



# INSIDE EARTH

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The main natural entrance to Carlsbad Cavern. (NPS Photo by Dale Pate)

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## NATIONAL CAVE AND KARST RESEARCH INSTITUTE

### COMPLETION OF THE INTERIM PHASE

*by Zelda Chapman Bailey*

The Interim phase of the Institute is essentially complete and staffing has begun. Applications for the position of Director of the Institute were solicited in late June through early July, and Dr. Louise Hose was selected. She reported to Carlsbad in mid-December 2002. Dr. Hose brings a wealth of experience in cave exploration, and cave and karst research and education. The Interim Director will overlap for a few months to ensure a smooth transition and to complete some of the activities begun during the first two years.

The financial status of the Institute remains uncertain for fiscal year 2003. The federal government, as of mid-January, remains under a continuing resolution, which means no budget has been passed for 2003. The Institute continues to operate at the 2002 funding level, although the proposed budget for 2003 would double the Federal funding for the Institute. If these additional funds are appropriated, the Institute can continue adding staff and can begin a grant program.

Some of the significant activities in the last half of 2002 include:

- Partial funding was provided to Boston University to support publication of the book "A Guide to Bats of North America."
- The Institute printed 1,000 copies of the American Caves Conservation Association "*Exploring caves and karst curriculum guide*" for their use and to support National Caves Association educational programs.
- A brochure was designed to provide basic information on the Institute and was first distributed at the annual GSA meeting in Denver.

- The Institute was one of the sponsors of the USGS Karst Interest Group Workshop, held in August in Shepherdstown, WV. This meeting was an excellent forum for bringing together karst scientists from a variety of federal, state, and local agencies, universities, and private firms.
- The draft manuscript of the USGS Circular "The Nation's Cave and Karst Resources: Science and Management" was sent to four technical reviewers in November. Two of the reviewers are USGS scientists and two are from outside the government.
- New Jersey Geological Survey was funded to provide digital graphics of karst in the state.
- Kentucky Geological Survey was funded to conduct a nationwide survey of State Geological Surveys for the National Karst Map program to provide a summary of criteria used in each state by to identify and map karst areas.
- The Institute and USGS sponsored and coordinated the first regional meeting to discuss criteria for the National Karst Map in Lexington, Kentucky in September. Attendees represented State Geological Surveys in the Appalachian region and some adjacent states. The meeting was very successful in providing a forum for jointly planning the content and form of a national map and for discussing criteria for mapping on local and state scales. The Institute, using input from this initial meeting, began design of the web site that will serve the National Map and link to sources of state and local karst maps and related data across the nation. The prototype web site was sent to reviewers in December.

The City of Carlsbad began the process of soliciting credentials and bids from design and construction firms for the Institute building. Design probably can begin in early 2003, but construction depends upon appropriation of additional state and federal funds.

### THE "GEARING UP" PHASE

*by Louise D. Hose*

After a 2-year "Interim Phase", the National Cave and Karst Research Institute (NCKRI), working out of the Geologic Resources Division of the National Park Service, began its "Gearing Up" Phase in late 2002. The hiring of the Institute's first permanent Director, Louise Hose, and establishment of an office in Carlsbad, New Mexico, marked the transition in December. We expect Interim Director Zelda Chapman Bailey to stay on the Institute staff through the first half of 2003 while she wraps up and hands-off the many projects she initiated. Zelda has done a magnificent job lifting the Institute from fledgling idea to a reality during her two-and-a-half year stint. The Institute will always owe her a debt of gratitude for her well-planned and successful efforts towards finding the matching funds required to move the project off the drawing board and into Carlsbad.

