

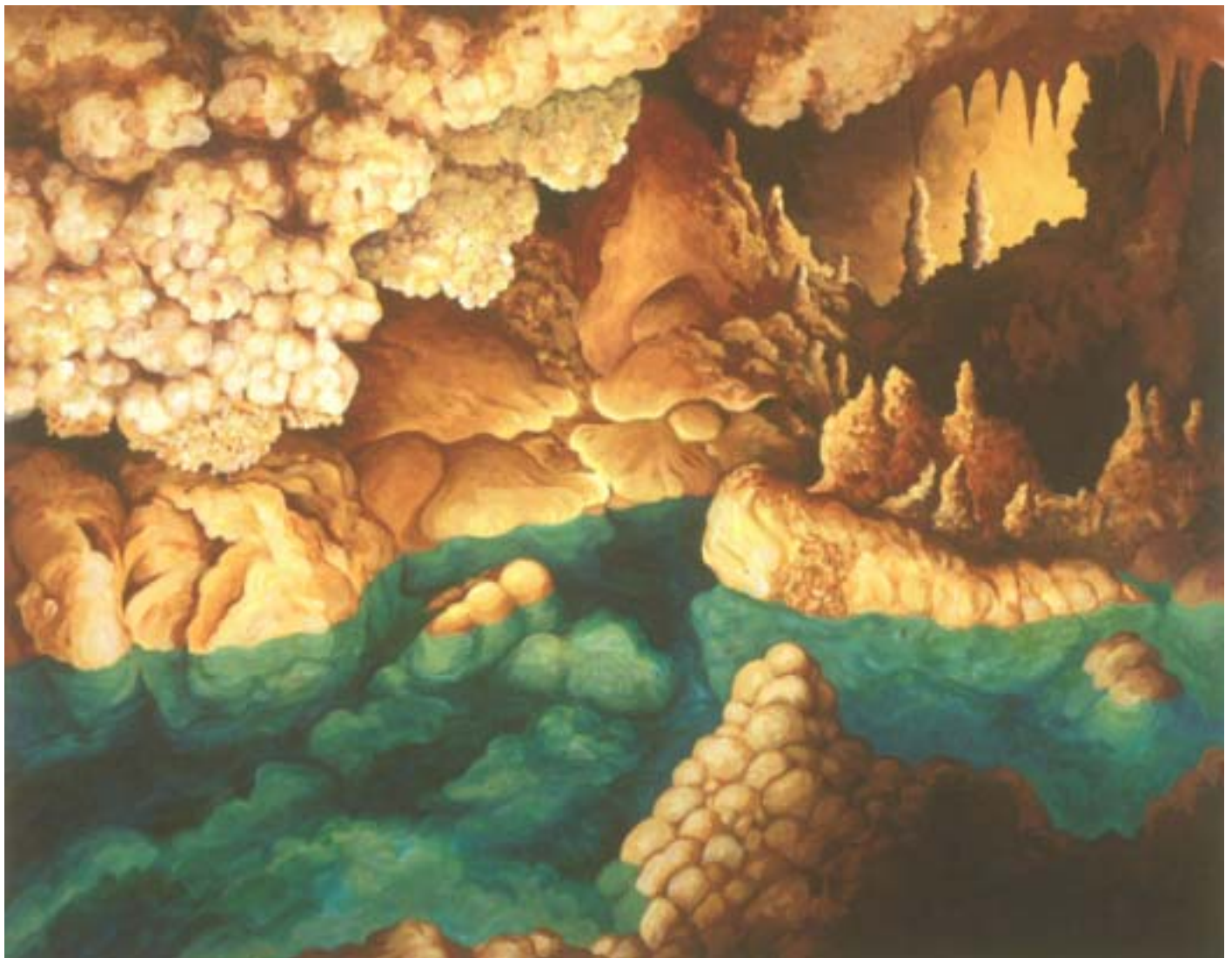


INSIDE EARTH

A Newsletter of the National Park Service Cave & Karst Programs

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"Lake of the Clouds" © Lois Lyles 2002

"Lake of the Clouds" is a 4-foot by 5-foot acrylic on canvas painting by Lois Lyles. Lois is a long-term volunteer caver at Carlsbad Caverns National Park with the Cave Research Foundation. Much of her imagery is derived from spectacular Carlsbad Cavern. A professionally trained artist, Lois exhibits her cave-inspired artwork nationally. This painting is from the collection of Jimmie Worrell of Lovington, New Mexico.

