

Cave Safely Cave Softly

BSA Caving Policy & Training



What you need to know *before* your Scout caving trip

This program created in cooperation with
NSS Youth Group Liaison Committee
and the BSA



Liability and assessment of responsibility

Ultimately, the safety and liability of each member of the participating youth lies with the youth group leaders. They are fully responsible for each member of their group, their level of participation, and their complete involvement in each step of the training. Leaders **MUST** be present at all times, participating and completing each part of the program. Groups do not advance or participate in the program in any way without their leaders

Youth group leaders should never subject their organization to the risks of cave exploration without training. Leaders must interview and be comfortable with the cavers facilitating the training sessions for their youth group participants. If you are not comfortable with the quality of training and the people who will lead your group – it is your responsibility to terminate the program.

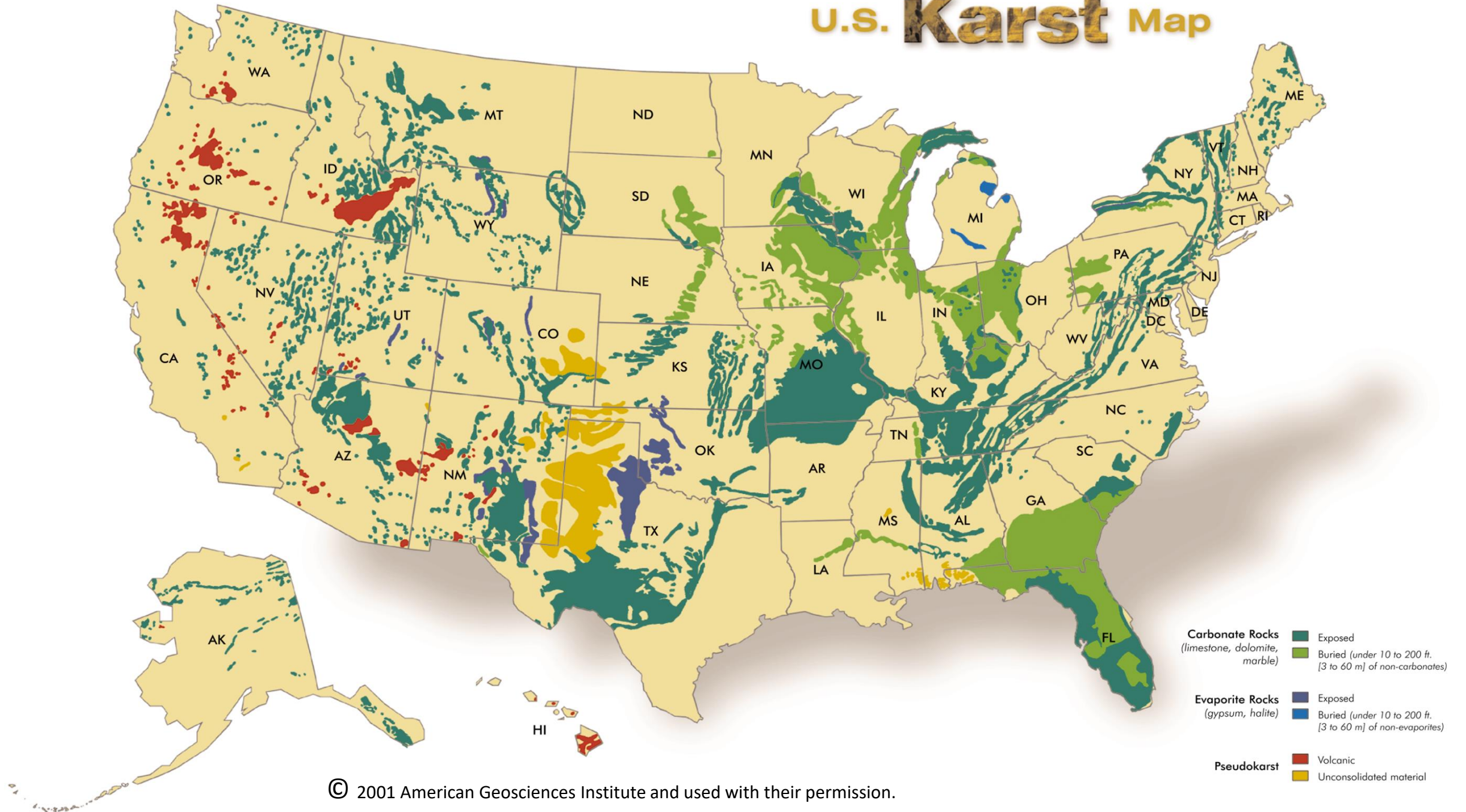
Warnings - Disclaimer of Liability

Participating in orientation and training for cave exploration, despite all of the best efforts to prepare and train individuals for caving, does not guarantee that everyone will be 100% safe. CAVE EXPLORATION IS INHERENTLY DANGEROUS. Serious injury or death could result from the use of the techniques, practices, or equipment described in this training program. You are responsible for your own safety. Even when using the most safe and cautious practices, accidents can happen. You assume the risk of injury or death by using the techniques, practices, or equipment described in this training.

CAVERS MOTTO:

- **Take Nothing but Pictures –**
- **Leave Nothing but carefully placed Footprints –**
 - **Kill Nothing but Time.**

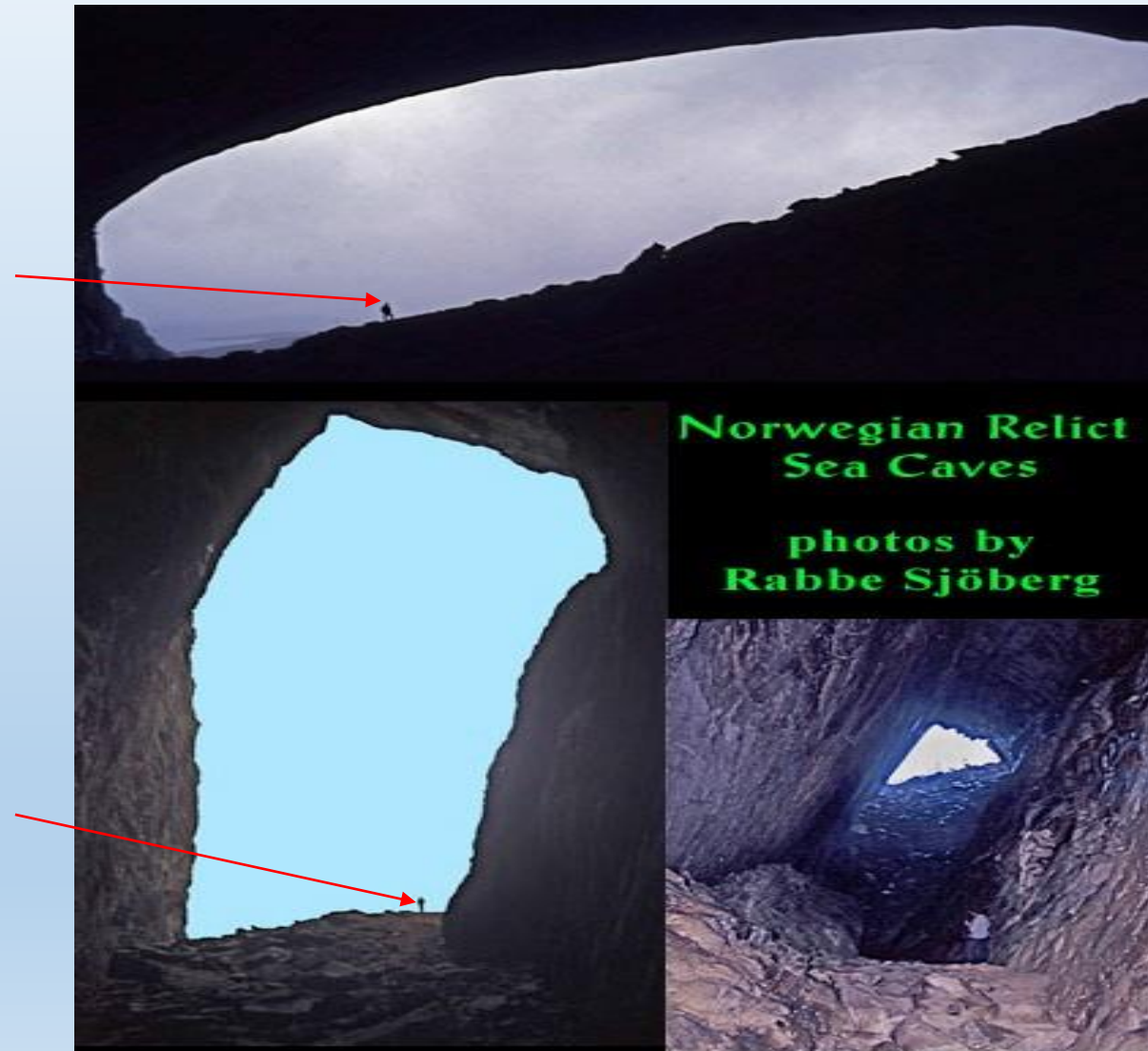
U.S. Karst Map





Caves are natural openings within the earth that usually extend deep beyond the reach of light. They are found in many types of rock, but are most common in limestone and gypsum. These caves were formed by water under the surface of the earth.