The Institute enjoys an immense amount of support in the city of Carlsbad and has received intense interest from the national and international cave and karst community. While considerable time has necessarily been spent learning my way around the federal system (coming out of academia), establishing a new office (buying pens and file folders, finding the water cooler and bathroom, and the big struggle to connect to the NPS computer system), undergoing radiation and health safety training (I work in a center that has radiation risks and hazardous chemicals on site), and exchanging business cards with everyone in town, considerable work has also been accomplished. A few of our projects over the last month (in addition to the ones mentioned by Zelda) include:

- Zelda's continuing negotiations to establish a Cooperative Agreement with the National Speleological Society to loan part or all of its book collection to the Institute;
- Numerous meetings with Carlsbad officials, federal land managers, and community groups;
- Participation in the process leading to the design of the Institute building in Carlsbad;
- Involvement with several potential academic partners in a possible National Institute of Health grant proposal;
- Meetings in D.C. with a congressional staffer and several key NPS officials;
- Continued development of the Memorandum Of Understanding with New Mexico Tech and the City of Carlsbad;
- Worked with science journalists from two major, foreign television networks and one international science journal, providing information for possible future special shows and article;
- Participation on a National Science Foundation grant review panel in D.C., and, of course...
- Answering scores of questions from cave and karst folks around the world who are curious about the activities and potential of the Institute.

I expect most of you share my excitement in "gearing up" the Institute and I hope you will join us in our upcoming activities. Our mission is to facilitate speleological research, enhance public education, and promote environmentally sound cave and karst management. We welcome your comments on how those goals can best be achieved. If you have ideas you wish to share, my contact information is as follows:

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## PARK UPDATES

### CARLSBAD CAVERNS NATIONAL PARK

by Dale Pate

**CARLSBAD CAVERN PROTECTION PLAN & EA** - In the works for at least 3 years, this Environmental Assessment has been released to the public for comment. This plan, based on information from an infiltration study, begins the long process of removing structures or mitigating their potential impacts to the cave below. The release of this document is an important step in the long-term protection for Carlsbad Cavern.

**LECHUGUILLA CAVE 2002** - Exploration, survey and inventory expeditions into Lechuguilla Cave during 2002 added 2.2 miles of new survey and resurveyed 2 miles, fixing 130 loop closure problems. This work brought the total length of the cave to 109.23 miles (175.79 kilometers).

**RINGTAILS** - This fall and winter, a number of ringtails (*Bassaricus astutus*) have been appearing in the Underground Concessions Area of Carlsbad Cavern. A member of the raccoon family, ringtails commonly enter and travel deep into caves. As early as 1928, Vernon Bailey in his book, *Animal Life of the Carlsbad Cavern*, reported numerous ringtail sightings in the cave. As many as six different ringtails have been trapped from the concessions area in the last few months. Park staff has been working with the park concessionaire to limit ringtail's access to any food items or water in the underground concessions area.



A ringtail trapped and removed from the Underground Lunchroom. (NPS Photo by Myra Barnes)

**MONITORING BAT SPECIES FROM ECHOLOCATION PATTERNS** - The park recently acquired an Anabat bat detector that records echolocation sounds emitted from bats. Every species of bat has its own unique echolocation patterns thus enabling the researcher to determine species from these patterns. Myra Barnes, a wildlife biologist for the park, has been routinely monitoring several locations within

Carlsbad Cavern and other locations in the park for species use. Of note was the echolocation of a Ghost-faced bat, not known from the park or from southeast New Mexico. The Anabat bat detector promises to be an excellent tool for monitoring bat use in the park.

LINT CAMP 2002 - Lint Camp 2002 occurred September 30 to October 4 with 15 participants this year. The camp, led by Pat Jablonsky removed thirteen pounds of lint from numerous locations along the main paved trail in the cave. The group donated 270 hours in this effort to keep the cave lint free.



Lint Camp 2002 crew. BACK ROW: Pat Jablonsky, Mike Kienker, Dave Owens, Cindy Collins, Dan Shultz, May Matthews, Marc, Kathryn and Veronica Myrsell, Margo Butner, Travis Owens, Jana Henson. KNEELING IN FRONT: Clarence Williams, Tem Hornday, and Greg Glasner

## GREAT BASIN NATIONAL PARK

by *Krupa Patel*

The FY2002 field season started with the enjoyable task of creating Access databases for field data, and continued with database restructuring throughout the summer. During the season eight caves were surveyed and inventoried. Digital and paper maps were drafted from the surveys. Human use monitoring points were also established to monitor long-term human impacts to the cave environment for the purposes of effective adaptive management.

