF CONTENTS

Preliminary Room Areas and Volumes..... K-1

KARTCHNER CAVERNS
Preliminary Room Areas and Volumes

SECTION	AREA (Sq. ft.)	APPROXIMATE HEIGHT (Ft.)	VOLUME (Cu.ft.)
Entrance Sink	391.2	15	5868.0
Blockade Room	90.1	4	360.4
Crinoid Room	1664.0	6	9984.0
LEM Room	997.9	4	3991.6
Blow Hole	312.1	2	624.2
Anticipation	2305.5	3	6916.5
Grand Central	12133.5	12	145602.0
Scorpion	2582.4	4	10329.6
Main Corridor 1	3577.0	10	35770.0
Main Corridor 2	4627.0	15	69405.0
Arch Room	4681.3	10	46813.0
Australia	3909.9	8	31279.2
Mud Flats	5780.2	12	69362.4
Tarantula Room	4589.0	10	45890.0
Jack Rabbit	1230.8	4	4923.2
Sharon's Saddle	8953.8	15	134307.0
Big Room 1	7527.5	20	150550.0
Big Room 2	5650.0	20	113000.0
Big Room 3	7705.0	30	231150.0
Big Room 4	8927.4	25	223185.0
Big Room 5	7348.2	20	146964.0
Red River	2054.9	5	10274.5
Bison Burial	1532.3	5	7661.5
Echo Passage	5433.9	15	81508.5
Pool Room	2436.8	5	12184.0
Strawberry	11530.3	12	138363.6
Cul-de-sac	16670.4	15	250056.0
River 1	537.8	4	2151.2
River 2	632.9	7	4430.3
River 3 Bathtub	2259.3	9	20333.7
River 4 Thunder	4037.2	35	141302.0
River 5 Shelf	1399.0	7	9793.0
River 6 Grand Canyon	6126.8	40	245072.0
River 7 Pyramid	4027.2	15	60408.0
River 8	2518.2	15	37773.0
Water Room	5140.0	20	102800.0
Granite Dells 1	2489.4	8	19915.2
Granite Dells 2	1565.6	4	6262.4
Triangle	3186.7	5	15933.5
Onyx/Marble	5402.5	5	27012.5
Mud Trench	7861.2	5	39306.0
Rotunda 1	7872.0	15	118080.0
Rotunda 2	14505.4	40	580216.0
North Passage	6500.0	8	52000.0
Subway 1	3704.0	8	29632.0
Subway 2	8927.1	15	133906.5

KARTCHNER CAVERNS
Preliminary Room Areas and Volumes

SECTION	AREA (Sq. ft.)	APPROXIMATE HEIGHT (Ft.)	VOLUME (Cu.ft.)
Subway 3	14800.0	15	222000.0
Angel Wing	2700.0	15	40500.0
Pirate's Junction	11152.2	12	133826.4
Pirates Den 1	3768.5	7	26379.5
Pirate's Den 2	1301.3	6	7807.8
Pirate's Den 3	2170.7	10	21707.0
Pirate's Den 4	8098.7	12	97184.4
Pirate's Den 5	1758.8	5	8794.0
Pirate's Den 6	1421.2	4	5684.8
Crow's Nest	4648.2	15	69723.0
Hill Room	8853.8	10	88538.0
Mushroom 1	2094.1	5	10470.5
Mushroom 2	4594.6	10	45946.0
Mushroom 3	3300.0	5	16500.0
Snail Passage	6810.8	6	40864.8
Sue's Room	8945.3	15	134179.5
TOTALS	309752.9		4602756.2

APPENDIX L

Impact of Development on Microclimate

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HEAT LOAD
Estimated Electric Light Power Consumption

An estimate of the power required to light the cave for display.

Heat given off by electric lights is a major contributor to the increased heat load imposed on a developed cave. In our analysis we will assume that 100% of the electric power used for lighting will be converted into heat. Additional heating from transformers and wire losses is not considered.

The amount of lighting required for the developed cave can only be approximated at this time. Two methods are used.

I. Based on general observations in other commercial caves.

Trail lighting; use one 15 watt bulb every 10 feet; trail assumed to be 3300 feet long. Total for trail lighting 5000 watts.

Assume that a single 100 watt light bulb can illuminate an area 50 feet in diameter. This is equivalent to 0.05 watts per square foot. The three rooms to be developed are:

Big Room	80,500 sq. ft. X 0.04 watt/ sq. ft. =	3220 watts
Throne Room	21,000 sq. ft. X 0.05 watt/ sq. ft. =	1050 watts
Rotunda Room	12,800 sq. ft. X 0.03 watt/ sq. ft. =	384 watts
	Total =	4654 watts

Spotlights-an Additional 50% =	2327 watts
Trail lighting =	5000 watts
Total	11,981 watts
	(use 12,000)

Assume that lights will be turned out when a tour is not in the area but that several tours may be in the cave at the same time. Lights are assumed to be on for 6 hours out of every 8 hour day.

6 hours X 12,000 watts = **72 Kilowatts per day**.

II. In order to be visible there must be a minimum level of illumination. To provide a low level of illumination the light intensity must be from 10 to 100 lumen per square meter. The area of the three main rooms totals 10,600 square meters. Incandescent lights have an efficiency of approximately 20 watts per lumen. Fluorescent lights have an efficiency of approximately 60 lumens per watt.

Assume that incandescent lights are used if the illumination level is 10 lumen per sq. meter = 10,600 X 10 / 20 = 5300 watts.

Assume that fluorescent lights are used if the illumination is 100 lumen per sq. meter = 10,600 X 100 / 60 = 17,700 watts.

The average of these estimates is 11,500 watts, which agrees well with the first estimate.

USE 12,000 watts as an estimate of the lighting heat load (72 Kilowatt-hours).

The heat load from the visitors is estimated to be: 100,000 visitors per year = 275 per day X 1.5 hours for the tour X 175 watts of heat given off by the average person per hour = 72,187 watts per day. (72 Kilowatt hours). This is as much heat as the lights will give off.

It is interesting to note that at Carlsbad Caverns, the visitors also contribute approximately half of the heat load.

Total heat load on an average day will be 72 Kw hours from lighting and 72 Kw hours from visitors for a total heat load of 144 Kw hours per day. (144 Kw hours is approximately 500,000 BTU) This is per day but the actual energy will be expended over approximately 8 hours.

Human Visitor Impacts To Cave Microclimate

Allowing people to enter the cave will unavoidably change the microclimate of the cave. The cave environment is in balance with the existing conditions. The presence of the visitor will alter the cave environment in four ways:

- Body Heat
- CO_2 from respiration
- O_2 consumed by respiration
- Water vapor given off by respiration

Each of these can vary considerably depending on age, sex, weight, level of exertion. Reasonable estimates for the impact from each person are:

- Body heat 175 watts per hour
- CO_2 20 liters per hour
- O_2 25 liters per hour
- Water vapor 13 grams per hour

Based on an average of 275 people per day (100,000 visitors/year) and a 1.5 hour tour length, the daily impacts would be:

- Heat 72 Kilowatt hours (250,000 BTU)
- CO_2 8.3 cubic meters released (293 cubic feet)
- O_2 12.4 cubic meters consumed (438 cubic feet)
- Water equivalent to 5.4 liters (1.4 gallons)

These impacts will vary with the number of people who visit the cave on any particular day. On days of high use the impact may be three times higher; on low use days, only half as high.

Effect of Development on Temperature, Evaporation and Airflow.

Development of portions of the cave for visitors will unavoidably alter the microclimate of the cave. The goal is to minimize these impacts while preserving those conditions which are necessary for maintaining the long term integrity of cave features.

Preventing dry surface air from entering the cave has been identified as the primary concern in developing the cave. However, even if no additional surface air is allowed into the cave, there will still be other changes in the microclimate of the cave. These changes will arise from the introduction of electric lights and the presence of the visitor. Both of these will give off large amounts of excess heat. The increased heat load is estimated to be 144 KW-Hr. per day spread over an eight hour period. This excess heat will be dissipated within the cave by several processes:

Increased convective airflow
Raising the air temperature
Increased evaporation from cave surfaces
Increased wall temperatures

In our analysis, we assume that air exchange with the surface is quite small, comparable to the rate found in the undeveloped cave. This should be the case if new entrance tunnels are properly constructed. In our calculations we will consider the outside air as being a negligible mechanism for exchanging heat. The cave can therefore be considered as approximating a closed system. Ultimately all of the excess heat introduced by the visitors and lighting will be dissipated as heat on the walls of the cave.

Convective airflow, increased air temperature and evaporation are the mechanisms that will transport and distribute the excess heat to the walls of the cave. The problem is how to proportion the excess heat among these mechanisms. The maximum possible effect has been calculated for each process assuming that it is the only mechanism in operation. Airflow will be increased by rising heat from electric lights and also from heat rising from visitors. The amount of airflow induced is estimated to be 4,000,000 to 9,000,000 cubic feet per day produced by a rise in air temperature around light fixtures. Airflow is an inefficient mechanism for dissipating the heat energy; only small amounts are lost by friction with the walls and internal viscose forces. The airflow pattern will dramatically change. The existing airflow patterns are produced by slowly varying temperature gradients in the cave which cause predominantly horizontal air movements. Electric lights and visitors will cause large thermal gradients over very short distances. These will produce predominantly vertical air motions.

The maximum internal air circulation within the cave in its undeveloped state is approximately 1,500,000 cubic feet per day. The increased circulation induced by the development will overwhelm the natural circulation pattern and result in a more uniformly mixed cave air. The maximum possible rise in air temperature is calculated to be 10.4°F. This could not occur because the heat would quickly be conducted to cave surfaces where it would be carried away by

conduction and evaporation. The amount of water that could be evaporated by 144 Kw is calculated to be 57 gallons per day. This is almost doubling the natural evaporation of the cave. However, since the cave will act as a closed system there will be only a small increase in moisture lost to the surface. This will occur because warm air will be able to evaporate and hold greater amounts of water. But this warmer and more humid air will lose moisture by condensation onto cooler walls of the cave. Increased evaporation is most likely to occur on the floor and ceiling of the cave. Walls of the cave are more likely to be areas of condensation. The walls of the cave can increase in temperature a maximum of 0.3°F if the excess heat is uniformly dissipated. If the heat is mainly dissipated on the ceilings (since warm air will rise), then the maximum increase will be 0.9°F.

The above discussion illustrates that the possible changes in airflow and evaporation rates could be quite substantial. Changes in air and wall temperatures are likely to be quite small. Ultimately the excess heat must be lost at the wall of the cave.

The estimated daily excess heat introduced by development (500,000 BTU) is aproximately equal to the observed daily heat flux from the walls of the cave (473,000 BTU). This implies that the long term effect of the development will be to raise the overall temperature of the cave by 1°F.

Flood Effects on Cave Microclimate

The two observed episodes of flooding have had a significant impact on the microclimate of the Back Section of the cave.

For the flooding of August 1990, the volume of water which entered the cave is estimated to be 80,000 cubic feet. Because the flooding occurred in summer the water entering the cave was warmer than the cave temperature. The incoming water is thought to have been about 10°F above cave temperature. The warm water carried in the equivalent of 50,000,000 BTU's of heat into the cave. The flooding raised the average temperature in the Back Section of the cave by 0.23°F. The evaporation rate in the Back Section changed from 0.18 milliliter per day of evaporation in July to 1.04 milliliter per day of condensation in August. The condensation was caused by the warm floodwater which warmed the cave air and increased the moisture content of the air. When this warm, moist air came into contact with the cool cave surfaces it would cause condensation. Also since the warm air will rise from the water surface a strong pattern of convective airflow is produced.

The flooding which occurred during the winter of 1991 brought a total of 500,000 cubic feet of water into the cave. Since the flooding occurred during the winter the water was colder than the cave temperature. Average incoming floodwater temperature was 50°F, about 15°F below the temperature of the cave. The floodwater carried in the equivalent of 466,000,000 BTU's of heat. The flooding occurred over a period of 90 days and the average rate was equivalent to cooling by approximately 5,000,000 BTU's per day. This is about ten times the heat flux expected from commercial operation. The winter flood had an unexpected impact on the microclimate. One would expect that bringing in large amounts of water would raise the overall humidity and thus lower the evaporation rate. This was not the case! Measurements at the environmental stations show a decrease in evaporation. This is due to the floodwater being colder than the cave. The flood water cools the air directly above it causing water to condense onto the surface of the water. This brings the air to 100% relative humidity directly over the floodwater but the air contains less water vapor per unit volume because of the cooler temperature. This creates a net gradient of moisture toward the flooded parts of the cave. Moisture from adjacent areas moves toward the flood waters and lowers the relative humidity and increases the evaporation rates in these areas. The moisture gradient is stable because the cool air above the flood water is denser and this stratifies the air preventing convective air flow from occurring. The environmental station records for the stations in the Back Section show that temperatures were an average of 0.96°F lower in March 1991 than they were in March 1990. Evaporation also increased by 0.08 milliliter per day, an increase of 24%.

The two types of flooding, by warm and cold water, allow us to make some estimates as to the likely effect that adding heat to the cave from public development is likely to cause. Adding 50,000,000 BTU of heat to the Back Section raised the cave temperature by 0.23°F, or 0.46°F for every 100,000,000 BTU. The winter flood extracted 466,000,000 BTU from the cave and dropped the temperature by 0.96°F, or 0.21°F per 100,000,000 BTU. (Cold water is not as effective in raising the cave temperature because it produces a stratified condition rather than a convective airflow pattern.).

Development of the cave is anticipated to add approximately 500,000 BTU per day of heat into the cave. The time span for the measured temperature rises due to flooding is approximately one month. Development will add 15,000,000 BTU per month to the cave. Since this is an addition of heat to the cave we would expect the temperature rise to be 15/100 X 0.46°F = 0.07°F. during the first month of operation. The temperature will continue to rise at this rate until it has reached an equilibrium value where the excess heat is lost by conduction and evaporation.

Energy Needed to Heat Outside Air for Air Exchange

If outside air were used to dilute the concentration of alpha radiation inside the cave it would usually need to warmed up to match the cave temperature. In order to reduce radon daughter levels in half it would require that the air within the cave be exchanged once every 5.5 days. If the air exchange were done during the night, this would limit the disruption to visitors caused by operating the air exchange equipment. The average temperature differential between cave temperature and outside night time air is estimated to be 19°F. The amount of energy required can be estimated from the change in enthalpy of air from 50°F to 69°F. This amounts to 0.902 BTU per cubic foot of air brought in. Assuming that only 3 million cubic feet of air must be exchanged every 5.5 days, the energy requirement is 492,000 BTU per day (144 kilowatt-hours). This is approximately twice the amount of power needed to run the electric lights. This also assumes that the process will be 100% efficient and does not include the power required to run any fans or other air handling equipment.

Operating a ventilation system during the day would reduce the energy requirements. It would also require a much more complicated set of equipment which could also cool outside air when it was warmer than cave air. Such a system would be much more complicated to run and maintain.

APPENDIX M

Water Quality Analysis Results

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Subway Tunnel (Floodwater Pool).....M-1
Strawberry Room (Dripwater Pool).....M-4
Quartz Divide.....M-7

DATE COLLECTED	DATE RECEIVED	DATE COMPLETED	SAMPLE CODE
10/02/90	10/03/90	10/11/90	9220118

WATERCHECK DIVISION / NATIONAL TESTING LABORATORIES INC.
6151 Wilson Mills Road
Cleveland, OH 44143
(216) 449-2525

CUSTOMER ADDRESS

ARIZONA CONSERVATION PROJECT
245 S. PLUMER AVE STE 38
TUCSON, AZ 85719-6347

Sample # KCW001 Subway Pirate's Den / Sue's Room Junction.

DEALER ADDRESS

OZARK UNDERGROUND LAB (Floodwater Pool)
RT 1 BOX 62
PROTEM, MO 65733-

DRINKING WATER ANALYSIS RESULTS

NOTE: "*" indicates that the MCL (Maximum Contaminant Level) has been exceeded, or in the case of pH is either too high OR too low.

"ND" indicates that none of this contaminant has been detected at or above our detection level.

"**" Result may be invalid due to lack of "Time Collected" or because the sample has exceeded the 30-hour time frame.

"BD" Bacteria destroyed due to lack of collection information or because the sample has exceeded the 48-hour time frame.

TNTC-Too Numerous To Count NBS-No Bacteria Submitted

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
Microbiological:			
Total coliform (organism/100ml)	0	0.0	ND
Inorganic chemicals - metals:			
Arsenic	0.05	0.002	ND
Barium	1.0	0.30	ND
Cadmium	0.01	0.002	ND
Chromium	0.05	0.004	ND
Copper	1.0	0.004	0.005
Iron	0.3	0.020	0.13
Lead	0.05	0.002	ND
Manganese	0.05	0.004	ND
Mercury	0.002	0.0002	ND
Nickel	0.15	0.02	ND
Selenium	0.01	0.002	ND
Silver	0.05	0.002	ND
Sodium		1.0	10
Zinc	5.0	0.004	0.022

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
Inorganic chemicals - other and physical factors:			
Alkalinity (Total as CaCO3)	---	2.0	90
Chloride	250	10.0	ND
Fluoride	1.4.0	1.0	ND
Nitrate as N	10	0.5	ND
Nitrite as N	---	0.5	ND
Sulfate	250	10.0	22
Hardness (suggested limit = 100)	---	20.0	110*
pH (Standard Units)	6.5-8.5	---	7.8
Total Dissolved Solids	500	20.0	195
Turbidity (Turbidity Units)	1.0	0.1	4.0*
Organic chemicals - trihalomethanes:			
Bromoform	---	0.004	ND
Bromodichloromethane	---	0.002	ND
Chloroform	---	0.002	ND
Dibromochloromethane	---	0.004	ND
Total THMs (sum of four above)	0.1	0.002	ND
Organic chemicals - volatile:			
Benzene	0.005	0.001	ND
Vinyl Chloride	0.002	0.001	ND
Carbon Tetrachloride	0.005	0.001	ND
1,2-Dichloroethane	0.005	0.001	ND
Trichloroethylene	0.005	0.001	ND
1,4-Dichlorobenzene	0.075	0.001	ND
1,1-Dichloroethylene	0.007	0.001	ND
cis-1,2-Dichloroethylene	0.20	0.001	ND
Bromobenzene	---	0.002	ND
Bromomethane	---	0.002	ND
Chlorobenzene	---	0.001	ND
Chloroethane	---	0.002	ND
Chloroethylvinylether	---	0.002	ND
Chloromethane	---	0.002	ND
2-Chlorotoluene	---	0.001	ND
4-Chlorotoluene	---	0.001	ND
Dibromochloropropane (DBCP)	---	0.001	ND
Dibromomethane	---	0.002	ND
1,2-Dichlorobenzene	---	0.001	ND
1,3-Dichlorobenzene	---	0.001	ND
Dichlorodifluoromethane	---	0.002	ND
1,1-Dichloroethane	---	0.002	ND
Trans-1,2-Dichloroethylene	---	0.002	ND
1,3-Dichloropropane	---	0.002	ND
2,2-Dichloropropane	---	0.002	ND
1,2-Dichloropropane	---	0.002	ND

 Sample code: 9291155

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
trans-1,3-Dichloropropene	---	0.002	ND
cis-1,3-Dichloropropene	---	0.002	ND
2,2-Dichloropropane	---	0.002	ND
1,1-Dichloropropene	---	0.002	ND
1,3-Dichloropropane	---	0.002	ND
Ethylbenzene	---	0.001	ND
Ethylenedibromide (EDB)	---	0.001	ND
Styrene	---	0.001	ND
1,1,1,2-Tetrachloroethane	---	0.002	ND
1,1,2,2-Tetrachloroethane	---	0.002	ND
Tetrachloroethylene (PCE)	---	0.002	ND
Trichlorobenzene(s)	---	0.002	ND
1,1,2-Trichloroethane	---	0.002	ND
Trichlorofluoromethane	---	0.002	ND
1,2,3-Trichloropropane	---	0.002	ND
Toluene	---	0.001	ND
Xylene	---	0.001	ND
Organic Chemicals, Pesticides, Herbicides & PCBs			
Alachlor	---	0.005	ND
Atrazine	---	0.050	ND
Chlordane	0.02	0.010	ND
Aldrin	---	0.005	ND
Dichloran	---	0.005	ND
Dieldren	---	0.002	ND
Endrin	0.0002	0.0002	ND
Heptachlor	0.01	0.002	ND
Heptachlor Epoxide	---	0.002	ND
Hexachlorobenzene	0.02	0.005	ND
Hexachloropentadiene	---	0.005	ND
Lindane	0.004	0.004	ND
Methoxychlor	0.1	0.05	ND
PCBs	0.008	0.004	ND
Pentachloronitrobenzene	---	0.005	ND
Silvex 2,4,5-TP	0.01	0.005	ND
Simazine	---	0.050	ND
Toxaphene	0.005	0.005	ND
Trifluralin	---	0.005	ND
2,4-D	0.1	0.010	ND

** These test results are intended to be used for informational purposes only and may not be used for regulatory compliance.

I certify that the analyses performed for this report are accurate, and that the laboratory tests were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.

PRESIDENT, NATIONAL TESTING LABORATORIES, INC.

REV. 4-89

DATE COLLECTED	DATE RECEIVED	DATE COMPLETED	SAMPLE CODE
10/04/90	10/05/90	10/15/90	9220216

WATERCHECK DIVISION / NATIONAL TESTING LABORATORIES INC.
6151 Wilson Mills Road
Cleveland, OH 44143
(216) 449-2525

CUSTOMER ADDRESS

ARIZONA CONSERVATION PROJECT
245 S. PLUMER AVE STE 38
TUCSON, AZ 85719-6347
Sample KCW 002 Strawberry Room (Drip water Pool)

DEALER ADDRESS

OZARK UNDERGROUND LAB
RT 1 BOX 62
PROTEM, MO 65733-

DRINKING WATER ANALYSIS RESULTS

NOTE: "*" indicates that the MCL (Maximum Contaminant Level) has been exceeded, or in the case of pH is either too high or too low.
"ND" indicates that none of this contaminant has been detected at or above our detection level.
"**" Result may be invalid due to lack of "Time Collected" or because the sample has exceeded the 30-hour time frame.
"BD" Bacteria destroyed due to lack of collection information or because the sample has exceeded the 48-hour time frame.
TNTC-Too Numerous To Count NBS-No Bacteria Submitted

Analysis performed	MCL (mg/l)	Detection Level	Detected
Microbiological:			
Total Coliform (organism/100ml)	0	0.0	45*
Inorganic chemicals - metals:			
Arsenic	0.05	0.002	ND
Barium	1.0	0.30	ND
Cadmium	0.01	0.002	ND
Chromium	0.05	0.004	ND
Copper	1.0	0.004	0.005
Iron	0.3	0.020	ND
Lead	0.05	0.002	ND
Manganese	0.05	0.004	ND
Mercury	0.002	0.0002	ND
Nickel	0.15	0.02	ND
Selenium	0.01	0.002	ND
Silver	0.05	0.002	ND
Sodium		1.0	1.7
Zinc	5.0	0.004	0.014

DATE RECEIVED	DATE COMPLETED	SAMPLE ID
		9220216

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
Inorganic chemicals - other, and physical factors:			
Alkalinity (Total as CaCO3)	---	2.0	170
Chloride	250	10.0	ND
Fluoride	4.0	1.0	ND
Nitrate as N	10	0.5	1.9
Nitrite as N	---	0.5	ND
Sulfate	250	10.0	20
Hardness (suggested limit = 100)	---	20.0	200
pH (Standard Units)	6.5-8.5	---	7.9
Total Dissolved Solids	500	20.0	325
Turbidity (Turbidity Units)	1.0	0.1	0.1
Organic chemicals - trihalomethanes:			
Bromoform	---	0.004	ND
Bromodichloromethane	---	0.002	ND
Chloroform	---	0.002	ND
Dibromochloromethane	---	0.004	ND
Total THMs (sum of four above)	0.1	0.002	ND
Organic chemicals - volatiles:			
Benzene	0.005	0.001	ND
Vinyl Chloride	0.002	0.001	ND
Carbon Tetrachloride	0.005	0.001	ND
1,2-Dichloroethane	0.005	0.001	ND
Trichloroethylene	0.005	0.001	ND
1,4-Dichlorobenzene	0.075	0.001	ND
1,1-Dichloroethylene	0.007	0.001	ND
1,1,1-Trichloroethane	0.20	0.001	ND
Bromobenzene	---	0.002	ND
Bromomethane	---	0.002	ND
Chlorobenzene	---	0.001	ND
Chloroethane	---	0.002	ND
Chloroethylvinyl ether	---	0.002	ND
Chloromethane	---	0.002	ND
2-Chlorotoluene	---	0.001	ND
4-Chlortoluene	---	0.001	ND
Dibromochloropropane (DBCP)	---	0.001	ND
Dibromomethane	---	0.002	ND
1,2-Dichlorobenzene	---	0.001	ND
1,3-Dichlorobenzene	---	0.001	ND
Dichlorodifluoromethane	---	0.002	ND
1,1-Dichloroethane	---	0.002	ND
Trans-1,2-Dichloroethylene	---	0.002	ND
cis-1,2-Dichloroethylene	---	0.002	ND
Dichloromethane	---	0.002	ND
1,2-Dichloropropane	---	0.002	ND

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
trans-1,3-Dichloropropene	---	0.002	ND
cis-1,3-Dichloropropene	---	0.002	ND
2,2-Dichloropropane	---	0.002	ND
1,1-Dichloropropene	---	0.002	ND
1,3-Dichloropropane	---	0.002	ND
Ethylbenzene	---	0.001	ND
Ethylenedibromide (EDB)	---	0.001	ND
Styrene	---	0.001	ND
1,1,1,2-Tetrachloroethane	---	0.002	ND
1,1,2,2-Tetrachloroethane	---	0.002	ND
Tetrachloroethylene (PCE)	---	0.002	ND
Trichlorobenzene(s)	---	0.002	ND
1,1,2-Trichloroethane	---	0.002	ND
Trichlorofluoromethane	---	0.002	ND
1,2,3-Trichloropropane	---	0.002	ND
Toluene	---	0.001	ND
Xylene	---	0.001	ND
Organic chemicals - pesticides, herbicides & PCBs			
Alachlor	---	0.005	ND
Atrazine	---	0.050	ND
Chlordane	0.02	0.01	ND
Aldrin	---	0.005	ND
Dichloran	---	0.005	ND
Dieldrin	---	0.002	ND
Endrin	0.0002	0.0002	ND
Heptachlor	0.01	0.002	ND
Heptachlor Epoxide	---	0.002	ND
Hexachlorobenzene	0.02	0.005	ND
Hexachlorocyclopentadiene	---	0.005	ND
Lindane	0.004	0.004	ND
Methoxychlor	0.1	0.05	ND
PCBs	0.008	0.004	ND
Pentachloronitrobenzene	---	0.005	ND
Silvex 2,4,5-TP	0.01	0.005	ND
Simazine	---	0.050	ND
Toxaphene	0.005	0.005	ND
Trifluralin	---	0.005	ND
2,4-D	0.1	0.010	ND

** These test results are intended to be used for informational purposes only and may not be used for regulatory compliance.

I certify that the analyses performed for this report are accurate, and that the laboratory tests were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.

PRESIDENT, NATIONAL TESTING LABORATORIES, INC.

REV. 4-89

DATE COLLECTED	DATE RECEIVED	DATE COMPLETED	SAMPLE CODE
05/29/91	05/31/91	06/17/91	9291155

CUSTOMER ADDRESS

Quartz Divide

KCW 003

DEALER ADDRESS

ARIZONA CONSERVATION
PROJECTS INC.
245 S. PLUMER #38
TUCSON, AZ 85719-

WATERCHECK / NATIONAL TESTING LABORATORIES INC.
6151 Wilson Mills Road
Cleveland, OH 44143
(216) 449-2525

DRINKING WATER ANALYSIS RESULTS

NOTE: "*" indicates that the MCL (Maximum Contaminant Level) has been exceeded, or in the case of pH is either too high OR too low.
"ND" indicates that none of this contaminant has been detected at or above our detection level.
"**" Result may be invalid due to lack of "Time Collected" or because the sample has exceeded the 30-hour time frame.
"BD" Bacteria destroyed due to lack of collection information or because the sample has exceeded the 48-hour time frame.
TNTC-Too Numerous To Count NBS-No Bacteria Submitted

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
Microbiological:			
Total coliform (organism/100ml)	0	0.0	ND
Inorganic chemicals - metals:			
Arsenic	0.05	0.002	ND
Barium	1.0	0.30	ND
Cadmium	0.01	0.002	ND
Chromium	0.05	0.004	ND
Copper	1.0	0.004	ND
Iron	0.3	0.020	0.050
Lead	0.05	0.002	ND
Manganese	0.05	0.004	0.022
Mercury	0.002	0.0002	ND
Nickel	0.15	0.02	ND
Selenium	0.01	0.002	ND
Silver	0.05	0.002	ND
Sodium	...	1.0	12
Zinc	5.0	0.004	0.004

 Sample code: 9291155

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
Inorganic chemicals - other, and physical factors:			
Alkalinity (Total as CaCO3)	---	2.0	100
Chloride	250	10.0	ND
Fluoride	4.0	0.50	0.7
Nitrate as N	10	0.5	ND
Nitrite as N	---	0.5	ND
Sulfate	250	10.0	27
Hardness (suggested limit = 100)		20.0	100
pH (Standard Units)	6.5 8.5	---	7.9
Total Dissolved Solids	500	20.0	200
Turbidity (Turbidity Units)	1.0	0.1	1.5*
Organic chemicals - trihalomethanes:			
Bromoform	---	0.004	ND
Bromodichloromethane	---	0.002	ND
Chloroform	---	0.002	ND
Dibromochloromethane	---	0.004	ND
Total THMs (sum of four above)	0.1	0.002	ND
Organic chemicals - volatiles:			
Benzene	0.005	0.001	ND
Vinyl Chloride	0.002	0.001	ND
Carbon Tetrachloride	0.005	0.001	ND
1,2-Dichloroethane	0.005	0.001	ND
Trichloroethylene	0.005	0.001	ND
1,4-Dichlorobenzene	0.075	0.001	ND
1,1-Dichloroethylene	0.007	0.001	ND
1,1,1,-Trichloroethane	0.20	0.001	ND
Bromobenzene	---	0.002	ND
Bromomethane	---	0.002	ND
Chlorobenzene	---	0.001	ND
Chloroethane	---	0.002	ND
Chloroethylvinyl ether	---	0.002	ND
Chloromethane	---	0.002	ND
2-Chlorotoluene	---	0.001	ND
4-Chlorotoluene	---	0.001	ND
Dibromochloropropane (DBCP)	---	0.001	ND
Dibromomethane	---	0.002	ND
1,2-Dichlorobenzene	---	0.001	ND
1,3-Dichlorobenzene	---	0.001	ND
Dichlorodifluoromethane	---	0.002	ND
1,1-Dichloroethane	---	0.002	ND
Trans-1,2-Dichloroethylene	---	0.002	ND
cis-1,2-Dichloroethylene	---	0.002	ND
Dichloromethane	---	0.002	ND
1,2-Dichloropropane	---	0.002	ND

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
trans-1,3-Dichloropropene	---	0.002	ND
cis-1,3-Dichloropropene	---	0.002	ND
2,2-Dichloropropane	---	0.002	ND
1,1-Dichloropropene	---	0.002	ND
1,3-Dichloropropane	---	0.002	ND
Ethylbenzene	---	0.001	ND
Ethylenedibromide (EDB)	---	0.001	ND
Styrene	---	0.001	ND
1,1,1,2-Tetrachloroethane	---	0.002	ND
1,1,2,2-Tetrachloroethane	---	0.002	ND
Tetrachloroethylene (PCE)	---	0.002	ND
Trichlorobenzene(s)	---	0.002	ND
1,1,2-Trichloroethane	---	0.002	ND
Trichlorofluoromethane	---	0.002	ND
1,2,3-Trichloropropane	---	0.002	ND
Toluene	---	0.001	ND
Xylene	---	0.001	ND
Organic chemicals - pesticides, herbicides & PCBs			
Alachlor	---	0.005	ND
Atrazine	---	0.050	ND
Chlordane	0.02	0.01	ND
Aldrin	---	0.005	ND
Dichloran	---	0.005	ND
Dieldren	---	0.002	ND
Endrin	0.0002	0.0002	ND
Heptachlor	0.01	0.002	ND
Heptachlor Epoxide	---	0.002	ND
Hexachlorobenzene	0.02	0.005	ND
Hexachloropentadiene	---	0.005	ND
Lindane	0.004	0.004	ND
Methoxychlor	0.1	0.05	ND
PCBs	0.008	0.004	ND
Pentachloronitrobenzene	---	0.005	ND
Silvex 2,4,5-TP	0.01	0.005	ND
Simazine	---	0.050	ND
Toxaphene	0.005	0.005	ND
Trifluralin	---	0.005	ND
2,4-D	0.1	0.010	ND

I certify that the analyses performed for this report are accurate, and that the laboratory tests were conducted by methods approved by the U.S. Environmental Protection Agency or variations of these EPA methods. These test results are intended to be used for informational purposes only and may not be used for regulatory compliance.

PRESIDENT, NATIONAL TESTING LABORATORIES, INC.

REV. 2-91

APPENDIX N

Results of Dye Tracing

TABLE OF CONTENTS

Groundwater Tracing Results 9/13/90 ..... N-1
Groundwater Tracing Results 4/4/91 ..... N-3

ARK UNDERGROUND LABORATORY
Rt. 1 Box 62 • Protem, Missouri 65733 • (417) 785-4289

September 13, 1990

Mr. Bob Buecher
Arizona Conservation Projects, Inc.
245 S. Plumer, Suite 38
Tucson, Ariz. 85719

RE: Groundwater Tracing Results

Dear Bob:

Please refer to your letter of September 5, 1990 on the dye tracing work. Your letter documents dye placement information and sampling data. My letter summarizes results. The dye which you injected was fluorescein.

You enclosed five charcoal samplers. Analysis results were as follows:

Sampling Station	Date Placed 1990	Date Recovered 1990	Fluorescein Peak (nm)	Fluorescein Concentration (ppb)
West Surface Stream OUL 6752	8/28	9/4 9:45A	ND	ND
Water Room OUL 6753	8/30 Noon	9/4 1330 hrs.	ND	ND
Marble Canyon OUL 6754	8/30 1345 hrs	9/4 1415 hrs.	ND	ND
Mushroom upstream OUL 6755	8/30 1440 hrs	9/4 1530 hrs.	517.9	50.3
Mushroom downstream OUL 6756	8/30 1440 hrs	9/4 1530 hrs.	519.0	768.0

ND = None Detected. Detection Limit 0.015 ppb

You enclosed one cotton sampler from the West Surface Stream for the period 8/28 to 9/4 at 9:45 AM. No optical brighteners were detected.

Five water samples were collected. They are summarized in the following table.

Sampling Station	Date Collected 1990	Time	Fluorescein Peak (nm)	Fluorescein Concentration (ppb)
Water Room nr. start of crawl to Granite Dells. OUL 6758	8/30	Noon	ND	ND
Marble Canyon near C-113. OUL 6759	8/30	1345 hrs.	ND	ND
Mushroom Passage. OUL 6761	8/30	1440 hrs.	ND	ND
Mushroom Passage OUL 6762	9/4	1530 hrs.	512.5	25.8
Pirate's Den and Sue's Rm. Jct. OUL 6763	9/4	1600 hrs.	ND	ND

ND = None Detected. Detection limit 0.0005 ppb.

Photocopies of all of the analysis graphs are enclosed. I am also enclosing descriptions of the analysis approaches and a section on interpretation of the charts.

The results show that fluorescein was recovered in the Mushroom Passage. The charcoal samplers concentrate the dye, so they routinely contain greater dye concentrations than are found in the water. I have enclosed a draft segment of a manual called "Joy of Dyeing" which we are preparing that provides some rule of thumb estimates of the magnitudes of dye concentration effects vs. time.

Why was dye concentration in charcoal packets from Mushroom downstream about 15 times greater than in Mushroom upstream? It suggests to me that appreciable amounts of dyed water enter the flow between these two stations, however, you were the one doing the sampling and there may be some other explanation. A difference of this magnitude is far outside the range of differences found in side by side packets.

I will look forward to the next samples.

Sincerely,

Tom Aley

Tom Aley

OZARK UNDERGROUND LABORATORY

Rt. 1 Box 62 • Protem, Missouri 65733 • (417) 785-4289

April 4, 1991

Bob Buecher
Arizona Conservation Projects, Inc.
245 S. Plumer, Suite 38
Tucson, AZ 85719.

Dear Bob:

In your letter of March 29, 1991 you asked if there were any results from the last samples you sent in conjunction with the Rhodamine WT dye trace. The attached tables detail the results from all samples run during the course of this trace. Rhodamine WT from charcoal samplers was recovered from the Water Room Pool, Subway Tunnel, South Pyramid Room, and Pyramid Room Pool. There was no detectable Rhodamine WT in the background sample from Guindani Wash upstream of the dye injection site.

Rhodamine Wt in grab samples of water was recovered at Pyramid Room Pool and from the Pool in the Subway Tunnel at Angel Wing Junction. No dye was recovered in the January 11 sample from Granite Dell, yet that sample was collected prior to the time at which any dye would have been anticipated in sampling stations within the Caverns.

Sincerely,

Tom

Tom Aley

Rhodamine WT dye analysis results from charcoal sampler elutants, Kartchner Caverns Groundwater Trace #2. 1991.

Lab Number and Sampling Station	Date Placed 1991	Date Recovered 1991	Rhodamine WT Peak (nm)	Rhodamine WT Concentration (ppb)
OUL 7941. Guindani upstr. dye injection site.	1/11	1/17	ND	
OUL 7939. Water Room Pool	1/10	1/11	ND	
OUL 7938. Water Room Pool	1/11	1/15	ND	
OUL 8025. Water Room Pool	1/15	1/21	570.6	17.0
OUL 8322. Water Room Pool	1/21	1/29	569.4	18.5
OUL 8642. Water Room Pool	1/29	2/10	569.8	8.84
OUL 8024. South Pyramid Room	1/10	1/21	569.4	19.2
OUL 8093. Pyramid Room Pool	1/21	1/23	570.4	14.8
OUL 8323. Pyramid Room Pool	1/23	1/29	569.5	27.9
OUL 8643. Pyramid Room Pool	1/29	2/10	570.1	5.07
OUL 8023. Subway Tunnel	1/10	1/21	571.1	4.03
OUL 8092. Subway Tunnel	1/21	1/23	569.4	5.83
OUL 8641. Subway Tunnel	1/23	2/10	569.8	18.9

ND = None Detected. Detection Limit 0.234 ppb

Rhodamine WT dye analysis results from grab samples of water, Kartchner Caverns Groundwater Trace #2. 1991.

Lab Number and Sampling Station	Date Collected 1991	Time	Rhodamine WT Peak (nm)	Rhodamine WT Concentration (ppb)
OUL 7942. Granite Dell	1/11	1600 hrs.	ND	
OUL 8094. Pyramid Room Pool	1/23	1210 hrs.	576.8	3.56
OUL 8644. Pyramid Room Pool	2/10	Not recorded	576.7	2.60
OUL 8645. Pool in Subway Tunnel at Angel Wing Jct.	2/10	Not recorded	577.1	3.82

ND = None Detected. Detection limit 0.008 ppb.

APPENDIX O

Bat Flight Exit Counts

TABLE OF CONTENTS

Summary of Bat Flight Counts O-1
Graphs of Bat Flights ..... O-3 to O-114

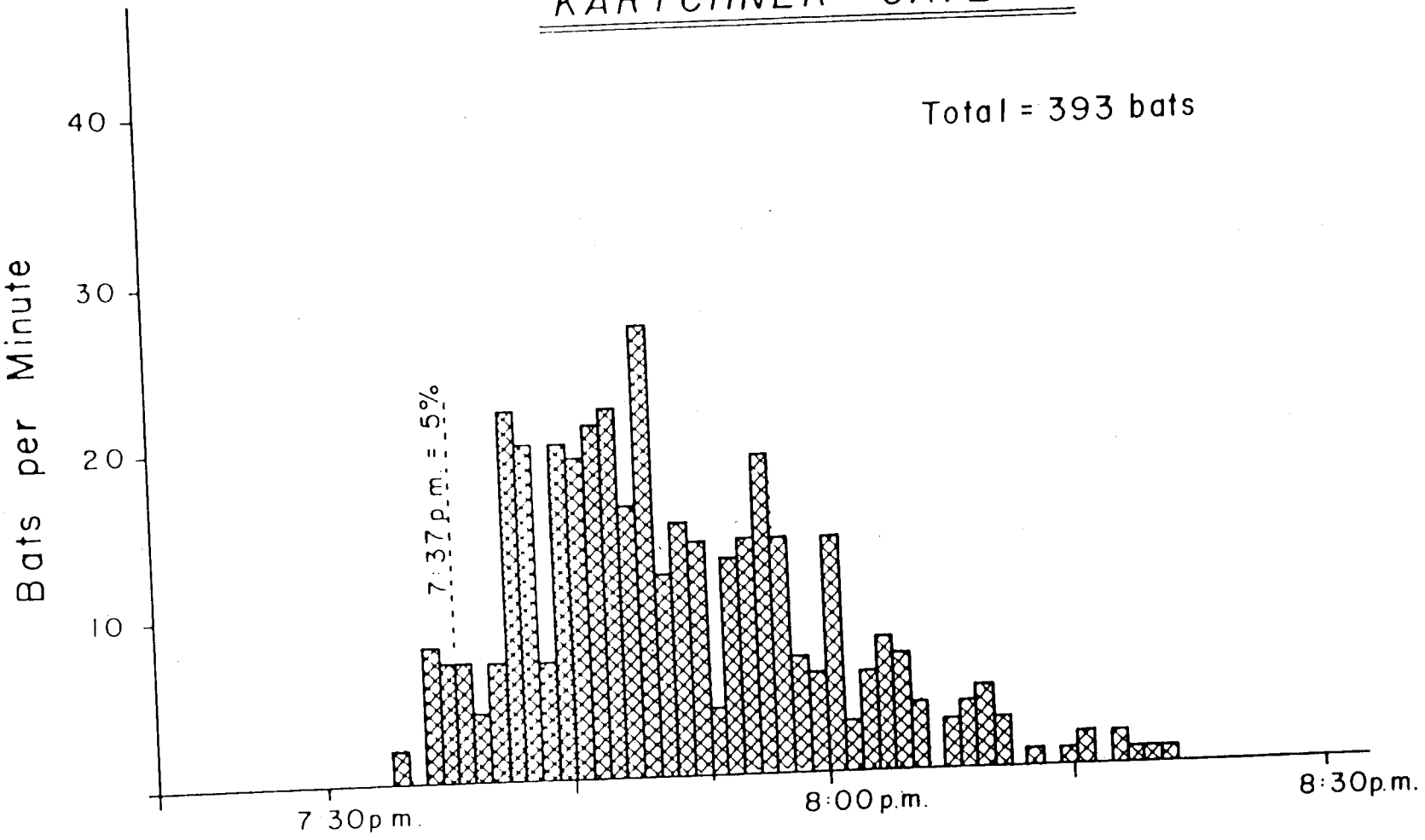
KARTCHNER CAVERNS STATE PARK
Bat Flight Counts

1987	# OF BATS	1988	# OF BATS	1989	# OF BATS	1990	# OF BATS	1991	# OF BATS
								Apr 25	4
								May 02	25
				May 05	160			May 05	16
				May 10	394	May 11	23	May 08	160
				May 13	64	May 13	52	May 15	204
				May 19	86	May 18	157	May 19	519
				May 20	159	May 23	509	May 23	663
		May 28	393	May 29	483			May 29	209
				May 31	514			May 30	544
		Jun 04	493	Jun 03	640	Jun 01	577	Jun 05	254
		Jun 07	580	Jun 06A	726	Jun 08	1170	Jun 09	218
		Jun 08	558	Jun 06B	721				
				Jun 09A	826				
				Jun 09B	822	Jun 11	1224	Jun 11	113
				Jun 13	941				
				Jun 14	884	Jun 15	1124	Jun 17	102
		Jun 18	623	Jun 20A	846	Jun 20	1172	Jun 19	154
				Jun 20B	831			Jun 23	146
				Jun 22	923	Jun 21	1212	Jun 27	332
		Jun 30	644	Jun 29	1086	Jun 29	1193	Jun 30	354
				Jul 02	1041	Jul 01	1115	Jul 01	358
								Jul 04	481
				Jul 09	851	Jul 07	1146	Jul 07	453
								Jul 10A	635*
								Jul 10B	481
								Jul 11	436
				Jul 15A	1224	Jul 16	672	Jul 14	422*
				Jul 15B	1008				
				Jul 20	746	Jul 18	1253	Jul 17	657
				Jul 22	1247				

1987	# OF BATS	1988	# OF BATS	1989	# OF BATS	1990	# OF BATS	1991	# OF BATS
		Jul 27	519	Jul 24	1288	Jul 24	1182	Jul 24	612
				Jul 31	1653			Aug 01	925
		Aug 02	929			Aug 04	1306	Aug 04	833
Aug 04	553	Aug 06	1303	Aug 07	1804			Aug 07	1210
Aug 08	864	Aug 07	1297	Aug 11	1804	Aug 12	1445	Aug 11	950*
				Aug 13	1689				
		Aug 14	1186	Aug 14	1608			Aug 14	903
				Aug 15	1714	Aug 15A	1290*	Aug 16	638
						Aug 15B	1270*		
						Aug 17	1493	Aug 19	1186
				Aug 22	1096	Aug 21A	1279		
						Aug 21B	1391		
						Aug 23	1195	Aug 23	730
		Aug 25	810	Aug 25	663			Aug 25	640
				Aug 29	225	Aug 29	695	Aug 28A	443
								Aug 28B	402
						Sep 01	510		
						Sep 03	473		
						Sep 07	371		
						Sep 08A	371	Sep 08	148
						Sep 08B	359		
						Sep 12	311	Sep 10	81
						Sep 15	212		
		Sep 16	21			Sep 19	121		

*Denotes a partial count.

KARTCHNER CAVERN

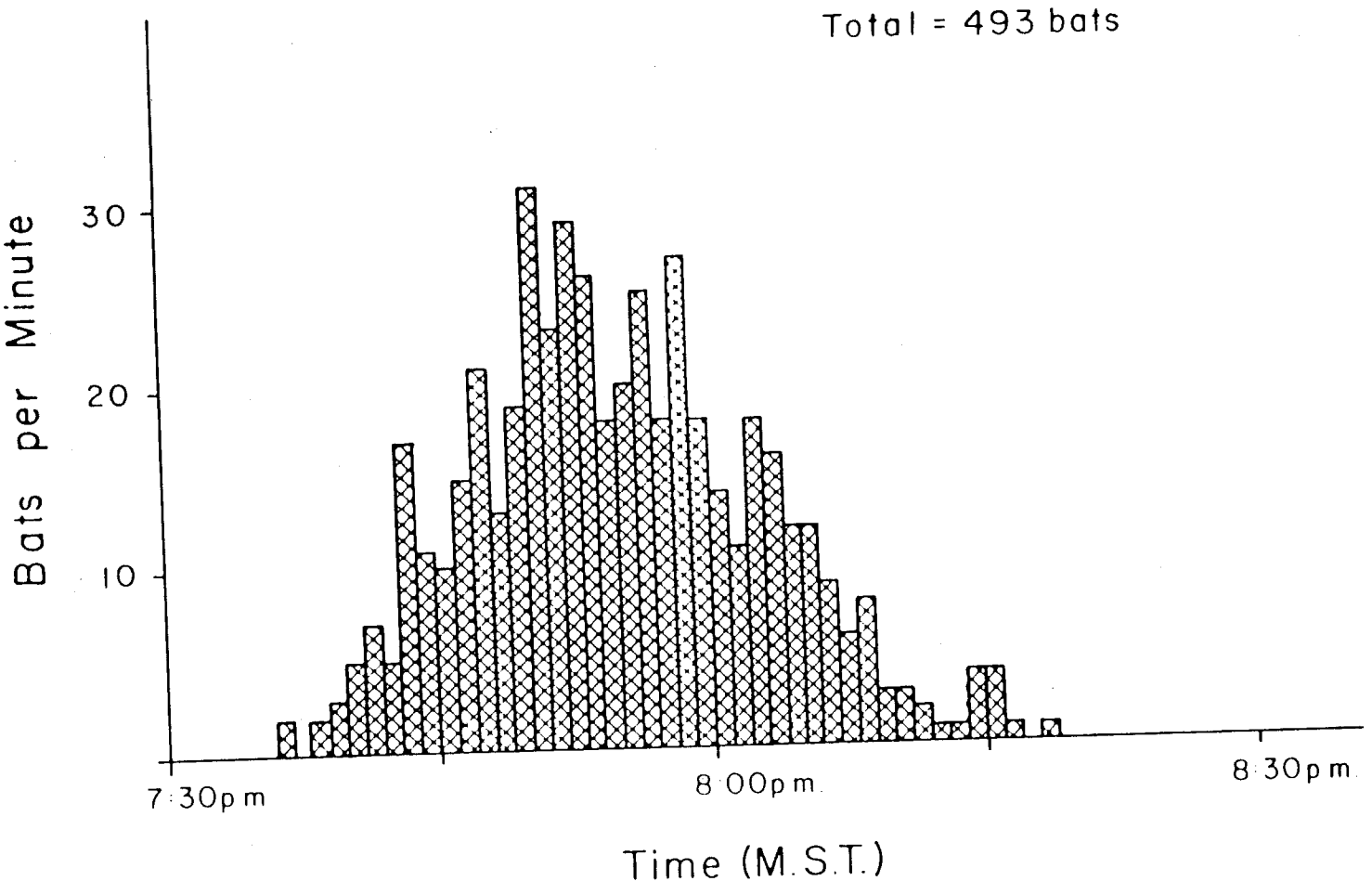


Sunset = 7:20 p.m.

May 28, 1988
Clear, Warm

Other Counts
this Night: 403
410

KARTCHNER CAVERN

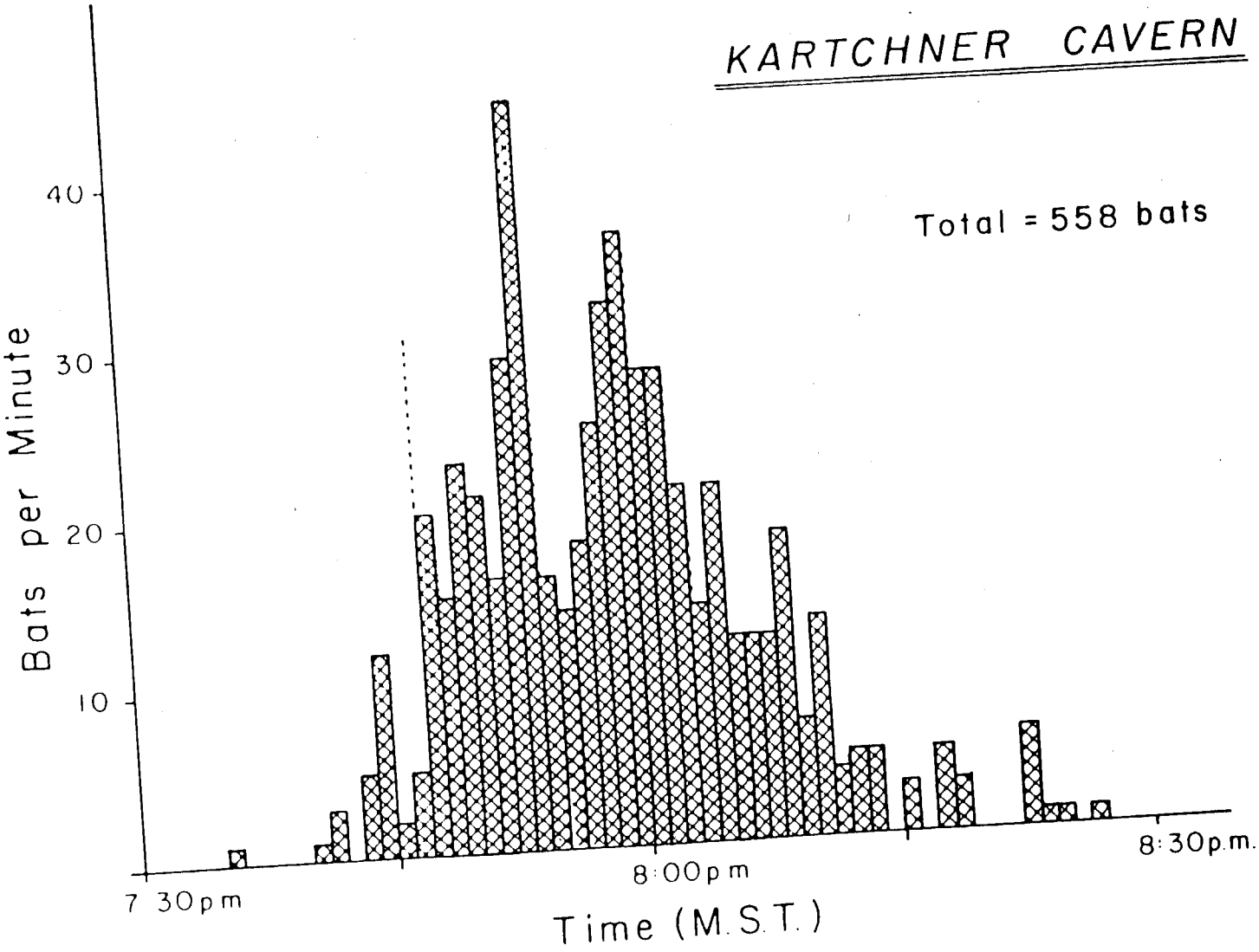


June 4, 1988

Scattered clouds, Warm

Rain in valley

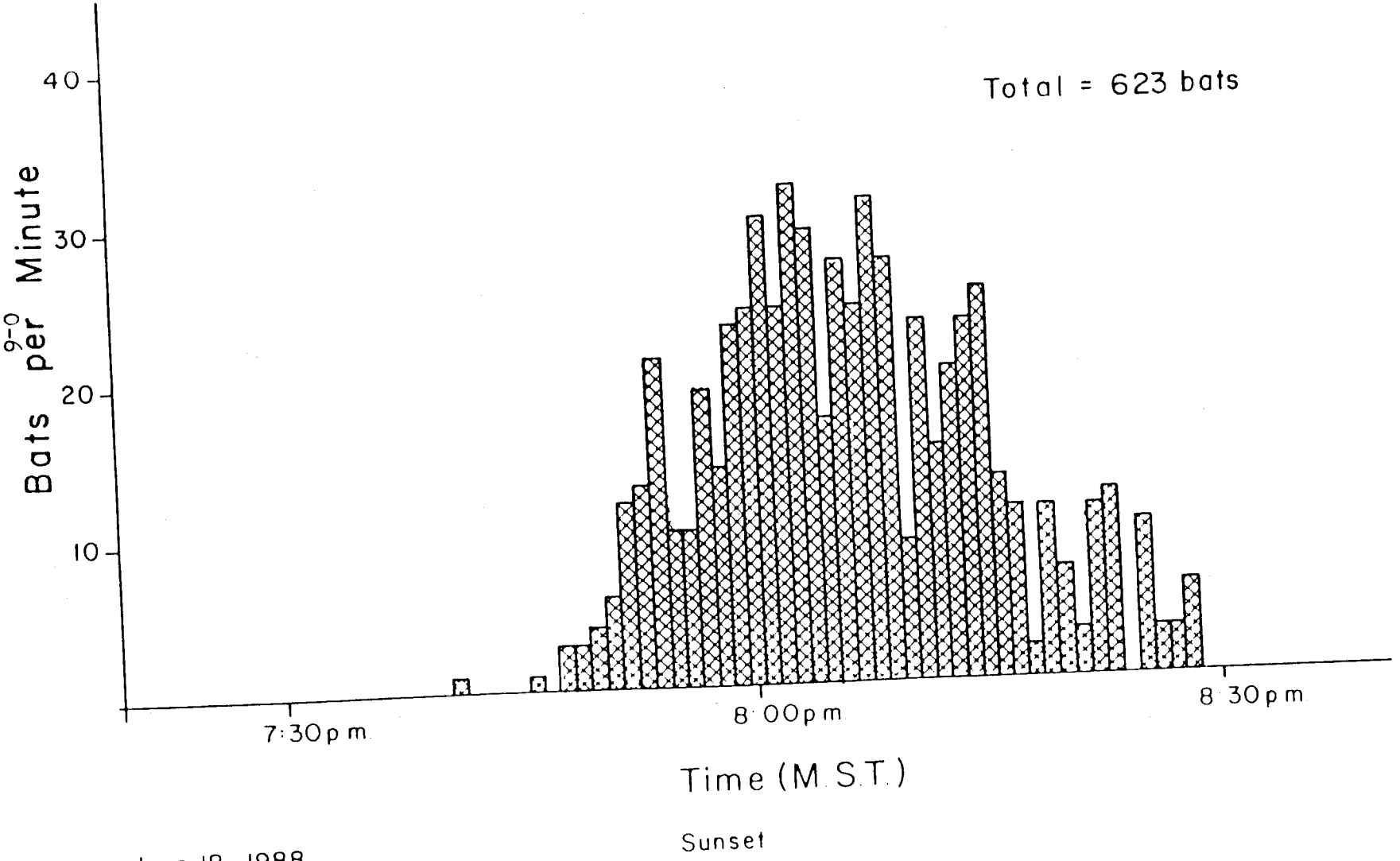
Sunset =



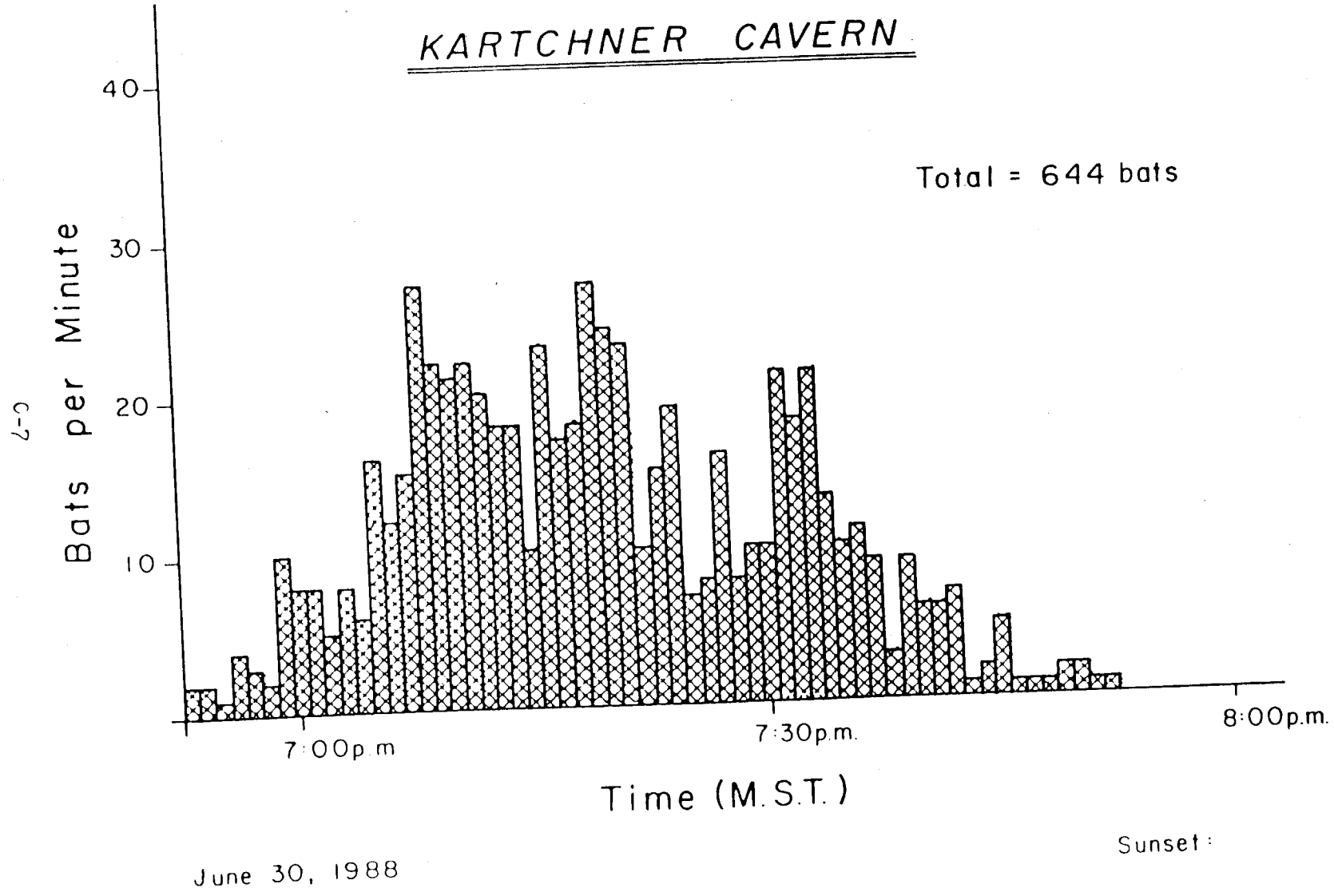
June 8, 1988

Sunset = 7:26p.m.