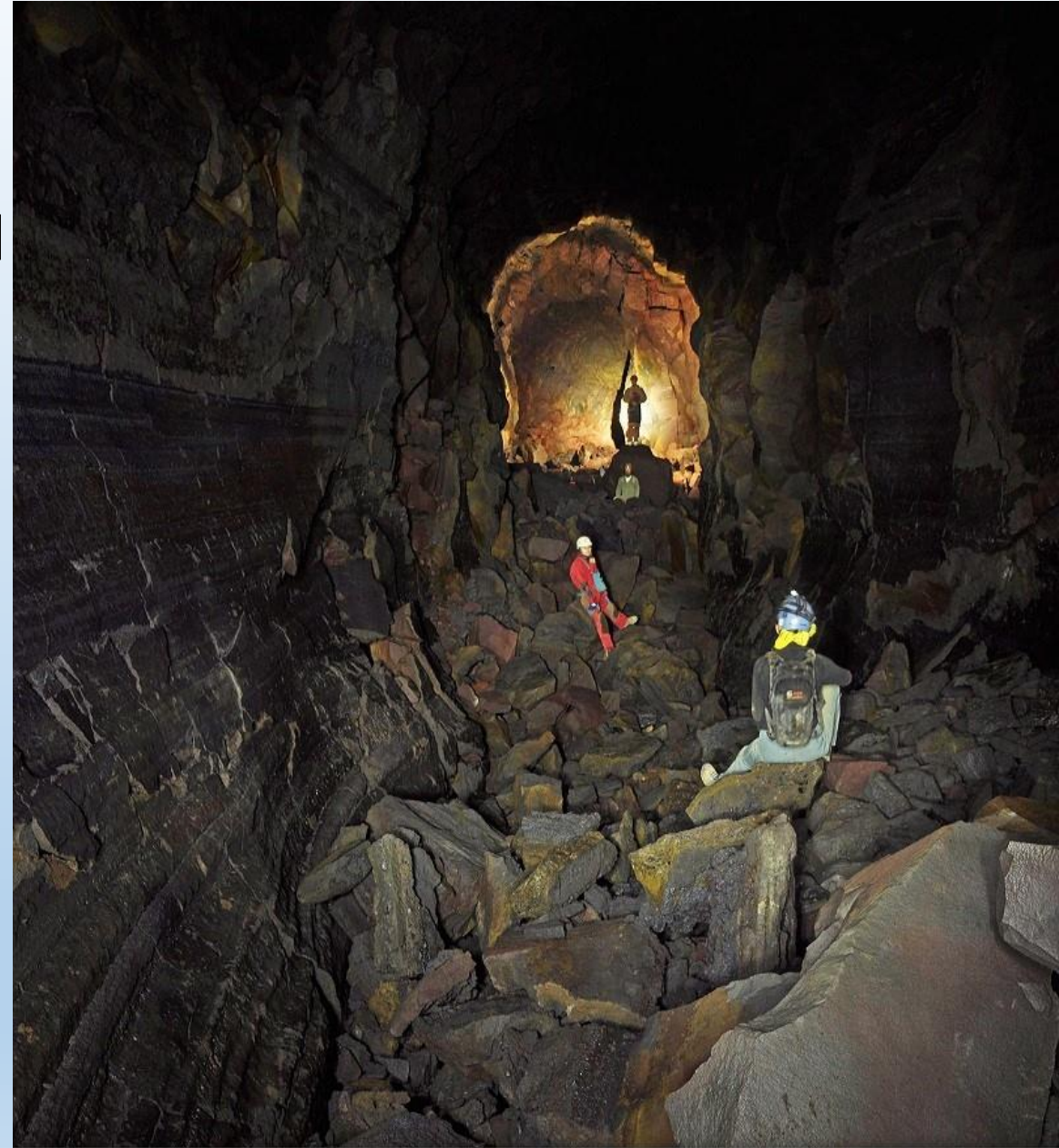
Another type of cave is the SEA CAVE.
Sea caves were formed along cliffs and rocky seashores.



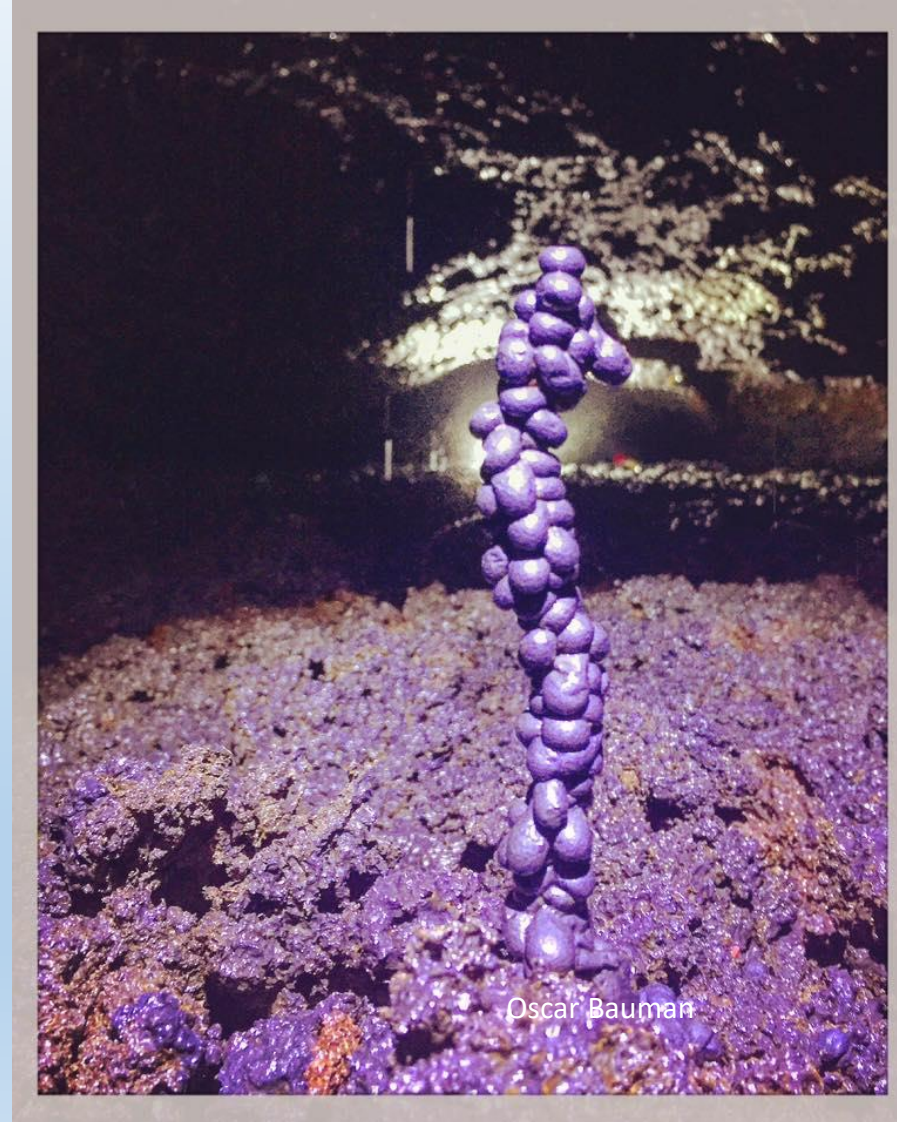
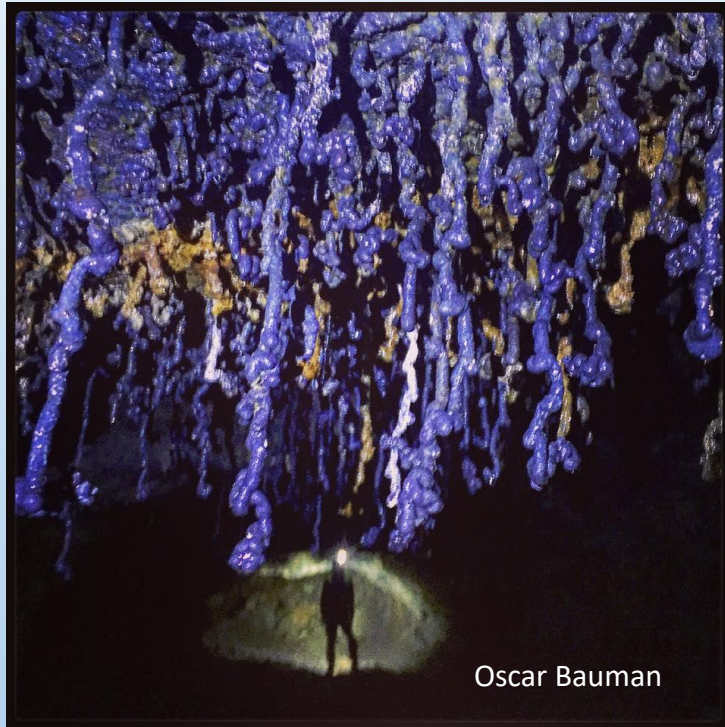
Sea caves were formed by waves crashing against rocky coastline or coral reefs. Waves can hit sea cliffs with blows averaging several hundred pounds per square inch, which erode the soil and rock, and after many years create sea caves



Another type of cave is a LAVA TUBE
As the lava flows from its source, the outside of the lava is cooled by air and creates a hard outer shell. As the lava flow decreases the hard outer shell is still intact, when flow finally stops the tube is left empty.



Lava Tube formations



This is an ICE CAVE



Ice caves are extremely dangerous due to the large icicles that fall and can cause serious injury or death.

**Glacier cave
Mt. Rainier
WA.**



Alaska glacier cave

Wrangell – St. Elias National Park

Glaciers melt from the bottom upwards so the rocks that are on the top stay in place. What looks like a dirt cliff wall in the picture, is actually glacial ice covered with dirt.

