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Pat Kambesis

Cave Research Foundation, pat.kambesis@wku.edu

Bob Osburn

Cave Research Foundation

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Ongoing Geographic Documentation of the Mammoth Cave System and Related Caves

Pat Kambesis¹ and Bob Osburn¹

¹ Cave Research Foundation

Abstract

One of the challenges of studying and protecting the globally significant resources of Kentucky's Mammoth Cave National Park is that many of them are underground. The Mammoth Cave System, with a current known length of over 675 kilometers and still growing, is the most extensive known cave on Earth. The primary reason the survey of the cave system is not yet complete is because of the cave's enormity. The Cave Research Foundation (CRF) Cartography Program has been collecting detailed geographic data from the caves of Mammoth Cave National Park, to produce cartographic interpretations of the data in the form of various types of maps, and to incorporate that data into a master data archive system. Copies of data and maps are provided to the Division of Science and Resource Management (SRM) at Mammoth Cave National Park via the conditions of an official Cartographic Research Project. In cooperation with SRM, the Cartography Program conducts ten expeditions a year in the park in a continuing effort to explore, survey, inventory and document the caves. Not only does this work identify locations and geometry of the passages themselves, but also documents the biological, mineralogical, cultural, archeological, and paleontological resources they contain. The maps produced by the CRF Cartography Program are an important resource for management of the cave and for scientists who study the cave, its water, and how the cave relates to the associated landscape. It is now known, for example, in large part by cave survey that the upstream ends of several of the cave's most significant underground rivers extend far beyond the park boundaries to agricultural land, industrial sites, and transportation corridors that pose detrimental impacts to the cave's water quality and aquatic ecology. The maps also provide critical resources for scientists in several other ways – base maps to plot the features they study, as well as “roadmaps” to find their way around (and back out of) this enormously complex labyrinth. A currently evolving task involves integration of these surveys into Geographic Information Systems databases and maps. CRF is also surveying and documenting other significant caves in the park, including Lee Cave (12+ km), Wilson Cave (6+ km), and Smith Valley Cave (4+ km), as well as a large number of minor ones in the “Small Cave Inventory” project. The ongoing survey and cartography work provides the baseline information that is critical for understanding and protecting the karst resources within Mammoth Cave National Park.