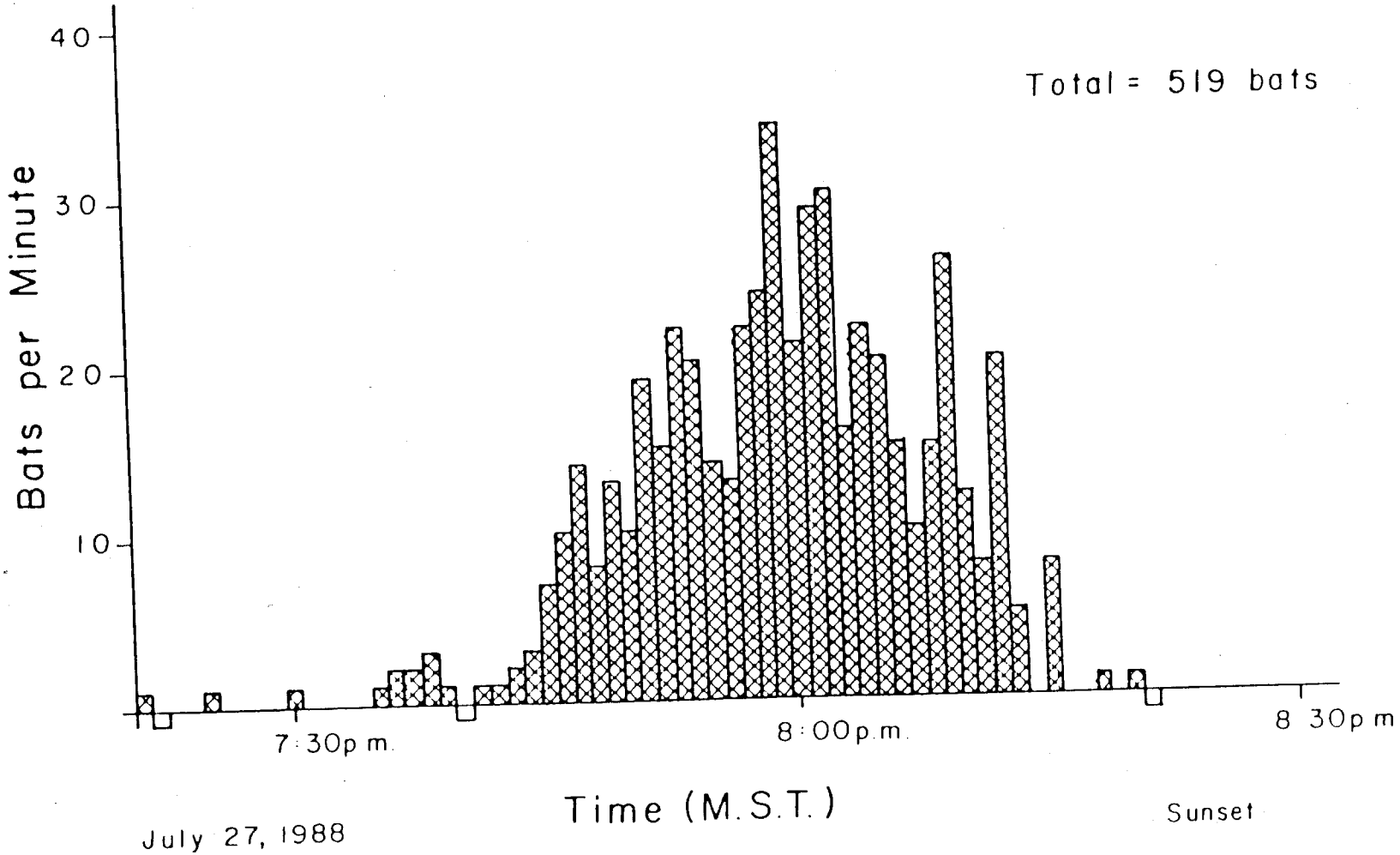
KARTCHNER CAVERN

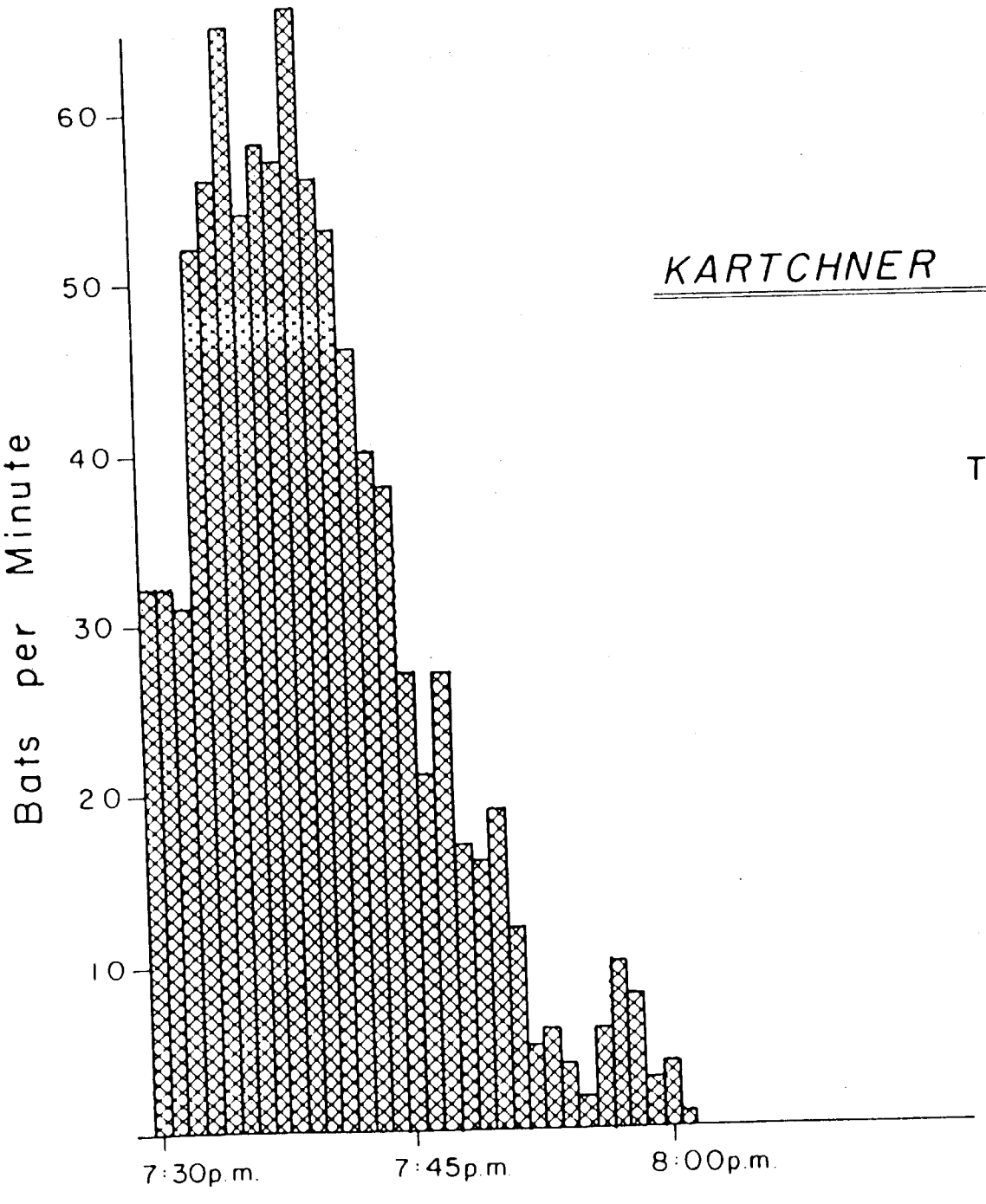


June 18, 1988


KARTCHNER CAVERN
Total = 644 bats
Bats per Minute
40
30
20
10
7:00p.m
7:30p.m.
8:00p.m.
Time (M.S.T.)
Sunset:
June 30, 1988

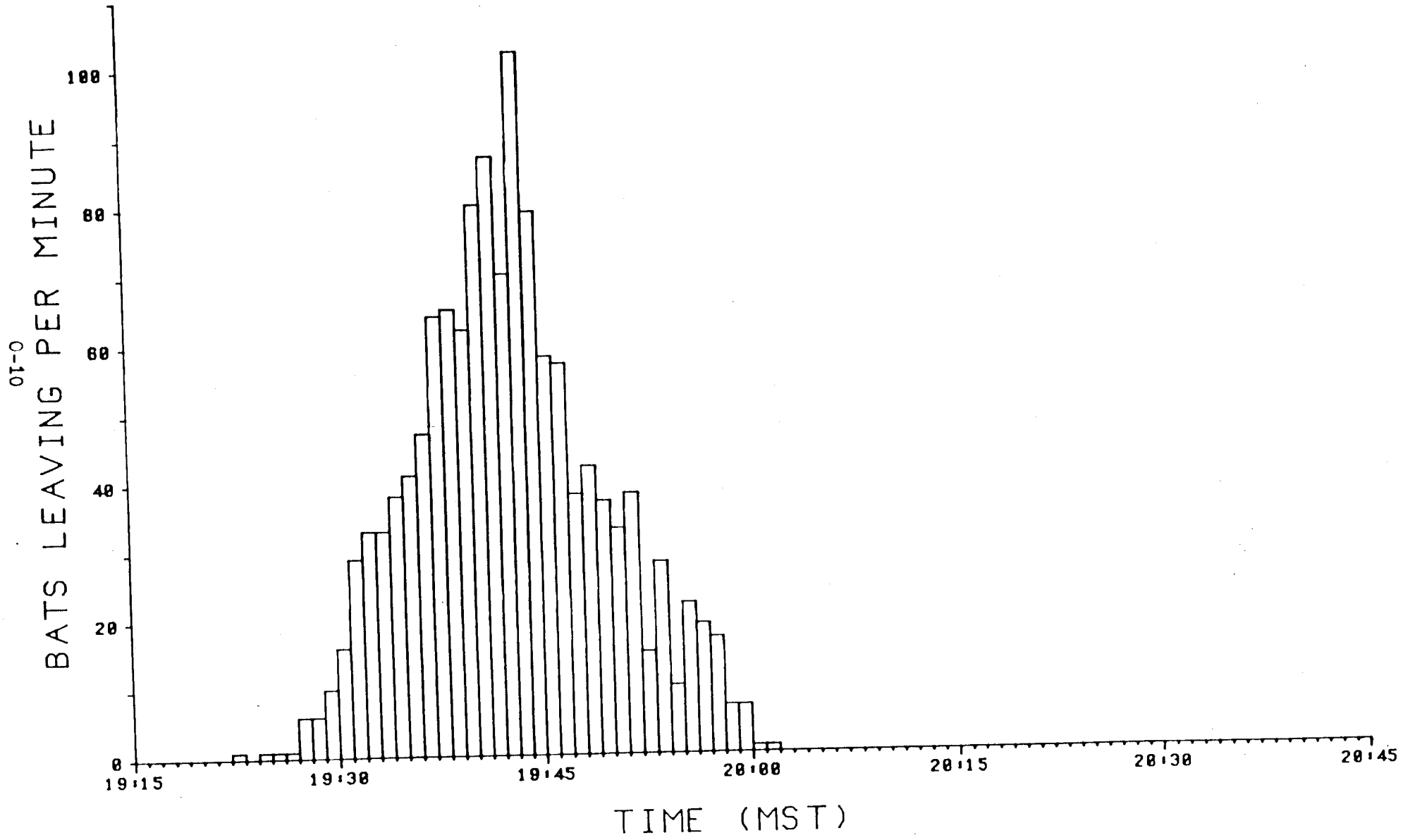
KARTCHNER CAVERN




KARTCHNER CAVERN
Total = 929 bats
Bats per Minute
60
50
40
30
20
10
7:30p.m.
7:45p.m.
8:00p.m.
Time (M.S.T)
August 2, 1988
Sunset:

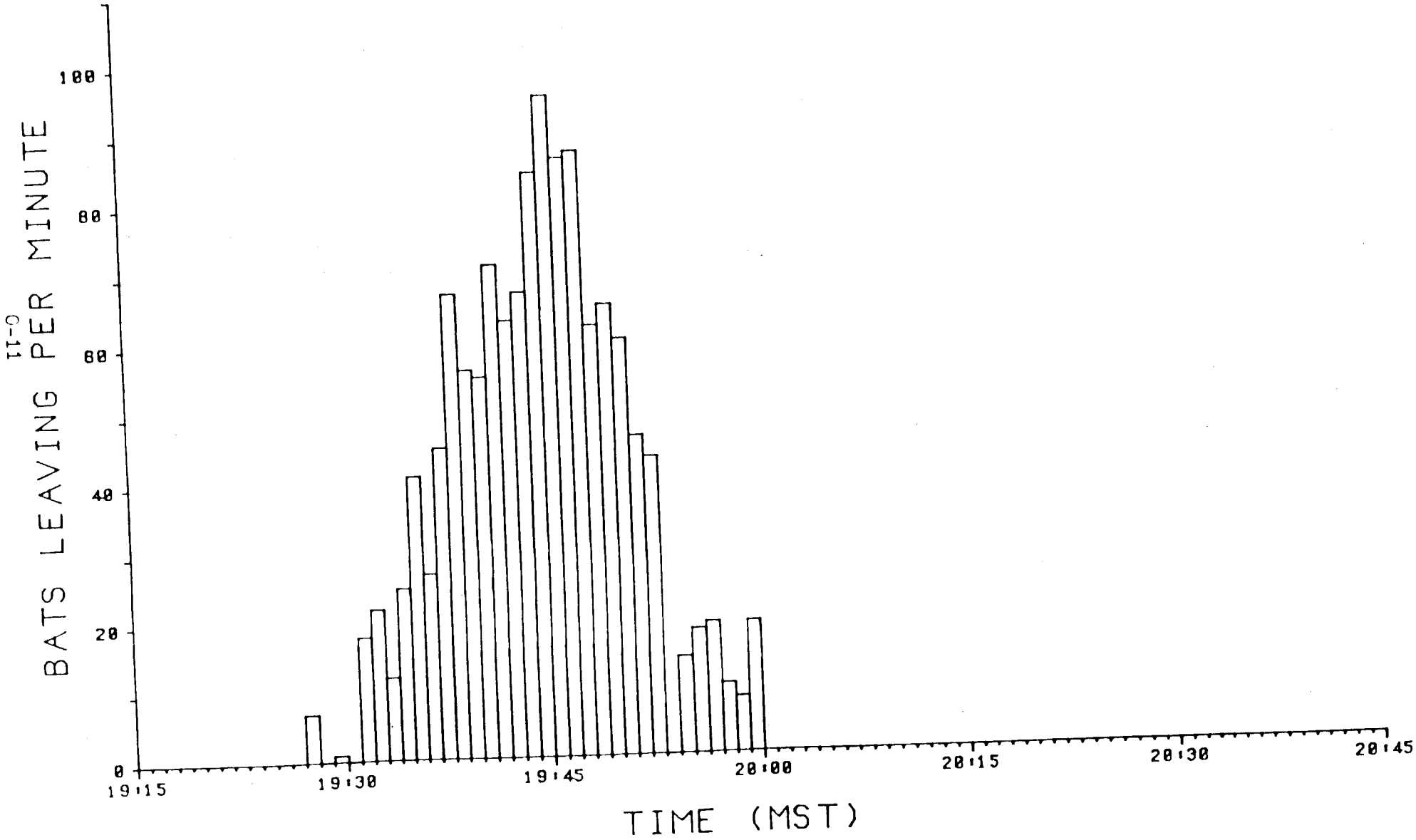
KARTCHNER CAVERNS BAT FLIGHT

DATE 8/6/88 TOTAL= 1302 BATS



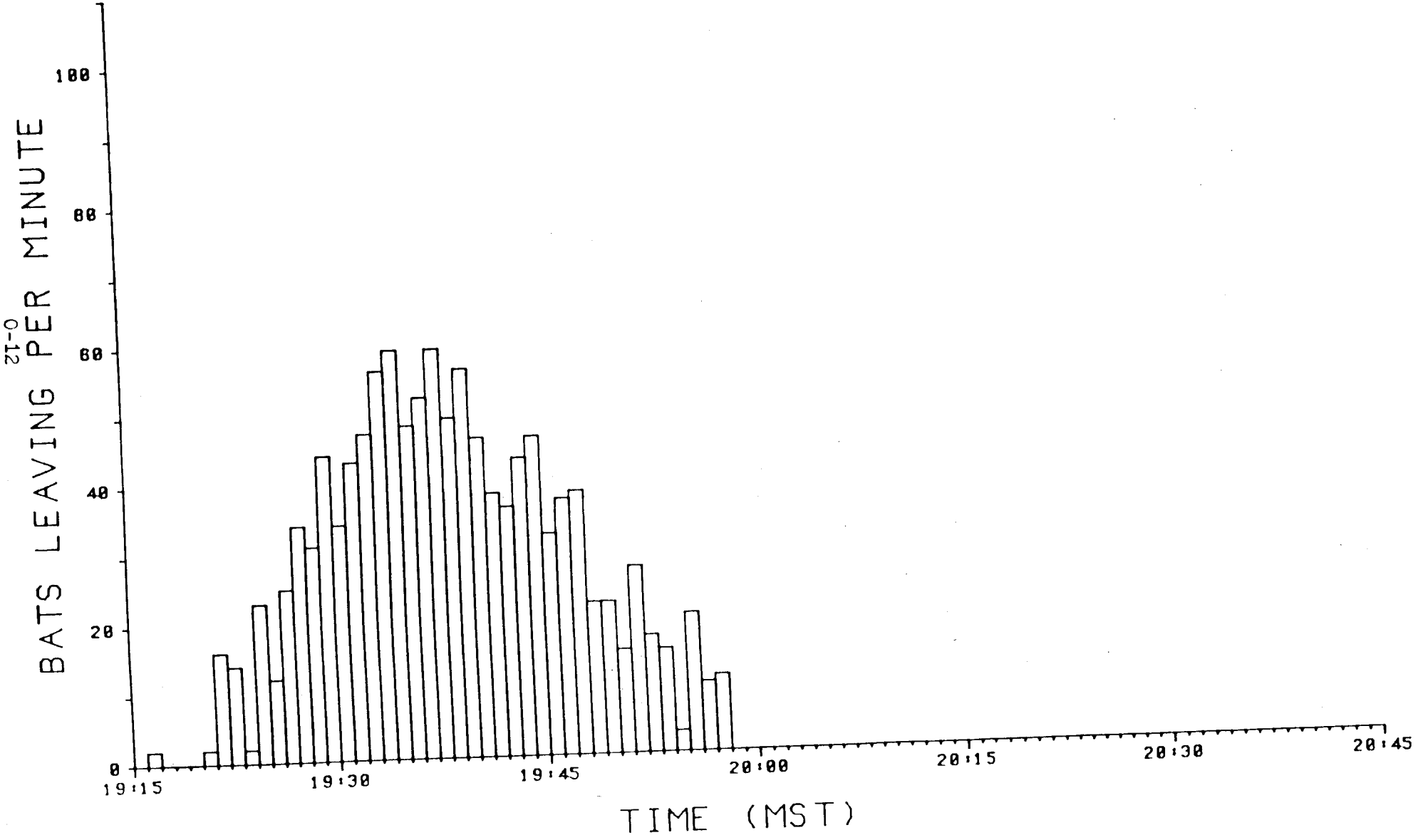
KARTCHNER CAVERNS BAT FLIGHT

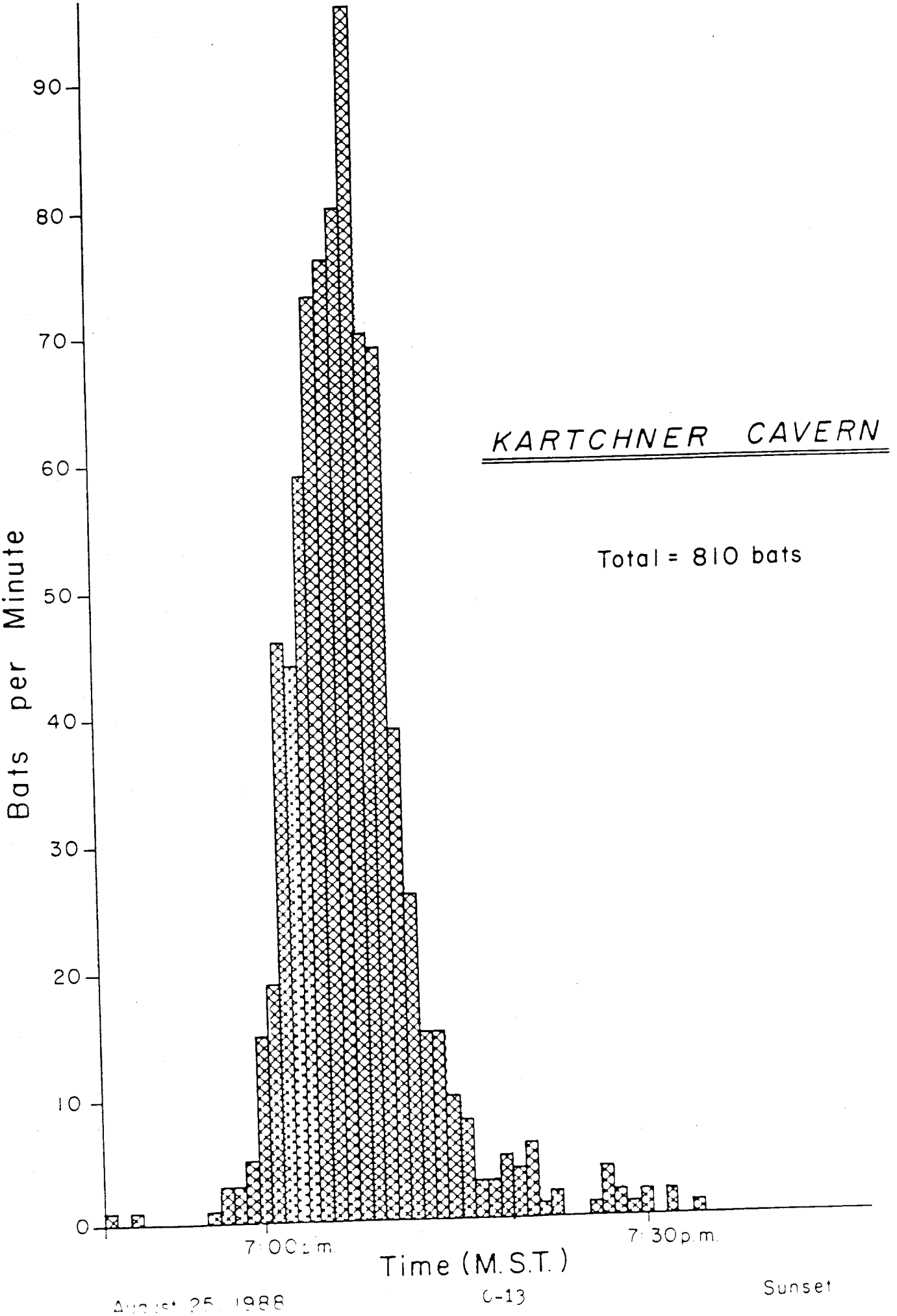
DATE 8/7/88 TOTAL= 1293 BATS

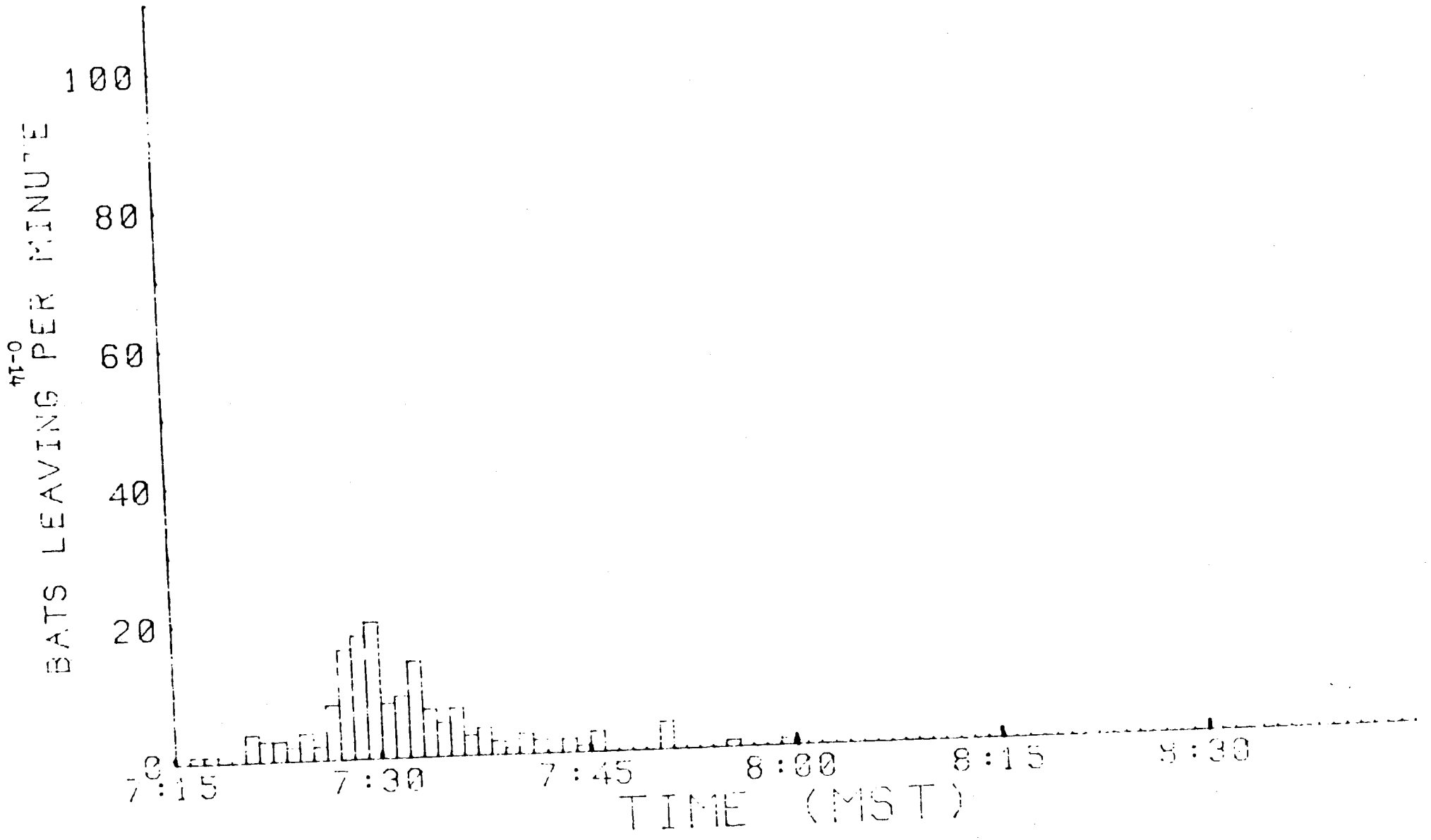


KARTCHNER CAVERNS BAT FLIGHT

DATE 8/14/88 TOTAL= 1186 BATS

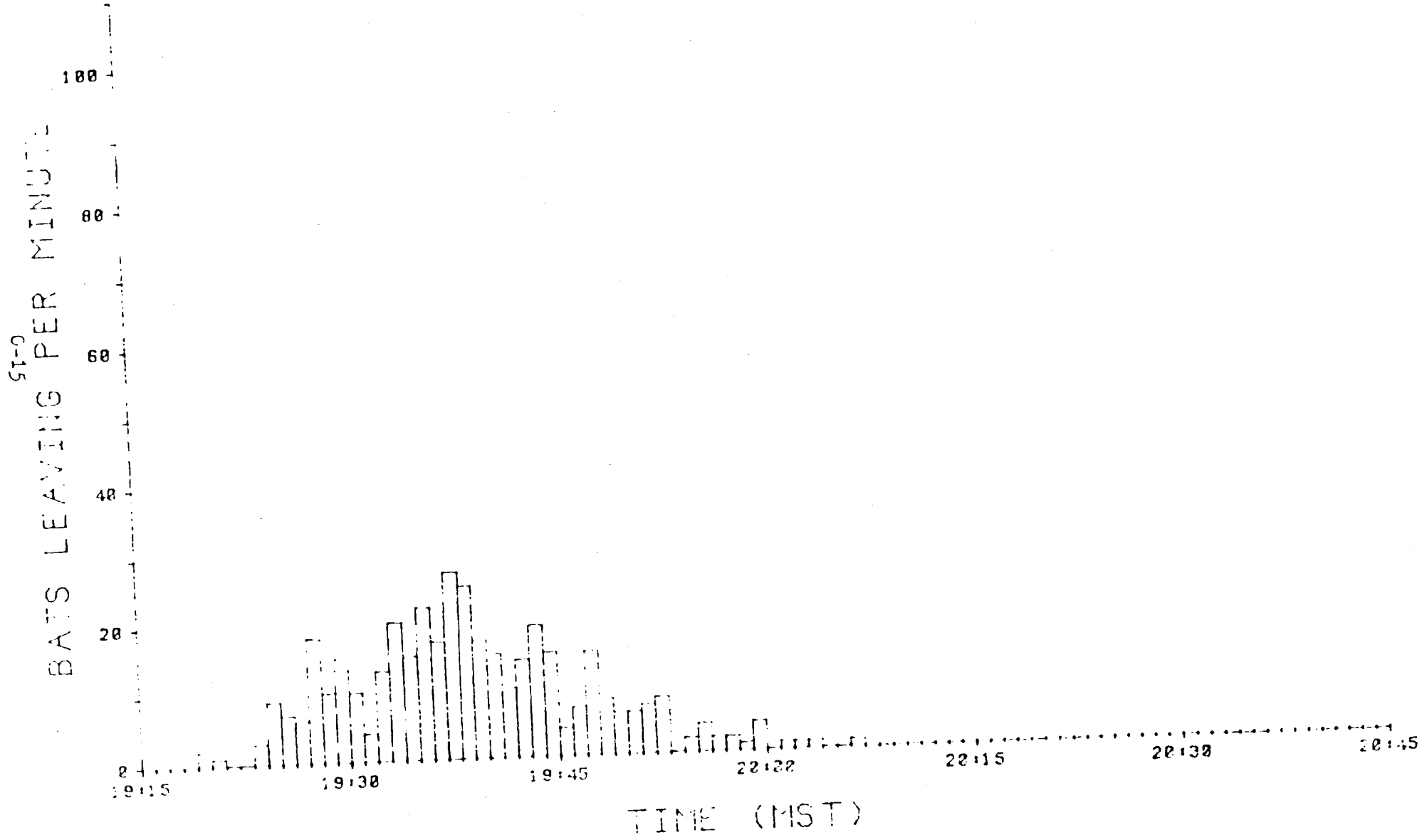



KARTCHNER CAVERN
Total = 810 bats
Bats per Minute
0
10
20
30
40
50
60
70
80
90
7:00 p.m.
7:30 p.m.
Time (M.S.T.)
Sunset


KARTCHNER CAVERNS BAT FLIGHT
DATE 05/05/89 TOTAL= 160 BATS
BATS LEAVING PER MINUTE
100
80
60
40
20
0
7:15
7:30
7:45
8:00
8:15
8:30
TIME (MST)

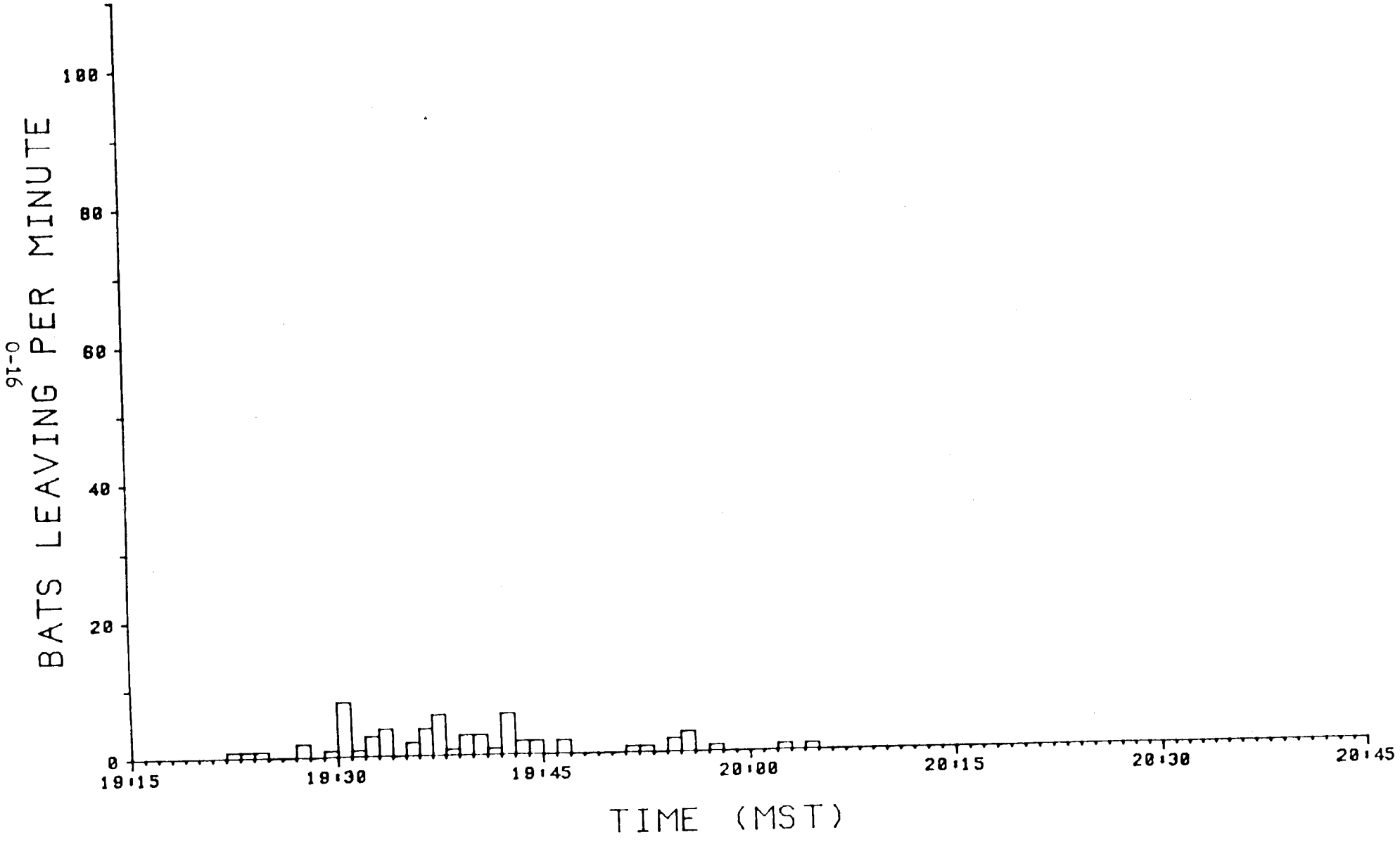
KARTCHNER CAVERNS BAT FLIGHT

DATE 05/10/89 TOTAL= 394 BATS



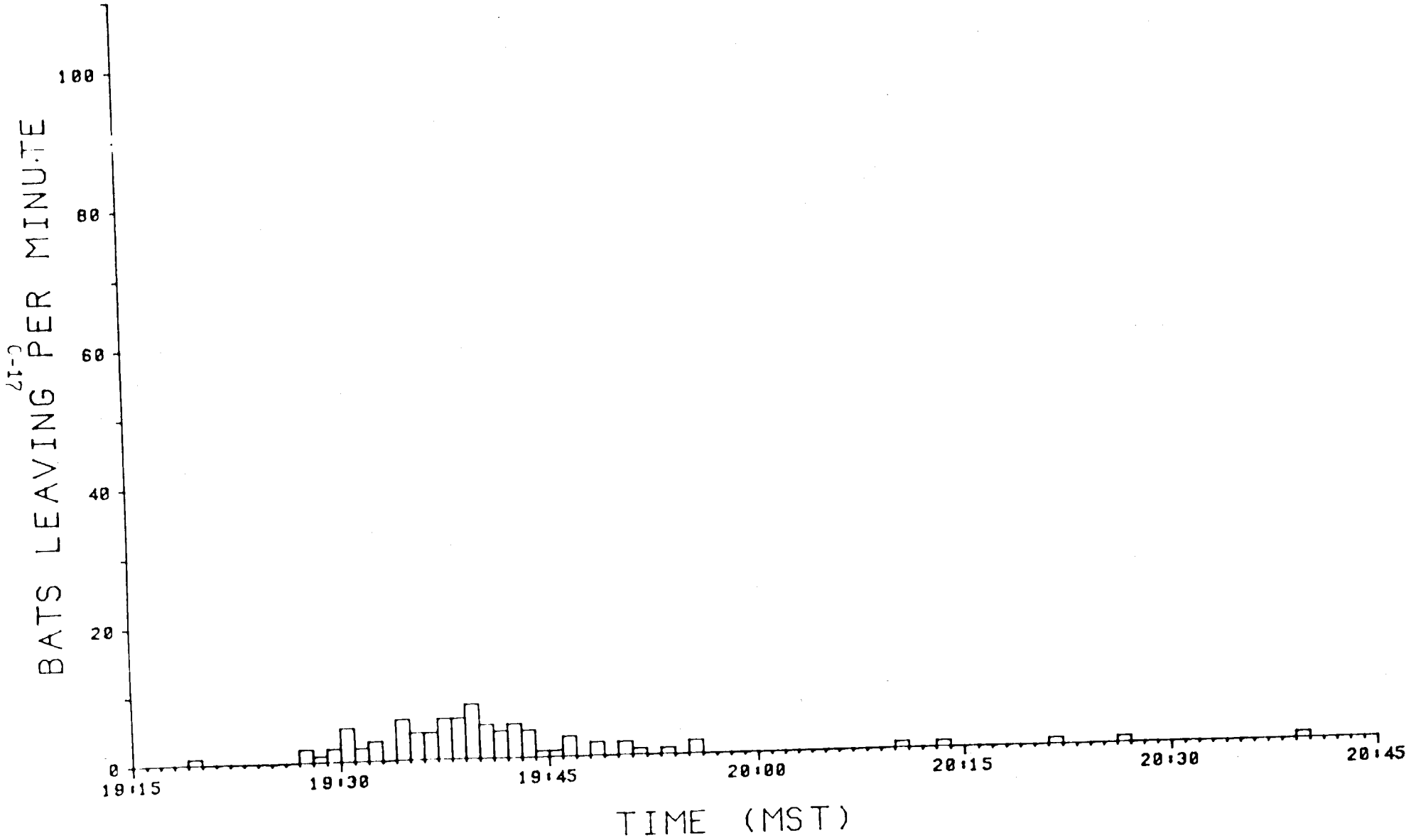
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/13/89 TOTAL= 64 BATS



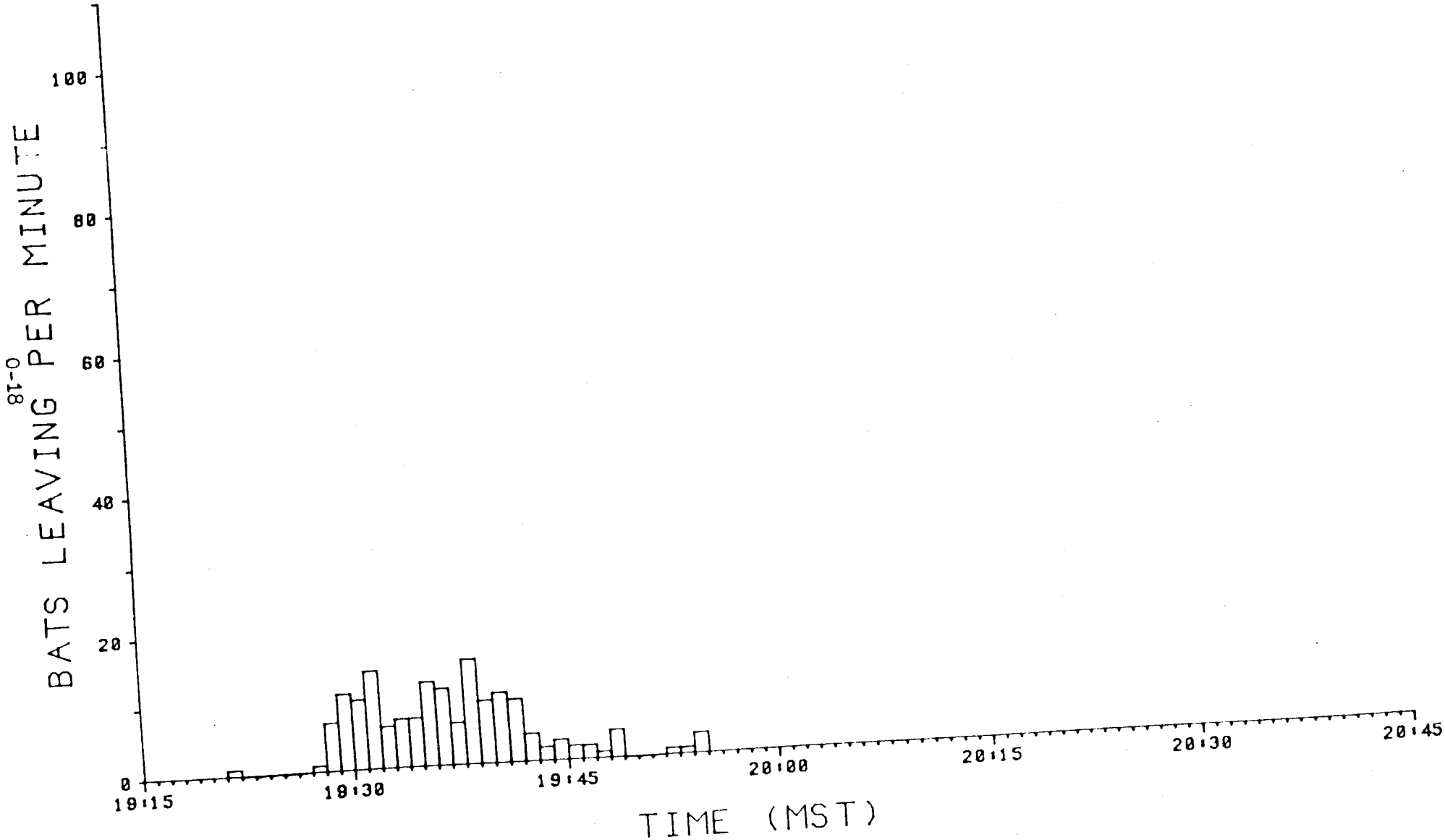
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/19/89 TOTAL= 86 BATS



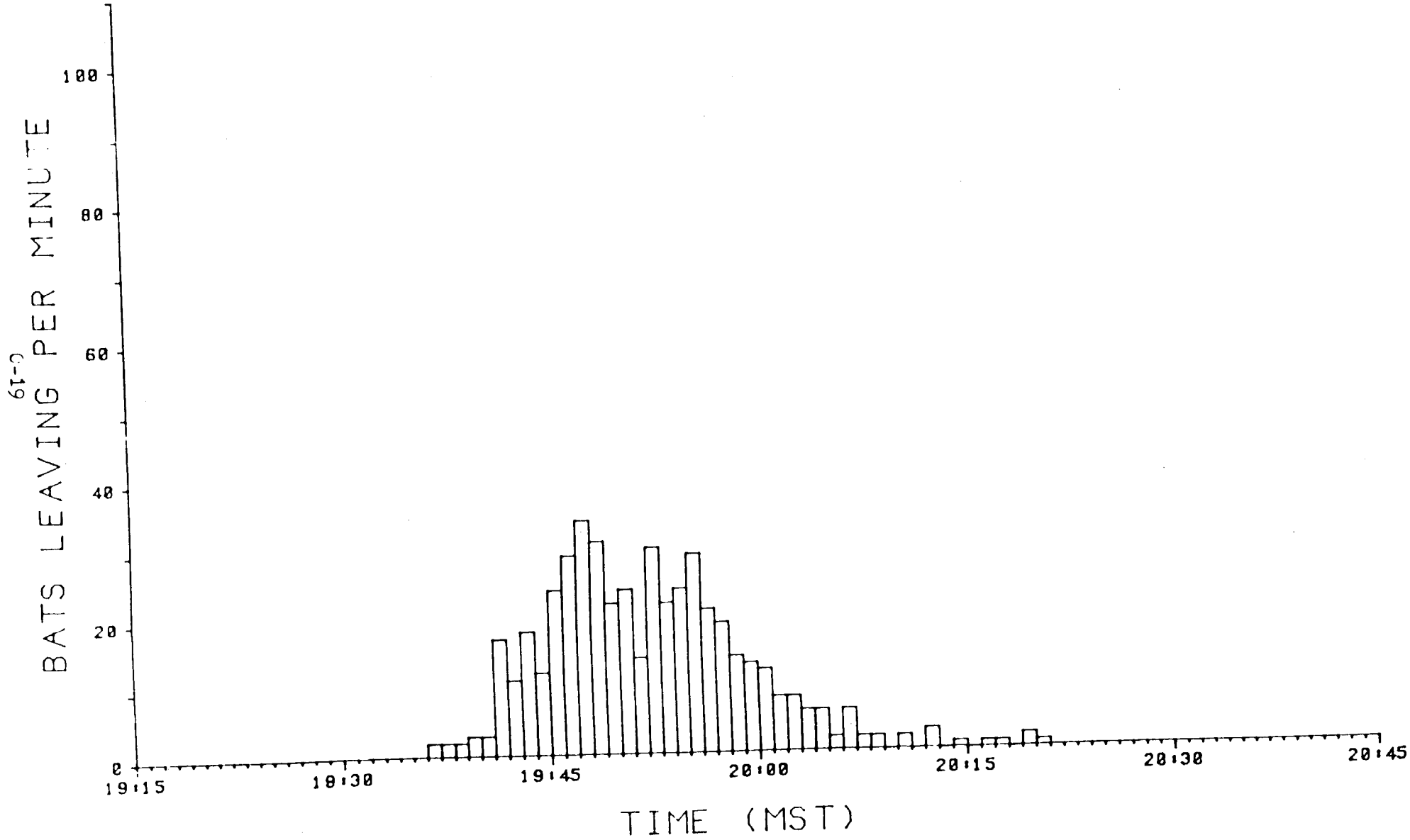
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/20/89 TOTAL= 159 BATS



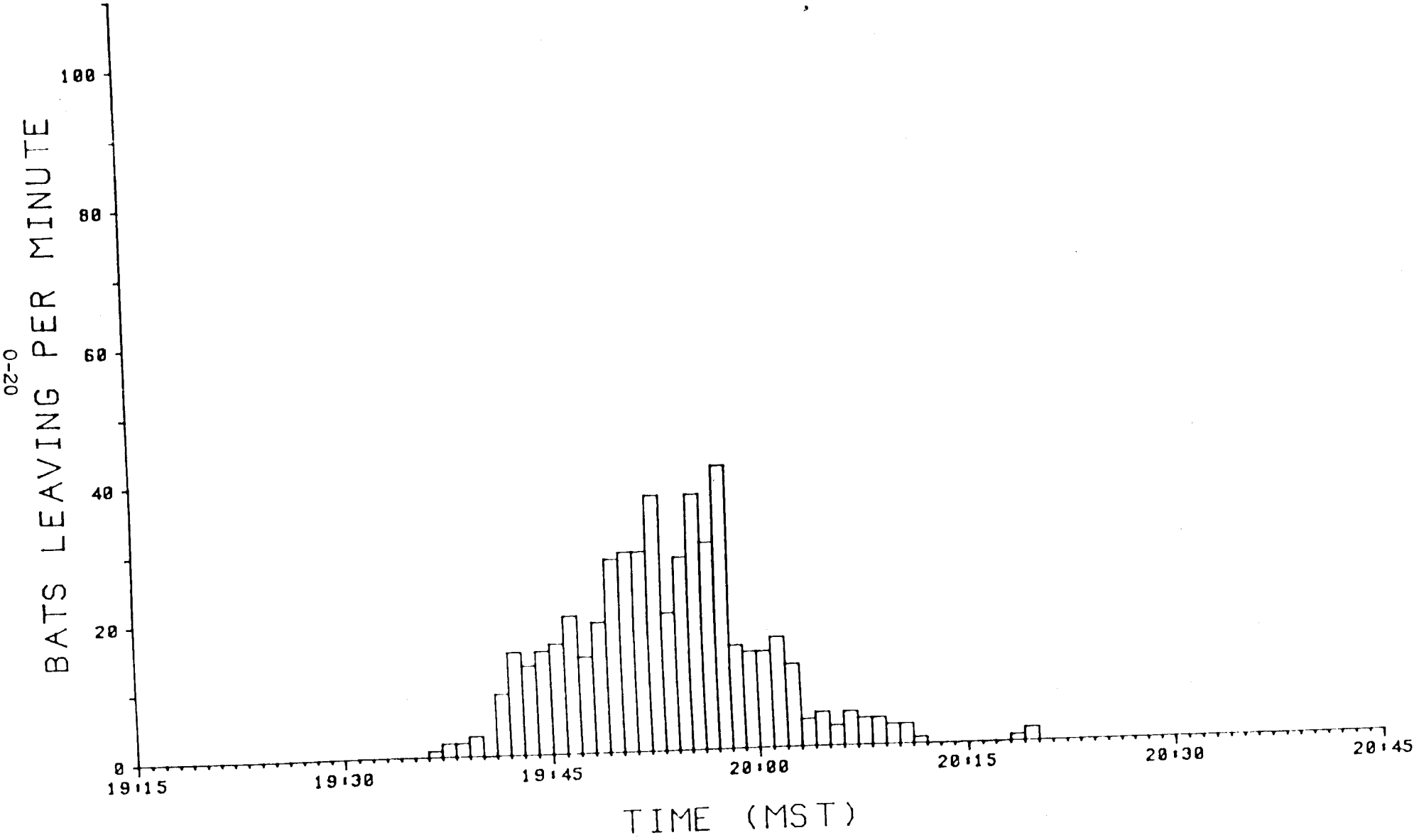
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/29/89 TOTAL= 483 BATS



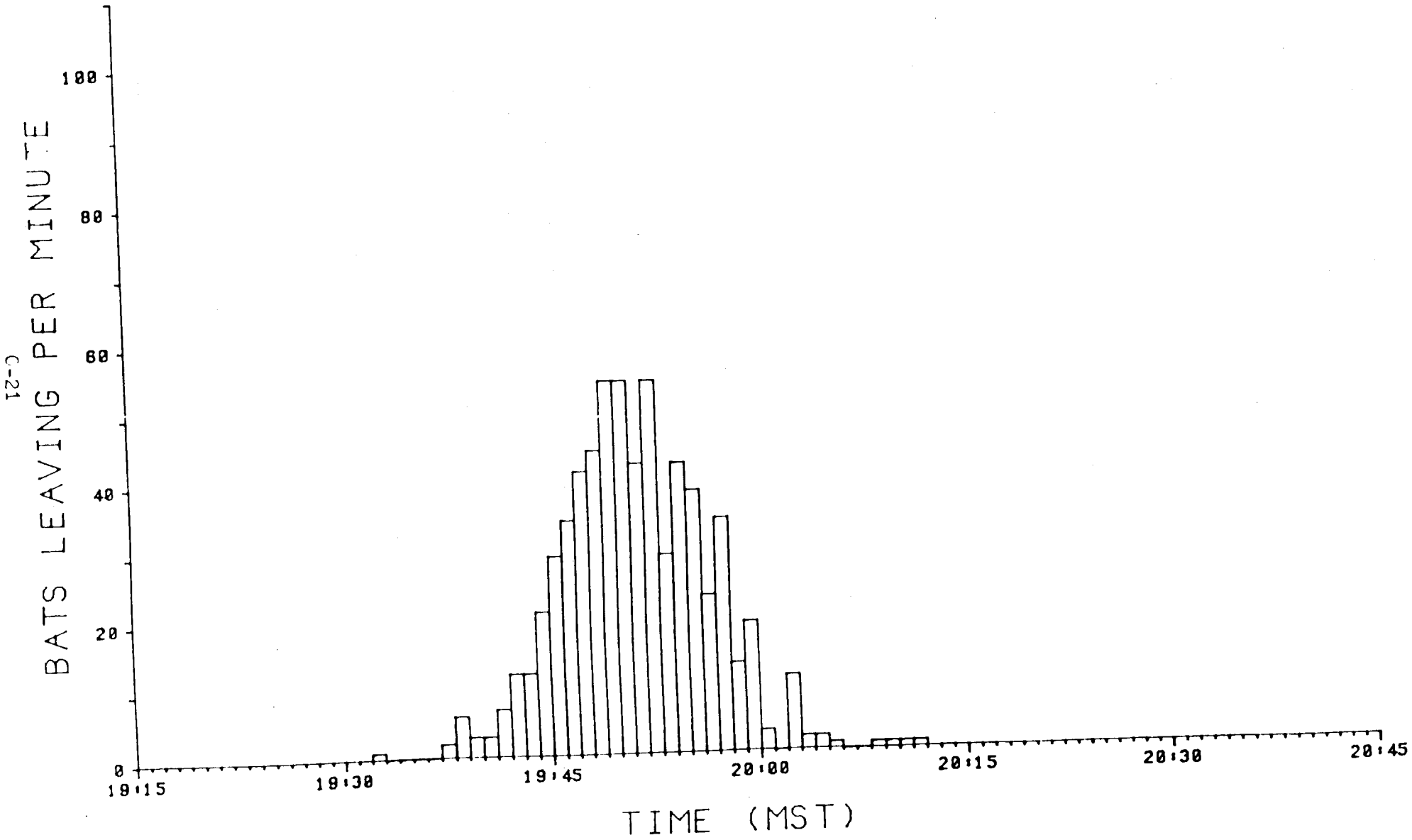
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/31/89 TOTAL= 514 BATS



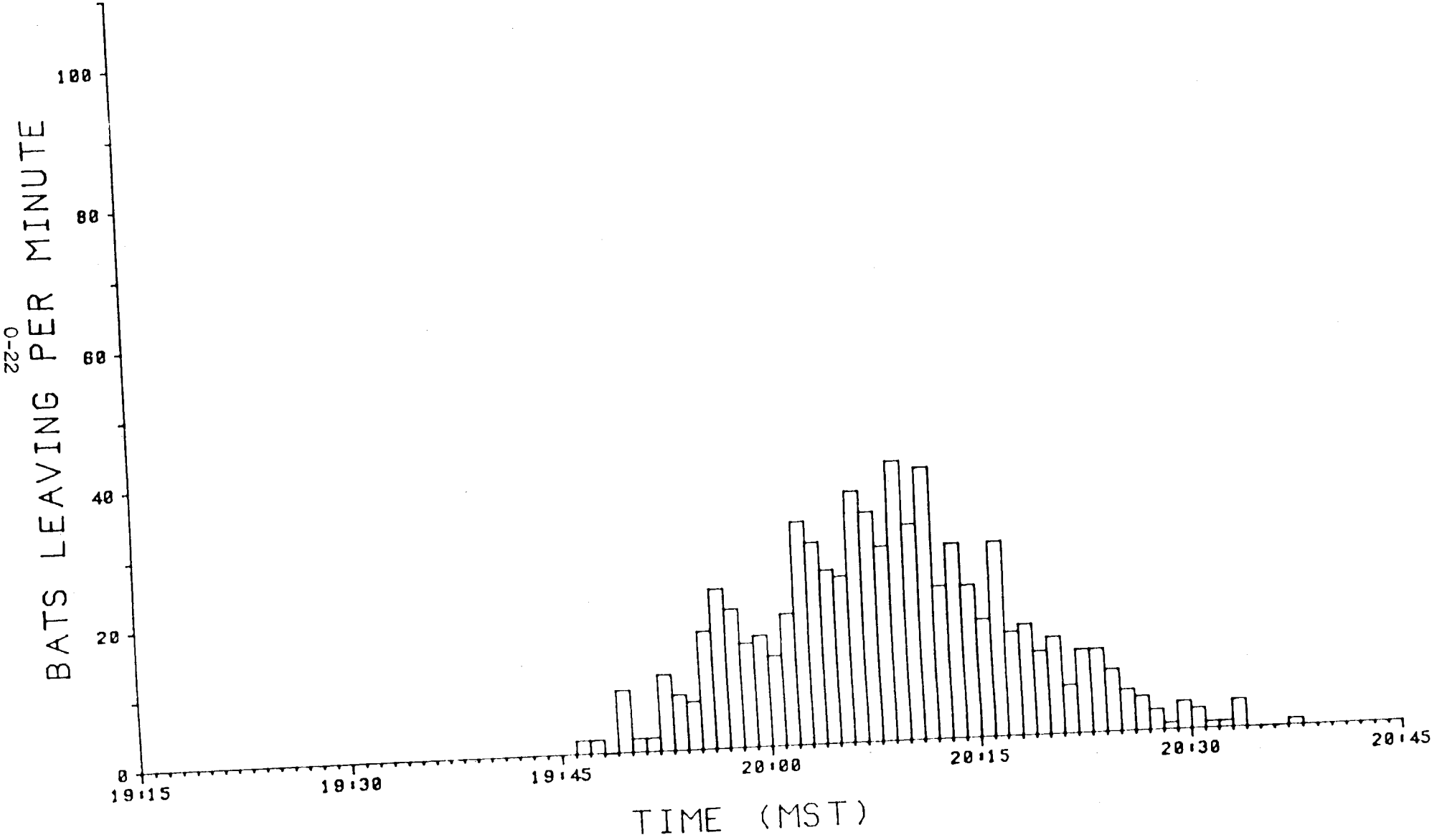
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/03/89 TOTAL= 640 BATS



