



NSS NEWS

JUNE 2015

American Caving Accidents

2013-2014



CALENDAR

USA

June 26-28th, 2015. Karst-O-Rama. Great Saltpetre Cave Preserve, Mt. Vernon, KY. For more information, go to karstorama.com or contact James Clements at j766clements@gmail.com

July 13-17, 2015—NSS Convention in Waynesville, Missouri. For more information visit the Convention Web site: <http://nss2015.caves.org/> or contact co-chairs Joe and Kris Nicolussi at chair2015@caves.org

August 7-9, 2015—The 62nd Indiana Cave Capers presented by the Central Indiana Grotto will be held at a new site for Capers, the Lawrence County Recreation Park; a fantastic facility. Friday night, once again, is the Campground Party and Open Jam hosted by The Shallow Grotto, and also great caving and led trips, vertical rope practice, vendor Inner Mountain Outfitters, Saturday night banquet, keynote speaker Clinton Elmore on recent discoveries in TAG, door prizes, and fun! More info: cavecapers.com or call Ron Adams 317-490-7727.

September 3-7, 2015—The annual Old Timers Reunion, Dailey, WV. For more information visit www.otr.org

September 4-7, 2015—Rocky Mountain Regional/Black Hills Caver Classic at Cavern Wells, Host Springs, South Dakota. Contact: Steve Baldwin sbaldwin9@gmail.com / 605-673-1571

October 9-11, 2015—Western Regional gathering, Twentynine Palms, CA info:www.westernregional2015.org/

July 17-23, 2016— NSS 75th Anniversary Convention - Ely, NV. Contact nss75th@caves.org for more info. <http://nss2016.caves.org>

Rescue

July 25, 2015 – Aug 1, 2015—National Cave Rescue Commission (NCRC) Cave Rescue Operations and Management Seminar at Park Mammoth Resort in Park City, Kentucky. Extensive classroom instruction and fieldwork in all phases of cave rescue including underground environment, vertical rescue, hauling systems, extrication techniques, medical management, communication systems, and the organization and management of cave rescue operations. Visit our website at caves.org/commission/ ncrc/national/ or facebook page at <https://www.facebook.com/Ncrc2014> for more information.

August 20-24, 2015—Rescue Technician: Cave Rescue I/II Class, Union Grove, AL (near Huntsville, NSS Members can camp at the NSS Headquarters for free)

Cost: \$50, Register through HCRU

Also offered as a NFPA 1006 & Alabama Fire College Certification course for fire/rescue personnel; this class is the only NFPA 1006 course in Cave Rescue in the nation.

All phases of cave rescue and management are covered including (but not limited to): Incident Command System, underground communications, patient packaging and movement, cave-specific medical considerations, haul & lower systems, vertical rescue, extrication techniques, and logistics.

See www.hcru.org/rescueclass for more information and registration.

Cave & Karst Science

October 5-9, 2015—The 14th Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst (also known as the Sinkhole Conference) will be held in Rochester, MN. This conference is co-hosted by the National Cave and Karst Research Institute and the Minnesota Ground Water Association. More information and registration can be found at www.sinkholeconference.com

October 20-23, 2015—2nd International Planetary Caves Conference, 20-23 October 2015, Flagstaff, AZ. Info: www.hou.usra.edu/meetings/2ndcaves2015 or contact conference organizer Jut Wynne: jut.wynne@nau.edu

April 11-14, 2016—International conference on the origins, resources, and management of hypogene karst, Deep Karst in Carlsbad, NM. Deep Karst 2016 is being organized by the National Cave and Karst Research Institute in cooperation with the Karst Hydrogeology and Speleogenesis Commission of the International Union of Speleology. More information and updates on registration at www.deepkarst.org

Foreign

August 13-20, 2016—European Federation meeting in Ingleton, UK

July 23-29, 2017—17th International Congress of Speleology, Sydney, Australia. Contact speleo2017@caves.org.au

Send items for the calendar to davebunnell@comcast.net at least 1 month before desired month of publication (i.e., by April 1 for the May issue).

American Caving Accidents

2013–2014

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CORRECTION

The “patient” on the cover and page 35 of the last ACA issue was incorrectly identified as Thomas Evans. The patient in both photos is actually Jeff Polk from Colorado. Thomas Evans is the patient on page 34.

ABOUT THE COVER

FRONT COVER:

Jon Schow captured these photos during a practice rescue exercise in Colorado in 2008.

BACK COVER:

Our back cover photos accompany some of the rescue accounts, as noted.

Right, top: Page 25: John Lyles escapes through a skylight to avoid a flooding entrance passage in County Line Cave, New Mexico. Photo by Jen Foote.

Left, bottom: Page 20: A woman who fell into Clarksville Cave, New York, while looking into the entrance, needed assistance to exit. Tony Hopkins

Bottom: More photos to go with some of the rescue accounts, as noted.

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Please include "NSS News" in your subject line when e-mailing material to help me sort it from the spam. Thanks!

Questions about submitting features and photos? Please see the style and submission guidelines on the NSS web site:

www.caves.org/pub/nssnews/style.html

ADVERTISING

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Deadline: Ads, articles, and announcements should be sent to the editor by the 20th of the month, 2 months before the month of issue (e.g., material for the March issue needs to be in by January 15).

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June 2015

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From the ACA Editor

"Prepare for the unknown by studying how others in the past have coped with the unforeseeable and the unpredictable."

General George S. Patton

General George S. Patton is one of the most celebrated military commanders in history and was a natural leader of men. He demanded rigid discipline in his troops, requiring them to wear their helmets at all times and to be prepared for the unknown. I think General Patton would have made an excellent cave-rescue instructor.

American Caving Accidents is more than the journal of record for caving accidents in North America; it is an educational resource providing insight into what can go wrong on a cave trip and why. By its very definition, an accident is unpredictable. But studying how others have handled unpredictable events can help us to be better prepared when faced with similar situations. When an accident happens, an important decision must be made to self rescue or call for help. This issue is filled with excellent examples of both large-scale callout rescues and small party assisted rescues that were handled competently and efficiently. Understanding what is involved in a cave rescue should also provide a little more impetus for cavers to work to avoid accidents in the first place.

The incident of a caver fall in Ellisons Cave was a complicated rescue of a severely injured caver from a vertical cave with multiple long drops. The success of the rescue was due to the combination of several factors. The quick actions of the patient's teammates likely saved his life by controlling his severe bleeding, and the rescuers who responded were capable and proficient due to years of commitment to practice and training in cave-rescue techniques. It is now a common joke among cavers to say that if you ever need to be rescued from a cave, "you better hope you are in TAG." While this is a great testament to the cave-rescue teams in TAG (the cave-rich area where Tennessee, Alabama, and Georgia meet), it should also be a motivation for cavers in other parts of the country to train with their local rescue agencies to encourage preparedness and rescue-readiness for caving emergencies. When rescue agencies are not familiar with or equipped to handle cave rescues, patient care can be prolonged unnecessarily. The Weybridge Cave incident is an example of this. Fortunately, following that incident, local agencies acknowledged the need for cave-rescue training and participated in a cave-rescue training seminar along with the local cavers.

Also in this issue are several reports of injured cavers being rescued by members of their own groups. These small party assisted rescues are often referred to as SPARs. The 23 May, 2013, and the 12 April, 2014, incidents in Virginia are two examples of well-executed SPARs. In other rescues, such as those at Iron Hoop and Lechuguilla Cave, patients were aided greatly by their own caving team until outside help arrived.

One thing several of these rescues have in common is that many of the cavers involved had previously taken one or more cave-rescue training courses through the National Cave Rescue Commission (NCRC) of the NSS. The NCRC is not a cave rescue group itself; rather it "provides training and development opportunities for persons and organizations engaged in cave rescue activities." To date the NCRC has offered more than 300 seminars and trained more than 6,500 people. That is an amazing number of people who have made a commitment to themselves and their teammates to be more prepared for the unpredictable. As the NCRC continues to offer more weekend and week-long trainings, we can expect to see even more cavers learning basic cave-rescue skills and those already with training continuing to learn ever more advanced skills.

As you read the following reports, I challenge you to ask yourself how you would have responded to the incidents if you had been involved. Would you have had the necessary gear? Would you have known how to use it? If you have difficulty answering those questions, please consider participating in a cave-rescue training (many of them are free or very inexpensive). If you feel confident that you could respond appropriately,

consider getting involved in teaching new cavers the basics of cave rescue. Accidents will happen, but with a little education, preparation, and cave-rescue skills practice, we can make good choices and take appropriate actions to achieve the best possible outcomes.

Bonny Armstrong
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Acknowledgements

I would like to thank the many individuals who submitted reports to ACA. These reports often involved several follow-up e-mails and phone conversations. Your time and contributions are what make ACA a valuable resource for cavers. In addition, several cavers assisted in providing additional information during the research of incidents including Dave Riggs, Ben Miller, Geary Schindel, Art Palmer, Brad Tipton, Michael Patton, Marty Abercrombie, Jack Speece, Greg Brick, and Ronald Stefan Stewart. John Adsit, Sarah Truebe, and Scott McCrea researched several incidents and spent a considerable amount of time conducting interviews and writing incident reports.

I am grateful to the ACA Review Committee: Andy Armstrong, Richard Breisch, Scott Christenson, George Dasher, Yvonne Droms, Mark Minton, Stephen Mosberg, Rene Ohms, Sarah Richards, and Forrest Wilson, who so enthusiastically lent their time and expertise to this publication. This publication is truly a collaborative effort.

And finally, I would like to thank Roger Mortimer and Tony Canike for providing feature articles for this issue and Dave Bunnell, Curt Harler, and Wm Shrewsbury for assistance in bringing this issue to print.

The National Cave Rescue Commission

www.caves.org/io/ncrc

The National Cave Rescue Commission (NCRC) received its charter from the National Speleological Society in 1979, and serves as the Society's representative on issues of cave rescue training and operations. It is a volunteer group developed primarily to train and track cave rescue resources throughout the United States.

