SUSS Bull 58(1)

October – December, 2019

Bulletin of the Sydney University Speleological Society

SUSS Bulletin published by the Sydney University Speleological Society, A23 Manning House, Level 1, Manning Road, Camperdown, NSW 2050

W: http://suss.caves.org.au/

Edited by Phil Maynard

Articles, news and gossip to Phil Maynard

Officeholders

President
Lily Guo zguo4653@uni.sydney.edu.au

Vice President
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Front Cover: Finn and Don Matthews, Mangaorongo Gorge, New Zealand

Photo Phil Maynard

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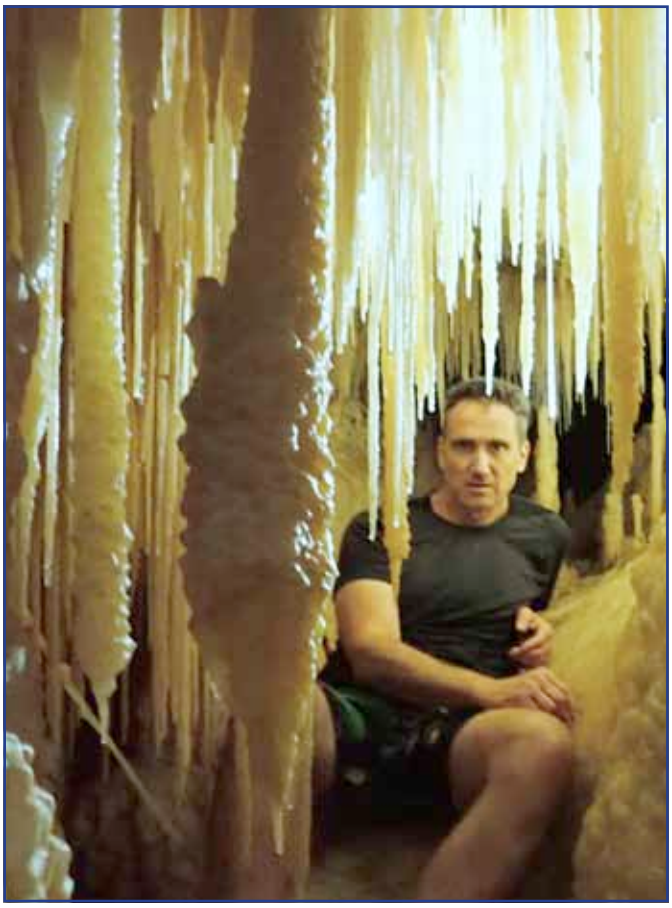


Don Matthews detrogged in a new discovery, New Zealand

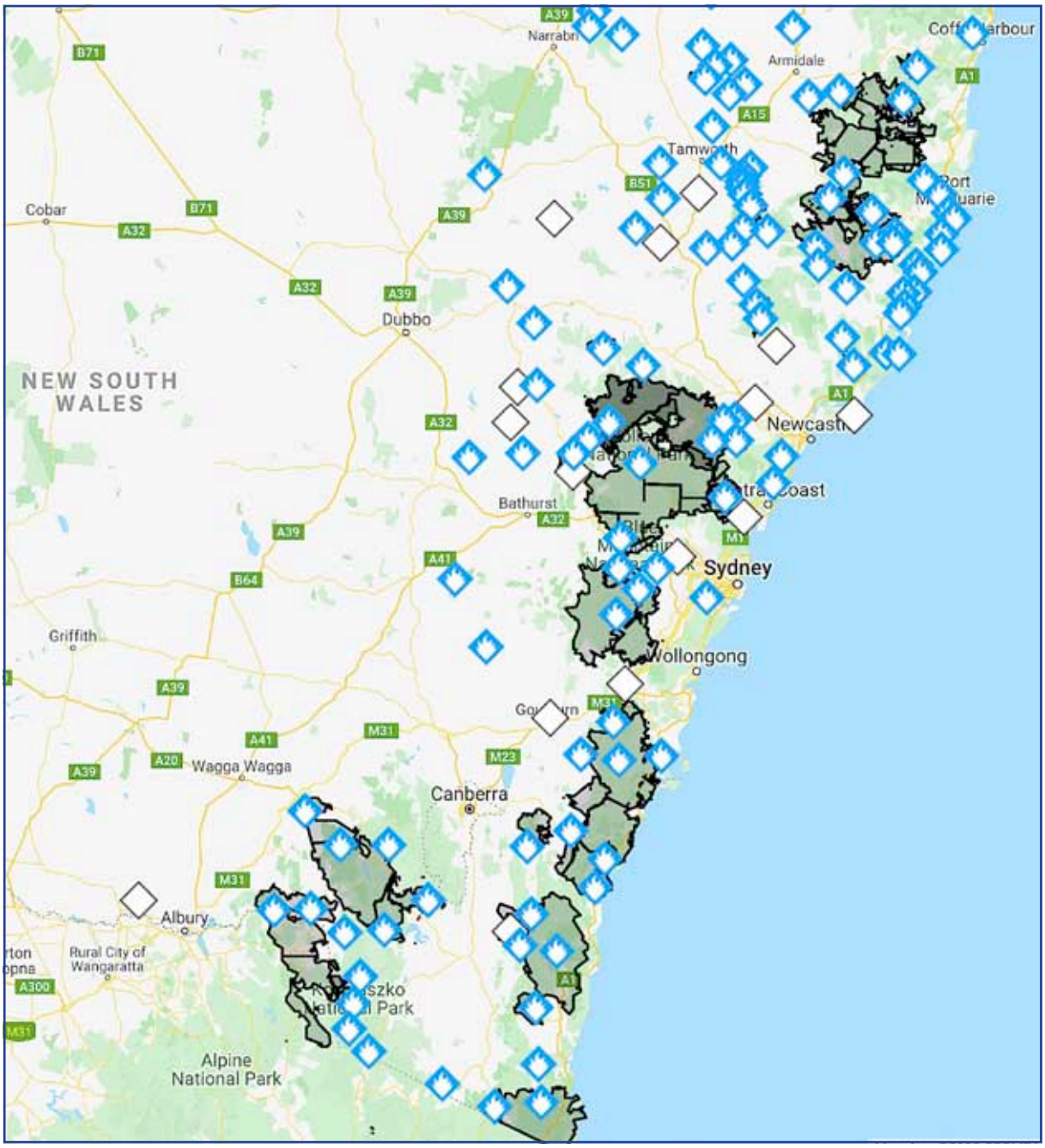
Photo Alan Pryke

It's been a grim summer in Australia. The largest fires ever recorded on the continent have ripped through more than seven million hectares of forest on the ranges of eastern Australia and spread out to the coast. Most of the karst areas in NSW and Victoria are affected, as well as Kangaroo Island in South Australia.

Jenolan fire

The fire had been approaching slowly from Kanangra since early December. On New Years Eve, fire burnt down to Blue Lake and the Grand Arch on the east, down to just above the main buildings at Caves House on the west, and into Burmah Road and down to Car-park 2 on the north west. All of the nature reserve was burnt, while the tourist area was saved by active defence.

On Burmah Road, the Rural Fire Service shed (a steel building), was left standing but the temperatures got so high that nothing inside the shed survived. Two of the houses next to the fire brigade shed were destroyed.... and up the slope from the shed, the cavers cottage was burnt to the ground. The Jenolan cavers cottage has been a central part of caving in eastern Australia for over thirty years, and many cavers will mourn its passing.



From Kempsey to Yarrangobilly, one thousand kilometres of burnt karst in New South Wales

Map Rural Fire Service of NSW, January 2020

The loss of the nature reserve at Jenolan is a tragedy. This area was stripped of foxes and other feral animals by National Parks over a campaign spanning ten years. The park had turned into a paradise for native wildlife as a result. On recent trips we've seen echidnas, quolls, brush-tailed rock wallabies, wombats, many bird species taking refuge from the drought, platypus, water dragons, sooty owls, and just recently and for the first time, SUSS witnessed a koala crossing the road on Five Mile Hill.

Postscript – in between the fires, flood, and COVID-19 pandemic, Jenolan briefly re-opened the tourist areas. Keir visited and photographed some of the damage, including one very lucky survivor! See photo below.

Wombeyan fire

Wobeyan Caves is very, very isolated. The two roads into Wombeyan are both exceptionally dangerous in a fire, and the campground is a flat valley surrounded by steep forested hills. The fire that consumed the southern Blue Mountains (the same that burnt Jenolan) had been heading slowly south towards Wombeyan since the end of November, eventually cutting both roads. The critical day for Wombeyan was the 4th of January, with record high temperatures and strong northerly winds.

Despite the risk and isolation Wombeyan was actively defended, and the tourist area and campground amenities were saved. The nature reserve containing the wild caves was almost entirely burnt out.

Postscript – the ABC is now reporting that Wombeyan Caves Road east of the reserve may be gone for good. A major grant from the state government would be needed before the local council will attempt a repair job on the road.

Tuglow/Colong/Church Creek fire

The southern Blue Mountains karst areas are in wilderness between Jenolan and Wombeyan, and they are impossible to defend. The area north of Tuglow was patrolled by the Jenolan RFS crew to protect nearby farmland and they described it as a particularly hot and dangerous blaze. Tuglow burnt very fiercely. There have been no reports from the other areas but the entire region burnt during December. The rainforest outside Colong cave is presumably dead. The RFS has saved the karst-rich farming properties north of Tuglow, including Tugallella, Jaunter, and Tarrakuanna.