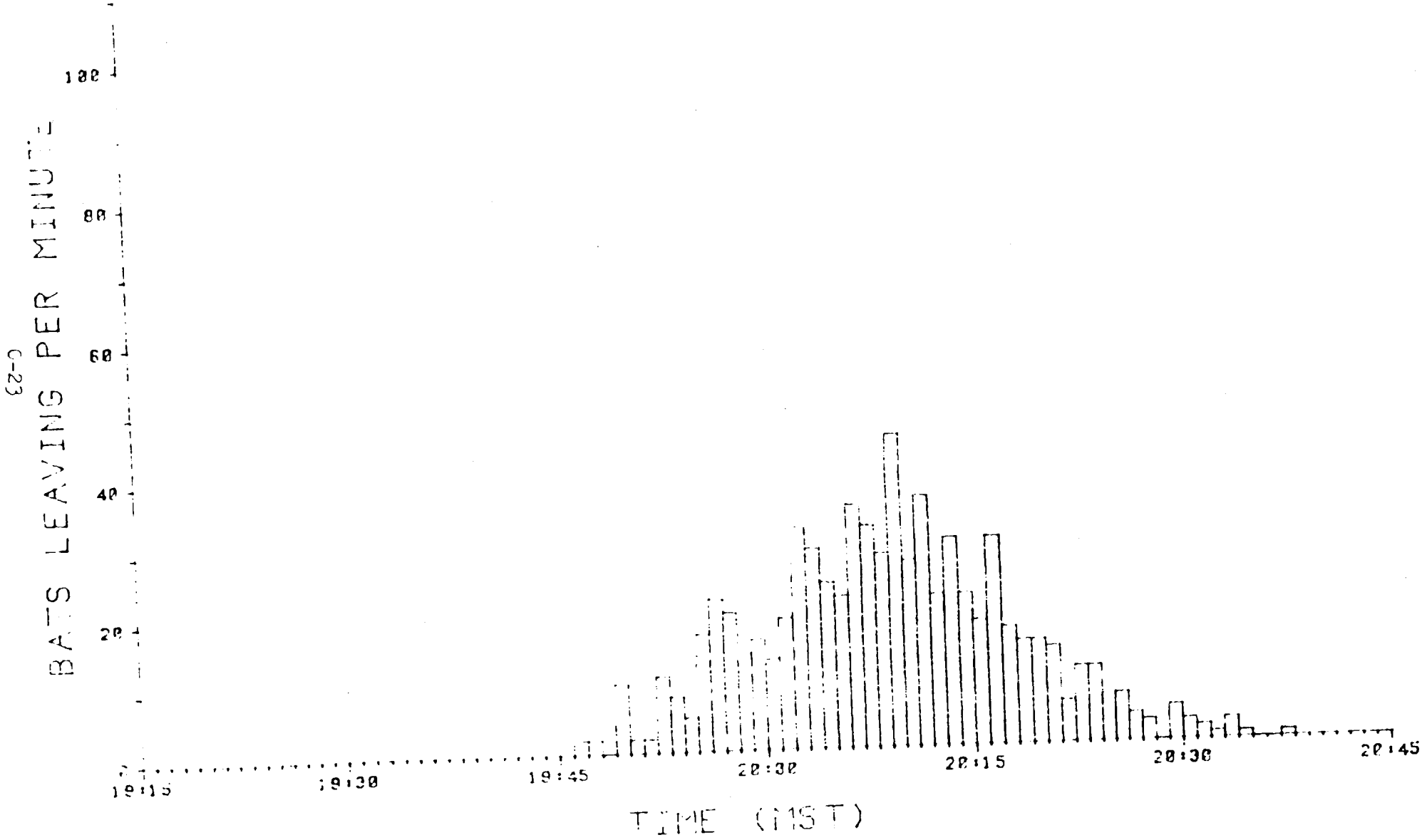
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/06/89 A TOTAL= 726 BATS



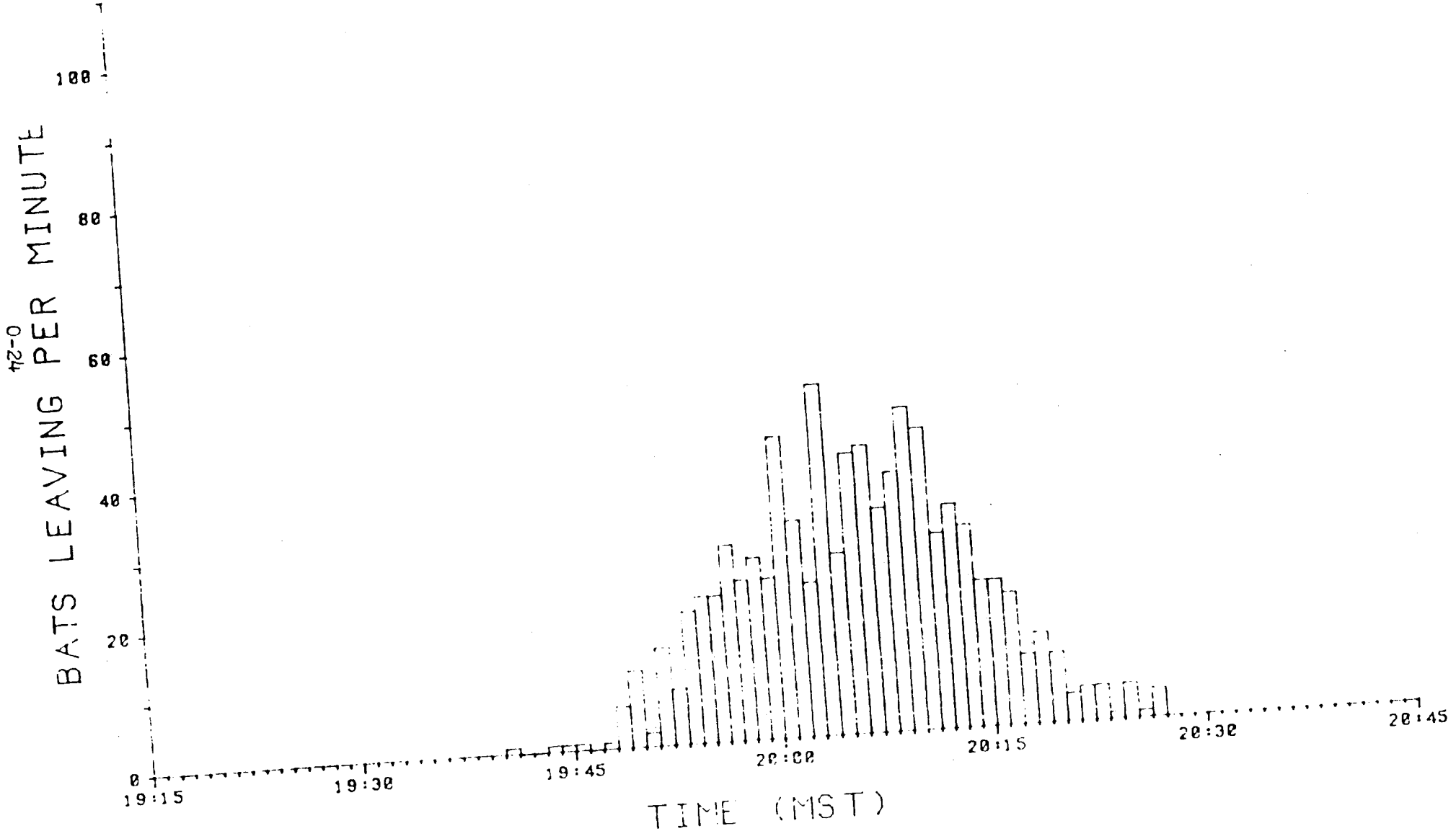
KARTCHNER CAVERNS BAT FLIGHT

DATE 06/06/89B TOTAL= 721 BATS



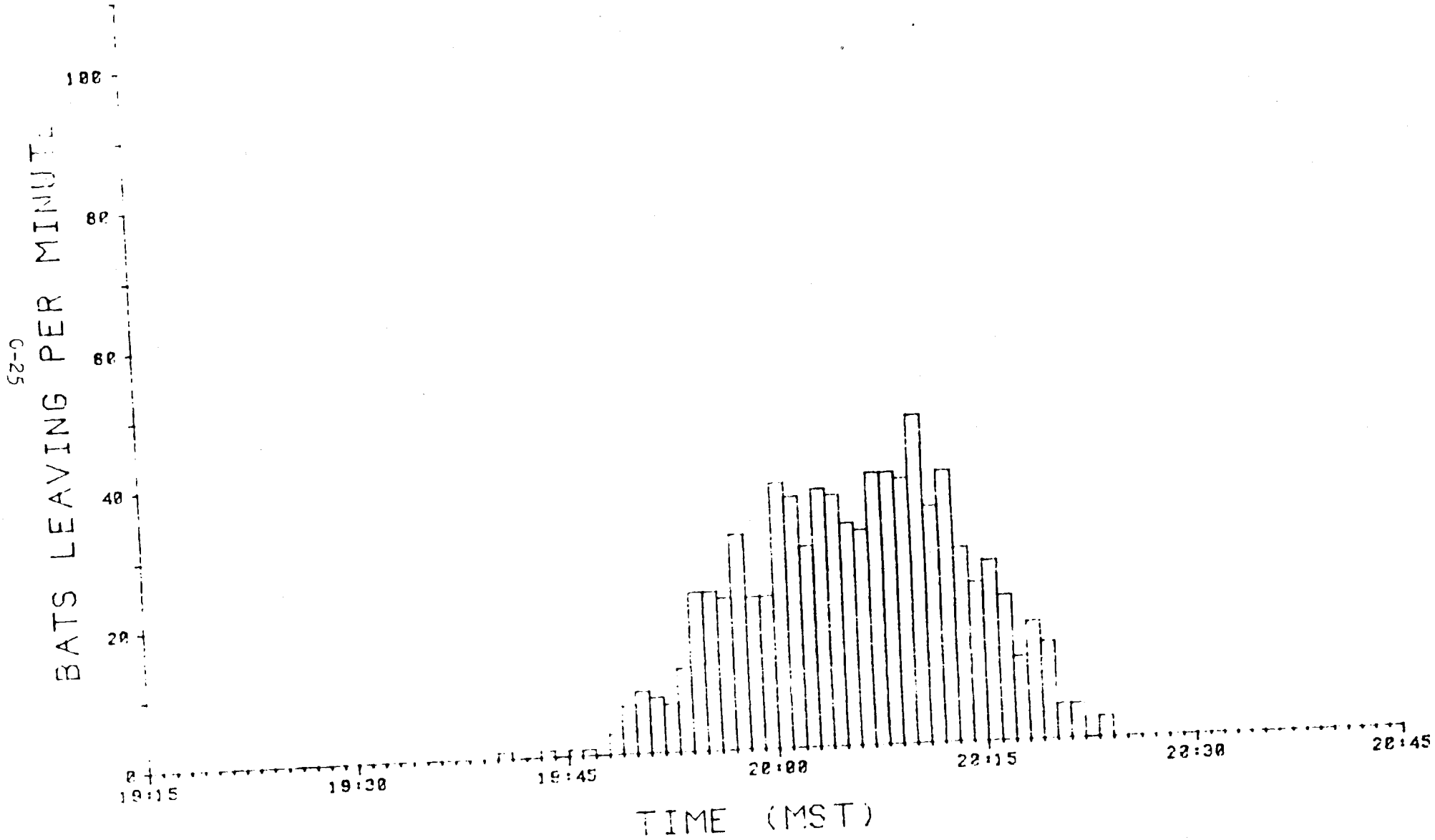
KARTCHNER CAVERNS BAT FLIGHT

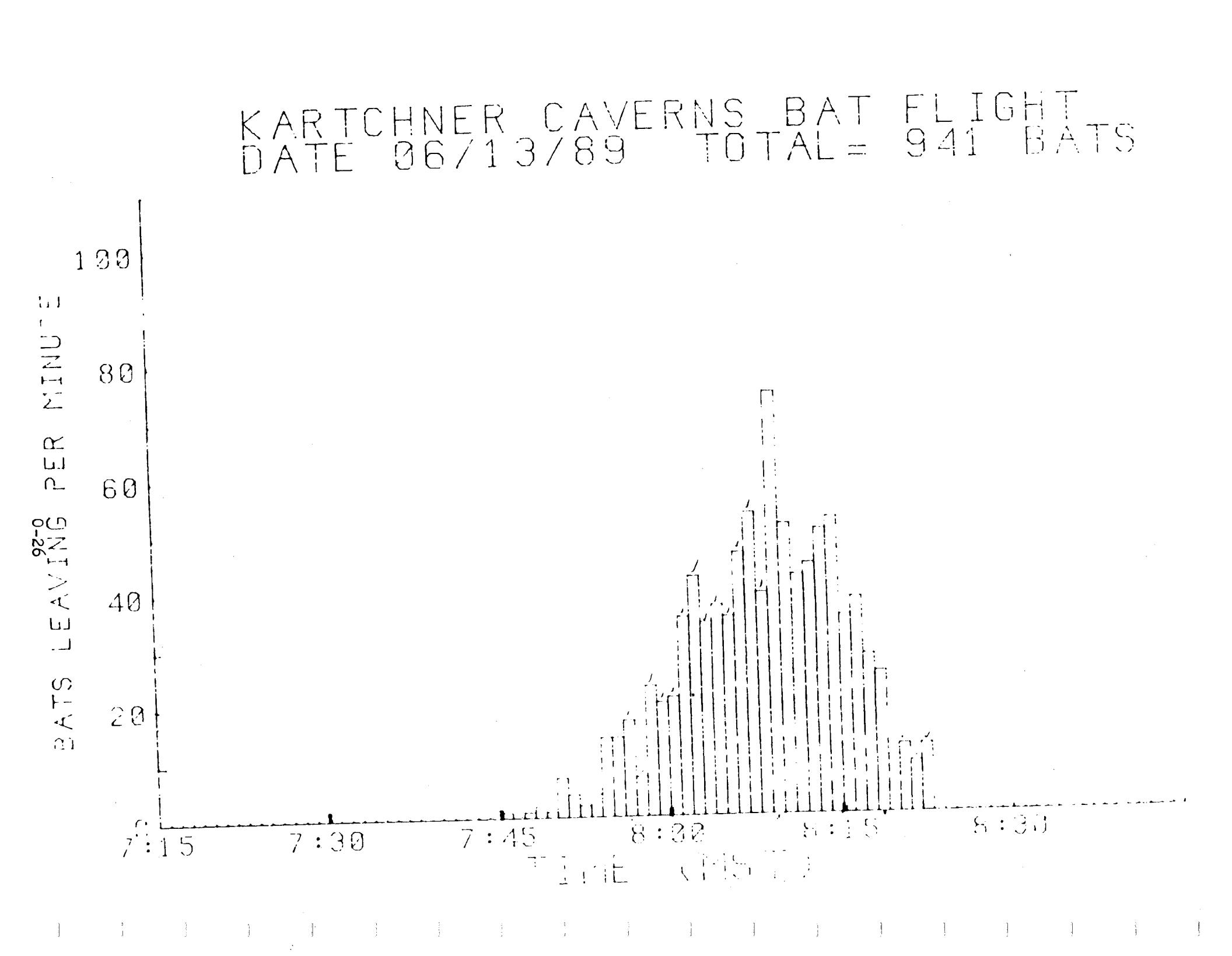
DATE 06/09/89A TOTAL= 826 BATS

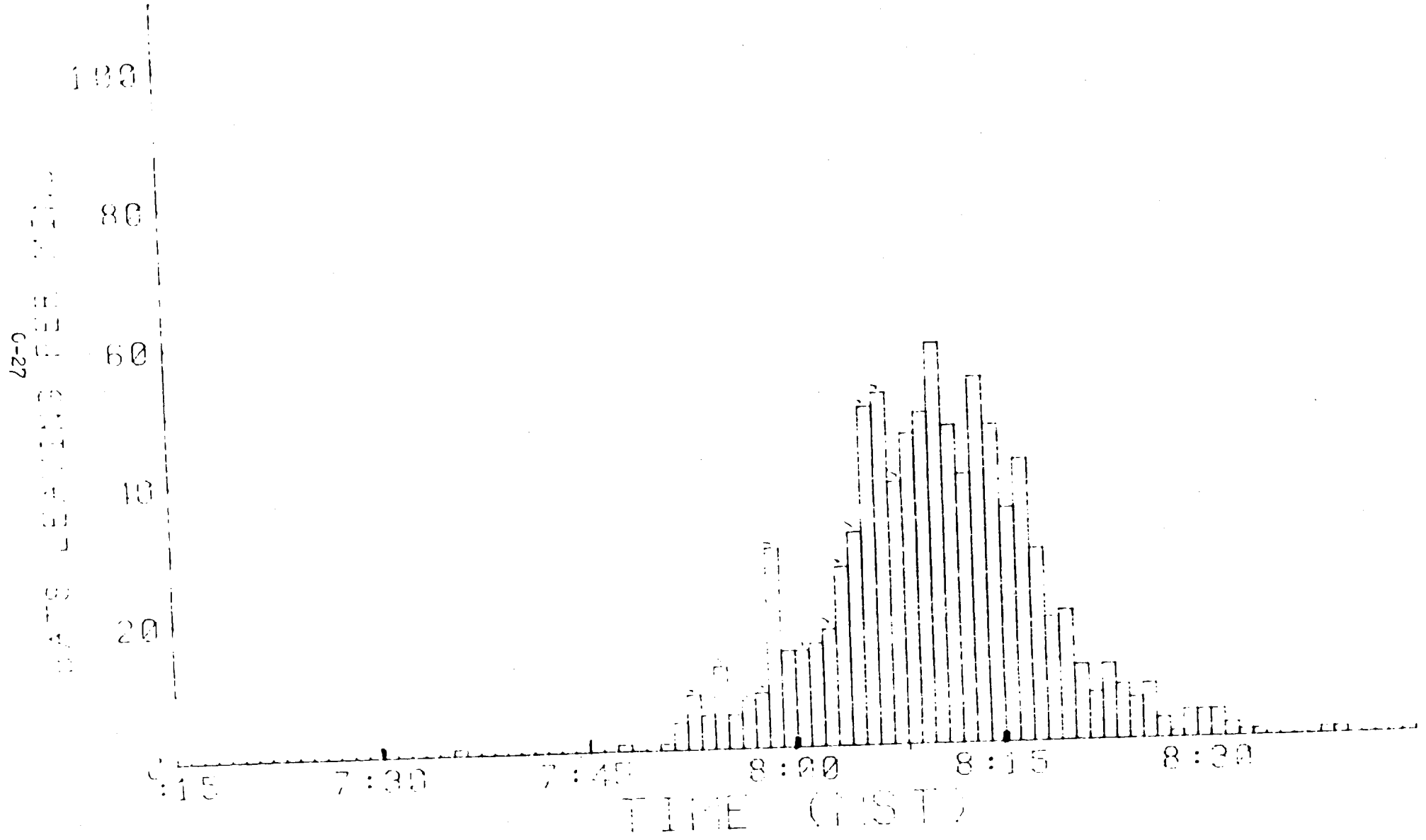


KARTCHNER CAVERNS BAT FLIGHT

DATE 06/09/89B TOTAL= 822 BATS

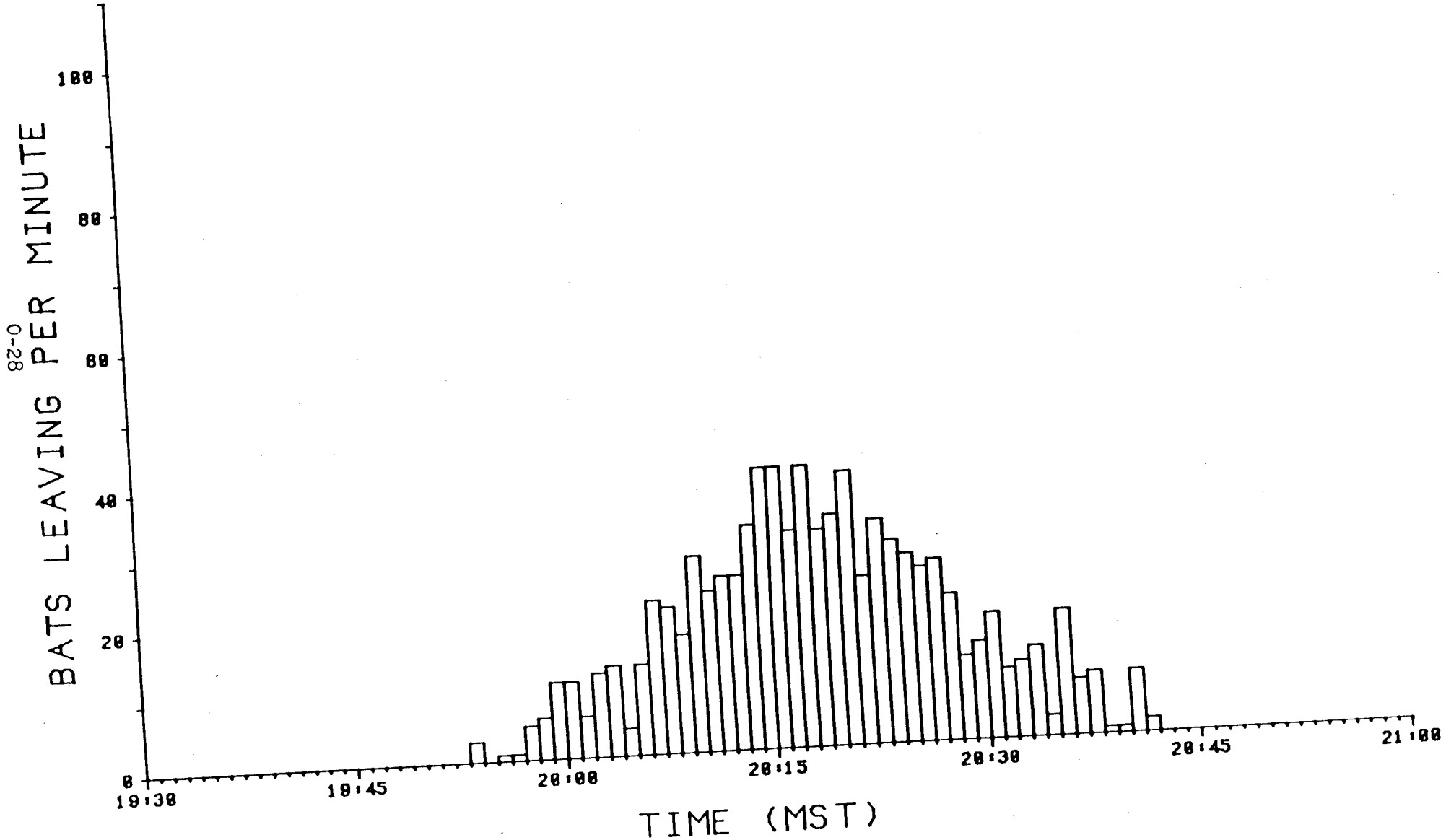



KARTCHNER CAVERNS BAT FLIGHT
DATE 06/13/89 TOTAL= 941 BATS
BATS LEAVING PER MINUTE
100
80
60
40
20
0
7:15
7:30
7:45
8:00
8:15
8:30
Time (MST)


KARTCHNER CAVERNS BAT FLIGHT
DATE 06/14/89 TOTAL= 884 BATS
100
80
60
40
20
7:15
7:30
7:45
8:00
8:15
8:30
TIME (MST)

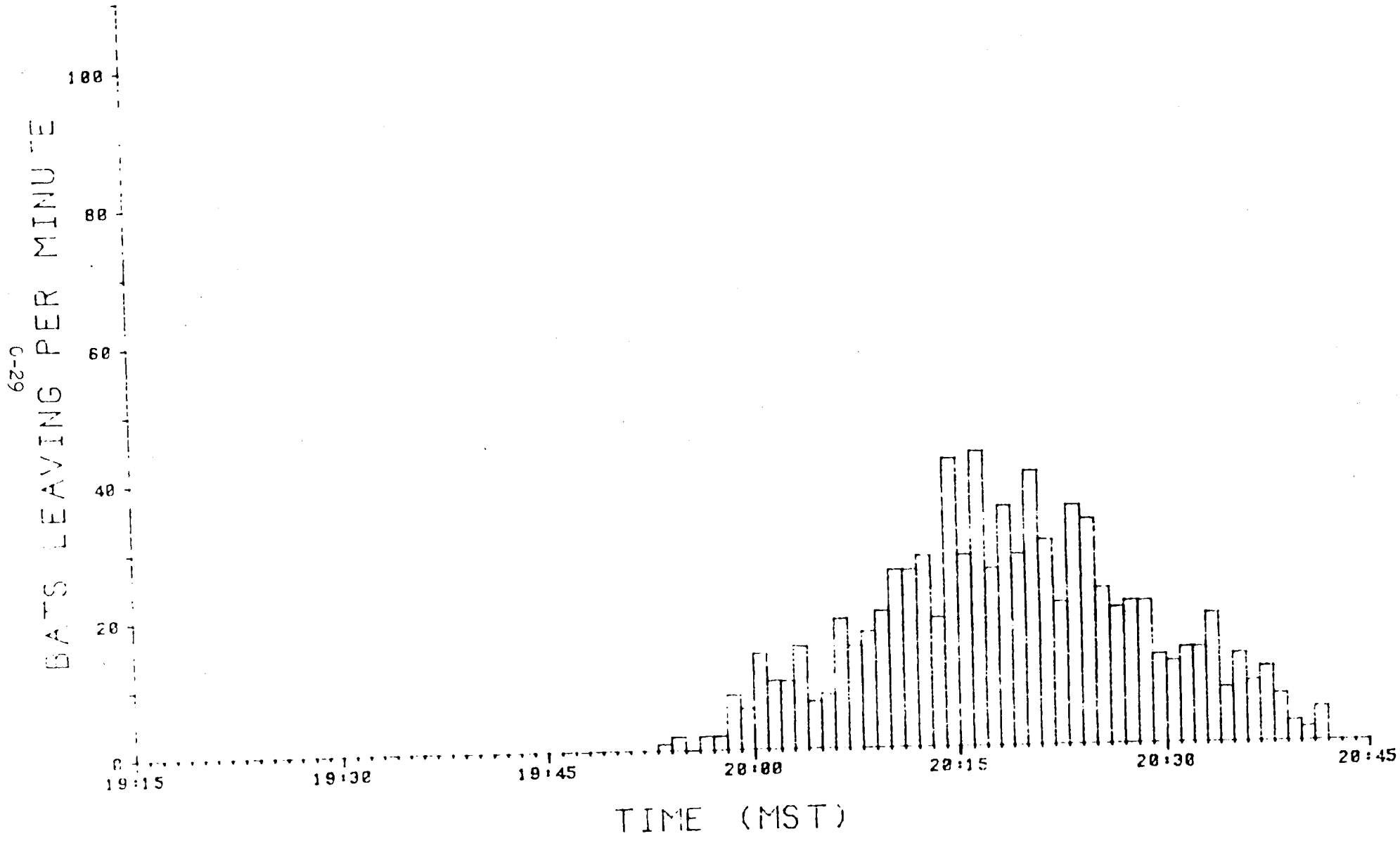
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/20/89 - A TOTAL= 846 BATS