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<http://www2.nature.nps.gov/grd/geology/caves/newsletter.htm>

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Cover Photo: A fabulous painting by Lois Lyles of the Lake of the Clouds in Carlsbad Cavern.

PARK UPDATES

CARLSBAD CAVERNS NATIONAL PARK

by Dale Pate

Palmers Visit - Art and Peggy Palmer were in the park in July to continue their study of the late-stage history of Guadalupe Caves with special reference to Lechuguilla Cave. Their studies this year focused on weathering processes and byproducts, the nature and correlation of cave pool deposits, including crusts and rafts, and the origin of solutional rills in limestone surfaces. Working with the Palmers were Richard Zopf, a professional surveyor from Ohio; Steve Worthington, a hydrogeologist from Ontario, Canada; Szabolcs Leel-Össy, a mineralogist from Budapest, Hungary; and our own Paul Burger, a hydrologist for the park. The Palmers research took them to Lechuguilla Cave, Carlsbad Cavern, and Spider Cave.

Update On Slaughter Canyon Cave Excavation - Sorting through material excavated in April 2002 by Gary Morgan from the New Mexico Museum of Natural History has yielded thousands of bones from *Tadarida constantinei* (an extinct bat only known from Slaughter Canyon Cave) and bones from ten other vertebrates. They are as follows: **Reptiles** - *Gopherus agassizi*, the Desert Tortoise no longer found in New Mexico, and an unidentified lizard and snake; **Birds** - the claw of a large raptor (not identified as of yet); and **Mammals** - Bat: a *Myotis* species, Rabbit: a cottontail rabbit from the genus *Sylvilagus*, Rodents: a pocket mouse from the genus *Perognatus* and a larger rodent perhaps from the genus *Neotoma*, Carnivores: *Arctodus simus*, the Giant Short-faced Bear and an ungulate: *Capromeryx minor*, a miniature pronghorn. Sorting the excavated material is not yet complete and may turn up even more vertebrates.

Two New Caves - Two new caves have been surveyed in the park's backcountry bringing the total number of caves to 102.

Infrastructure Removal Continues - The fencing, lights, and barbeque pit from around the tennis court (a Mission 66 structure) and the cinder-block walls around all the Mission 66 apartments have been recently removed. The concrete slab for the tennis court is slated for removal at a later date. These structures were built in a different time when park management did not realize the impacts that new infrastructure may have on park resources, especially by placing them directly on top of one of the world's most spectacular cave systems.



The tennis court in early May 2002.

(NPS Photo by Stan Allison)



The same area on June 6, 2002.

(NPS Photo by Dale Pate)



Angel Hernandez carefully demolishes a cinder-block wall associated with the Mission 66 apartments. (NPS Photo by Dale Pate)

LAVA BEDS NATIONAL MONUMENT

by Matt Reece

As another summer season seems to be rapidly drawing to a close, we've got lots of great projects going on here at Lava Beds. Due to the theft of our Chief by those Carlsbad folks, we've had some lapse money to help out with projects and people. This allowed us to bring on Ben Miller, an alumnus of the prestigious Jewel Cave internship program. Ben has been a big help this summer, and will soon be leaving us to finish up school at the University of Missouri.

Cave Recon/survey - Ben and I, along with some of our Youth Conservation Corps (YCC) staff, as well as volunteers from the CRF and Shasta Area Grotto have been documenting caves this summer. Ben adopted one of our trench systems as his own and has begun to systematically survey all of the caves of that system with the assistance of the YCC. We still have three relatively large areas of the monument that haven't had a systematic recon. We began the recon of two of these areas, leaving an area lovingly referred to as "The Big Nasty" for a later date, when we've forgotten how nasty it really is out there. We're up to about 460 caves at this point, and finding more every week!

Visitor Center Relocation - The new Visitor Center is very close to becoming reality. The contract has been let, and we're dealing with final details at this point. The contractor should be on-site in mid-September to begin groundbreaking. They plan to have a shell of the building up before winter sets in, and possibly to have the entire building ready for the summer season.

USFS Cave Inventory - We have been assisting the forests in Northern California with some cave inventory work. This involves performing detailed resource inventories of caves on the Klamath, Modoc, Shasta-Trinity and Lassen National Forests. Ben has been heading up this project, and has completed detailed inventories and reports on five caves this summer. We've adapted the Lava Beds (LAVE) cave database and inventory forms for use by the Forest Service,

and will provide the individual forests with the information upon the project's completion this winter. The Shasta Area Grotto has provided invaluable assistance throughout this project, and we greatly appreciate their help.