Kempsey fire

The enormous arc of karst areas in the mountains behind Kempsey was the epicentre of the north coast fires in November and early December. Of all the karst areas in there, only Yessabah Hill is known to have escaped the blaze. Temagog, Moparrabah, Willi Willi, Carrai, Stockyard Creek and Kunderang Brook are known to have burnt but there are no first-hand reports from these mostly very remote wilderness areas. The area burnt for more than four weeks.

Hunter Valley fire

Crawney Pass was burnt by the southern edge of the north coast fire complex during December. The other karst areas in the back of the Hunter Valley (Timor, Glenrock, Barry, Pigna Barny) escaped the fires.

Brush-tailed rock wallaby (Petrogale penicillata) near carpark no. 2, Jenolan Caves. Photo Keir Vaughan-Taylor.

Wombeyan Caves Road. Photo Wingecarribee Shire Council.

Tufa dams at Scrubby Creek, Buchan, before and after the fires

Photos courtesy Nicholas White

South Coast fire

Wyanbene appears to be on the very edge of the burnt zone on RFS maps. The campsite burnt, while areas west of the access road appear to be unburnt. Ettrema is in the middle of a wilderness area in Morton National Park which burnt fiercely for an extended period, but there are no reports and no access. Bungonia escaped the fire! Bendethra is currently inaccessible, and will be assessed for damage by ISS when access is possible.

Kosciuszko fire

Yarrangobilly is even more dangerous than Wombeyan as a place to stand and defend. The only access is the two steep dirt roads on the side of forested gorges. The huge Tumbarumba fire burnt into this area from outside the National Park within days of ignition, consuming the entire western side of the park. On the 4th of January the fire swept north through the tourist precinct. Remarkably, the RFS crews saved the tourist area in a 36 hour firefighting shift. The forested areas containing the wild caves were devastated.

Cooleman: After burning through the Yarrangobilly area, the Tumbarumba fire merged with the Yaouk fire which was out of control to the north of Adaminaby. That left Cooleman Plain threatened by a continuous arc of fire from the west through the south and around to the east. Eventually, the fire burnt through Clark Gorge from the east and up to Blue Waterholes. National Parks reports that 10% of the critically-important karst plain ecosystem was burnt, which is a lucky escape. The fire never got far enough north to threaten Wee Jasper.

Subsequently, an agreement has been reached to destock the feral horses on Cooleman Plain, due to the damaged landscape and ongoing threat to endangered native species. Given the politics and legislation protecting the feral horses, that's a remarkable decision.

Buchan fire

Uniquely for Australia, the local cavers (Rimstone Collective) have purchased outright two of the major caves at Buchan. That puts them at risk of major financial and asset losses in a natural disaster. Our information so far is that M3 Shades of Death cave was unaffected by the fires, while the property containing M49 Scrubby Creek cave was fiercely burnt.

Scrubby Creek cave sits in a rugged area of karst within the property, and was covered by remnant native vegetation. There's a major set of tufa dam formations leading from the resurgence down to the river flats, and the river flats are cleared grazing land. When Rimstone bought the property they fenced off the karst area and leased the river flats to a sheep farmer. The fire has burnt the fences, devastated the vegetation and tufa on the karst, and destroyed the farmer's tractors, sheds and stock. The state of the cave is unknown.

Apart from Scrubby Creek, there are many other caves in the area, in scattered reserves between the farmland and logging areas. Many of the dispersed Karst Reserves were burnt, such as the Potholes, the Basin, Wilsons Cave, and the main Buchan Cave Reserve. This had severe infrastructure damage as well as damage to the Show Cave entrances.

Kangaroo Island fire

The wild caves and the showcaves at Kellys Hill were devastated. All of the tourist precinct was destroyed (every building lost), and there are requests going out for any archival material describing the caves (maps, reports, tourist brochures) held by cavers and club libraries.

Much of the coastal limestone ecosystem on the western third of the island has been destroyed. The fire destroyed the whole of Flinders Chase National Park, one of the most important reserves in Austalia for native animals and karst landscapes.

The alpine plain above Yarrangobilly Caves

The long lost caves of Texas

22-25 Nov 2019

by Rod Obrien

Participants:

SUSS: Rod OBrien, Phil Maynard, Keir Vaughan-Taylor

MSS: Cathi Humphrey-Hood, , Anna Ossig-Bonanno, Marcia Kaye, Rod Smith, Penny Sze

NHVSS: Garry K. Smith, Peter Downes, Brian Reeves, Murray Dalton

NUCC: Lachlan Bailey

Viator Hill and Glenlyon caves are two caving areas near Texas, QLD. In the 1970s a dam was proposed to be built across Pike Creek that would flood these two caving areas. The proposed dam was originally named Pike Creek Dam but the name was later changed to Glenlyon Dam. The University of Queensland Speleological Society (UQSS) spent several years putting together a report to stop the dam being built. Unfortunately, despite their efforts they were not successful and the caves were flooded as the Glenlyon Dam filled up in 1976.

In June 2019 Rod OBrien and Cathi Humphrey-Hood made a brief stopover at Glenlyon Dam for Rod to assess the viability of running cave diving trips to the Viator Hill and Glenlyon caves. Rod envisioned these would be similar to cave diving trips previously carried out in Burrinjuck Dam, NSW. The only other recorded diving history for Viator Hill and Glenlyon caves was in 1970, before flooding, when many of the sumps were free-dived.

Rod and Cathi found the dam nearly empty at 9% and the caves now accessible above the water. A return trip was organised for November 2019 to assess the cave diving potential and to document how the long-term submersion had affected the caves.

From Newcastle, NSW it was a comfortable 9-hour drive to the caves stopping for lunch along the way. Most of us arrived at the Glenlyon Dam campsite mid-afternoon on Friday with the exceptions of Phil (who flew up and arrived early), Lachlan's late 11pm arrival and Peter and Murray who arrived just in time on Saturday morning nearly missing the boat. The campground had all amenities and a kiosk was open during the day for take away food etc. We all fitted into three cabins with

Viator Hill (l) and Glenlyon bluff (r)

Photo Rod Obrien

Landing the boat at Viator Hill

Photo Rod Obrien

Brian staying in his campervan. The dam had dropped to its lowest level, 2.9%, since 1994.

After meeting our hosts for the weekend, Brian and Debbie (park managers) we readied the 12ft aluminium hire boat for Saturday morning. Brian (park manager) launched his private boat and a few of us motored up the dam to familiarise ourselves with the caves. During the trip the hire boat's 4hp motor developed an engine problem and Brian had to tow us back. A couple of hours later it was ready to go again, sporting a new water pump impeller.

An early 7am start on Saturday morning found everyone keen to get to the caves which are 4kms up the dam from the camp ground. It was to be a long hot day and everyone wanted to be underground before it got too hot. We would look at the caves on Viator Hill first. Brian had volunteered to be the boat driver for the weekend. It was to be a slow scenic trip with the boat packed to the gunwales and the 4hp outboard struggling to push the boat through the water at walking speed. The dam was alive with abundant bird life and fish. The occasional tortoise was spot-

Rod and Rod inViator Main cave. Photo Cathi Humphrey-Hood.

ted swimming around and goats, kangaroos and wild pigs roamed the shoreline. This was probably due to the drought and the dam was the only source of water for miles around.

To speed things up, the first boat load took all of the caving packs, 20 litres of extra drinking water and three people whilst the rest of the team began walking up the dam. They were picked up as the boat returned shortening the distance of each trip. On reaching Viator Hill there was a couple of hundred metres of dried out muddy river bottom to cross before the limestone was reached. This mud had dried and cracked into columns that crumbled or swayed as you stood on them. Areas of dried out freshwater mussels were scattered about along with the occasional expired tortoise. Old fishing lures hung from the dead trees like xmas decorations and the urban myth of how well fishing and drinking beer go together became evident as the popular fishing spots were identified by the large number of beer bottles laying around. We were treated as royalty by the local fly population and they greeted our arrival in great numbers and much enthusiasm.

Rod diving in Viator Main

Photo Keir Vaughan-Taylor

Keir in Viator Main

Photo Cathi Humphrey-Hood

As people arrived on Viator Hill they formed into groups and spread out. The two Rods, armed with maps and GPS, wandered about relocating and marking the caves. They found some cave tags were still readable but others had completely dissolved away. Keir ducked across the dam to scope out the Glenlyon caves and Cathi did some drone flying to complete a photogrammetry of Viator Hill.

Meanwhile in VR-1 Viator Main Cave Phil, Murray, Peter and Anna were surveying and Garry, Marcia, Lachlan and Penny were photographing and exploring the cave. The cave had a lot of mud and debris washed into it. A particular boggy area found Lachlan being rescued, then his boots, by Penny as he sunk up to his knees in one spot trying to rescue a tortoise. The large flowstone walls were still quite nice but the smaller formations present were in different stages of dissolving.

