CaveTalk

Core Values: Stewardship, Education, Entertain, Cooperation
Core Focus: Our Niche – Help Show Caves to Learn and Grow
Our Purpose – A Platform to Share, Support and Sustain

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NCA Facebook

April 2024

From the desk of the president

Wow! I've always wanted to say that!

It's April already and we are moving into the busy spring season. I have been looking into the official NCA crystal ball that I received at last year's convention – it's clear! That means it will be a good year ahead for all our operations.

As for War Eagle Cavern, we opened the '24 season on March 2, and are off to a good start. Over the winter, we laid new flooring in the gift shop (and that means moving absolutely everything), replaced fencing and gates throughout the property, and added new handrails on the pathways heading to the cavern. As soon as weather permits we will be putting finishing touches on the project by adding extensive non-slip blacktop on all walkways. I have been working with the fencing company since November, and we still don't have a front gate! Promises, promises …

As most family-owned businesses, we are an optimistic bunch and believe - in fact expect - our future will be bright. Take care, believe, and enjoy! See you at the convention at Niagara Cave.

Dennis Boyer
NCA President

Meet Au-Spot, the AI robot dog that's training to explore caves on Mars

Who's a good boy? Image credit: (Image: © NASA/JPL-Caltech}

Sit! Stay! Fetch! Map a Martian cave!

Mars exploration is going to the dogs. The robot dogs, that is.

Scientists are equipping four-legged, animal-mimicking robots with artificial intelligence (AI) and an array of sensing equipment to help the bots autonomously navigate treacherous terrain and subsurface caves on the Red Planet.

In a presentation on Dec. 14 at the annual meeting of the American Geophysical Union (AGU), held online this year, researchers with NASA/JPL-Caltech introduced their "Mars Dogs," which can maneuver in ways the iconic wheeled rovers such as Spirit, Opportunity, Curiosity and the recently launched Perseverance never could. The new robots' agility and resilience are coupled with sensors that allow them to avoid obstacles, choose between multiple paths and build virtual maps of buried tunnels and caverns for operators at home base, scientists said at AGU.

Traditional Mars rovers are limited mostly to flat surfaces, but many scientifically interesting Martian regions are only reachable by crossing very rough terrain or descending below ground. Walking robot "dogs" are well-suited for such challenges — even if they fall down, they can get back up again.

"Toppling does not mean mission failure," the scientists said during the presentation. "Using recovery algorithms, the robot can self-right from a multitude of falls."

A Mars Dog would also be roughly 12 times lighter than current rovers and would be capable of traveling much faster, reaching normal walking speeds of 3 mph (5 km/h) during terrestrial tests. To put that into perspective, the Curiosity rover rolls along the Martian surface at about 0.09 mph (0.14 km/h), the researchers reported.

On Mars, caves may offer shelter for future human colonies, providing natural protection against deadly UV radiation, extreme cold and intense dust storms that can last for weeks and are sometimes big enough to be spotted by telescopes on Earth, according to NASA. Caves may also harbor evidence of life from Mars' distant past, or even provide a current home for organisms living deep underground, the researchers said at AGU. Legged robots that can walk around rocks, lower themselves into caves and select a path — while also gathering measurements and building a map of what they "see" — could offer scientists new opportunities to detect signs of life beyond Earth.

The autonomous Mars canine, dubbed "Au-Spot," is a modified version of "Spot," a four-legged mechanical explorer created by the robotics company Boston Dynamics. More than 60 scientists and engineers on the team of Collaborative SubTerranean Autonomous Resilient Robots, or CoSTAR, equipped Au-Spot with networked sensors and software to help it safely and autonomously scan, navigate and map its environment.

Au-Spot processes input from Lidar (remote sensing using laser pulses), visual, thermal and motion sensors to create 3D maps. The Mars Dog also uses AI to learn which structures to avoid, and to identify objects that may be of scientific interest, while a communications module allows the robot to transfer data to the surface while it's exploring underground.

CoSTAR team members are testing Au-Spot in a range of obstacle courses, putting it through its paces in tunnels and hallways; up stairs and ramps; and in outdoor locations that mimic Martian landscapes, such as lava tubes in Northern California. Those demonstrations show that untethered robots can navigate around boulders and map deep caves.

"These behaviors could one day enable revolutionary scientific missions to take place on the Martian surface and subsurface, thereby pushing the boundaries of NASA's capability in exploring traditionally inaccessible sites," the scientists said at AGU.

Watch Spot explore a cave: https://youtu.be/qTW-dbZr4U8

Robotic exploration of caves on Mars

University of Arizona engineers have developed a system that allows autonomous vehicles to scout out underground habitats for astronauts

House hunting on Mars could soon become a thing, and researchers at the University of Arizona are already in the business of scouting real estate that future astronauts could use as habitats. Researchers in the UArizona College of Engineering have developed technology that would allow a flock of robots to explore subsurface environments on other worlds.

Wolfgang Fink, Associate Professor of Electrical and Computer engineering at UArizona, believes the approach could help address one of NASA's Space Technology Grand Challenges by helping overcome the limited ability of current technology to safely traverse environments on comets, asteroids, moons, and planetary bodies such as Mars.

Fink is lead author of a new paper in Advances in Space Research that details a communication network that would link rovers, lake landers, and even submersible vehicles through a so-called mesh topology network, allowing the machines to work together as a team, independently from human input.

In this artist's impression of the breadcrumb scenario, autonomous rovers can be seen exploring a lava tube after being deployed by a mother rover that remains at the entrance to maintain contact with an orbiter or a blimp. (Image: John Fowler/Wikimedia Commons, Mark Tarbell, and Wolfgang Fink/University of Arizona)

A hole in the surface of Mars, spotted by the HiRISE camera, reveals a cave below. Protected from the harsh surface of Mars, such pits are believed to be good candidates to contain Martian life, making them prime targets for possible future spacecraft, robots, and even human interplanetary explorers. (Image: NASA/JPL/University of Arizona)

The new concept dovetails with the tier-scalable reconnaissance paradigm devised by Fink and colleagues in the early 2000s. This idea envisions a team of robots operating at different command levels — for example, an orbiter controlling a blimp, which in turn controls one or more landers or rovers on the ground.

Already, space missions have embraced this concept, several with participation by UArizona researchers. For example, on Mars, the Perseverance rover is commanding Ingenuity, a robotic helicopter. The new approach takes the idea one step further by providing a robust platform allowing robotic explorers to operate underground or even submerged in liquid environments. According to Fink, such swarms of individual, autonomous robots could also aid in search and rescue efforts in the wake of natural disasters on Earth.

Tech Briefs: Why do astronauts need to scout out underground habitats?

Professor Wolfgang Fink: As we all know, NASA is pushing very much for the return of humans to the Moon. At first, we will be looking at orbiting the Moon, then at some point landing on the Moon and establishing a permanent presence on the Moon. But of course, all of that with the look toward the horizon, which is Mars, where the same will be happening as well in the future. So why do we need to scout out underground habitats? Once you want to establish a permanent presence on another planetary body, you have two choices. Either you bring all your habitat material with you, which is a great amount of payload, and they are cumbersome, or you take advantage of things and materials you find on that planetary body to build your habitat. But there is a third opportunity here which is to take advantage of caves or lava tube caves which may already exist on planetary bodies such as the Moon and Mars. And you basically scout these out, go underground, seal them off if you find them, and make it real cozy for yourself. So, the home is pretty much already prebuilt.

Tech Briefs: How will the Dynamically Deployed Communication Network paradigm (DDCN) enable a flock of robots to explore subsurface environments on planets such as Mars?

Fink: Yes, especially with Mars. We're not yet quite ready to send humans. So, the early stages will be done by robotic explorers such as rovers and of course a cave or a lava tube environment, or any kind of subsurface environment, is naturally a high-risk environment. You want to have some kind of redundancies and send in a flock of potentially expandable smaller robotic units and see how far they can proceed into the subsurface environment. What the DDCN technology will enable is to allow for the rovers to send the data, the pictures, the measurements, temperature, humidity, and so forth to send all these data back out to a rover in front of the cave in order to transmit the data back to Earth. And another way of saying this is since there's no cell phone network established on Mars or on the Moon, there's no communication network, you have to basically create your own communication network as you go. So, it's on the fly. As you proceed into the cave, you deploy your communication beacons to establish your own network.

Tech Briefs: Can you explain in simple terms how the DDCN would work, for example, on Mars?

Fink: On Mars, you would have a larger rover, for example of the size of perseverance or Mars science laboratory. Piggybacking on such a rover would be few smaller rovers, which might be expandable. The large rover would drive toward the entrance of a cave or lava tube caves or perhaps a skylight leading to these caves, and deploy these small expandable units into the cave. Each expandable unit, each mini rover would have a stack of small breadcrumb beacons as we call communication beacons, which are pretty much the size of a dollar coin with a battery. And they would basically deploy these little communication beacons as they go. The deployment would not be governed based on time or distance. It would be governed based on communication signal strength. So, as you proceed into the cave, if you realize that your connection to the previous bread crumb is below a certain threshold, you deploy simply another one and then you proceed further into the cave.

One of the experimental rovers used by Fink's team to test hardware and software related to autonomous exploration. This prototype is outfitted with cameras and other sensors for navigation. (Image: Wolfgang Fink/ University of Arizona)

Tech Briefs: What's the Hansel and Gretel fairy tale connection here?

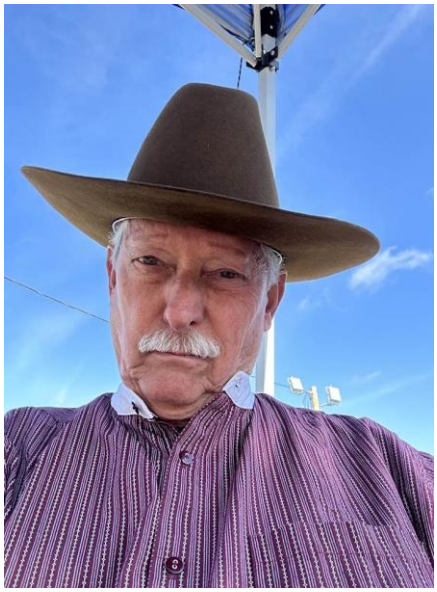
Fink: The Hansel and Gretel fairy tale as we recall is when Hansel and Gretel proceed into the dark forest, basically Hansel left breadcrumbs behind in order to find the way back out. In our case, it's not so much to leave a breadcrumb trail or for the mini rovers to find their way back out because we don't expect them to do so. Quite on the contrary, we expect them to drive as long as possible before they expire to discover and explore the caves as much as possible. But it's actually for the data to find their way out of the cave back to the mother rover on the outside of the cave. That is the analogy. So, it's the data finding their way out of the cave as opposed to the rovers finding their way out of the cave.