Kelly Fuhrmann and Ben Miller inventorying in Barnum Cave, Klamath National Forest (NPS photo by Matthew Reece)



Matthew Reece admiring graffiti in Barnum Cave, Klamath National Forest (NPS photo by Ben Miller)

Research Center - The Lava Beds Research Center is in the final design phase. It's getting closer and closer. We hope to have the center up and running by winter 2003 or before.

Cave Management Plan Update - The revised Cave Management Plan is moving right along. It's currently running through the in-park review process. Rachel Castner, one of our Student Conservation Association (SCA) interns is working hard on the associated environmental assessment. We're beginning to see the light at the end of the tunnel.

Rock Art Conservation - We've had a private contractor in the park a few times this summer working on rock art photography. Using some special techniques, he is able to digitally enhance the photographs of the rock art, and the resulting images are quite impressive – some even look as if they were just completed. While natural processes are

rapidly covering or fading some of the artwork, this will help us to "save" the artwork for future generations.

Cave Inventory - A year after its re-development, our cave database is running flawlessly, and has been enhanced with new and exciting features! Bill Devereaux and the Cave Research Foundation (CRF) folks have been helping out by filling in missing information, collecting Global Positioning Systems (GPS) observations of caves, and photographing entrances.

Monitoring - The monitoring program at LABE is going ahead full steam! We've completed a round of photomonitoring of ice in Merrill Ice, Skull Ice, and Crystal Ice Caves. Dozens of dataloggers in a handful of caves are helping us get a better understanding of the microclimate demands of bats for both nursery colonies and hibernacula. Our *Corynorhinus* and *Tadarida* maternity colonies are doing quite well. John Dunne, our bat specialist for the summer, has been keeping tabs on the ladies and making sure that we're not bugging them with unnecessary visits. The numbers aren't in on our *Tadarida* colony yet, but based on the most recent outflight we observed, they're doing very well.

CRF Projects - Volunteers from the CRF are continuing with the cave monumenting project, and we have many CRF cartographers finalizing maps. In addition to these projects, they're constantly field checking and revising cave information, as well as collecting entrance photographs for the database.

SEQUOIA AND KINGS CANYON NATIONAL PARKS

by Shane Fryer

This season two cave gates within the park were compromised on separate occasions. Soldiers Cave was the first breached while Clough Cave was broken into this summer. Luckily, the 13-meter drop in the entrance of Soldiers Cave prevented further entry, and a second gate in Clough stopped the vandals. In either case no further sign of vandalism occurred beyond the gates. The cave management program has designed two entirely new gates for the caves, and is working hard to secure funds and material for their fabrication. The new designs will be more secure, bat friendly, and restrict less airflow. Both caves were originally gated due to their close proximity to a campground, rare biota and delicate speleothems. Clough Cave has seven endemic species including cave-adapted scorpions, isopods, and spiders.

On a brighter note, Lilburn Cave has passed 30 kilometers of surveyed passage. The Cave Research Foundation has worked in the area since 1976 and is also conducting hydrologic and sedimentation studies. Thirty kilometers adds the cave to the world long cave list.

Other efforts include a resurvey of Lange Cave after new discoveries extended its known length and an initial survey of Windy Pit. Discovered in the early 1990s and noted for its nice rappels and decorated rooms, Windy Pit is a significant cave now approaching 60m in depth. Projects to tag entrances and key survey stations in several caves are under way.

The Regional Office supplied an \$80,000 grant for a two-year inventory of biota in park caves. The funds will be used to hire a biologist to collect specimens and coordinate efforts to classify the cave-adapted animals. The work should help define the range of known park species and will likely discover species new to science.

WIND CAVE NATIONAL PARK

by Rod Horrocks

The summer season has been incredibly busy at Wind Cave National Park especially due to funded projects and an increase of 17% in park visitorship.

On 8/12/02, a local contractor spilled several gallons of diesel fuel on the visitor center parking lot. This spill entered the Wind Cave Canyon drainage after 20 minutes and disappeared underground within 50 feet of the culvert outlet. Water from this culvert has previously been dye traced to Wind Cave after an 8.5 hour flow through time. We collected multiple samples in the cave from 9-18 hours after the spill and then once each day for several days thereafter to determine if the fuel appeared at that cave site. These samples are being analyzed by Alan Heakin from the Hydrology Division of the USGS as part of the parking lot runoff study. Alan had already detected Acetone and Toluene in these cave waters from a previous test.