Early in 1976 a hole in the floor of the main chamber suddenly appeared after a flooding event. Once the water level had dropped Henry Shannon discovered it led to a lower section with dinner plate sized current scalloping on the walls. These scallops would indicate that there is a cave system running underneath Viator Hill. This hole

Cathi in Russenden cave

Photo Rod Obrien

was still full of water so Rod OBrien thought that was a good candidate for a cave dive and Henry Shannon had put in a request for some photos of the scalloping if possible. Garry, Marcia, Cathi, Keir and Penny were the dive support team. After moving some branches that blocked the underwater passage Rod was able to slowly squeeze down the small vertical tube by manoeuvring his dive cylinders around the rock obstacles. Some of these rocks were unstable and fell out when touched or bumped. The water visibility that was poor at the start quickly turned to zero. As the passage turned horizontal Rod discovered this area was also silted up. He dug for a while with his back on the roof and body half buried in mud. Pushing branches out to the side and dragging himself through the mud, Rod progressed about 4 metres along this passage before turning back in total blackout conditions.

After lunch everyone went over to VR-2 Russenden Cave. Phil, Peter, Murray and Anna were surveying while the rest of us explored and photographed. There had been some silting up but not as bad as Main Viator Cave. It's most likely the lower entrance is completely blocked with mud. The flowstone walls were still quite nice but a lot of the smaller formations were gone and the rimstone pools were covered in mud.

Several smaller caves VR-3 Crystal Grotto, VR-6 Mikes Pot and VR-4 Bevans Pot were looked at and found to be silted up. By this stage several people were starting to feel the effects of the very hot day in an area with no shade. A refreshing swim in the dam was a good way of cooling down. It was getting late and it would take a while to get everyone back so we wrapped up for the day. Poor Brian was feeling like an Uber driver, ferrying people up and down the dam and it was 6pm before we all got back to camp.

Another early 7am start on Sunday found everyone concentrating on the Glenlyon Caves. They are in a narrow belt of limestone that short cuts a bend in the creek. Part of Pike Creek diverts into this, cutting a string of caves through the limestone before emptying back into the creek.

Rod OBrien started the day by locating the caves with map and GPS, Cathi was drone flying to complete a pho-

Entrance to Glenlyon cave

Photo Rod Obrien

togrammetry of the Glenlyon area, Keir, Anna, Lachlan, Murray and Peter went straight to GL-1 Glen Lyon Cave and everyone else were scattered about exploring. Marcia rescued a tortoise that was stuck in old tree roots.

At GL-1 Glenlyon Cave the river entrance and exits were silted up. We entered the cave by using some of the other 30 known entrances. The river passage was heavily silted but a through trip was still made, often wading in mid-thigh deep mud. Endless hours of entertainment was had by all watching people trapped in the sticky ooze trying to extricate themselves from their entombment. Waist deep mud seemed to be the order of the day.

Generally speaking, the Glen Lyon caves, being at a lower level than the caves on Viator Hill, had been affected more by the silting. GL-8 Efflux Cave and GL-6 Dustbath Cave were completely silted up. GL-3A Swallow Arch was heavily silted up but by laying in the mud it was still possible to drag oneself through.

We had given the area a good go over by midday and due to the heat and long previous day we called it quits. Rod OBrien, Cathi, Rod Smith, Murray, Peter, Phil and Lachlan walked back to the boat ramp along the western shore. There were small pockets of limestone that we looked at along the way. Everyone was back at camp by 2pm. The inside of the boat was a mess of black mud. Park Manager Brian declined our offer to clean it and he went to town on it with a pressure washer. Anna, Penny and Brian left us late in the afternoon and missed out on the post trip celebrations.

Monday morning saw everyone pack up and leave for home. Rod Smith, Lachlan, Garry, Marcia, Peter, and Murray detoured to have a look through AS-1 Ashford Cave and take some photographs. Ashford is a rarely visited small caving area about 30 minutes' drive from Glenlyon Dam. There are several caves here with Ashford Cave being the main attraction. There is a bat roosting area that should not be entered during certain months of the year.

Phil in Glenlyon cave

Photo Cathi Humphrey-Hood

Chevaladdin

Rowena Larkins

The caves Glass/Chevalier, Rho Hole, and Aladdin at Jenolan all exist in close proximity to each other. It has long been assumed they are connected, though no connection has ever been found. In 2016 a trip by SUSS to Chevalier started a DistoX survey of the base legs of Chevalier. For those who don't know, Chevalier is a restricted cave with much of its length requiring exploration in clean shoes and clean clothes.

Following the trip the survey legs of Chevalier were overlaid on the map of Glass, with a surface survey tying in the entrance to Aladdin. Once this was done it could be seen that the north chamber of Aladdin was very close to the south section of Chevalier.

In Winter of 2018 Suss was approved for a trip to Chevalier, attended by long term SUSS members. Simultaneously a beginners trip was run to Aladdin. As an afterthought, as the parties were splitting to head to their respective caves, it was decided that we would try co-ee-ing at the indicated overlap points at 2pm to see if we could hear each other.

1:50pm saw Rowena sitting quietly in the dark silent north room of Aladdin, waiting for time to be well after the 2pm timeframe, so she could head off to a more interesting activity.

Then out of the silence came a distant coo-ee! Alan had called out. Rowena stirred herself and gave a hearty coo-ee back. Alan responded and Rowena took note of the sound location. It was coming from the wrong part of the cave, the southern point of Nth Aladdin chamber rather than the northern part where she was seated.

She headed to the area the sound was coming from and faced a blank, solid west wall! Maybe the connection was further south. She headed down the crawl passage

View underneath the false floor in Aladdin

Photo Rowena Larkins

coo-e-ing as she went but got no response. Maybe Alan and the Chev team had gone off to admire the gleaming passages.

Rowena left the cave.

Back at the hut notes were compared. Alan said the sound seemed to come from the Aven in the south end of Chevalier. Both groups agreed the sound seemed distant, as if there was 100 m of passage.

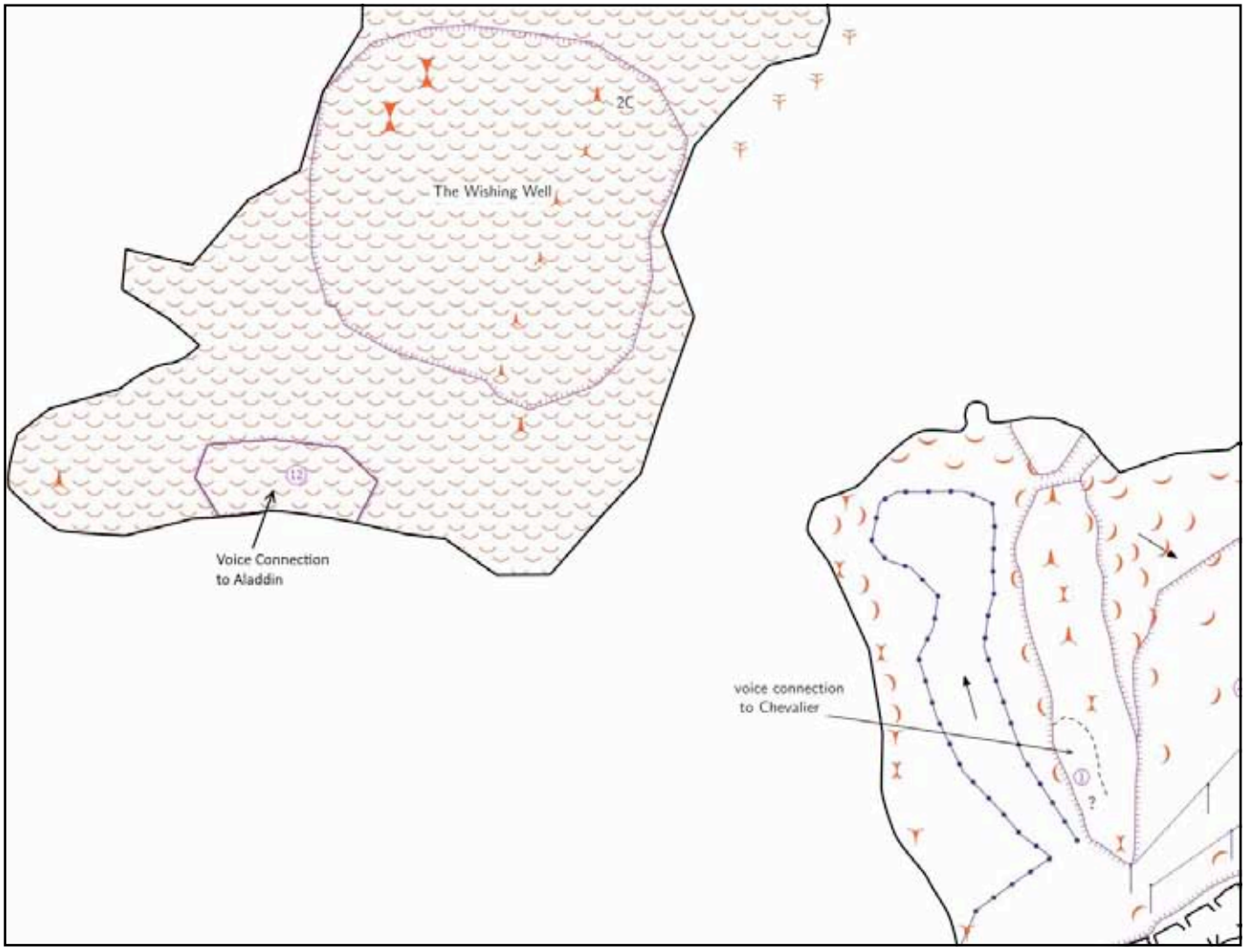
On the next trip to Aladdin Rowena hunted the west blank wall in the north room for something she had missed. She turned to leave and noticed the east wall had stalagmites opposite the precise point she was hunting, and there was a gap between the decoration and the wall. The north room of Aladdin is a false floor!