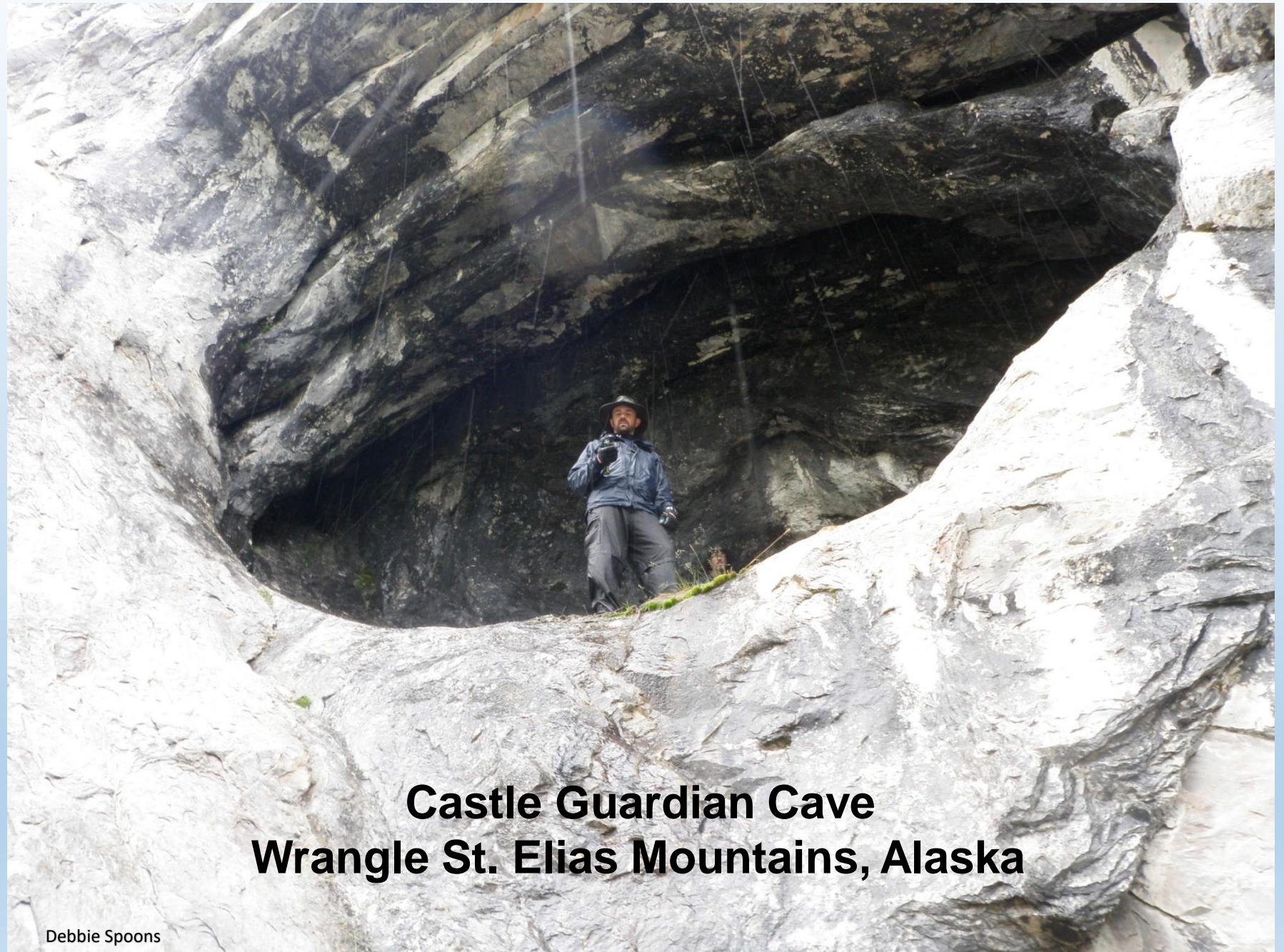


Debbie Spoons

Wrangell – St. Elias National Park



Debbie Spoons



**Castle Guardian Cave
Wrangle St. Elias Mountains, Alaska**

Debbie Spoons

Caves in the United States

There are thousands of caves in the United States. Mammoth Cave, in Kentucky, has over 400 miles of passageways. Carlsbad Caverns, in New Mexico, has a cavern that is the size of eight football fields.

Most American caves are found in limestone rock. The caves began as water made cracks in the limestone and the cracks got bigger and bigger. The openings eventually grew into underwater streams and rivers.

When the water was gone, these underground waterways became cave tunnels and caverns. It can take from 10,000 to 100,000 years to make a cave that is large enough for humans to explore.

How are cave formations made?

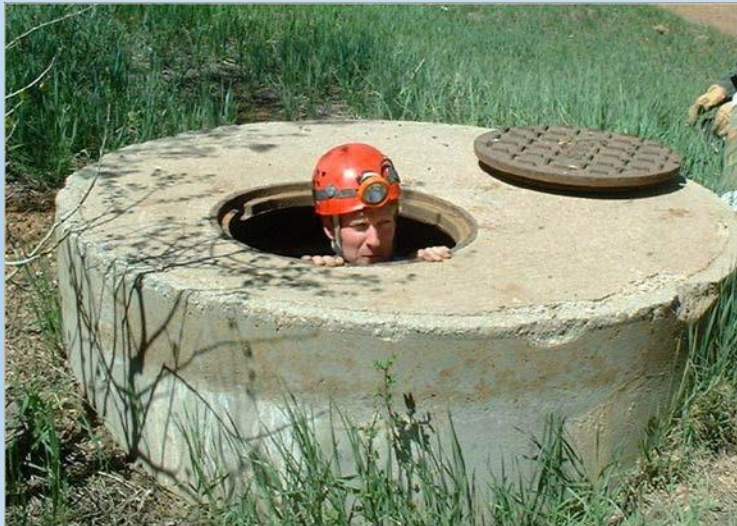
As water passes through limestone, it dissolves away calcite, a portion of the calcium carbonate rock, and carries it away.

When a supersaturated water droplet hits the cave floor or just simply evaporates, the calcite that was held in the water is left behind on the ceiling and the floor. This creates formations called “Speleothems”.



