THE GLOBAL KARST DIGITAL PORTAL: AN EMERGING COLLABORATORIUM WILL ENHANCE INFORMATION EXCHANGE AMONG CAVE AND KARST MANAGERS

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Abstract

The National Cave and Karst Research Institute, the University of South Florida, and the University of New Mexico are developing an on-line portal to enhance information access and improve communication within the national and international karst community. The partnership will develop an on-line portal housed at the three institutions and provide free access to a variety of information including journal articles, images, maps, datasets, bibliographies, and gray literature. This holistic undertaking seeks to bring karst research and management forward in the digital age. In addition, the project will create global connections by creating Institutional Repositories in countries with active karst research programs. These Institutional Repositoriess will be linked to the portal and will provide a user-generated submission process for enhancing the diversity of materials available through the portal. We are currently transforming *A Guide to Speleological Literature of the English Language 1794-1996* into the portal's first searchable on-line product. In the future, thematic areas, such as cave sediments, conduit flow models, best practices for management, established restoration techniques, geoengineering, geomicrobiology, and speleothem records of climate change, are among many topics to be included in the portal. A key component of this project is the gathering of lesser-known materials, such as masters' theses, technical reports, agency file reports, maps, images, databases, and newsletters. We seek input from the karst community as to what materials are most critical to

bring on-line at the outset of the project and on the identification of significant repositories of karst digital data and information. The U.S. Congress has charged the National Cave and Karst Research Institute to centralize and standardize speleological information and to promote national and international cooperation. The international community has expressed a desire for greater information coordination and global accessibility. Thus, this project responds to disciplinary needs by integrating individual scientists into a global network through the karst information portal.

Introduction

Karst science is coming of age and is of growing significance to our global population. Approximately 20% of the earth's land surface is karst and ~40% of the world's populations get their drinking water from karst aquifers. Thus, karst science has expanded in recent decades from a subdiscipline of geology and geography to a major interdisciplinary area that brings together teams of researchers and educators from the physical, natural, and social sciences. Due to the geographic extent of karst landscapes, researchers from numerous countries actively investigate karst science. Although significant to the global karst community, the results of much of this research are difficult to obtain. Likewise, given the local significance of karst, such as in areas like the Edwards Aquifer basin of central Texas and the Floridian Aquifer, research is often reported in the gray literature or exists electronically in the form of data files or maps. The best collections of karst literature are private, limiting general access to these materials.

A team of karst scientists, educators, and librarians from the University of South Florida, University of New Mexico, and the National Cave and Karst Research Institute came together in spring 2005 to build a partnership between themselves and other members of the karst community to address these needs through a Karst Information Portal. The mission of the project is to transform global understanding of karst terrains through an innovative, on-line linkage among karst researchers, educators, and land managers who desire a wide variety of electronic information on karst topics (Figure 1).

Goals of the Karst Information Portal

The goals of the Karst Information Portal project are to foster:

1. communication among karst scientists, and,
2. accessibility of the results of karst research projects globally.