The NCRC does not perform cave rescues. It organizes, develops, and provides training in cave rescue techniques, maintains list of individuals trained in cave rescue, and can help locate rescue resources in times of need. Most NCRC-trained cavers do participate in rescues, but not as part of the NCRC. They work as members of their local rescue teams, civil defense units, or cave rescue groups.

The NCRC sponsors a week-long Cave Rescue Operations and Management Seminar each year that is held in various locations around the United States. The seminar serves as a "boot camp" of cave rescue and provides three levels of training. Cave rescue is constantly evolving, and the most up-to-date techniques are presented each year. In addition to the annual week-long seminar, the NCRC regions sponsor regional week-long seminars, regional modular seminars (taught over a series of weekends), courses in small-group and self-rescue techniques, and weekend cave rescue orientation courses.

Information on NCRC operation, activities, and training is available on the NCRC website at www.ncrc.info. Upcoming seminars are announced on the website and in the *NSS News*.

Descriptions of Incident Results and Types

American Caving Accidents (ACA) is a special publication of the National Speleological Society (NSS). Since 1967, ACA has served as the journal of record for caving accidents in North America. The purpose of collecting and reporting caving accidents and incidents is to help cavers educate themselves on the hazards of caving based on real-life incidents. These incidents, when reported accurately and in detail, should ultimately help readers become safer cavers by learning through others' experiences.

Reports are collected through submissions by cavers involved in the incident or rescue or by those who otherwise have some credible knowledge of the event. Caving incidents brought to the attention of ACA by media reports are verified for accuracy by contacting involved parties directly when possible.

As with previous issues, caving reports have been divided into two categories: regular caving and cave diving. These categories are further classified by incident result or outcome, and incident type (causes and contributing factors).

Some reported incidents are placed in a separate category called "caving-related." These include incidents in which a person needed rescuing from a cave that they did not intend to enter, incidents that occur on the way to or from a cave, incidents involving animals needing rescue from a cave, or other unusual circumstances. Because these incidents did not occur during normal caving activities but required caving gear, cave-rescue techniques, or cavers to effect a rescue, they are considered caving-related. Caving-related incidents are not included in the statistics.

DESCRIPTION OF INCIDENT RESULTS

Fatalities—Fatalities from caving are relatively uncommon and average about three per year. Although fatalities tend to occur with inexperienced, ill-equipped persons, experienced cavers are not exempt.

Injury vs. No Injury—An injury is physical damage or harm inflicted on a person, usually by an external force. Examples include wounds, fractures, contusions, burns, and frostbite. Heart trouble, allergic reactions, migraines, and other conditions are not considered injuries and are categorized as an illness/medical issue incident type.

Aid vs. No Aid—For the purposes of this publication, aid is considered rendered in the following cases: if one or more persons needed the help of others outside of those in their caving party to exit the cave, if outside or additional assistance was requested, or if an ambulance or Life Flight was used to transport the patient to a medical facility.

DESCRIPTION OF INCIDENT TYPES

Acetylene-related—Acetylene-related incidents were more common in the 1960s and 1970s than during the last few decades. No acetylene-related incidents have been reported since 1996, probably because bright yet relatively inexpensive LED lights are now favored among the majority of American cavers. This issue contains one previously unreported acetylene-related incident from 1995.

Bad Air—There were no incidents due to bad air reported for this issue, although one person who built a fire while stranded in an artificial cave had to be treated for carbon monoxide poisoning. In past reports, the presence of bad air in caves has been due to biological decomposition, poor air exchange, carbon monoxide from fires, blasting fumes, or chemicals being washed into the cave.

Caver Fall—Caver falls continue to constitute a large proportion of caving accidents. For simplicity, any fall by any person in a cave, regardless of their experience, is considered a caver fall. This includes the report of a three-year-old child who fell on a commercial tour of Jewel Cave (SD). In

this issue, there are 22 reports of people falling while on a caving trip, and five of people accidentally falling into a pit or cave. With only one exception, all of the falls resulted in injury or a fatality.

Difficulty on Rope or Ladder—The category of difficulty on rope or ladder was added to ACA in 1994 to encompass a variety of problems that may prevent a caver from being unable to ascend or descend a rope or ladder. This issue contains a report of a youth who could not climb a cable ladder and another of a person having difficulty ascending out of War Eagle Cave (AL). A third report from Alcove Pit (NM) resulted in a fatality.

Drowning—There were two drowning incidents in 2014—one in Guam and the other in Hawai'i. Both incidents involved noncavers visiting caves that were popularized on the Internet.

Equipment Problem—In previous issues, this catch-all category has included rigging, light, and rope failures; slipping ascenders, and misuse or lack of equipment. Four equipment problem incidents are reported here; one involves a caving harness with three straps not doubled back, and another involves an anchor failure on a deviation. A third incident occurred when a caver with muddy ascending gear could not ascend a rope. In the fourth incident, a caver rerigged a rope incorrectly, resulting in a 20-foot fall. There are also two incidents included in the previously unreported section. One involves a rope ladder with faulty rigging; the other involves a defective O-ring on a cave diver's regulator.

Exhaustion—Only the Scroll Cave (AZ) incident is attributed mainly to exhaustion, although dehydration was also likely a key factor (compare this to the Lechuguilla Cave (NM) incident). In other incidents—Serendipity Pit (TN), Big Bertha Cave (KY), and Pettijohn Cave (GA) 2014, exhaustion was likely a contributing factor.

Flooding—Cavers were able to escape a flooding entrance crawl through a skylight in County Line Cave (NM) in 2014. The only other flooding incident reported is from 1963 when Scouts were rescued from Nickajack Cave (TN).

Hypothermia—Hypothermia is often a secondary result in caving incidents, often resulting from a caver being stuck, injured, or stranded in a cave. It is especially dangerous not only because of the physiological aspects, but because it impairs judgment, which can lead to mistakes and other accidents. No incidents are listed with hypothermia as the primary factor.

Illness/Medical Issue—There are three incidents of persons becoming ill during caving trips. One caver experienced chest pains that required medical attention and another died from a heart attack in the Binkley Cave System (IN). A caver in Lechuguilla Cave (NM) became extremely dehydrated and required intravenous fluids. One cave diving fatality is attributed to a medical issue, and a caving-related incident reports a medical problem while canoeing to a littoral cave.

Lost—Out-of-state cavers became lost while trying to negotiate a through trip in the Bone-Norman Cave System (WV). Luckily they had a surface watch who reported them missing, and cavers found them the next day. In another report, a caver became separated from her group in Run to the Mill Cave (TN). After pulling up all their ropes and exiting the cave, her group noticed that she was missing. They reentered the cave and eventually found her.

Lost Control on Rappel—This incident-type category was added in 2011 to cover incidents of persons losing control while on rappel. In previous issues, these incidents were listed under Caver Falls or Difficulty on Rope. While most out-of-control rappels also result in a caver fall, the contrib-

uting factor or cause is very different than those typical for caver falls.

In 2013, a caver at Valdina Farms Sinkhole (TX) was rappelling with a heavy load of video equipment. He was able to avoid a free fall but sustained severe rope burns to his hands. An out-of-control rappel in Missouri in 2009 resulted in severe damage to one caver's foot and heel that has required numerous surgeries to repair.

Rock fall—Five incidents from rock fall are reported in this issue. Two incidents involved cavers who were on rope and resulted in significant injuries. Rock fall in Warrens Cave (FL) and Happy Top Horror Hole (TN) resulted in no injury. In the final incident, a caver was struck in the mouth by a falling rock in Fulford Cave (CO).

Stuck—Two people required aid when they became stuck in tight cave passages in 2014. Both persons were inexperienced and not associated with any caving groups.

Trapped or Stranded—This category describes incidents in which the caver or cavers are prevented from exiting the cave. There are 11 incidents reported of this type. Reasons include being trapped by a dislodged boulder (two incidents), encountering an obstacle (ice plug, high water levels) partway during a pull-down through trip, running out of light (two incidents), not being able to ascend back up a rope (two incidents), not being able to free-climb out of a small pit (two incidents), and not wanting to cross a stream to exit. Except for the trapped cavers in Raspberry Cave (AZ), all of these incidents required aid.

Other—This catch-all category includes incidents that don't quite fit in other categories. Examples in this issue include cavers that were overdue from a survey trip in Serendipity Pit (TN), an injury from a finger being caught between webbing and rock, and a reoccurring knee problem during a mock rescue in Idaho.

Cave Diving Accidents and Incidents—Six cave diving accidents reported in 2013 resulted in two injuries and six fatalities. Three fatalities, including a father and son diving on Christmas day, were due to divers running out of air. Two divers used wrong gas mixtures; one died and one survived. A Missouri man died from a medical issue while cave diving in Mexico. In the final fatal incident, a cave diver may have had an equipment problem. His dive partner required decompression in a hyperbaric chamber after attempting to rescue him.

Only 2 incidents and no fatalities were reported in 2014. This is only the second year since 1986 that no cave-diving fatalities were reported. A cave diver in New Mexico had difficulty exiting a spring due to a constriction at the entrance and the presence of bad air. A diver in Florida took a wrong turn while exiting the cave and found himself in a silted-out and tight passage. His partner went for help, but the partner and a rescuer returned to find the diver making his way out of the cave with a spare tank he had found in the cave.

Two previously-unreported diving accidents are included. In one, a woman died of an unknown cause after being found unresponsive in shallow water. The other incident involves faulty equipment, but the diver was successfully assisted by her partner.