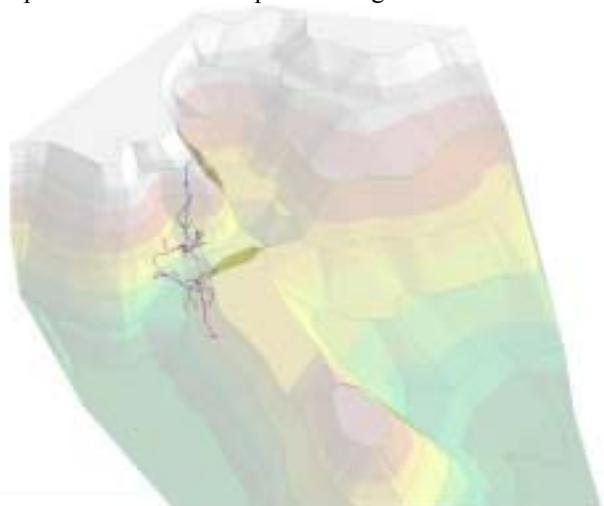


FIGURE 1. GIS map of Baker Creek Cave System, the longest known cave system in Nevada.

GIS maps with physical and biological inventory layers were created for all eight caves. 3-D GIS maps with COMPASS line plots were created to study the relationship between cave morphology and surface features. The maps also allow us to study the spatial relationships between various caves within the same system and between caves that are close in proximity.

A contract was established with Steve Taylor, University of Illinois, Illinois Natural History Survey, and Jean Krejca, University of Texas, to conduct cave invertebrate inventories in the eight permitted caves within the park. In addition to species composition lists, current and potential threats to cave invertebrate populations will be identified. Management strategies will be developed based on ecological and biological information on the collected taxa.

Megan Porter, Brigham Young University, conducted a microbiological survey of Halliday's Deep within the Baker Creek system. The purpose of the microbiological survey was to verify the presence of a potential rash-causing agent in the cave sediment (reported by a group of cavers), and if present, to identify its cause.

During the summer, four new high-alpine caves were discovered on a ridgewalk through the park. Noah Daniels, Megan Porter, and Megan's friend Katerina discovered and named three of the caves Deep Fall, Second Chance, and Wild Goose. Noah dubbed the fourth cave Alpine Kyle after the discoverer, Kyle Voyles.

External and internal bat surveys in ten caves and two abandoned mine sites were conducted to gain species composition and distribution data for bat populations within the park. HOBO Pros were installed in the bat-significant caves to measure the effects of the microclimate components, temperature and humidity, on roost selection for sensitive bat populations.



FIGURE 2. Weighing a bat captured during mist-netting at Upper Pictograph Cave

During the year more than 200 bats were captured, their data recorded, and released. Seven different bat species were found during the surveys, including the four known NPS-Sensitive species present within the park: *Myotis evotis* (Long-eared myotis), *Myotis volans* (Long-legged myotis), *Myotis ciliolabrum* (Western small-footed), and *Corynorhinus townsendii* (Townsend's Big-eared).

During FY2003, the cave crew will continue to survey caves and collect physical and biological inventory data through the wild cave project. We also hope to initiate a bat telemetry study to map habitat use by sensitive bat populations in the park. Radio telemetry will enable us to determine where bats are forming sensitive roost sites. This information will allow us to monitor trends in population size and seasonal roost use. Bat location information will enable us to protect important roost sites and water sources from human impact and disturbance.