Tech Briefs: Where are you with this research and what are the next steps?

This article first appeared in the July, 2023 issue of *Tech Briefs* Magazine. Read more articles from this issue here or from the archives here.

Fink: Based on the tier-scalable reconnaissance paradigm, which my lab devised over 20 years ago that talks about multi-tiered multiagent reconnaissance missions by robotics, we have currently over the years developed a set of robotic platforms such as a larger rover, not quite the size of a Perseverance for example, but more the size of the Mars exploration rovers. We have also developed a prototype of a cave-exploring rover, called the ICE or intra-cave explorer, which is equipped with obstacle-avoidance sensors and also light arrays, such as UV light, in order to evoke fluorescence if there's any fluorescent material such as minerals or even plants or algae inside the cave. We have these devices, which are of course prototypes — it's understood that these are not going per se to Mars — but similar devices or similar platforms will go to Mars. We have also developed the breadcrumb prototype. We are now concerned with the deployment mechanism as well as, which is always the challenge for all these endeavors, is the system's integration to have the mother rover, to have the small intra-cave explorer, and to put it all together to have a demonstrable system that you can deploy in a cave or in a mine.

Blaze from cave owner to Blaze the actor

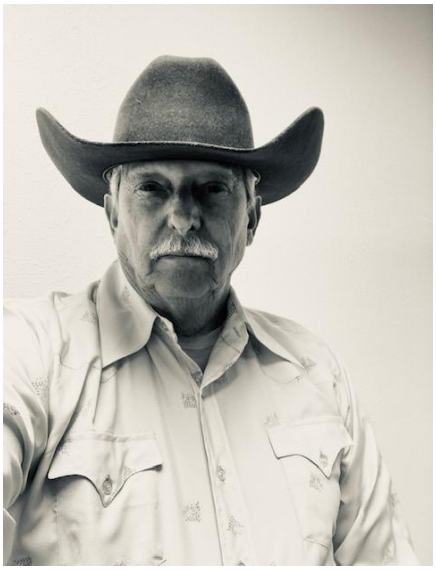


Yes, you remember him… Blaze Cunningham, one time owner and operator of Crystal Cave, Wisconsin along with his wife, Jeannie.

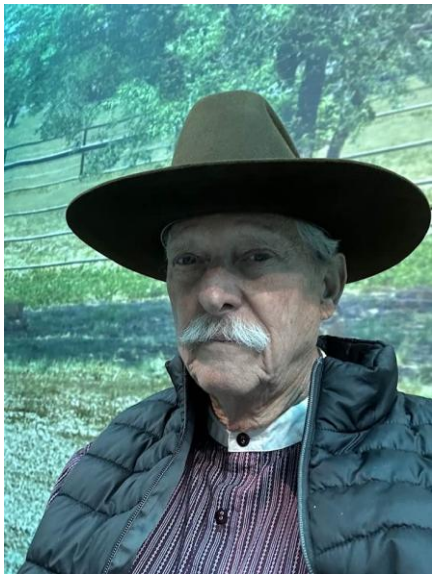
The Cunningham's retired to the "Land of Enchantment" New Mexico; living in the community of Tijeras located in the East Mountains, just a short 15 minute drive to the metro limits of Albuquerque.

During the past couple of years, Blaze was looking into becoming an "extra" needed in the booming tv and movie industry in New Mexico where shows like "Breaking Bad" and "Better Call Saul" were filmed.

Blaze (left) has gained acting parts such as a cowboy driving cars in a western scene (right) filmed on a street in Santa Rosa, NM. Blaze commented on Facebook, "I'm not sure if I am chasing the bad guy or I am the bad guy!" LOL



Say "Howdy" to the bad-ass cowboy (left) roaming in the background on the set for "Duster" tv series on HBO! Yee-Haw! "We are delighted to bring this high-voltage crime caper from the brilliant minds of J.J. Abrams and LaToya Morgan to the HBO Max audience," said HBO Max head of original content Sarah Aubrey. "This show has all the elements of a great Max Original, with propulsive storytelling, fantastic characters like 'Blazer Cunningham', and some truly bad-ass car chases'" (middle right)



Most recently, says Blaze, "I've been background acting (left) for a show supposed to be in West Texas at Gracie's Bar and Dancehall." On the last day of filming (right), Blaze responded, "I'm following two HOT chicks into the dancehall! Wow. What a day!" A friend was quick to add "That'll get your old blood flowing Blaze!"

Stark Caverns new discoveries

This past month we made a major advancement in one of our smaller caves by having a team of surveyors go in and map measurements for the first time.

This smaller cave is separate from Stark Caverns and is not open to the public, but we are excited to learn more about the rest of the systems that lie beneath the surface of this property.

Mapping a cave with both technology and by hand includes the documentation of angles and depth within the cave as well as notable formations, wildlife and artifacts that may have been left behind.

Pretty cool right?! Would you belly crawl through a cave?

95th anniversary year for Ruby Falls

We are celebrating the 95th anniversary of the discovery of Ruby Falls all year long!

A HUGE part of that celebration is thanking the local community that has helped support us for nearly a century, and our first responders are a big part of that!

Our team helped deliver a small token of our appreciation to a few of our incredible local, first responders! Thank you to the Chattanooga Fire Department and EMS! We appreciate your years of service to our community!


NATIONAL CAVES ASSOCIATION
USA
APRIL 17
BAT APPRECIATION DAY

Bat Appreciation Day story!

Merlin Tuttle

The following article is reprinted from merlintuttle.org. This is a great article about bats' contributions to pest control and forestry in the winter - probably the first study of its kind.

Merlin is still working hard, travelling around the world to educate the importance of bat conservation. Donations to the organization are very much appreciated.

Dining in the chilly season – bats helping farmers and foresters even in the winter

Santiago deploying an ultrasonic bat detector for another of his Ph.D. chapters

Most North American bats migrate or hibernate during winter[1]. In some areas, such as the southeastern United States, they remain active in winter. Some are year-round residents while others migrate to these regions seeking warmer temperatures where the insects that bats eat stay active year round[2,3]. However, we still know very little about the winter activity of bats and how they use working forests. Given this, we took the initiative to better understand how bats forage in the southeastern United States, particularly in working pine forests of the Coastal Plain.

Before going into detail about results, let us put this region in context. Forests are an important component of the landscape, with more than 86 % of them being privately owned[4]. Working forests refer to forests that are actively managed to achieve specific goals, such as timber products, recreational activities, creation or maintenance of wildlife habitat, and carbon sequestration. Additionally, these forests are important for numerous bat species, including bat species devastated by white-nose syndrome, a fungal disease that is decimating millions of bats that use caves for hibernation, or migratory species affected by wind energy developments. Forests provide foraging and roosting resources for bats[5]. In turn, bats provide essential ecosystem services to forests, such as control of insects that feed on plants[6,7].

Santiago Perea releasing a Tricolored bat (Perimyotis subflavus). Use of Covid-19 masks were required at the time of this study because the low risk of transmission from humans to bats hadn't yet been documented.

Santiago Perea releasing a Hoary bat (Lasiurus cinereus) from a mist net

What did we find? Overall, our results showed great variability in food preferences among the seven bat species analyzed. As expected, we observed differences among species with different foraging strategies, but also among species with similar foraging strategies, such as eastern red and Seminole bats. In addition, we noted that prey diversity in winter bat diets was similar to, if not greater than, what bats consume in summer. Frequent consumption of Diptera (flies and mosquitoes) by all bats in our study could reflect prey availability, with more Diptera in winter compared to other insects. This finding corroborates previous work indicating that foraging opportunities in winter probably depend on prey availability, making bats more generalist during winter[8].

So, what role do bat communities play as pest controllers in winter? We confirmed that bats consume at least 47 arthropod species considered to be agricultural and forest pests. Among them, the Nantucket pine tip moth and the pale weevil, serious pests of young pines and seedlings, were important food sources for bats in winter.

During our first field season in 2020, we focused on evaluating the influence of forest characteristics and forest management on winter acoustic activity and bat foraging habitat use. We then decided to go further in understanding foraging bat winter ecology. After all, we are what we eat. Over the next two years, we also collected fecal samples from bats captured in working pine forest landscapes of Georgia, Louisiana, North Carolina, and South Carolina. Why did we do it? Our goal was to identify diet composition of overwintering bats relying on DNA metabarcoding techniques. We compared composition of prey consumed among different bat species and determined the potential role of forest bats as pest controllers. To our knowledge, our study is the first one to evaluate diet of overwintering bat communities in these forests, while documenting agricultural and forest pest consumption.

An eastern red bat (Lasiurus borealis) on the left and a Seminole bat (Lasiurus seminolus) on the right

Thinned pine stand

Tricolored bat (Perimyotis subflavus)

Evening bat (Nycti

Southeastern myotis (Myotis austroriparius)

Burned pine stand

Santiago deploying an ultrasonic bat detector for another of his Ph.D. chapters

We also observed many agricultural pests, such as the garden tortrix moth and the green clover worm. We believe that these pests probably inhabit agricultural areas adjacent to working forests. It was not a huge surprise; bats are highly mobile mammals, and the ecosystem services provided by them are expected to go beyond benefiting farmers and local communities. The green clover worm, although not the most consumed pest, was found in the winter diet of five bat species, including migratory eastern red and hoary bats. Green clover worms are migratory moths, with most populations overwintering south of the midwestern United States Corn Belt[9]. Although generally considered to be of minor economic importance, it is one of the most common defoliating insects in alfalfa and soybean fields. Thus, consumption of overwintering green worm populations may provide an ecosystem service by controlling populations of green clover worms outside of the growing season and outside major crop-producing areas of the Corn Belt.

Additionally, our study identified several species of flies and mosquitoes in overwintering bat diets that are recognized as nuisances or threats to human or livestock health. Mosquitoes in particular are important disease

vectors of worldwide concern because of their impact on public health[10, 11]. Our analyses revealed a high diversity of vectors (e.g., *Aedes* and *Culex*) in many samples, including species that are common vectors of diseases such as malaria or West Nile virus. Finally, we highlight consumption of other dipterans, such as black flies, capable of transmitting pathogens to wildlife, livestock, and poultry.

By providing valuable information on winter diet composition and ecosystem services provided by bats, we hope to guide management decisions for forest attributes important to these species, thus increasing conservation opportunities within working forests.

Thank you to Merlin Tuttle for sharing his story with us!

Donations to Merlin's organization are greatly appreciated.

