The Role of Research and Education in Cave and Karst Management

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Abstract

To effectively manage and protect karst resources, we must first understand them. This requires not only an inventory of the resource elements, but also an understanding of how these elements are related and how they behave. Changing management strategies for the Mammoth Cave System by the National Park Service, for example, illustrate this concept. For years exploration and survey of the cave were actively discouraged. Eventually, efforts by Cave Research Foundation with the support of the National Park Service revealed that the Park's most important resource was indeed the longest known cave in the world. Even then, more years passed before resource managers appreciated the importance of land use beyond the boundaries of the national park, where most of the cave's major rivers were shown by dye tracing to originate.

A multifaceted program of research is underway in the south central Kentucky karst by Western Kentucky University, Mammoth Cave National Park, and the Cave Research Foundation to investigate a wide range of basic and applied questions. These include fundamental questions about cave, landscape, and aquifer development, including cave enlargement rates and processes, cave stream network organization, and carbon dioxide transport. Applied investigations are evaluating threats to the cave and aquifer from agricultural, urban, and transportation land use, working to develop effective strategies that strike a balance between competing economic and ecological needs. There are also less parochial questions: rivers within the cave system are part of a global network of research sites evaluating the impact of karst geochemical processes on the global carbon cycle and thus the potential for global climate change.