CORRELATING GEOPHYSICS AND CAVE CARTOGRAPHY FOR GREATER ACCURACY AND APPLICATION

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Abstract

The accuracy of cave cartography will inherently be compromised due to factors associated with cave survey. A few of the more common of these error producing factors include but are not limited to: subsurface conditions causing errors; magnetic drift created from head lamps, lighting products, and other electromagnetic emitting devices; and survey instrument miscalibration. These errors are usually slight, but as the length of the cave increases, so does the cumulative effects of these errors.

The paper demonstrates how the correlation of geophysics and geographical information systems can be combined to detect and eliminate these errors for a significantly higher level of accuracy when drafting surface to subsurface cartographic representations of a project area. The paper also demonstrates these techniques for improving this accuracy through a variety of means. Initially, a brief description of subsurface survey techniques and associated errors are discussed. Geophysical equipment and data interpretation techniques for the respective equipment are examined. Geophysical equipment discussed includes microgravity, electrical resistivity, cave radio, and others. Next, methods for integrating this geophysical data into GIS programs including ArcGIS 9 are shown. Finally, multiple case studies are presented to demonstrate how these techniques are being used for better surface to subsurface cartographic correlation.