Donate Now

Santiago Perea, from Madrid, Spain, is a Ph.D. candidate at University of Georgia. Broadly speaking, his main research interests focus on understanding ecological processes that drive animal population distributions and abundance within the conservation biology framework. His current Ph.D. research is on bat winter ecology in working forests of the southeastern United States Coastal Plain. Santiago is approaching these questions from different angles: applying hierarchical modeling to assess how different factors influence winter foraging activity and habitat selection at multiple scales, assessing direct and indirect relationships between bats, insect communities, and different forest management decisions, for example, by evaluating the bat diet composition by DNA metabarcoding. His Ph.D. dissertation is funded and supported by the National Council of Air and Stream Improvement, Inc., Resource Management Service, the Westervelt Company, the Weyerhaeuser Company, and the University of Georgia, Warnell School of Forestry and Natural Resources.

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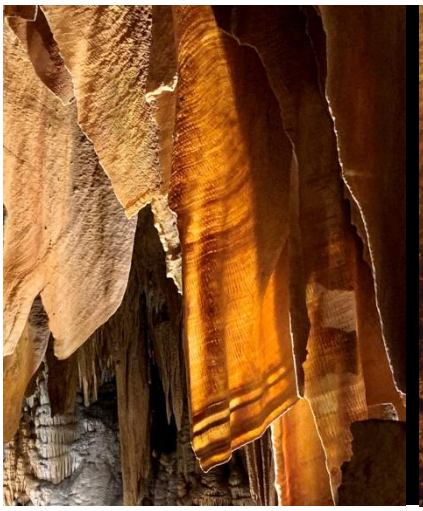
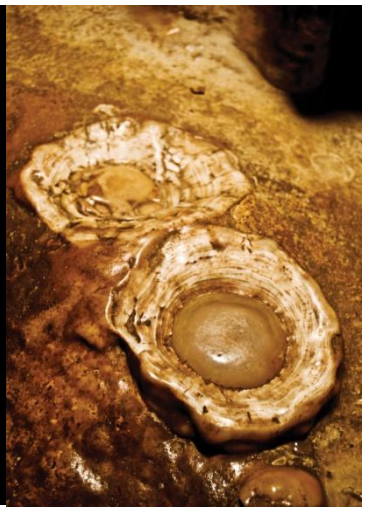
Shenandoah Caverns hosts Wine Valley Trail


We are so thankful to have been able to host the Shenandoah Valley Wine Trail meeting recently! Our caverns cafe staff put together a beautiful spring time spread, including Cucumber Tea Sandwiches, Charcuterie Cups, Spinach Dip and a few other items 😛🍷

Meanwhile, Luray Caverns celebrated Pi Day

Happy Pi Day (March 14), friends! 🥧 We might not have fresh pie in the caverns, but we do have 4-million-year-old fried eggs and cave bacon. Although, we promise they don't taste very good. 😬 #piday

Bridal Cave unveils new sluice and pavilion

Just in time for spring break, Bridal Cave opened our new sluice and the new pavilion which will help increase our business on rainy days. No soaked clothes or sunburns for us! 🤞

Shawn Thompson
Bridal Cave

FAQS: Air quality in national parks

NPCA has released its 2024 “Polluted Parks” report, showing 97% of national parks suffer from air pollution. Meanwhile, the Environmental Protection Agency recently strengthened its air quality standards, which will provide additional protection to these places we love.

Here are the latest developments and what they mean.

Why is air pollution an issue in national parks?

Air pollution is among the most serious threats to our national parks and monuments. Whether generated by industrial facilities near a park boundary or traveling from afar via air currents, dirty air ruins scenic views, harms wildlife and historic sites, and affects the health of visitors.

Hazy mountain views in Olympic National Park.
© Noblige | Dreamstime

Ozone is one of the most widespread pollutants in parks, and it’s caused when naturally occurring volatile organic compounds react in sunlight with pollution from cars and industries. Ozone makes it harder for people and wildlife to breathe because it inflames and irritates the lungs. Those with asthma or other respiratory illnesses are especially at risk. Ozone pollution also stifles the growth of trees and plants.

What is NPCA’s’ “Polluted Parks” report, and what does it reveal?

A follow-up to NPCA’s 2019 assessment, 2024’s **“Polluted Parks: How Air Pollution and Climate Change Continue to Harm America’s National Parks”** is an air pollution and climate threats report prepared and released by NPCA based on data provided by the National Park Service. It shows that **97% of U.S. national parks suffer from significant or unsatisfactory levels of harm from air pollution** in at least one of the report’s categories. Specifically, **98% of parks suffer from concerning levels of haze pollution**, obscuring scenic views and landmarks; **96% face ozone pollution that negatively affects human health** for staff, visitors and communities which live nearby; and **96% have sensitive species and natural habitats harmed by pollution**.

The report found that air pollution permeates nearly all national parks across the United States, from Hawaii’s iconic volcanoes to Kentucky’s Mammoth Cave. Coast to coast, Americans experience muddied views and skies choked with dirty air that harms people’s health and nature in and around national parks.

We know air pollution drives the climate crisis, and NPCA’s latest report additionally shows that while all parks struggle with various effects of a rapidly changing climate, **57% of parks face heightened threats from four serious consequences of climate change**: wildfire, drought, sea level rise and invasive species. Our parks are, in many cases, on the frontlines of the climate crisis.

What is NPA doing to clean up air in national parks?

For years, NPCA has taken the lead in curbing pollution at its source to address not only risks to air quality, but the various climate risks found in the report. We work for clean air and a healthy climate for national parks and all people by strengthening clean air and climate laws and regulations, putting people first in our advocacy to hold polluters accountable, and engaging park advocates.

A coal-fired power plant in Central Utah, one of many sources of air pollution that drift into national parks.
© Gary Whitton | Dreamstime

In fact, NPCA's leadership has resulted in the reduction of 1.4 million tons of visibility-impairing pollution reduced, the closure of cleanup of over 150 park-polluting coal plants and the elimination of 171 million metric tons of climate pollution.

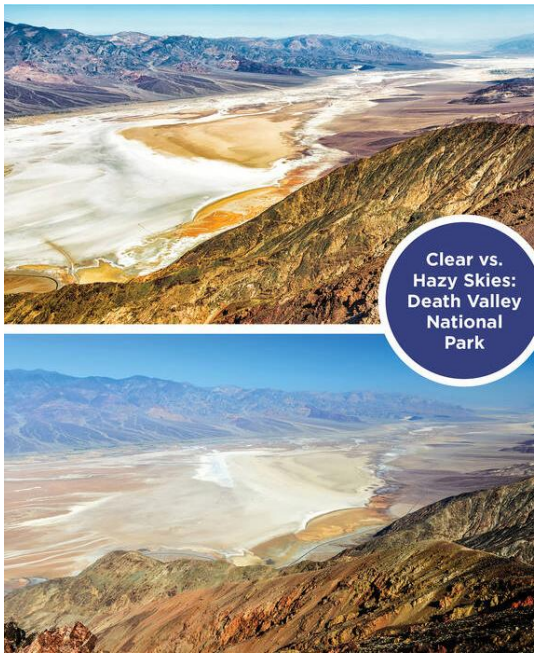
Our advocacy efforts involve a combination of raising awareness, working to hold states accountable for their industrial facilities that causes haze pollution, advocating for strong national air standards to protect parks and nature, and emphasizing the importance of stronger climate science. NPCA also advocates for funding so the National Park Service and Environmental Protection Agency can continue monitoring air pollution and updating their instrumentation, and we alert decision makers of environmental damage and apply pressure to the EPA.

In what way did EPA recently upgrade air quality standards?

On Feb. 7, the EPA announced an **updated primary national air quality standard** under the Clean Air Act, which provides protections for all people against fine particulate matter, known as PM2.5. Particulate matter pollution comes from heavy duty trucks and vehicles, as well as industrial facilities such as coal plants. This air pollutant is known to harm human health and creates the haze that ruins scenic views.

A girl uses a respirator to treat impaired breathing.
© Photographerlondon | Dreamstime.com

However, EPA failed to update what it calls secondary standards, missing an opportunity to extend protections beyond human health to park visibility, animals and crops. Still, the strengthened primary annual standard serves as a big step in recognizing the harmful effects of PM2.5 and acknowledges years of efforts from NPCA and our partner, the Appalachian Mountain Club. Together, our organizations have steadfastly advocated for ecosystems and national park health in EPA's consideration of stronger standards to protect scenic views, sensitive ecosystems and nature.



What will the strengthened air quality standard mean for national parks?

These stronger standards will provide additional clean air protection for national parks across the country — from Sequoia and Kings Canyon in California to Gateway Arch and Mammoth Cave national parks in Missouri and Kentucky. These places and many others suffer from excessively hazy skies.

Left: A graphic from the 2024 "Polluted Parks" report, using a clear view from Death Valley National Park's Dante's Point and the same viewpoint obscured by haze pollution. (credit: ©Federico Franzone | Dreamstime) © NPCA

Ulla Reeves, interim director of NPCA's Clean Air Program, said, "People who travel thousands of miles to behold these national

treasures should not bear risks to their health resulting from air pollution. We look forward to working with EPA to ensure this rule benefits parks and people far and wide, so that all can enjoy stunning vistas, clean air and cultural resources for generations to come."

Does pollution affect parks equally?

A winding staircase on an underground path in Mammoth Cave National Park. Thomas DiGiovannangelo/National Park Service

No, pollution affects parks in different ways. The latest "Polluted Parks" report includes five case studies to highlight the assorted challenges and the diverse air and climate issues faced by parks in various geographic locations. The case studies also reflect how NPCA is working to improve those specific conditions, particularly with regional haze.

For example, in Everglades National Park at the southernmost tip of Florida, the average natural visual range should span about 100 miles without pollution, but the actual typical visual range is about 40 miles. It can dip as low as 20 miles on high pollution days because of contaminants in the air — which can come from nearby agricultural burning and industrial facilities, or polluters hundreds of miles away.

Drought has made Sequoia and Kings Canyon National Parks more susceptible to wildfire. - NPS

Mammoth Cave National Park in Kentucky has unsatisfactory levels of hazy skies and unhealthy air — not just above ground, but underground, too — from nearby coal-fired power plants and industry. Airborne contaminants find their way into the cave system, affecting delicate geologic formations and influencing the subterranean ecosystems that have remained preserved for thousands of years. The park experiences significant concern levels in the Polluted Park report's "Harm to Nature" category, mainly due to nitrogen and sulfur deposited in soil and water.

California's Sequoia and Kings Canyon National Parks are among the most polluted, with poor visibility and dirty air a regular occurrence of significant concern. This is a direct result of pollution from industrial sources such as oil and gas, agricultural operations, and cars and trucks throughout the state. The parks are also vulnerable to increased drought and wildfire due to climate change.

What has NPCA been doing to curb pollution at Everglades, Mammoth Cave and Sequoia and Kings Canyon?