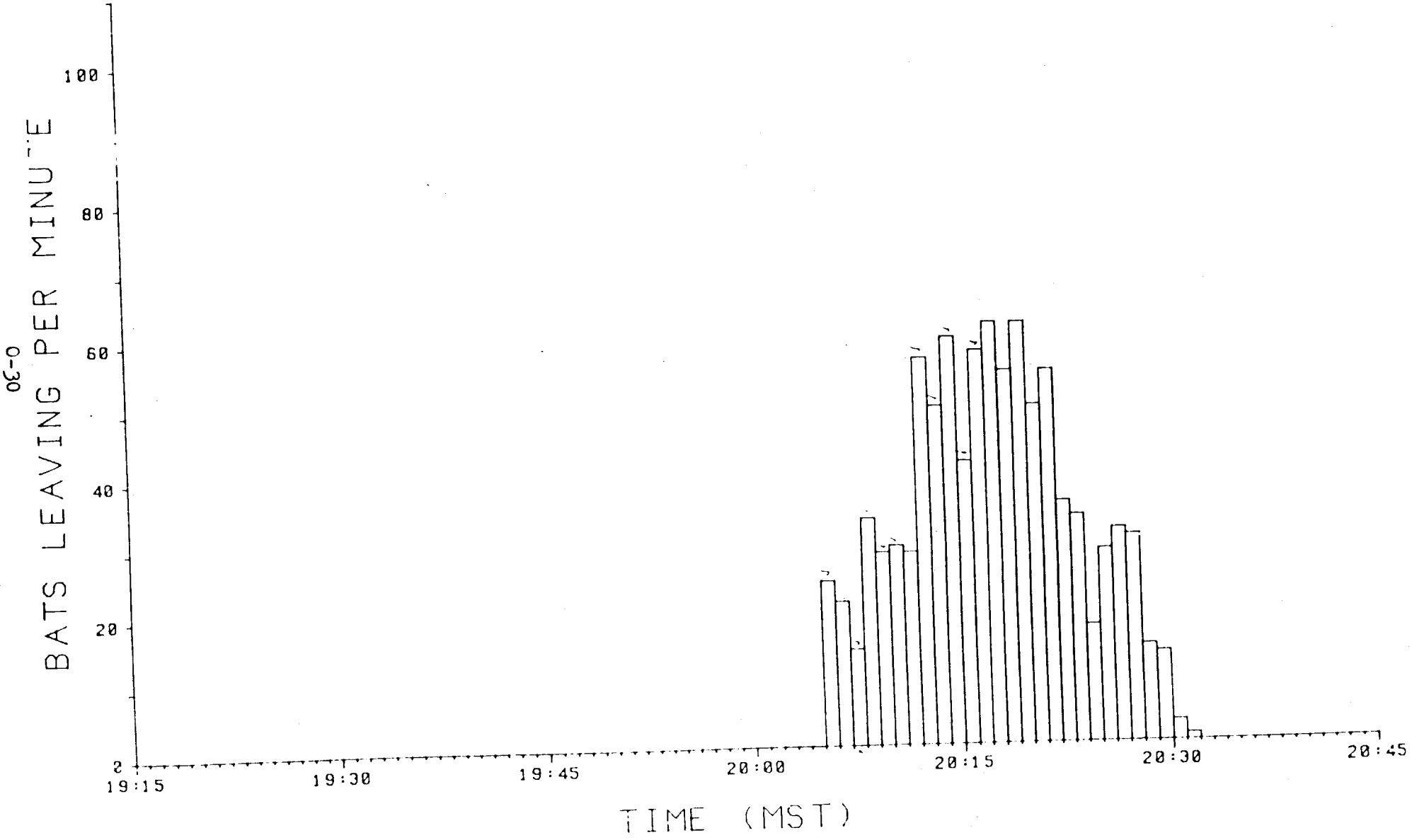
KARTCHNER CAVERNS BAT FLIGHT

DATE 06/20/89B TOTAL= 831 BATS



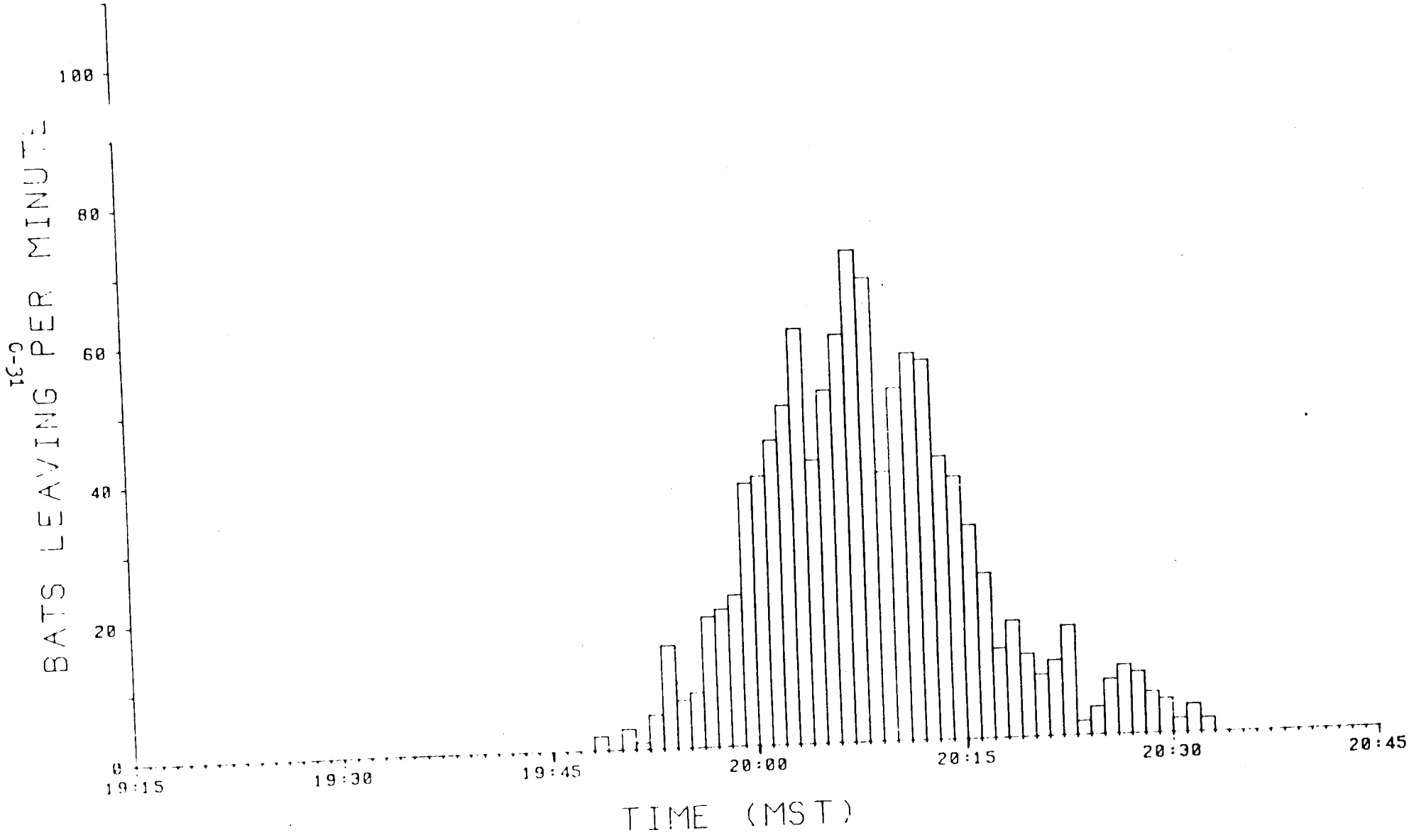
KARTCHNER CAVERNS BAT FLIGHT

DATE 06/22/89 TOTAL= 923 BATS



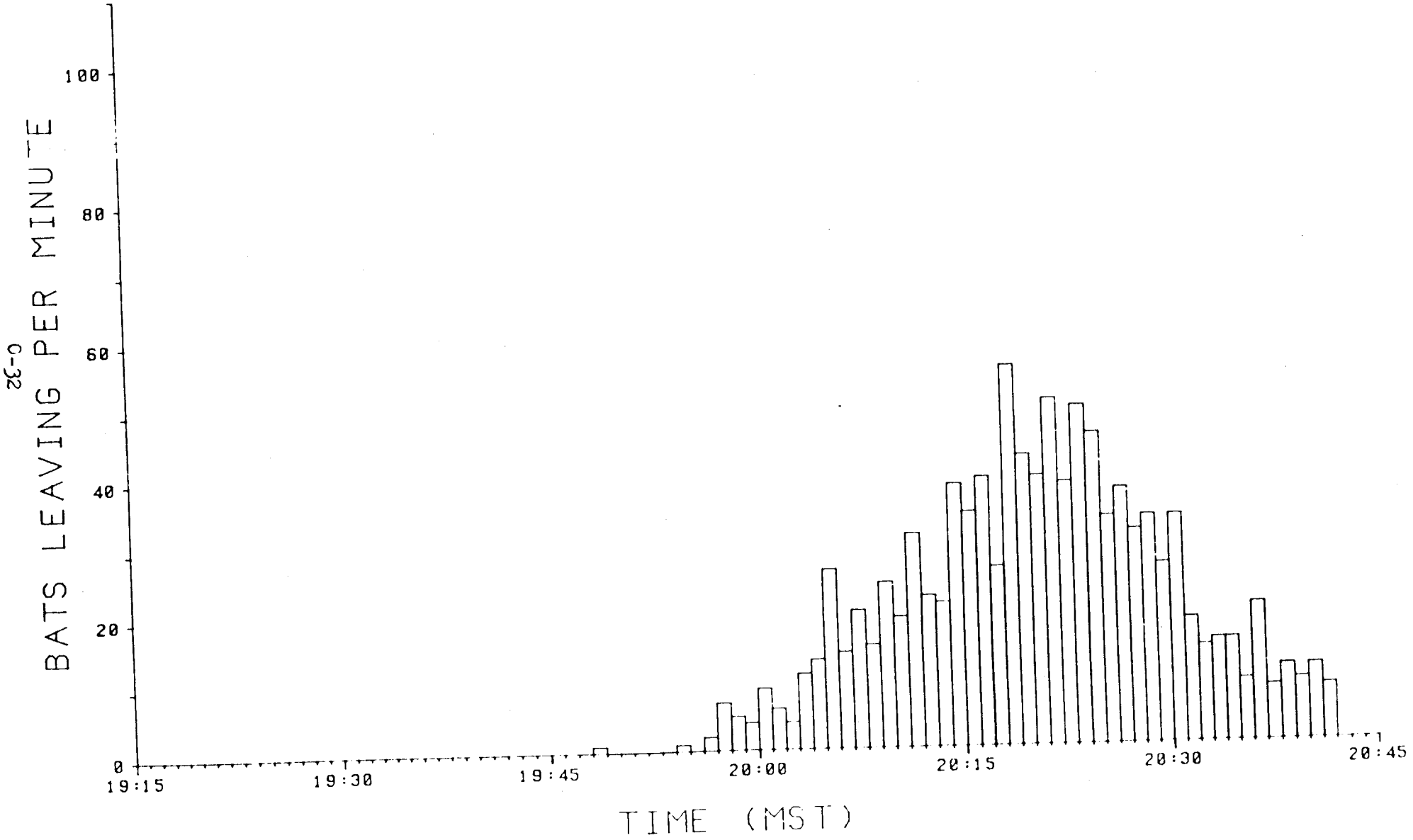
KARTCHNER CAVERNS BAT FLIGHT

DATE 06/29/89 TOTAL= 1086 BATS



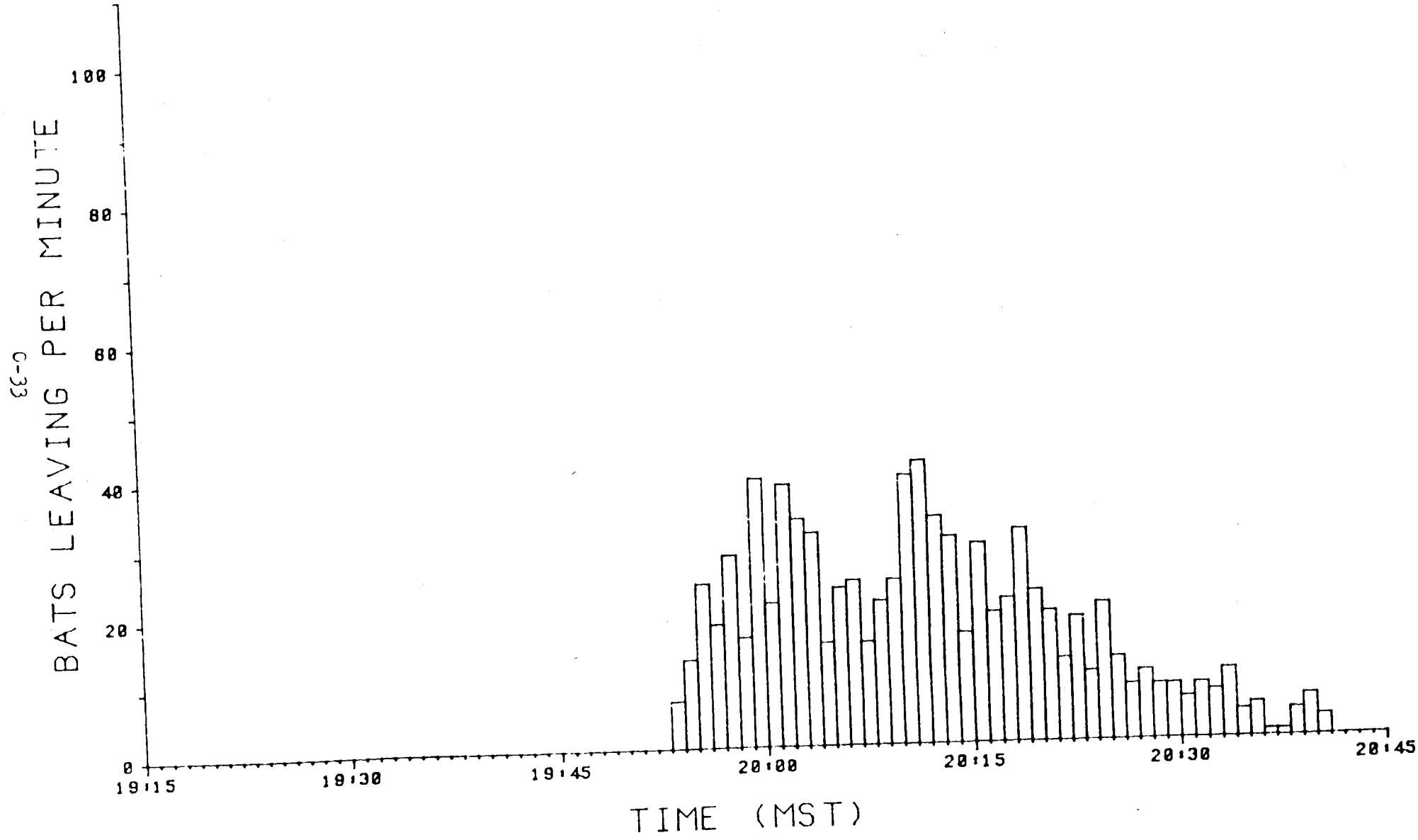
KARTCHNER CAVERNS BAT FLIGHT

DATE 07/02/89 TOTAL= 1041 BATS



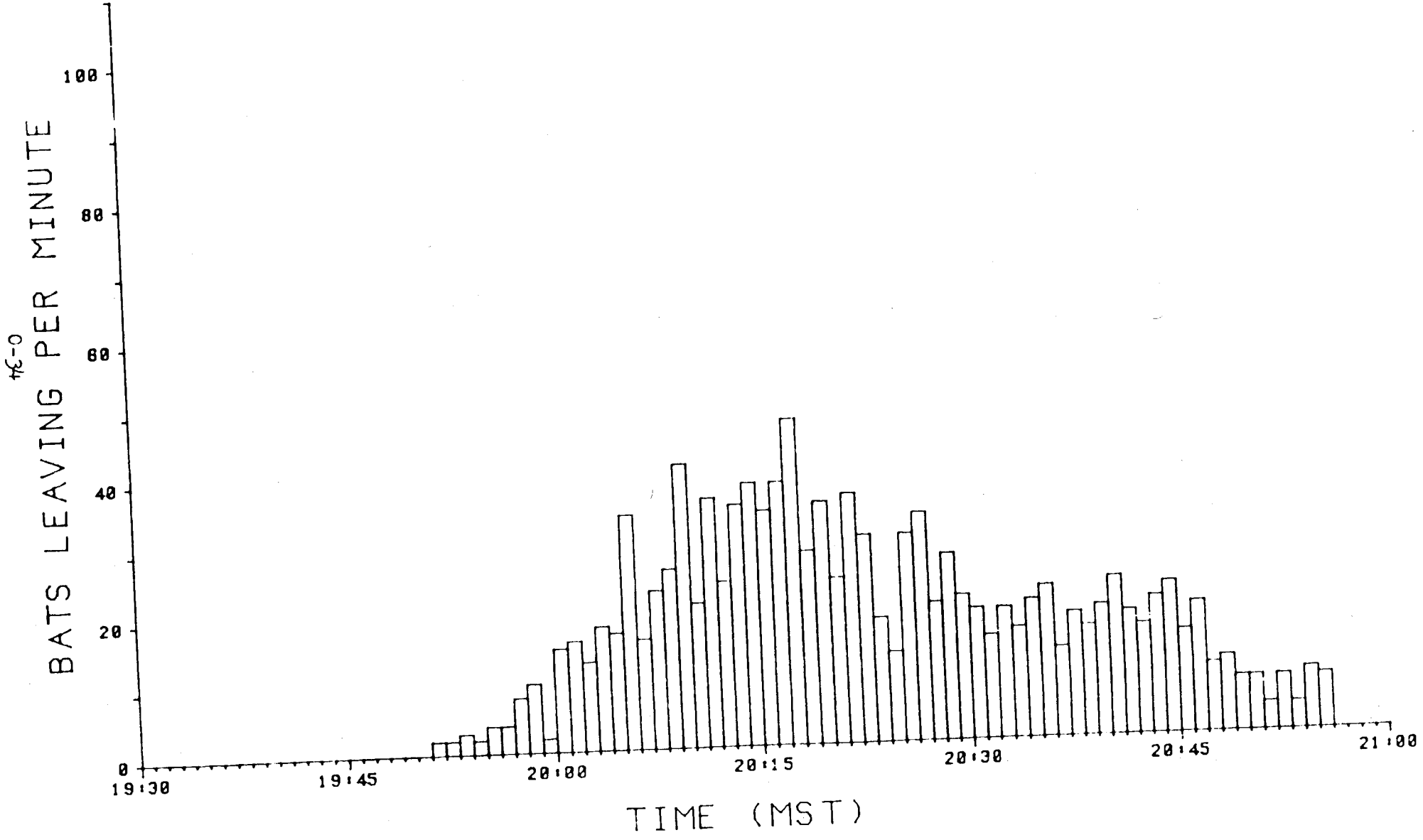
KARTCHNER CAVERNS BAT FLIGHT

DATE 07/09/89 TOTAL= 851 BATS



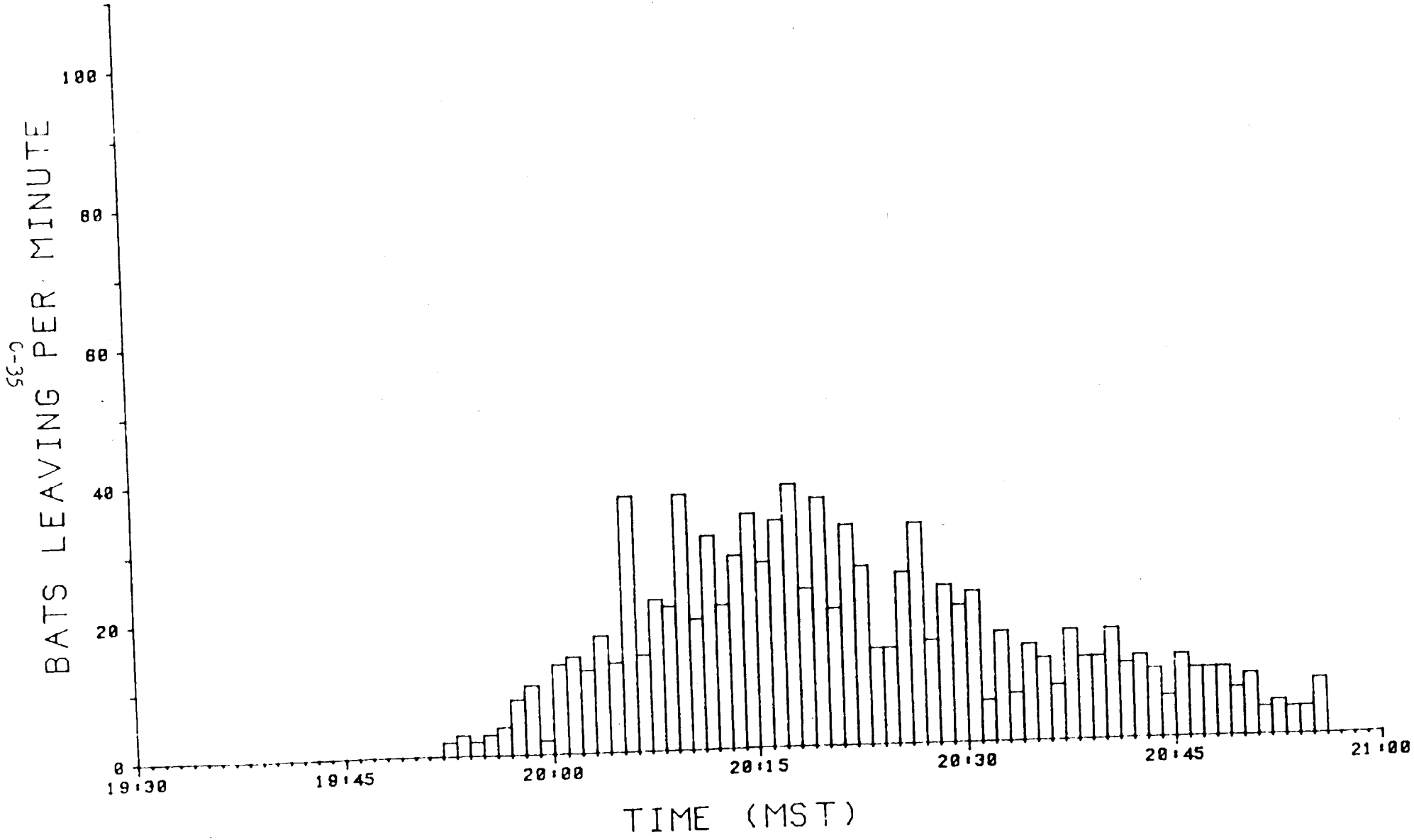
KARTCHNER CAVERNS BAT FLIGHT

DATE 07/15/89A TOTAL= 1224 BATS



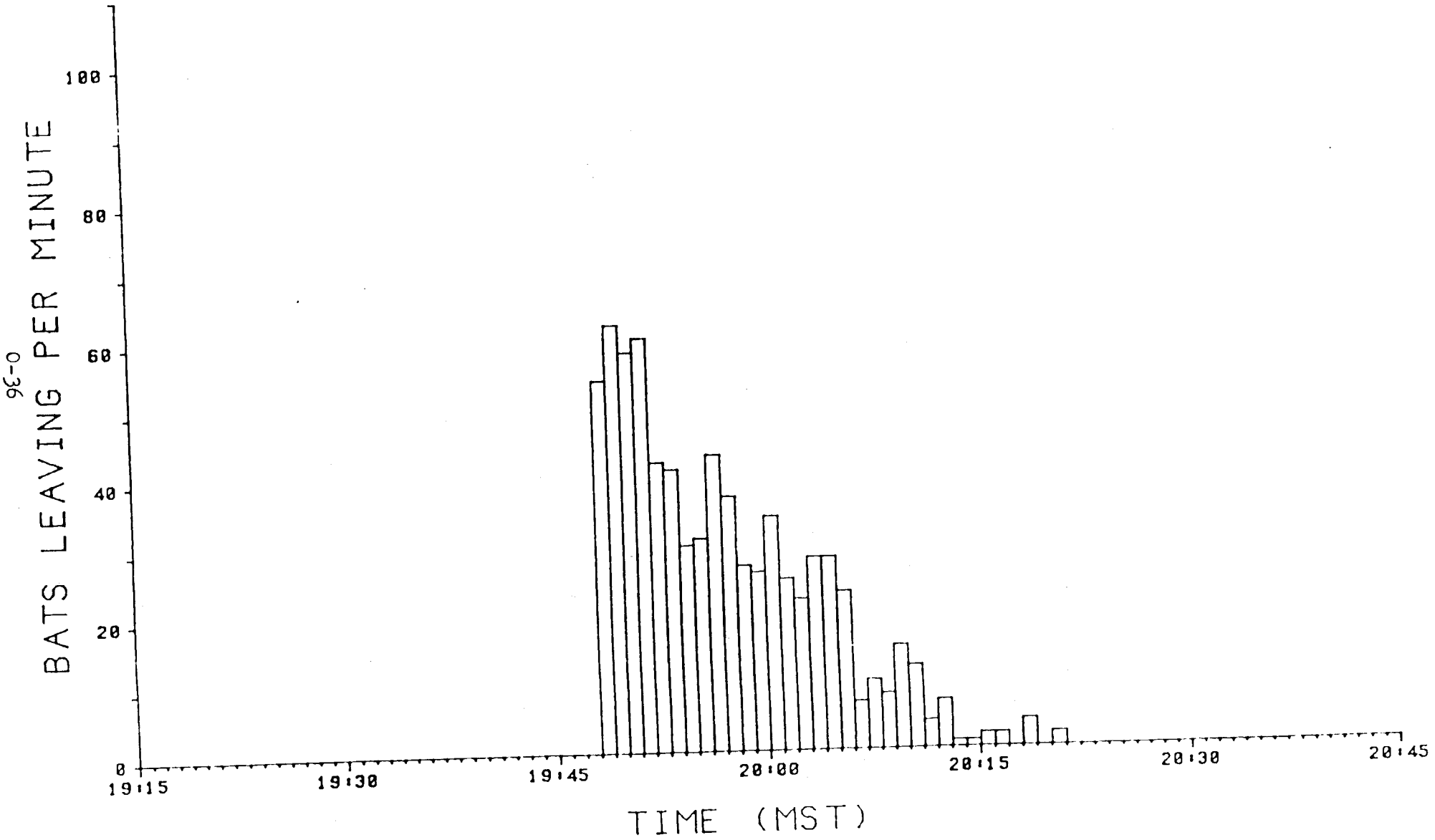
KARTCHNER CAVERNS BAT FLIGHT

DATE 07/15/89B TOTAL= 1008 BATS



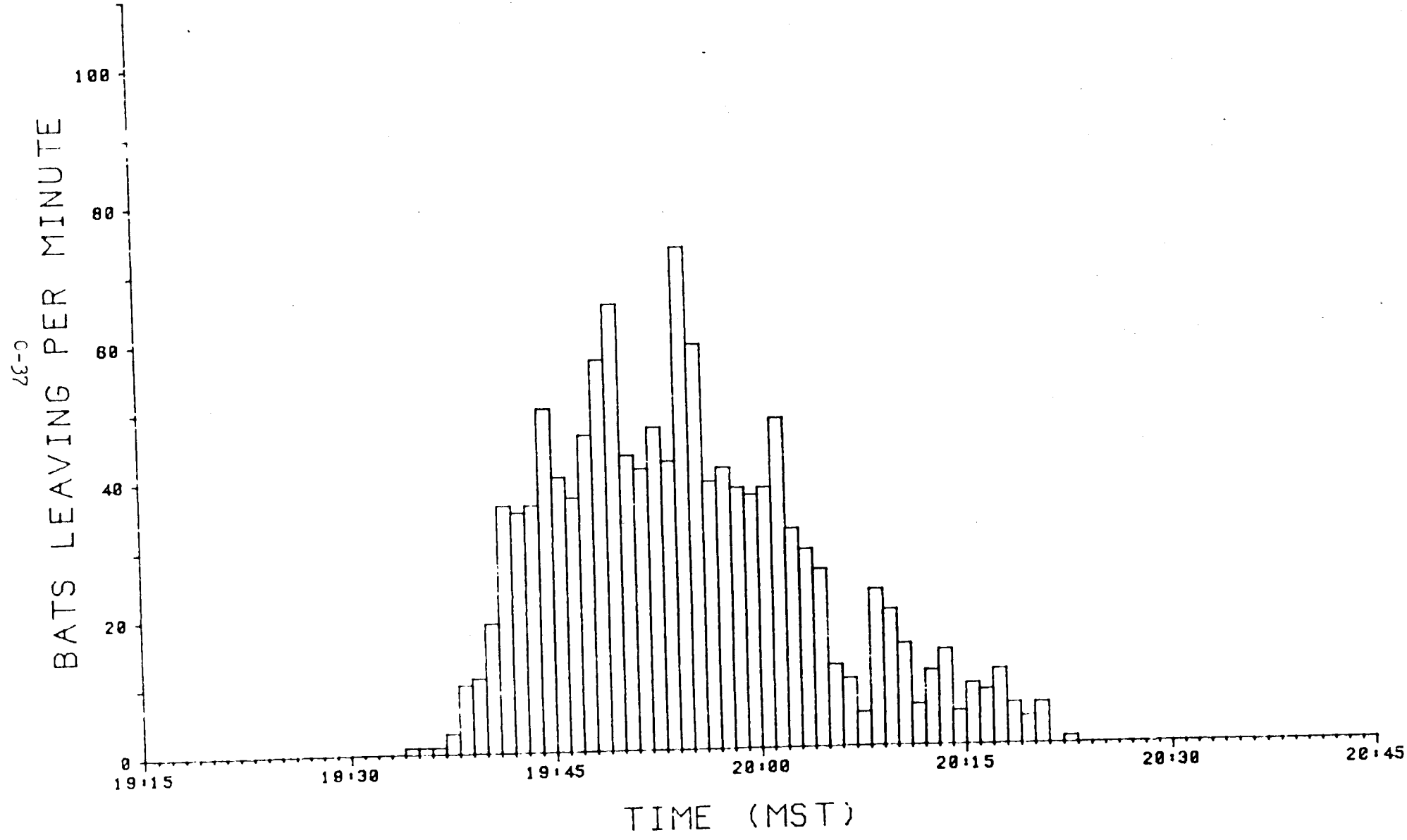
KARTCHNER CAVERNS BAT FLIGHT

DATE 07/20/89 TOTAL= 746 BATS



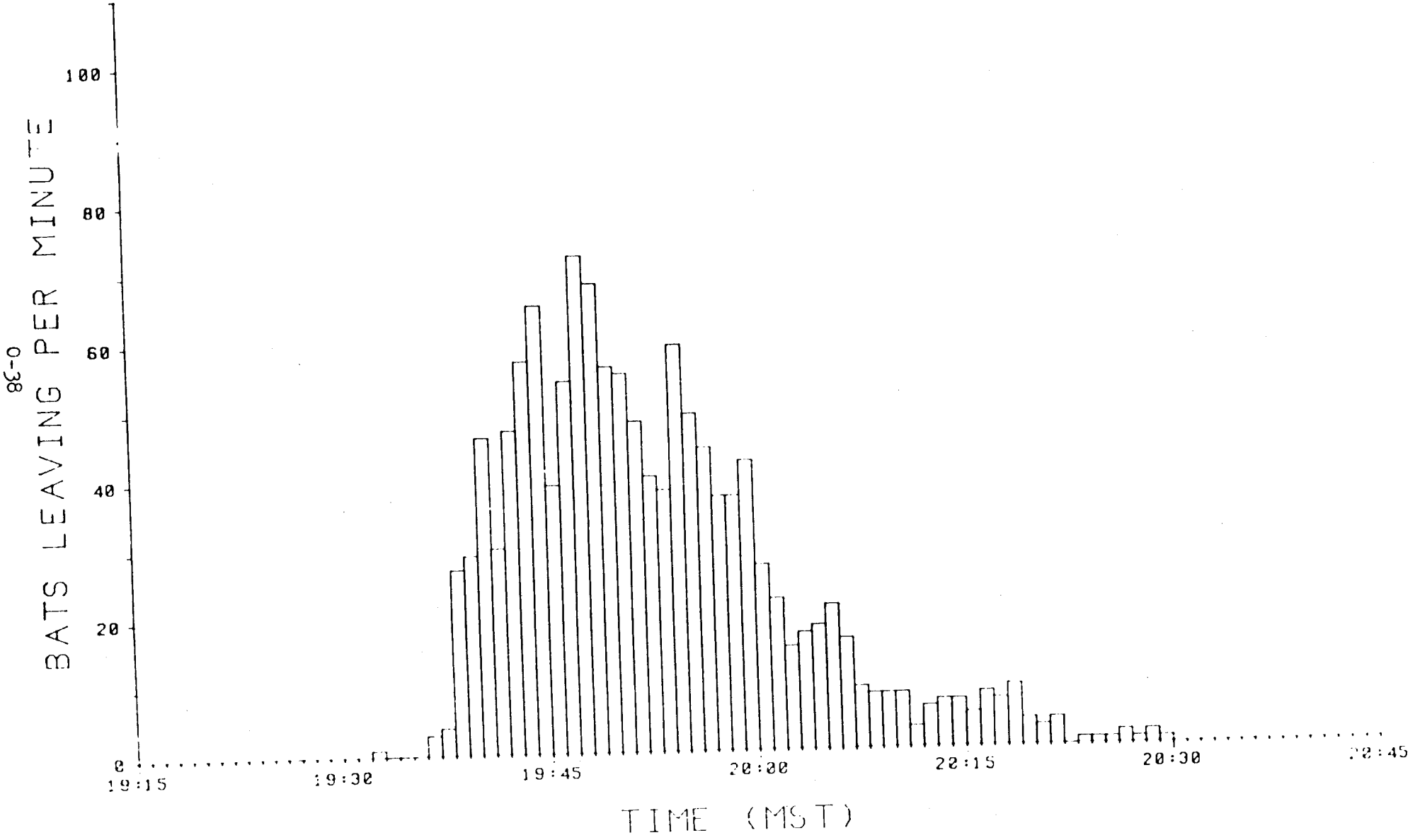
KARTCHNER CAVERNS BAT FLIGHT

DATE 07/22/89 TOTAL= 1247 BATS



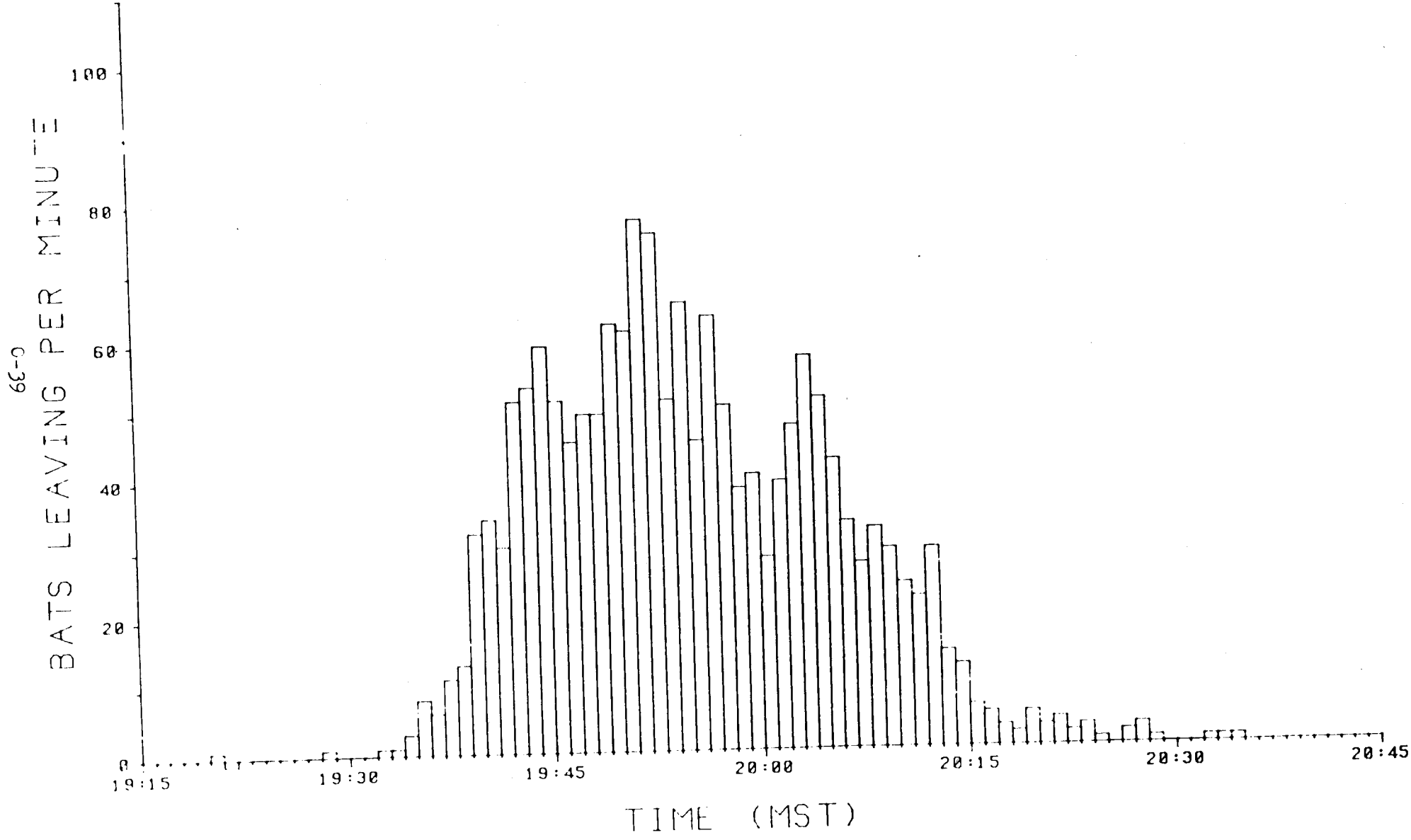
KARTCHNER CAVERNS BAT FLIGHT

DATE 07/24/89 TOTAL= 1288 BATS



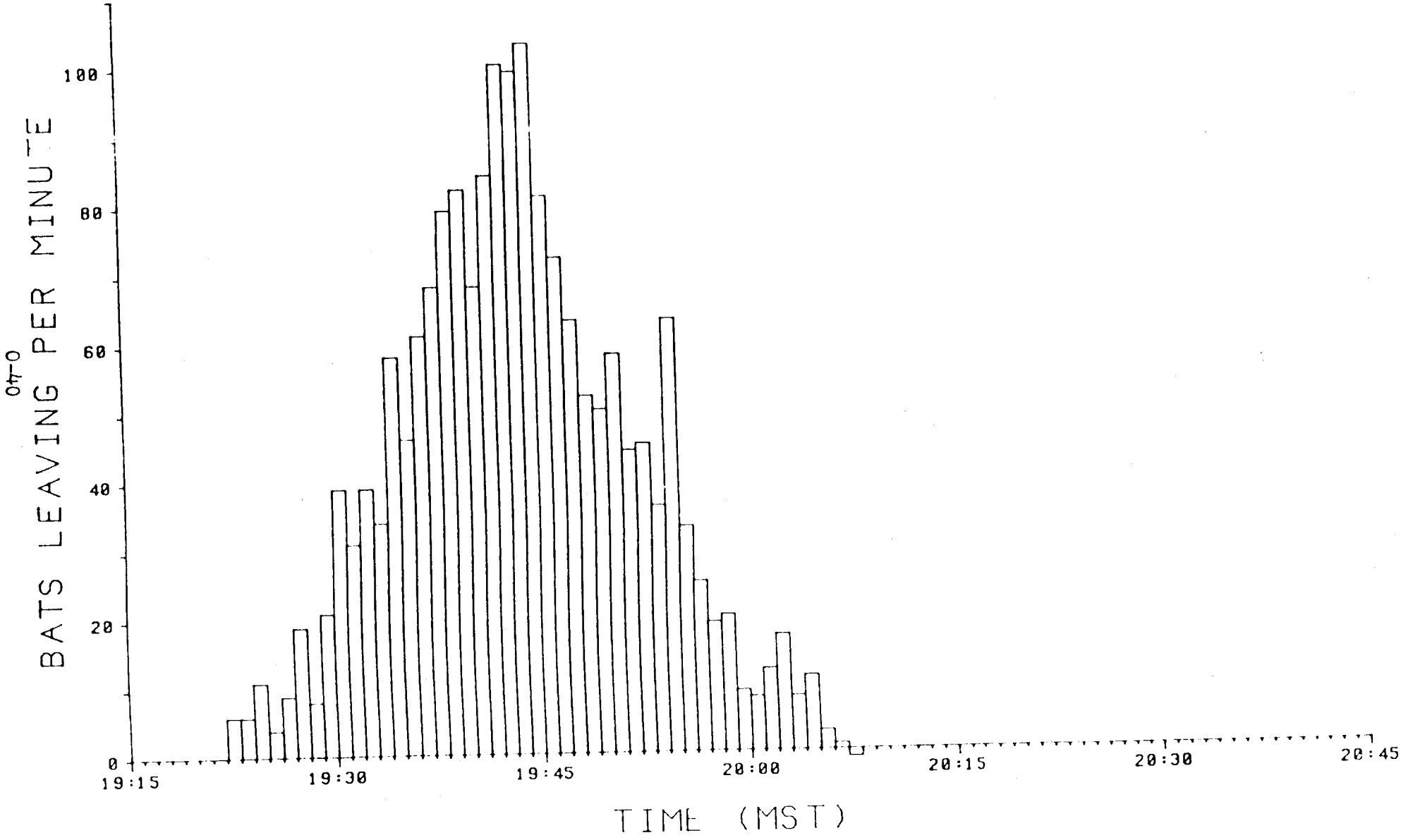
KARTCHNER CAVERNS BAT FLIGHT

DATE 07/31/89 TOTAL= 1653 BATS



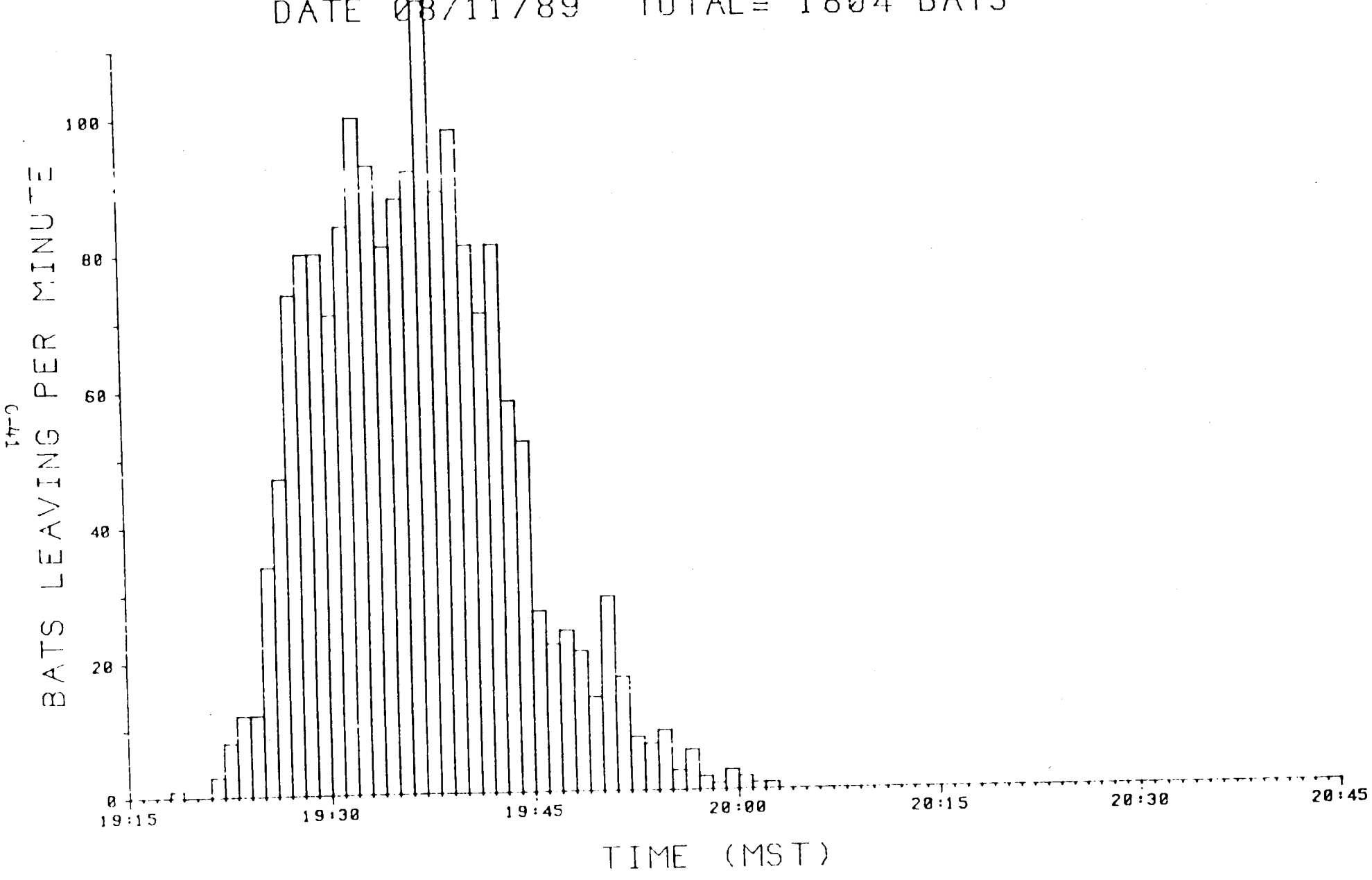
KARTCHNER CAVERNS BAT FLIGHT

DATE 08/07/89 TOTAL= 1804 BATS



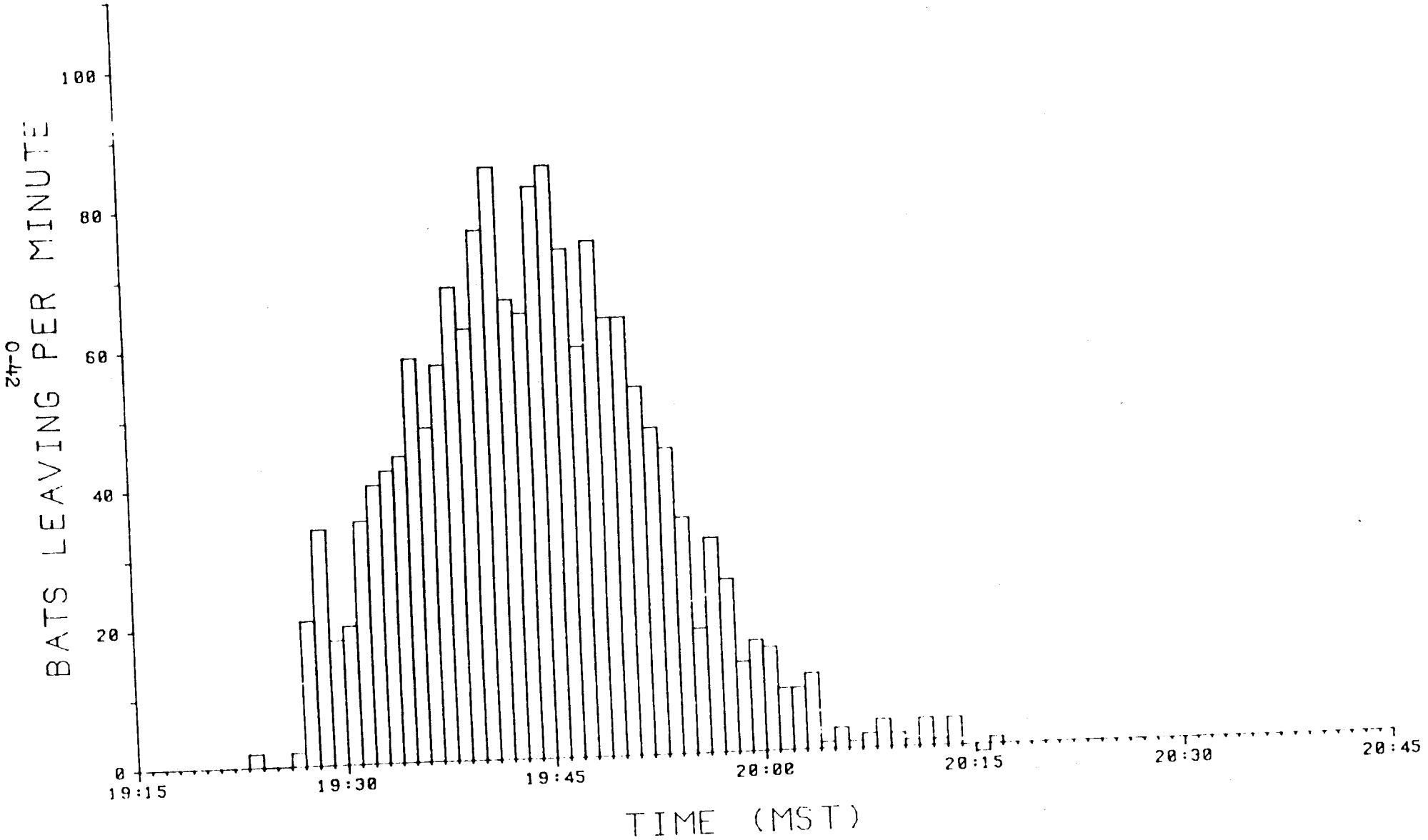
KARTCHNER CAVERNS BAT FLIGHT

DATE 08/11/89 TOTAL= 1804 BATS



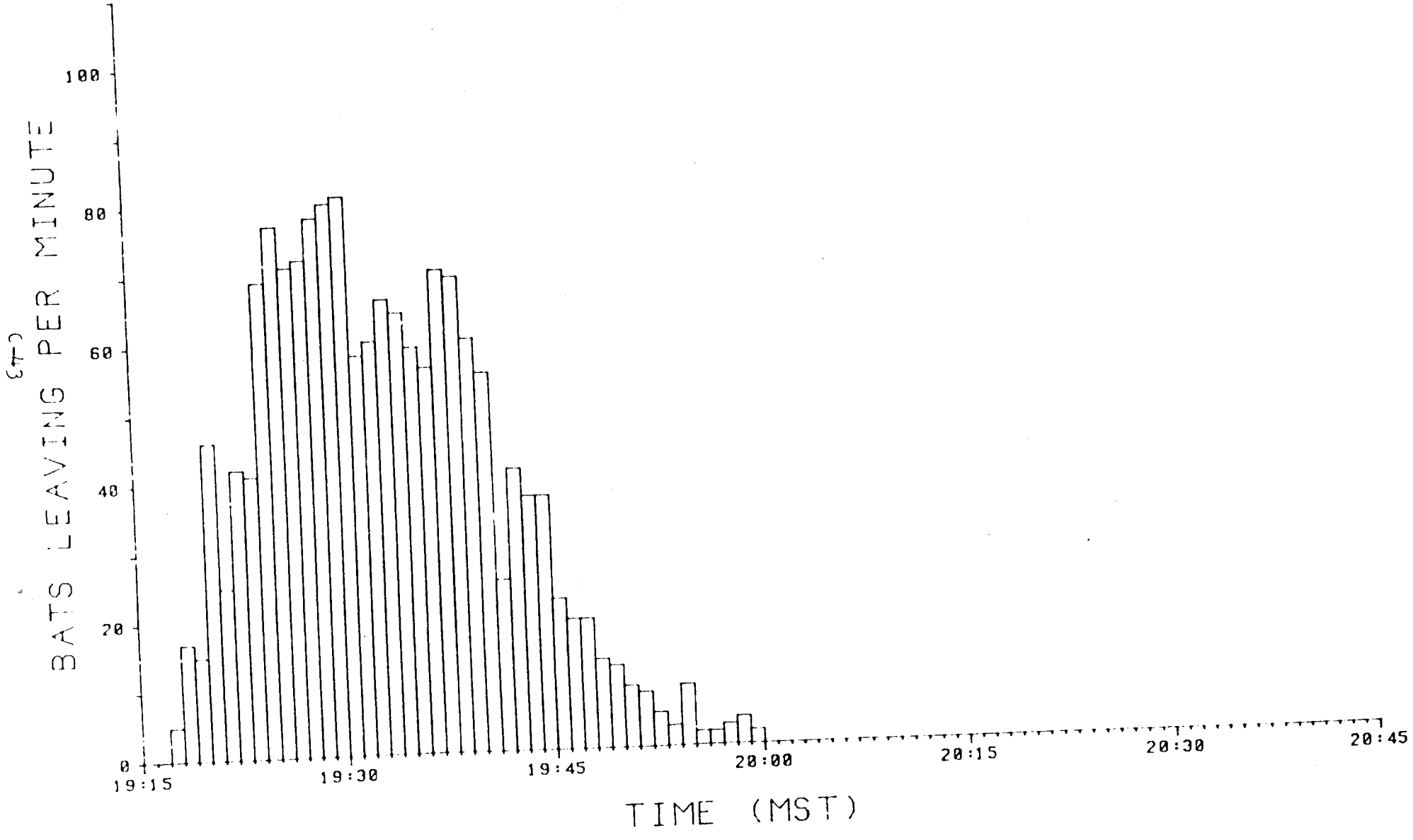
KARTCHNER CAVERNS BAT FLIGHT

DATE 08/13/89 TOTAL= 1689 BATS



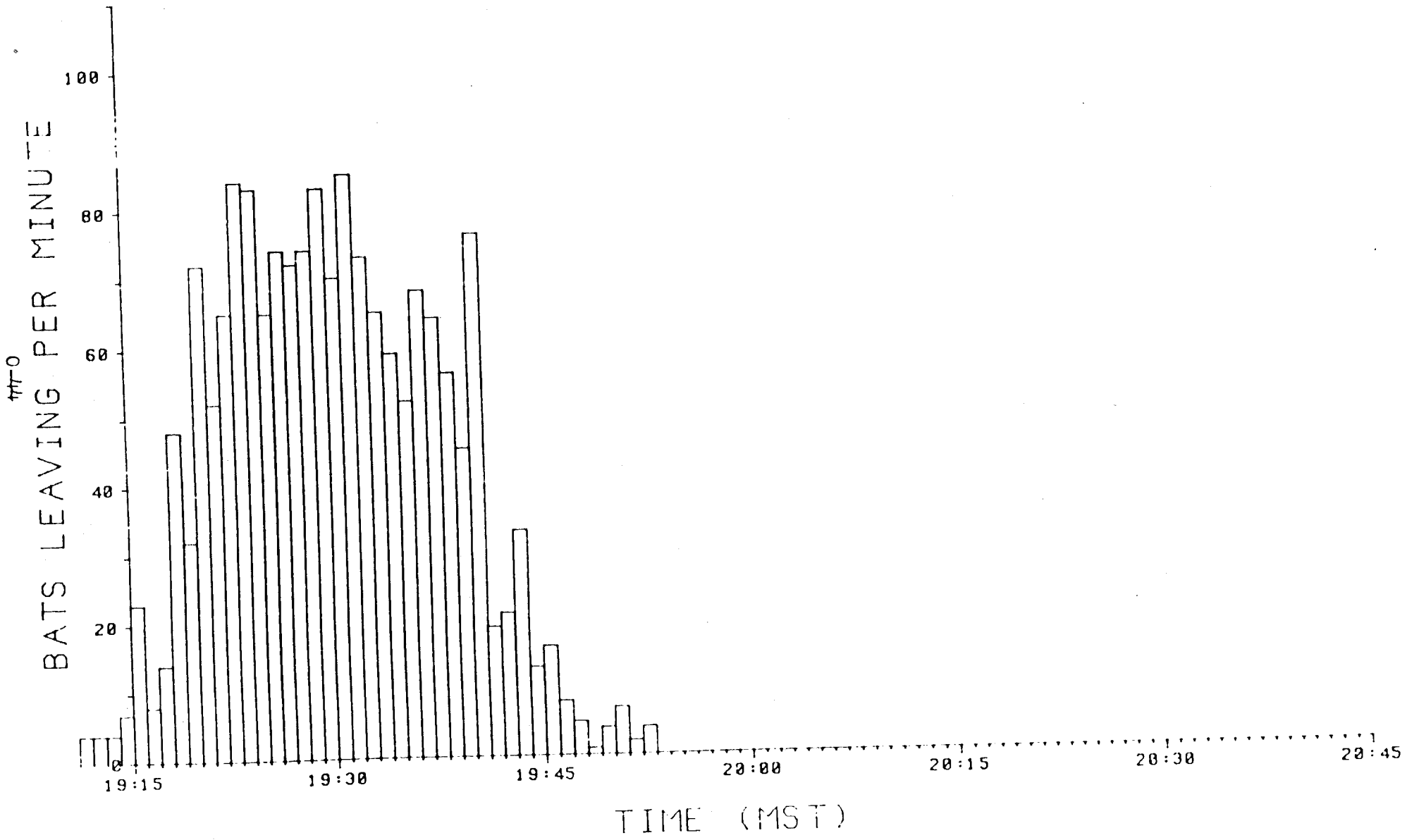
KARTCHNER CAVERNS BAT FLIGHT

DATE 08/14/89 TOTAL= 1608 BATS



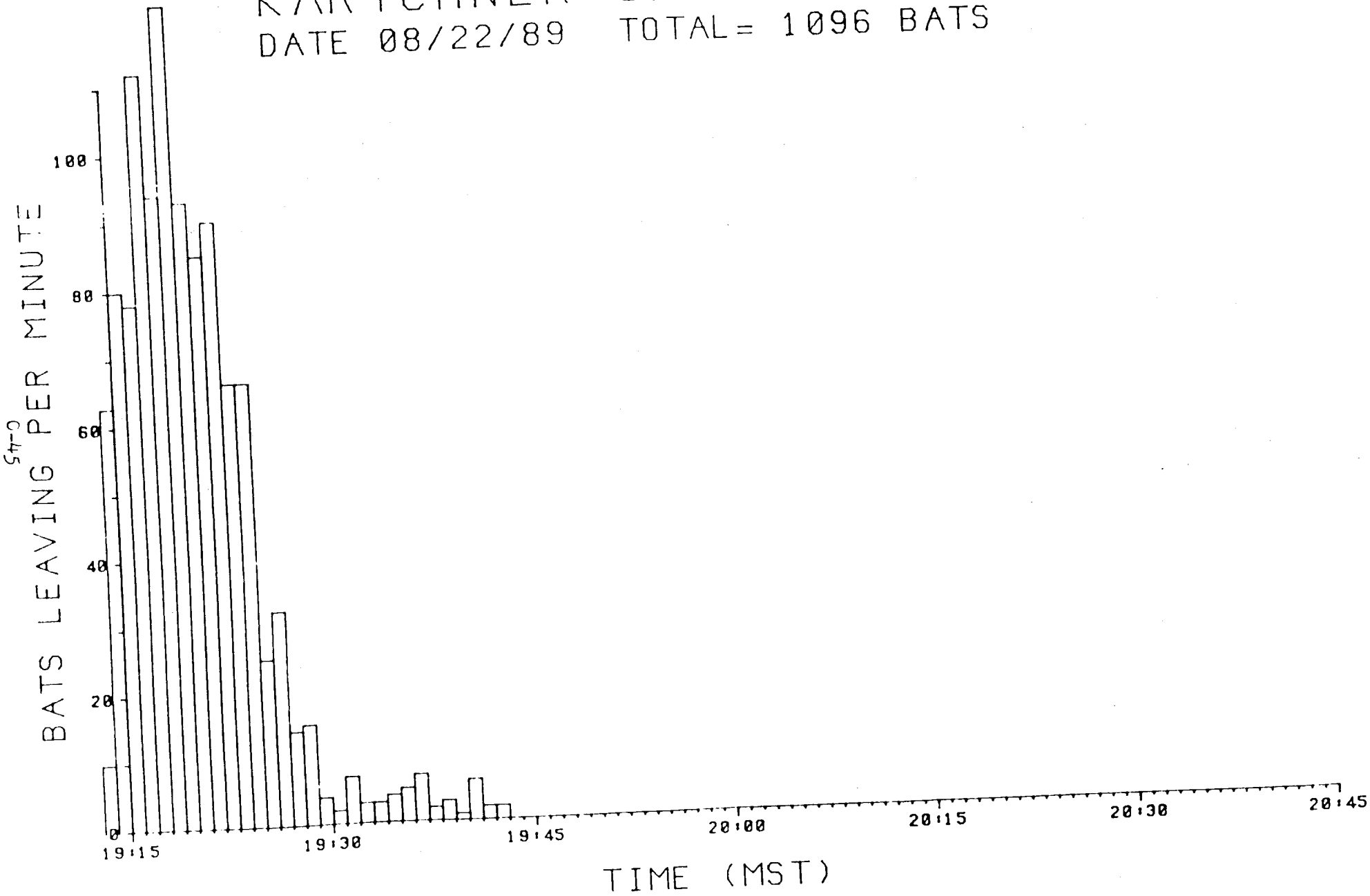
KARTCHNER CAVERNS BAT FLIGHT

DATE 08/15/89 TOTAL= 1714 BATS



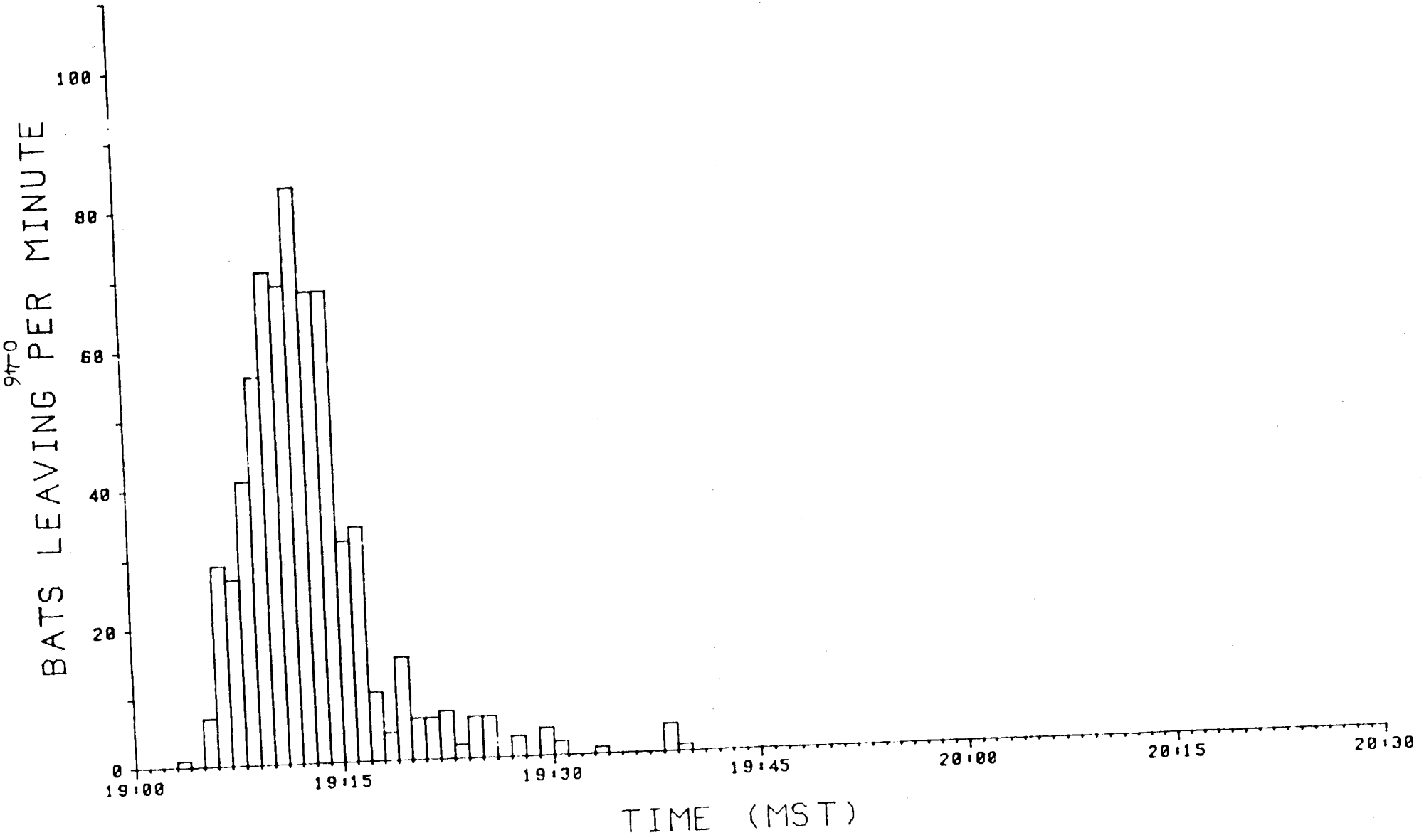
KARTCHNER CAVERNS BAT FLIGHT

DATE 08/22/89 TOTAL= 1096 BATS



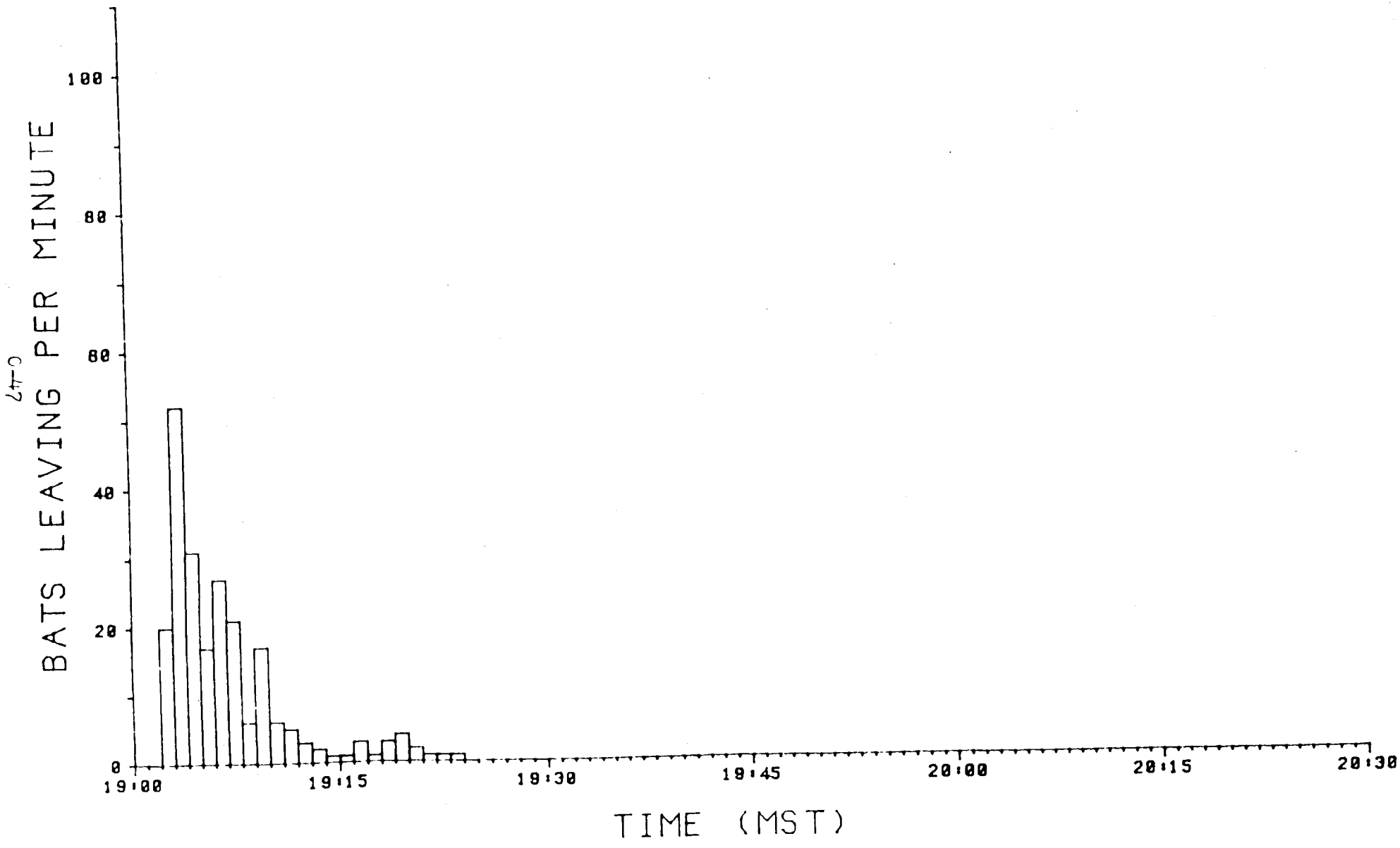
KARTCHNER CAVERNS BAT FLIGHT

DATE 08/25/89 TOTAL= 663 BATS



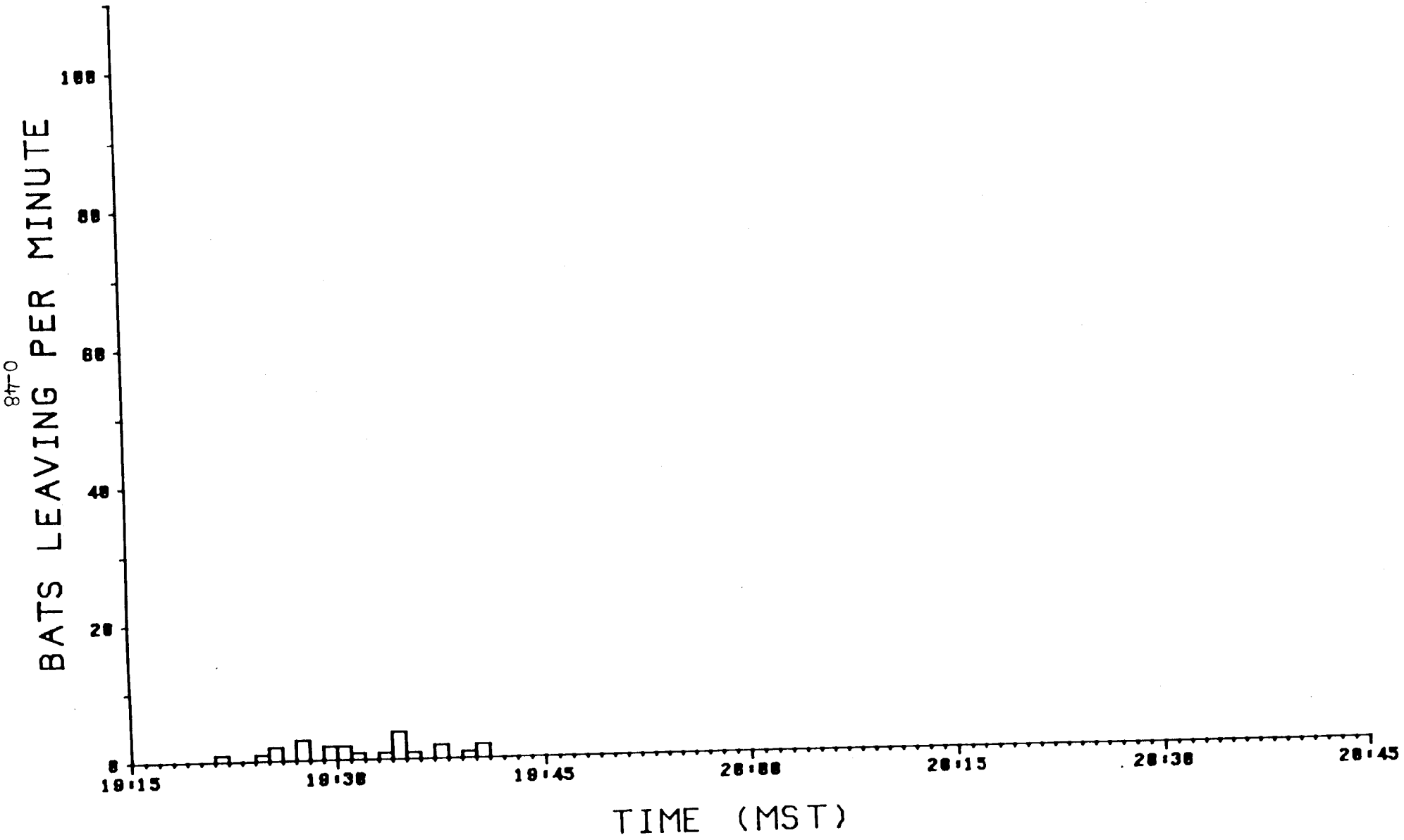
KARTCHNER CAVERNS BAT FLIGHT

DATE 08/29/89 TOTAL= 225 BATS



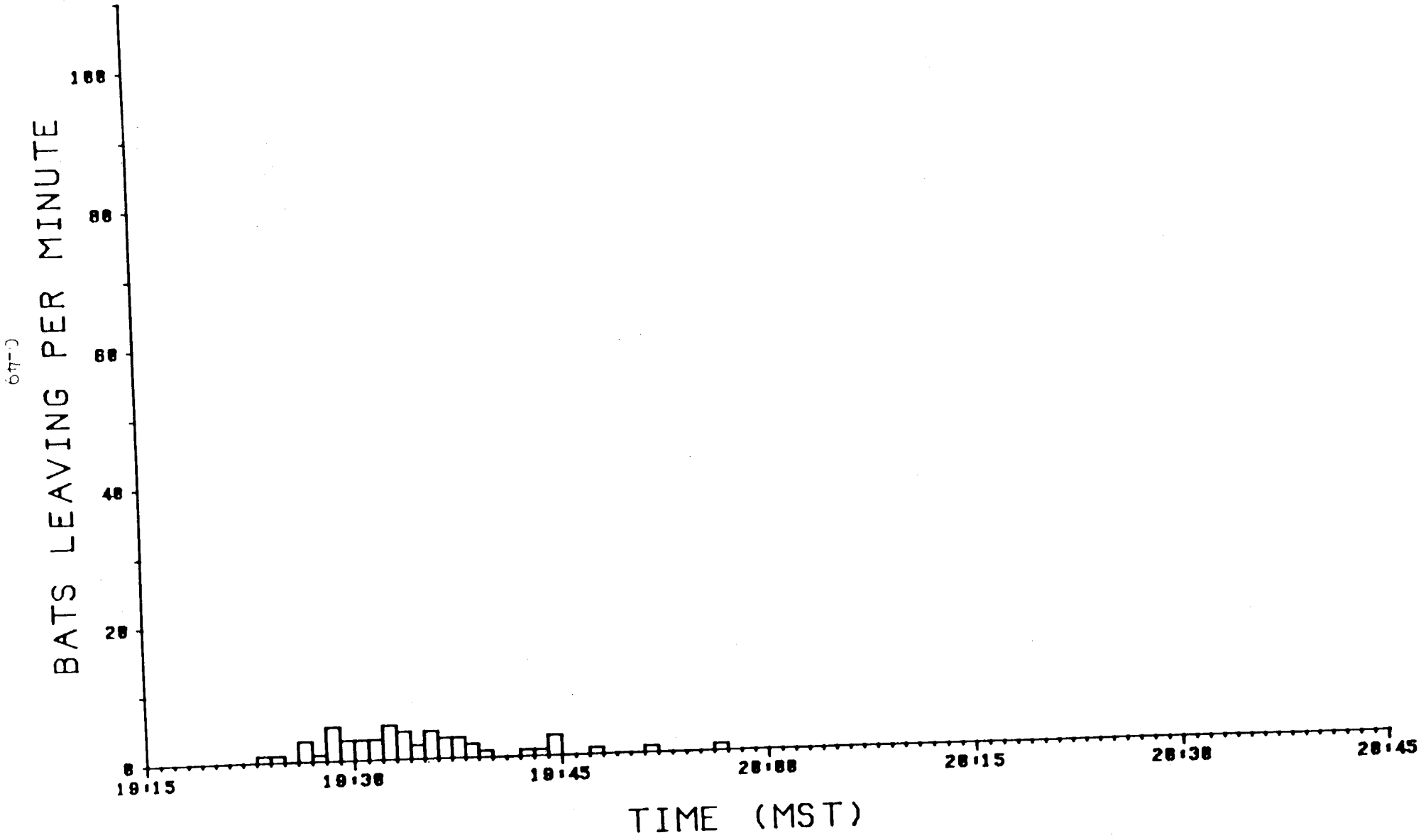
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/11/90 - A TOTAL= 23 BATS



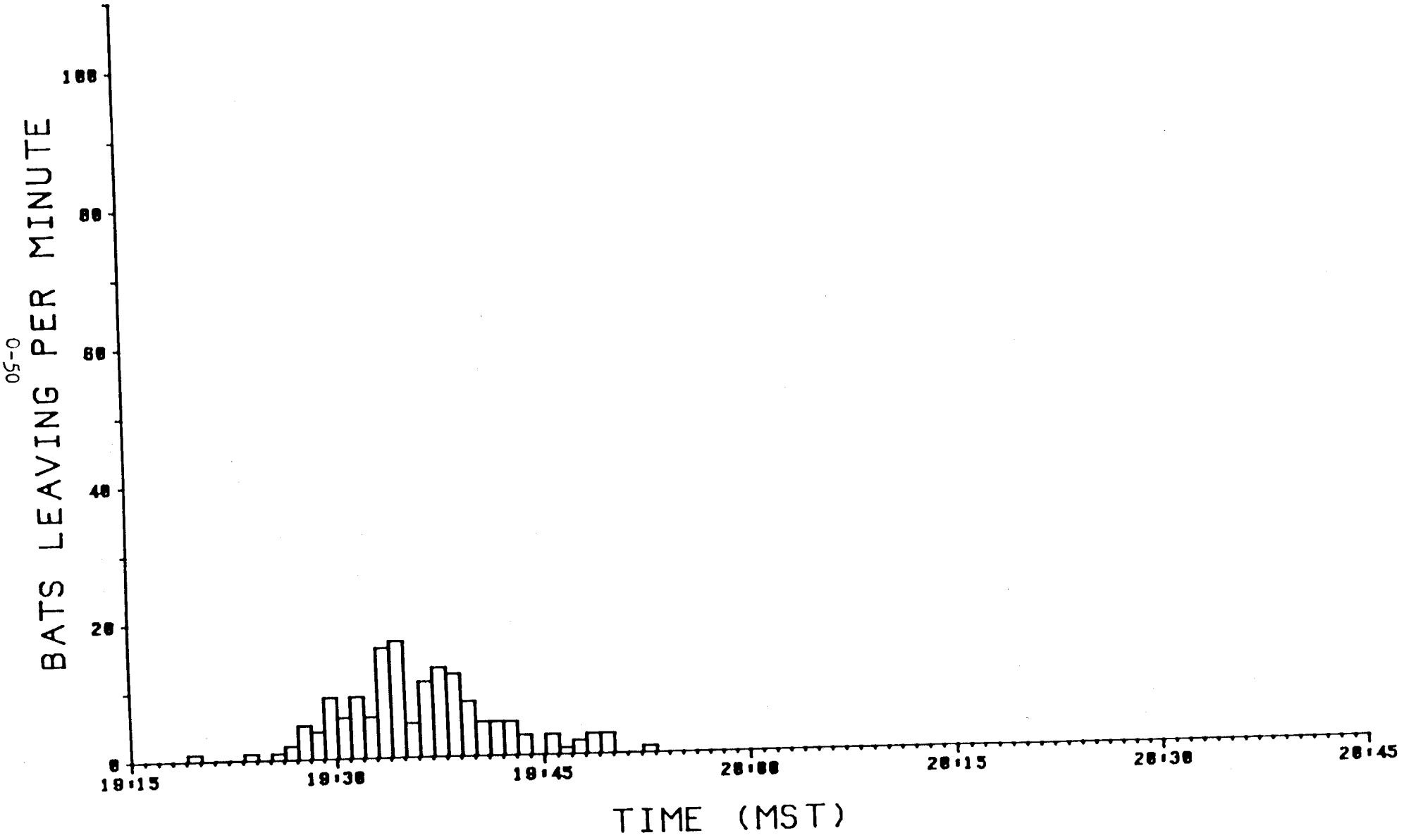
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/13/90 - A TOTAL= 52 BATS



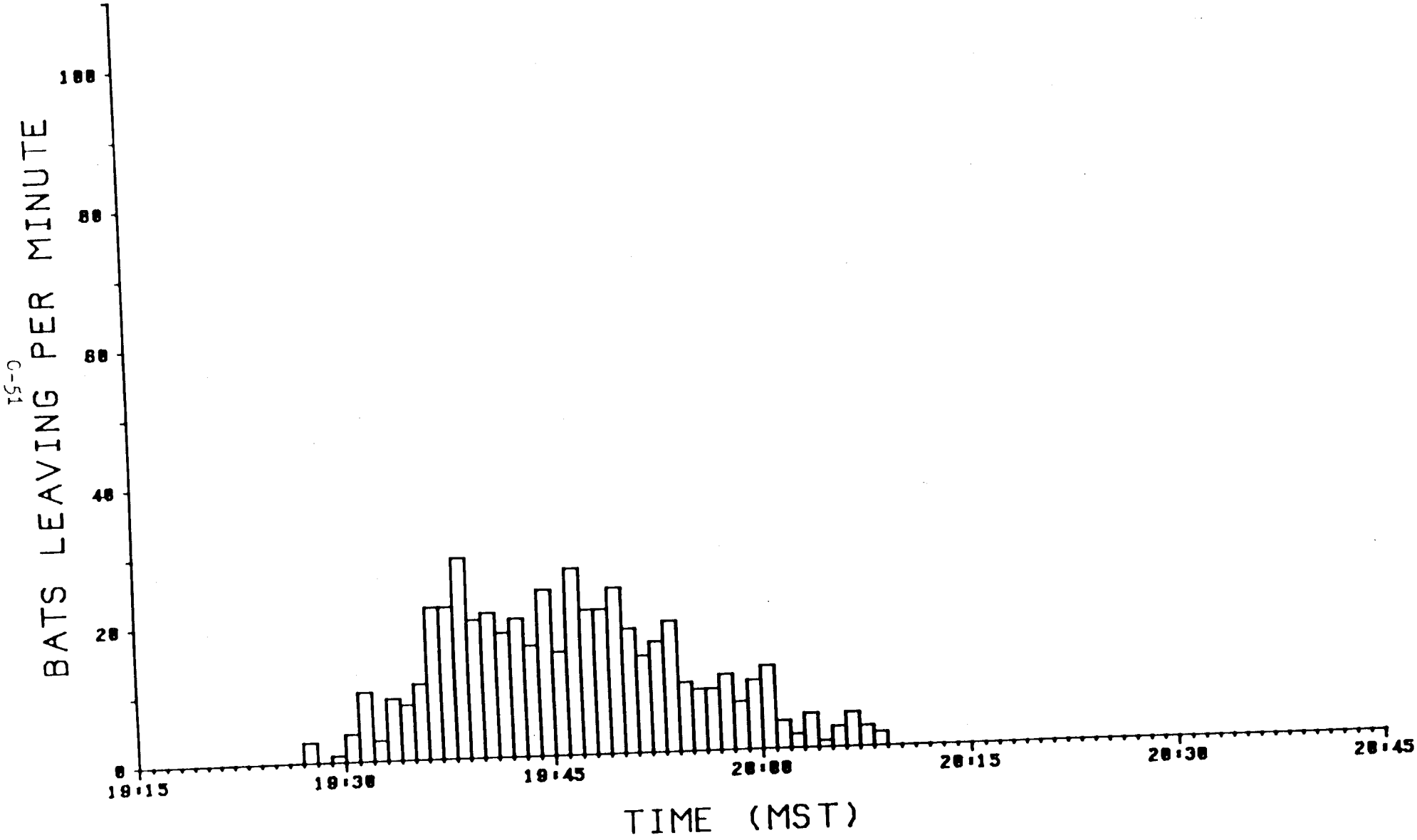
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/18/90 TOTAL= 157 BATS



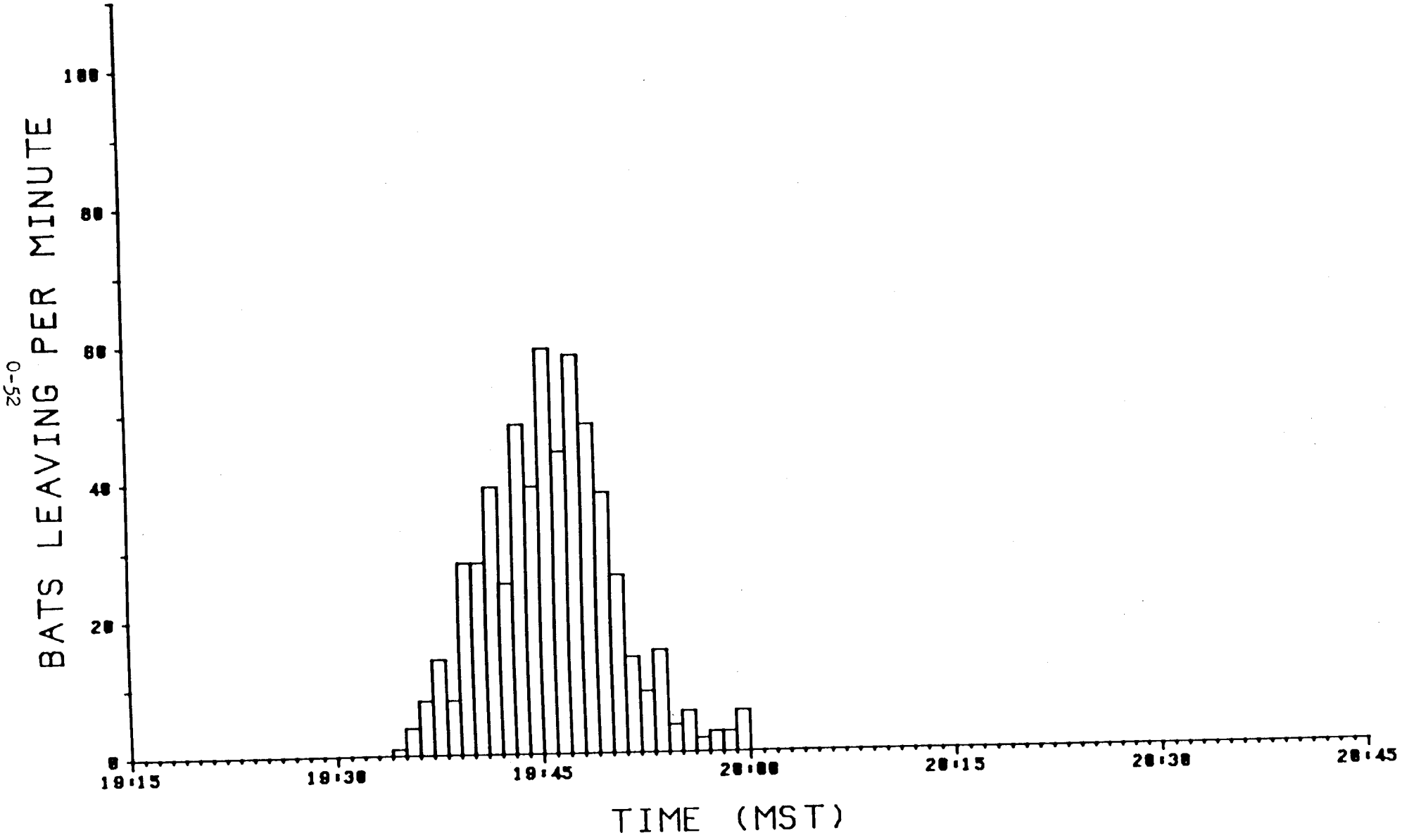
KARTCHNER CAVERNS BAT FLIGHT

DATE 5/23/90 - A TOTAL= 509 BATS



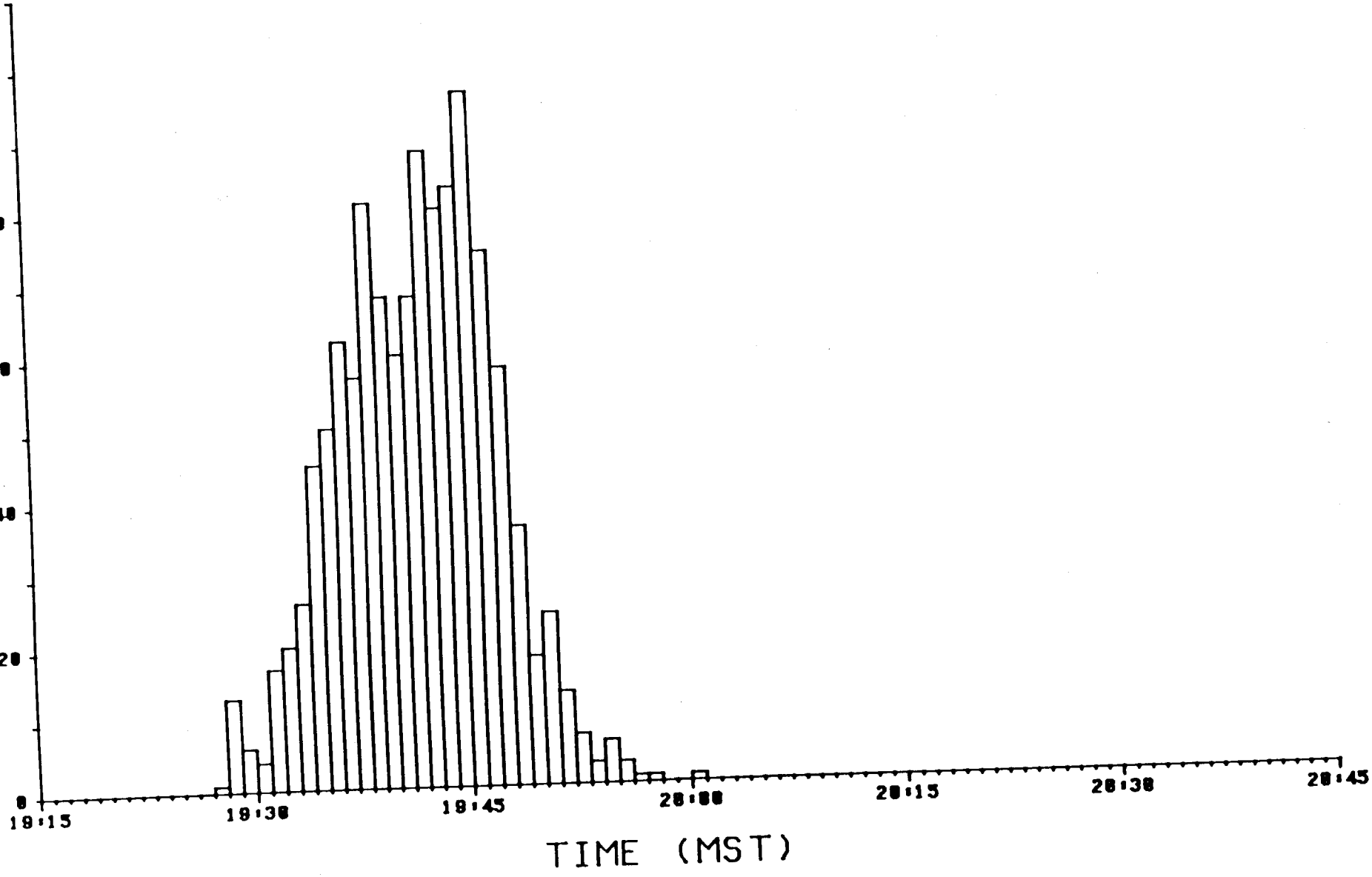
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/1/90 TOTAL= 577 BATS