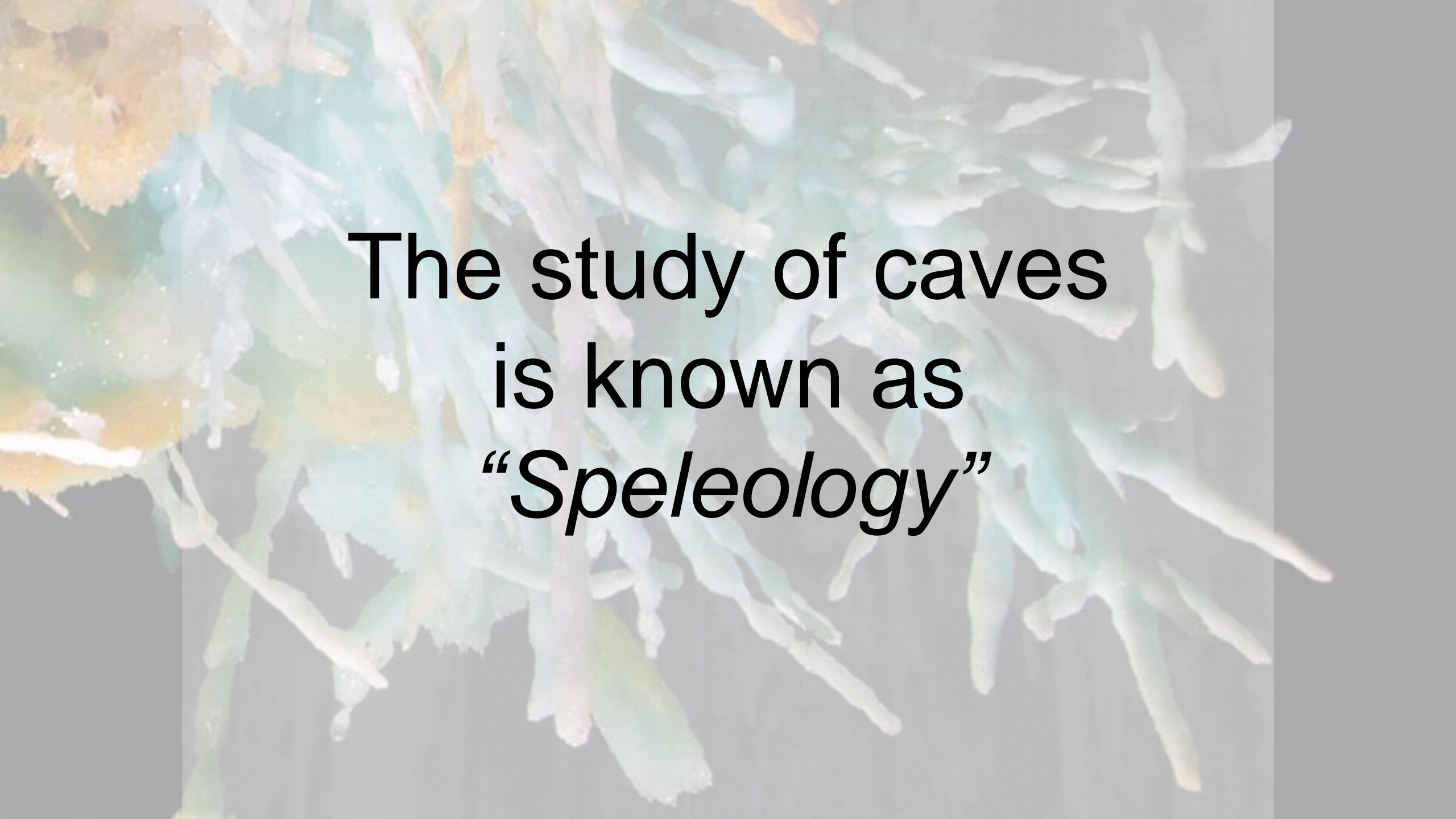
**LET'S ENTER INTO THE
AMAZING,
FRAGILE
AND DANGEROUS
WORLD OF CAVES**

There are many different types of cave entrances



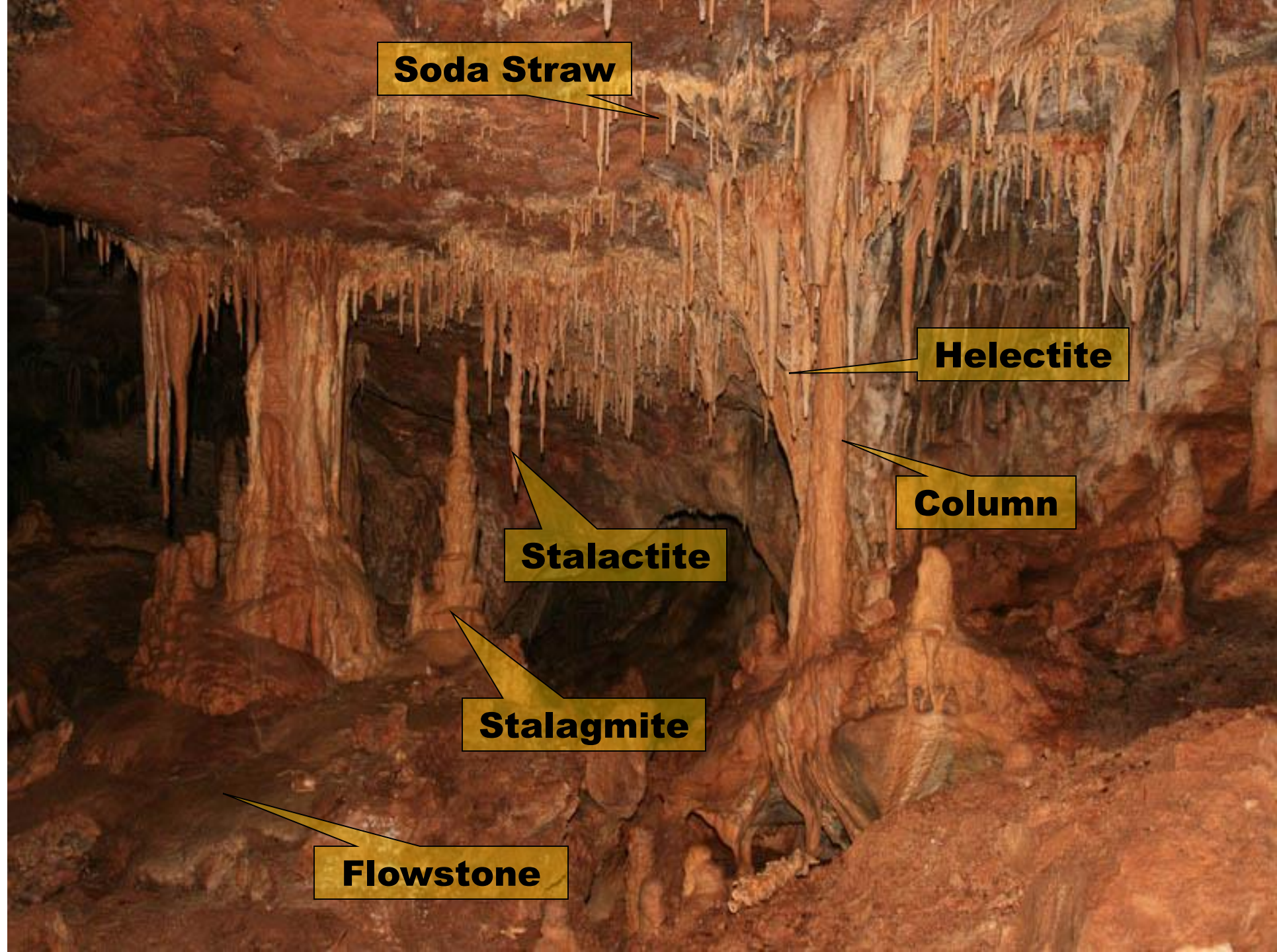






The study of caves
is known as
“Speleology”

There are many different types of formations found in caves. These are a few of the most common ones.



Soda Straw

Helectite

Column

Stalactite

Stalagmite

Flowstone

There are several types of speleothems. **Flowstone** forms as water flows over walls, floors, or other formations and builds up sheets of calcite that look like a rock waterfall.



Stalagmites
rise upward from
the floor of the cave
passage and are
usually formed by
water dripping from
the ceiling.



Stalactites

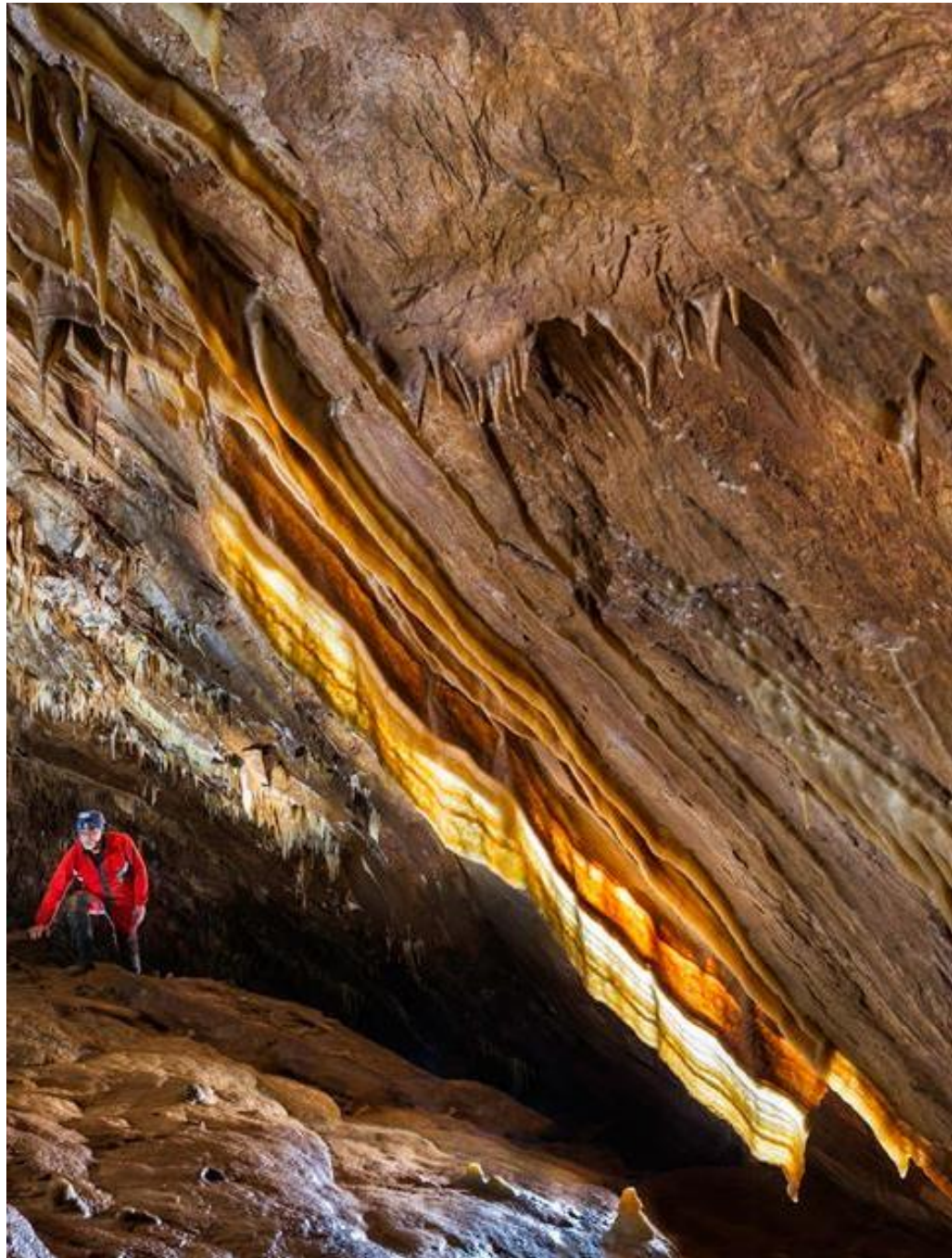
hang from the cave ceiling and form as water flows down the formation, and deposits layers of calcite. You can remember the difference between stalagmites and stalactites by remembering that stalactites “Hang tightly to the ceiling”.



A **Column** is when a stalactite and a stalagmite join.



In general, all ceiling formations are stalactites, but because there are so many distinctive types, there are more specific terms. For instance, a **Drapery** develops when water deposits calcite in thin sheets that hang in delicate folds like a curtain. Cavers refer to this as "**Cave bacon**"



The tiny, hollow stalactites known as **soda straws** are particularly fascinating. They grow as water runs down inside them and deposits a ring of calcite at the tip.