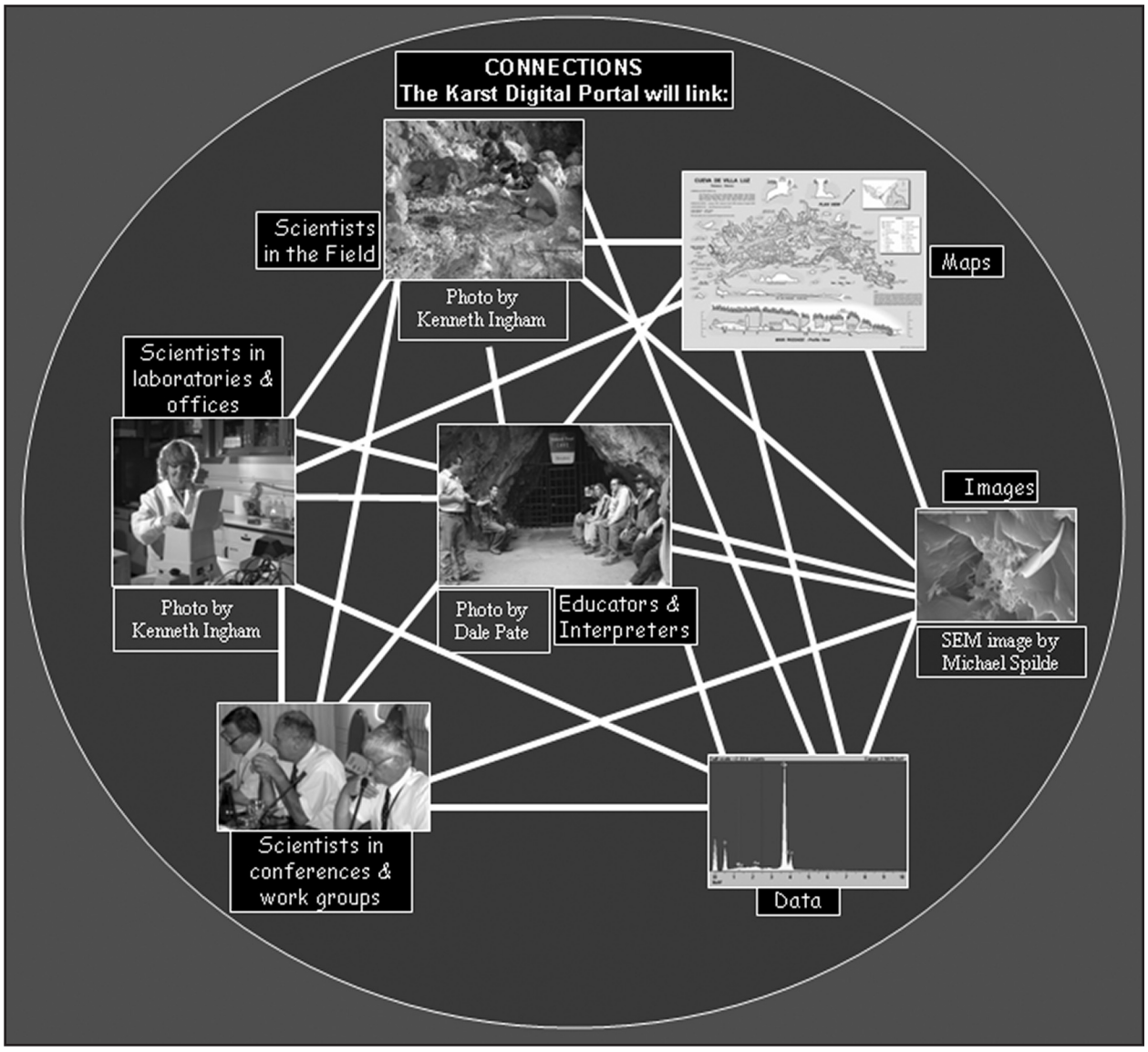
Specific ideas for Karst Information Portal include to:

- Create innovative linking between repositories of digital objects;
- Increase access to karst literature and resources, many of which are:
  - grey literature;
  - in non-English languages;
  - poorly indexed;
  - inaccessible;
- Provide searchable digital versions of key karst resources;
- Create a searchable version of *A Guide to Speleological Literature*;
- Establish Open Archive Initiatives through the fostering of Institutional Repositories at key karst centers worldwide.

The partners

Diana Northup, a Professor Emerita in the University Libraries, a Visiting Associate Professor in the Biology Department and an active karst researcher, instigated the University of New Mexico effort. Her team includes several members of the library faculty and staff who are already involved in innovative digitization and portal efforts, such as SORA (digitization of key ornithology journals), a Dspace institutional repository of University of New Mexico scholarly output, and Harvester for Creating Knowledge Streams in the Americas, which brings together social science and medical content and metadata for an Open Archive Initiative covering North and South American publications.

The Karst Research Group at the University of



South Florida houses one of the largest concentrations of karst researchers in the country. Consisting of nine faculty from four departments (Geology, Geography, Environmental Science, and Biology), the group conducts research on a variety of topics including karst geomorphology, hydrology, climate change, and karst policy. The group offers Ph.D. and masters opportunities in all participating departments. Ten graduate students are currently mentored by faculty in the program. Members of the Karst Research Group, in partnership with the University of South Florida's Patel Center for Global Solutions and the University of South Florida Library, make up the University of South Florida team working on the karst portal. The Patel Center's Mission is to develop a body of knowledge that is used to promote sustainable economic development and reduce poverty, improve the quality of the natural environment, human health, and security, and foster an understanding of diversity of cultures and arts. The support of the Patel Center provides a global focus to the portal project.