Among our efforts in Florida, NPCA and its partners are advocating for EPA to hold the state accountable to cut haze emissions. We also lead advocacy efforts in support of the Western Everglades Restoration Plan, which — if authorized by Congress — would improve connectivity in this ecosystem and could lead to fewer, less severe wildfires.

In Kentucky, we have consistently asked the state to develop a strong plan to reduce haze pollution. We also continue urging the EPA to hold Kentucky accountable and strengthen national clean air standards to protect the park's ecological integrity both on the surface and underground.

Everglades National Park
SimonSkafar via iStock

In California, NPCA has worked with a large coalition of environmental and public health groups to clean up some of the nation's dirtiest air in the San Joaquin Valley to https://www.msn.com/en-us/movies/news/cheech-chong-return-for-one-last-movie/ar-BB1k62Wmhelp benefit local communities and adjacent national parks. We have helped oversee local planning and enforcement of the Clean Air Act to seek reductions in fine particulate matter and ozone pollution from cars, trucks, and oil and gas operations. Our **2018 court victory** held state agencies accountable for air pollution regulation throughout the state that will also benefit Yosemite, Sequoia and Kings Canyon.

Are parks better off or worse than they were in 2019?

While the 2019 and 2024 reports were conducted in slightly different ways and analyzed different number of parks (417 in 2019 versus 399 this year), there have been notable improvements in some of the reports' categories.

An Eastern Bluebird sits on a lilac tree. Birds and other wildlife are affected by air pollution. © Dssimages | Dreamstime

For example, the 2024 report shows a considerable reduction in the number of parks exhibiting significant concern levels in the "Hazy Skies" and "Unhealthy Air" categories. However, there has been a decline in the health of parks in the "Harm to Nature" category — specifically from ozone damage and pollution such as nitrogen and sulfur that is deposited into soil and water.

The key air quality findings in 2019 were that 85% of U.S. national parks had air that was unhealthy to breathe at times, 88% had air pollution that was harmful to nature and 89% suffered from haze pollution. This year's report findings are that 98% of the 399 national parks NPCA assessed suffer from haze pollution, 96% face ozone pollution that negatively affects human health for staff, visitors and nearby communities and 96% of parks have sensitive species and natural habitats harmed by pollution. While these figures represent higher percentages compared to the previous report, it's important to acknowledge that the number of parks assessed was slightly different.

In 2019, climate change was a significant concern in 80% of national parks. The updated analysis, which is a very different set of data than before (looking specifically at high risk climate threats for parks), finds that 57% of parks face heightened threats from four specific consequences of climate change.

What more needs to be done?

To protect the places we love, we need continued action from federal and state agencies to cut air pollution through time-tested, effective programs such as the Regional Haze Rule — which is mandated by the Clean Air Act but is not being effectively implemented by most states.

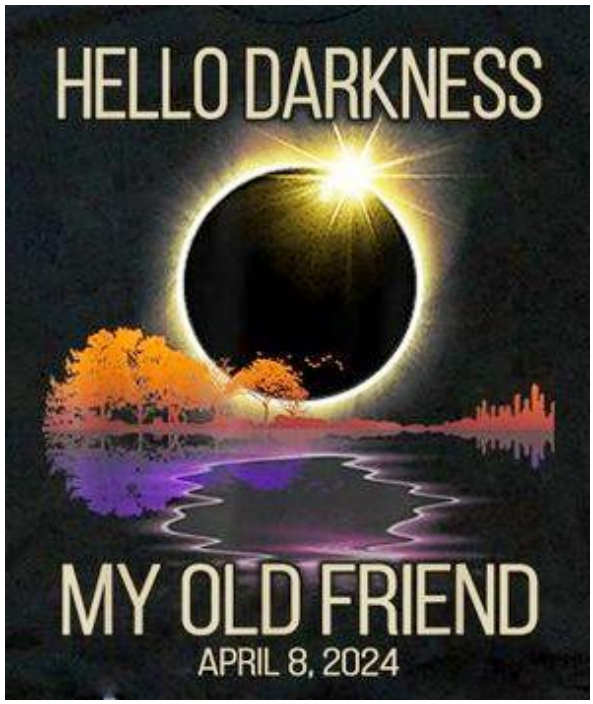
Additionally, the strengthening of national air standards and the haze rule, improvement of air monitoring in and near national parks, and the advancement of climate-friendly policies are critical to the future of our public lands.

The progress we've made so far could not have been possible without engaged citizens who lift their voices for the protection of national parks. We are grateful for the work of NPCA's members and supporters!

Fishing is a common activity in many national parks. © Feverpitched | Dreamstime.com

We encourage everyone to stay involved by subscribing to NPCA emails, texts and action alerts and lending your voice to our initiatives through NPCA's **Our Advocacy webpage**.

Are you in the path of the total eclipse? Planning a special event April 8th?



Send your event photos for the May issue of CT

What's new in the gift shop?

Stark Caverns bat friends

We have some new friends flying around the gift shop and think they are looking for new homes 🦇

For a cuddle-worthy adoption fee, you could make one of these fluffy friends your newest family member today. Don't let them hang around waiting for too long! 🦇

Stump Cross Caverns, UK

Our Easter egg seems to be hatching!! 🪺

This Easter you can venture down into the caverns to discover the name of the Stump Cross Dino hatchling! 🦕🥚

If you figure out the name you can choose a FREE piece of treasure! Don't miss out, come and see us this Easter at Stump Cross Caverns 😄🩵💗 https://stumpcross.digitickets.co.uk/category/53663

Lost Sea mugs

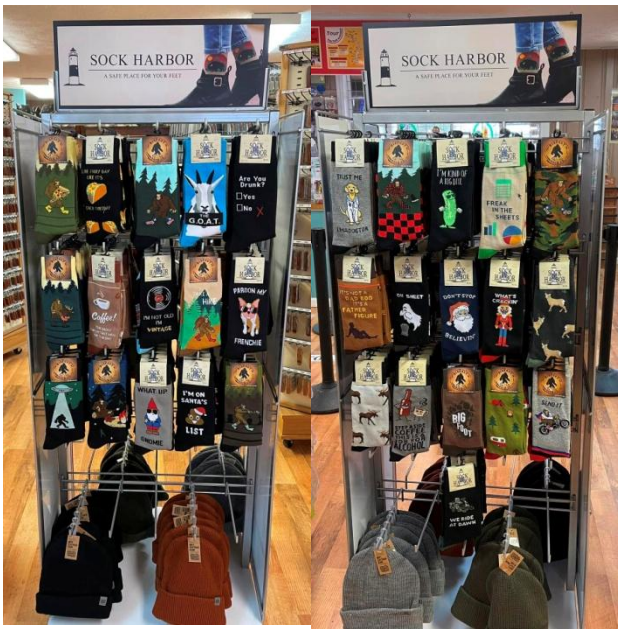
New mugs and tumblers at our Lost Sea gift shop. Have coffee with Dolly or Dogwoods in one of our new mugs. Spring tumblers and boujee tumblers make great gifts. 🌺🌺🌺❤️❤️

Inner Space Cavern hot water changing mugs

We recently purchased mugs from The Mug Experience. We purchased black mugs with our logo in white. When you add hot water, the mug changes to a scene from the cave. Our sales rep is Suzanne and she can be reached at suzanne@lovetexasgift.com

Marengo Cave sock collection

If you're looking for that perfect pair of socks. We have them, Sock Harbor, come check them out.

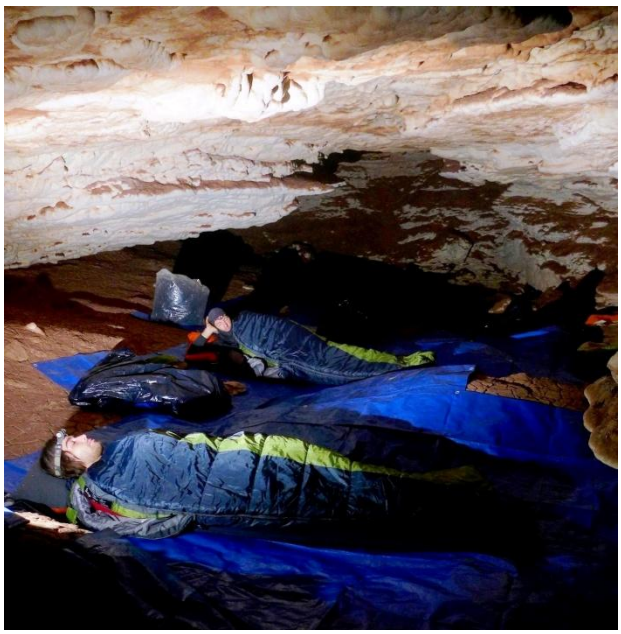


Onyx Cave, KY mugs

The Rock Shop at Onyx Cave has been receiving new mineral specimens, fossils, jewelry, and souvenirs. Here we are showing off the new glassware. We have new coffee mugs and shot glasses.

Talking Rocks Cavern new items for rock shop

Agate points: Agate is a banded form of chalcedony that can exhibit a druse crystal habit. This silica-based mineral may also feature inclusions of rutile or tourmaline appearing as small dark spots or long, needle-like structures. Vendor: Village Originals. **Ammonites** like these were cephalopods with external shells similar to Orthoceras. Today nautilus are the only remaining shelled squids with this body plan. Vendor: Western Woods. **Selenite** is a translucent white gypsum that can transmit light along its fibrous crystals. This makes this mineral ideal for decorative lamps with undermounted light. Selenite sales increased dramatically when we increased the variety of selenite are offered and displayed them on a light table that changes colors. Vendor: Village Originals. **Tranca Geodes** are found in Chihuahua, Mexico. They contain clear, white and blue/grey calcite crystals which often fluoresce in UV light. We offer guests the opportunity to break their own tranca geodes. (Side note: We also offer the larger sized Moroccan geodes, which have a white crystal structure.) Vendor: Rock Shop Wholesale and Supply.



Happy World sleep day at Jewel Cave National Park

"It's probably the darkest and quietest place you'll ever sleep" - Jewel Cave explorer.

As we discover more passageways in Jewel Cave and the length of the cave gets longer, exploration becomes more difficult. The length of the cave has reached a point where discovering new passageways often requires cave explorers to stay in the cave overnight. When cave explorers go on an overnight trip, they stay at one of our four established basecamps. These basecamps are stocked with tarps, sleeping bags, stoves, and anything else the cave explorers might need.

Image: Two cavers laying inside blue sleeping bags on a blue tarp (NPS Photo).