CAVING ACCIDENT AND INCIDENT STATISTICS 1986-2014

Result of Incident

Result	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Fatality	4	3	4	1	4	6	5	5	1	2	1	4	4	4	2	5	2	6	3	0	4	1	4	3	5	3	2	2	2
Injury and Aid	10	15	11	16	18	16	17	22	19	17	16	22	14	14	20	11	15	9	7	8	15	9	9	9	8	9	5	6	8
Aid, No Injury	21	15	20	20	23	20	28	33	26	17	16	13	13	18	15	13	8	14	12	8	12	9	7	5	7	6	10	10	6
Injury, No Aid	10	15	14	14	10	12	10	4	11	9	10	4	2	8	3	6	6	6	0	10	4	7	2	2	7	6	9	5	9
No Injury, No Aid	19	16	12	21	9	12	16	3	20	12	11	4	8	3	1	2	4	5	1	1	1	1	3	3	2	3	1	2	5
Total	64	64	61	72	64	66	76	67	77	57	54	47	41	47	41	37	35	40	23	27	36	27	25	22	29	27	27	25	30

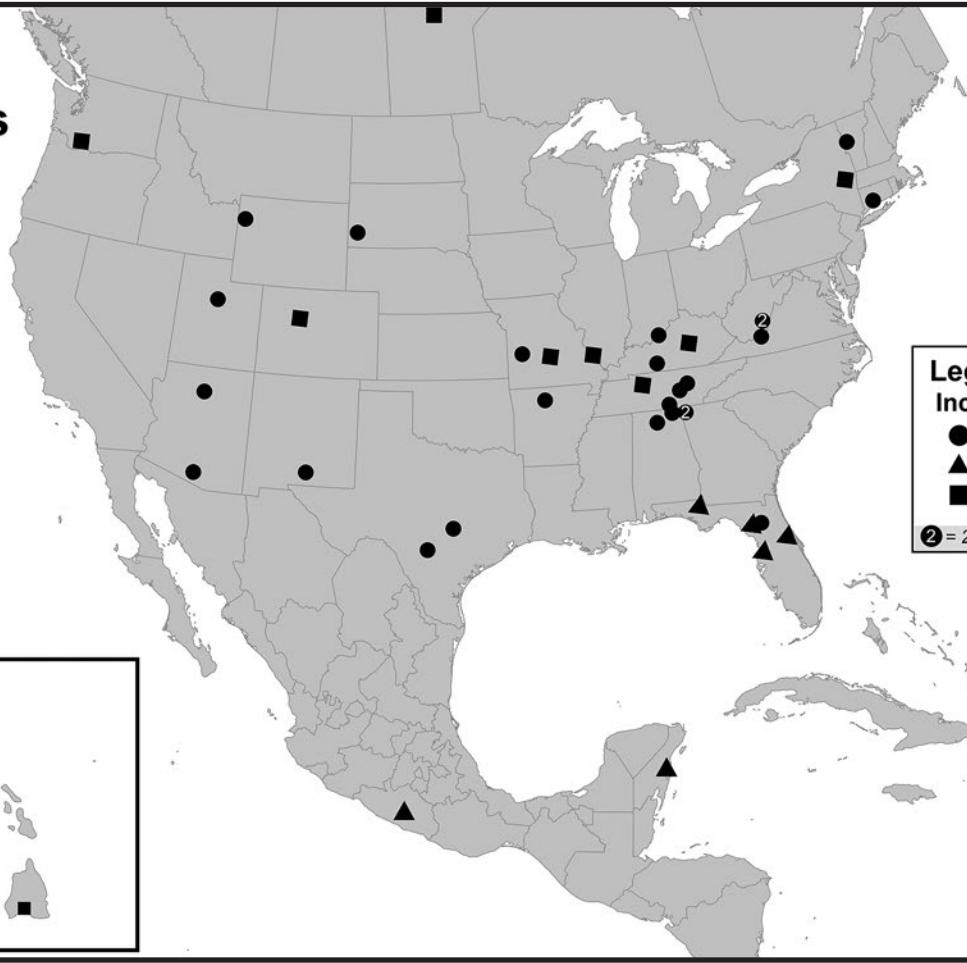
Incident Type

Type	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Caver Fall	25	14	20	19	22	22	19	20	15	21	27	15	20	17	14	20	14	5	10	12	11	11	10	13	8	8	10	10	
Trapped/Stranded	-	-	-	-	-	-	-	-	1	13	18	19	13	10	17	4	9	10	5	7	4	3	3	4	2	3	5	5	
Difficulty on Rope	-	-	-	-	-	-	-	-	11	4	6	5	1	4	3	1	5	5	1	2	2	2	1	2	4	1	2	0	
Rock Fall	12	17	7	11	11	12	16	11	12	10	5	5	2	4	2	3	3	5	3	7	4	4	3	1	1	1	3	1	3
Lost	8	5	3	9	4	3	4	5	12	7	4	5	3	3	3	1	1	5	4	2	3	4	2	0	1	2	1	1	1
Flooding	1	3	3	4	2	2	1	3	1	4	5	2	1	4	1	1	0	6	1	0	1	0	0	1	0	0	1	0	1
Hypothermia	1	2	0	5	0	2	4	0	3	6	6	2	2	2	3	1	1	3	0	1	2	1	2	0	1	0	0	0	0
Illness/Medical Issue	0	0	2	3	2	1	0	3	3	0	1	1	8	0	2	2	1	2	2	0	0	1	0	1	2	2	2	1	1
Exhaustion	0	1	1	3	0	2	4	2	4	1	4	1	1	2	3	1	2	1	0	0	2	0	1	0	1	0	0	1	0
Drowning	1	2	0	2	2	2	0	0	0	1	0	0	1	0	1	0	0	3	1	0	1	1	1	0	1	0	0	2	0
Stuck	3	1	0	1	1	3	5	5	2	1	2	0	1	5	3	5	0	1	6	3	2	0	2	2	3	1	5	0	2
Bad Air	3	2	1	1	1	2	1	1	2	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acetylene-related	3	0	1	1	0	0	0	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equipment Problem	14	17	20	20	23	21	20	11	11	4	4	2	2	0	0	3	2	0	0	0	4	4	2	1	1	0	0	1	3
Other	3	4	8	6	8	4	5	4	6	6	3	2	3	2	3	3	2	1	1	2	1	0	3	1	2	3	2	1	2
Lost Control on Rappel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	1	1	0
Caving-related Incidents	-	-	-	-	-	2	1	0	2	0	1	1	5	2	11	2	9	4	20	9	8	4	6	3	15	9	13	11	7

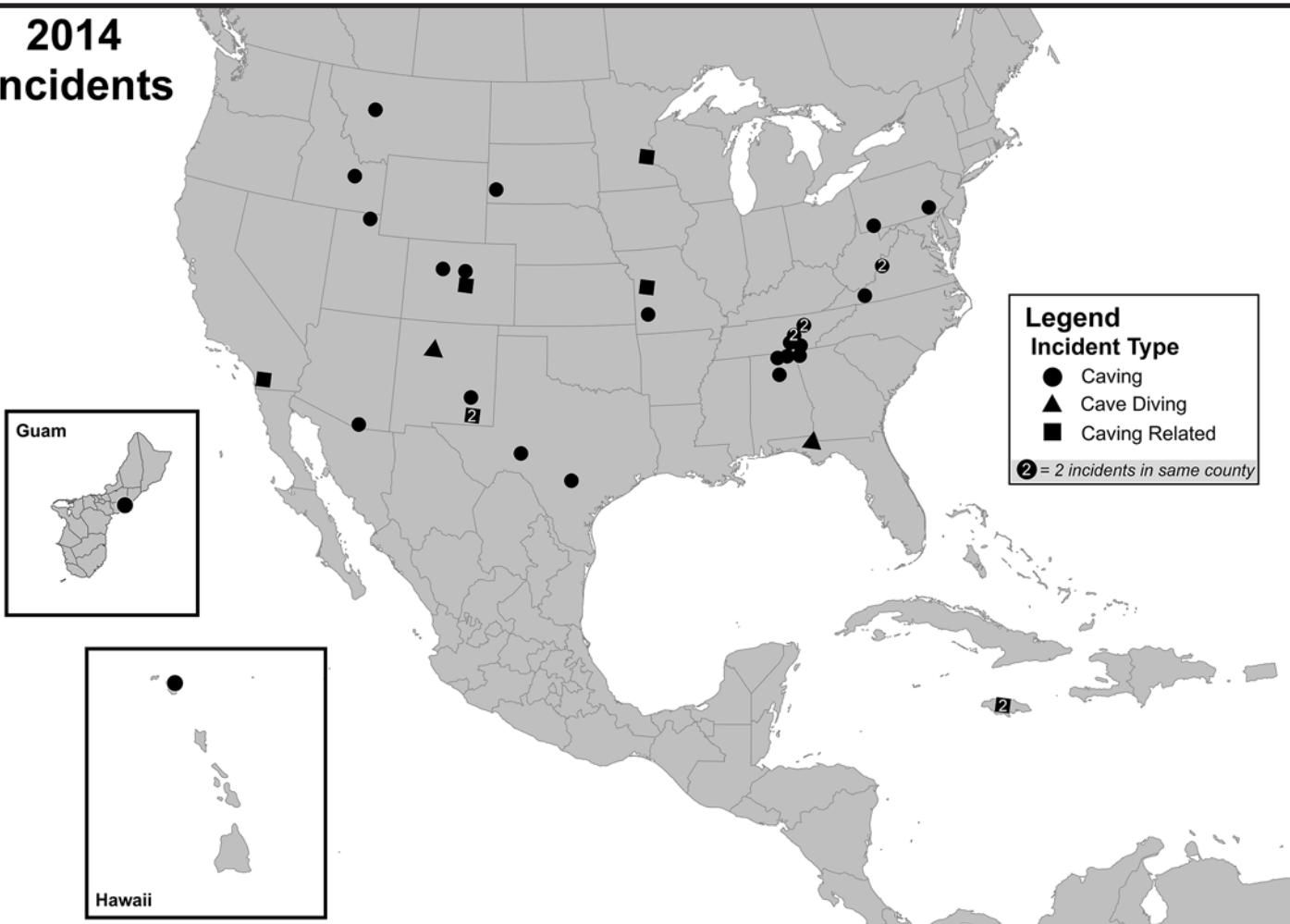
Cave Diving Incidents

Result	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	
Fatality	7	5	9	4	8	2	5	6	8	6	2	2	2	0	5	7	9	3	5	6	2	1	5	7	2	1	5	7	6	0
Injury and Aid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	
Aid, No Injury	1	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	4	1	0	
Injury, no Aid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
No Injury, No Aid	1	2	1	1	0	5	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0	1
Total	9	7	10	5	8	8	7	6	9	7	2	2	1	7	8	9	4	5	7	4	2	5	8	4	1	5	11	8	2	