The next month's trip to Aladdin included a smart camera and disto. Taking DistoX readings between the stals showed the room was 1m wide. Inserting the smart camera in the room got pictures showing the room to be a metre high, with continuation heading south around a corner. All this was under the Aladdin floor. The photos showed this was a room with a rim pool and features an old water level line about 25 cm deep. A dark mud-like blob on the crystal and debris on the wall could be a few days old or a few centuries old.

The location of the voice connection room is shown on the attached map, as well as showing the relative locations of Chevalier and Aladdin.

This voice connection should be redone, now we know it exists, with a plan to locate and confirm the exact spot in Chevalier of the voice connection. With any luck there may be a human accessible passage leading through to Aladdin.

Also of interest is that the line of Rho hole cave passage underlies Aladdin, though it runs tens of meters below Aladdin entrance chamber. The establishment of a possible connection between Aladdin and Rho is a job for the future.



Relative positions of Chevalier (left) and Aladdin (right)

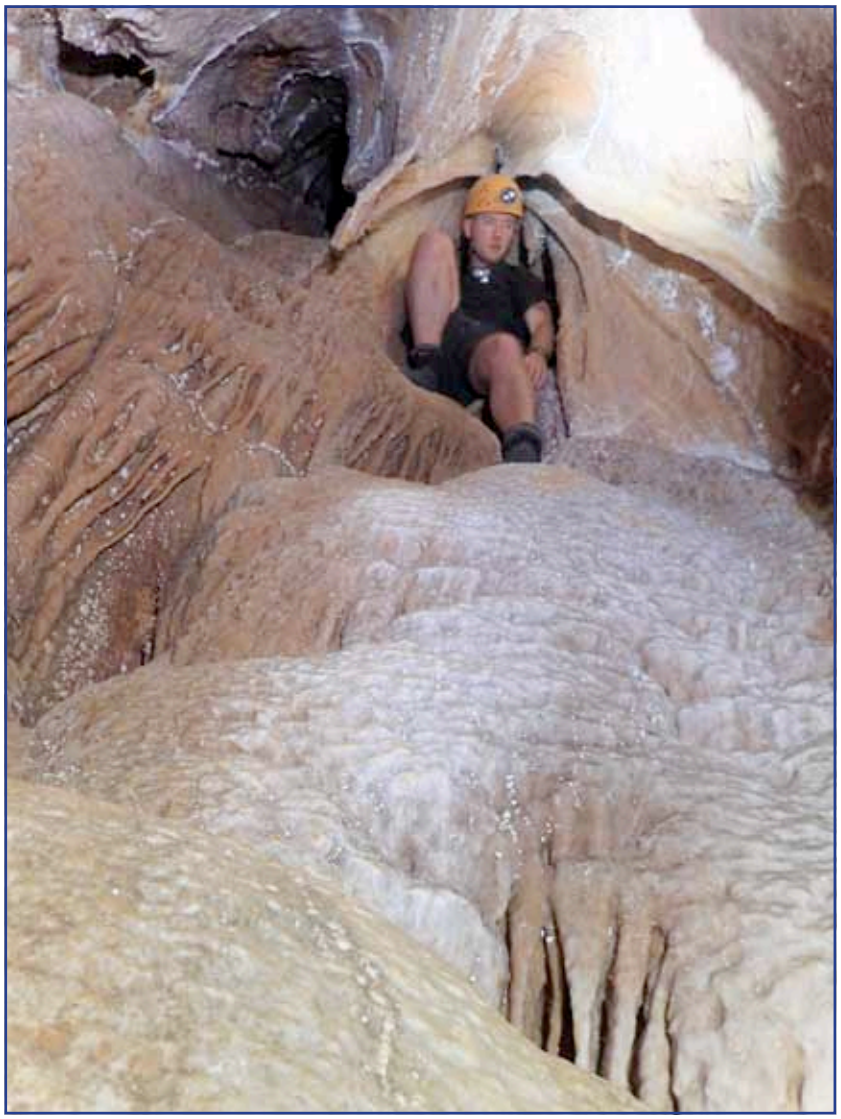
Mapping by Rowena Larkins

The low-down on a high aven in Henrys Hole

By Simon Murphy

This short article describes an NHVSS trip to Jenolan in September 2019, on which Stephanie, Rafid and I were kindly accommodated so that we could finish surveying Wallaby Cave. In return, we showed the NHVSS crowd Infinite Crawl in Mammoth Cave, and Henrys Hole.

Henrys Hole is of significant interest because of its location. Perched innocently on Playing Fields Bluff, within the Wallaby enclosure, it lies vertically above Spider Cave and is thought to permit bats to enter deeper parts of Spider Cave than they would otherwise be expected to visit. The cave is predominantly vertical but requires no ropes, and can be accessed by competent cavers without a handline either. Small chambers are punctuated by squeezy downclimbs.



Simon detrogged and desperate in Henrys Hole

Photo Rafid Morshedi

We rummaged around at the lowest level, hoping to find some way on. Of course, this has been looked at many times before, and the drought appears to have done little to improve the prospects.

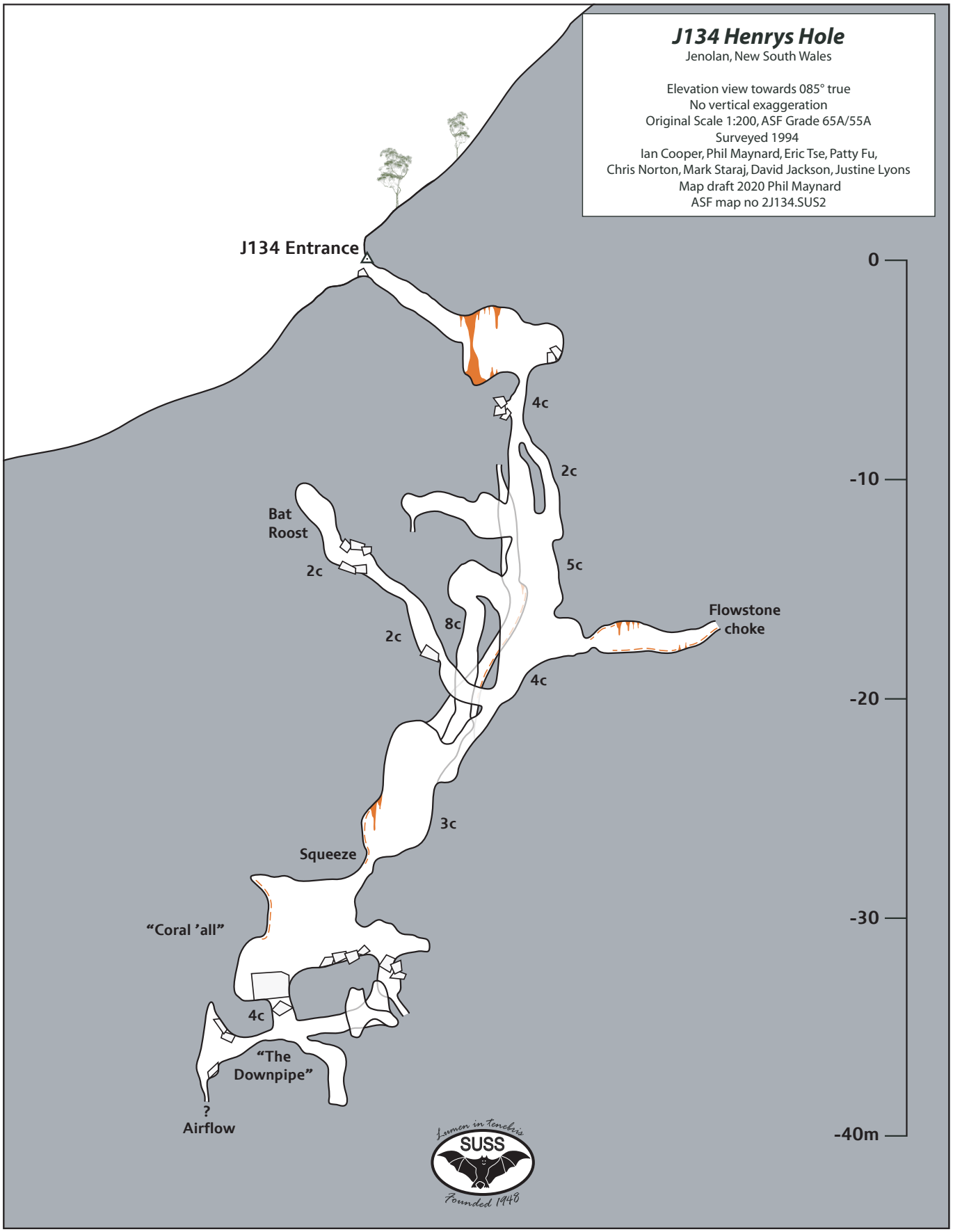
On the way back out, I spotted a climb over some old decoration and through a small hole in the ceiling. It is hard to locate this climb on the maps in the Blue Book, but it could be the "high aven" described therein. Either way, it was located on the left wall of a relatively large chamber (by Henrys Hole standards), as seen when looking a small up-climb of approximately one metre heading back out of the cave.