## WIND CAVE NATIONAL PARK

*by Rod Horrocks*

In the WICA Cave Resource Management office, we are now concentrating on on-going projects and preparing for the upcoming year. Some of the highlights that have occurred in the previous few months include:

In August, Ron Kerbo and Dr. John Moore assisted our cave resource management staff in representing cave management during a Resource Management Scoping meeting for Wind Cave National Park. A total of 30 people participated in portions of this three-day meeting. It was decided that the four most important areas of cave resource management in the park are, in priority order: the developed corridor in Wind Cave, off-trail Wind Cave use, backcountry caves, and finally cave research needs. Each of these areas was then broken into numerous individual projects or issues.



*The 2002 Cave Restoration Crew standing on top of 13.98 tons of trail construction debris removed from the Natural Entrance Tour Route. This debris is composed of displaced sediment, small pieces of blast rubble, asphalt, concrete, and some abandoned cables and pipes. L-R: Matt Reece, Ari Juhala, Jessica Weinman, Seth Spoelman, Bonnie Curnock, & Barry Oost (not pictured: Noah Daniels). (NPS Photo)*

Our seasonal cave restoration crew is currently working on the Natural Entrance Tour Route. Thus far they have removed 13.98 tons of trail construction debris and cleaned over 200 feet of that tour route. This included a project to remove an abandoned transformer on the Candlelight Tour Route.

As part of this cave restoration project, we recently invited several historic and cultural landscape architects to evaluate the Natural Entrance Tour Route as a cultural landscape. This was part of a larger project, a Cultural Landscape Report that is looking at both the Historic District and the cave. Their recommendations will be used to help us determine how these impacted areas will be restored.

Marc Ohms has completed an experiment on the Candlelight Tour Route that compares natural dust deposition with dust generated from candlelight tours. He has found that the dust accumulations are ten times higher during the candlelight tour season than during the off-season.

We are conducting a cave lighting experiment to determine how lighting systems can be used to reduce algae growth in caves. This two-year experiment will be conducted on the Natural Entrance Tour Route, where we have the highest concentration of dripping water and the worst algae problem. This experiment will be composed of 14 individual experiments. The information gained will guide us in redesigning our entire cave lighting system.

The interpretation division has started a project to completely redesign the cave and karst exhibits in our visitor center. The park recently held an initial concept-planning meeting for this project. The initial plans call for the new exhibits to flow linearly from surface/cave connections to geology, then to history, on to exploration, and finally to cave resource management.

Marc Ohms recently completed a radon monitoring study of Wind Cave, including both tour routes and remote sections of the cave. Ten passive radon detectors were placed throughout the cave and left in place for three months. The results showed little variance in radon levels in respect to location in the cave. The results were also comparable with past radon monitoring tests stemming back to the 1970's.

Marc Ohms recently found and documented four small caves in the park, bringing the total number of caves, including Wind Cave, to 25.

Marc Ohms has recently been given air and water quality responsibilities for the park. This includes both surface and subsurface resources, a Level 1 air quality station, a NADP (National Atmospheric Deposition Program) station, and an ozone monitoring station.

Jason Walz recently finished his first season working in cave resource management at the park. During the previous six months, he was an immense help while he completed numerous projects, from redesigning the candlelight tour

buckets to assisting in water quality sampling of parking lot runoff.

Since the last reported length of Wind Cave within Inside Earth, volunteer cavers have increased the surveyed length of the cave by 1.9 miles, establishing the current length of 106.03 miles.