The U.S. Congress charged the National Cave and Karst Research Institute to centralize and standardize speleological information and to promote national and international cooperation. The University of New Mexico team initially asked the National Cave and Karst Research Institute to join their effort, recognizing the need to build a broader community effort. University of South Florida

was independently developing a similar effort and, through the National Cave and Karst Research Institute, learned of the University of New Mexico initiative. the National Cave and Karst Research Institute arranged a meeting between Len Vacher of University of South Florida and members of the University of New Mexico team in May 2005, and the triad partnership was established.

Current status of the project

Staff, faculty, and graduate students from the three partners identified the development of a karst information portal as a main objective of our joint efforts. Current plans focus on a karst information portal hosted at the University of South Florida, the University of New Mexico, and the National Cave and Karst Research Institute. The portal is envisioned to provide free access to a variety of information including journal articles, images, maps, datasets, bibliographies, and gray literature. In addition, the project will create global connections establishing global Institutional Repositories (institutional repositoriess) that include a user-generated submission process for enhancing the diversity of materials available through the portal. Karst Information Portal's first entry will be a transformed *A Guide to Speleological Literature of the English Language 1794–1996* as a searchable on-line database of the references included in the *Guide*. Access to this information has been graciously granted by the original publisher, Cave Books.

A second project is the creation of a global repository of scanning electron images and spectra from karst and cave investigations. Scanning electron micrographs from geomicrobiological and mineralogical investigations in caves represent a major data management problem and a major opportunity for increasing linkages among karst scientists. Much new morphological data is being discovered in these images and the Karst Information Portal represents an ideal means of fostering collaborations in interpreting these morphological data.

In the future, thematic areas, such as cave sediments, conduit flow models, best practices for management, established restoration techniques, geoengineering, geomicrobiology, and speleothem records of climate change, are among the many topics contemplated for inclusion in the portal. A key component of this project is the gathering of lesser-known materials, such as masters' theses, technical reports, agency file reports, maps, images, and newsletters.

January 2006 Workshop

The partners seek input from the karst community as to what materials are most critical to bring on-line at the outset of the project and on the identification of significant repositories of karst digital data and information. To this end, an international panel of karst and mega-cyber information specialists, consisting of researchers, educators, land managers, and information technology specialists, will gather in Carlsbad, New Mexico, in mid-January 2006. The workshop will:

- Identify needs that may be met through a karst digital portal;
- Identify resources that might be enhanced through a karst digital portal;
- Seek ideas as to how best to structure a karst digital portal;
- Learn from experienced leaders in mega-cyber efforts;
- Explore opportunities to collaborate with existing mega-cyber efforts;
- Develop a planning document from the workshop that will guide efforts over the next several years in the development of the karst information portal;
- Provide an opportunity for interaction among international leaders in karst science and experts in mega-cyber efforts to develop linkages for future collaborative efforts.

The resulting planning document will be posted on the the National Cave and Karst Research Institute Web site and widely distributed.

Summary

This holistic undertaking seeks to bring karst research and management forward in the digital age. Besides being a source of karst research results and references, linkages will foster communication among karst scientists, educators, and land managers, many of whom are widely scattered and unknown to each other. This portal will help to usher in a new era of karst research and education that is focused on global understanding of karst sci-

ence. The international community has expressed a desire for greater information coordination and global accessibility. Thus, this project responds to disciplinary needs by integrating individual karst workers into a global network through the karst information portal.

Biographies

Hose is the National Park Service's Director of the the National Cave and Karst Research Institute and an adjunct professor of earth and environmental sciences at the New Mexico Institute of Mining and Technology.

Brinkmann is a karst geomorphologist and public policy specialist and professor in the Department of Geography at the University of South Florida.

Northup is a Professor Emerita in the Science and Engineering Library and a Visiting Associate professor of Biology at the University of New Mexico.