2013 Incidents



2014 Incidents



2013 Reported Caving Accidents and Incidents

Date	Cave	Location	Result	Incident Type
January 6	Serendipity Pit	Tennessee	aid, no injury	other
February 23	Crownover Salt peter Cave	Tennessee	injury and aid	caver fall
February 23	Bone-Norman Cave System	West Virginia	aid, no injury	lost
March 23	Fox Hole Cave	Tennessee	injury and aid	caver fall
March 23	Iron Hoop Cave	Alabama	injury and aid	caver fall
April 5	Warrens Cave	Florida	no injury, no aid	rock fall
April 20	Poor Farm (Greenbrier) Cave	West Virginia	aid, no injury	illness/medical issue
May 12	Fossil Mountain Ice Cave	Wyoming	aid, no injury	stranded
May 13	Big Bertha Cave	Kentucky	aid, no injury	stranded
May 23	unspecified cave	Virginia	injury, no aid	caver fall
May 26	Ellisons Cave	Georgia	injury and aid	caver fall
May 28	Jewel Cave	South Dakota	injury and aid	caver fall
June 3	Hughes Cave	Alabama	aid, no injury	stranded
June 8	Valdina Farms Sinkhole	Texas	injury, no aid	lost control on rappel
June 22	unspecified cave	Arkansas	aid, no injury	equipment problem
July 20	Up and Down Cave	Missouri	aid, no injury	difficulty on rope/ladder
July 31	La Crosse Cave	Texas	injury, no aid	caver fall
August 6	Weybridge Cave	Vermont	injury and aid	caver fall
August 12	Torys Cave	Connecticut	aid, no injury	stranded
August 31	Raspberry Cave	Arizona	no injury, no aid	trapped
September 5	Alcove Pit	New Mexico	fatality	difficulty on rope/ladder
September 21	Scroll Cave	Arizona	aid, no injury	exhaustion
November 23	Binkley Cave System	Indiana	fatality	illness/medical issue
November 23	Neffs Cave	Utah	injury, no aid	caver fall
December 15	Pettijohns Cave	Georgia	injury, no aid	caver fall

2013 Reported Cave Diving Accidents and Incidents

Date	Cave	Location	Result	Incident Type
February 11	Sistema Sac Actun (Cenote Calimba)	Mexico	fatality	lost, out of air
August 8	Devils Eye Spring	Florida	fatality	used wrong gas
October 9	Volusia Blue Spring	Florida	1 fatality, 1 injury	possible equipment failure
November 18	Jackson Blue Spring	Florida	injury and aid	used wrong gas
December 10	Jail Hause Cenote	Mexico	fatality	medical issue
December 25	Eagles Nest	Florida	2 fatalities	out of air

2013 Reported Caving-related Accidents and Incidents

Date	Cave	Location	Result	Incident Type
March 16	unspecified cave	Tennessee	aid, no injury	stuck on cliff climbing to cave
April 10	Thurston Lava Tube	Hawaii	aid, no injury	fell into lava tube
April 20	Clarksville Cave	New York	aid and injury	fell in entrance
May	unspecified lava tube	Hawaii	fatality	murder victim found in lava tube
June 7	Sotano de las Golondrinas	Mexico	fatality	fell into pit
July 16	unspecified cave	Kentucky	no injury, no aid	dog stranded in cave
August 15	unnamed sinkhole	Missouri	injury and aid	drove 4-wheeler into sinkhole
September 1	Sinking River	Colorado	no injury, no aid	dog found in pit
September 11	littoral caves	Canada	aid	illness while canoeing to caves
September 16	unnamed sinkhole	Missouri	fatality	fell into sinkhole
September 28	unspecified caves	Washington	fatality (presumed)	missing while ridgewalking

2014 Reported Caving Accidents and Incidents

Date	Cave	Location	Result	Incident Type
January 4	Marbo Cave	Guam	fatality	drowning
January 28	Jewel Cave	South Dakota	injury, no aid	other
January 31	unnamed karst feature	Tennessee	injury and aid	trapped
February 13	McBrides Cave	Alabama	aid, no injury	stranded
February 27	Natural Well	Alabama	aid, no injury	stranded
March 7	Cave of the Bells	Arizona	injury and aid	caver fall
March 16	unspecified cave	Pennsylvania	injury, no aid	caver fall
April 4	O-9 Well	Texas	injury, no aid	caver fall
April 12	unspecified cave	Virginia	injury, no aid	caver fall

May 4	Paradox Cave	Tennessee	injury, no aid	rock fall
May 24	Cemetery Pit	Georgia	no injury, no aid	equipment problem
June 2	Speedwell Cave	Virginia	aid, no injury	stuck
June 7	County Line Cave	New Mexico	no injury, no aid	flooding
June 20	Waikapala`e Cave	Hawaii	fatality	drowning
June 28	Laurel Caverns	Pennsylvania	injury and aid	caver fall
June 28	Wind Cave	Pennsylvania	injury and aid	caver fall
June 28	Lechuguilla Cave	New Mexico	aid, no injury	illness/medical issue
July 24	Boy Scout Cave	Idaho	injury, no aid	other
July 28	Bryant Mountain Cave	Alabama	injury and aid	caver fall
August 2	Fulford Cave	Colorado	injury, no aid	rock fall
August 8	Lucifers Lair	Utah	injury, no aid	equipment problem
August 20	Ophir Cave	Montana	injury and aid	stranded
September 3	Pettyjohns Cave	Georgia	aid, no injury	stranded
September 11	Sausage Cave	Tennessee	injury and aid	caver fall
September 30	unspecified cave	Texas	injury, no aid	equipment problem
October 3	Butler Cave-Sinking Creek System	Virginia	no injury, no aid	caver fall
October 12	Run to the Mill Cave	Tennessee	no injury, no aid	lost
October 23	Happy Top Horror Hole	Tennessee	no injury, no aid	rock fall
November 9	Fault Cave	Colorado	aid, no injury	stuck
November 28	Raccoon Mountain Caverns	Tennessee	injury and aid	caver fall

2014 Reported Cave Diving Accidents and Incidents

Date	Cave	Location	Result	Incident Type
June 28	unspecified karst spring	New Mexico	no injury, no aid	other, difficulty exiting
November 4	Jackson Blue Spring	Florida	aid, no injury	other

2014 Reported Caving-related Accidents and Incidents

Date	Cave	Location	Result	Incident Type
February 14	New Hall Cave	Jamaica	injury and aid	attempted murder
March 4	Pertle Spring Research Cave	Missouri	no injury, no aid	infant found dead
May 17-24	multiple caves	Colorado	multiple injuries, no aid	various
June 3	Swimming Hole Pit	New Mexico	injury, no aid	attacked by Africanized bees
July 26	Retirement Cave	Jamaica	fatality	elderly man found dead
August 17	Lamberts Cave	Minnesota	injury and aid	stranded
October 12	Smugglers Cave	California	injury and aid	3 people stranded

Previously Unreported Caving Accidents and Incidents

Date	Cave	Location	Result	Incident Type
12 March 1963	Nickajack Cave	Tennessee	aid, no injury	flooding
1970	Knox Cave	New York	injury, no aid	equipment problem
1982	unspecified cave	Alabama	injury, aid	stranded
1995	Solution Rift	Tennessee	injury, no aid	acetylene-related
July 14, 1996	Newell Street Cave	New York	aid, no injury	stranded
July 2001	unspecified cave	Kentucky	injury, no aid	caver fall
November 3, 2005	C.C.C. Bottomless Trash Pit	Arizona	no injury, no aid	skunk encounter
November 8, 2009	unspecified cave	Missouri	injury, no aid	lost control on rappel
February 16, 2011	Barton Creek Cave	Belize	fatality	drowning
October 10, 2011	War Eagle Cave	Alabama	no injury, no aid	difficulty on rope
2012	Blue Spring Cave	Tennessee	injury, no aid	caver fall
April 12, 2012	Mill Creek Pit	Tennessee	injury, no aid	rock fall

Previously Unreported Cave Diving Accidents and Incidents

Date	Cave	Location	Result	Incident Type
June 14, 2008	Devils Ear	Florida	fatality	unknown
2009	Guy James Cave	Tennessee	no injury, no aid	equipment problem

Previously Unreported Caving-related Accidents and Incidents

Date	Cave	Location	Result	Incident Type
February 4, 2004	Hutchinsons Hole	Jamaica	fatality	fell into pit
December 2012	Sotano de las Guaguas	Mexico	fatality	suicide

2013 Caving Accidents and Incidents

6 January

Serendipity Pit, Tennessee other (overdue), aid, no injury

The Chattanooga Hamilton County Rescue Service (CHCRS) was notified that a group of four cavers, who had been in Serendipity Pit for more than 30 hours, missed their out time. As CHCRS prepared to enter the cave, a member of the overdue group exited the cave and informed them that everyone was all right. Four hours later, however, a second caver exited alone and expressed concern for the two cavers still in the cave. Cumberland County authorities were notified and requested the assistance of CHCRS.

Interviews of the two cavers who had exited revealed that the team had been pushing a "very grim lead deep in the cave." They estimated their travel time out of the cave from their turn-around spot to be about 10 hours, including a long, grim crawl and a pit series beyond two J-rappels.