Lincoln Caverns and NSS, a long history

Lincoln Caverns has a long history with the National Speleological Society (NSS), the largest caving organization in the world. First generation cave owner, Myron C. Dunlavy, Sr. was NSS #44 and second generation, Myron, Jr. was NSS #459. The tradition of partnering with cavers continues today. The new section of Whisper Rocks was discovered in 2005 by a group of NSS members and we have worked hard to protect and preserve it ever since. Pristine and highly decorated, we will never be able to develop it, but caver friends, Ryan Maurer and Hope Brooks are working hard to preserve and protect it, recently installing a gate and continuing their work by cleaning the evidence left behind by the few who have had the privilege of exploring the new section, with help from generation #4, Riley Hopkins. Thank you for your hard work and dedication!

Congratulations Cumberland Caverns!

The National Natural Landmarks program recognizes & encourages the conservation of exceptional geological resources,

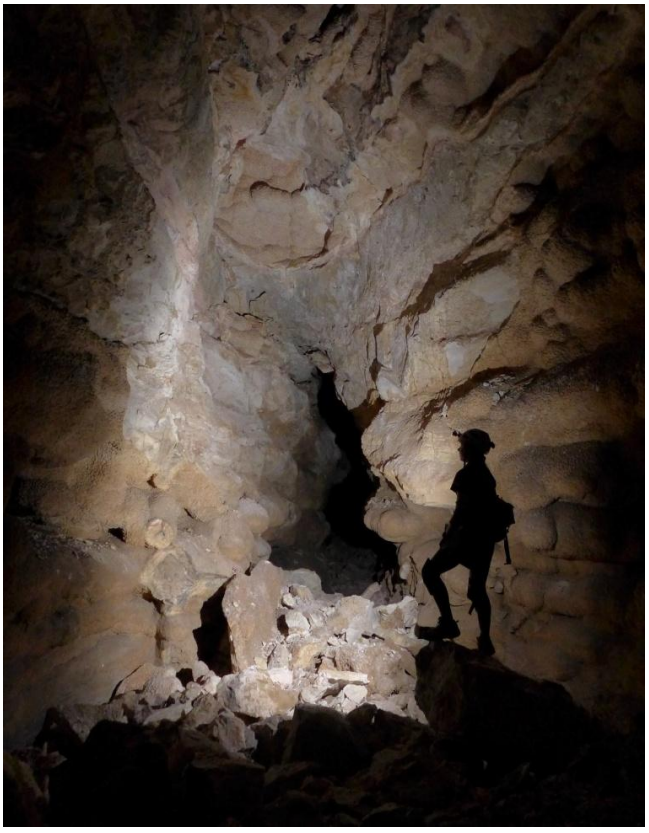
like Cumberland Caverns.

Though we are a privately-owned, small-business operation, we wear this designation proudly, and take our mission to be stewards of our magnificent cave to heart! We use about 10% of our cave as a stage for cave education and conservation, guided tours allowing us to get visitors captivated and enlightened about these amazing natural resources. We conserve the rest of our cave in its natural state to protect delicate geology and unique ecosystems.

Murphys, CA, home of Mercer Caverns - one of eight best small towns to retire in California

A historic hotel in Murphys, California. Editorial credit: JRJfin / Shutterstock.com

A small town of just about 2,000 residents, Murphys seems designed for retirees. For perspective, the town's median age stands at 60.7, and residents aged 60 and above make up 52% of its population. A retiree here, therefore, will feel part of a big, welcoming family. Concerning healthcare access, Adventist Health is next door in Sonora and has been recognized for the Patient Safety Excellence Award (2024 and 2022). Alternatively, San Andreas, just as close, is home to the Mark Twain Medical Center. Every other evening, you will enjoy catching trout at the stream in Murphys Community Park and exploring **Mercer Caverns**. This surreal subterranean wonderland will make you think you are entering another planet or taking lessons in humility at the nearby Calaveras Big Trees State Park. If you want your own space, you should remember that homes in Murphy are listed for a median price of $624,700. Before you curl your eyebrows, remember homes in California are listed for a median price of well over $700,000.



Exploration continues at Jewel Cave National Monument -"Four Minute Mile"

Herb and Jan Conn were very close to adding another mile to the total cave length on one of their survey trips when fellow explorers, Dave Schunte and Ron Holbert, stumbled upon this rather long passageway. They proclaimed they could "get a mile in 4 minutes out of this passage." Though not actually a mile long, the discovery of this passageway brought the total for the survey trip to over a mile long.

Image: Silhouette of a caver standing in a dimly lit cave passage equipped with caving gear (NPS Photo).

#JewelCave #JECA #MidwestNPS #NPS #FindYourPark #BlackHills #Cave #CaveExplorer #Explore #Explorer #CaveExploration

First time visitor's guide to Carlsbad Caverns

The United States National Parks program is home to many of the country's most enjoyable outdoor parks and activities, full of natural wonders and incredible sightseeing opportunities. Carlsbad Caverns is no different. Located in New Mexico, this park is known for limestone caves, rock formations, and hiking trails. There's a lot to see, so our handy guide is the perfect place to start for first-time visitors.

What are the Carlsbad Caverns?

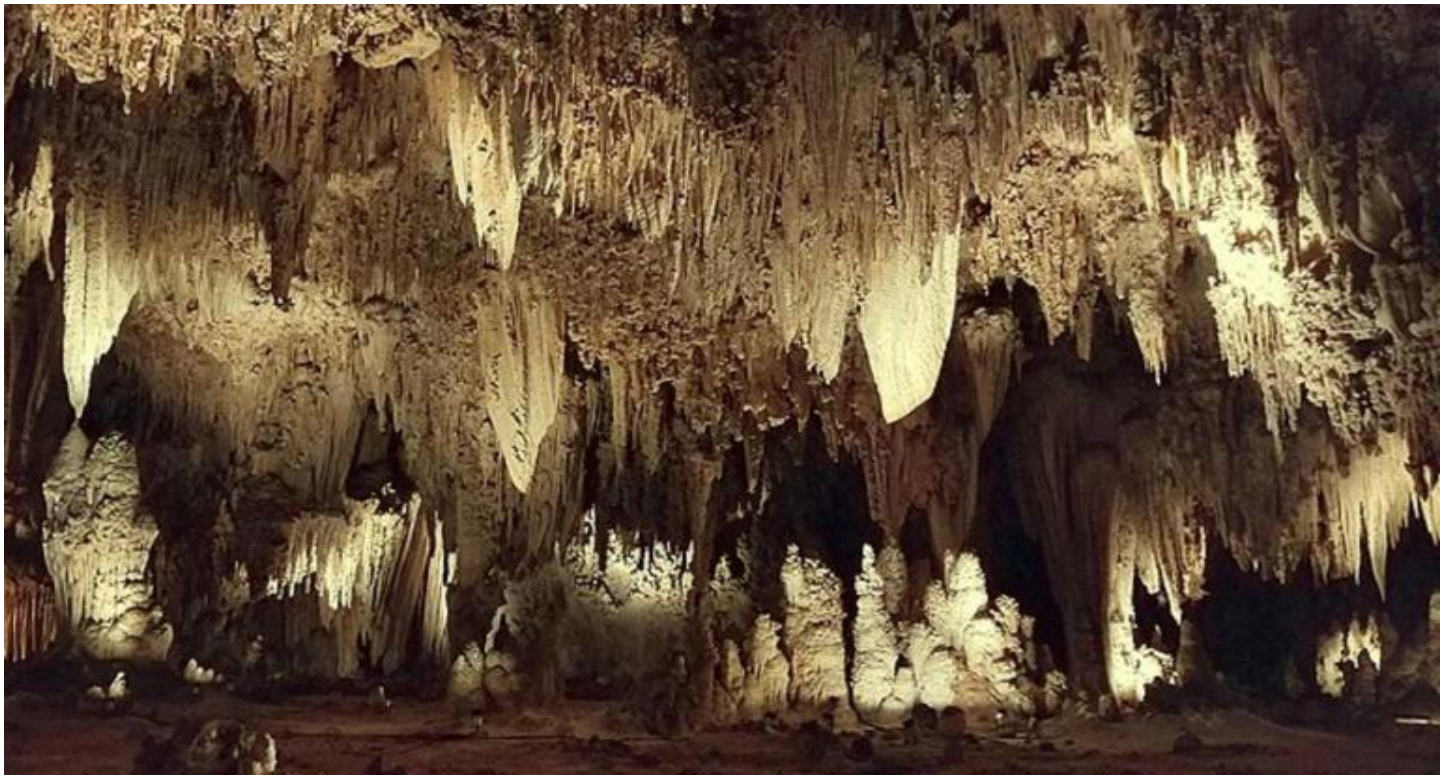


Image Credit: Jhaiisiin, CC BY-SA 4.0 via Wikimedia Commons.© Provided by Wealth of Geeks

According to US National Parks, the Carlsbad Cavern is one of 300 limestone caves in a fossil reef created by an inland sea that existed 250 to 280 million years ago. Somewhere between 12,000 and 14,000 years ago, Native Americans lived in the nearby Guadalupe Mountains. Cooking rings and other artifacts have been found within park boundaries. The Caverns park spans 47,766 acres and was created by legislation in October of 1923, signed by President Calvin Coolidge. Famous Americans like Amelia Earhart have visited the caverns, which see about 500,000 visitors each year. Since 1924, the park and its 120 known caves have welcomed 44 million tourists.

Most popular Carlsbad Caverns activities

There are plenty of family- and adventure-friendly activities in the Carlsbad Caverns. The park has two distinct districts in the National Register of Historic Places: the Cavern Historic District and the Rattlesnake Springs Historic District. The Big Room Trail is the most popular cave trail, which features the largest cave room by volume in North America. The 1.25-mile-long trail is relatively flat and should take about 1.5 hours to walk. Visitors are treated to spectacular views of rock

Image Credit: CarlsbadCavernsNPS, Public domain, via Wikimedia Commons.© Provided by Wealth of Geeks

formations and even the original rope ladder used by explorers in 1924. Parts of the Big Room Trail are wheelchair accessible, and there is a shortcut for those looking for a quicker visit.

The Natural Entrance Trail is less accessible and a much more challenging hike, and isn't recommended for travelers with respiratory or heart conditions. However, you'll see the same formations early explorers did as you descend the equivalent of a 75-story building, including the Devil's Spring, Whale's Mouth, and Iceberg Rock. This hike takes about an hour to complete.

In addition to hiking trails, Carlsbad Caverns features a museum, visitor's center, bookstore, gift shop, and restaurant. The park is home to around one million cultural artifacts being preserved and protected. Exhibits are hands-on and help visitors understand the surrounding environment, plant and animal life, and how the cavern was created. A free film shows every 30 minutes at the visitor's center, and both the gift shop and bookstore offer t-shirts, hats, mugs, Native American art, and junior ranger products.