The climb itself was done without rope because there was no particular natural protection, and of course we had no bolting permit (do those even exist?). I accepted that it was my turn because Rafid had shouldered his fair share of danger already today, and the Anti-Safety Committee approved the climb. This climb was relatively easily until the hole in the ceiling, which I almost succeeded in squeezing through twice. Both times, the same two burdens prevented my ingress: 1. I appeared to be too large for the squeeze, particularly in having legs that were too long and glutes that were too large to permit me to bend into the squeeze from my perch on the climb; and 2. the exposure of the climb made me very nervous of having to perform this squeeze as part of a down-climb where I couldn't see the footholds, especially since my legs were already shaking on the way up.

I decided to give it a third go and removed my overalls for good measure. It is the first time I have removed my overalls whilst ~7 m above the ground. I strongly recommend against doing this. On the third try I made it through the squeeze and offered to install a handline if the others wanted to ascend. Rafid and Mark Saville (NHVSS) did eventually join me. I had climbed the rest of the well-decorated aven by the time they were up, and would have detrogged for this anyway if I hadn't done so for the squeeze. No effort

wasted! The other two also enjoyed this well-decorated area, but shared my disappointment that it didn't take us to new areas. By the quality of the formation and the lack of mud, it seems nobody had been here before. As the last person down, I derigged the tape and climbed down unaided. With this article I hope to discourage others from attempting the same.

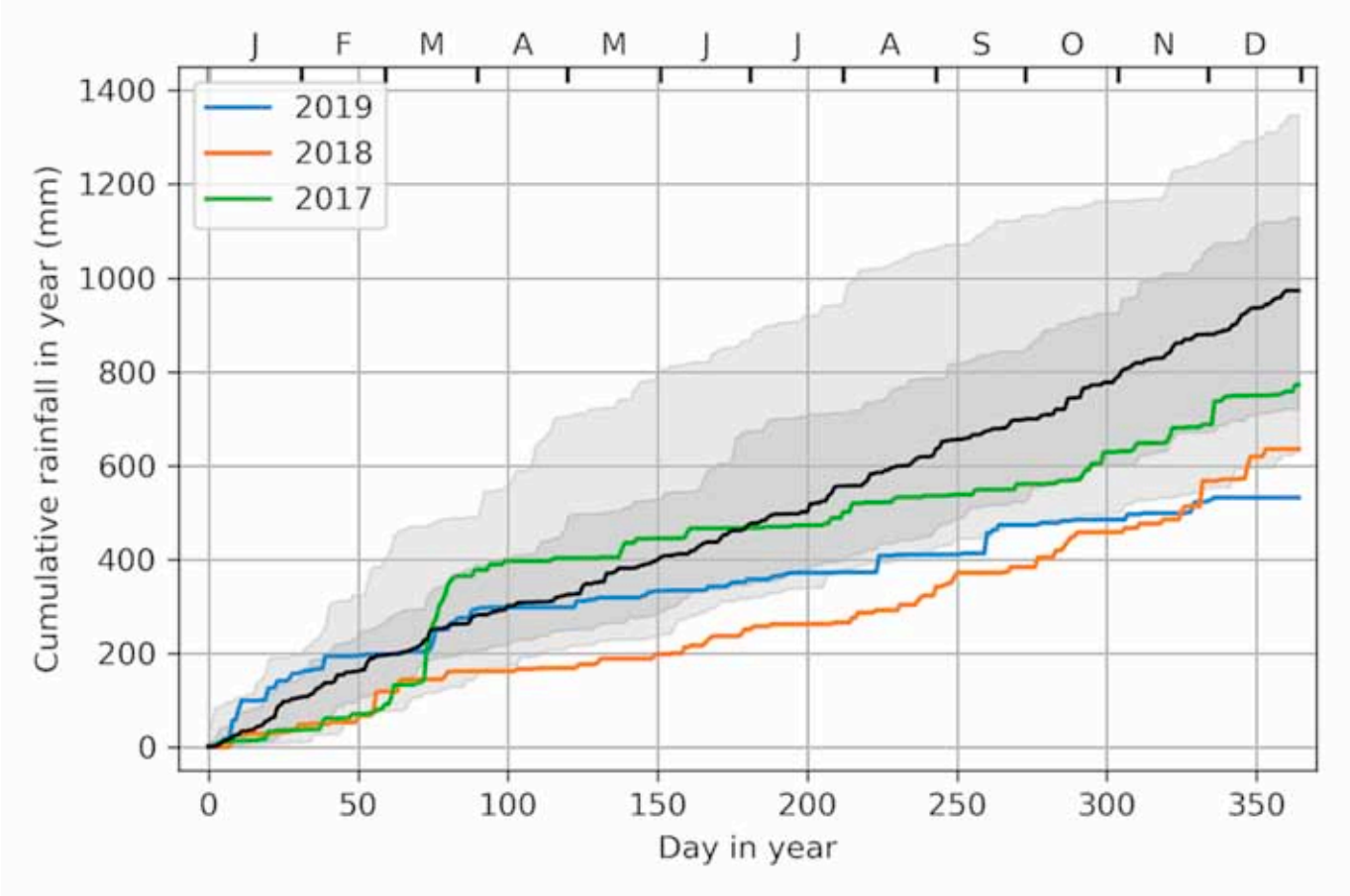
[*This lead may have been climbed by David Jackson during the survey for the Spider project in 1994. ed.*]



Drought Continues at Jenolan

Simon Murphy

January 2020



Jenolan rainfall in each calendar year 2017—2019. The median for the past 30 years (1988-2017) is shown as the solid black line, with the 1 and 2σ ranges shown as dark and light grey bands, respectively.

Data: Bureau of Meteorology, accessed 2020/01/08; analysis and chart: Simon Murphy.

It won't have escaped your attention that we're in the midst of one of the most severe droughts this country has ever faced. Quantitative information is hard to find in the mainstream media, though the Bureau of Meteorology remains a font of data and insight. I decided to provide a quantitative update on the severity of the drought, contextualised to our Second Home: Jenolan.

I followed the data processing methodology in the Helictite paper I published last year (Murphy 2019, Helictite 45, p11), and extended this to the rainfall data from 2019. I computed the statistical 1σ and 2σ values for the rainfall distributions over the 30 years preceding the drought. Rainfall data at Jenolan only goes back to 1988 before there is a large gap in the record, hence the median was calculated over the years 1988-2017, inclusive. Annual rainfall values do not follow a normal distribution – the variance above the median is much larger than it is below the median. Rather than taking the standard deviation, I therefore calculated the 1σ and 2σ values by taking the rainfall quantities that encompass the central 68.27% and 95.45% of the distribution, respectively. It is not possible to reliably compute the 3σ boundaries (99.7%), because that would require over 300 years of rainfall data.

The drought appears to be not only persisting but intensifying (Fig. 1). Rainfall in 2019 lies quite far below the 2σ boundary, at only 530 mm for the year (the median over 1988-2017 is 975 mm). For a simplistic perspective, if you take a year at random, there is a (100-68.27)/2 = 15.87% chance of rainfall in that year being below the lower 1σ threshold, and a 2.28% chance of rainfall below the 2σ level. Jenolan has now experienced a 1σ drought year in 2017 and two 2σ drought years, all consecutively.[1] Again, simplistically, this is extremely rare,

1 Wombeyan is a little less severely drought affected, with 2017, 2018 and 2019 being a median, 1σ and 2σ year, respectivly.

with any year beyond the 2σ boundary being a "once in fifty years" event. However, because adjacent years are correlated and can be affected by the same weather event, a more sophisticated analysis is required to contextualise the current drought. This was performed in the Helictite article, where I took historical data and showed that this drought was the worst in terms of rainfall deficit since the Federation Drought (1902–1903). If we consider the average temperature increase of over 1°C since then, which increases the rate of evaporation and transpiration, then the ground is the driest it has been since meteorological records at Jenolan began. The present drought is also remarkable in its duration, surpassing the Federation Drought and being similar to the slightly-less-dry WWII Drought.