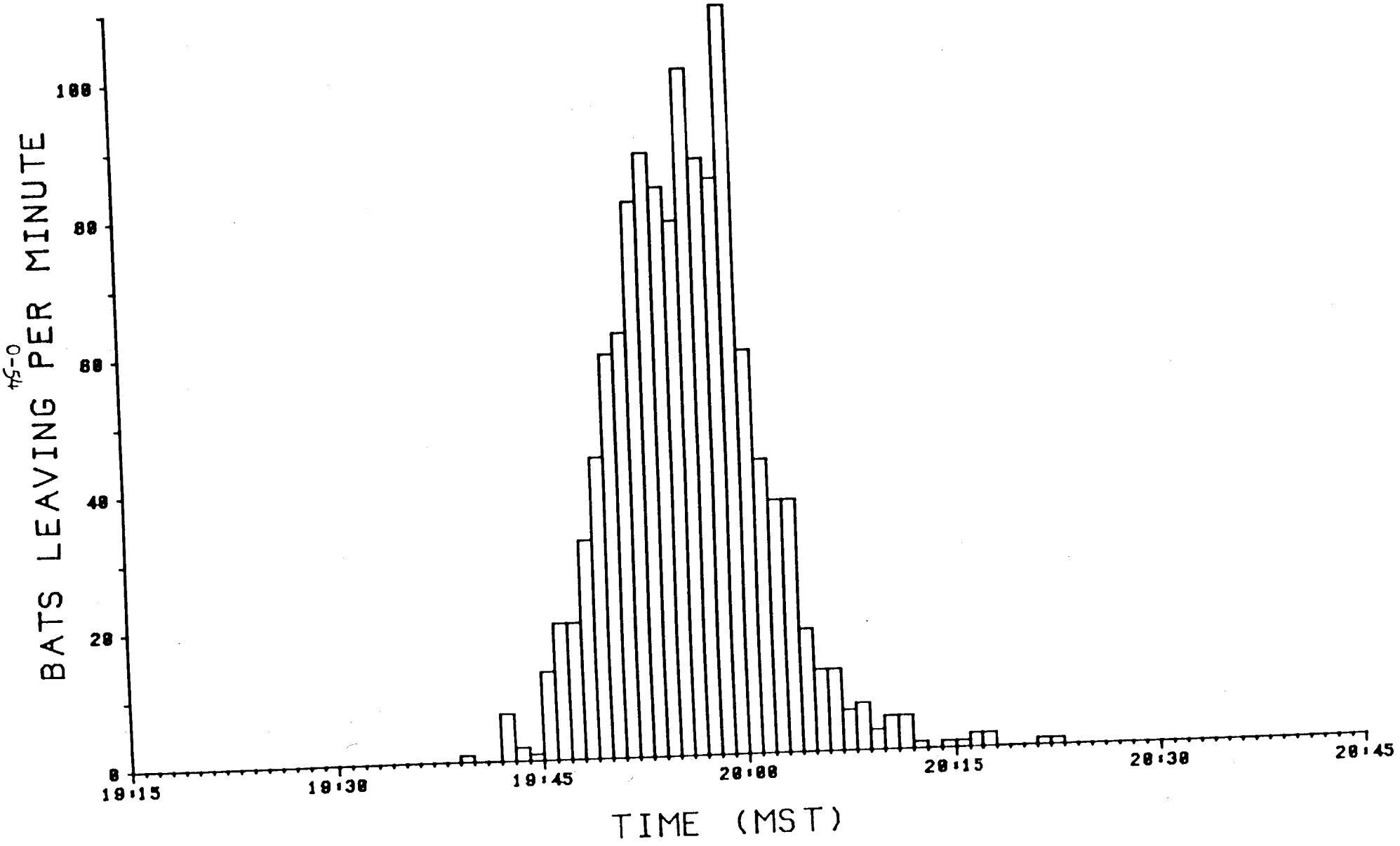
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/8/90 TOTAL= 1170 BATS



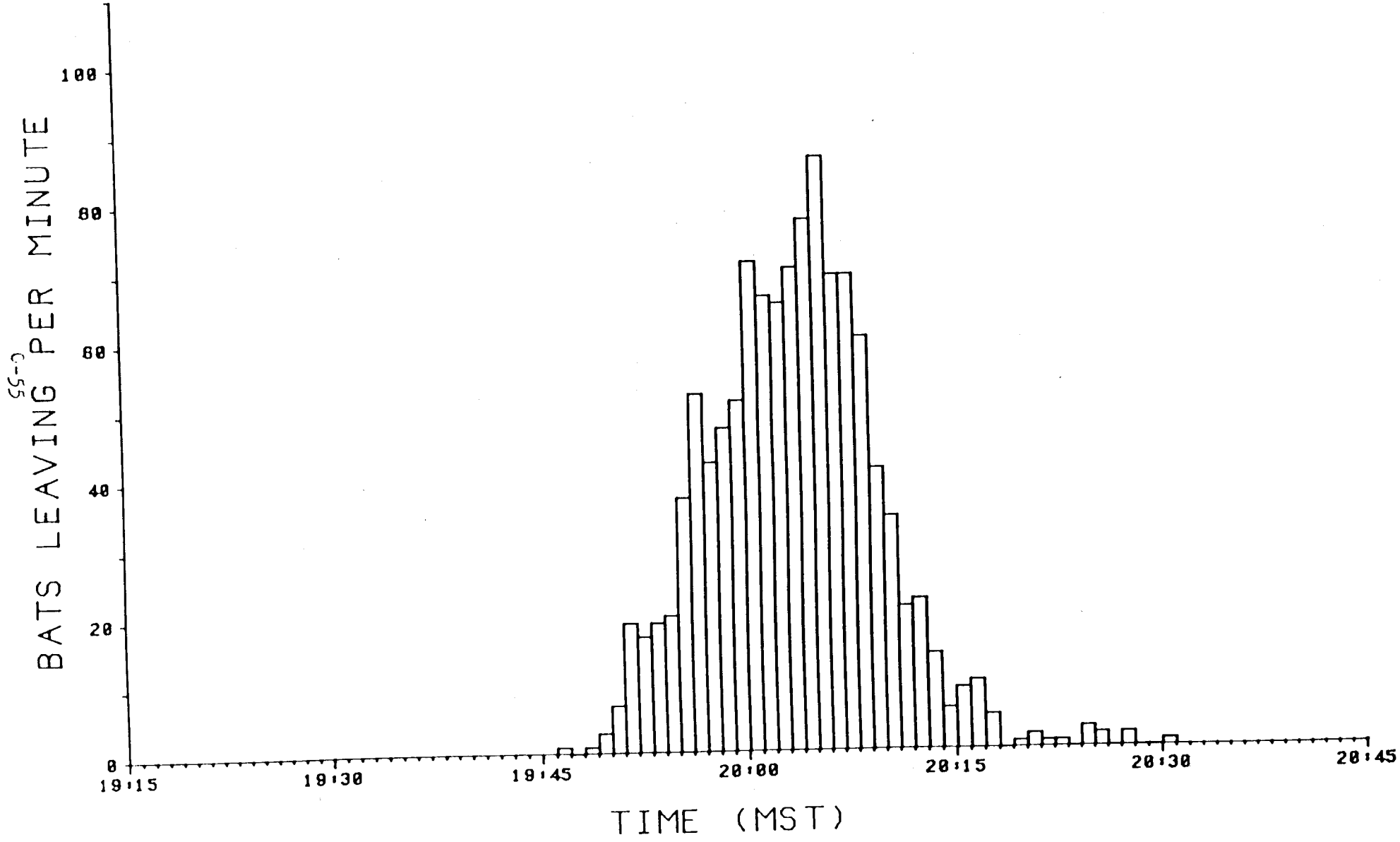
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/11/90 TOTAL= 1224 BATS



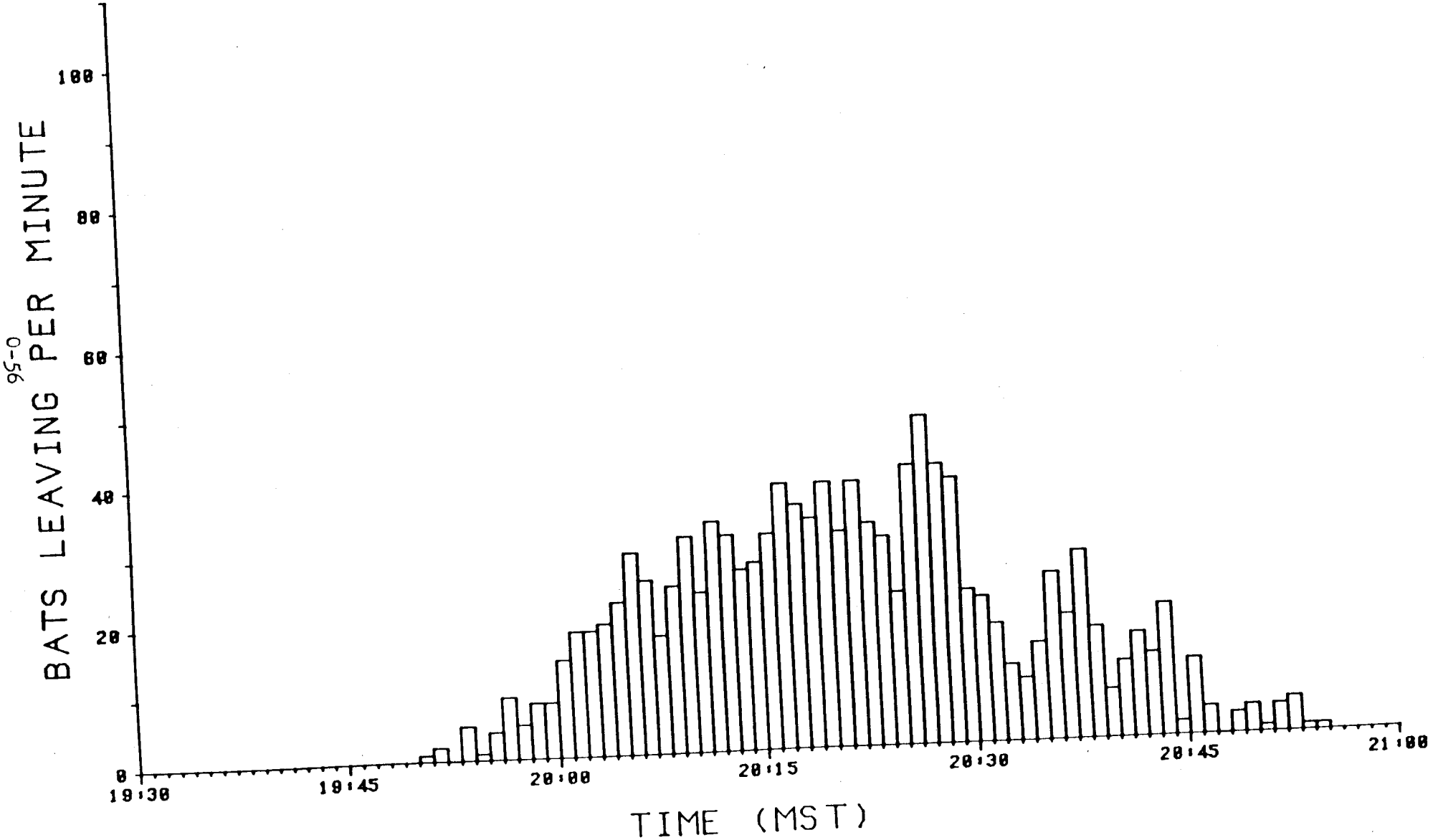
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/15/90 TOTAL= 1124 BATS



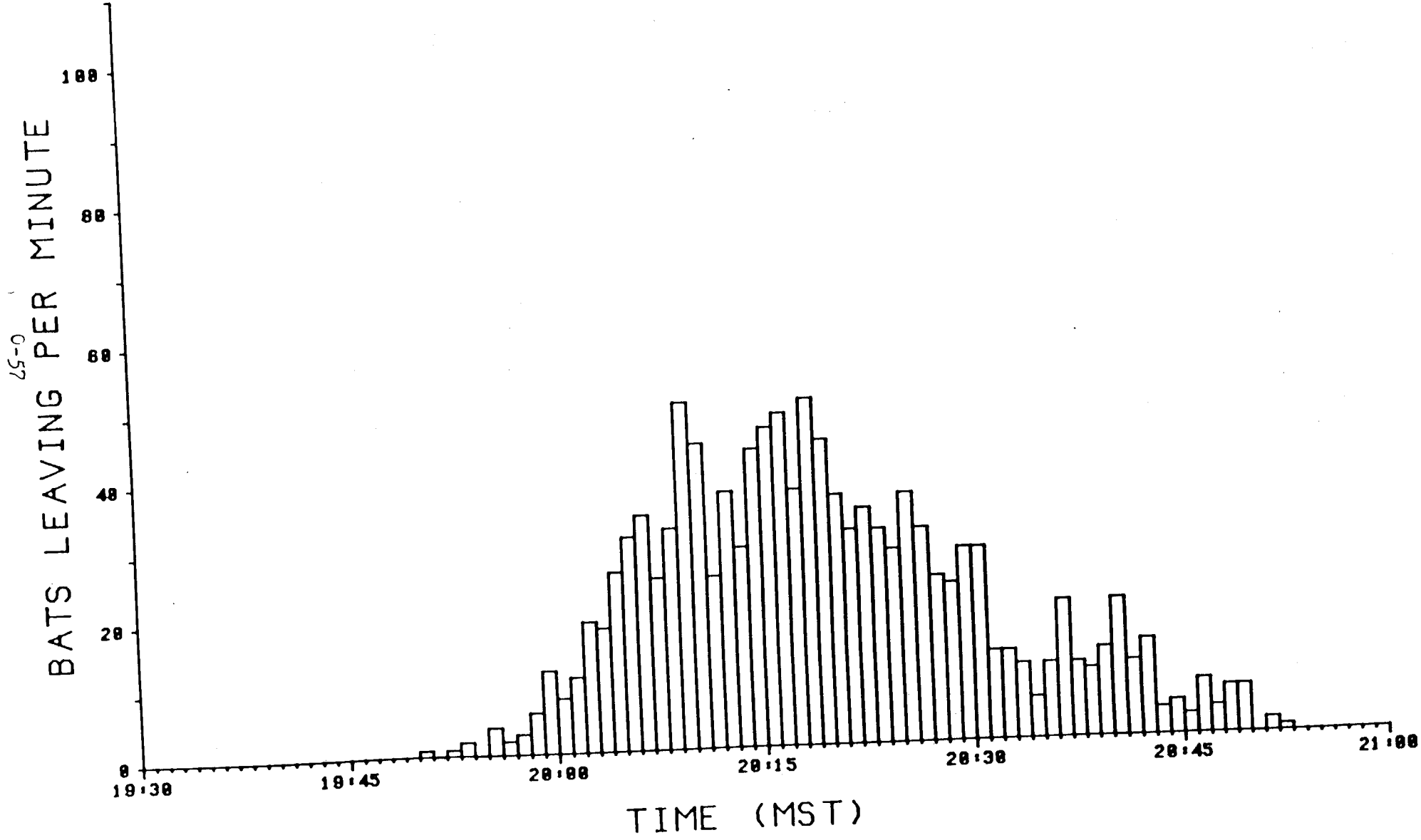
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/20/90 TOTAL= 1172 BATS



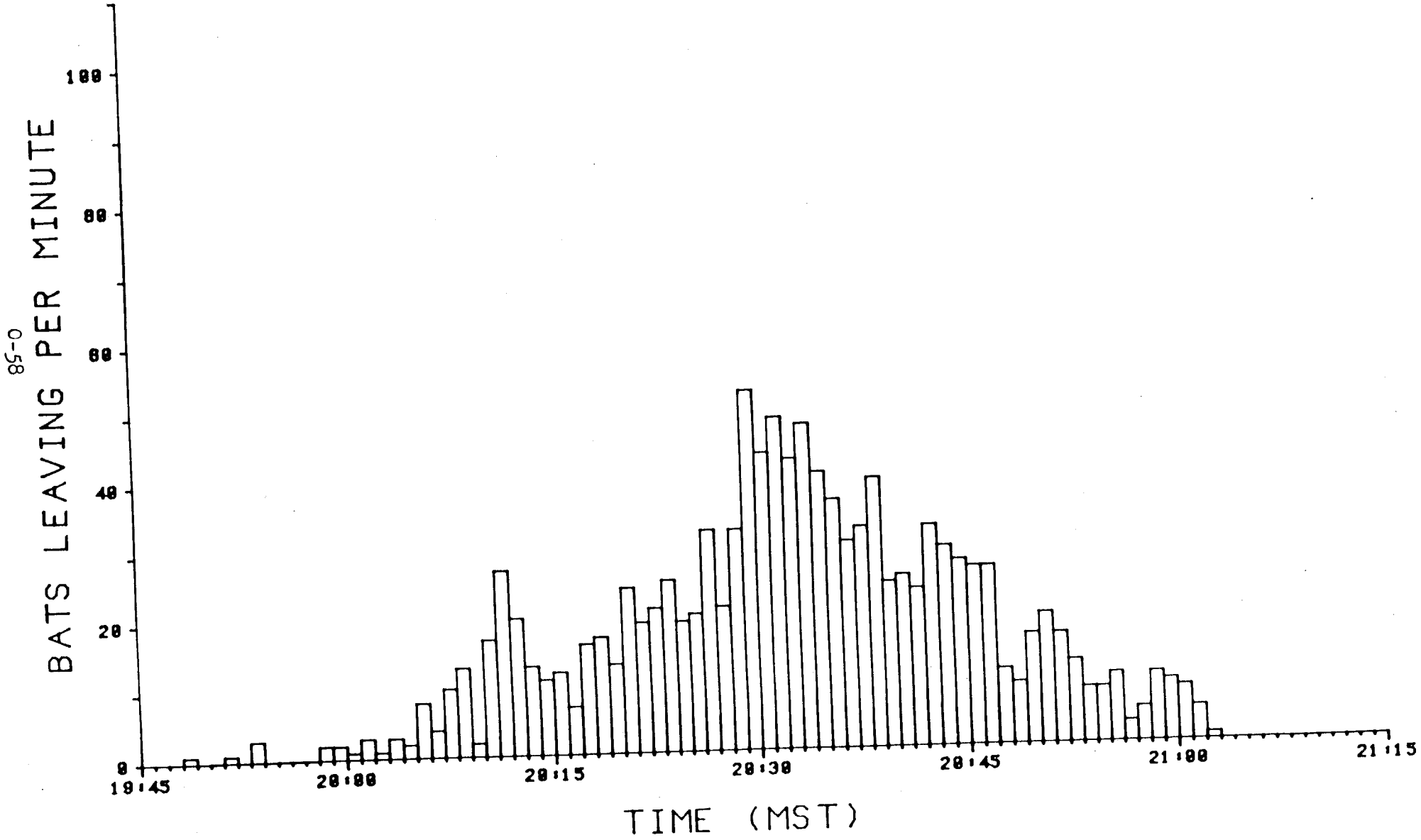
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/21/90 TOTAL= 1212 BATS



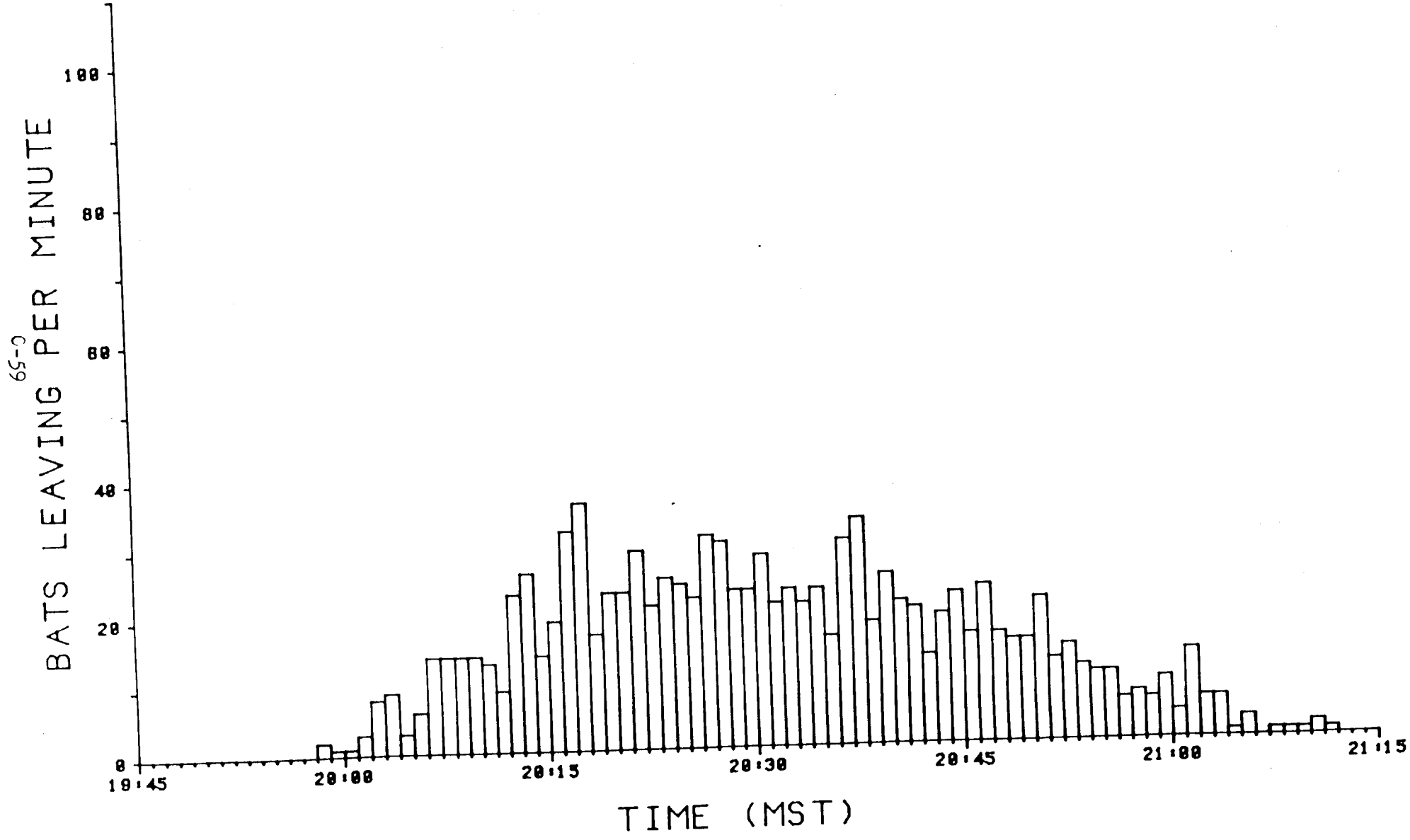
KARTCHNER CAVERNS BAT FLIGHT

DATE 6/29/90 TOTAL= 1193 BATS



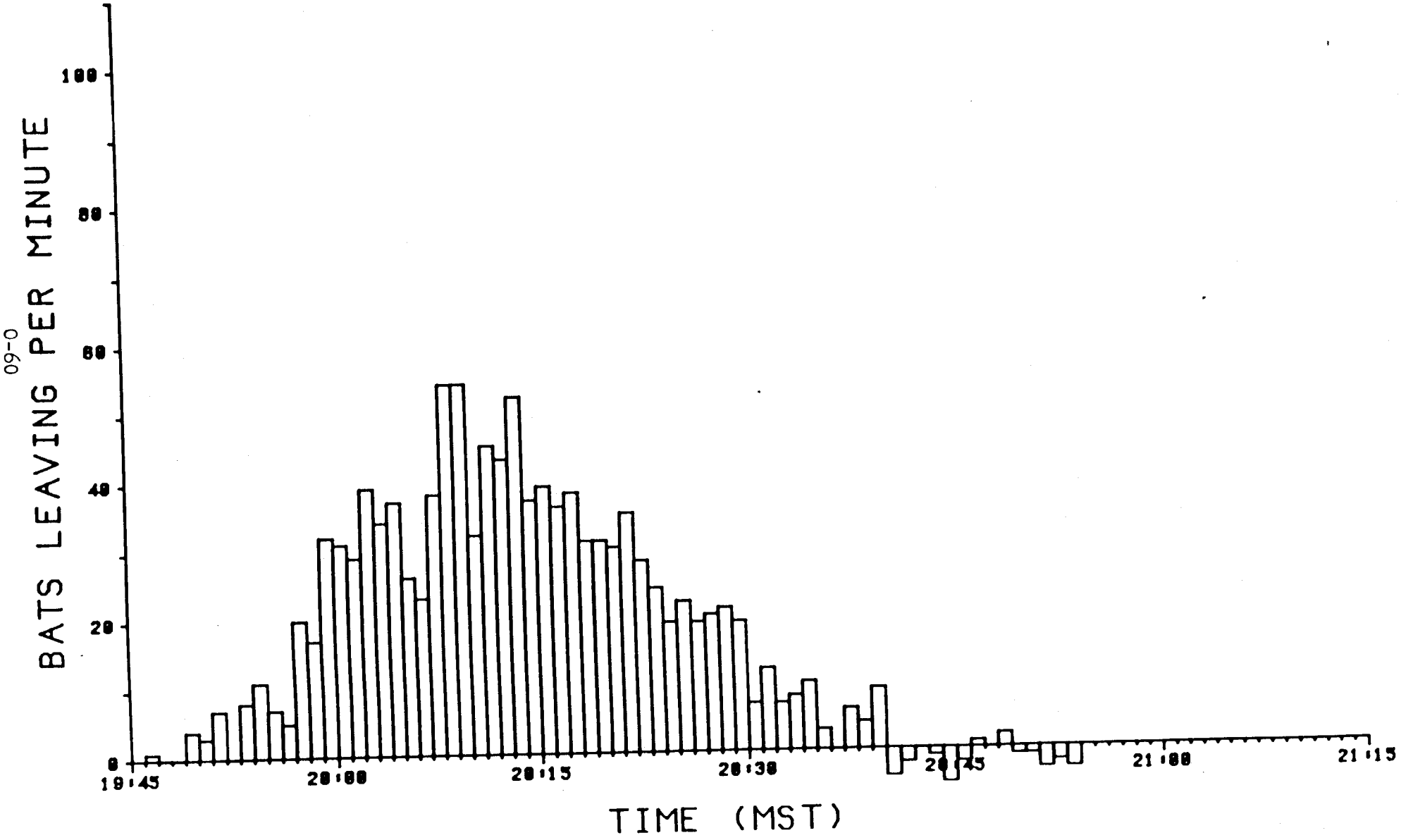
KARTCHNER CAVERNS BAT FLIGHT

DATE 7/1/90 TOTAL= 1115 BATS



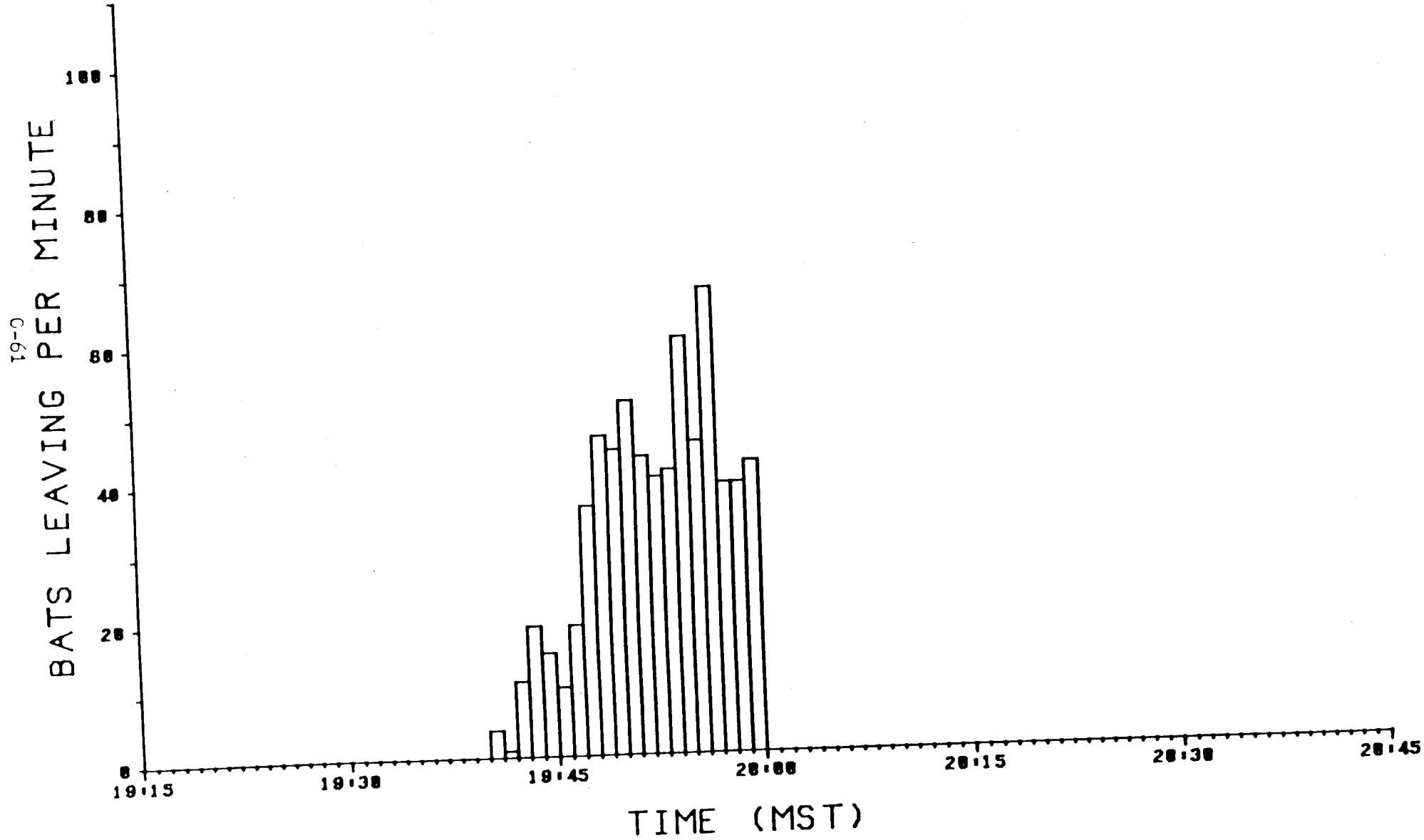
KARTCHNER CAVERNS BAT FLIGHT

DATE 7/7/90 TOTAL= 1146 BATS



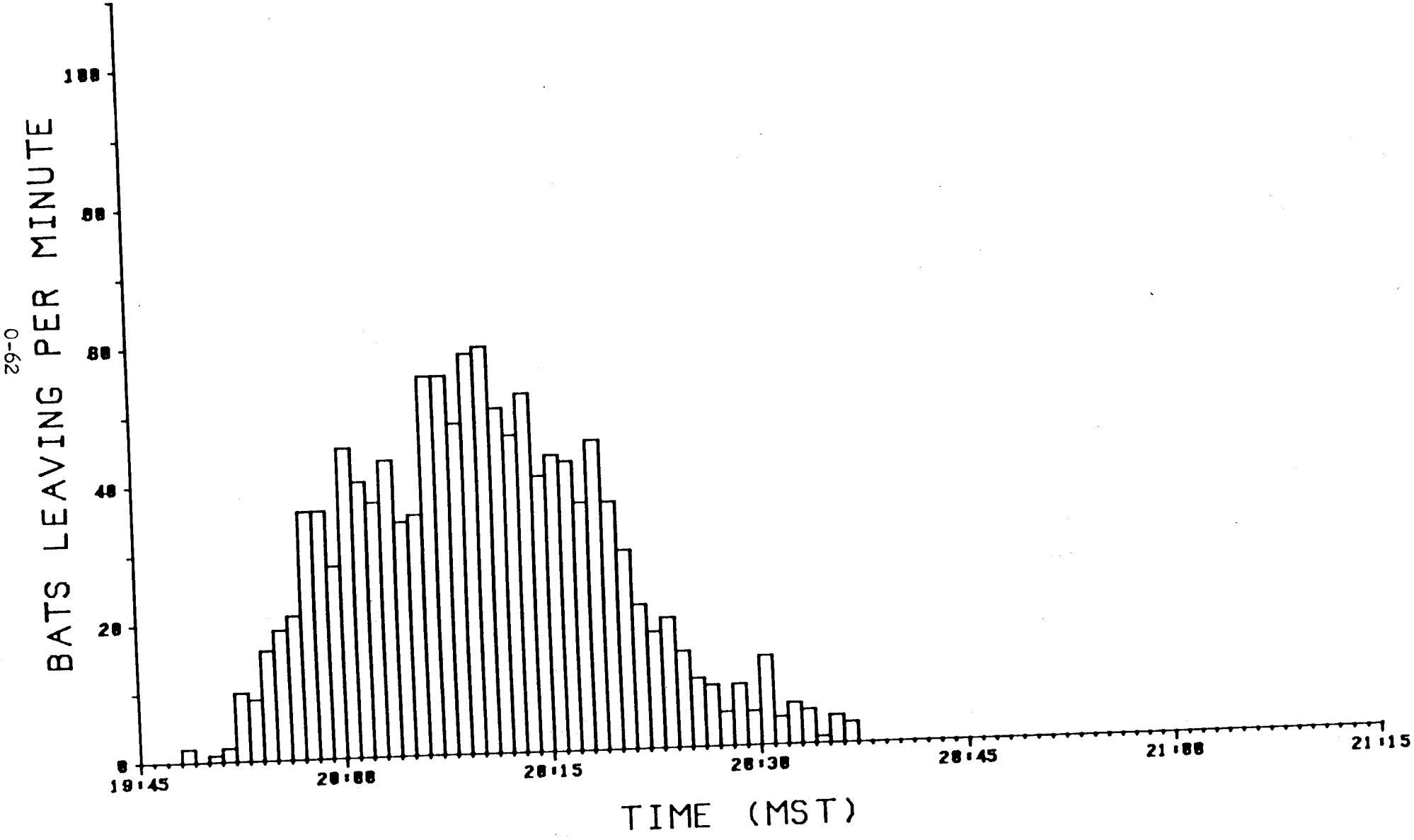
KARTCHNER CAVERNS BAT FLIGHT

DATE 7/16/90 PARTIAL TOTAL= 672 BATS



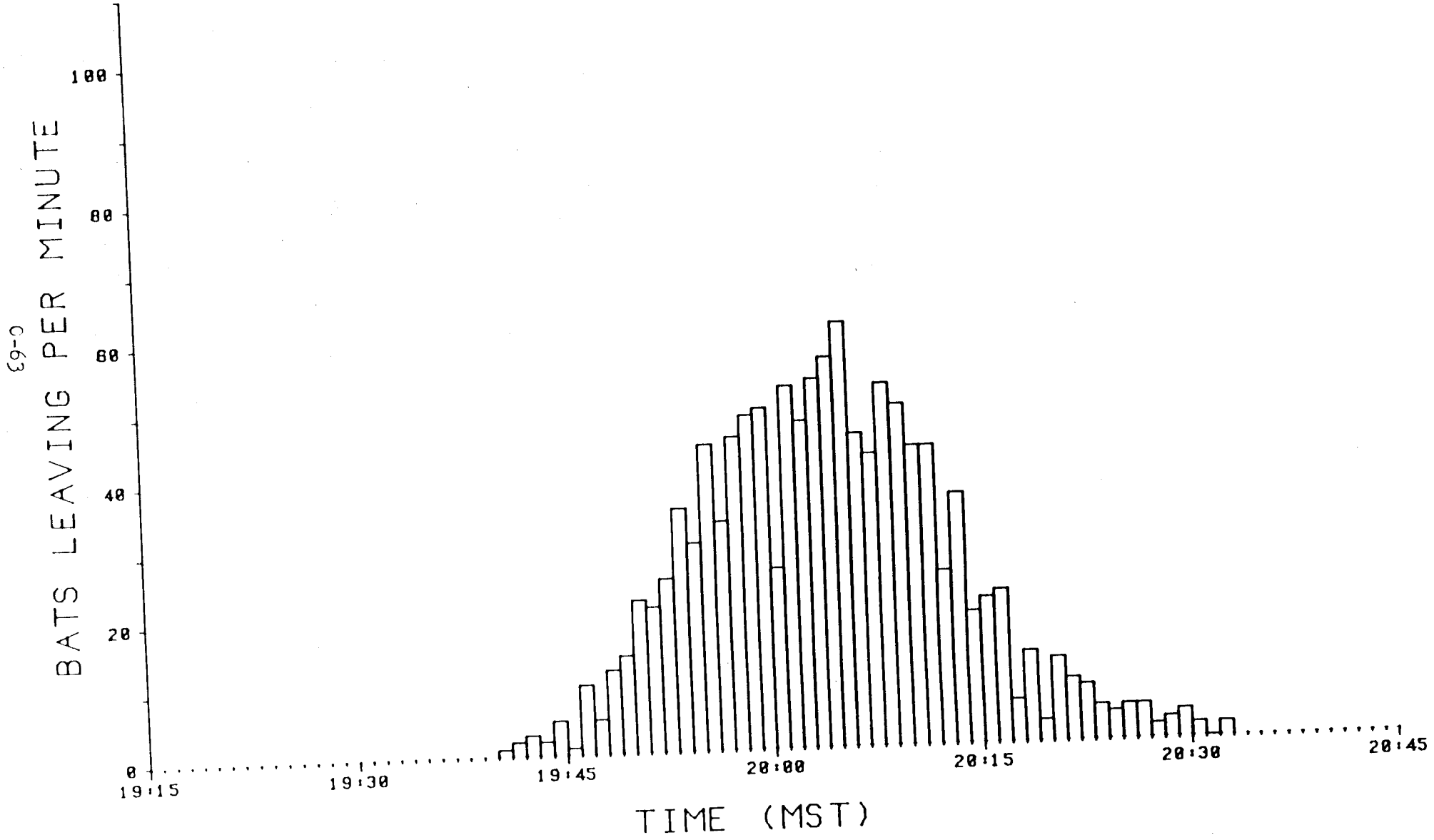
KARTCHNER CAVERNS BAT FLIGHT

DATE 7/18/90 TOTAL= 1253 BATS



KARTCHNER CAVERNS BAT FLIGHT

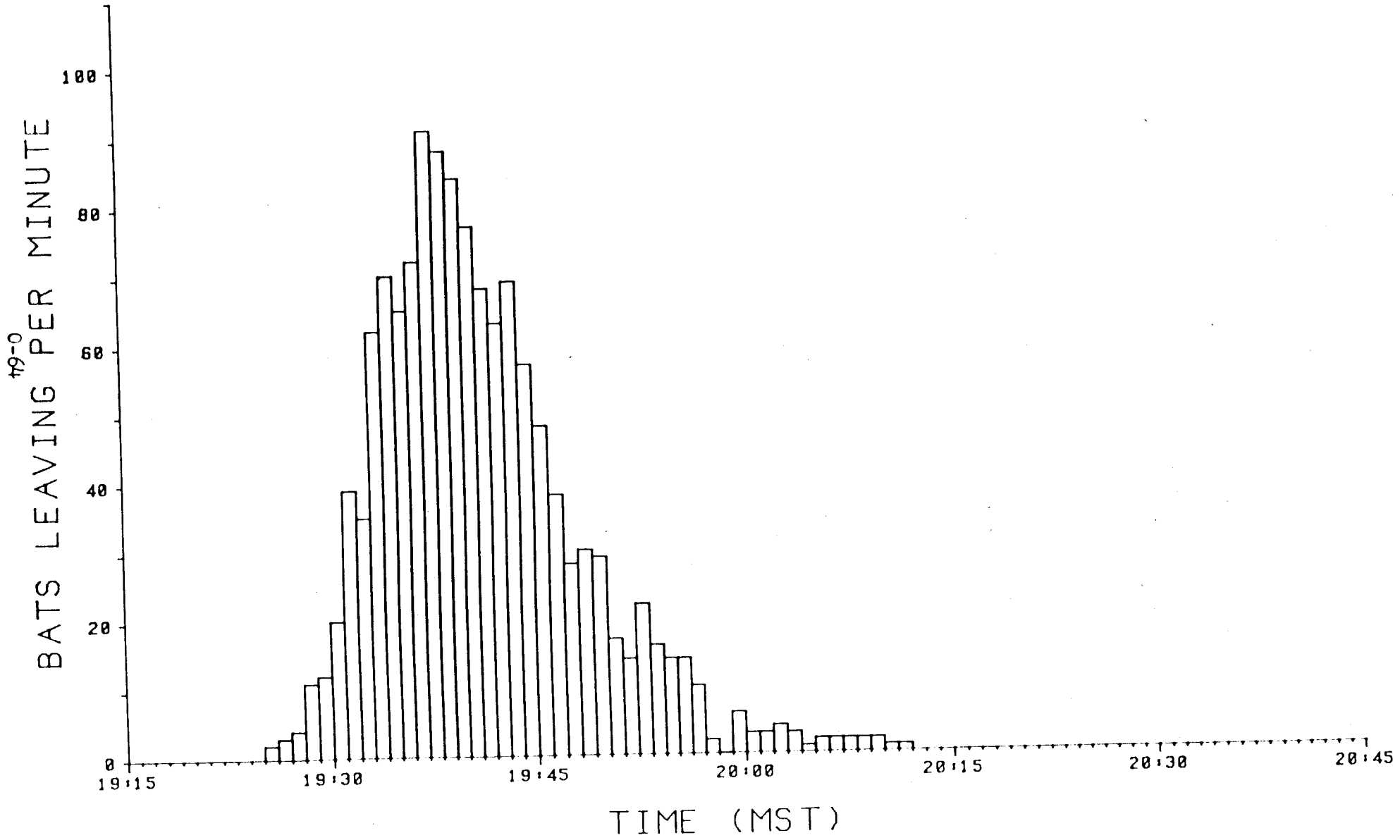
DATE 7/24/90 TOTAL= 1182 BATS

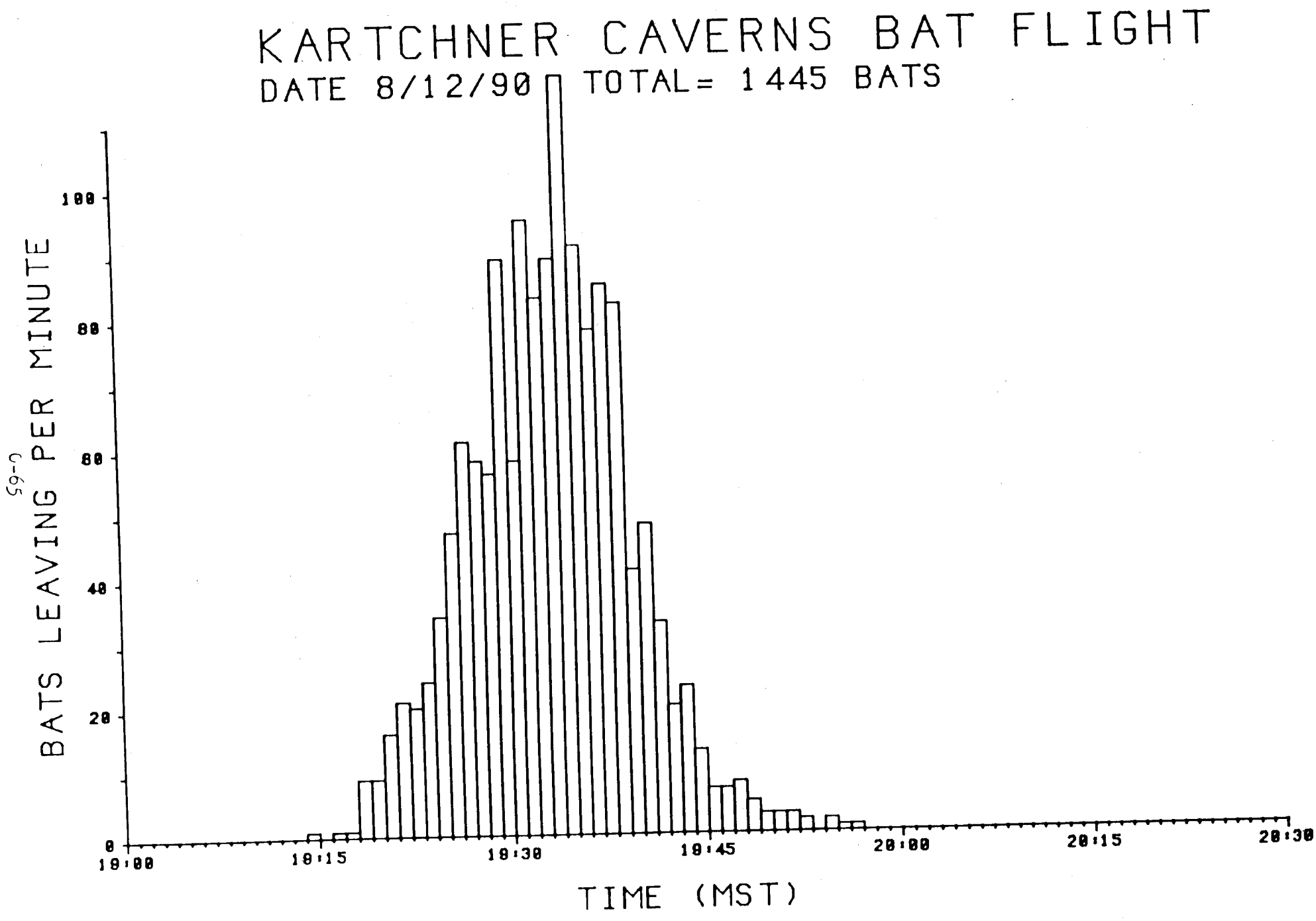


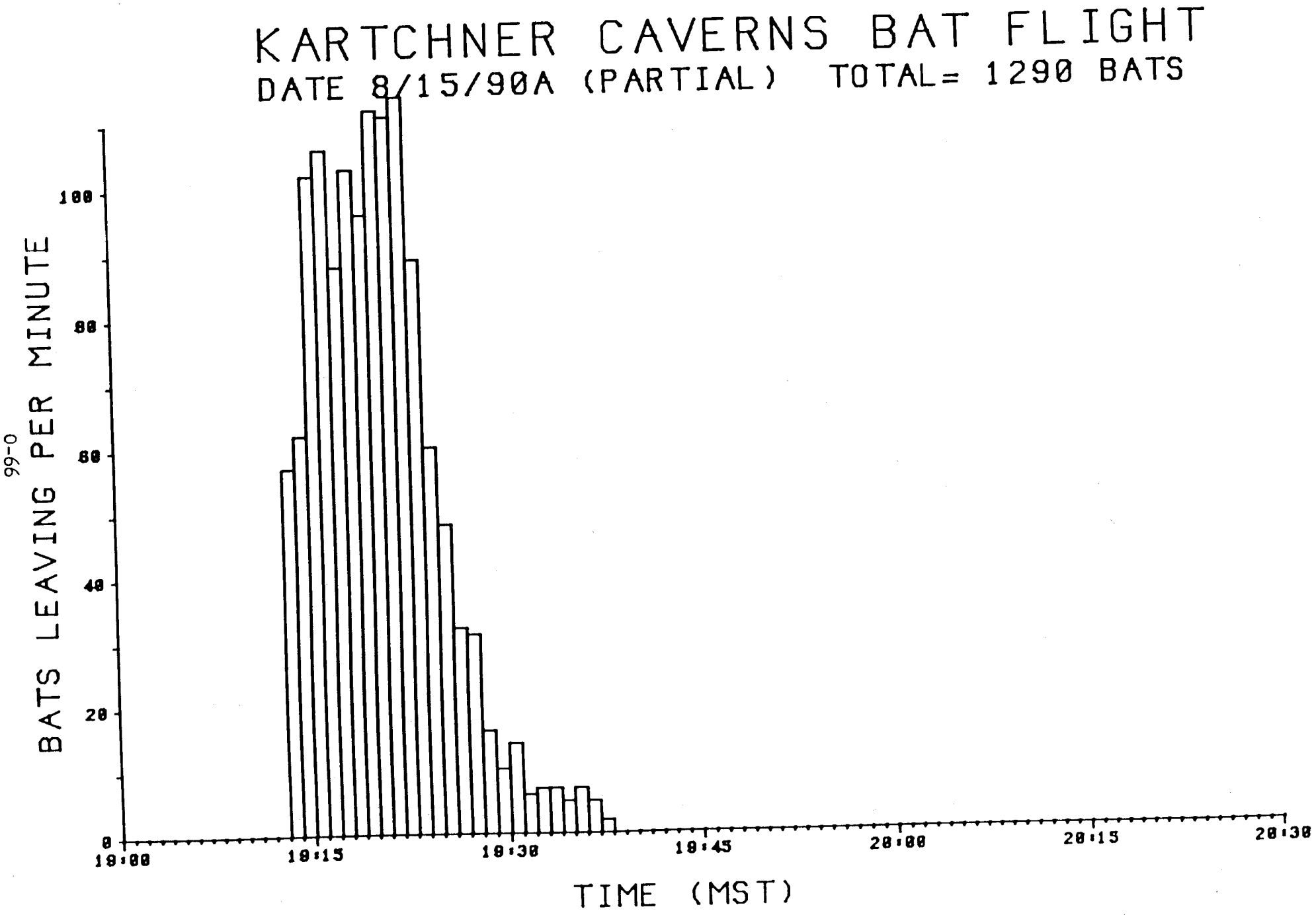
C9-0

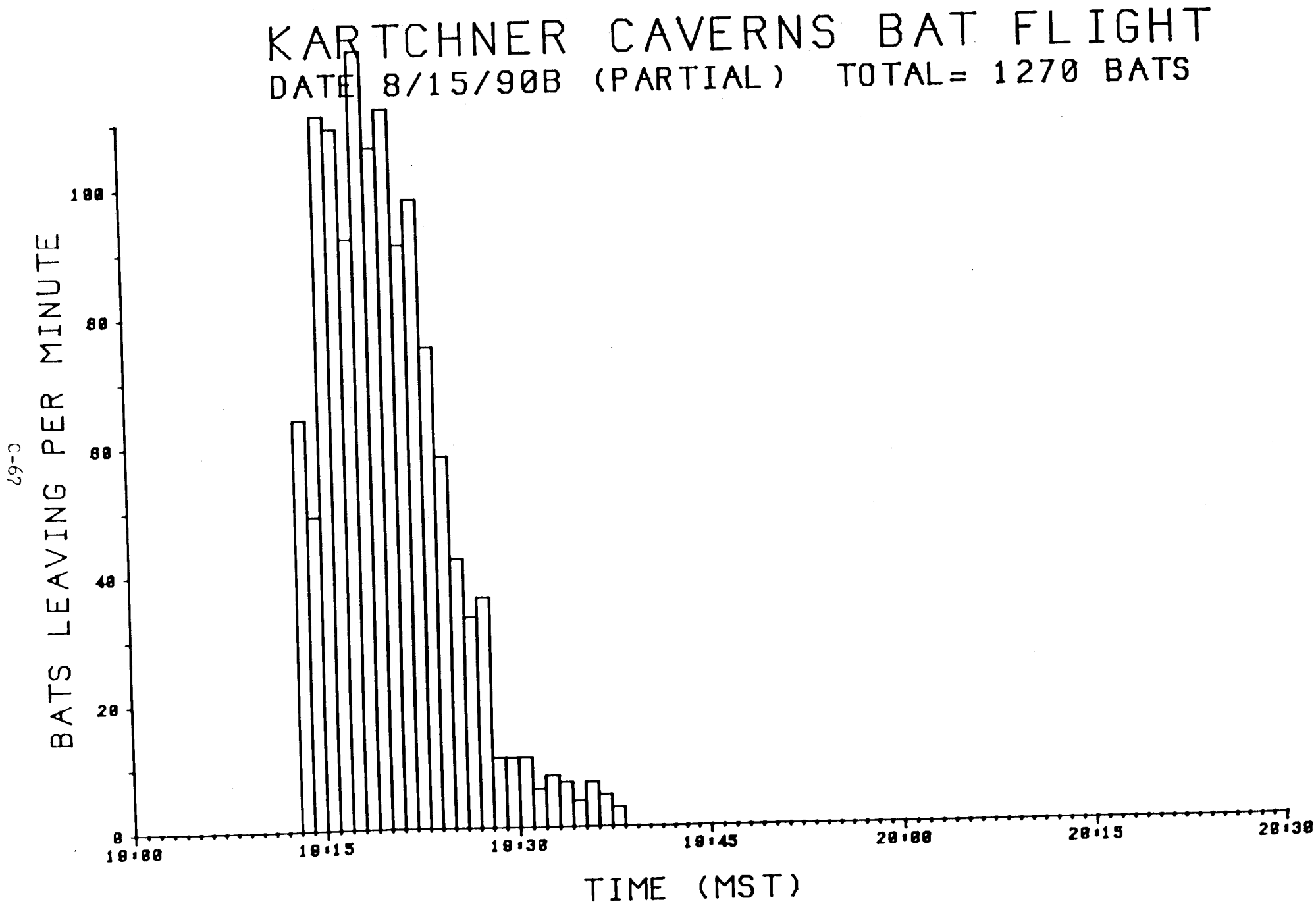
KARTCHNER CAVERNS BAT FLIGHT

DATE 8/4/90 TOTAL= 1306 BATS



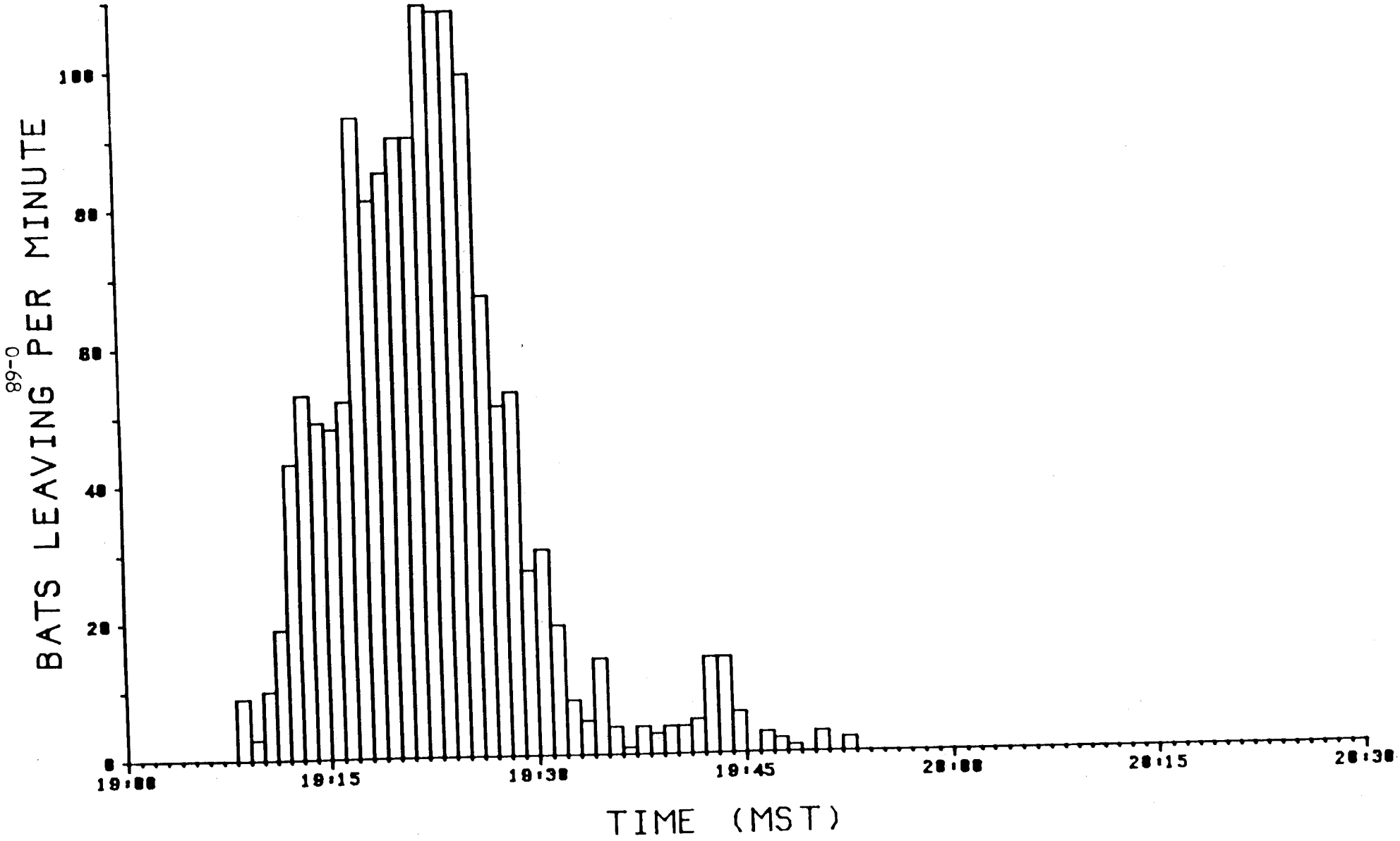

KARTCHNER CAVERNS BAT FLIGHT
DATE 8/12/90 TOTAL= 1445 BATS
BATS LEAVING PER MINUTE
0
20
40
60
80
100
19:00
19:15
19:30
19:45
20:00
20:15
20:30
TIME (MST)


KARTCHNER CAVERNS BAT FLIGHT
DATE 8/15/90A (PARTIAL) TOTAL= 1290 BATS
BATS LEAVING PER MINUTE
0
20
40
60
80
100
19:00
19:15
19:30
19:45
20:00
20:15
20:30
TIME (MST)