Lechuguilla Cave

New Mexico

“Lilly Pad”



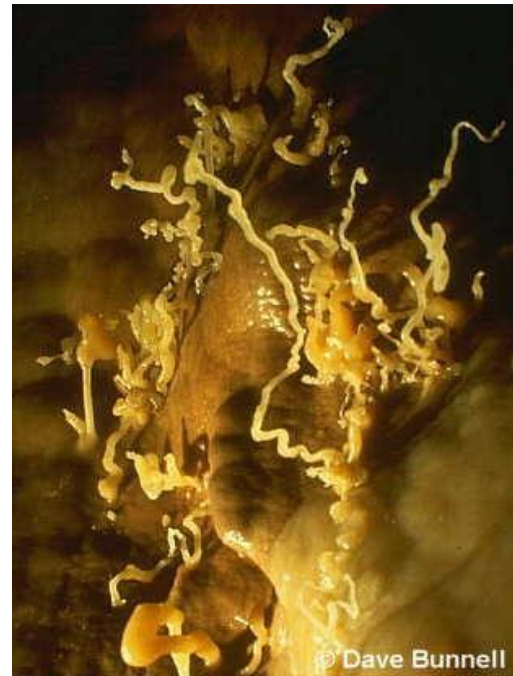
NPS Photo by Daniel Chailloux and Peter Bosted

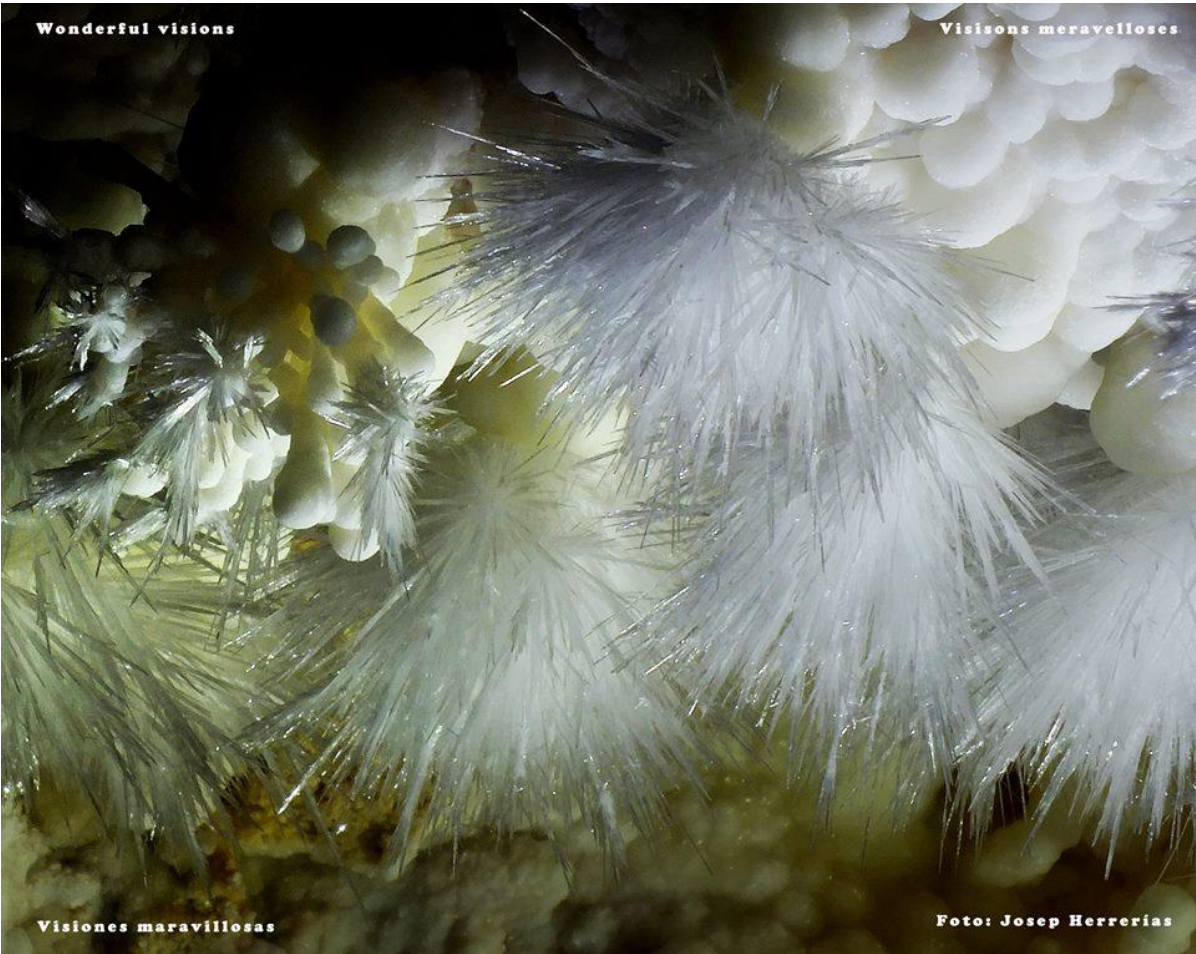
Rimstone Pool





Helictites, or delicate, twisted speleothems, form as air movement within particularly humid cave passages causes the calcite formations to project at odd angles from the ceiling or walls of caves. They have a curving or angular form that makes them look like they formed in zero gravity.



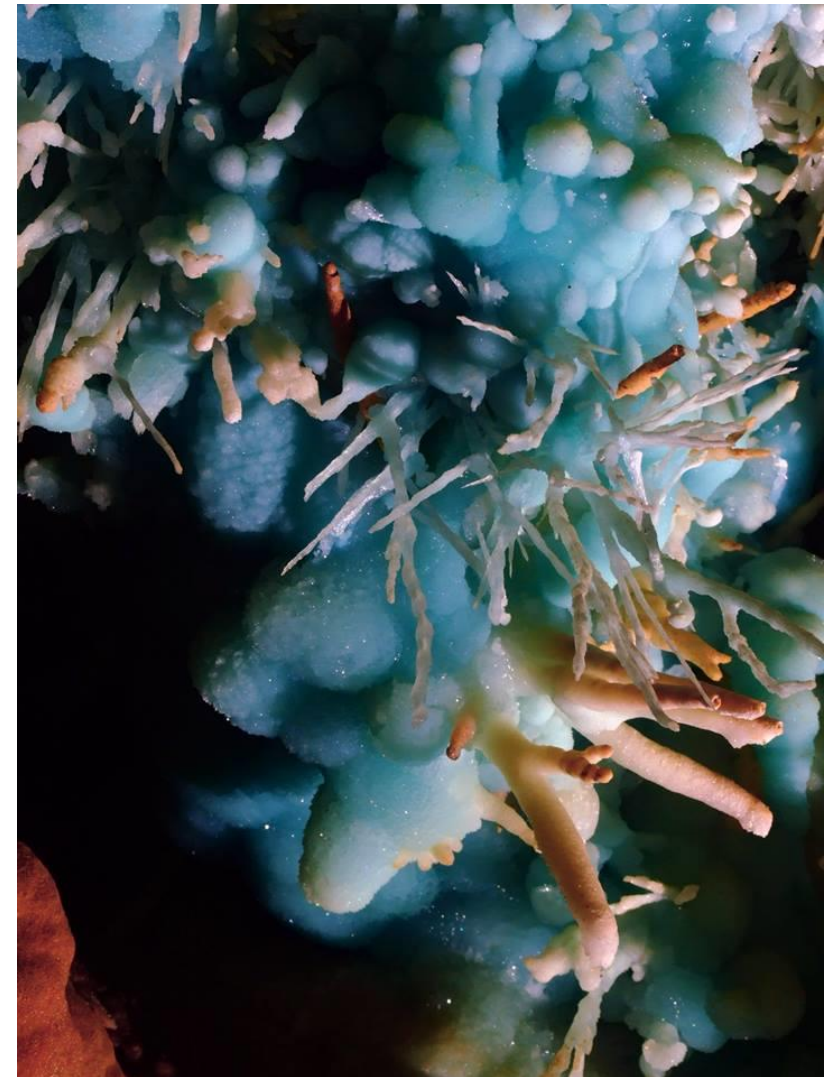


Aragonite Hairs

Aragonite Spikes



Blue Calcite Spire
(Picture below)



Naica mine, Chihuahua Mexico



Naica crystals are composed of gypsum

(the same thing used in drywall)



Penny Boston

Due to the 124 degree temp and 100% humidity of Naica, Dr. Penny Boston and Danielle Winget, wearing “Ice vests”, can only stay in the cave for 10 minutes before their body starts to shut down.



Mike Spilde

DR. Penny Boston
wearing ice
cooled suit and air
tank cooled by
ice, can stay in the
cave for about an
hour to do
scientific research