The CHCRS team found the two cavers at about 5:00 a.m. on the far side of the J-rappels. They offered some assistance with the rebelay, but the cavers were otherwise moving slowly under their own power. With assistance from the Crossville Fire Department, one caver was hauled up the 49-foot entrance pit. The last caver exited at 9:30 a.m., after 41 hours in the cave. Paramedics determined that the cavers were dehydrated and exhausted but otherwise unhurt.

1. Brad Tipton, e-mail communication, 9 January 2013.

Comments: One of the first rules of caving is to always tell someone where you are going and when to expect your return. If cavers miss their "out time," the person acting as surface watch should call the local authorities immediately. Although the cavers in this incident probably would have made it out on their own eventually, initiating a quick response was the appropriate thing to do.

23 February

Crownover Saltpeter Cave, Tennessee caver fall, injury and aid

Seventeen students from the Georgia Institute of Technology were visiting Crownover Saltpeter Cave when Steven Touchton (21) slipped and fell about 40 feet. While the other students had traversed a narrow canyon via a lower route, Touchton had remained high, stemming across on sloping ledges. His injuries included a fractured pelvis and wrist, compression fractures to several vertebrae, and multiple fractures to his clavicle.

Several agencies responded but determined the rescue to be too technical for their personnel. Chattanooga Hamilton County Rescue Service (CHCRS) was contacted to respond. CHCRS packaged the patient in an Oregon Spine Splint (OSS) and a SKED® litter. They used a mechanical-advantage haul system to first raise him out of the canyon. They then converted the haul system to a lowering system to lower him into an adjacent room. The patient was then hauled up another 30-foot pit, where an evacuation team carried him through walking and stooping passage to the surface. He was airlifted to Erlanger Hospital in Chattanooga and treated for his injuries.

1. "Rescuers pull Georgia Tech student out of a Franklin County cave, airlift him to Erlanger in Chattanooga," www.timesfreepress.com, 23 February 2013.
2. Lindsay Burkholder, "Georgia Tech student says he was lucky after rescue from Franklin County cave," www.tfponline.com, 25 February 2013.
3. Brad Tipton, Incident Report, 25 March 2013.

Comments: This rescue, which was deemed too technical by some

responding agencies, was accomplished in a little over an hour by CHCRS. Cavers and teams experienced in cave rescues should establish good working relations with other local rescue teams and invite them to cave-rescue trainings when possible.

23 February

Bone-Norman Cave System, West Virginia lost, aid, no injury

Two novice cavers (both in their 20s) from New Jersey entered the Bone-Norman Cave System on a Friday morning intending to complete a through-trip from the Bone Entrance to the Norman Entrance. They traveled through the Devil's Pinch and the following maze section but stopped at the waterfall in Norman. The two cavers did not know how to climb up or bypass the waterfall, so they turned around to retrace their steps. Along the way, they became lost. When they had not returned home by Saturday morning, Greenbrier County 911 was alerted. The Renick Fire Department responded and called local caver John Pearson, who spread the word through the caving community.

Search teams were sent in from both entrances. The missing cavers were eventually located around 7:00 p.m. Saturday evening by Michael and Brandon Vance. The Vance brothers led the two cavers back through Bone Cave and exited the cave. The search team that entered from the Norman side was not given a time to report back. They continued searching for many hours and exited the cave at 3:00 a.m. on Sunday morning, several hours after the rescue had concluded.

1. David and Mary Sue Socky (eds.), *Grotto Trip Log, Carbide Dump*, April 2013, 48(4).

2. Ed Saugstad, e-mail communication, 22 April 2013.

Comments: Establishing a time to report back may have saved the Norman-side search team the extra effort. Incident command responsibly left someone at the entrance to make sure they exited safely.

23 March

Foxhole Cave, Tennessee caver fall, injury and aid

On 23 March, a small group toured Foxhole Cave as customers of a company that leads wild cave tours. During their tour, the group negotiated a traverse on a narrow ledge around a 40-foot-deep pit. A traverse line was provided, but the group did not have harnesses or other equipment to clip into the line. While making her way along the ledge, using the rope as a handline, a 41-year-old woman slipped and fell into the pit. Most of this 40-foot fall is a freefall. She landed among jagged breakdown directly below a constant drip of water. She fractured her pelvis, a rib, and several vertebrae, was unable to move from her position, and was quickly soaked in cold water. No vertical equipment was available to reach her, so the guide exited the cave to call for help.

Chattanooga Hamilton County Rescue Service (CHCRS) responded and sent teams to reach and stabilize the patient and to begin rigging for the patient's extraction. The first rescuers to reach the patient found her to be in severe pain and suffering from exposure. She was given fluids and an IV and was packaged in a full-body vacuum splint. Brad Tipton, Lieutenant for the Chattanooga-Hamilton County Cave/Cliff Rescue Unit, explained how the patient was removed from the pit: "Once the Ferno arrived, they packaged for a vertical haul due to the keyhole-shaped, body-sized hole we were forced to haul through. The pit was bisected by breakdown wedged between the walls. This provided us with an opportunity to get edge tenders and manpower in good positions for the haul. Unfortunately, there wasn't a single natural anchor anywhere in the cave

to use for hauling. We set two bolts in the ceiling at the edge of the pit for high help and two more 50 feet back in the ceiling for the anchor for the haul and belay. In the meantime, we needed a redirect 25 feet out in the middle of the pit due to the boulder choke halfway down the pit. The boulder choke problem was solved by wedging Jeff [Bartlett] above the keyhole with a pulley rigged to his harness. Jeff was able to sustain the force of the redirect, which saved us at least an hour of bolting and rigging. [Other rescuers] were then able to use the boulder choke to position themselves to receive the patient as she reached Jeff's redirect. This worked to perfection."

Rescuers then began to move the patient toward the entrance. More bolts were placed to lower the patient down a 15-foot drop where she was received by a fresh team of rescuers. At the entrance, a determination was made that hauling the patient out of the 100-foot-deep sinkhole would be safer than rescuers trying to carry her up the steep slope. Due to inclement weather, air evacuation was not an option, so the patient was transported to Erlanger Hospital by ambulance.

1. "Woman trapped in cave, rescued after 7 hours," www.wkrn.com, 24 March 2013.
2. "Rescue at Foxhole Cave," www.cavechat.org, 25 March 2013.
3. "Knox Co. team called to assist in 7 hour cave rescue," www.wbir.com, 25 March 2013.

Comments: Cave rescuers often comment that horizontal caves become vertical caves during a rescue. Many free-climbable slopes and pits become vertical hauls and lowers for an incapacitated patient. In some cases, such as this incident, horizontal caving takes us into the fall zone of vertical pits, but few of us take the extra step of keeping rope and vertical gear in the vehicle when going on a horizontal cave trip. In this incident, the lack of vertical gear prevented access to the injured patient for more than three hours. When planning for emergencies, consider all possible accidents, including falling down a pit in a horizontal cave. Don't think only of gear that you carry with you in the cave, but also consider essential rescue gear that could be retrieved from your vehicle.

23 March **Iron Hoop Cave, Alabama** **caver fall, injury and aid**

Eight cavers entered Iron Hoop Cave for a day of exploration and photography. Three cavers stopped to take photographs while the other five traveled further into the cave. While traversing a narrow passage above a stream, Jim Gerwer (51) reached for a handhold that broke free. Gerwer fell 5 feet into the stream, landing on his back and fracturing several lumbar vertebrae in the process.

Bil and Sherry Davis witnessed the fall and hurried down to help him. Although Gerwer was in a great deal of pain, he showed no obvious deformities, and he had normal vital signs. Gerwer wanted badly to begin moving toward the entrance, but the nature of his injuries prevented him from doing so. While Sherry Davis and Jim Corey stayed with the patient, Bil Davis and Stephanie Schleis left to inform the other cavers and summon help.

To get a cell phone signal, Bil and Schleis had to drive about six miles. Once Jackson County 911 was notified of the situation, Schleis remained at the local volunteer fire station to guide the first responders to the scene. Meanwhile, Bil returned to the cave to get updates for the first responders and to provide additional Mylar blankets and candles for heat if needed. Two hours had now passed since the accident.

After delivering supplies and getting a patient update, Bil and Sherry exited the cave, leaving Corey and Matt Blake to care for Gerwer. Upon exiting, Sherry maintained an entrance log until she was relieved by Jackson County Fire and Rescue (JCFR). JCFR was given updates on the patient's condition and location along with estimates of what would be needed

to evacuate the patient. Bil, Alicia Nelson, and a member of JCFR, carried supplies to Gerwer, flagging the route as they went. Gerwer was packaged in a SKED® litter to be carried out of the cave. Other than a belay on a few slopes and a haul system at the entrance, no other technical rigging was required. At the entrance, the rescuers realized that the SKED® would not fit through a constriction, so the patient was hauled up in his harness.

1. Bil Davis, Incident Report, 6 April 2013.
2. Brad Tipton, Facebook post, 24 March 2013.

Comments: Gerwer's companions did an excellent job of assisting the rescue teams in this operation. Maintaining an entrance log, flagging a route to the patient, and running information between the patient and the surface support helped to make this rescue run efficiently. These actions were extraordinary given the fact that the cavers and rescuers were all the while facing the threat of the cave flooding. A local rainstorm was causing the entrance crawl to fill with water, and local authorities had to divert a surface stream in order to carry out the rescue operation. This incident occurred while many local rescuers were responding to the Foxhole Cave incident on the same day.

5 April **Warrens Cave, Florida** **rockfall, no injury, no aid**

A group of cavers were working on a dig in Florida's longest dry cave on a Friday afternoon. The passage in which they were digging is described as "filled with thin, horizontal layers of fine sand, evidently laid down by stream flow long, long ago. The ceiling is composed of a layer of chert embedded within limestone." The purpose of the dig was to try to bypass a tight squeeze, thus making travel to the back of the cave quicker and easier.