KARTCHNER CAVERNS BAT FLIGHT
DATE 8/15/90B (PARTIAL) TOTAL= 1270 BATS
BATS LEAVING PER MINUTE
100
80
60
40
20
0
19:00
19:15
19:30
19:45
20:00
20:15
20:30
TIME (MST)

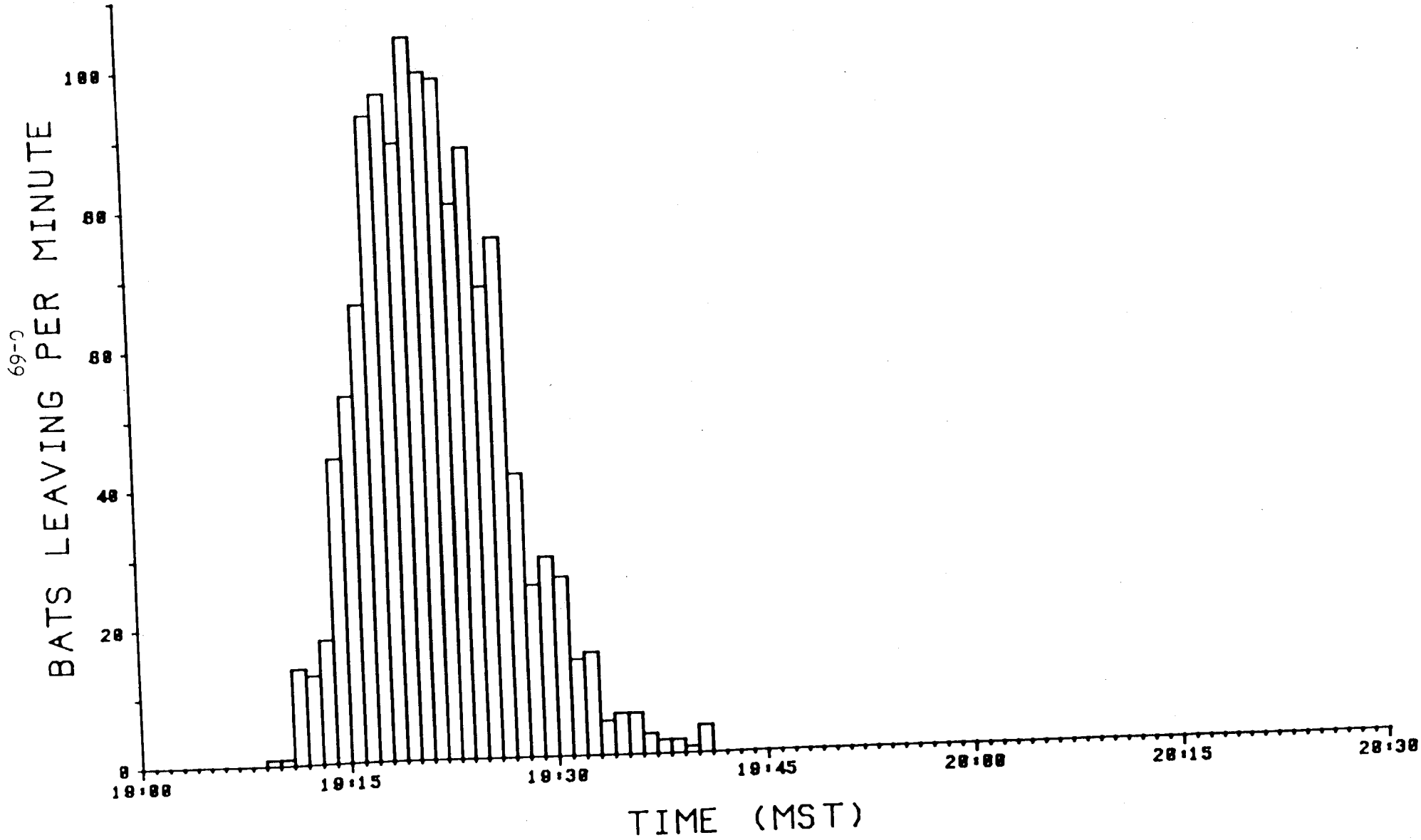
KARTCHNER CAVERNS BAT FLIGHT

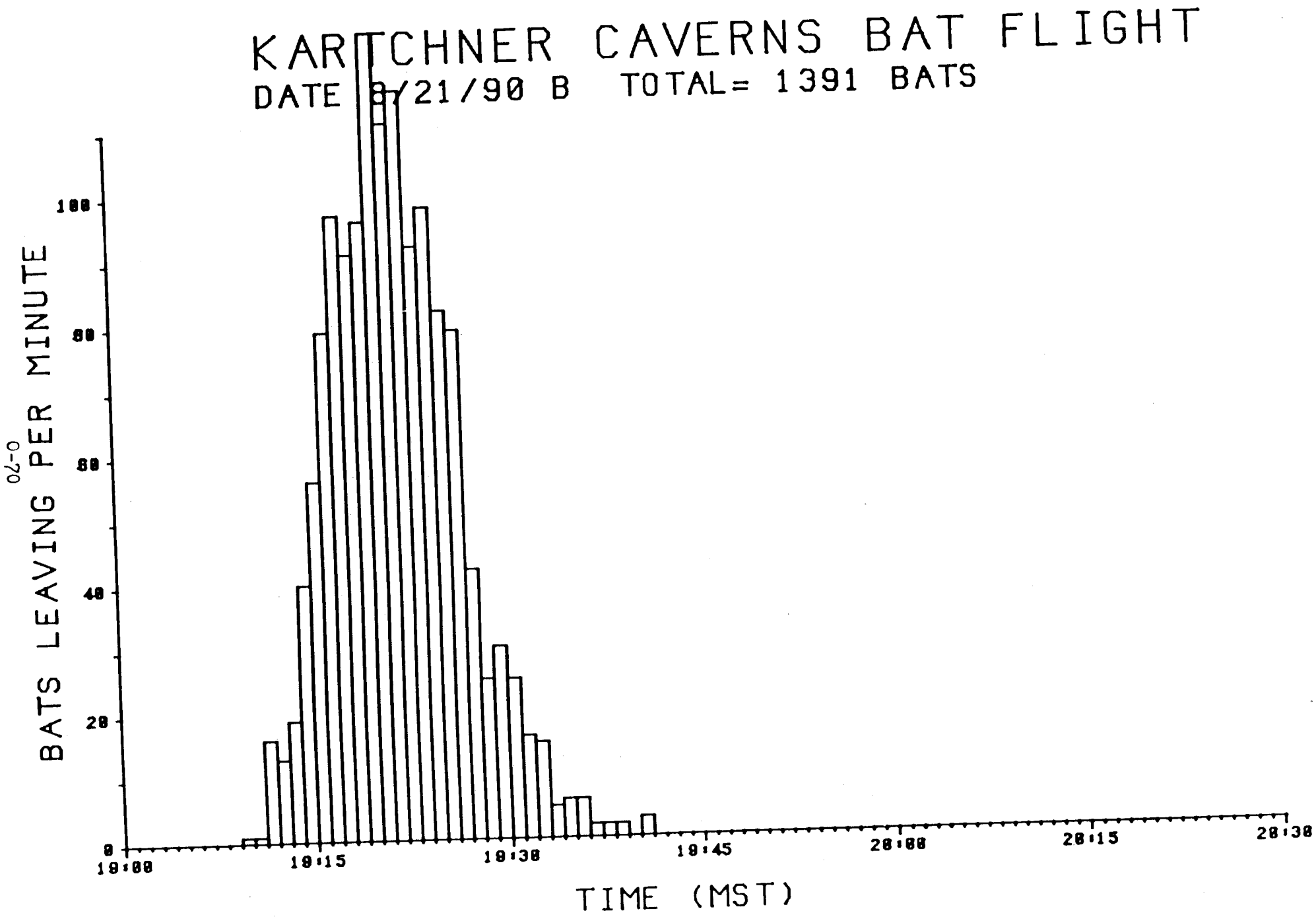
DATE 8/17/90 SINKHOLE TOTAL= 1493 BATS



KARTCHNER CAVERNS BAT FLIGHT

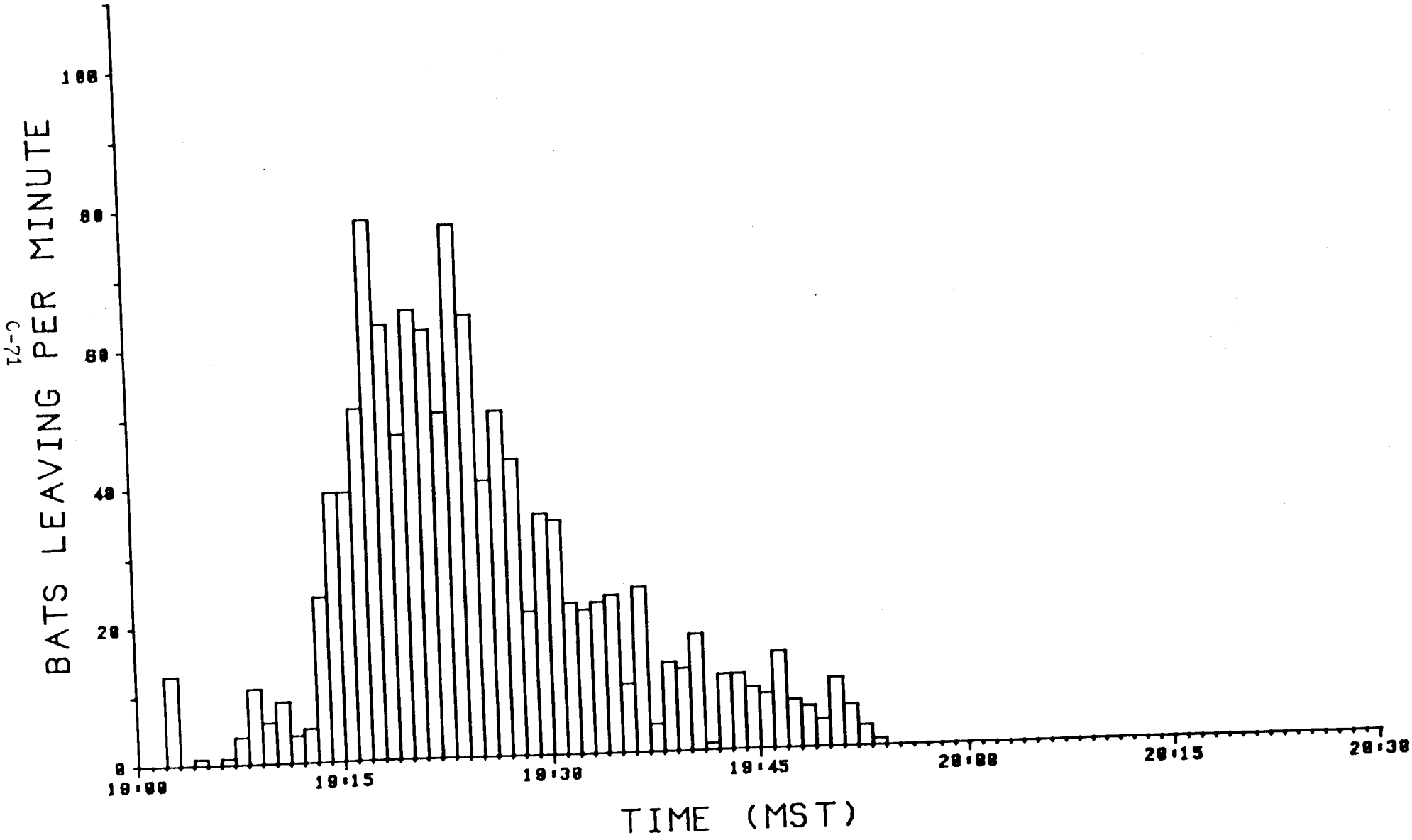
DATE 8/21/90 A TOTAL= 1279 BATS




KARTCHNER CAVERNS BAT FLIGHT
DATE 8/21/90 B TOTAL= 1391 BATS
BATS LEAVING PER MINUTE
0-70
100
80
60
40
20
0
19:00
19:15
19:30
19:45
20:00
20:15
20:30
TIME (MST)

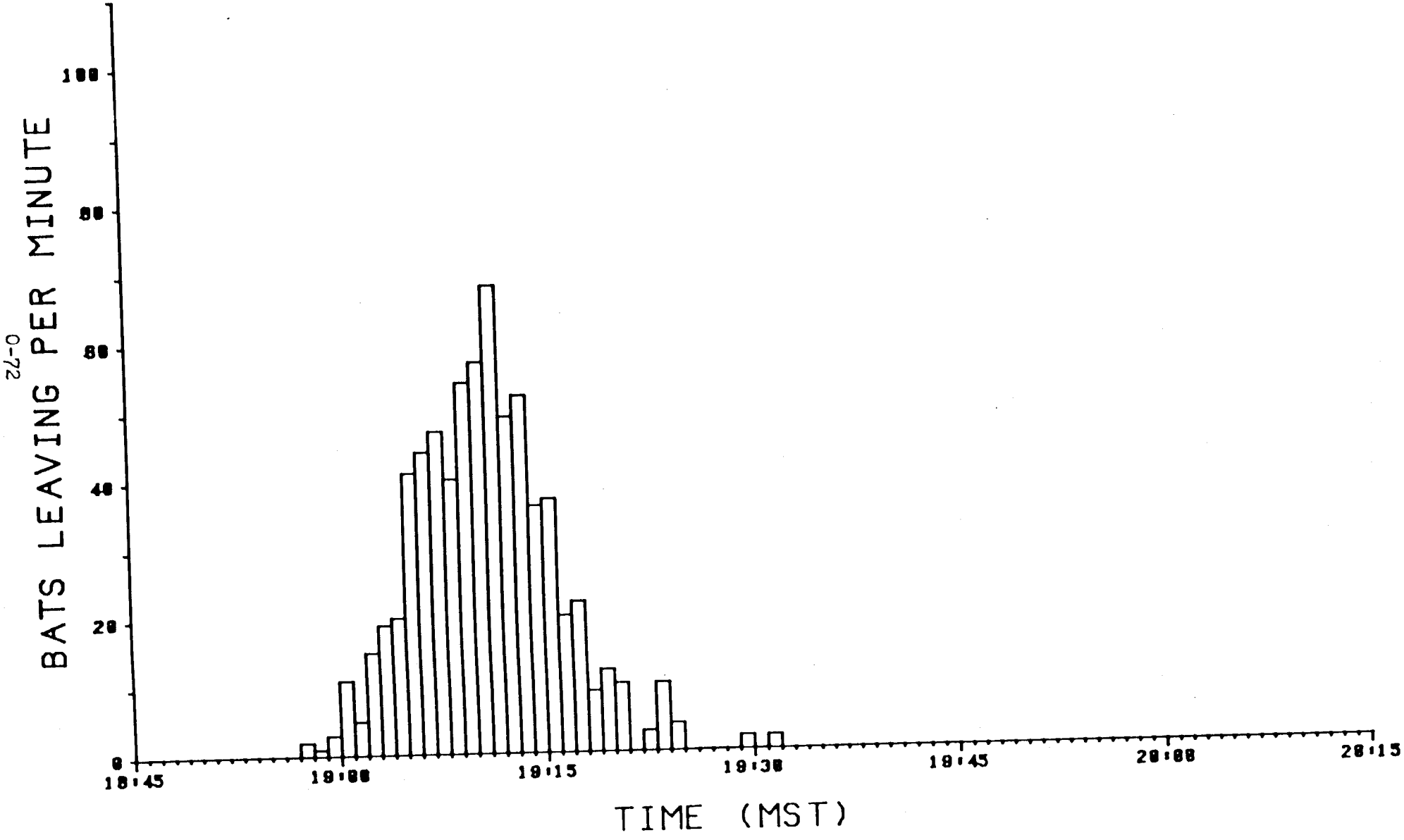
KARTCHNER CAVERNS BAT FLIGHT

DATE 8/23/90 TOTAL= 1195 BATS



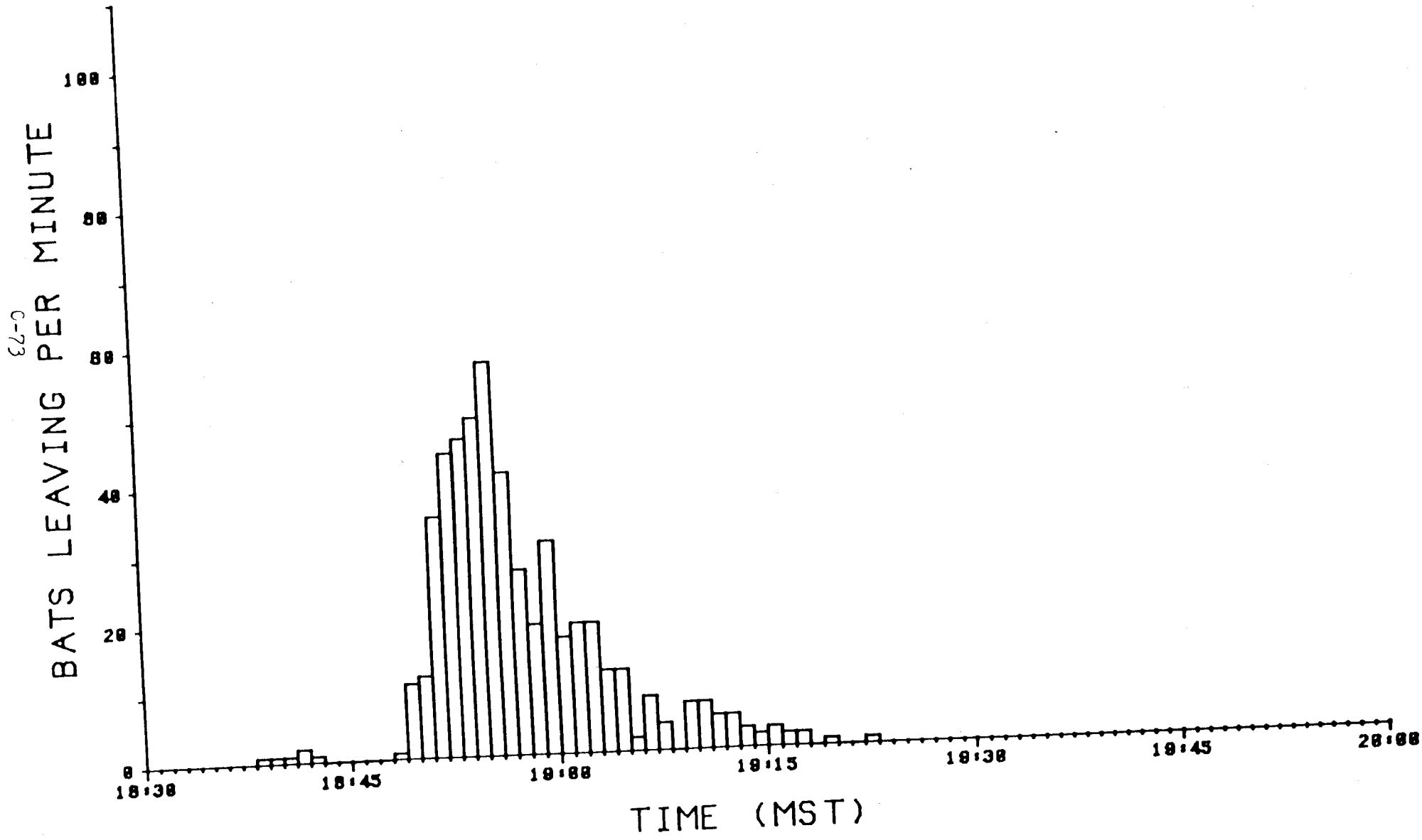
KARTCHNER CAVERNS BAT FLIGHT

DATE 8/29/90 TOTAL= 695 BATS



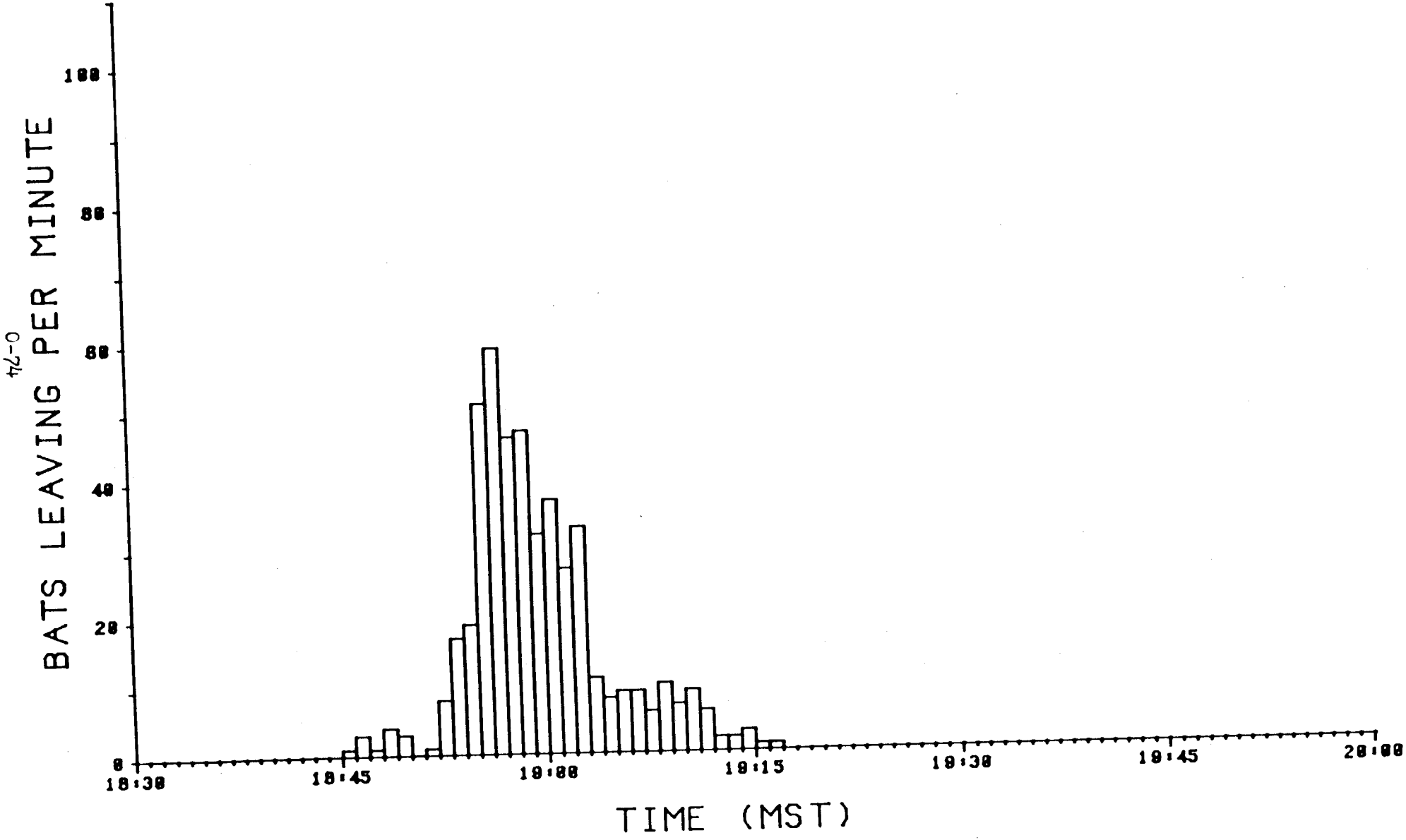
KARTCHNER CAVERNS BAT FLIGHT

DATE 9/1/90 TOTAL= 510 BATS



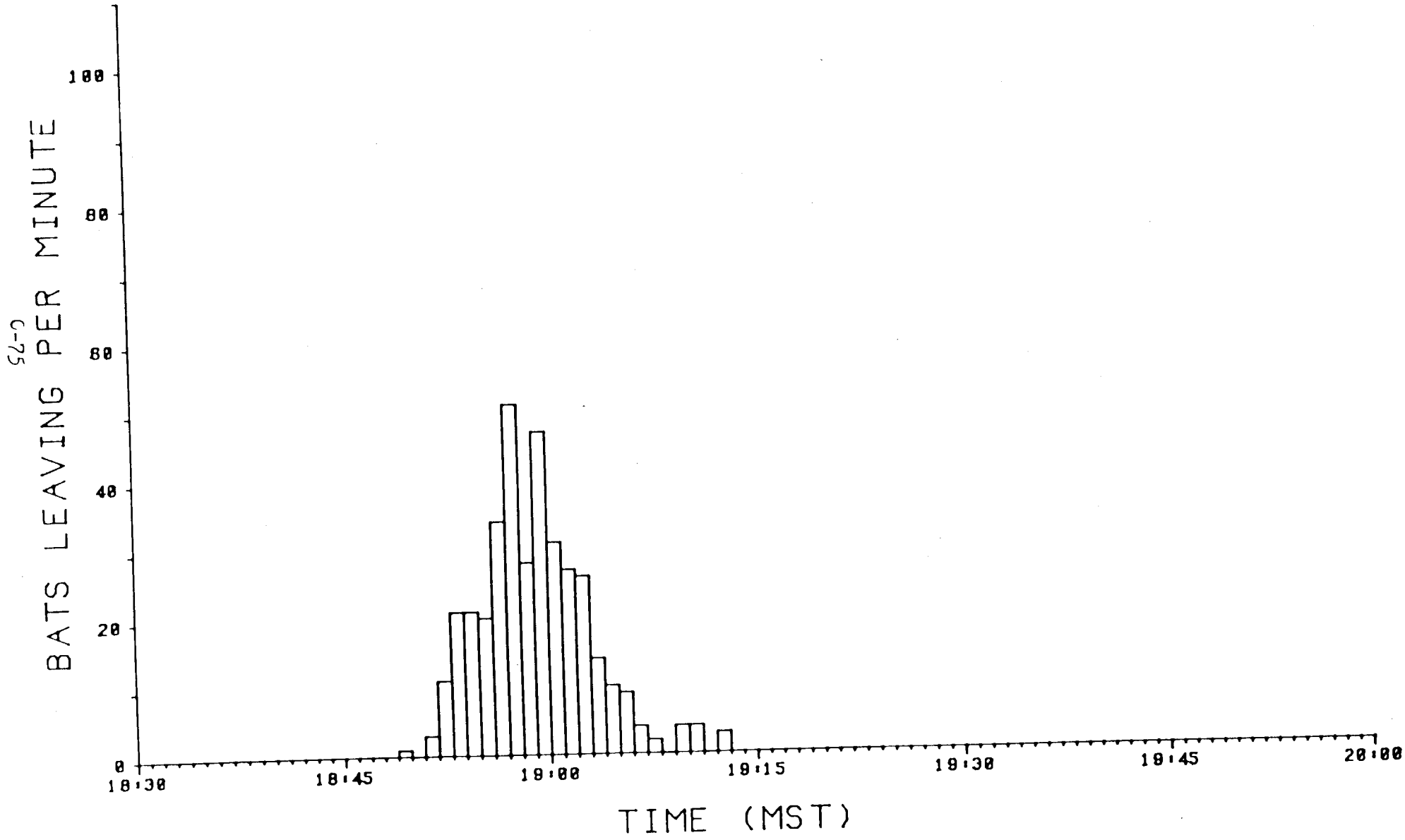
KARTCHNER CAVERNS BAT FLIGHT

DATE 9/3/90 TOTAL= 473 BATS



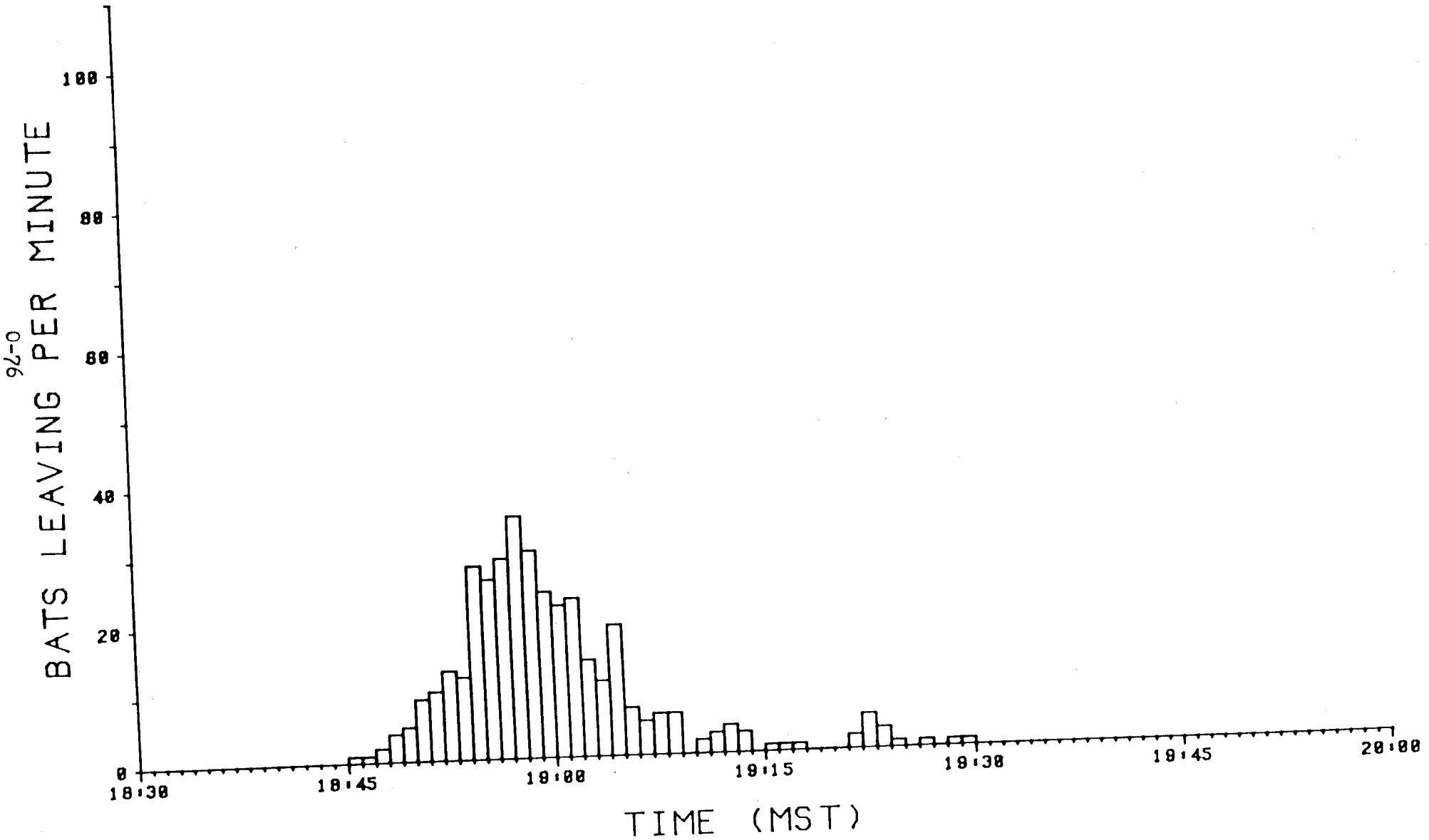
KARTCHNER CAVERNS BAT FLIGHT

DATE 9/7/90 TOTAL= 371 BATS



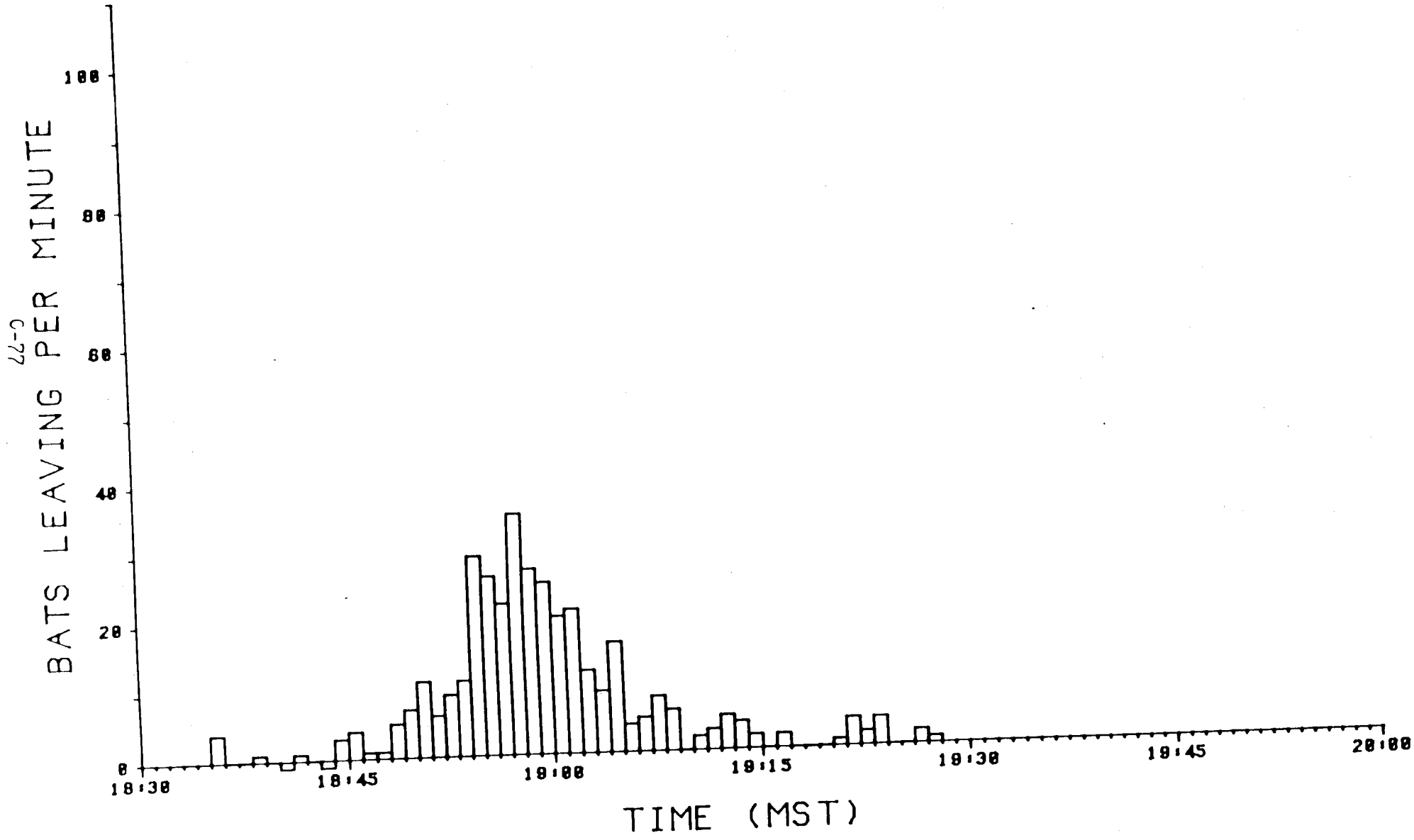
KARTCHNER CAVERNS BAT FLIGHT

DATE 9/8/90A JOHN TOTAL= 371 BATS



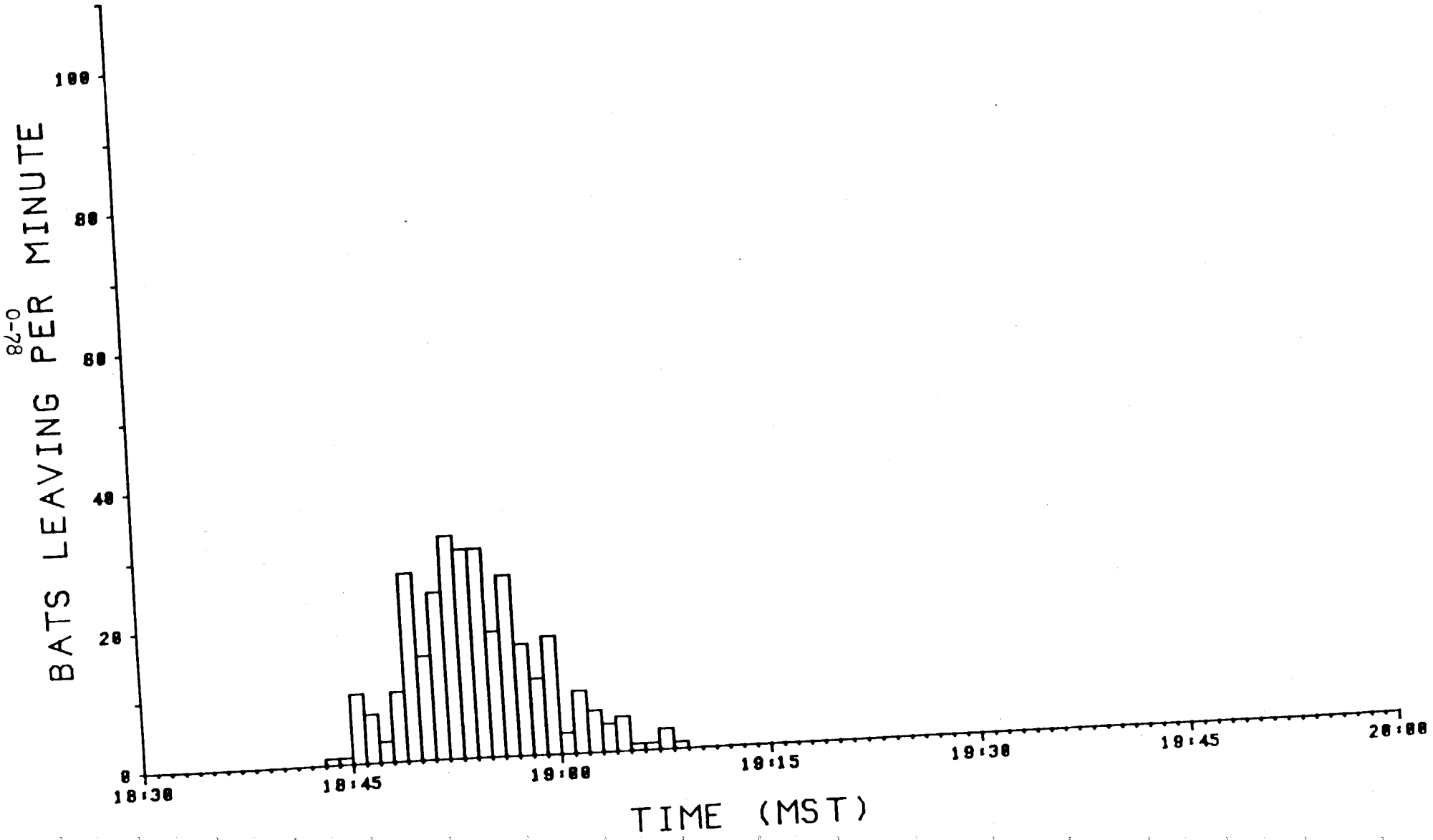
KARTCHNER CAVERNS BAT FLIGHT

DATE 9/8/90B BLOCKADE ROOM TOTAL= 359 BATS



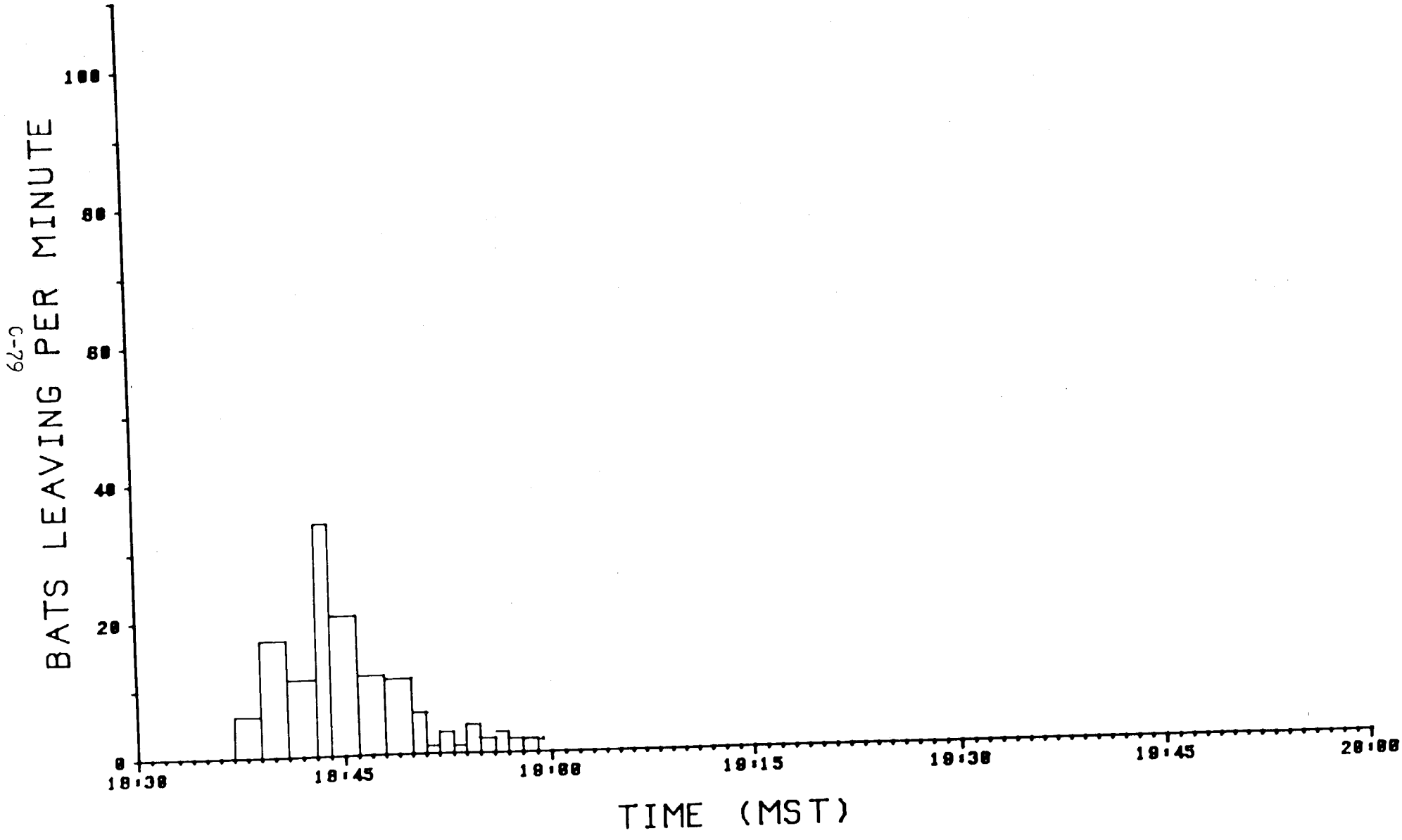
KARTCHNER CAVERNS BAT FLIGHT

DATE 9/12/90 TOTAL= 311 BATS



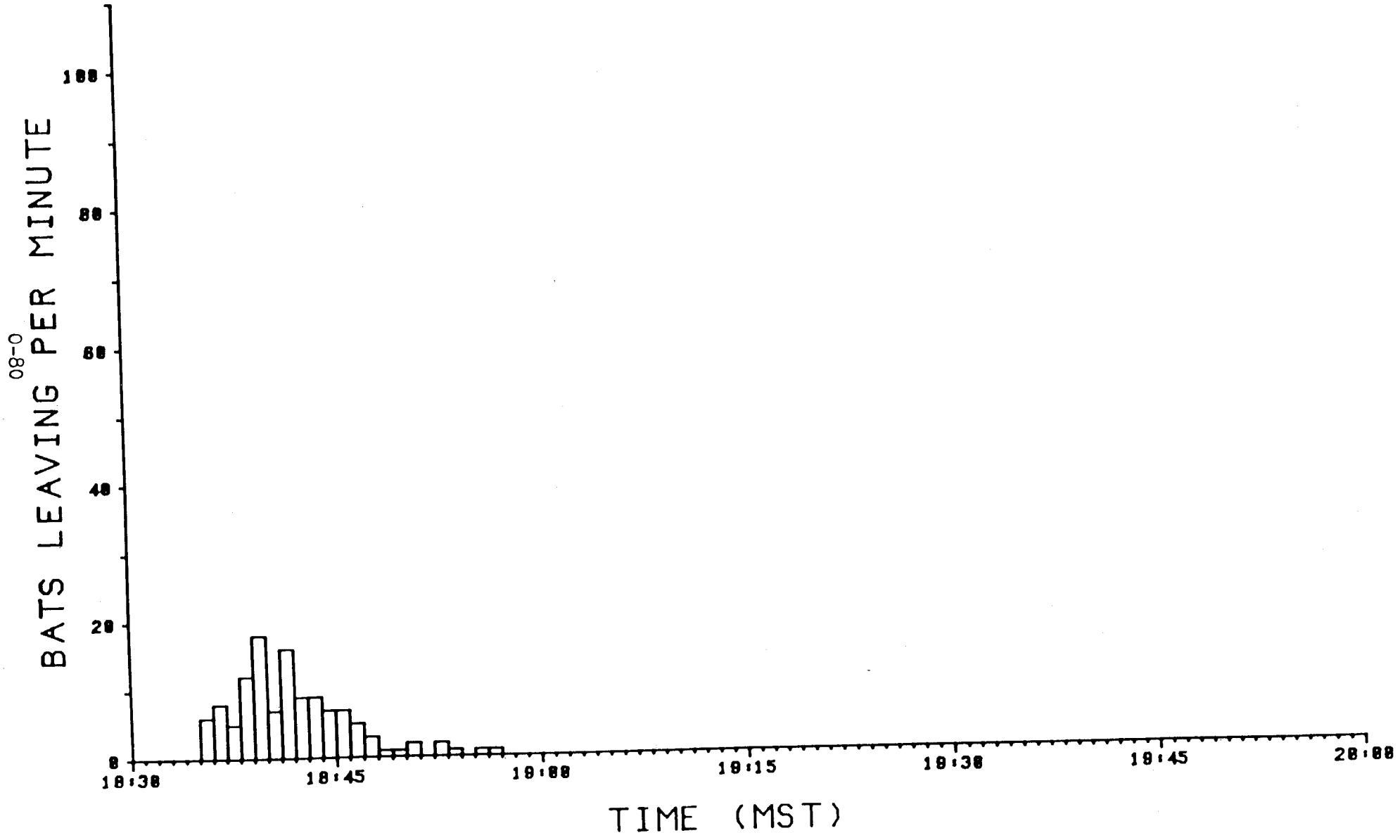
KARTCHNER CAVERNS BAT FLIGHT

DATE 9/15/90 TOTAL= 212 BATS



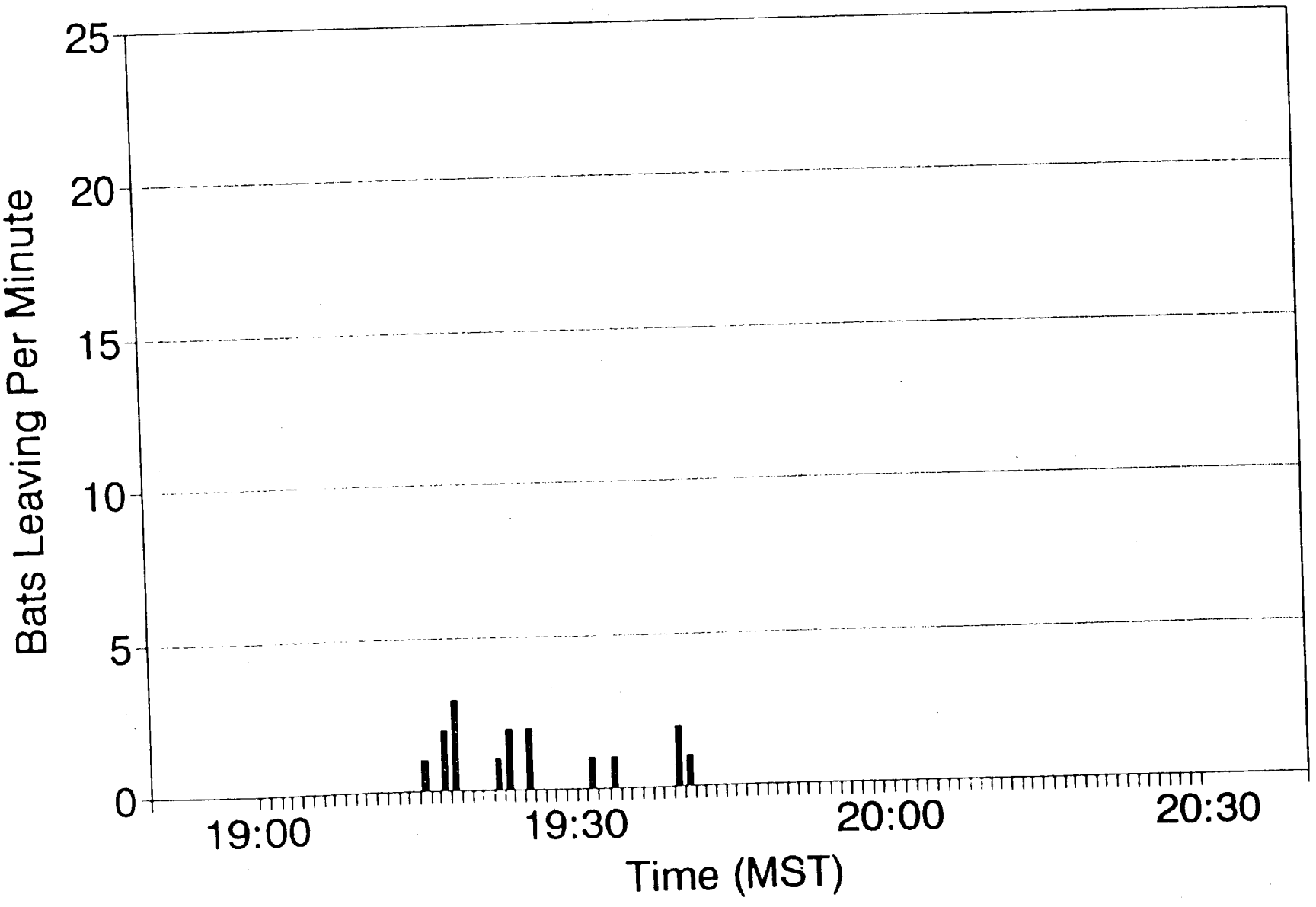
KARTCHNER CAVERNS BAT FLIGHT

DATE 9/19/90 TOTAL= 121 BATS



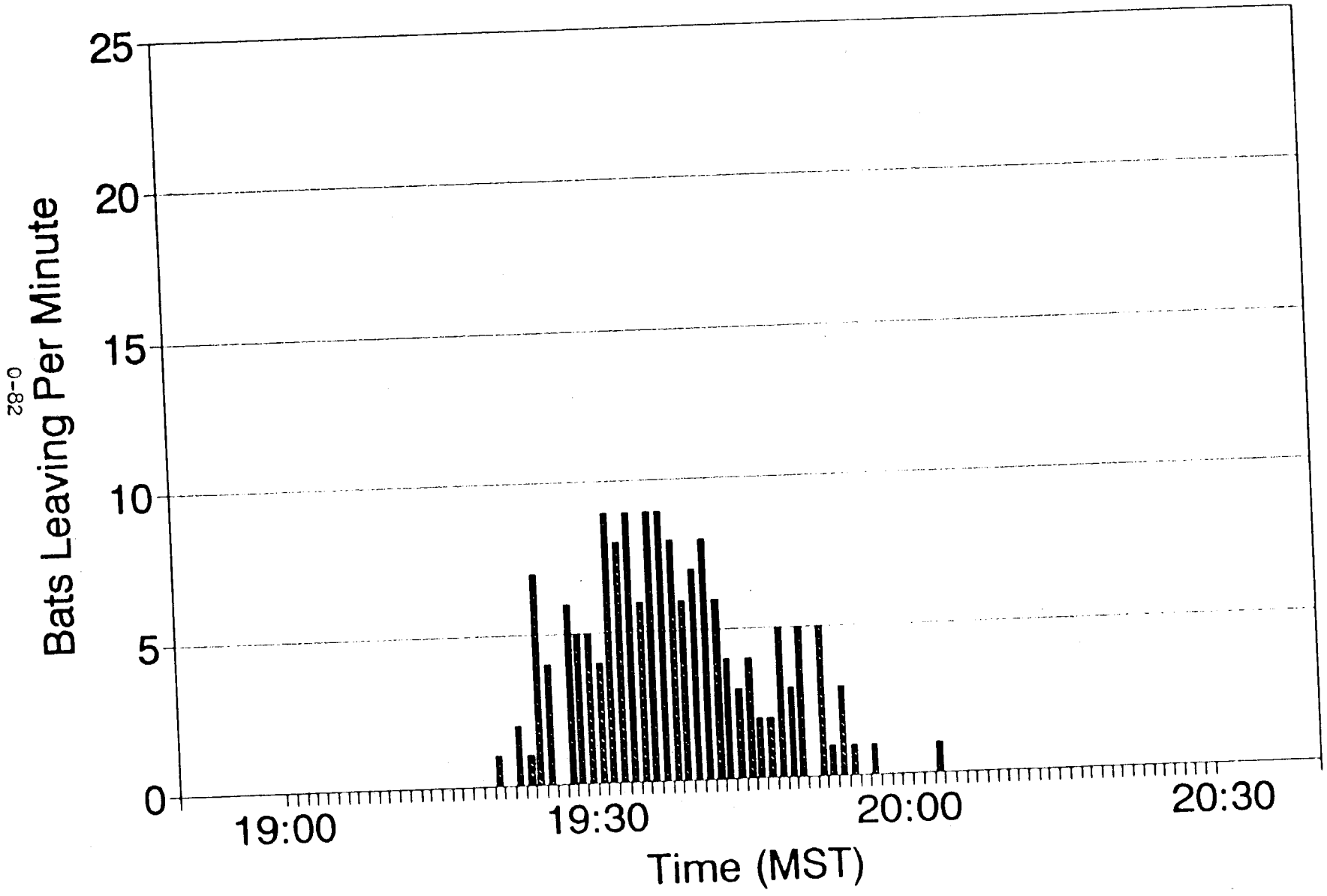
Kartchner Caverns Bat Flight

May 5, 1991 Total # of Bats 16

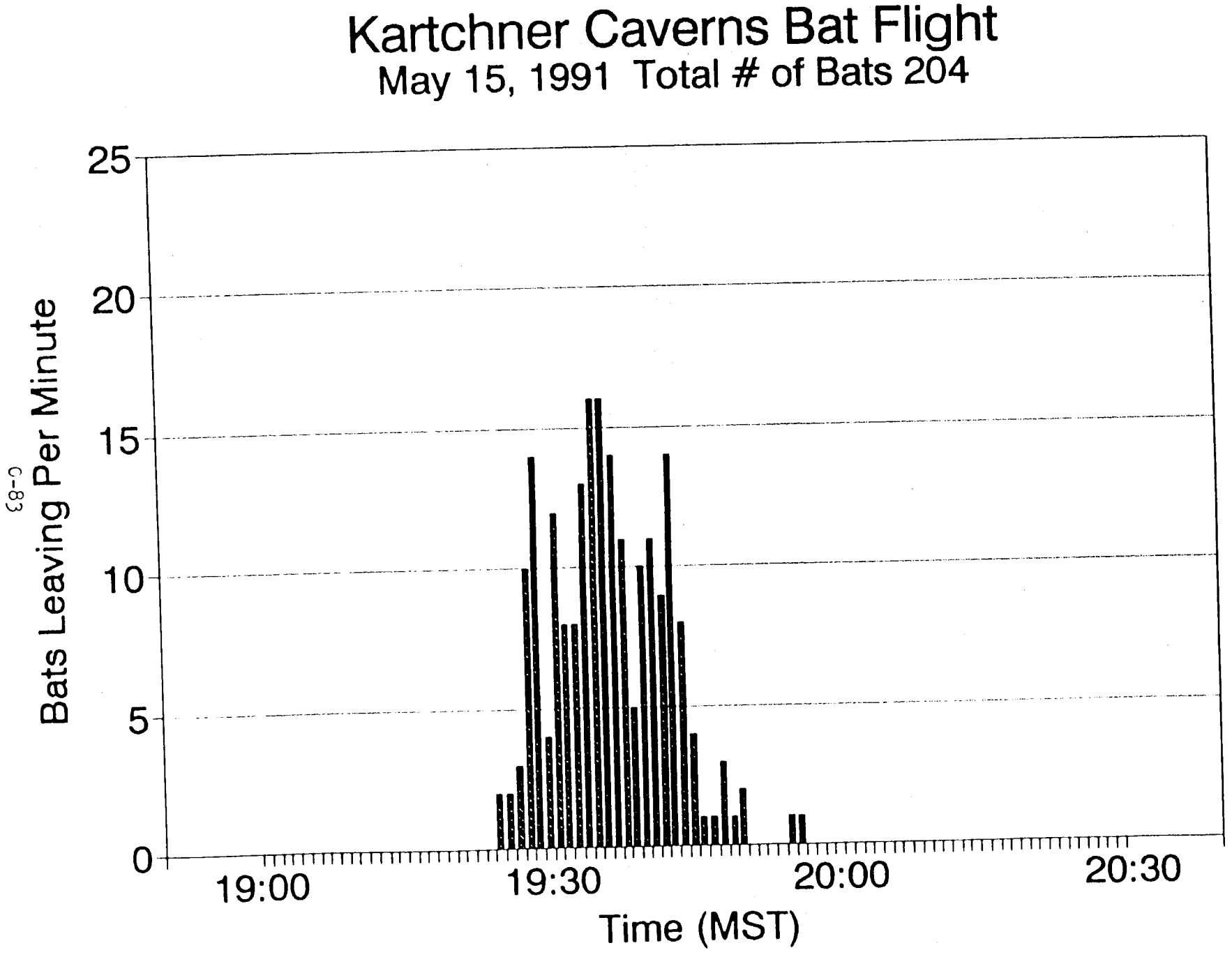


Kartchner Caverns Bat Flight

May 8, 1991 Total # of Bats 160

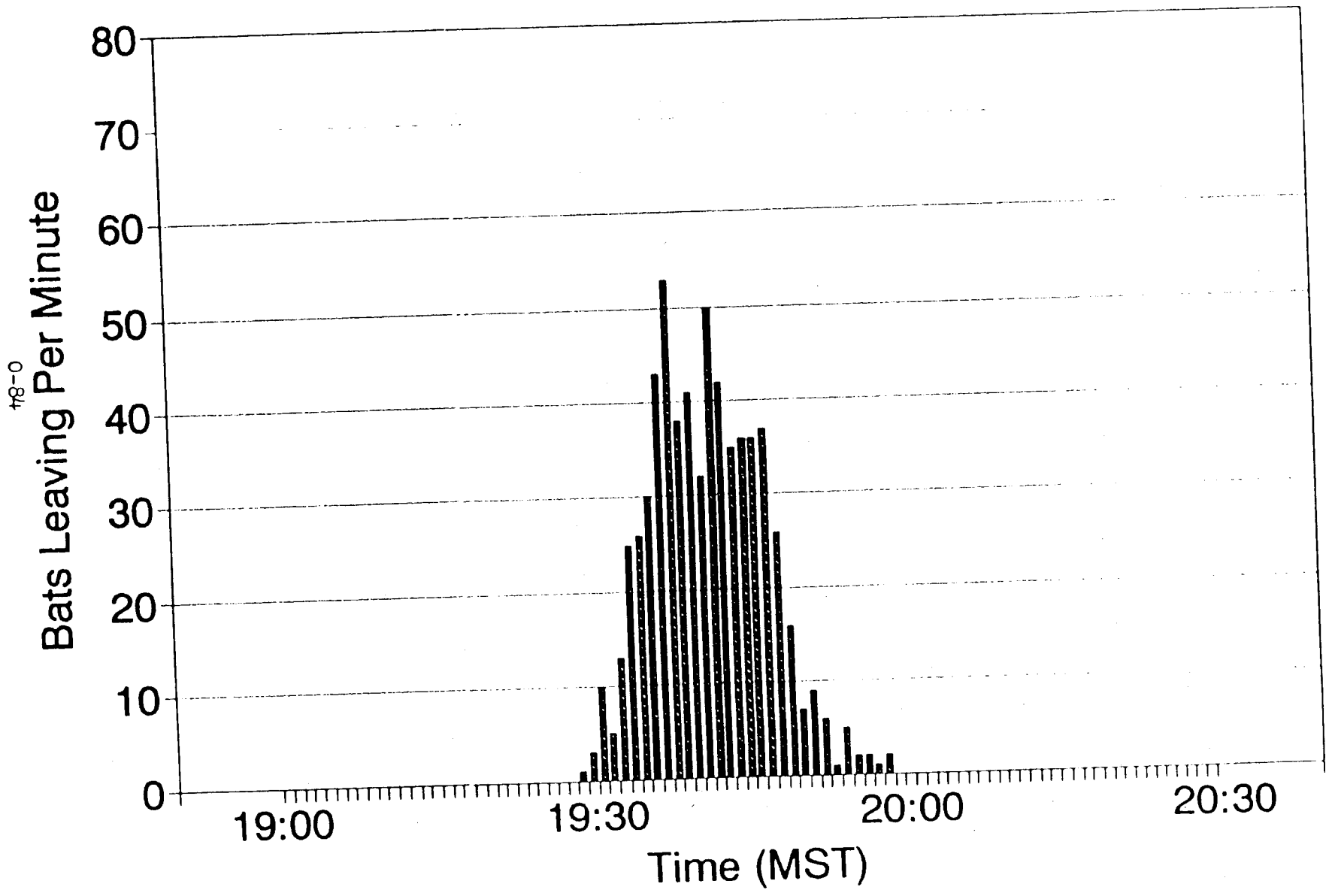


0-82

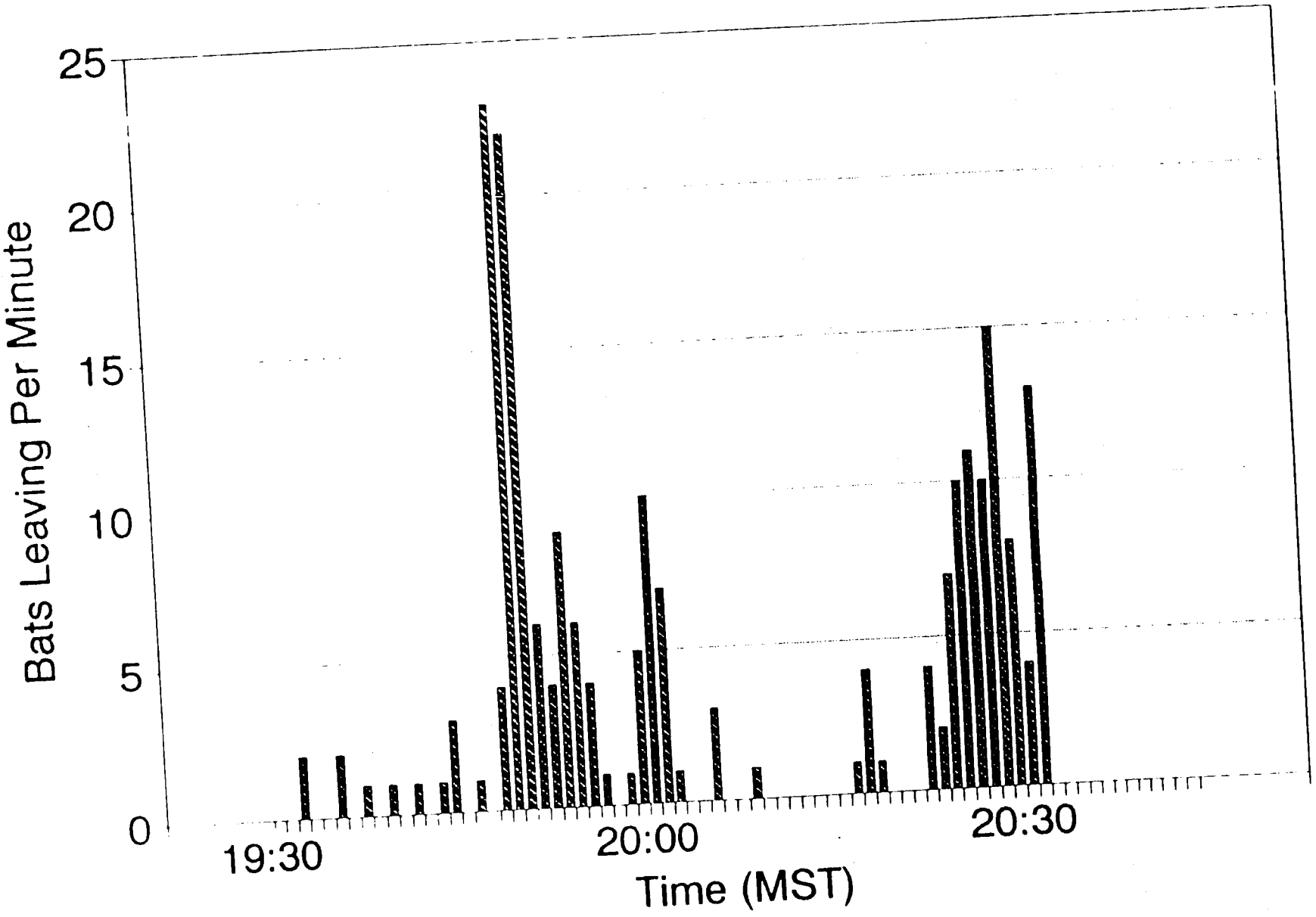

Kartchner Caverns Bat Flight
May 15, 1991 Total # of Bats 204
Bats Leaving Per Minute
25
20
15
10
5
0
19:00
19:30
20:00
20:30
Time (MST)