During a 1 1/2" rainstorm, a recent survey party led by Rene Ohms noticed a waterfall entering Wind Cave from the top of a rubble-choked dome. This water took less than 1/2 hour to enter the cave. A cave radio was used to determine that the top of the dome was 100 feet south of the Natural Entrance and only three feet-below the surface of Wind Cave Canyon.

We are currently hiring a crew of seven individuals for a cave restoration project along the tour routes in Wind Cave. The crew will be cleaning dust, lint, hair, and construction debris from our four developed tour routes. Removing the blast rubble component has been put on hold pending a cultural landscape survey that will determine if any debris should be left in the cave.

The park will be hosting a scoping meeting for our new Resource Management Plan in late August. Ron Kerbo and Dr. John Moore will be joining our staff in representing cave resource management at this meeting.

The park was approached by members of the Casey family and asked if we were interested in purchasing 5,555 acres in the keyhole area south of the park. South Dakota Senator,

and Senate Majority Leader, Tom Daschle has introduced legislation to revise the boundary of Wind Cave National Park accordingly. This land contains karst and cave resources.

The new lake, What the Hell, has only dropped .01" since it was last checked two months ago. The lake has now virtually maintained the same elevation for the previous 10 months.

Dan Foster has started as the new Chief of Resource Management at the park. He comes to us from Nez Perce National Historic Park in Idaho.

ARTICLES

USGS KARST INTEREST GROUP WORKSHOP

August 20-22, 2002

From the office of Ronal Kerbo

About 80 people attended the second U.S. Geological Survey (USGS) Karst Interest Group (KIG) workshop in Shepherdstown, West Virginia, August 20-22. The attendees included USGS and other Department of Interior scientists and managers, University researchers, and members of State agencies and the private sector that are interested in karst areas and features. Voluntary coordinator of the USGS Karst Interest Group is Eve Kuniasky, Southeastern Region Ground-Water Specialist, USGS. Attendees from the National Park Service were Zelda Bailey (National Cave & Karst Research Institute), Paul Burger (Carlsbad Caverns National Park), Ronal Kerbo (Geologic Resources Division) and Joe Meiman (Mammoth Cave National Park).

Presentation topics included: integrating science, the use of tracers in karst studies, state and national karst programs, the structure and genesis of karst areas, borehole flow measurements in limestone, and a field trip. Randall Orndorff and George Harlow, both from the USGS, developed the workshop field trip and field trip guide. The field trip was designed to help members of the KIG understand the hydrogeologic framework of the carbonate aquifers of the northern Shenandoah Valley and included lectures from local experts, such as David Hubbard, who discussed sinkhole hazards and Robert Denton, who helped provide the tour of Crystal Caverns.

Zelda C. Bailey, Interim Director of the Cave and Karst Research Institute and Norman Grannemann, USGS Ground-Water Resources Program Coordinator sponsored this KIG workshop, including the proceedings published as Water-Resources Investigations Report 02-4174. The proceedings for the first KIG workshop in St. Petersburg, Florida were published as Water-Resources Investigations Report (WRIR) 01-4011 and is available at the following

website: <http://water.usgs.gov/ogw/karst/index.htm>. The proceedings for the Shepherdstown workshop (WRIR 02-4174) will be made available at the same website.



Workshop attendees on a field trip stop at a roadcut in the Shenandoah Valley, Virginia. (USGS Photo by Eve Kuniasky)

According to Eve Kuniasky, "The mission of the Karst Interest Group is to encourage and support interdisciplinary collaboration and technology transfer among U.S. Geological Survey scientists working in karst hydrology. Additionally, the Karst Interest Group encourages cooperative studies between the different disciplines of the U.S. Geological Survey and other Department of Interior agencies, and university researchers." The interest group receives some continuous support from the USGS, Office of Ground Water, which provides for the public and internal web site.



Dave Hubbard holds a picture taken of a sudden collapse sinkhole in Shenandoah Valley at the time of the collapse. (USGS Photo by Eve Kuniasky)

In order to provide KIG participants a feel for the wide variety of karst aquifers in the United States and to encourage local participation, each workshop will be held in different locations. The next meeting will be held in October of 2004 or May of 2005 in Rapid City, South Dakota. Jack Epstein, Geologist Emeritus, USGS, Larry Putnam and

Andrew Long, USGS, Rapid City have agreed to assist Eve with the next meeting. This should allow ample time for scientists to have new information to report on at the meeting and to publish in the proceedings. The location is near several National Parks, the Madison limestone aquifer, along with numerous karst features, including gypsum karst features. If the next meeting is as well planned and interesting as the Shepherdstown workshop, it will be well worth attending.

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