During their activities, one caver was attempting to hammer a chunk of chert "weighing a few tens of pounds" out of the ceiling when it fell onto his foot. Fortunately, the soft sand floor cushioned the impact and he was not injured.

1. Buford Pruitt, "Warrens Cave Dig," <http://onrappel.blogspot.com>, 7 April 2013.

Comments: The plug of fill to be dug out was originally estimated to be 115 feet long, based on a study using a radio transmitter and receiver system. Over several years and many dig projects, this distance has been reduced to about 20 feet. Fortunately, this is the only incident that has occurred there during that time.

20 April **Poor Farm (Greenbrier) Cave, West Virginia** **medical issue, aid, no injury** *"One of us came back early by helicopter."*

Eight cavers from Blue Ridge Grotto went to Poor Farm Cave in Greenbrier County for a day trip on 20 April. On trips to this cave, the group usually tours the sportier, northern section first, then back in the entrance room continue around a southern loop which is shorter and easier. For this particular trip, though, the group decided to do the southern loop first.

All went well as the group traveled the southern loop. Near the end of the loop, Patrick Sims (56) went ahead of the group to take photos as the other cavers climbed down into the entrance room. As Sims was putting away his camera gear, he suddenly began to feel ill. Sims explains: "It's hard to describe how I felt, other than I started feeling crappy really quick. I felt a mild discomfort in the center of my chest, and at first thought it was simply acid indigestion. It was also uncomfortable to take a breath." He told the group he would wait back at the vehicles while they continued

their trip. As soon as he got up to leave, he realized something was very wrong and told the other cavers he may need to go to the hospital.

Sims was helped back to the vehicles where he required assistance taking off his coveralls. At this point, he felt his condition worsening as his hands began to tingle. His companions called 911 and made arrangements to meet an ambulance en route. They met the ambulance near U.S. Route 219 and I-64. The ambulance transported Sims to Greenbrier Valley Medical Center, where doctors determined that he needed to be flown to a cardiac-care unit in Roanoke. Sims received a stent in his right coronary artery and, after a few weeks' rest, was ready to resume his normal activities.

1. Patrick Sims, "April Grotto Trip: My Heart Just Wasn't In It," *The West Virginia Caver*, August 2013, 31(4).
2. Patrick Sims, e-mail communication, 13 August 2013.

Comments: In his report, Sims says he was incredibly lucky that the group was so close to the entrance when his trouble began and that he is grateful for his caving friends who took good care of him.

12 May

Fossil Mountain Ice Cave — Wind Cave System, Wyoming stranded, aid, no injury

When three Brigham Young University—Idaho students (ages 21, 22, and 24) did not return from a planned trip to the Fossil Mountain Ice Cave—Wind Cave System, a friend reported them missing. The Teton County Sheriff's Search and Rescue Team located the trio's vehicle at the trailhead. Rescue personnel were concerned that the men may have triggered and been caught in an avalanche, so teams were sent to search for avalanches as well as to look for signs near the cave entrance. A recent avalanche was discovered but was not searched because evidence was found that the students had made it to the cave.

Rescuers entered Wind Cave and within 45 minutes located the three behind a 4-foot-thick plug of ice. It took crews two hours to break through the ice and free the students, who were unhurt.

1. TVN staff, "Three rescued from Darby wind cave Sunday," www.tetonvalleynews.net, 13 May 2013.
2. Warren Anderson, Incident Report, 14 May 2013.
3. Emma Breysse, "BYU students de-iced in Wind Cave rescue," www.jhnewsandguide.com, 16 May 2013.

Comments: Getting stranded in this cave system is unfortunately a common incident that has been featured in ACA several times. These young men, like many others, entered the Fossil Mountain Ice Cave side intending to do a pull-down through trip to exit via Wind Cave. Once the first rope is pulled, cavers are committed to finishing the trip. Running into an ice plug is one way to become stranded. Another common reason is explorers not knowing that a rope should be rigged to climb a 20-foot pitch to exit the Wind Cave side. Before starting the through trip, a 45-minute round trip into Wind Cave allows rigging the 20-foot pitch and scouting for ice plugs.

Becoming stranded in this cave system is especially dangerous due to the cold temperature of the caves and their remote, high-altitude location. Always research a pull-down trip thoroughly before attempting. It is also a good idea to go with someone who is familiar with the route your first time.

13 May

Big Bertha Cave, Kentucky stranded, aid, no injury

Brian Ahlers (20) and his friend (22) went to Big Bertha Cave in

Bowling Green to video the inside of the cave. Big Bertha Cave is part of the Lost River Cave System and has a wide, fast-moving stream flowing from its entrance. After crossing the waist-deep stream, the 22-year-old felt he was too cold and tired to attempt the trip back across. Ahlers exited the cave and went for help.

The Bowling Green Fire Department was conducting technical rescue training exercises nearby and responded quickly. With assistance from the Warren County Rescue Department, the man was brought out of the cave one hour after he entered.

1. Rialda Zukic, "Firefighters rescue man from cave," www.bgdailynews.com, 14 May 2013.
2. "Firefighters Assist Explorer Stranded in Kentucky Cave," <http://caving-news.com>, 16 May 2013.

Comments: Reports did not mention what type of gear or clothing the men had. The men were fortunate that rescuers were nearby and were able to respond almost immediately.

23 May

unspecified cave, Virginia caver fall, injury, no aid

"At the bottom of the pile, there was a 20- to 25-foot very restricted squeeze/crawl to get out on the other side. This is where I destroyed what was left of my shoulder."

Seven hours into a cave trip in Virginia, Phil Goldman (47) attempted to climb over a ledge with 90 feet of vertical exposure below him. Goldman had already crossed this ledge three times that day, but on his fourth time, he struggled to make it over. After repeated attempts, he began to make some progress when he found small holds for his left hand and both feet. As he reached for another hold with his right hand, both feet slipped out from under him. Goldman caught a handhold with his right hand but then fell the length of his arm, dislocating his shoulder.

The pain seemed minimal, and Goldman managed to get over the ledge. A short distance later, he realized that his injury was worse than his initial assessment. The team discussed whether to go for help or try to self-rescue. They opted for the self-rescue and began planning for the upcoming obstacles: a steep, 100-foot-high mud slope to be climbed; a section of vertical breakdown to squeeze through, and a 120-foot rope climb at the entrance. To get up the mud slope, a caver wedged himself near the top and, using himself as an anchor, provided 80 feet of rope for Goldman to ascend using two handled ascenders. Goldman believes that while this was effective, it may have caused more damage to his shoulder. Squeezing through the breakdown further worsened his condition.

When the cavers reached the 120-foot rope climb, Goldman was concerned that he would not be able to perform a changeover if needed, so another caver climbed to the top, pulled up all of the extra rope that was on the bottom, and rerigged the rope to be able to lower Goldman if he had trouble while climbing. Another caver helped Goldman put on his gear and adjust it so that he could climb left-handed. Goldman climbed the rope and exited the cave without further incident.

1. Phil Goldman, Incident Report, 26 September 2013.

Comments: The team assessed patient condition, rescuer condition, obstacles, and available gear and decided to initiate a small party assisted rescue (SPAR) instead of calling for rescuers. Advantages of a SPAR over a large callout rescue in certain cases can include reduced patient time to entrance, improved patient morale, reduced amount of gear necessary, and improved cave conservation. However, caver-rescuers should monitor team fitness and not hesitate to call for additional resources before members reach the point of exhaustion. Fortunately during this incident, the challenge was within the abilities of the team, and they were able to conduct a well-executed SPAR response all the way out of the cave.

Rigging ropes in such a way that the rappeller/climber can be lowered to the ground is an excellent preventative measure if there is concern that someone may become exhausted or stuck on rope. This technique is known as contingency rigging, releasable rigging, or rigging for rescue, and is much safer for rescuers than other techniques, such as pickoffs, when a patient is stuck on rope. The technique is often used by canyoneers and cavers for rappels in flowing water, as it enables a quick rescue of anyone stuck in the waterfall.

26 May

Ellisons Cave, Georgia

caver fall, injury and aid

Troy Fuqua, John Burns, Ed Kehs, Jr., and Dwight Kempf (54), all experienced cavers, entered Ellisons Cave via the Stairstep Entrance/Incredible Pit (440 feet) at 10:00 a.m. on Sunday, 26 May. Their plan was to do a crossover trip with another group who entered from the Fantastic Pit (586 feet) side. The two groups would pass each other in the lower levels of the cave, and exit by climbing the other pit.

After passing the other group in the cave, they came to a handline. The handline, 8 to 9 feet long, is knotted and has loops to assist in climbing. Kempf, on his third Ellison's trip, was the last to use the handline. He lost control and fell, bouncing off a small ledge, sliding down an angular ledge, and disappearing down a hole, where he then fell about 40 feet. His friends shouted but received no response. The time was about 3:30 p.m. No apparent route could be seen to descend to Kempf. Fuqua, the trip leader, left the two other cavers at the site and exited the cave via the Fantastic Pit side to call for assistance.

While Fuqua went for help, Burns and Kehs searched for a route to descend to Kempf. After about 20 minutes, they found a route to Kempf. He was now conscious, but apparently he had been unconscious for about 15 minutes. He had a significant head laceration with a possible basal skull fracture, his face was swollen, his ribs were tender to the touch, and his left leg was angulated. Upon further examination, they saw that the left femur was fractured and had created an open wound. Kempf was bleeding heavily. Burns and Kehs used improvised materials to staunch the bleeding and a brake-bar rack to stabilize his femur. They padded the rack and held it in place using 1-inch tubular webbing. To help prevent further heat loss, they placed a plastic garbage bag around Kempf. They made him as comfortable as possible and provided reassurance. This initial care, provided by Kempf's teammates, likely saved his life.