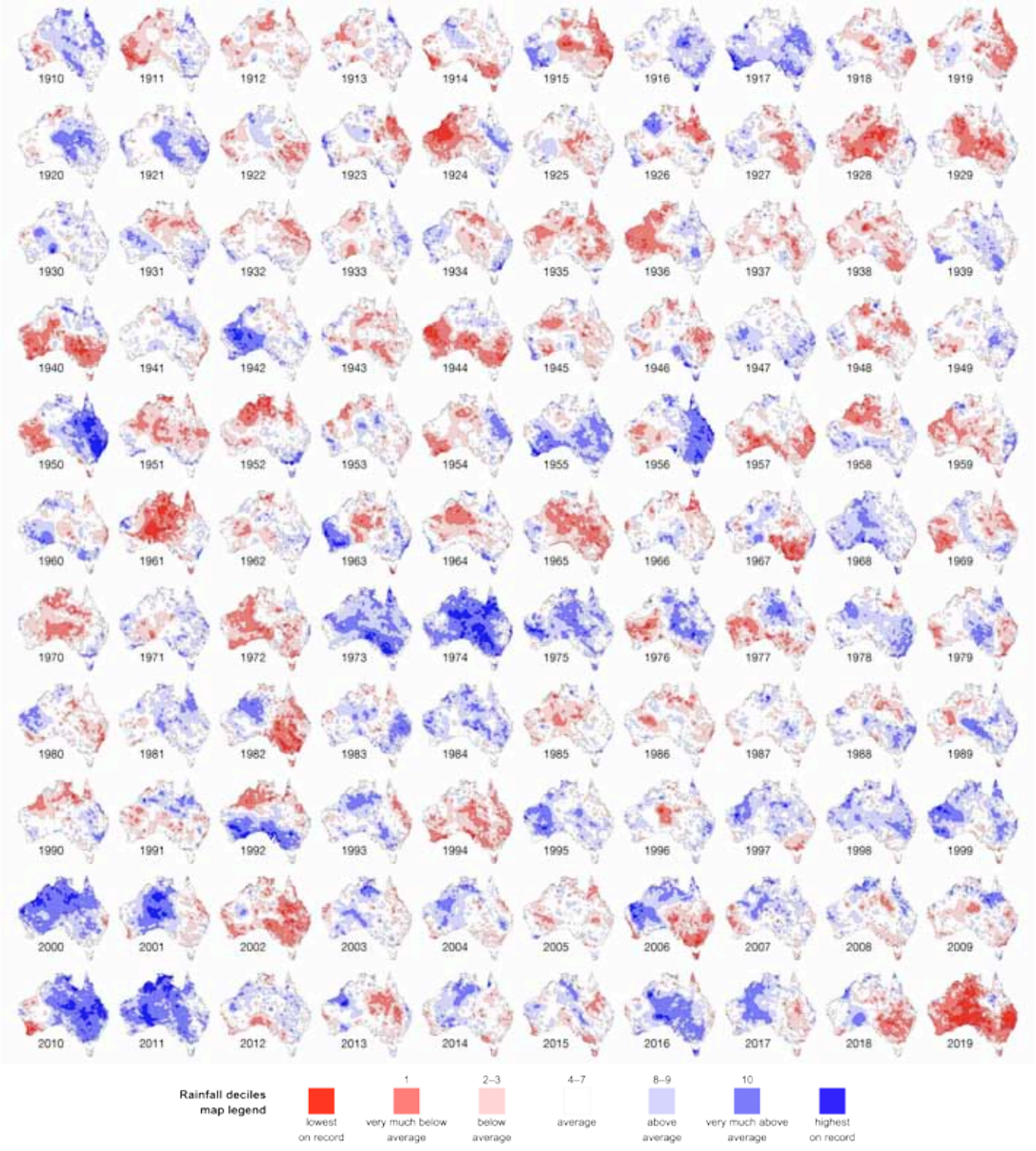
The driving force behind the extremely dry weather is, among other factors, an extremely positive Indian Ocean Dipole (IOD). When the eastern half of the Indian Ocean is cooler than the western half, the IOD is positive. A positive IOD tends to cause floods in eastern Africa and drought in Australia. The end of 2019 saw the IOD reach its most positive values in recent history. On 7 Jan, the Bureau of Meteorology (BoM) reported that the IOD had returned to neutral, which favours neither high nor low rainfall. Whether this will spell the end of

the drought is not clear [*It became clear in February. ed*]. Certainly, there is not much moisture around inland to evaporate and cause rainfall. The BoM rainfall outlook is for a slightly drier-than-average January and a return to 'normal' over February to April.

The tragic consequence of the current drought has been, at the time of writing, the burning of 6 million hectares of bushland nationwide. The RFS estimates that 1687 homes have been lost in NSW alone, at least 20 people killed (many remain unaccounted for) and over half a billion wildlife dead according to the Sydney Morning Herald. It resulted in the loss of the Cavers Cottage at Jenolan, and almost all caving areas across the state have burned in some form, or are closed with active fires nearby.

I encourage all members to demand climate action from government. Take it up with your local representatives. Join the many climate marches happening in Sydney, which are echoed across Australia and indeed globally. Australia has the second largest carbon footprint per capita of any nation on Earth. It's time that changed.

Temperature and rainfall posters Bureau of Meterology



Maiden Over

By Simon Murphy

Trip date: 09 December 2019

Dig Participants: Max Midlen, Simon Murphy, Shannon Crack

Recon Participants: Simon Murphy, Stephanie Murphy, Max Midlen, Callum Clarke.

During heavy rain, the entrance to Maiden cave, and indeed all of the cave's upper levels act like a funnel, pouring water down into the lower levels. This water at the lowest level pools into a sump. The height of this sump, when filled with water, it seen to vary by up to seven metres. During the recent (November 2019) SUSS trip to the cave, the sump was gone and only wet mud left behind. This is certainly attributable to the current drought (see the preceding Bulletin article).

Following that November recon trip, SUSS applied for a digging permit for the sump, to take place in December. The goal was to find and explore an extensive lower area of the cave. Given the location, it was hypothesised that farther passage would lead to the mysterious Jenolan Underground River, upstream of its first known location in Mammoth Cave at Lower River (note that no Underground River flowed in Wiburds Lake Cave throughout the drought).

It was hard digging – the mud was very sticky and, at the bottom, very sloppy. The sump chamber is on such a steep slope that it is hard to store the spoil without it sliding down the slope again. We were encouraged by a small opening at the bottom that we were desperate to gain easy access through. We took some video using a camera phone at arms-length through the tiny opening, which appeared to reveal a large room.

The bottom of Maiden Cave, where a sump is normally observed. Due to the drought, the sump is 'dry', but the mud is wet (Stephanie for scale).

Photo Simon Murphy

There was also some discouragement. There was a puddle at the bottom of the hole we had dug and it seemed that we had hit water. Max was undeterred, from the digging at least, but he wasn't keen to attempt the squeeze through the opening while it had a puddle in it. We considered bailing the puddle, but felt that if we kept digging we could just drain it by making a canal, and also make the approach to the squeeze much easier.

Eventually the floor was of almost quick-sand consistency, and it was difficult to avoid losing gumboots in the slop. The spoil up slope was also really piling up, with an omnipresent danger of it all sliding down-slope at once. It was time to cease digging and attempt the squeeze. We ultimately excavated a hole about 2 m high and 1 m wide.

The sound of disappointment groaned throughout the chamber. What had appeared on the camera phone to be a large room had, due to some false perspective, turned out to be scarcely a metre long and was a complete dead-end.

It was a promising lead that absolutely had to be investigated during the drought but was ultimately ruled out with nothing to show for our effort. No Jenolan Underground River this time, but we will keep trying elsewhere.

The main pitch in Maiden cave

Photo Rod Obrien

Cave Surveying Course at Wombeyan

19/20 October 2019

Report by Mike Lake, Jill Rowling and Phil Maynard.

Instructors: Mike Lake, Phil Maynard and Jill Rowling.

Participants: Alan Silva (CSS), Anna Ossig-Bonanno (MSS), Lachlan Bailey (NUCC), Emily Butcher (SUSS), Katherine Li (SUSS), Lisa Vitaris (SUSS)

The cave surveying was run again at Wombeyan Caves on the weekend of 19 and 20 October 2019. It's been run previously by Mike Lake, Phil Maynard and Jill Rowling in 1997, 1998, 2013, 2017 and 2018.

SUSS instructors supply all the survey equipment needed on the weekend. We have three DistoX's for participants to use in-cave and some classic Suuntos for them to use as well. The following is provided at-cost to the participants; the hire of the cottage, full course notes, both printed and as PDF, open source surveying software and a simple survey kit consisting of pencil, eraser, ruler, protractor, drawing pens, clip board, printed survey forms, graph paper and drawing film for the final map.