Other popular activities include the Bat Flight Program and Night Sky Programs. The first is held daily at the Bat Flight Amphitheater, located at the Natural Entrance to Carlsbad Cavern, although the start time changes seasonally based on sunset. The program is free, and a ranger explains the nightly bat flight as the animals fly over your head! The Night Sky Program is also free, allowing visitors to see the cosmos through a high-powered telescope. The event is suitable for kids of all ages, but anyone under 16 must have an adult chaperone.

Image Credit: National Park Service Digital Image Archives, Public domain, via Wikimedia Commons.© Provided by Wealth of Geeks

Tips and tricks for first-time visitors at Carlsbad Caverns

First-time cavern visitors need to know a few things upfront for a smooth trip — especially if traveling with a family or kids! Admission to the park costs $15 for anyone over 16. Anyone under 15 or with a National Parks and Federal Recreational Lands Pass gets in for free. Once inside, you can explore the caverns and trails at your own pace. There's no time limit! While many ranger-guided tours are currently closed until further notice, the King's Palace Tour is open. Audio guides are also available to rent at the visitor's center.

The park system recommends wearing sturdy shoes for your trip. Some caverns are wet from water drips, and trails can be steep. Other trails may require actual hiking boots, and flip-flops or sandals are never recommended because they offer little to no traction. Handrails are available in some locations. The caverns are lit, so additional lighting isn't required, but headlamps and flashlights are allowed if desired. The park service recommends bringing a light jacket, as cavern temperatures are cool all year round.

Image Credit: NPS Photo/Peter Jones.© Provided by Wealth of Geeks

All visitors must walk on special anti-fungal bio-cleaning mats before leaving to protect local bat populations. The bats are prone to White Nose Syndrome, a type of fungus. In addition, food and drink aside from plain water aren't allowed on the trails or in the caverns. Limited food options are available daily at the visitor center restaurant. Although multiple businesses, programs, and activities are

available in the park, it's best to check the website before heading over in case of any important closures. After all, NPS doesn't control the environment!

Where to stay near Carlsbad Caverns

In the park itself, only backcountry camping is available. Although backcountry campers need to get a permit at the visitor's center, they're free. Commercial campgrounds can be found in Carlsbad and White's City. There are also hotels nearby for those who want to avoid camping altogether.

In Carlsbad, visitors can stay at the National Parks Inn for around $90 per night. The Hyatt House Carlsbad costs about $170 per night, and the La Quinta Inn costs around $130 per night. Fiddler's Inn, a more boutique-style hotel, is around $150 per night. At around a 30-minute drive away, these hotels are relatively affordable and convenient options.

Can I bring pets to Carlsbad Caverns?

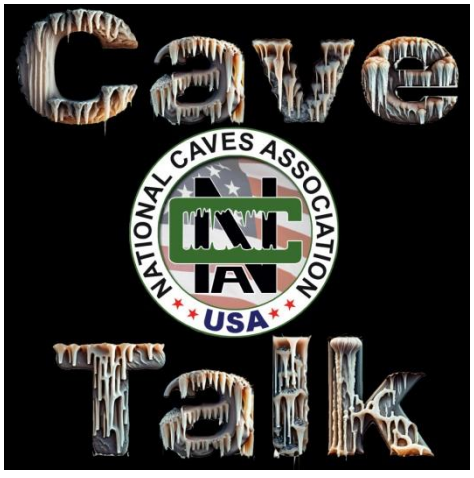
Image Credit: Shutterstock.© Provided by Wealth of Geeks

Like most national parks, pets are prohibited inside caverns or on the trails. Although the parks allow trained service animals, this does not include emotional support animals. For a fee, kennels are available at the visitor's center to accommodate pets. Pets aren't allowed to be unattended in the parking lot or vehicles. While this might change your travel plans, it's for the safety of trained service animals and park wildlife.

Providing natural beauty and sightseeing for thousands of years, the Carlsbad Caverns is an excellent adventure for families, solo travelers, and visitors of all kinds. Ecotourism is a massive industry in the US, and with so many wonders, it's not hard to see why. There are national parks open all year for curious visitors, and the New Mexico cave system is a favorite for many. With sturdy shoes and a little knowledge, first-time visitors will create memories they cherish for years.

Story by Lonnie Lee Hood

(Thank you to Rod Graves, Luray Caverns, for sending this article along - which you might consider adapting for your own cave)



March Podcast - The Rooney Family

CAVE OF THE MOUNDS
National Natural Landmark

Becca and Jack sit down with the Rooney family from **Cave of the Mounds** in Wisconsin to learn of their experiences as a family growing up with the cave. They give a first-hand account of the amazing growth of this National Natural Landmark.

Listen here: https://open.spotify.com/episode/6kAgGJrrsw13ishcQ0x9IR?si=69d799a6320844f8

Continued federal gridlock has once again shifted major policy decisions down to state governments. With the increased focus on state-level policy making, the 2024 presidential election will significantly influence the direction of governance across the nation. In addition to the presidential election, 11 governors, 85 state legislatures, and mayors in 24 major cities will face elections this fall.

2024 Multi State Legislative Update

36 states remain in session, and the IAAPA Public Affairs team is monitoring more than 1,000 bills that could potentially impact your business. Approximately 75 percent of these bills focus on labor issues, including proposed minimum wage increases. Many of them appear to be election-driven "messaging" bills, rather than actual policy objectives. Nevertheless, we will continue to monitor potential increases.

One emerging trend worth highlighting is the implementation of new workplace violence prevention programs. California's SB 533 - signed into law last year and in effect July 1, 2024 - establishes the nation's first set of general workplace violence prevention requirements. Similar measures have also been introduced in New York and Minnesota.

The rapid expansion of AI use has influenced the swift enactment of new state laws written to limit misuse. Fortunately, a significant portion of the over 500 AI-related bills propose to set clear boundaries without impeding innovation, allowing policymakers time to better understand the technology.

Data privacy laws continue to expand, with New Jersey and New Hampshire being the latest to pass new requirements on personal data collection and disclosure. In total, 15 states have enacted data privacy laws in recent years, with more expected as federal action on this matter stalls.

2024 Multi State Regulatory Update

In the regulatory space, IAAPA Public Affairs remains engaged in efforts in Florida, Oregon, and Colorado.

Efforts to implement rules involving last year's amusement ride legislation continue at the Bureau of Fair Rides Inspection within the Florida Department of Agriculture and Consumer Services. Proposed rule-making can be found at this link. The department held a public comment meeting last Thursday. Feedback from that event motivated the Department to hold off on final proposed changes. The effective date will likely be early this summer, so stay tuned for further updates.

Oregon Department of Consumer and Business Services – Building Codes Division is hosting a rule-making hearing on March 20 involving potential changes to the state's ride operator age requirements. IAAPA Public Affairs was instrumental in securing this hearing and plan to be in attendance to advocate on behalf of Oregon based operators.

Colorado began an amusement ride regulatory review earlier this year, marking the first review since 2019. Stakeholder meetings to collect feedback on proposed changes remain ongoing. IAAPA Public Affairs remain actively involved in these discussions and offering recommended revisions to division staff based on member feedback. The last stakeholder meeting is scheduled April 10, 1:00 p.m. – 2:30 p.m. MT, with a public hearing expected in May.

Multi State Projects

With last year's success in Alabama, 48 states now have ride safety laws in place. It's our goal to get ride safety laws in all 50 states. Accordingly, this year we are laying the foundation in the remaining states of Montana and Wyoming. Stay tuned for updates on this initiative later this year.

We urge you to remain engaged on behalf of your business, and the attractions industry as a whole.

Thank you,
Zach Stokes
Public Affairs Manager - IAAPA North America

WNS Report

PA expanding spraying of PEG 8000
The Game Commission of Pennsylvania, with researchers from Temple and Lock Haven Universities, developed a spray called PEG 8000 that disrupts and lessens the transmission of the WNS fungus in the environment. A Clearfield County tunnel was sprayed for two seasons and found a 90% decrease in the fungus on the bats. They will expand spraying to four more counties this year.

Cave closures
Caves in Hoosier National Forest, Indiana, will remain closed until May to protect bats.

Bat Found Flying 30 Miles from Coast
A research cruise by scientists from Oregon State University had the first documented sighting of a hoary bat flying over open ocean. It was seen about 30 miles off the coast of northern California in the Humboldt Wind Energy Area. This raises concerns about ocean wind farms, as the hoary bat is the species most frequently found dead at wind power facilities on land.

Bat Found in Illinois is Oldest Found Since the State Started Doing Surveys
An adult male Indiana bat was photographed on February 15, 2024 at an entrance to a cave in Pope County, Illinois. The bat had been captured and banded in October 2009 at the same came. This makes it the oldest documented bat in the state since they started surveys in the 1990s. It is significant because the bat survived WNS (WNS was first found in that cave in 2013).

Patty Perlaky
WNS Chair

Education Committee needs your help… Please take a few minutes to fill out our survey!

Dear NCA Member,

The NCA Education Committee has been working hard to put together helpful information and ideas to aid our fellow member caves in education and interpretation.

We have begun a series of Cave Talk Podcasts, articles in Cave Talk Newsletters and have other great ideas in mind. But we need your help and input to better serve your needs.

Please take a few minutes to complete the survey by following the link below. It should only take you 6-8 minutes. We ask that **surveys be completed by April 8, 2024**.

Thank you in advance for your help and ideas!

Survey Link: https://www.surveymonkey.com/r/ZQRVSCY

Ann Dunlavy
Education Committee Chair

Silver Dollar City
Herschend Entertainment

Silver Dollar City founders and NCA founding members Jack & Sherry Herschend (front row) took their first ride on the NEW **"Fire in the Hole"** on March 27 and gave it their seal of approval!

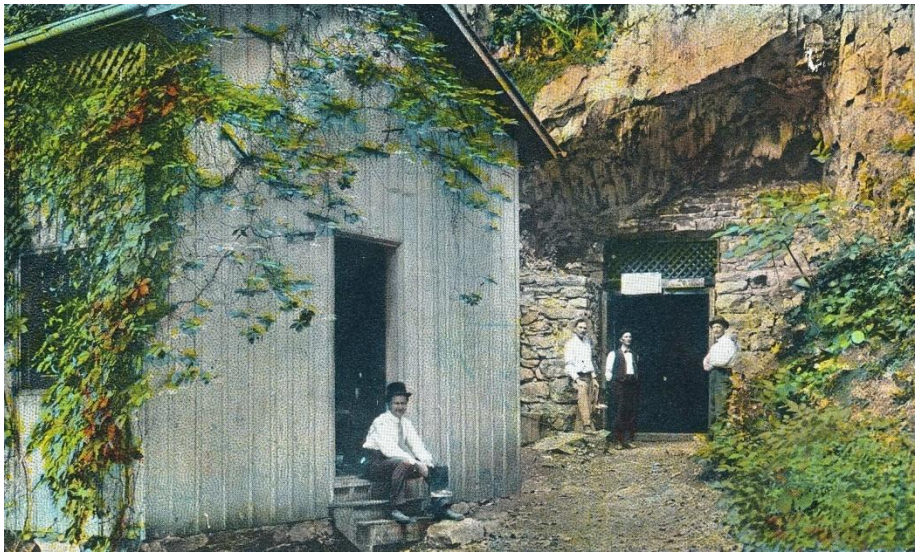
"How great to visit with a legend. I was pleased to see Pete Herschend (above right)," said Tim Baldwin (above left), editorial writer for **Amusement Today**. At (right) Sherry Herschend poses with these two young VIP men. Brad Thomas (below right) speaks to the crowd on the future of Silver Dollar City.