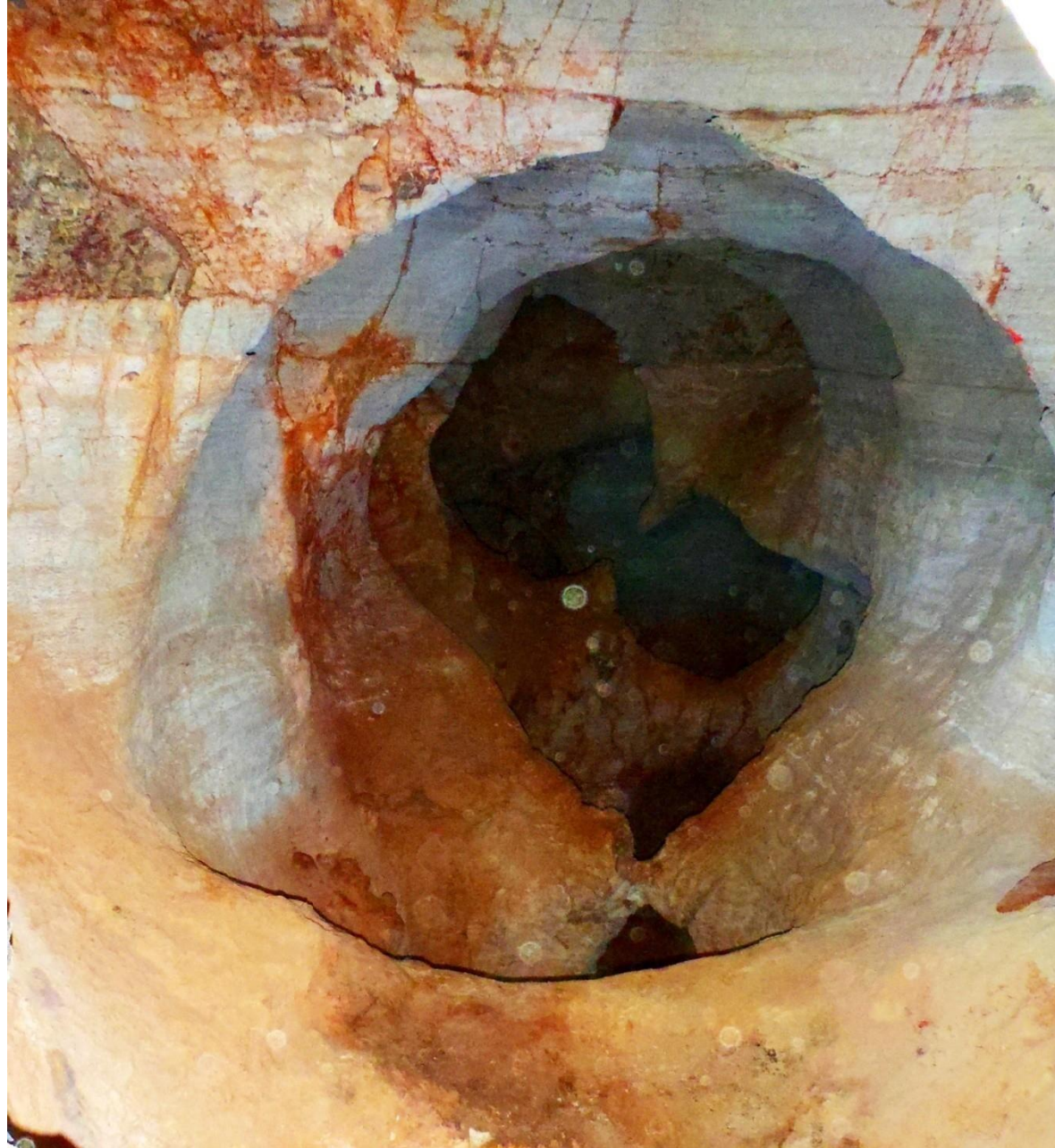
Tom Kieft

Cave of Swords

Mexico



Antelope Springs Cave







Lechuguilla Cave

Chandelier Room



NPS Photo by Gavin Newman

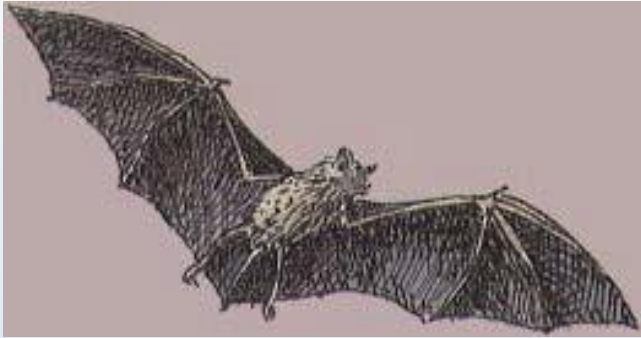
Cave Creatures

Animals use caves in different ways. Some animals, including humans, use caves only for temporary shelter. Other creatures are dependent on the cave environment for their survival.

Trogloxenes (literally “cave guests”),

Troglophiles (literally “cave lovers”)

Finally, troglobytes.



Little Brown Bat



Packrat



Raccoon

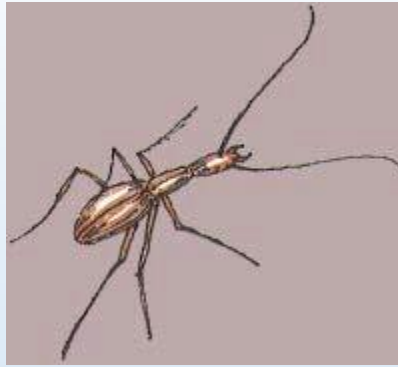
Trogloxenes

The word TROGLO means hole.

**Trogloxenes are animals
who sometimes choose caves as their
homes.**



Camel backed cave cricket



Blind cave beetle



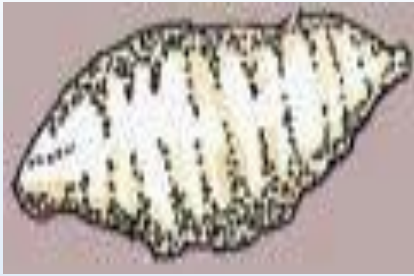
Adult cave salamander



Harvestman
("Daddy longlegs")

Troglophiles

Troglophiles are animals who like to live in caves but also live elsewhere.



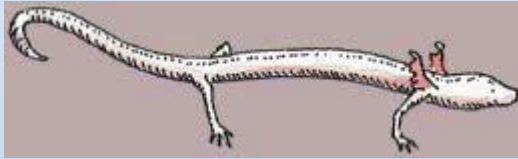
Blind flatworm



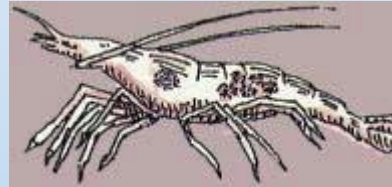
Blind millipede



Blind crayfish



Blind Texas Salamander



Blind shrimp




Troglobites

Troglobites are animals who only live in caves. They can't survive anyplace else.

Preparing to go Caving

- **SAFTY FIRST and ALWAYS**
- **Properly trained Leaders**
- **Follow Policies & Have Permits**
- **Proper Attitude**
- **Proper Equipment**
- **Teamwork, Teamwork, Teamwork**
- **Leader at front and back of group**
- **Two-Deep Leadership at all times.**



These are a few
Dangers of Caving

Dangers of Caving

- Trips and Falls



DANGER

Dangers of Caving

- Rock fall



DANGER

Dangers of Caving

- Getting Lost



DANGER

Dangers of Caving

- Getting Stuck



DANGER

Dangers of Caving

- Dehydration



DANGER

Dangers of Caving

- Hypothermia



DANGER

Dangers of Caving

- Possible Bad Air & Sickness



DANGER

WHAT TO TAKE INTO A CAVE

- **Every caving trip requires basic equipment and supplies. However, equipment for a safe and comfortable trip may differ from that listed here, depending on the cave.**
- **To learn what is appropriate, ask your Qualified Trip Leader what is needed for your particular trip.**

LIGHTS

- Carry at least **three independent sources of light per person**. Mount the primary light on your helmet. The second and third light sources must be adequate to use as a primary source, and must fit on your helmet. Take three sets of extra batteries.

(Wear a spare light around your neck. It will be easy to get to if you need it)

- ***Remember Murphy's Law; If you only have one source of light, IT WILL GO OUT WHEN YOU NEED IT MOST!***

HELMET

- The ideal type of helmet for most caving activities is a climbing style helmet, which provides impact protection and shock absorption to protect the head.



GLOVES

- Gloves are required to protect the cave from you. Touching formations with your bare hands can kill the formation, due to the dirt and oil on your hands.

ELBOW AND KNEE PADS

- There are caving Knee pads; however you can use other kinds of knee & elbow pads for caving. Roller skating knee and elbow pads work well for beginners.

FOOT WEAR

- Wear sturdy boots with lug soles to protect your feet and grip securely on rocks and mud. Ankle support is very important, you can easily twist an ankle in a cave.

Equipment used for caving



CLOTHING

Proper clothing is very important on cave trips. Plan ahead ask your Qualified Trip Leader what type of clothing to wear and dress appropriately.

Wet clothes in a cold cave can cause hypothermia which can kill quickly. Except in the very driest, warmest caves, avoid wearing cotton clothing, because it absorbs and retains more water than synthetic fabrics and draws heat from your body.

Polypropylene, nylon, and polyester tend to be more abrasion-resistant, absorb less water, dry quickly, and retain heat better than cotton fabrics.

Know the cave conditions before you go.



FOOD

- Food sufficient for the length of the trip, plus extra in case the trip takes longer than expected. High energy foods, not sugary foods are best. Power bars, nuts, trail mix etc.
- Caving trips are hard on everything so pack durable foods. Bananas and sandwiches get crushed during a trip but bagels and energy bars usually do fine. Pack foods in crush-proof Boxes. You can find tuna in aluminum pouch that is great for cave trips and takes up little space and the package is very durable.
- Do not take crumbly or messy foods into a cave. The crumbs that you leave can damage the delicate ecosystem of a cave.



DRINKS

- Replacing fluids & electrolytes and staying hydrated is essential while in a cave. Bring plenty of liquid to drink! Caving can be a very physical activity. Don't let yourself become dehydrated. Dehydration can lead to hypothermia.
- Use a durable plastic bottle, never take glass and avoid aluminum. Do not bring milk or soda or carbonated drinks into a cave. The milk will sour and the soda will be so shaken that it will explode and damage the cave ecosystem.
- Be aware of the rules for the cave you are visiting. Some caves prohibit food or drink of any kind to enter the cave.
- **LEAVE NO TRACE, WHAT YOU PACK IN, YOU PACK OUT!**

FIRST AID KIT

- We strongly recommend a personal size First Aid Kit for each person. You should have at least a knife, gauze pads, an Ace Bandage, garbage bag or space blanket, candle and water proof matches. Store your kit in a waterproof container, Pelican box or in sealable plastic baggies to keep the contents dry.
- KEEP THIS WITH YOU AT ALL TIMES IN A CAVE!
- Accidents aren't planned that is why they are called "**accidents**".