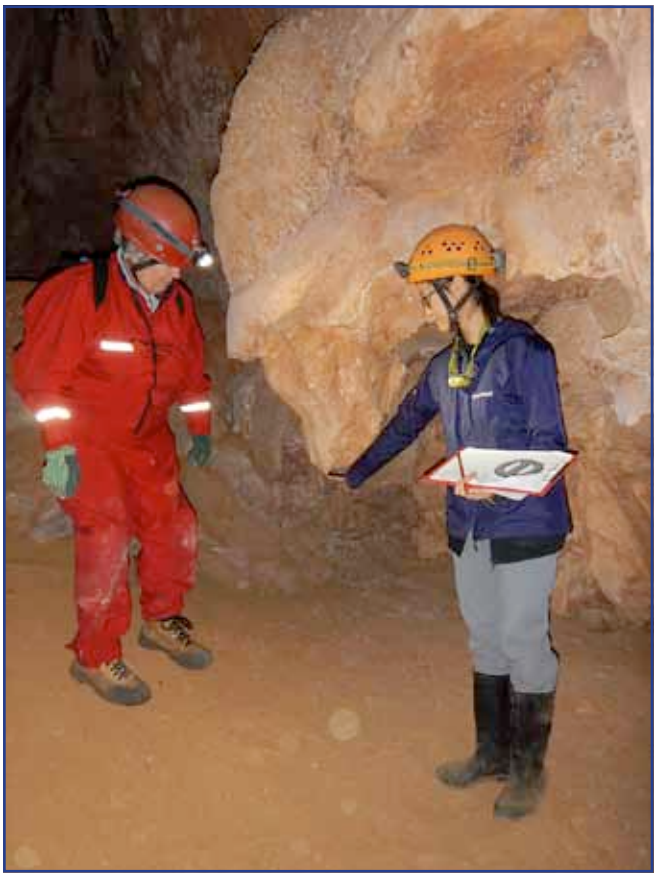
Our accommodation for the weekend is the comfortable "Post Office Cottage". When you're reducing survey data and drawing maps into the night, you do need a nice place to stay with a couple of tables, electric light, kitchen, bedrooms, loungeroom and shower! Plus we throw in some coffee, tea biscuits and cake for the weekend. Participants just bring their caving gear and food. The cottage is also just 5 minutes' walk away from the Fig Tree Cave where we do the actual cave surveying.

Saturday 20th

Our course has a nice start at 9 am – not too early. Participants sit through a short briefing on the course and the weekend by Mike Lake followed by the first talk on basic survey theory by Phil Maynard. Then it's time for our first morning tea or coffee.

After that we get into our caving stuff and stroll over to Victoria Arch, part of Fig Tree Cave. There is a short climb up into an extension on the western side of the arch. It's an excellent site for learning how to survey as it's not too complicated, has some roof and floor slope changes, speleothems, potential for doing survey loops and splay shots, and keeps our group not too far apart.

The six participants divided into pairs so we had three teams, each team had a DistoX to survey with. First though there is a brief intro to safety when using DistoX units – they are a class 2 laser. Before you turn on the laser look at where it will point. Say out loud "laser ON"



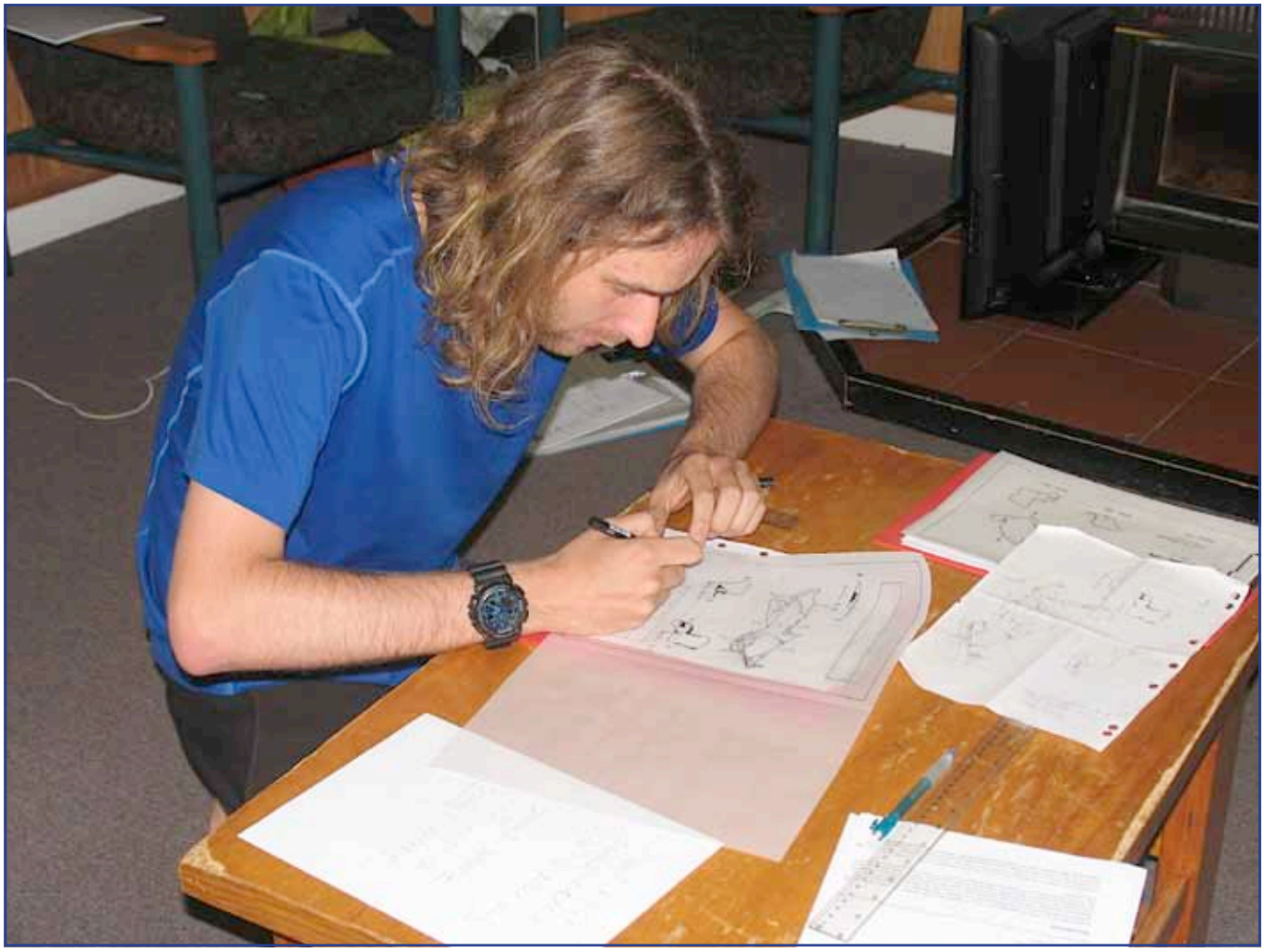
Jill Rowling and Katherine Li surveying in Figtree cave

Photo Alan Silva

and make sure people in the vicinity are aware it will be turned on. Then turn it on. As well as a DistoX each team has an instructor that guides them in the use of the DistoX, selecting survey stations, sketching and map drawing throughout the weekend.

At 1 pm we head back to the cottage for lunch, then after an hour we head back to the site for the last bit of surveying for the weekend. We try to get a plan, a loop closure and one or two cross sections. At about 6 pm we finished and headed back for dinner.

After dinner, from 8 pm Phil gives the second talk which covers the principles of processing survey data and specifically how to create a text file for processing by Survex. Participants had previously installed Survex on their laptops as pre-course homework. They enter their survey data in and process the data. Loops are closed,



Lachlan Bailey drafting the map

Photo Mike Lake

errors found and fixed, and the skeleton of their survey is realised. We finished at about 11 pm.

Sunday 21st

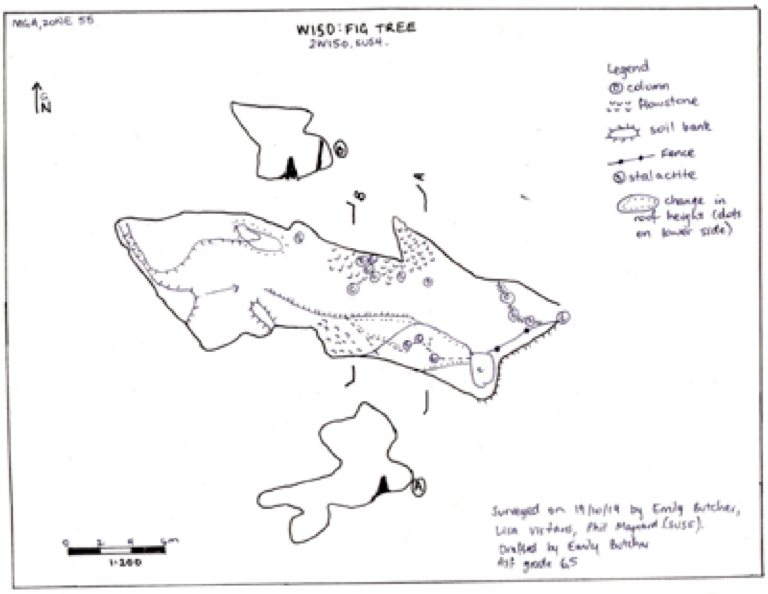
We start at 9.00 am with a talk by Phil on maps; map standards, naming and numbering, units, scales, survey record sheets, survey datums, symbols, survey and map detail grades and information required on maps. After that we all need some morning tea/coffee.