## ARTICLES

### NATIONAL SPELEOLOGICAL SOCIETY RESTORATION CAMP AT MAMMOTH CAVE NATIONAL PARK NOVEMBER 2-3, 2002

*by Rick Olson*

Well, they did it again. Forty-four high-spirited, high-energy volunteer cavers worked their magic in Mammoth Cave. On Saturday, November 2<sup>nd</sup>, three crews tackled different tasks. Montana Spencer, a veteran of 17 Mammoth restoration camps, organized her crew in the Vanderbilt Hall "Chop Shop". No, they weren't making hot rods. They reduced creosote soaked timbers with a chainsaw to manageable chunks, which were then bagged for removal. All morning and into early afternoon a continuous line of cavers carried hundreds of bags to Mammoth Dome (picture army ants). Roy Vanhoozer led a phalanx of cavers to Silliman Avenue via the Carmichael Entrance, and they carried roughly 200 bags to Marion Avenue where they were staged for eventual removal. Averaging 25 pounds per bag, this crew moved about 2.5 tons of old cable and waterlogged wood, and that was in the morning. Camp Leader Kevin Betz led a wheelbarrow crew to Chief City, over a mile and a half into the cave. The wheelbarrows were much easier to push after their 80 pound loads of sackcrete (6 bags) were delivered. The concrete will be used for trail repair by park teams.



Loading the dump trucks. (NPS Photo by Rick Olson)

In the afternoon, all hands congregated at Mammoth Dome to form a human chain all the way up the tower to Little Bat Avenue. They relayed approximately 600 bags of fragrant wood to the top. We were all glad to hear "last bag!" called

out, since this is the kind of workout some yuppies actually pay for. No time for rest yet. All shoulders and six wheelbarrows were loaded for the haul out to the base of the entrance stairs. After many trips back and forth, we all ran out of steam at about 5:00pm. That evening, pizza and barbecue were consumed in large quantities at Cave City restaurants.

**Sunday morning, 08:30 at the Historic Entrance** - All seemed to have rested well, since spirits were unbent even if joints and muscles were a bit sore. The human chain formed on the stairs, and bags flew uphill and into the dump truck. With two loads off to the dumpster, plus all tools and wheelbarrows hauled out, we judged it a very successful camp. Significantly, there were no injuries or apparently even any hurt feelings.



The crew poses for a picture. (NPS Photo by Rick Olson)

Who are these people? They are cavers from Georgia, Illinois, Indiana, Kentucky, Ohio, Pennsylvania, Tennessee, and Wisconsin. Because of multiple memberships, more than eight Grottos of the National Speleological Society were represented, although many participants are independent cavers. Ages ranged from those with distinguished gray to youngsters with Boy Scout Troop 605 from Rising Sun, Indiana. This Troop (not all boys) is a credit to scouting as these young people with their more mature leaders were among the diehards. The only diversification lacking was racial, and that is true of caving in general. This is likely due to the unglamorous "grovel-in-the-gravel" nature of the activity, rather than acceptance problems (it has long been said that if cavers will not accept you, then you *really* have a problem!). A few people, like Steve Petruniak, have been active in Mammoth Cave restoration work for over 10 years. A quarter of the participants were new to this project with everyone else ranging between one previous camp and the dozen attended by Dan Williams. People departed with a great sense of accomplishment, and many said "see you next March!"

## MEETINGS & CONFERENCES

April 14-18, 2003 - **George Wright Society Conference** -  
San Diego, California  
<http://www.georgewright.org/2003.html>

May 15-17, 2003 - **Mapping Cave Resources (Biological  
and other resources)** - sponsored by the Karst Waters  
Institute & the Missouri Department of Conservation -  
Kirkwood, Missouri

May 21-22, 2003 - **Drinking Water Protection in Karst  
Terrain: A Groundwater Conference and Field Seminar**  
sponsored by the U.S. Environmental Protection Agency -  
Abingdon, Virginia

June 3-6, 2003 - **International Conference on Karst  
Hydrogeology and Ecosystems** sponsored by the Hoffmann  
Institute, Western Kentucky University and the Cave  
Research Foundation - Bowling Green, Kentucky  
<http://karst.wku.edu/2003/>

August 4-8, 2003 - **National Speleological Society  
Convention** - Porterville, California  
<http://www.nss2003.com/>

September 6-10, 2003 - **Ninth Multidisciplinary  
Conference on Sinkholes and the Engineering and  
Environmental Impacts of Karst** - Huntsville, Alabama  
<http://www.asce.org/conferences/karst2003>

October 13-17, 2003 - **National Cave and Karst  
Management Symposium** - Gainesville, Florida  
<http://cavediver.org/nckms/nckms.htm>

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