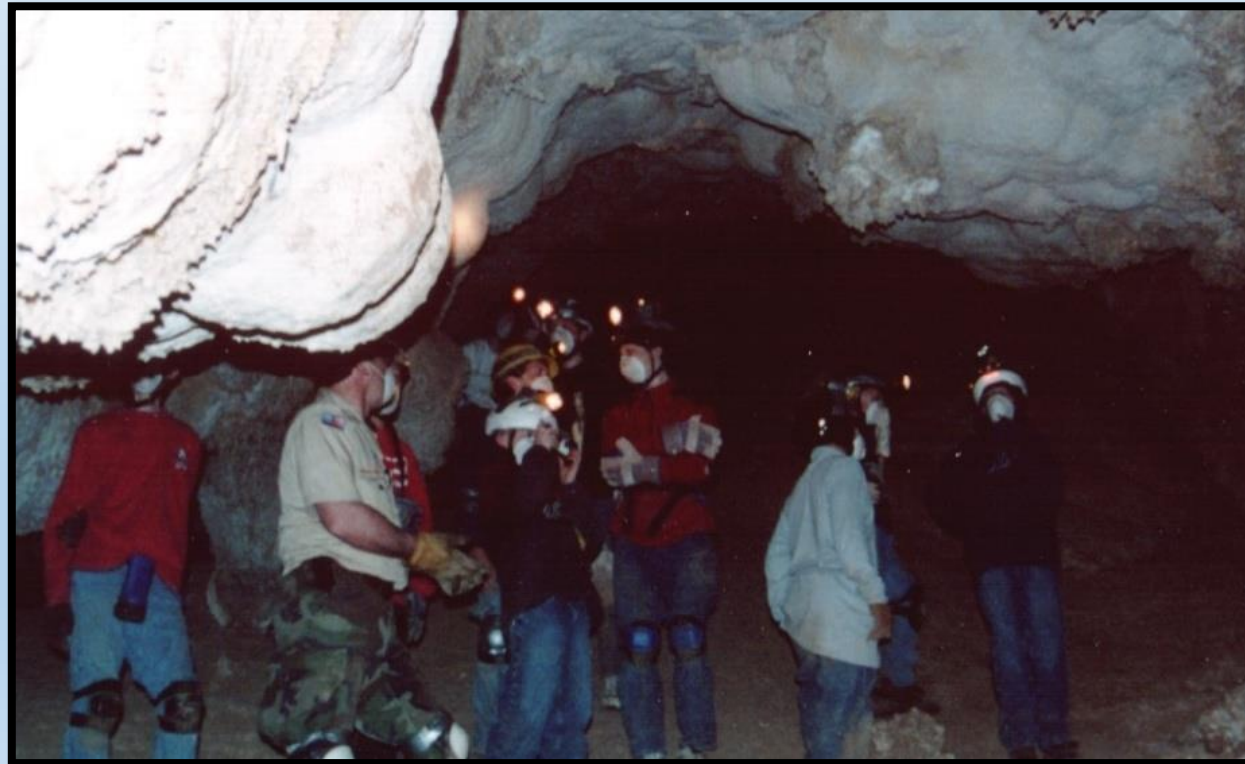
TRAIL MARKERS

- Use trail markers when inside the cave. Even if you have a map and you know the cave well, placing markers along your way will help ensure that everyone will find their way out. Just in case something happens to the leaders, the other members can find their way out to get help.
- One inexpensive idea is to put reflective tape on one end of a large pop-sickle stick. Remember the last person to leave should remove the markers on the way out of the cave.
- DO NOT paint, mark or otherwise damage the cave to mark the trail out! This is called vandalism and is illegal!



Disposable dust masks.

Some caves can be very dusty, and or have a lot of guano. An inexpensive dust mask will make your trip much more pleasant and safe. Most cavers carry two masks in your helmet for easy access.



WHAT TO DO IN A CAVE

- SAFETY FIRST AND ALWAYS!
- Follow BSA Cave Safely Cave Softy policy and Caving rules.
- Watch your step, don't run or jump on or off of anything. Depth perception underground is much different than above ground.



- Do not bother, harass or touch bats, especially while they are hibernating. Disturbing bats will cause them to use their energy storage and they may die before spring.
- Always keep your gloves on when in a cave. The oils and dirt from your skin will kill the part of the cave that you touch.



- Never break formations or take anything that belongs in a cave, from a cave. Caves are protected by law.
- Do not make marks in or on the cave in anyway.
- Stay together, be aware of your surroundings.
- Be aware of the time. “Cave time” (your perception of time) is much different underground. Don’t miss your check in time, unless you want to meet the local Search and Rescue Team.
- Leave no trace of your presence in the cave.
- Be respectful of the cave owner.
- Have fun and learn a lot!
- Cave Safely, Cave Softly!



If Something Goes Wrong....



Cave Rescue



For approximately every 10 minutes that you venture into a cave, it will take about an hour to get you out, if you can't move on your own.



Moving a patient through a cave is slow work.



It takes Planning...



Training and Team Work....



©2012 Jeff Burns

Are Essential...



For a Cave Rescue.



©2012 David Ochel

Caving Ethics and Conservation



Why cavers seem secretive

Irreparable damage to a once beautiful cave



Cave damage from harvesters
The stalactites could not be repaired





What to Do:

- Be safety conscious
- Work as a team
- Follow instructions from leaders
- Follow all BSA policies and the caves rules
- Stay on trails
- Have all proper equipment
- Keep hydrated
- Take breaks to eat to keep energy level up
- Learn as much as possible about the cave
- Take lots of pictures
- Have lots of FUN



Cave Rules

What not do in a cave:

- smoke,
- Chew tobacco,
- Use drugs that may impair your judgment
- Leave trash
- Take anything from a cave.
- **Do not drink:**
 - Alcoholic drinks,
 - Highly caffeinated drinks, (caffeine can impair youths judgment)
 - Carbonated drinks (they can explode and will damage the cave)



Cave Safely, Cave Softly

Requirements for Unit Caving

Cave Safely, Cave Softly is the Boy Scouts of America's procedure for organizing BSA activities in commercial and non-commercial caves or lava tubes



The Qualified Trip Leader is responsible for all procedures for safely conducting the caving activity. The adult supervisor works cooperatively with the Qualified Trip Leader and is responsible for all matters outside of the caving activity. If at any time the Qualified Trip Leader feels that the rules are not being followed, or there is unsafe activity, then the Qualified Trip Leader has the right to cancel the trip. For more information refer to the “NSS Guide to Responsible Caving” (<http://caves.org/brochure/NSS%20Guide%20Color%20809.pdf>)



Cub Scouts and Webelos Scouts are encouraged to visit commercially operated caves and lava tubes. For commercial operations, Leaders should follow the guidelines set by the operators and reference Cave Safely, Cave Softly for more information. Non-Commercial “Easy Caves” with no access control, such as those in parks where people of all abilities are allowed uncontrolled access, may also be suitable for Cub Scouts and Webelos.



Boy Scout age youth are generally mature enough to enter “Easy wild caves” which means; easily accessible, nontechnical/non-vertical caves.

A “wild cave” is anything that is not commercially operated with a professional tour guide. Older Boy Scouts, Varsity Scouts, Sea Scouts and Venturers should be ready to explore more technical wild caves.



Qualified Supervision

All caving activities must be supervised by a mature, conscientious adult at least 21 years of age who understands the risks inherent to these activities. This person knowingly accepts responsibility for the well-being and safety of the youth in his or her care. This adult supervisor is trained in and committed to compliance with the eight points of the Boy Scouts of America's Cave Safely, Cave Softly procedure and responsible for recruiting and verifying the qualifications of the Qualified Trip Leader.

Two adult supervisors are required for every 12 participants with a minimum of two adults for any one group, and must be physically present with the group at all times. Adult supervisors must review the 8 points of Cave Safely, Cave Softly with their youth group prior to the cave trip.

The adult supervisor is responsible for ensuring that someone in the group is currently trained in Wilderness First Aid. The group must carry a first aid kit that is appropriate for the experience. It is strongly recommended that all of the youth have completed a basic first aid course, or have earned the First Aid Merit Badge, prior to the caving trip, and all members should have in their possession a small personal basic first aid kit.



Qualified Trip Leader

Non-vertical caving: For trips to non-vertical caves, there must be one Qualified Trip Leader, at least 21 years of age, and one additional Trip Leader, that is at least 16 years of age. Qualified Trip Leaders must have recent and ongoing caving experience and preferably be a member of the National Speleological Society (NSS) or equivalent.

They must be proficient in all necessary established safety practices including cave rescue, and must also understand conservation measures, courtesy to cave owners, and any current environmental concerns for that caving area. The Qualified Trip Leader must be very familiar with the cave to be visited.

Vertical Caving:

Qualified Trip Leaders for vertical caving must be proficient in both non-vertical caving skills listed above and vertical caving skills. Two Qualified Trip Leaders are required. Vertical caving requires special ascending and descending equipment and techniques (vertical caving skills). In addition, they must be able to perform on rope rescues in case of an emergency.



The Qualified Trip Leader managing the vertical caving activity must meet the following criteria:

- Have successfully completed Intermediate Vertical Training or equivalent from a training source associated with NSS and:

- Should have at least one year of ongoing vertical caving Experience

- Have experience teaching vertical caving techniques

Note: Qualified Trip Leaders must maintain their skills through ongoing vertical activity and/or training

OR

- * Be a qualified instructor in accordance with Climb on Safely (other than qualifications that are limited to artificial structures) and successfully complete either of the following training courses:

- * National Speleological Society (NSS) Intermediate Vertical Training or equivalent from a training source associated with NSS

- * Council approved vertical caving training that is taught by someone who has successfully completed Intermediate Vertical Training from a training source associated with NSS

All qualified trip leaders must be current in their training and qualifications (assessment or documented practice within three years).