Silver Dollar City is home to Marvel Cave which SDC was built around.

That’s the way it was…

Mammoth Cave Rock Shop, 1941. Stopping at a rock shop on Mammoth Cave Road between Cave City, Kentucky, and the National Park boundary is still part of the experience of visiting the world's longest cave system. In 1941, the Mammoth Cave Souvenir Shop was selling "Mammoth Cave Onyx" for ten cents a piece. The stalagmites and stalactites rising from the tables may have gone for a bit more.

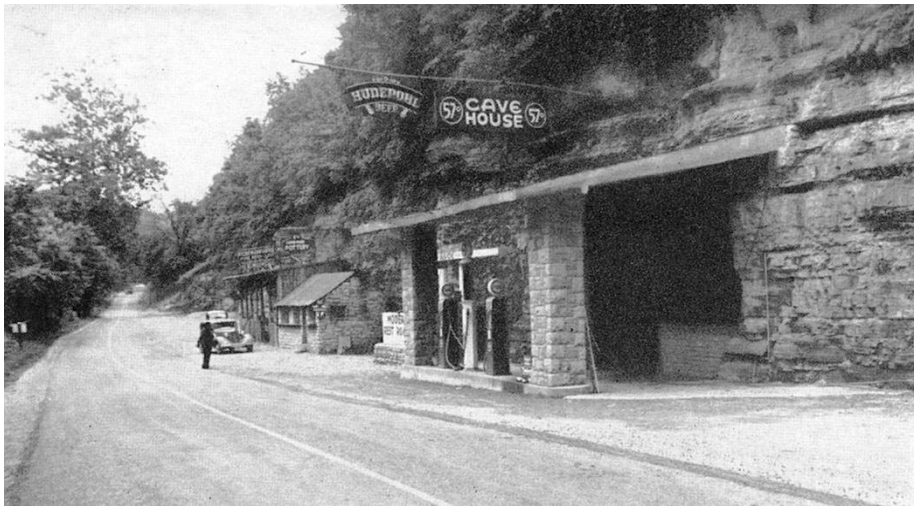
Hi-wa-may Caverns later **Lincoln Caverns** property owner Harry Stewart developed the newly discovered cave, opening it in 1931 as Hi-wa-may Caverns, a vaguely Indian-sounding name that referenced the cave’s discovery by highway builders in May. He soon changed the name to William Penn Caverns, another reference to the highway. Stewart built a little complex of ticket office, hot dog stand and filling station on fill across the highway from the cave entrance. Stewart sold the cave to Myron Dunlavy in 1932 who changed the name to Lincoln Caverns.



Weyers Cave later **Grand Caverns** Discovered in 1804, Weyers Cave in Virginia’s upper Shenandoah Valley started receiving tourists in 1806 making it the oldest continuously operated show cave in America. It was further developed with trails and lighting in the 1920s and rebranded Grand Caverns in 1926.

*Thanks to Kevin Patrick who is the administrator of the **Show Cave, USA!** Facebook page for posting many of this photo postcards.*

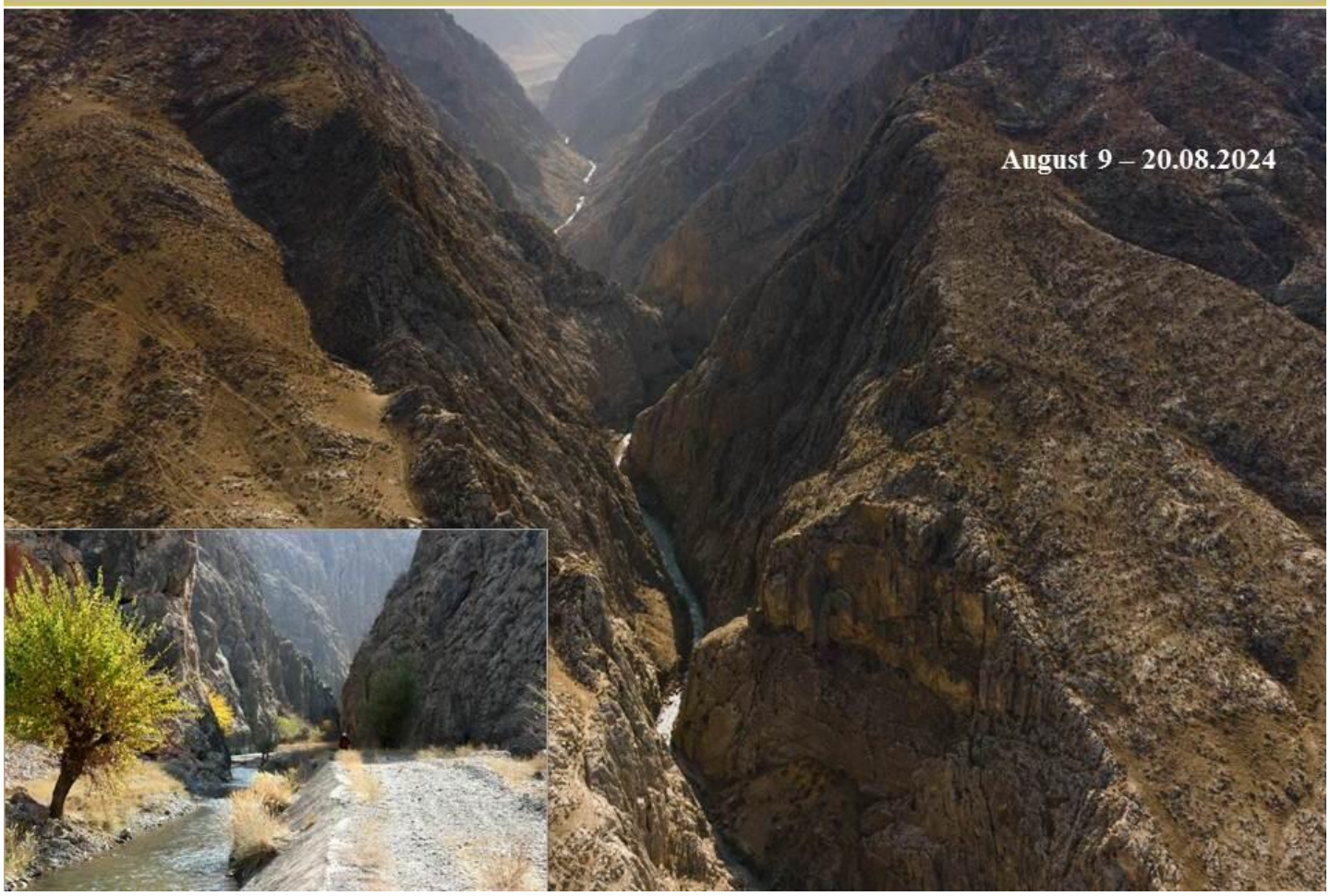
Indian Echo Caverns The well-groomed picnic grounds, pavilions and refreshment stands at Indian Echo Caverns soon after the cave was commercialized in 1929. The Golden Age of Show Cave Development was 1925-1935 when more caves opened than any other period. By the time the roads were paved, the electric lights strung, and the trails and stairs built it was likely to be 1929 with a Great Depression and World War II travel restrictions around the corner to kill many newly opened caves. Indian Echo was killed by the Depression and re-opened by a new owner in the 1940s.



Chinn's Cave House George Chinn opened up - literally, with dynamite- Chinn's Cave House at Brooklyn Bridge, Kentucky, in the 1920s. It was a well-known hole in the wall where US 68 crossed the Kentucky River between Lexington and Harrodsburg famous for his wife Cotton's ham sandwiches, and infamous for its penny and nickel slot machines operating in a not-so-secret passage in the back of the cave. When Chinn was busted for operating "illegal games of change" his defense was that his customers "don't have a chance" to win at his rigged machines. The postcard shows the Cave House in 1942 when it was selling Hudepohl Beer. It also shows a second hole in the wall that may have been the calcite mine operated by a Chinn relative before World War I. Long gone as a business, the holes and ruins of Chinn's Cave House still exist along the banks of the Kentucky River.

Crystal Cave – Heineman Winery was opened by Gustave Heineman on Lake Erie's South Bass Island in 1898. By the time the show cave opened, South Bass Island was a well-known summer resort for Great Lakes cities from Buffalo west through Cleveland and Toledo to Detroit. The island resort centered on the town of Put-in-Bay, which was connected to the cave by a trolley that served the Victory Hotel. Crystal Cave continues to cater to Put-in-Bay vacationers operating in conjunction with the Heineman Winery.

International Speleological Expedition to the Kozu-Baghlan karst region, Southern Tien Shan, Kyrgyzstan



Dear Cave Explorers,

In August 2024, in the southern Tien Shan of Kyrgyzstan, a speleo expedition to unexplored karst areas is being organized. Majestic canyons, unknown grottoes and caves can become large caves in these unexplored karst areas of Central Asia.

We invite speleo clubs, as well as interested cave explorers, to the international expedition "Tien Shan -2024".

More details of the expedition can be found on our website:
https://speleo.kg/en/expeditions/mezhdunarodnaya-speleologicheskaya-ekspedicziya-v-geopark-madygen-iyul-2022/

You can send your application by email: info@speleo.kg

Whatsapp: + 996 553 991663

Secretariat of the Foundation for the Preservation and Exploration of Caves
1a Lineinaya str. 720021, Bishkek,
Kyrgyzstan
https://speleo.kg/

Insurance Column Emergency Preparedness: Active Shooter

While most of us will never experience an active shooter emergency, the number of incidents is on the rise. Given this fact, and the seriousness of these events when they happen, it's important to be attentive to both education and prevention.

According to the U.S. Department of Homeland Security, an active shooter is an individual actively engaged in killing or attempting to kill people in a confined and populated area. In most cases, active shooters use firearm(s), and there is no pattern or method to their selection of victims.