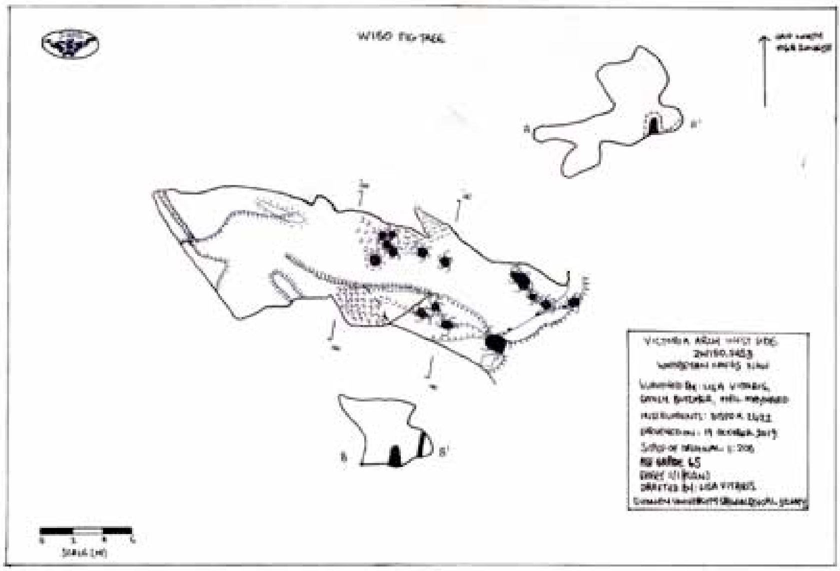
Then we distribute drafting film and with their drafting pens the participants have the opportunity to show off their artistic skills. Quite a bit of help is provided so the participants can start on the right place on the page. It's always interesting to see how each participant uses different techniques and skills to create their final cave map.

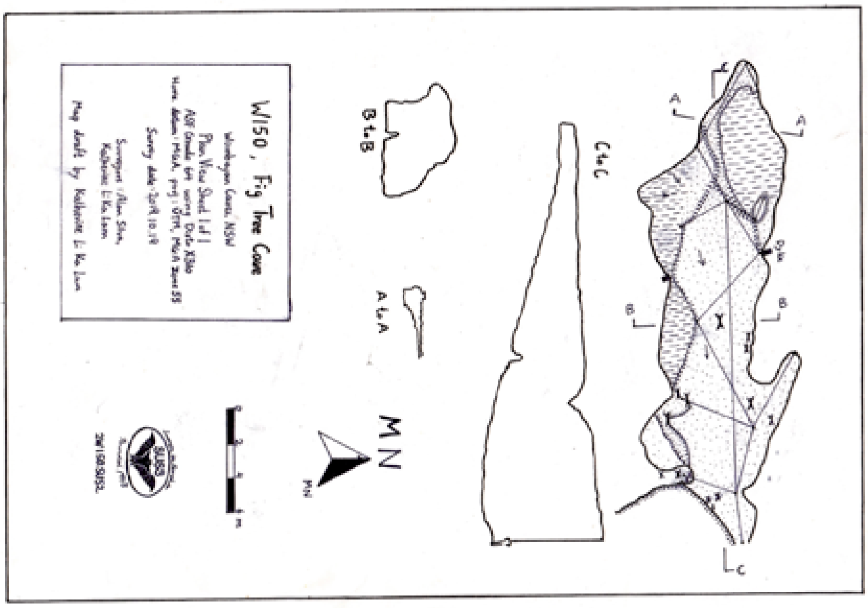
This year we didn't have a printer so we just exported the reduced survey data positions from Survex and plotted those on the graph paper rather than printing out the reduced survey legs on paper. That graph paper is then placed under the drawing paper and copy those points and draw the survey legs onto the drawing paper. Then they place their in-cave sketch under the drawing paper and trace out wall details, followed by features, a title block, North arrows, and a scale bar. This takes two sessions separated by an hour lunch break in the sun. All the participants had finished their maps by about 3:30 pm. We finished the official part of the course by comparing the four maps produced: what's similar, what's different?

At about 5 pm the participants packed up with their new maps and headed home.

The instructors would like to thank the following individuals; Marilyn Scott for organising the accommodation and the permit for the weekend, Kevin Moore and SUSS for lending their DistoX units and the Wombeyan staff for the permit for the weekend and the use of the Post Office Cottage.


MGA, ZONE 55
W150: FIG TREE
2W150, SUS4.
Legend
column
flowstone
soil bank
Fence
stalactite
change in roof heights (dots on lower side)
Surveyed on 19/10/19 by Emily Butcher, Lisa Vitaris, Phil Maynard (SUSS).
Drafted by Emily Butcher
ASF grade 6.5
1:200


W150 FIG TREE
VICTORIA ARCH WEST SIDE
2W150.SUS3
WOMBEYAN CAVES NSW
SURVEYED BY: LISA VITARIS, EMILY BUTCHER, PHIL MAYNARD
SCALE (M)


W150, Fig Tree Cave
Wombeyan Caves, NSW
Plan View Sheet 1 of 1
Survey date: 2019.10.19
Surveyors: Alan Silva, Katherine Li Ka Lam
Map draft by Katherine Li Ka Lam
C to C
B to B
A to A
MN
2W150.SUS2

Stephanie Murphy in Henrys Hole

Photo Rafid Morshedi

Cave hazard, Pio Pio New Zealand

Photo Don Matthews

Photogallery

Fish Rock Cave

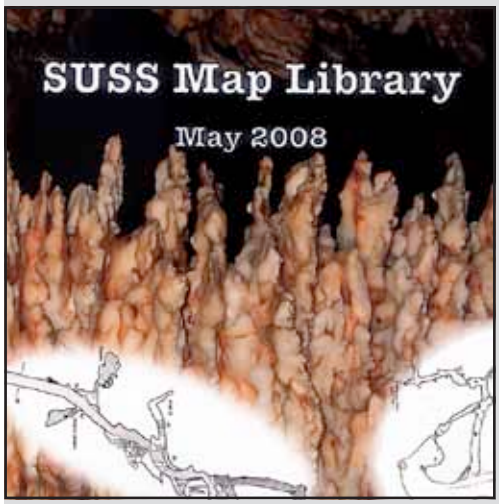
Photos by Rod Obrien

Not limestone, but it is a cave.... right through the island

Fish Rock Cave, photos by Rod Obrien

Things to buy

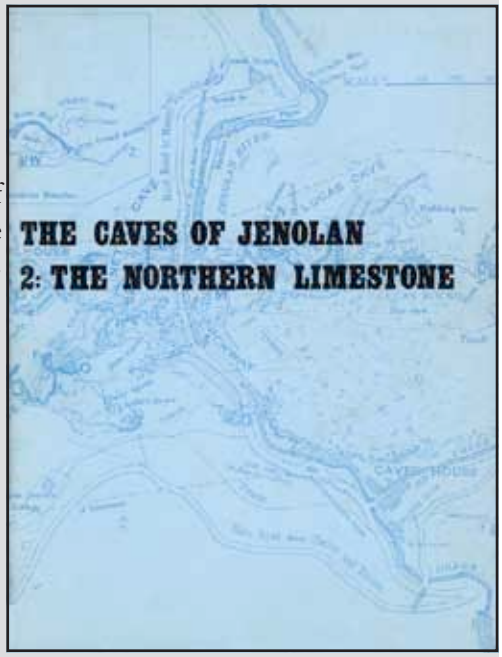
For postage and handling costs and the details of how to order go to http://suss.caves.org.au/publications. There you will also find a range of must-have maps and other publications.



Maps And Bulls On DVD

The entire SUSS cave map library of over 300 maps is on DVD and available for purchase. Our map library was scanned to provide wider access to the maps for SUSS and other ASF caving clubs. There are field sketches, ink maps produced on drafting film, ink maps produced on linen, as well as some of the latest digitally-produced cave projects. The DVD also contains all SUSS Bulls in HTML format from 35(1), July 1995 to 47(4), March 2008 and SUSS Bulls as PDF format from 42(1), April 2002 to 47(4).

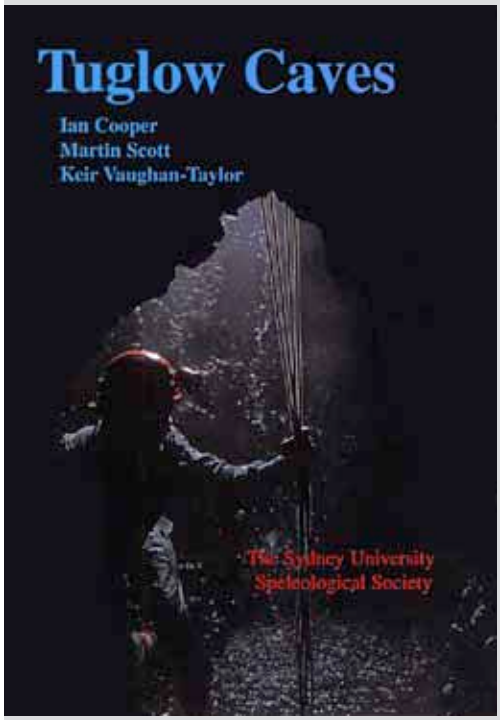
Price is $10.00 + PH.



The Caves Of Jenolan 2: The Northern Limestone

Edited by Bruce R. Welch. 1976, 140 pages. We still have some copies of these books left. Contains maps and descriptions of many caves in the Northern Limestone section of Jenolan plus notes on the history of Jenolan and its geology, geomorphology and hydrology.

Cost is $8 for members and $10 for non-members + PH.



Tuglow Caves

By Ian Cooper, Martin Scott and Keir Vaughan-Taylor. 1998, 70 pages. Examines caving procedures, site descriptions, history, biology, surveying and maps, geology and hydrology of Tuglow Cave and others.

Cost is $13 for members and $16 for non-members + PH.

Back Cover: Jenolan
Photo Keir Vaughan-Taylor

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