Fuqua exited the cave at the Dug Entrance and called 911. The first units arrived at the staging area at the base of the mountain at 6:32 p.m. The cave entrance is located a mile up the mountain and is accessed by either a steep foot trail or a slightly longer, rugged road. From the staging area, travel times were 20 minutes up the road by ATV. Walking the shorter trail takes about 40 minutes.

Not knowing the condition of the fallen caver or the route to reach him, the Incident Commander waited for the arrival of cavers who were familiar with the area. Once entrance control was established, the first rescuers entered the cave at 9:15 p.m. All rope drops were rerigged with rescue ropes, and teams moved toward the accident site. Communication consisted of wired field phones from the entrance to the top of Fantastic Pit. Walkie-talkies were used to communicate in the pit. A second phone line was run from the bottom of the pit toward the patient.

When the rescue team reached the patient, and as soon as communications were established at the site, rescuers requested additional equipment, including a Kendrick traction splint, a SKED® flexible litter, a spine splint, litter-packaging material, and medical supplies, including IV fluids and medications. They administered IV fluids, pain medication, antibiotics, and later a unit of blood. They placed the patient in the litter atop an Oregon Spine Splint spine board and protected him with a vapor barrier and large heat packs. A blood pressure cuff and stethoscope were used to continuously monitor vitals. Once all the needed gear had reached the patient and paramedics had completed their initial packaging, crews

began moving the patient toward the entrance at 4:40 a.m.

While awaiting the patient's arrival at Fantastic Pit, rigging crews prepared for a litter raise, rigging a 1:1 mechanical advantage counterbalance haul system. A rope ran from the litter up to a pulley attached to a ceiling by strong bolts. Once over the pulley, the rope ran across the pit to a section known as The Balcony. There, a second rope was attached to bolts on the wall and dropped into the pit. Two rescuers would provide the counterbalance weight. To do this, a rescuer attached a brake-bar rack to the second rope. Attached below by a short tether was a second rescuer to add extra weight. The main line haul rope was attached to the upper rescuer. To haul the litter, the upper rescuer began a controlled rappel with his rack; as the two rescuers descended, the litter ascended.

Because the launch point for the rappeller counterbalance team was lower than the top of the pit, the rappellers would arrive at the bottom before the litter reached the top of the pit. It was too time-consuming and dangerous to tie off the main line, have the counterbalance team ascend back up some 70 feet and restart their descent. The litter also needed to be moved horizontally above the pit to the "Attic," where rescuers could detach the litter and move it toward the entrance. To solve this challenge, the rescuers rigged a 3:1 mechanical advantage haul system with a rope grab to be attached when the counterbalance team reached the bottom. They also rigged (on the far side of the Attic) a brake-bar rack anchored to a large boulder. They threaded a tagline through the rack. When it was needed, rescuers slacked off on the tagline as rescuers on the opposite side hauled the litter across the top of the pit.

The patient was successfully raised up Fantastic Pit, and at 11:45 a.m. he reached Warm-Up Pit for a second haul of 125 feet, which was already rigged. The patient exited the cave at 12:30 p.m. and was placed in a four-wheel-drive vehicle and transported down the mountain to a waiting Life Force helicopter. The helicopter took off with the patient at 1:30 p.m.

The operation was not finished at this point. There were many rescuers still in the lower levels of the cave. All of these rescuers had to ascend the ropes and assist with moving a massive amount of muddy, wet equipment toward the entrance. All of the cavers were out of the cave at 6:35 p.m. The total number of personnel involved in the incident was 106; 71 rescuers entered the cave. Command was terminated at 7:41 p.m., Monday, 27 May.

1. Troy Fuqua, "Rescue in Ellison's Cave," 30 May 2013.
2. Tom Vines, "Complex Rescue in Deep Cave Takes More Than 24 Hours," www.firefighternation.com, 8 August 2013.
3. Allan Padgett and John Hickman, e-mail communication, 20 March 2014.

Comments: The fall occurred at the 8- to 9-foot handline, which was knotted and had loops for climbing. The handline was a fixture in the cave and was not brought by the cavers. Most experienced cavers have probably used this type of handline and would have used this handline if encountered in Ellisons Cave. Although the handline was rigged on a very short drop, the short drop is at the top of another drop with a 40-foot fall. Knots and loops make it impossible to use ascending and descending gear on the handline.

The rescuers in this incident were competent, prepared, well-equipped, well-coordinated, practiced, and efficient. They extracted a severely injured patient from a remote and difficult location in what can only be described as an amazingly short period of time; the caver fell at 3:30 p.m. on 26 May and was on the helicopter at 1:30 p.m. on 27 May, 22 hours later. This rescue from Ellisons Cave is a shining example of how to conduct a successful rescue of a seriously injured patient from an extreme vertical cave environment. A successful outcome was achieved not through luck or chance, but as the culmination of years of dedication in the region to cave-rescue training, planning, practice, and coordination for just such an event.

28 May

Jewel Cave, South Dakota

caver fall, injury and aid

A Utah family, including a three-year-old girl, took the Scenic Tour, which is a guided cave tour offered by Jewel Cave National Monument. Upon arriving at an elevated platform at the top of a set of stairs, the girl's mother, who had been carrying the little girl, put the girl down. The child promptly ran over to a railing and fell through, landing on an outcrop of the cave wall. She then slid down the angled wall below the platform, colliding with rocks on the way down and falling a total of about 17 feet. She was taken to the surface by her father and National Park Service staff, provided initial basic life support stabilization by Park EMTs, and transported by ambulance to the Custer Regional Hospital. She was then flown by Life Flight helicopter to Rapid City Regional Hospital, the nearest Level 2 trauma center.

The girl suffered a basal skull fracture; a broken nose, cheekbones, and jaw; and numerous abrasions and lacerations. On 1 June, she was released from the hospital and was expected to make a full recovery. The family stopped by the Monument visitor center shortly thereafter to visit staff involved in the rescue.

1. David Yim, <http://home.nps.gov/morningreport>, 3 June 2013.

3 June

Hughes Cave, Alabama

stranded, aid, no injury

"I just kept venturing deeper and deeper and my flashlight ran out of electricity and I was just stranded in the dark..."

Joseph Hockett became separated from his group while exploring Hughes Cave on a Monday evening. When his only flashlight died, he became stranded in the dark. According to the Morgan County Rescue Squad, "the search and rescue operation was routine and the man was recovered safely."

1. Drew Galloway, "Man Rescued from Cave in Morgan County," <http://whnt.com>, 3 June 2013.

Comments: A classic example of why cavers should always carry multiple sources of light and spare batteries.

8 June

Valdina Farm Sinkhole, Texas

lost control on rappel, injury, no aid

On 8 June, a party of 16 people entered Valdina Farm Sinkhole. Twelve were experienced cavers, and four were novices. The novices were print journalists and videographers from news organizations in San Antonio, and the trip's purpose was to assist the media with a story on the Edwards Aquifer.

The cave's entrance pit descends 75 feet to a large ledge, from which a second 75-foot drop leads to the floor of the cave. One caver was assisting the group by carrying gear down the first drop. He weighed approximately 250 pounds and was carrying an additional 30 pounds of gear, which was attached to his rappel device with a sling. He was using a micro-rack and wearing fingerless gloves. When he started to descend, he did not have the rope over the rack's hyperbar, and when he entered the free-fall portion of the drop and fully weighted the rack, he was unable to adequately control the rappel. A bottom belay was ready, but the caver did not call out for it during the rappel, and he did not engage the hyperbar. Although the caver was able to maintain a reasonable speed on descent, he suffered second-degree burns to his fingers, and he lost significant skin between his thumb and index finger. The caver rappelled the second drop, and continued with the trip without sharing the extent

of his injuries with the rest of the team. He exited the cave under his own power, but the injuries took more than six weeks to heal.

1. Geary Schindel, e-mail communication, 10 July 2013.

Comments: It is good practice to begin every rappel with the maximum amount of friction engaged on the descending device. In the case of a micro-rack, which has two friction settings, this maximum friction is achieved with the hyperbar engaged. If engaging the hyperbar causes so much friction that you cannot move toward or over the lip, then disengage some of the friction but be ready to re-engage it at the lip or breakover point. When crossing a lip, going from a slope to vertical, cavers must anticipate the additional load that will suddenly be transferred to the descender. This transfer is very sudden and cavers using a lower friction setting to cross a lip must be ready to reapply more friction to maintain control. Cavers should practice adding higher friction to their devices while rappelling so as to be practiced and ready to apply it quickly in an emergency. Also, in a last-resort, out-of-control situation, fingerless gloves provide less protection and friction than full-fingered gloves.

Bottom belayers should remain attentive and be ready to apply the belay, even if there is no vocal call for the belay. Even when the rappeller is not visible, it is often possible to detect an out-of-control rappel audibly.

Finally, injury or illness should be reported to the rest of the group so that appropriate decisions can be made about whether or not to continue with the trip.

22 June

unspecified cave, Arkansas

equipment problem, aid, no injury

"The rescuer followed next, bringing along the fused wad of metal, nylon, and mud that had once been the caver's ascending system."

A local caver and his companion visited a privately owned cave near Cozehome to document the cave and its formations through photography. When they encountered a 30-foot drop down a steep, flowstone slope, the caver descended to take photos from below. The assistant, who had no gear or vertical caving experience, remained at the top to set off strobe flashes. At the bottom of the drop, the floor is mud, 6- to 8-inches deep.

After a photography excursion, the caver attempted to ascend the rope, but found that the amount of mud caked on his ascenders made it impossible to climb back up, and each attempt further muddied the rope. For more than four hours, the caver tried many different ways of getting back up to the main passage, including scraping the mud off of the rope and his gear, trying to free-climb out using an old nylon and wood ladder that was at the bottom of the slope, and even having his assistant throw down the tail end of the rope to climb out on. When none of this worked, the caver sent his assistant to call for help.