Kartchner Caverns Bat Flight

May 23, 1991 Total # of Bats 633

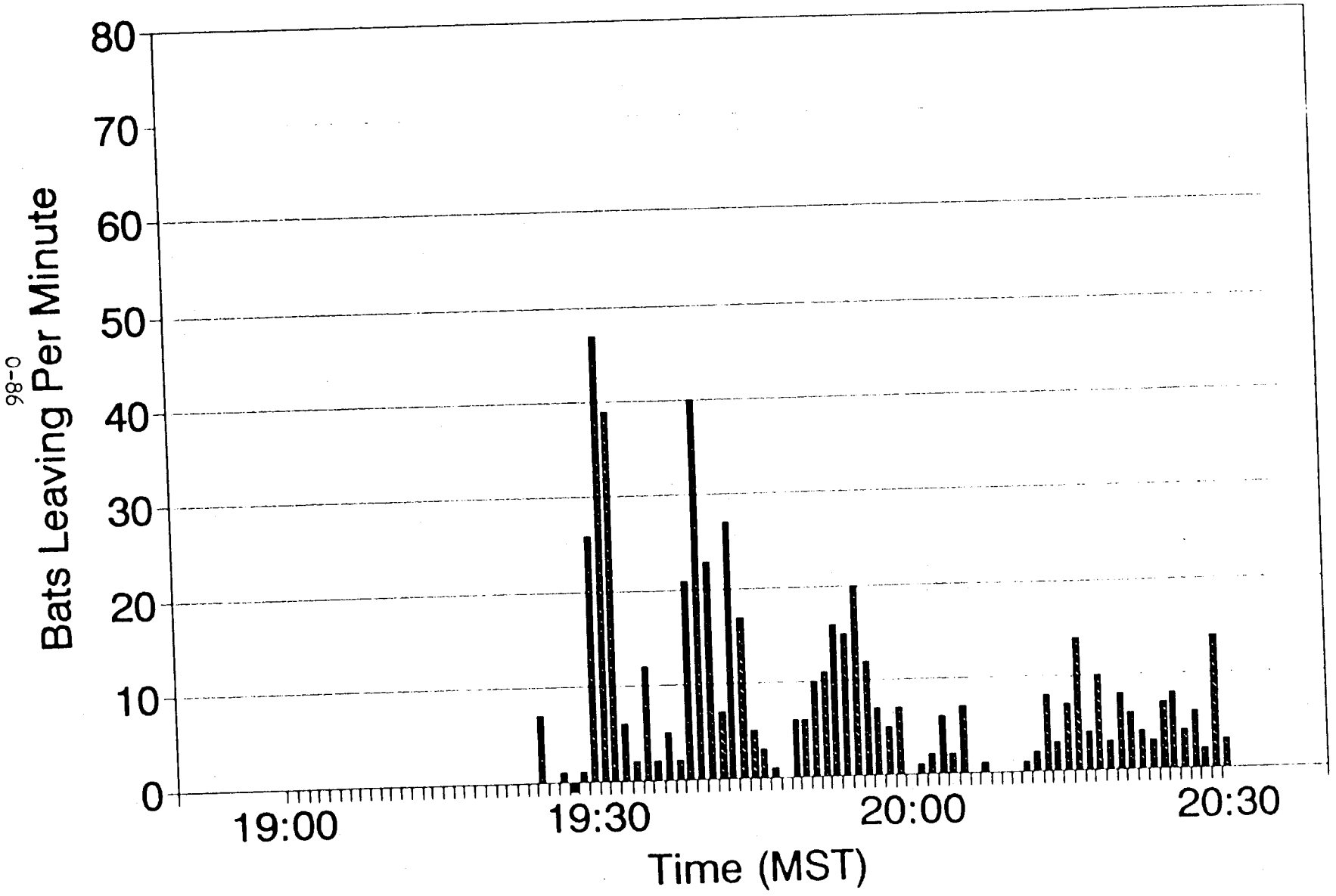


Kartchner Caverns Bat Flight
May 29, 1991 Total # of Bats = 209



Kartchner Caverns Bat Flight

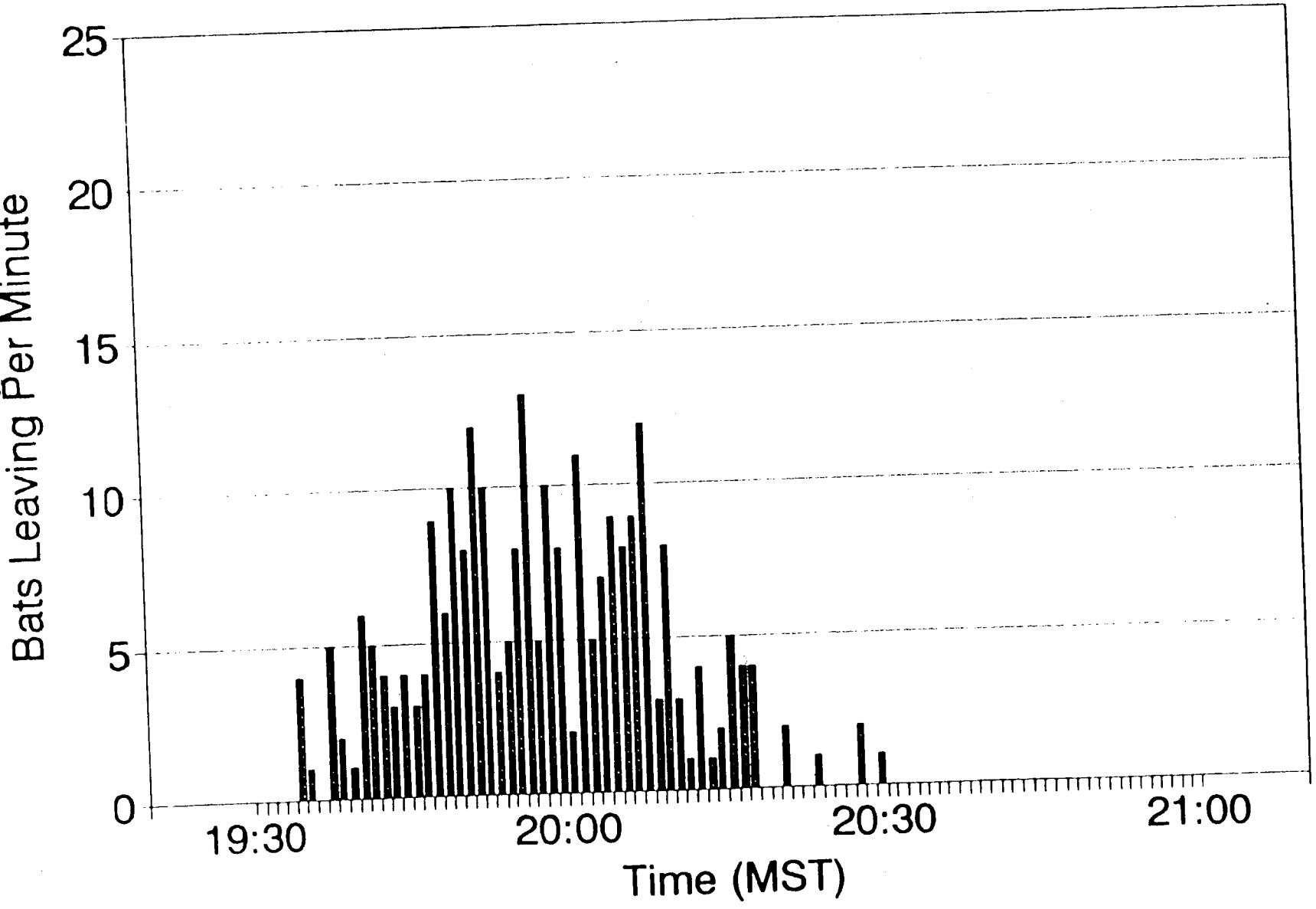
May 30, 1991 Total # of Bats 544



98-0

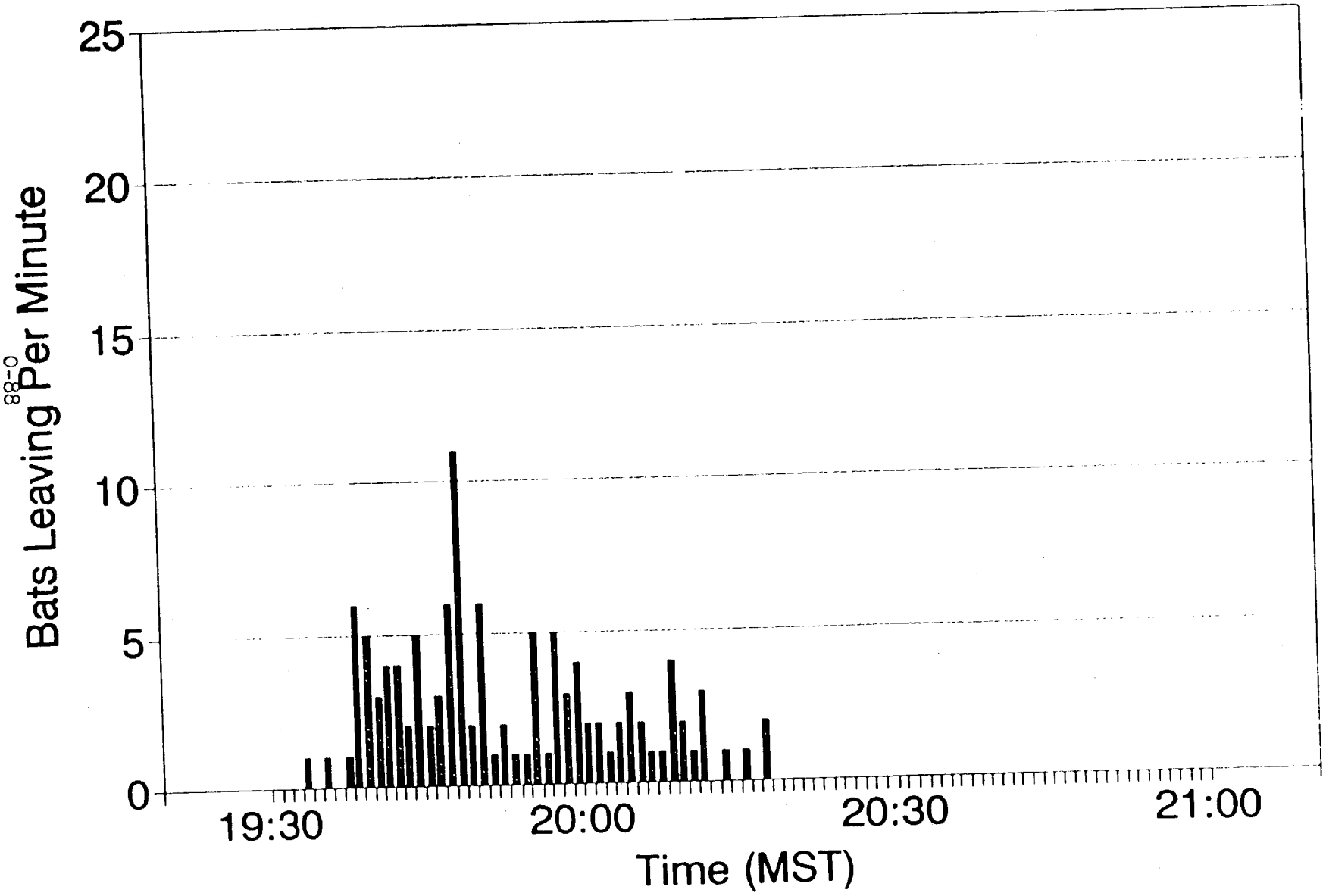
Kartchner Caverns Bat Flight

June 5, 1991 Total # of Bats 254



Kartchner Caverns Bat Flight

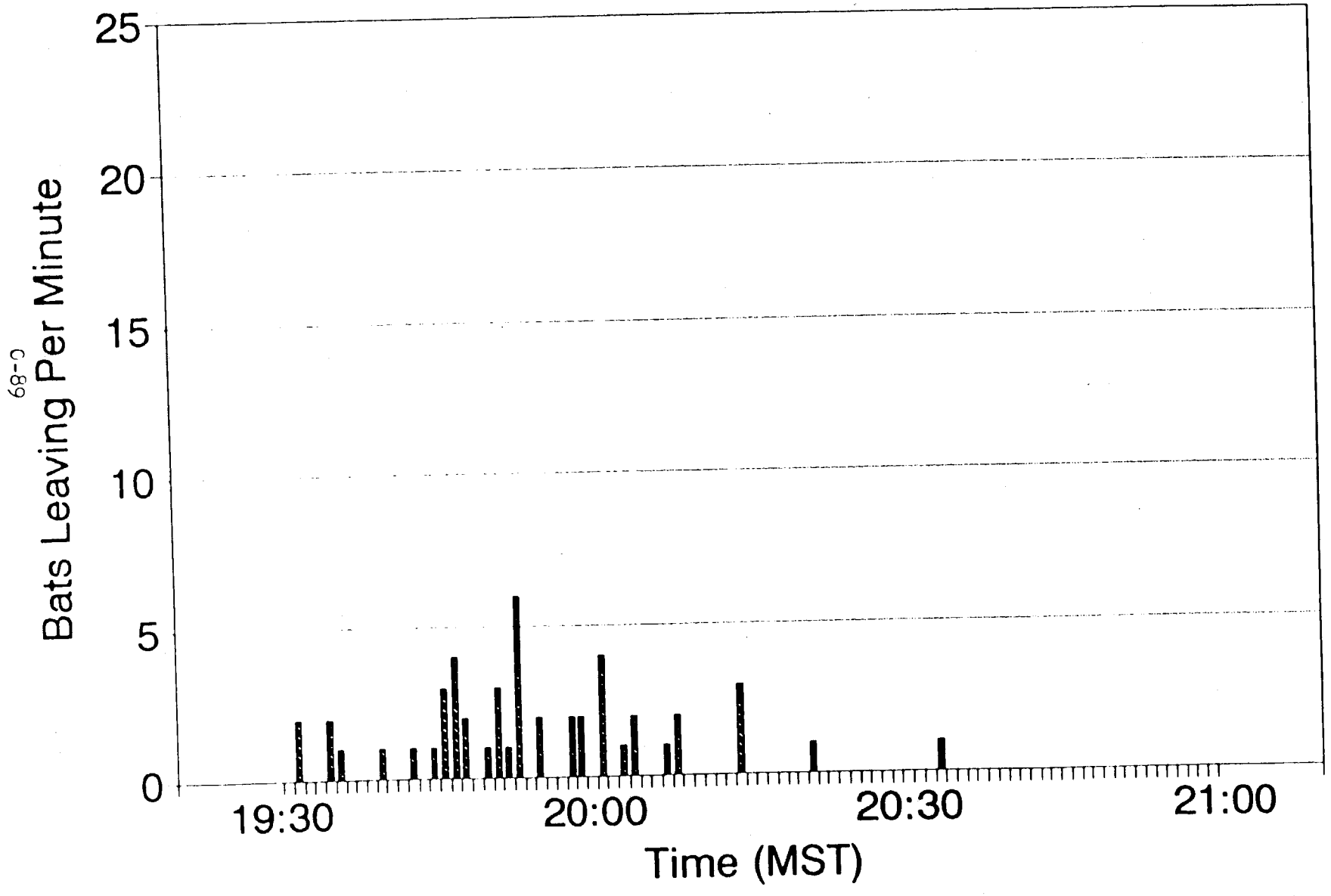
June 11, 1991 Total # of Bats 113



88-0

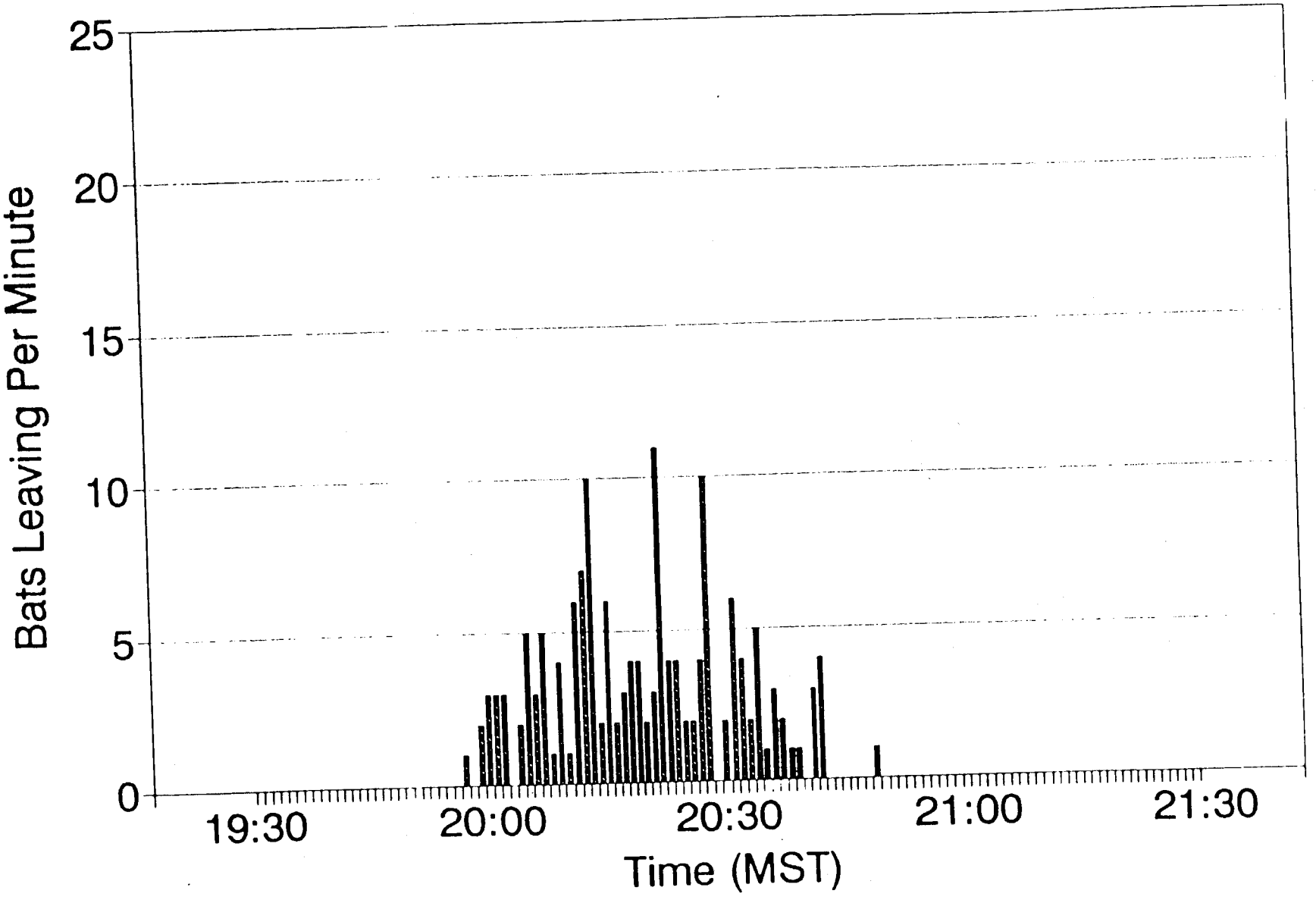
Kartchner Caverns Bat Flight

June 14, 1991 Total # of Bats 49



Kartchner Caverns Bat Flight

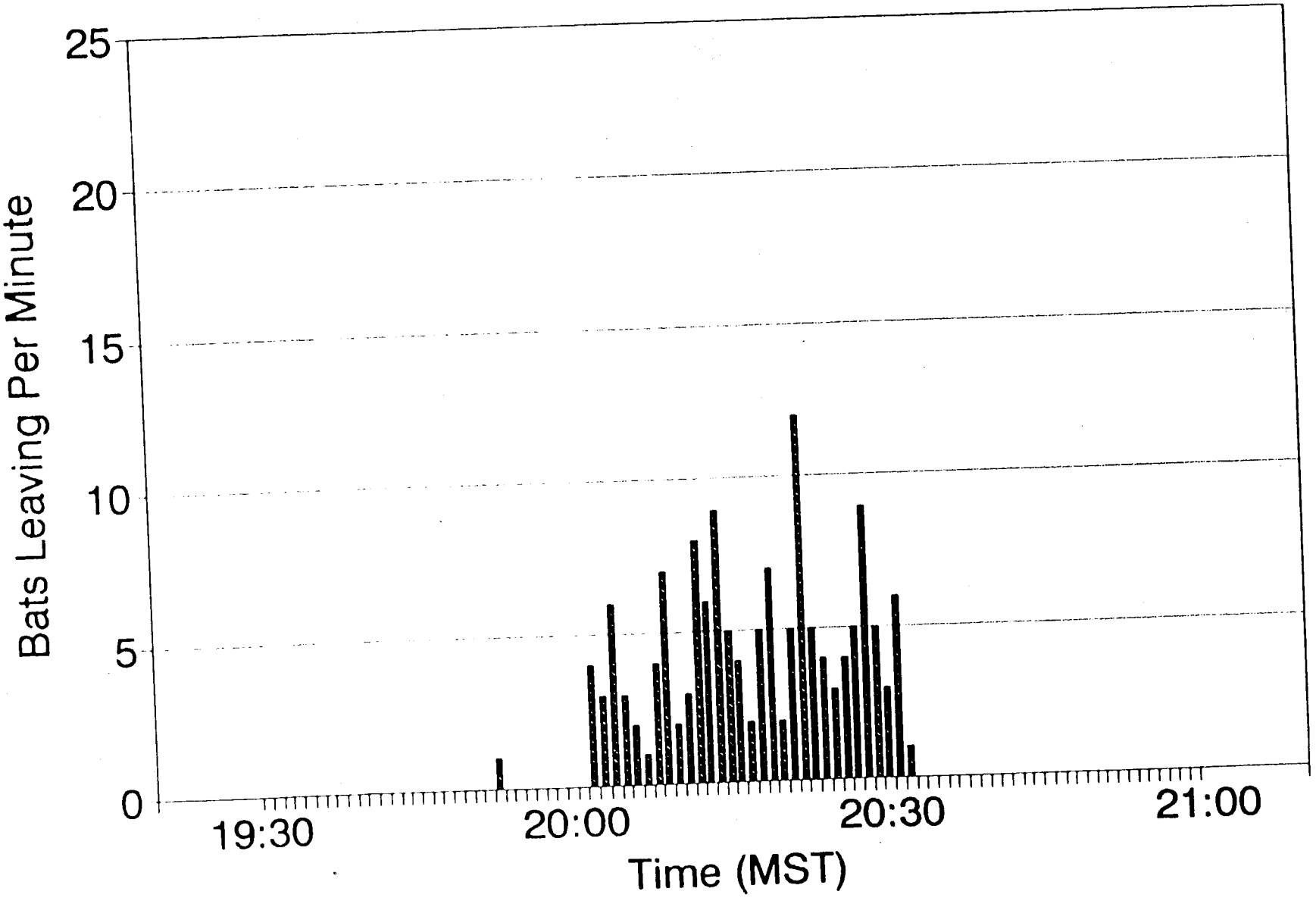
June 19, 1991 Total # of Bats 154



06-0

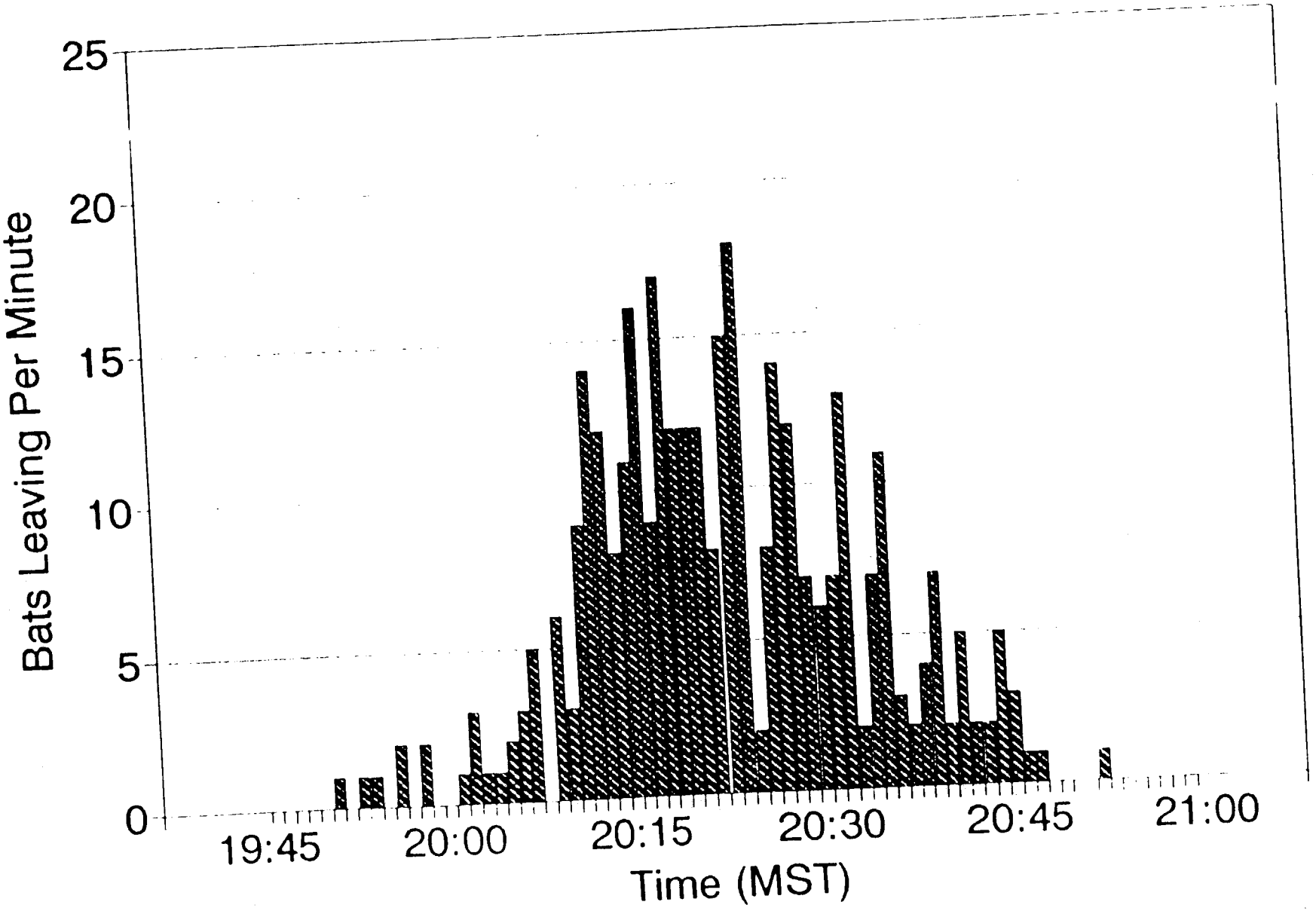
Kartchner Caverns Bat Flight

June 23, 1991 Total # of Bats 146



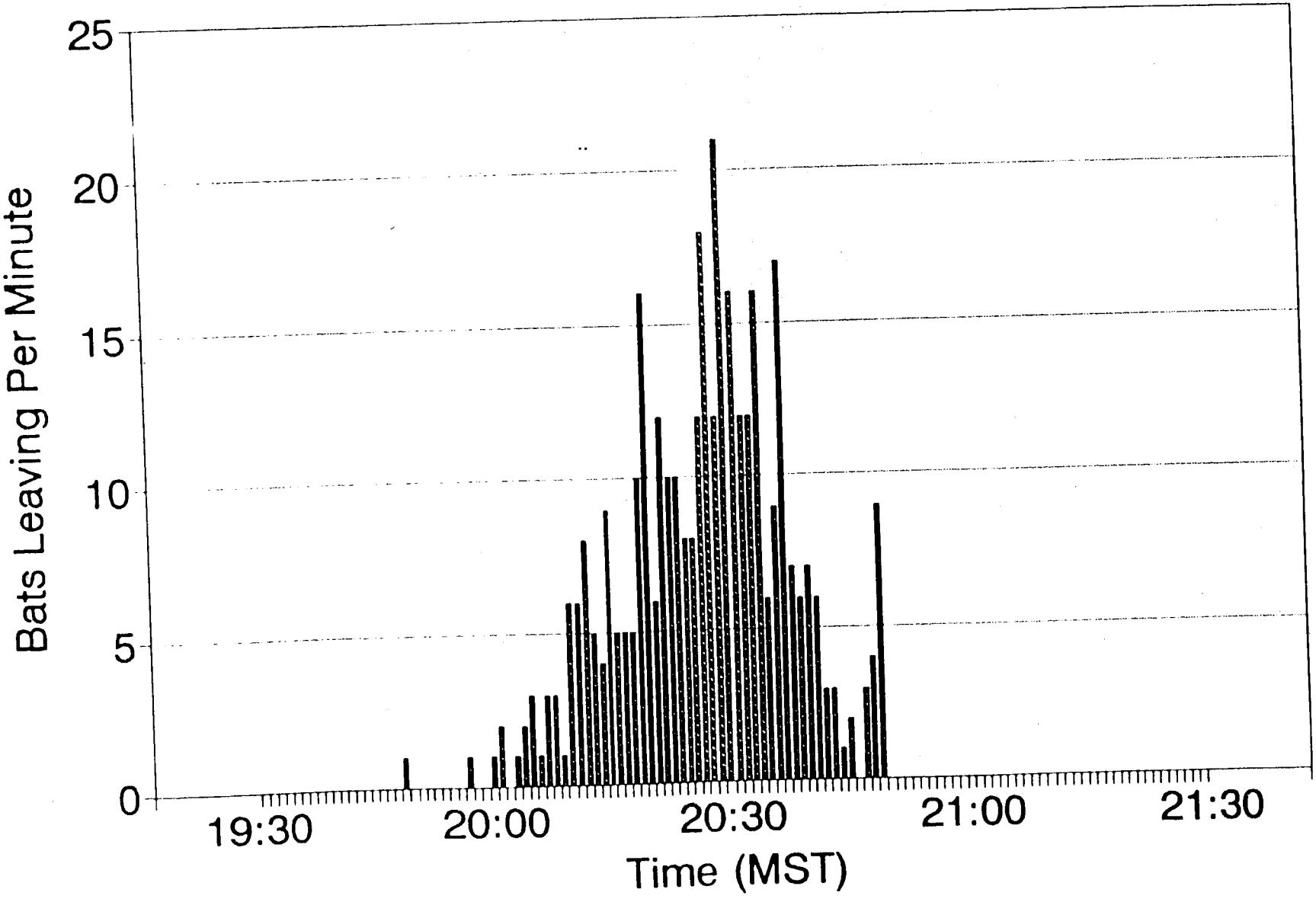
Kartchner Caverns Bat Flight

June 27, 1991 Total Bats = 332



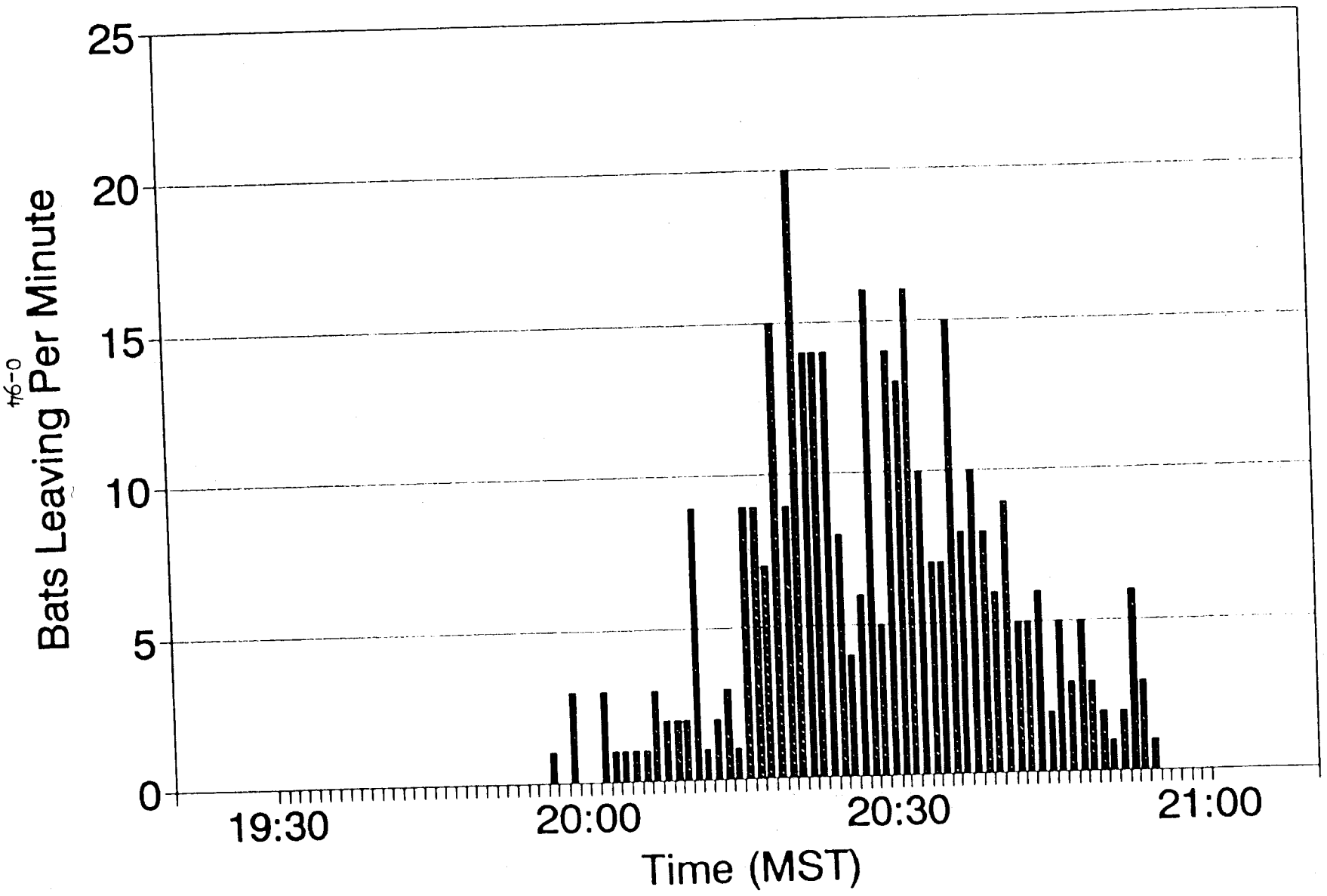
Kartchner Caverns Bat Flight

June 30, 1991 Total # of Bats 354



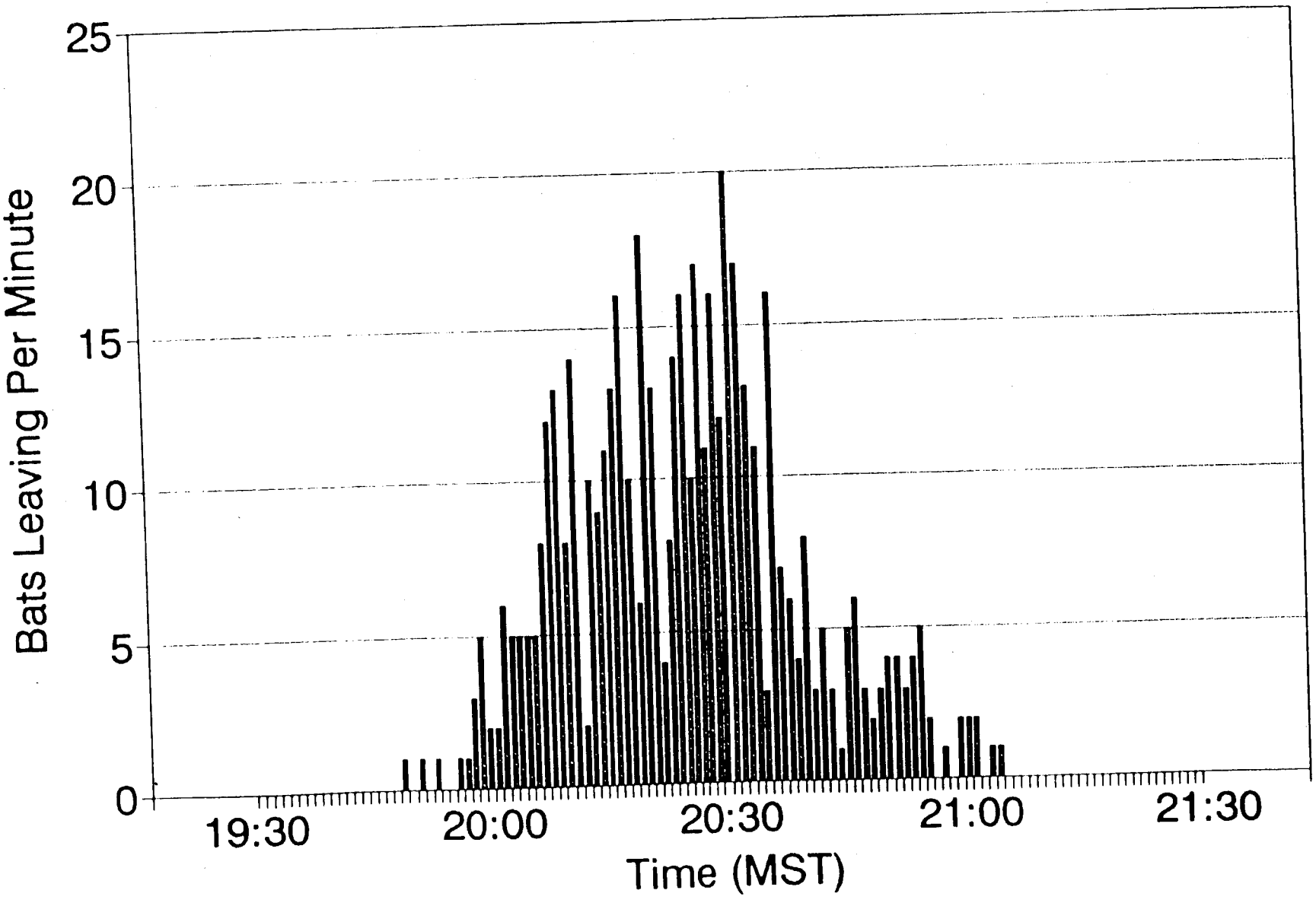
Kartchner Caverns Bat Flight

July 1, 1991 Total # of Bats 358



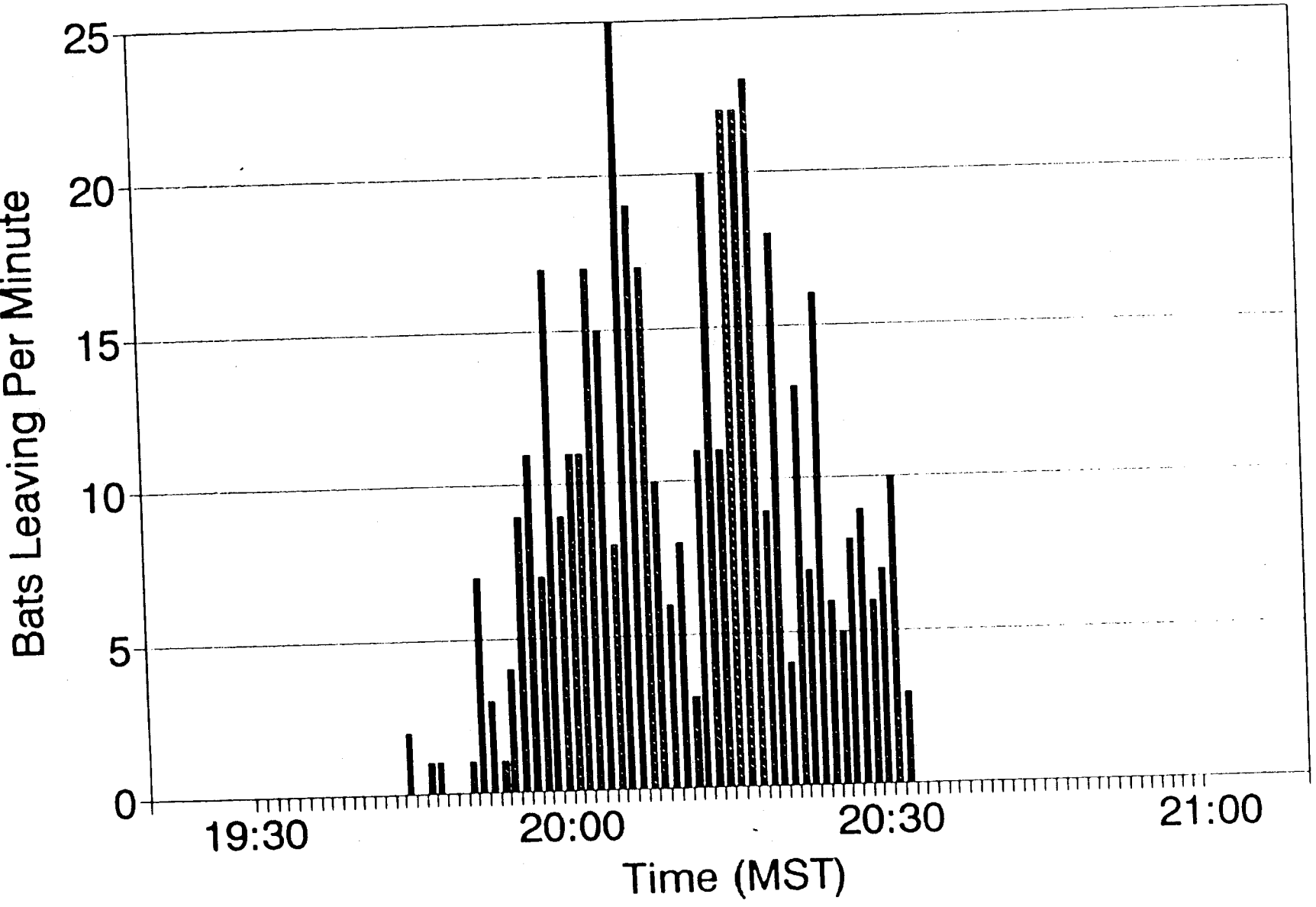
Kartchner Caverns Bat Flight

July 4, 1991 Total # of Bats 481



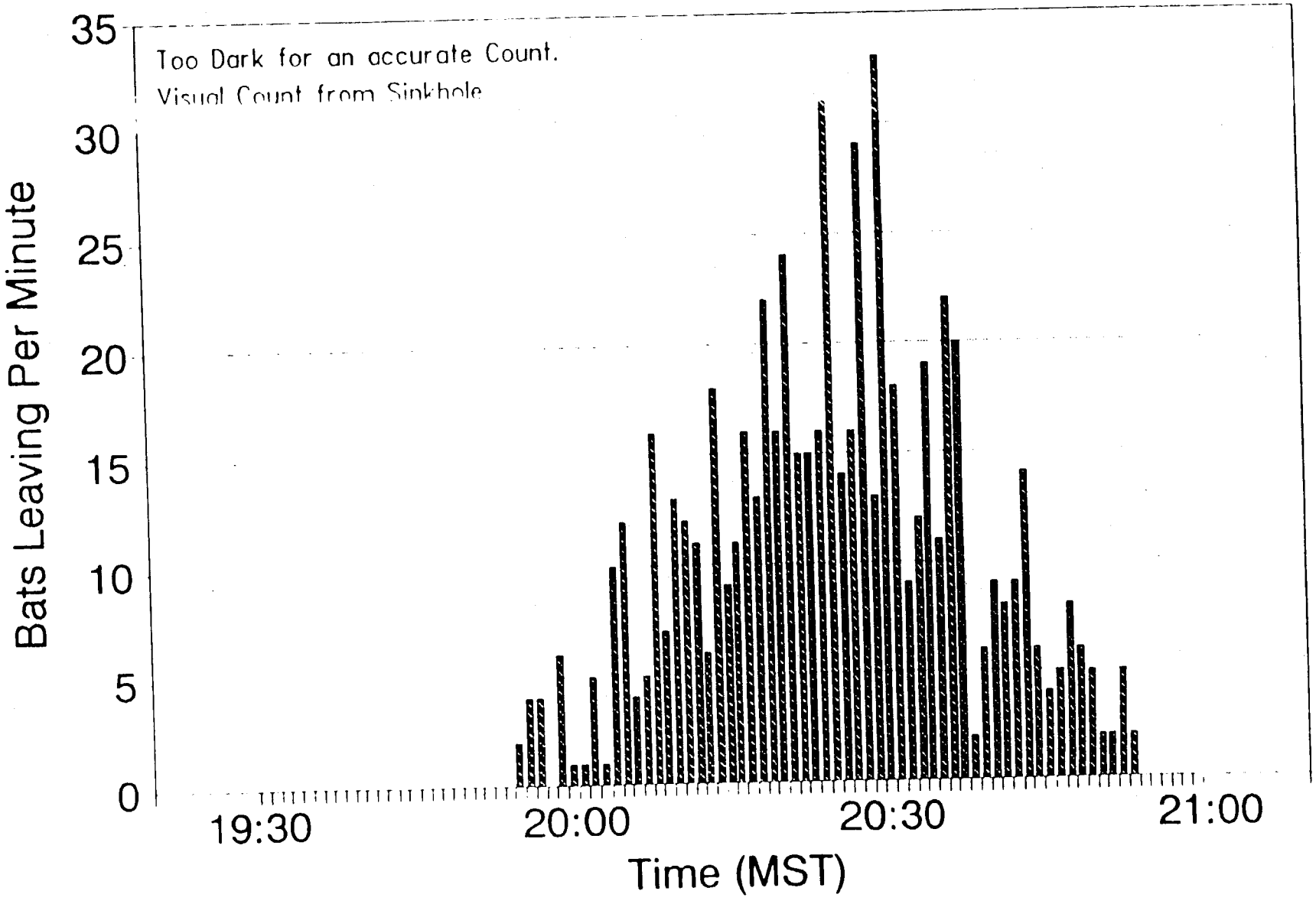
Kartchner Caverns Bat Flight

July 7, 1991 Total # of Bats 453

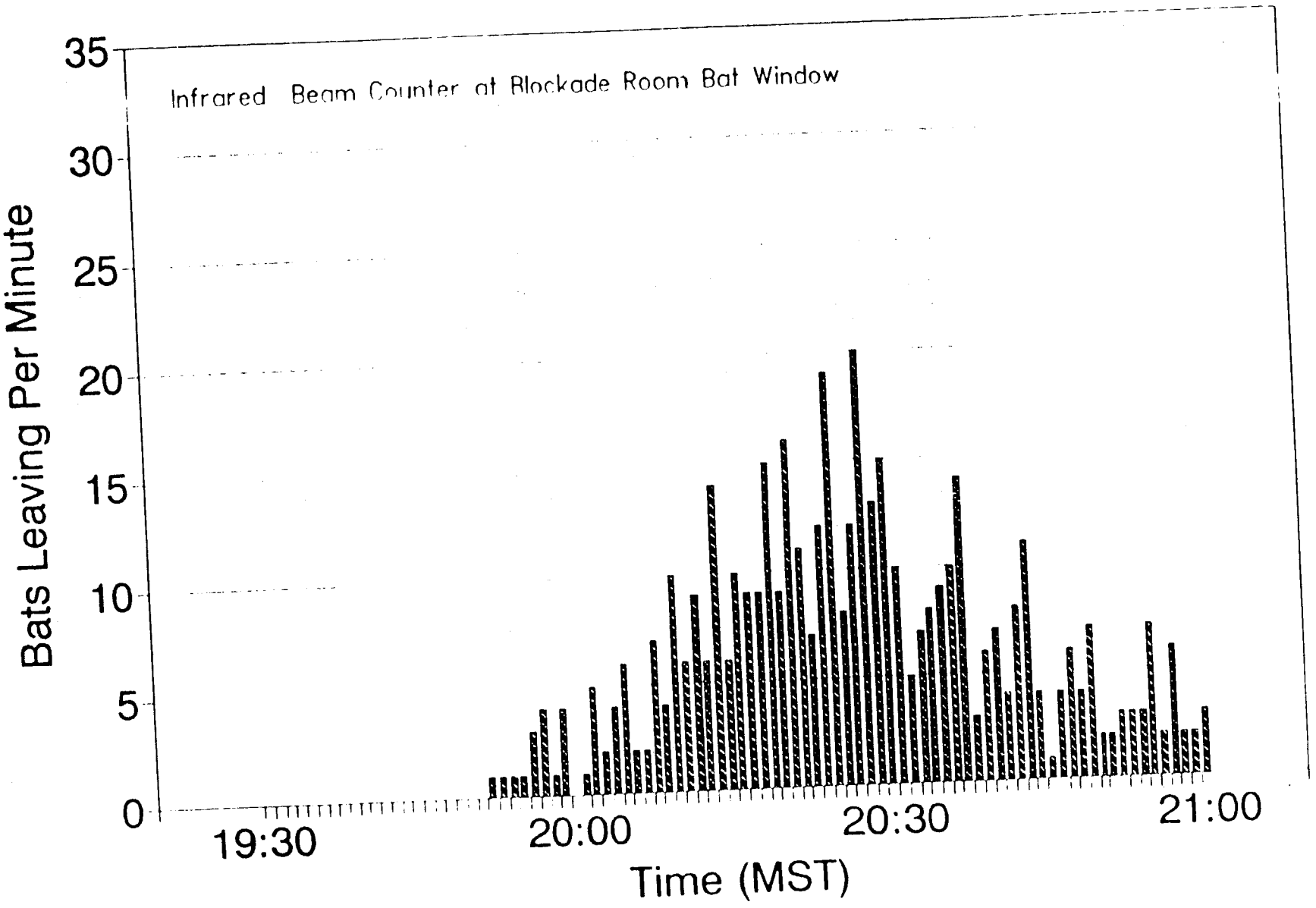


96-0

Kartchner Caverns Bat Flight
July 10, 1991 Total # of Bats 635?