There is not one, single profile of an active shooter. Personality traits do not follow any set pattern, vary widely, and are usually too general to be useful. According to the Department of Homeland Security, many active shooters follow a violence pattern that begins with negative situations, moves to intense negative feelings and the idea that violence is the right way, followed by planning the violent incident. Some workplace shooters are trying to right a perceived wrong, such as a conflict on the job or termination, and may have a specific target. Many others have no specific target, but may have an ideological goal. Perpetrators are relatives in 40% of female workplace homicides, while only 2% of perpetrators against males were relatives.

Active shooter incidents are often unpredictable and evolve quickly. Recognizing potential threats and reacting as quickly as possible cannot be emphasized enough. Many survivors of active shooter incidents have said that they heard noises, but weren't sure they were gunshots. Every second counts. An active shooter situation will put you under extreme stress, so much so that your ability to think straight and make good decisions may be impaired. It is important that you have trained, practiced, and mentally rehearsed what you will do in this type of emergency, so you can react without hesitation.

The City of Houston Mayor's Office of Public Safety, with funding from the U.S. Department of Homeland Security, produced the Run, Hide, Fight video. This is an excellent free resource for training your employees and volunteers and has quickly gained traction as a national standard for active shooter protocol.

While the majority of all incidents from 2000-2013 occurred in an environment related to commerce, you should be sure that active shooter training is part of your workplace violence program. An effective response plan should include procedures to respond to mass casualty threats, such as active shooters, by developing evacuation or sheltering plans that are appropriate and feasible for the facility, a procedure for warning individuals of the situation, and a procedure for contacting the appropriate law enforcement agency.

In your training, encourage individuals to consider the environment in which they work and identify two possible escape routes. If possible, identify a secure location in your facilities where individuals could take cover and hide. Hiding in a secure location has been extremely effective in active shooter situations. The shooter knows there is limited time before law enforcement arrives and will typically move on from locked doors rather than use that time to attempt to force entry.

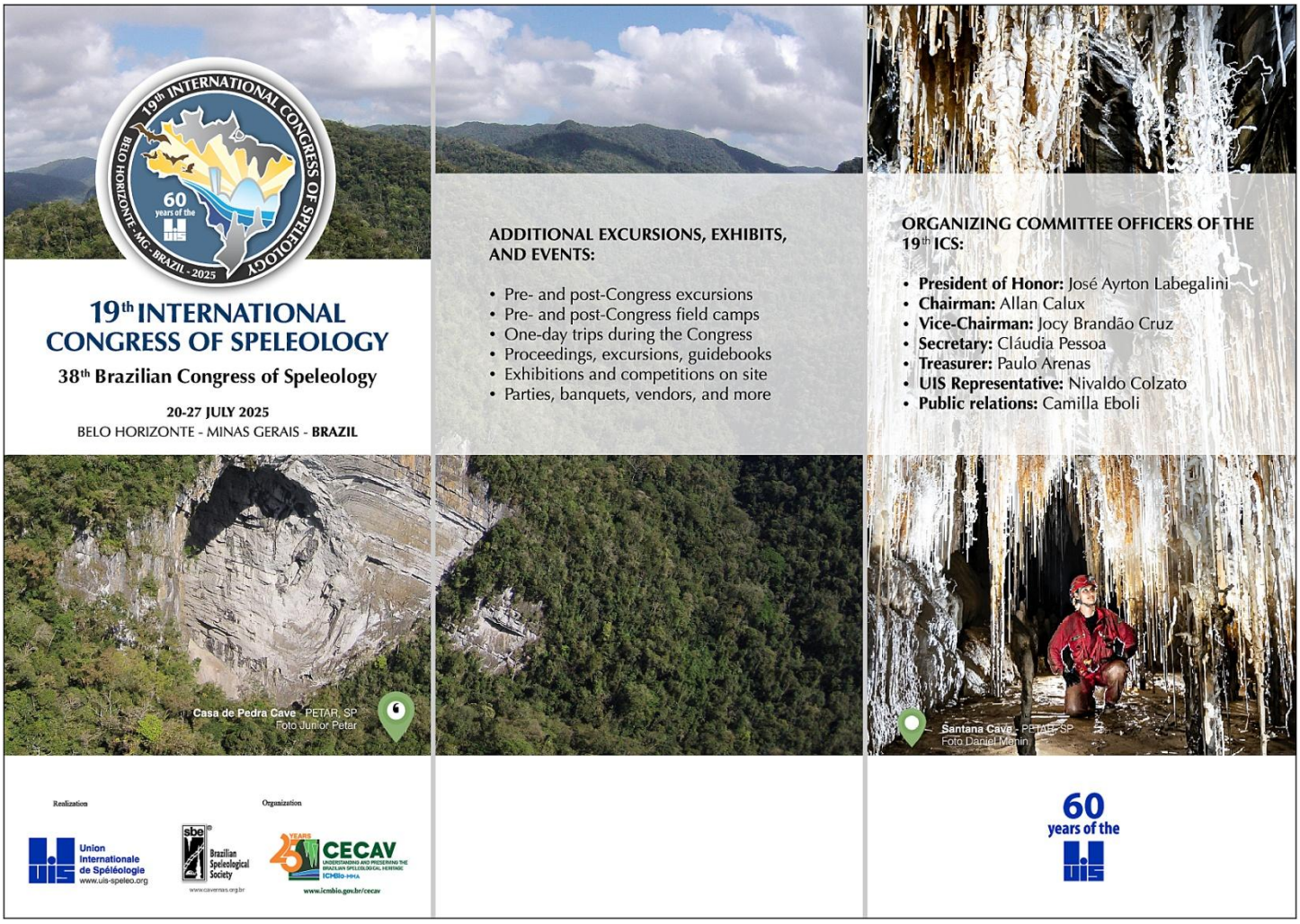
In an active shooter situation, do not assume that someone else has called 9-1-1. Call if you can do so without slowing down your exit or revealing your hiding place. When calling, be prepared with your exact location (address, floor you are on, section of building, etc.). If you have the information, provide the number of shooters, including a description of the individual(s) and any weapons, their current location, and if there are any victims.

It is important to note that even when law enforcement arrives, the danger is not over. The responsibility of the first officers on the scene is to stop the shooter before they do anything else. Officers will be under stress and prepared to use deadly force. If an officer sees you, they will look at your hands for a threat, so put your hands up, spread your fingers, show them your palms and stay very still.

The U.S. Department of Homeland Security (DHS) aims to enhance preparedness through a "whole community" approach by providing products, tools, and resources to help you prepare for and respond to an active shooter incident. Visit their website to access the many resources available to help your nonprofit with this important area of emergency preparedness.

Adam Bryant, CRIS, CLCS, RRE
Senior Safety Consultant
Marsh McLennan Agency

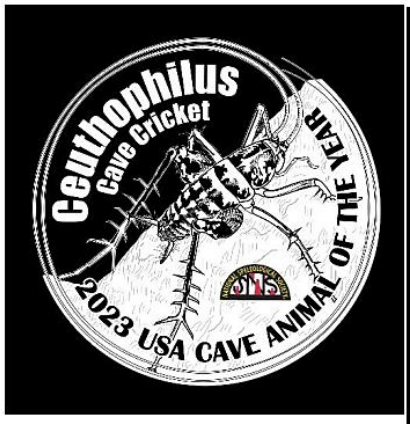
19th International Congress of Speleology Brazil 2025



Open Link: https://www.speleo2025.org/#

Cave Preservation Network

Fundraising Merchandise for NCA Show Caves



It's a new animal every year! 2022 was the Little Brown Bat, 2023 is the Cave Cricket! 2024 is TBD. You can order previous years while supplies last!

CPN Glow BAT Bracelets Qty_____ x $1 each = $_____

Cave Animal of the Year Stickers (2022-Bat) Qty_____ x $1 each = $_____

Cave Animal of the Year Stickers (2023-Cricket) Qty_____ x $1 each = $_____

Subtotal = $_____

**Most economical shipping will be determined by NSS office.*

Cave Name:_____

Contact Name/Title:_____

Shipping Address:_____

_____

Email Invoice to:_____

Please send order form to Nicole via email to NicoleRidlen@gmail.com

Please put "CPN Order" in the email subject.

Be watchful when walking a property…

Went out with Tom F. to look at a property near Kerrville, Texas. The property owner was concerned that he may have sinkholes and caves that could be hazardous and also damage his house. We walked the property, found a few fossils in the upper Glen Rose Limestone and two very small sinks in the broad shallow valley. We did find one sink which was a compound sink with two open throats covered by leaves. Neither Tom nor I would fit. 😜

–***Geary Schindel***

Calendar of Events

- **International Bat Appreciation Day**, April 17, 2024
- **National Travel and Tourism Week,** May 5 -11, 2024
- **National Caves and Karst Day,** June 6, 2024
- **World Hydrology Day,** June 21, 2024
- **NSS Convention 2024,** Sewanee, Tennessee, July 2 – 6 2024
- **International Speleological Expedition** to the Karst Areas of Southern Tien Shan, Kyrgyzstan, August 8-20, 2024
- **International Bat Night,** August 24 – 25, 2024
- **ISCA Conference 2024,** Mulu National Park, Malaysia, September 29 – October 3, 2024
- **NCA Convention 2024,** Niagara Cave, Harmony, Minnesota, October 7 – October 10, 2024
- **Earth Science Week,** October 13 – 19, 2024
- **National Fossil Day,** October 16, 2024
- **Bat Appreciation Week,** October 24 – 31, 2024
- **IGES 2024,** Sevierville, TN, November 5 – 7, 2024; Pigeon Forge, TN, November 6 – 9, 2024
- **IAAPA 2024,** Orlando, Florida, November 19 – 22, 2024
- **World Soil Day,** December, 6, 2024
- **NCA Mid-Winter Board of Directors Meeting,** Houston, TX, February 25 – 26, 2025
- **International Bat Appreciation Day**, April 17, 2025
- **National Travel and Tourism Week,** May 4 -10, 2025
- **NSS Convention 2025,** (Dates TBD), Cobleskill, NY
- **National Caves and Karst Day,** June 6, 2025
- **19th International Congress of Speleology,** Brazil, July 20 – 27, 2025
- **NCA Convention 2025,** Luray Caverns, Harrisonburg, Virginia
- **IAAPA 2025,** Orlando, Florida, November 18 – 21, 2025
- **NCA Mid-Winter Board of Directors Meeting,** Houston, TX, February 24 – 25, 2026
- **ISCA Congress 2026,** (Dates TBD), France

Got News?

Please make sure you let Bob Holt know when you have news to share with the membership regarding you and your cave. It is the goal of the NCA office to continue producing monthly issues of Cave Talk and this can only happen when you help with the sharing of your news. Please send your articles, photographs to **bob@cavern.com.**

May 2024 Cave Talk Deadline

Please have all articles to Bob Holt no later April 15. Thank you..