Qualified Trip Leaders must assure that all participants in the caving activity possess basic level vertical caving skills as established by NSS (see <http://caves.org/safety/safety.shtml#newbies>).

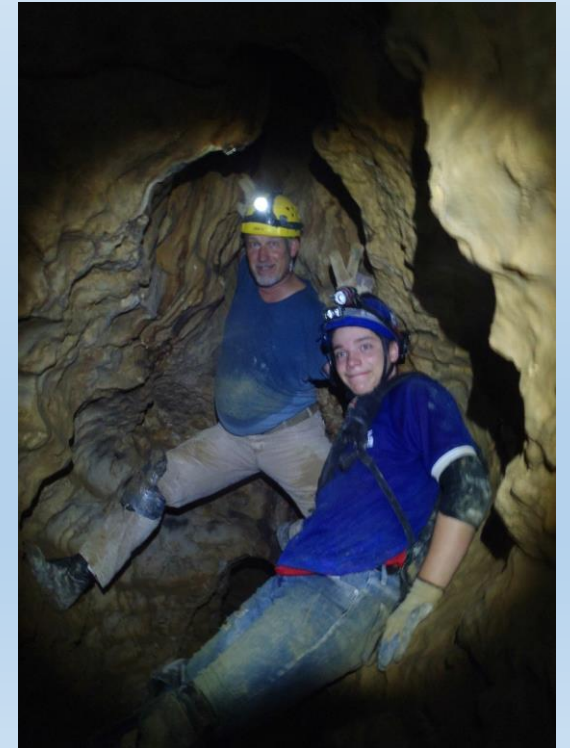
There are many institutions and/or businesses that offer training for climbing and rappelling; however, most do not prepare instructors to lead groups of people on caving trips. Your local council COPE and Climbing Committee, Area COPE and Climbing Advocates, and Region COPE and Climbing Chairs can help locate resources in the NSS to answer questions about caving. For guidance or additional information, contact the BSA's Outdoor Programs/Properties Department through your local council office.

Physical Fitness

Adult supervisors must require evidence of fitness for caving activities with a current BSA Annual Health and Medical Record.

The adult supervisor must adapt all supervision, discipline, and precautions to anticipate any potential risks (claustrophobia, fear of total darkness, etc) with individual health conditions.

The adult supervisor should inform the Qualified Trip Leader about each participant's medical conditions.



Safety

The overall capability and pace of a caving group is always that of the least able member of that group, and no member of the group should ever be encouraged or permitted to attempt an act that is beyond their ability even when the remainder of the group has the necessary ability.

All participants must complete a pre-trip cave safety inspection of all necessary equipment, conducted by the Qualified Trip Leader, prior to leaving on the trip.

Each participant should learn to identify natural and simulated hazards and be prepared to use the buddy system to monitor such concerns as, dehydration, hypothermia, and an unusually high degree of fear or apprehension.

Vertical caving by BSA groups is only permitted when all the participants possess the basic level vertical caving skills established by the National Speleological Society (see <http://caves.org/safety/safety.shtml#newbies>).

Vertical caving skills must be taught under controlled conditions above ground. All youth are required to wear their complete ascending system anytime they are on rope.

When safe and practical, bottom belays must be used during rappelling. If a bottom belay can't be used safely, then an auto-block hitch or separate top belay must be used.

For safety reasons, a hand line should be used on slick areas or for short scrambling climbs.

If there is a steep area to be down climbed that is more than approximately two body lengths, then vertical gear and training is recommended.



Equipment

It is the responsibility of the Qualified Trip Leader to ensure that all equipment is appropriate for the cave being visited, and that each member has all of the required equipment prior to leaving for the caving trip. Under no conditions should any member of the group be permitted to enter the cave if they do not have all of the required equipment in their possession. (No sharing of required equipment)



Required Personal Equipment

(Qualified Trip Leader will set final requirements for personal equipment):

- * **Wear a helmet with a quick release clip.** (Should meet UIAA or CE standards.)
- * **Have 3 sources of light** (two headlamps securely mounted on the helmet, 3rd headlamp easily accessible)
- * **Sets of spare batteries for each headlamp**
- * **Wear proper clothing for the environment** (consult Qualified Trip Leader)
- * **Gloves** (with fingers)
- * **Appropriate footwear as specified by Qualified Trip Leader**
- * **Knee pads & elbow pads are strongly recommended**
- * **Small personal first aid kit**
- * **Appropriate food and water**
- * **Small (loud) whistle**
- * **Hypothermia kit** (large plastic bag, matches & a tea candle)
- * **Other Emergency essentials as required by the Qualified Trip Leader**

Planning

All members of the trip must have completed the “Caving Introduction” training program on the NSS website prior to their caving trip

(see <http://caves.org/youth/National%20BSA%20youth%20caving%20presentation%204-13.pdf>).

When planning, remember the following:

- * Share the caving plan and the alternate activity with parents and the unit committee.
- * Secure the necessary permits or written permission for using private or public lands.
- * Qualified Trip Leaders plan for the caving portion of the activity.



Group size should follow regulations established by the managing jurisdiction for the cave. Groups entering wild/unimproved caves should not exceed 14 individuals total including adult supervision and Qualified Trip Leaders.

If the group is larger, then additional Qualified Trip Leaders and qualified supervisors must be recruited to subdivide the group. Remember that each group must have the gear and supplies to function independently of one another.

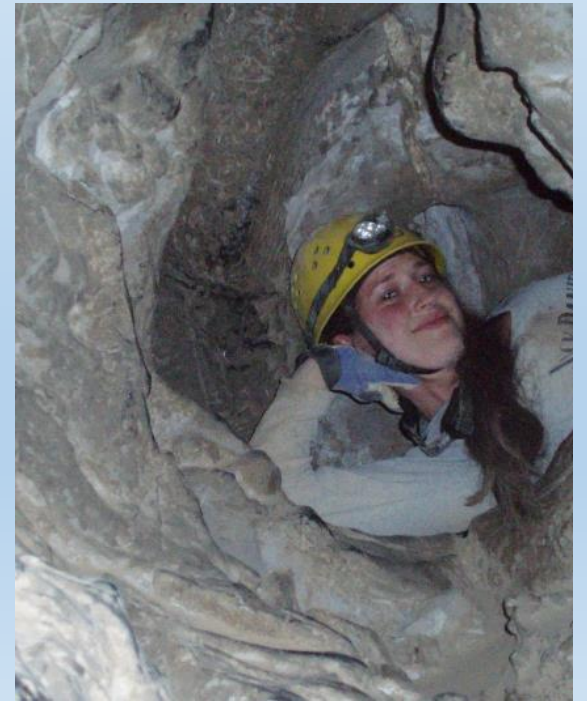
The Qualified Trip Leader must have an emergency plan that includes contacting rescuers in the event of an emergency, and must be shared with the entire group.

The adult supervisor must leave specific information about the caving trip with two responsible persons **before** the group leaves on the trip. This information must include:

- * The GPS location and name of the cave
- * Cave Map (If available)
- * Length of time in cave
- * Time you will call to advise that you are out of the cave
- * Roster of participants and their emergency contact information
- * What to do if you become separated from the group
- * Phone number for emergency services in the trip area in case you do not return on time

Conservation

Always practice “Leave No Trace”. Pack out what you packed in & never take anything out of a cave that belongs in it. Never spray paint or write or mark on any part of a cave. Never remove anything from a cave; this is a federal crime in many caves. Do not touch cave formations with bare hands or dirty gloves, as contact can interfere with future growth of the formation. Remember that you are a guest in a cave and cave life must never be disturbed or removed from the cave for any purpose.



During the winter months, hibernating bats should never be disturbed. Bats that are awakened too often will use up their winter's store of fuel and die of starvation before summer. The Qualified Trip Leader will explain your regions White Nose Syndrome or other decontamination protocol.



Personal sanitation requirements should be met before entering the cave. If there is a sanitation issue while in the cave, then the appropriate containers must be packed out of the cave. Human waste will destroy the ecosystem of a cave and will also ruin the area for the next group of cavers.

Pee Bottle & zip lock bag (Fill zip lock bag 1/3 full of kitty litter)

Burrito bag (for solid waste two layers of aluminum foil, a layer of plastic wrap & baking soda)



Discipline

Each participant knows, understands, and respects the rules and procedures for Cave Safely, Cave Softly and Leave No Trace. All participants should respect and follow all instructions and rules of the Qualified Trip Leader. The applicable rules should be presented and learned prior to the outing and should be reviewed for all participants before activity begins. Running, jumping, horseplay, and solo exploration must be prohibited, these actions jeopardize not only the individual, but also the entire group.



Additional Information

Cave Rescue—The National Speleological Society's National Cave Rescue Commission (NCRC) is a good source of information on cave rescue.

Those interested in a caving trip may contact a local chapter (grotto) of the National Speleological Society (NSS) at www.caves.org.



CAVERS MOTTO:

- **Take Nothing but Pictures –**
- **Leave Nothing but carefully placed Footprints –**
- **Kill Nothing but Time.**

Acknowledgments:

Thanks to Chuck Acklin who began this program, “Cave Safely Cave Softly” over 20 years ago, and thanks to Max Barker, Allen Maddox, Geary Schindel, David Lawrence, Kent Forman, Jason Knight and numerous others who helped with this program.

Photos, unless other wise credited, are thanks to:

Max Barker, Kent Forman, Debbie Spoons,

Cartoon thanks to Angel Fire