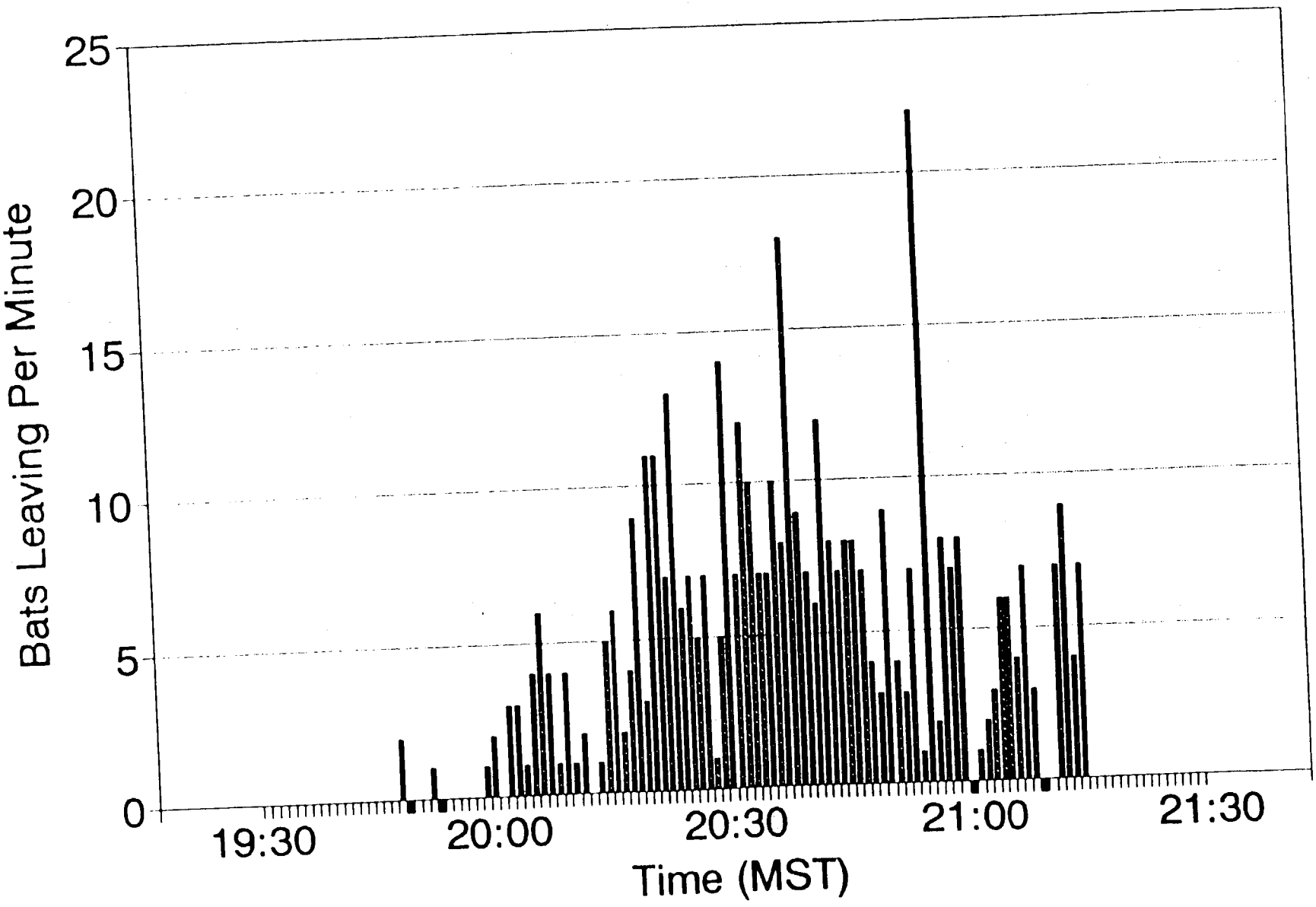
Kartchner Caverns Bat Flight
July 10, 1991 Total # of Bats 481



86-0

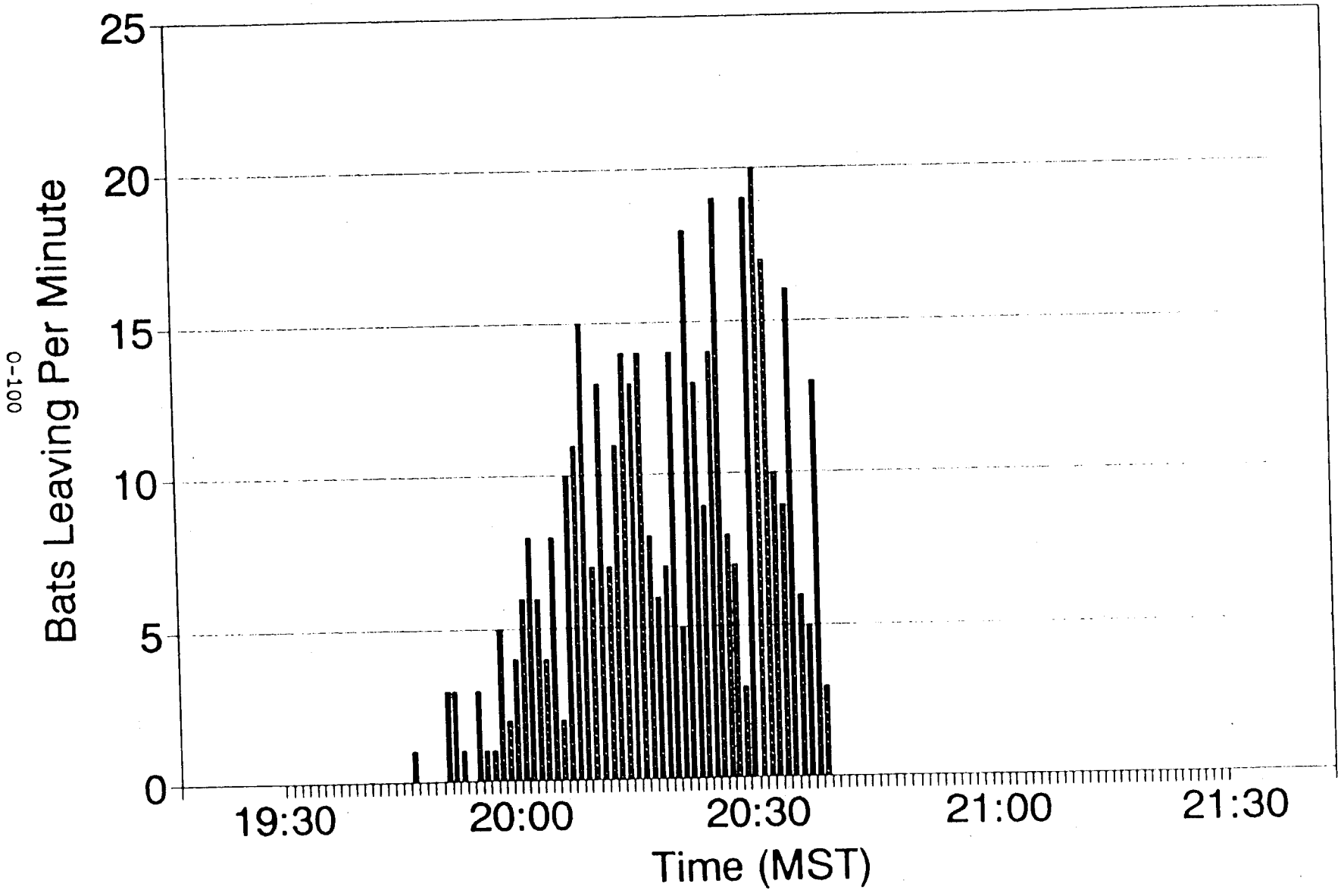
Kartchner Caverns Bat Flight

July 11, 1991 Total # of Bats 436



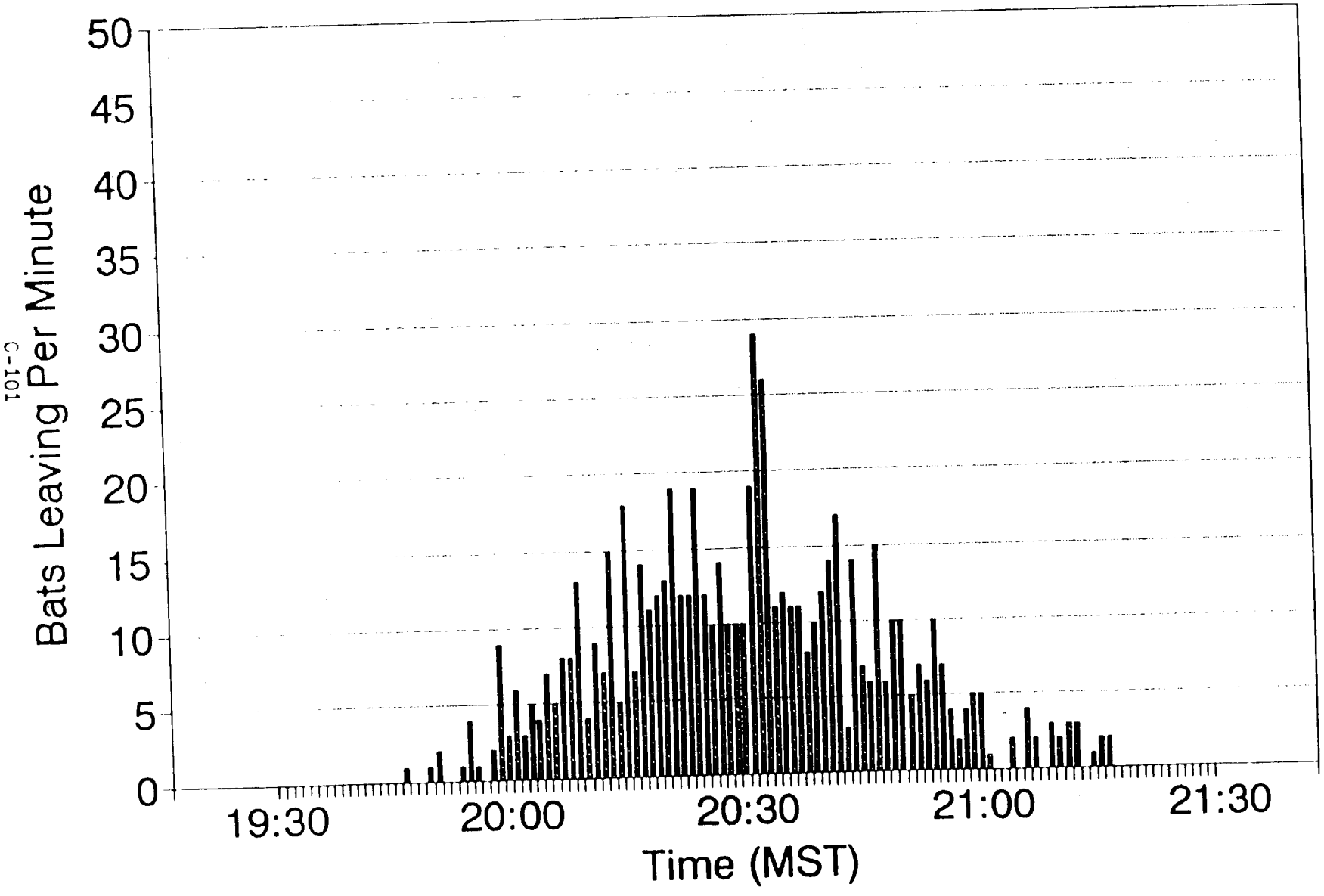
Kartchner Caverns Bat Flight

7/14/91 Total # of Bats 422(partial)

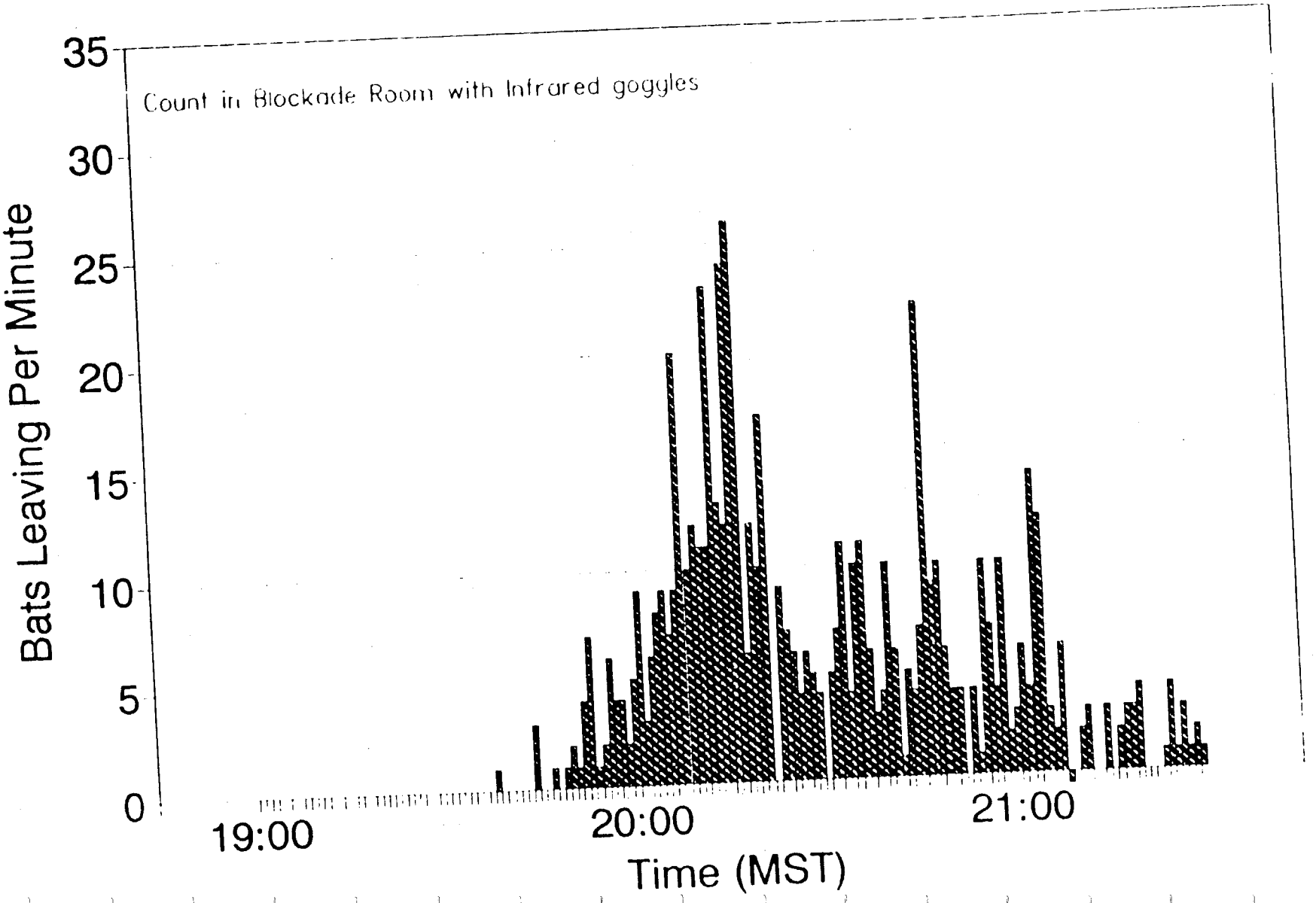


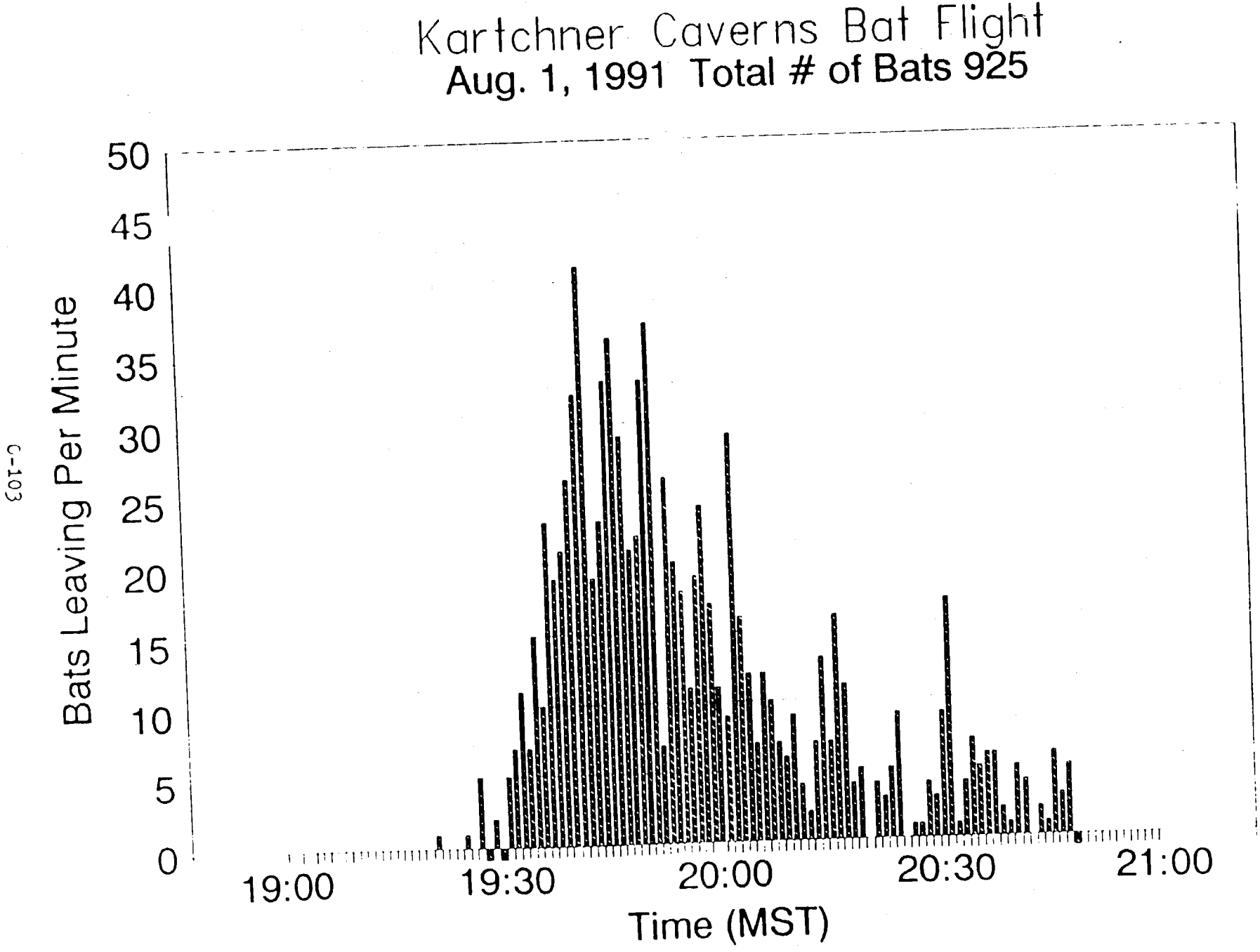
Kartchner Caverns Bat Flight

July 17, 1991 Total # of Bats 657



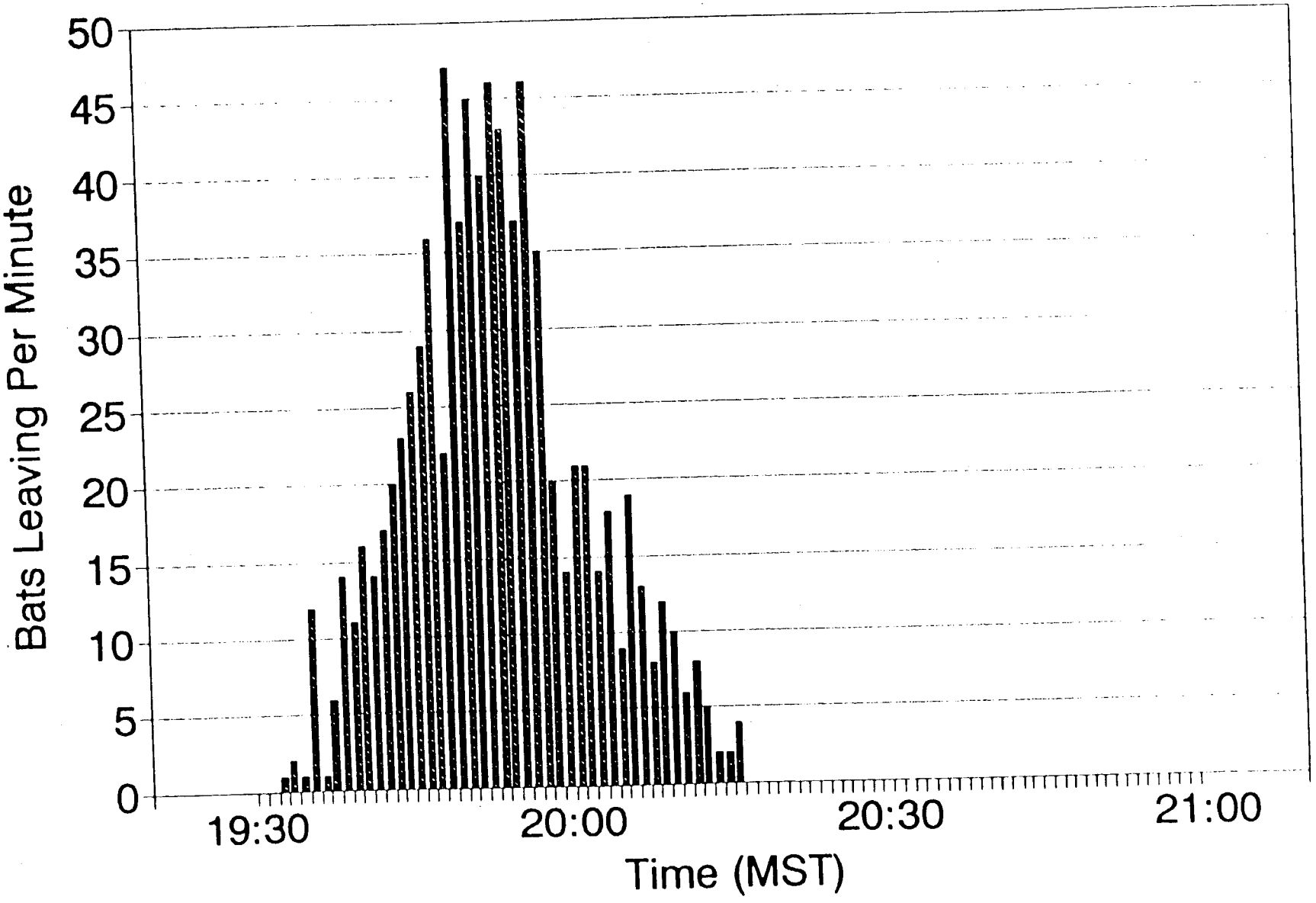
Kartchner Caverns Bat Flight
July 24, 1991 Total # of Bats 612




Kartchner Caverns Bat Flight
Aug. 1, 1991 Total # of Bats 925
Bats Leaving Per Minute
50
45
40
35
30
25
20
15
10
5
0
19:00
19:30
20:00
20:30
21:00
Time (MST)

Kartchner Caverns Bat Flight

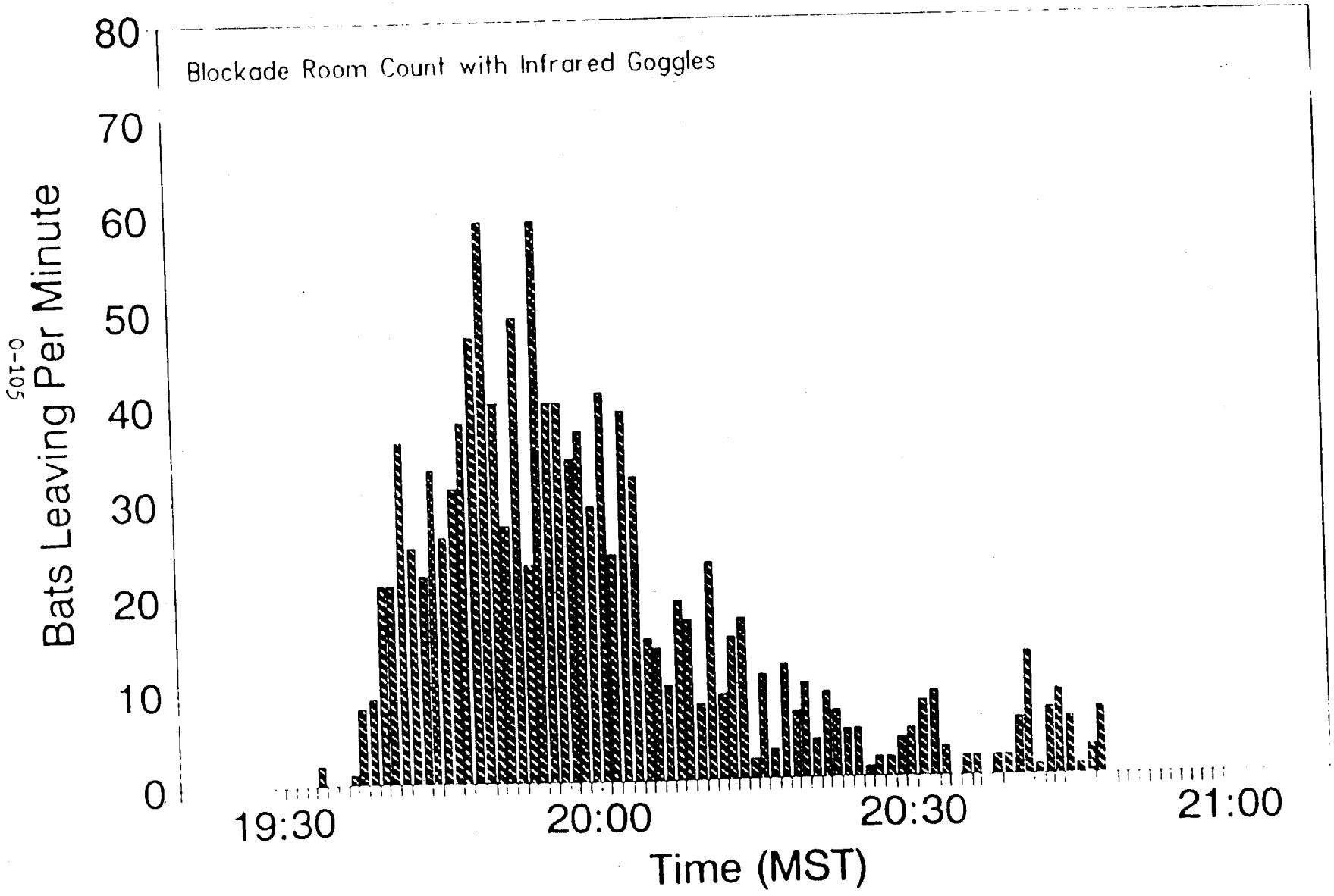
Aug. 4, 1991 Total # of Bats 833



0-104

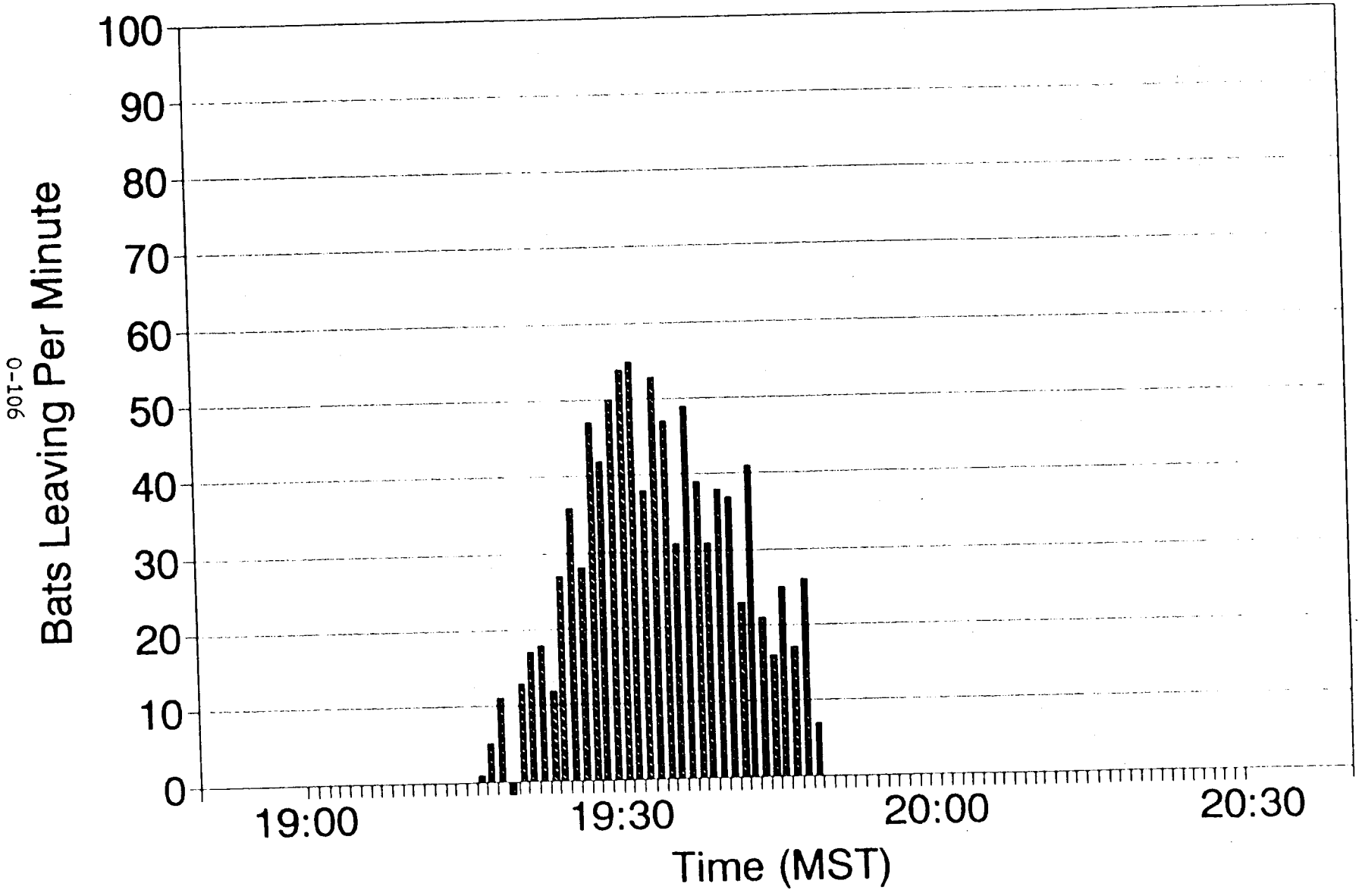
Kartchner Caverns Bat Flight

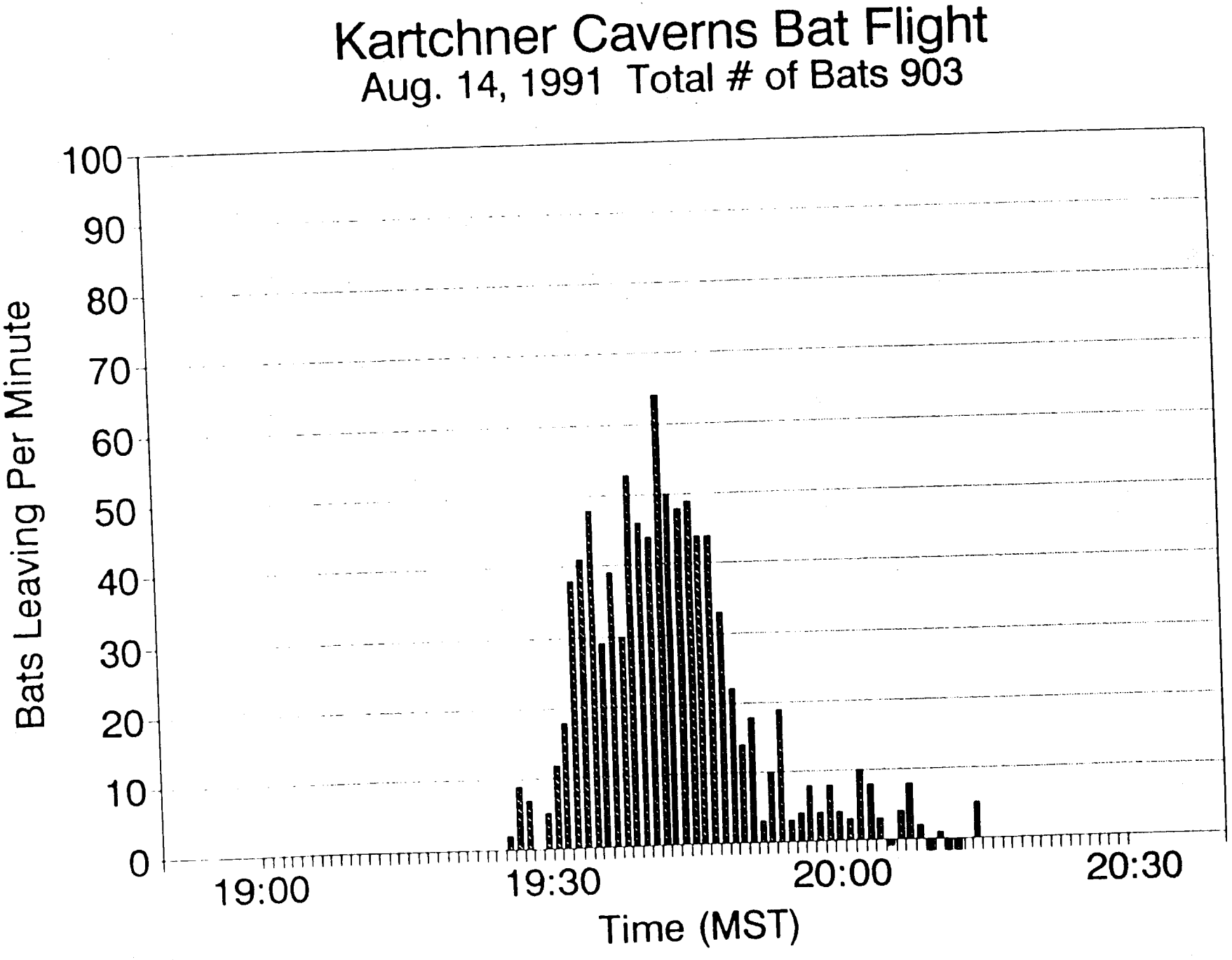
Aug. 7, 1991 Total # of Bats 1210



Kartchner Caverns Bat Flight

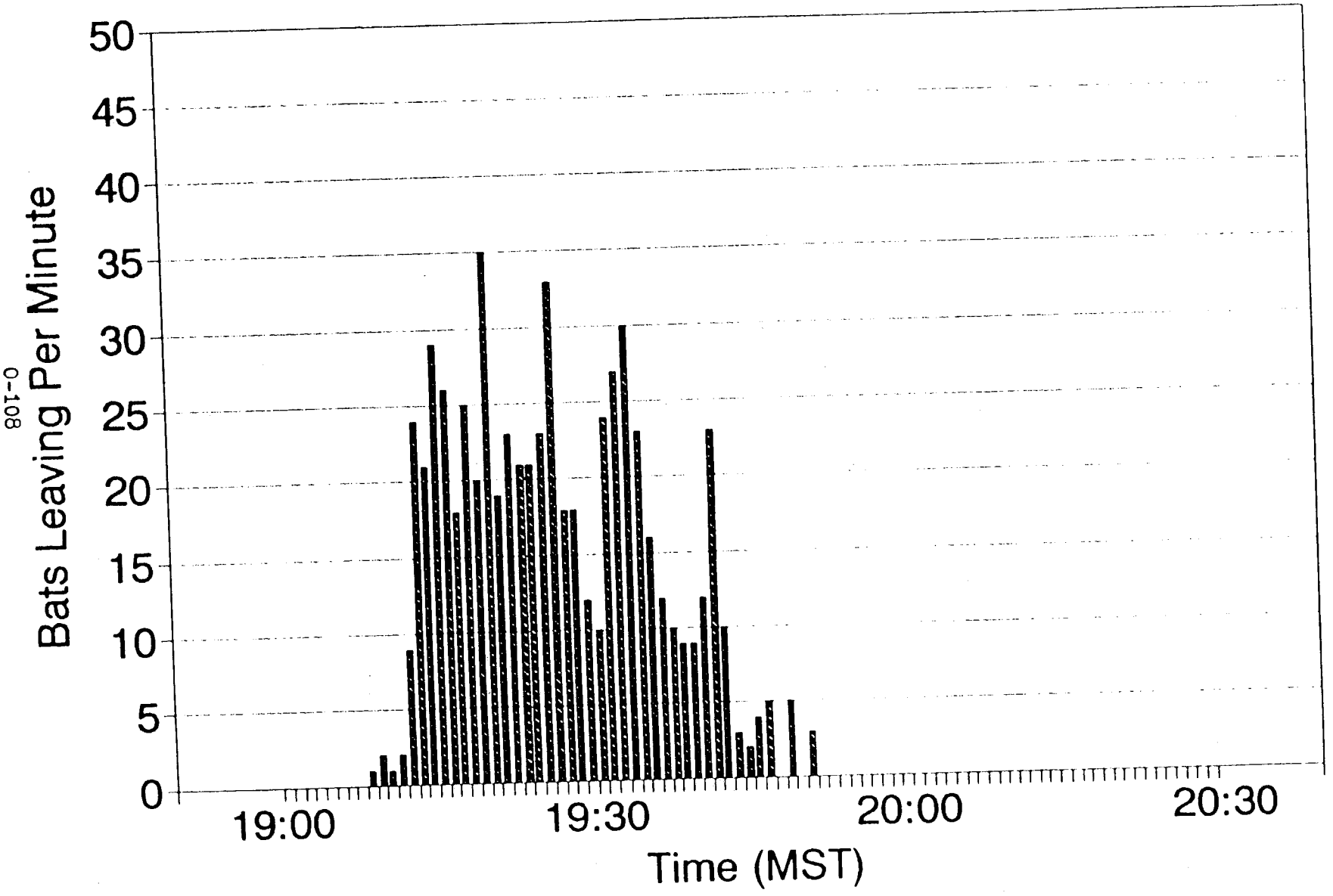
8/11/91 Total # of Bats 949 (partial)




Kartchner Caverns Bat Flight
Aug. 14, 1991 Total # of Bats 903
Bats Leaving Per Minute
100
90
80
70
60
50
40
30
20
10
0
19:00
19:30
20:00
20:30
Time (MST)

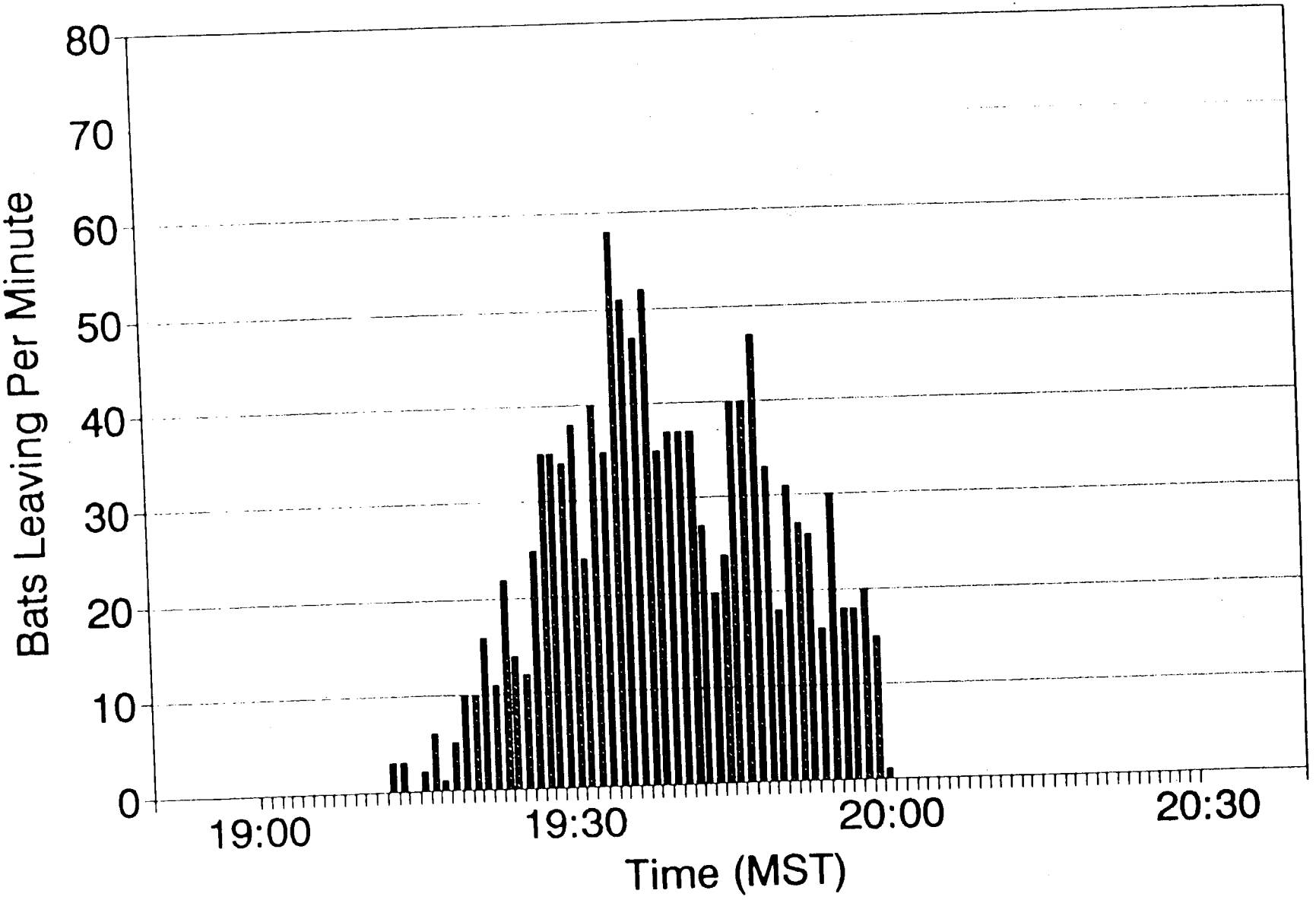
Kartchner Caverns Bat Flight

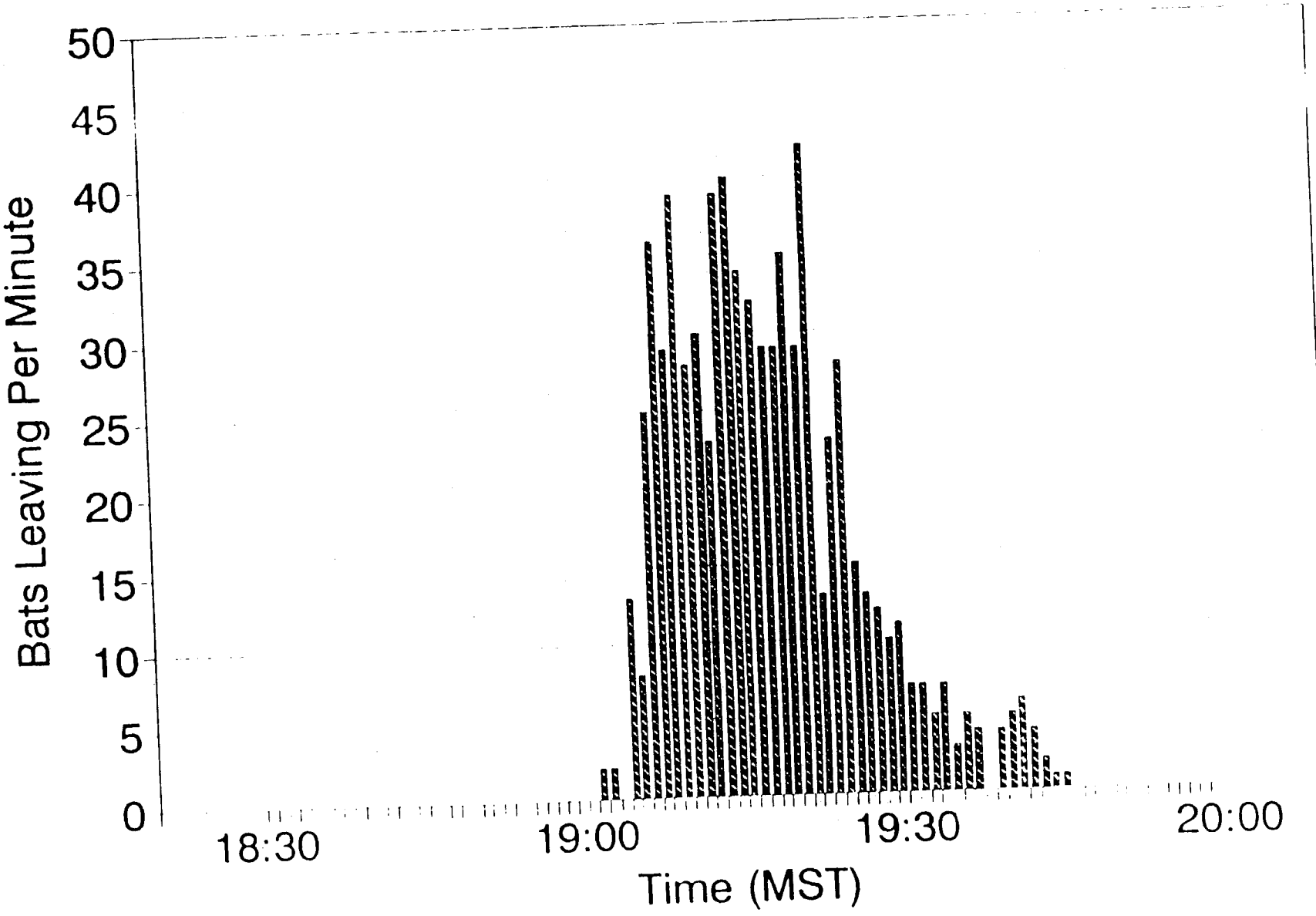
Aug. 16, 1991 Total # of Bats 638



Kartchner Caverns Bat Flight

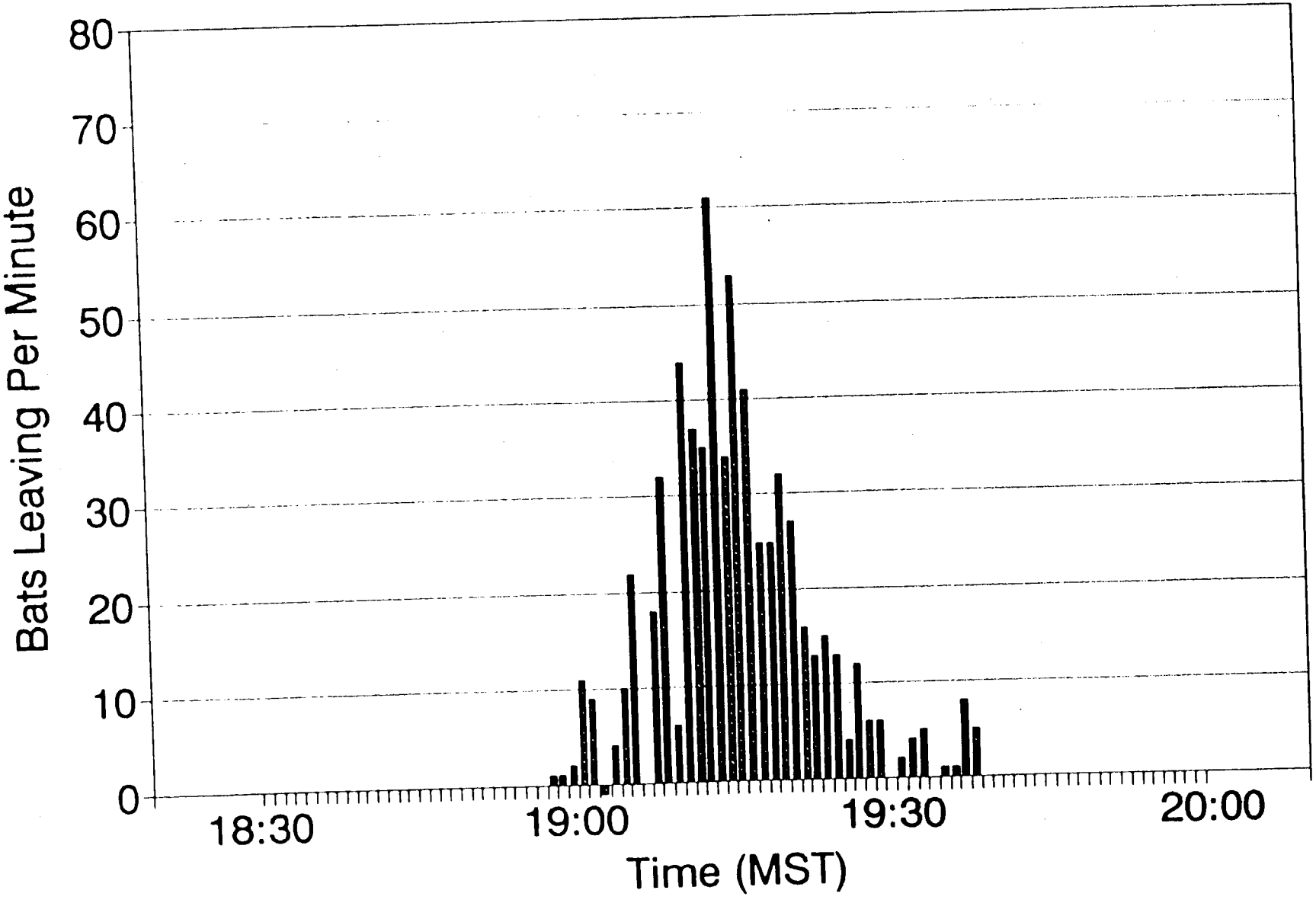
Aug. 19, 1991 Total # of Bats 1186




Kartchner Caverns Bat Flight
Aug. 23, 1991 Total # of Bats 730
Bats Leaving Per Minute
50
45
40
35
30
25
20
15
10
5
0
18:30
19:00
19:30
20:00
Time (MST)

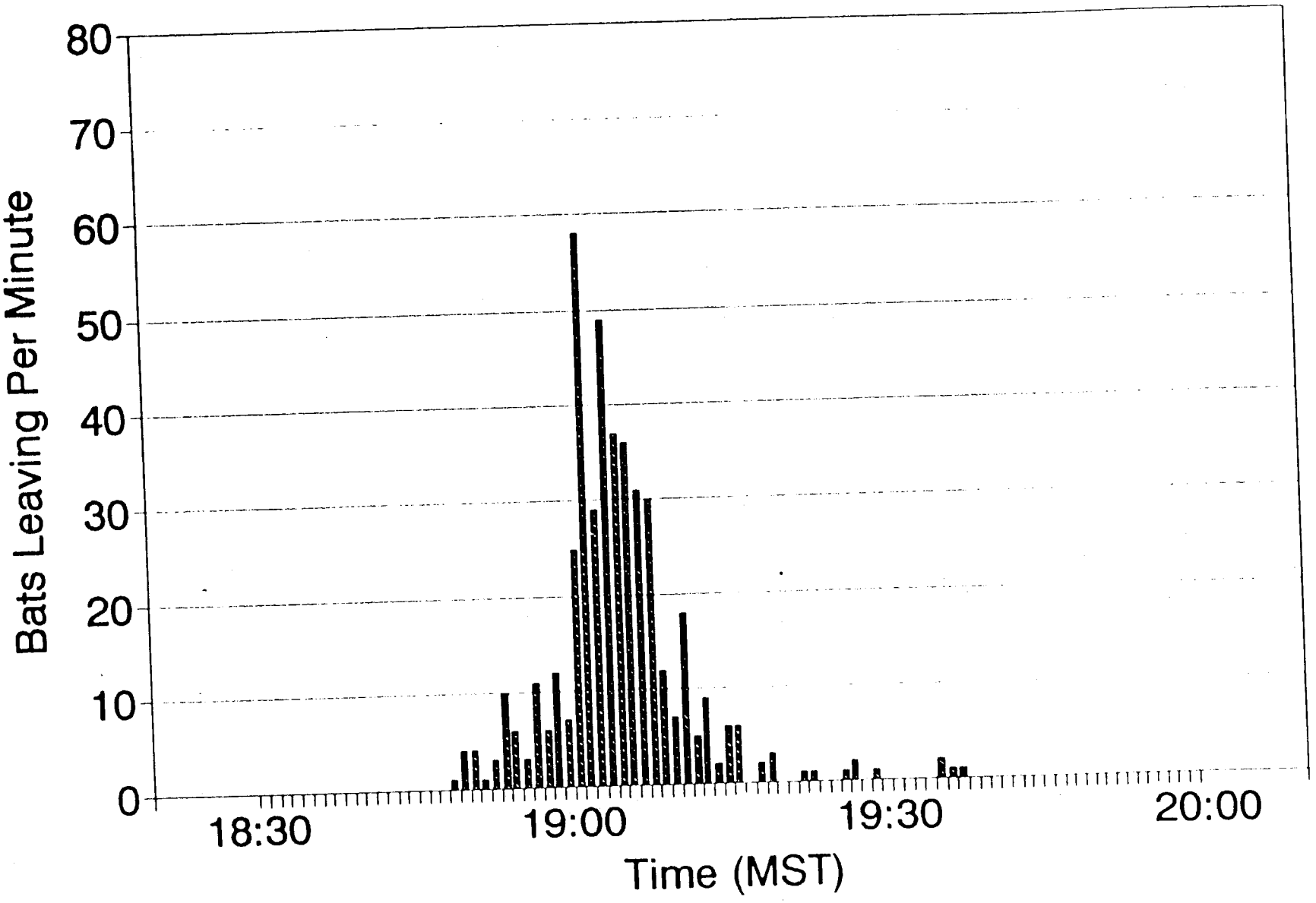
Kartchner Caverns Bat Flight

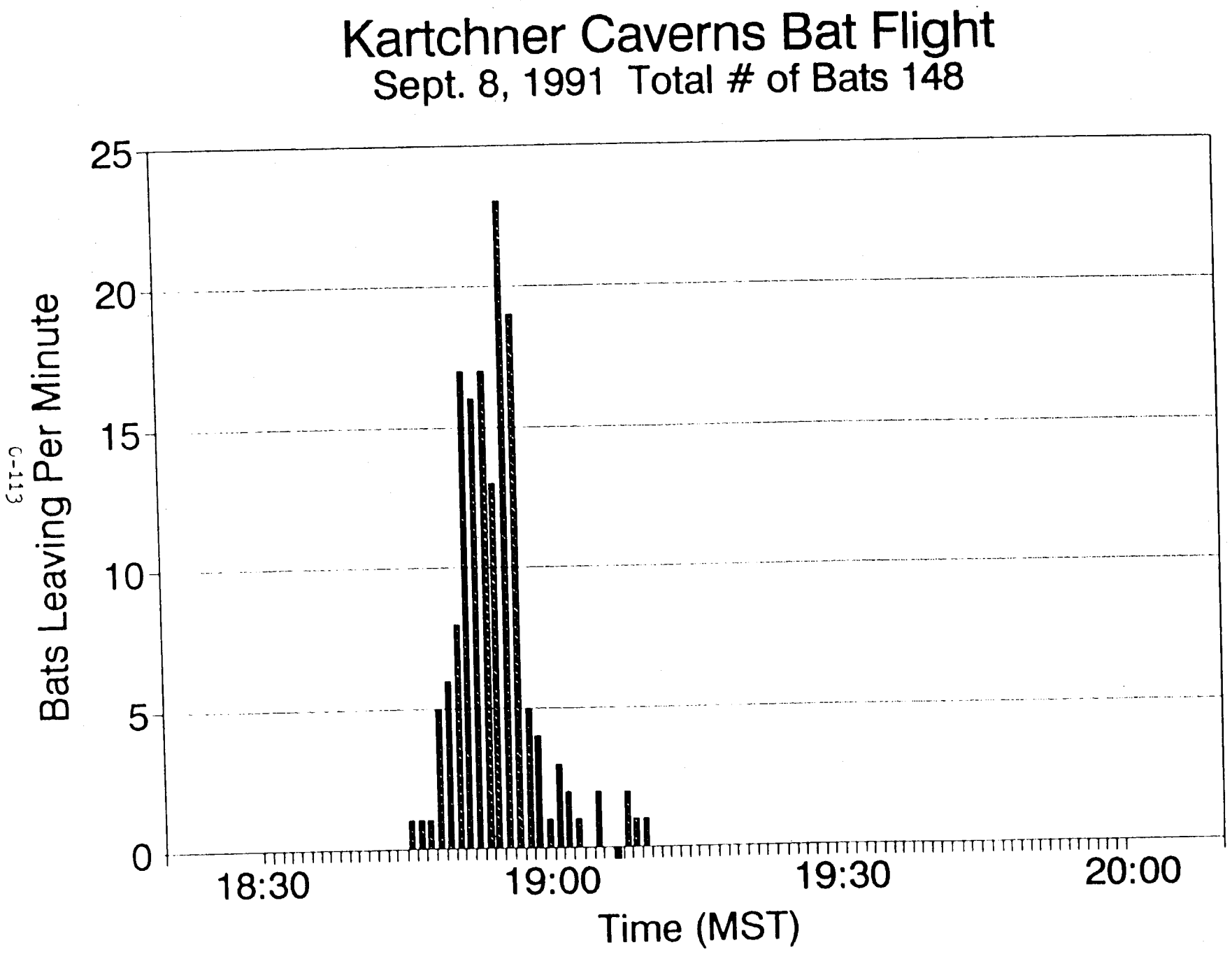
Aug. 25, 1991 Total # of Bats 640

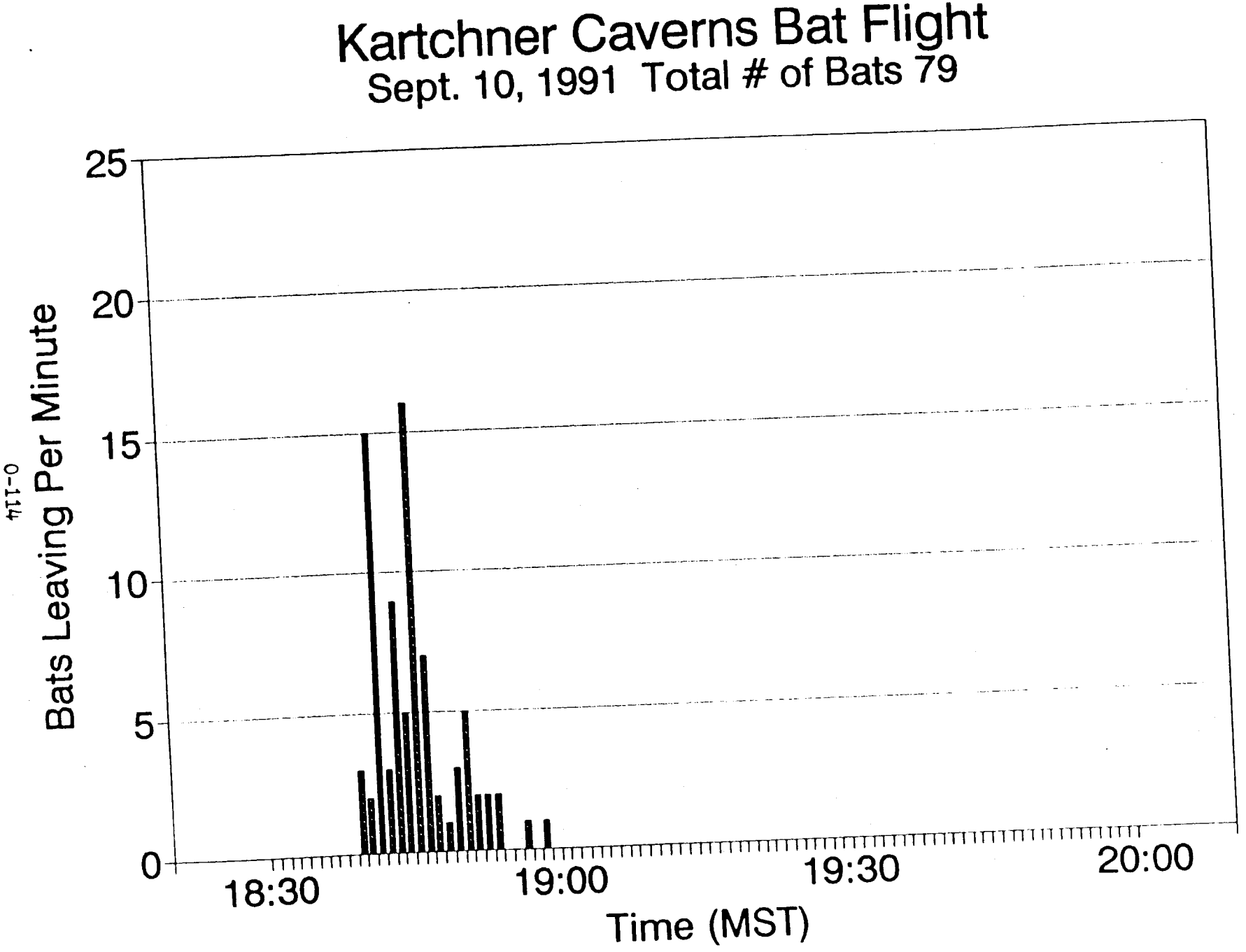


Kartchner Caverns Bat Flight

Aug. 28, 1991 Total # of Bats 443




Kartchner Caverns Bat Flight
Sept. 8, 1991 Total # of Bats 148
Bats Leaving Per Minute
25
20
15
10
5
0
18:30
19:00
19:30
20:00
Time (MST)


Kartchner Caverns Bat Flight
Sept. 10, 1991 Total # of Bats 79
Bats Leaving Per Minute
25
20
15
10
5
0
18:30
19:00
19:30
20:00
Time (MST)