The Marshall Police Department, Searcy County Sheriff's Office, nearby National Park Service (NPS) personnel, and local cavers responded to the callout and assessed the situation. After making contact with the stranded caver, a rescuer rappelled the slope and supplied him with fresh clothes, clean vertical gear, water, and food. Once freshly geared, the caver ascended the majority of the way up the drop. Park rangers hauled him the final 10 feet when he became too exhausted to continue. The caver exited the cave under his own power after 17 hours underground.

1. Jason Flood, "Rangers Conduct Technical Rescue Of Trapped Caver," <http://home.nps.gov/morningreport>, 24 June 2013.
2. "Caver Trapped in Pit After Mud Clogs Vertical Gear," <http://cavingnews.com>, 27 June 2013.
3. Chad Holderfield, Incident Report, 8 January 2014.

Comments: Ascending a muddy rope with muddied gear should be a basic skill of vertical cavers. This incident was exacerbated by the caver's outdated climbing system with worn teeth on his ascenders.

20 July

Up and Down Cave, Missouri difficulty on cable ladder, aid, no injury

A group of 10 Boy Scouts, two Scout leaders, and two camp employees visited Up and Down Cave on the H. Roe Bartle Scout Reservation. Trips to Up and Down Cave are a planned activity at the Scout camp and are popular with the Scouts; the cave is frequently visited during the summer season by groups of 10 to 20 Scouts and leaders.

The cave entrance is vertical, and the group entered using a 30-foot cable ladder, with one camp staffer staying at the entrance to provide a belay. The group toured the small two-room cave and then began to exit the cave using the cable ladder with a belay. Most Scouts climbed the ladder without difficulty, but one Scout (14) had difficulty climbing, despite ascending halfway up the ladder several times. He stated, "My arms are going numb and I can't feel my fingers" each time before aborting his ascent.

The remaining Scouts climbed out on belay until only the one Scout, a Scout leader, and a camp staffer remained. The camp staffer attempted to communicate with the outpost director by radio but could not do so. One camp staffer returned to the main site on foot to summon assistance. One of the Scout leaders at the cave, Jay Kennedy, is an experienced caver with cave-rescue training. Kennedy and the remaining camp staffer inventoried their equipment, including gear in an emergency duffel that accompanies all groups to the cave. The available equipment included a 150-foot-long static rope, two double pulleys, several carabiners, a sling loop, and a Petzl Traxion. By this time the other staffer had returned with a third staffer. The Scout leaders and camp staff decided the most expeditious method to extract the Scout was to establish a haul system and belay. One staffer descended into the cave, and the haul system and belay ropes were attached to a seat harness. Kennedy and the third staffer were able to extract the Scout without complication.

1. Jay Kennedy, Incident Report, 31 July 2013.

2. Jay Kennedy, e-mail communication, 12 August 2013.

Comments: The Scout group was properly equipped for a trip that was a routine part of the experience of attending the Scout Reservation. Bringing equipment for a haul system demonstrates the Boy Scout motto, "Be Prepared"—in this case for a Scout unable to ascend the cable ladder. The group was fortunate to include a caver with cave-rescue training. Kennedy led a quick and safe extraction instead of waiting for hours for outside assistance.

31 July

La Crosse Cave, Texas caver fall, injury and aid

Gill Ediger (65) and others were working on a dig in a cave in south Austin on 31 July. Shortly after a lunch break, the cavers were gathered around several leads at the bottom of the pit they had dug open. After some discussion, Ediger stood to leave and momentarily blacked out, falling backward into one of the leads, a 10-foot-deep pit. He landed on his back among several boulders and lost consciousness for about 15 seconds. When he came to, his friends reported that he was speaking incoherently, and some left immediately to call 911. Ediger managed to climb out of the pit on his own and began making his way toward the entrance. The 50 feet he had to travel was mostly walking passage up a slope, which he managed with only a little assistance. Ediger has no memory of his trip from out of the pit to the entrance.

A local fire department arrived on scene just as Ediger reached the entrance. He was transported by ambulance and kept overnight for observation and treatment for nine broken ribs, some minor vertebral damage, and lacerations to his face and scalp.

1. Gill Ediger, e-mail communication, 13 August 2013 and 16 October 2013.

Comments: Ediger is extremely lucky that he did not sustain more serious injuries. Spinal injuries should be considered in all persons who have sustained a fall, especially a backward fall of 10 feet followed by a loss of consciousness. Being so close to the entrance was probably strong motivation to self-rescue. This proximity would also enable a professional assessment to be performed in the cave rather quickly.

6 August

Weybridge Cave, Vermont caver fall, injury and aid

"So there I was, blissfully reading the latest issue of ACA that had just appeared in my mailbox that day and counting my blessings that my name wasn't in it, when the shrill ringing of the telephone suddenly blasted me out of my solitude..."

Vermont's Weybridge Cave is a popular cave for both cavers and adventure-seeking locals. The entrance passage is sporty with a 20-foot drop (Nuisance Drop) followed by another drop that is 45-feet deep (Main Drop). Although both drops can be free-climbed, local grottos discourage this practice, and most cavers rig the second drop.

On 6 August, two men entered Weybridge Cave and down-climbed both drops. Neither man was wearing a helmet. When it came time to exit, one of the men (26) began to climb out of the first pit. Unlike his companion, this was his first time in the cave. He made it about halfway up when he slipped and fell 20 feet to the bottom. He initially landed on his feet but then fell backward, striking the back of his head. When he was unable to continue due to leg and back pain, his friend left to call 911.

In his report, Steve Hazelton explains what happened next: "The local Fire Department, a nearby Fire Department Technical Rescue Team, and the local ambulance responded. The Vermont Cave Rescue Network, a telephone tree for cavers, was then activated which included retrieval of the cache of cave-rescue equipment.

"The local fire department established a Command Post near the entrance. After viewing the narrow entrance passage and the 20-foot Nuisance Drop about 20 feet inside the entrance, the agency responders decided that they were not comfortable working in the vertical cave environment and waited for the cavers to arrive and perform the rescue. Meanwhile, [the patient's companion] was allowed to enter the cave and free-climb the drops at least two more times to take extra clothing and provide emotional support to [the patient].

"The first caver who arrived rigged both vertical drops since no ropes had been used by the original party. He found the patient to be relatively stable but with significant lower back pain and an obvious lower leg injury. Despite having lain on the mud floor for over two hours, the patient was found to be relatively normothermic [normal body temperature].

"The need for immobilization meant that passage modification would be needed in several places, in particular the top of Main Drop. The slot at the top was 12 inches wide and quickly did a zigzag of about 5 feet down a steep slope. Neither of these was a major obstacle for an average-sized uninjured caver, but was a major obstacle for a patient packaged in a SKED®. The packaged patient was measured and it was determined that the slot would need to be widened to at least 16 inches in a way that also straightened out most of the zigzag. A request was made to the local agencies to assist with in-cave passage modification and vertical rigging as there were still very few cavers on scene, but once again the Incident Commander asserted that they were not properly certified for such activities in the cave environment and chose to wait for more cavers."

As more cavers arrived, patient packaging, passage modification, and rigging continued. The Fire Department provided the cavers with an air chisel and air tanks. The tanks only lasted a few minutes each, requiring more than 30 tanks to enlarge one section of passage. Another section was enlarged with the use of a sledgehammer.

The patient was brought up the first pitch using a 4:1 haul system. A 3:1 haul system was built to move the patient up the second drop and out through the entrance. The rough and narrow entrance passage made it difficult to move the SKED®, so additional rigging was incorporated. The patient reached the surface 12 hours after first becoming injured. He was diagnosed with a broken lumbar vertebra and a broken ankle with peripheral nerve damage.

1. April Burbank, "Crews describe Vermont cave rescue: Addison County man spent at least 12 hours in Weybridge cave after he fell; crews suspect climber was not using ropes," www.burlingtonfreepress.com, 7 August 2013.
2. "Vermont bat researcher helps injured man out of cave," <http://vtdig-ger.org>, 13 August 2013.
3. Steve Hazelton, "Cave Rescue at Weybridge Cave, Weybridge, Vermont," undated.

Comments: Local cavers had practiced a mock rescue of this very scenario a few years earlier using a log as a patient. During that training, cavers identified rigging points, passages that would require modification, and additional hardware that would be needed.

Coordination between cavers and local rescue agencies is crucial to effective cave rescues. Hazelton concludes his report with these comments: "A very successful OCR (Orientation to Cave Rescue, a training conducted by NCRC) was held for the agencies later that fall, with the mock being a simplified re-creation of the incident. Agency personnel participated in all aspects of the in-cave activities, including descending and ascending Main Drop. The actual rescue's Incident Commander went into the cave as far as the top of Main Drop to see what the cavers faced for challenges, and plans were developed for in-cave agency roles should another rescue occur. The local fire department donated money for additional passage-modification and anchoring equipment for the cache, and improved techniques for passage modification have been evaluated."

12 August

Torys Cave, Connecticut stranded, aid, no injury

"This was not the way we planned to spend the day."

Shortly after entering Torys Cave, a woman became stranded at the bottom of an 8-foot-deep slot near the entrance. Her partner tried for several hours to help but eventually left to call 911. Gaylordsville firefighters responded, and four firefighters entered the cave. After assessing her situation, one of the firefighters was able to get behind her and, using items that were passed to him, built up the floor of the crevice until the woman could climb out. She was then able to exit the cave under her own power.

1. John Pirro, "Woman rescued from New Milford Cave," www.newstimes.com, 12 August 2013.
2. Doug Truitt, e-mail communications, 13 August 2013 and 2 March 2015.

31 August

Raspberry Cave, Arizona trapped, no injury, no aid

Bob Goforth, Mark Pansing (60), Adam Zipkin, and Mike Van Note entered Raspberry Cave late in the morning of 31 August with the intent of digging on some promising leads. They squeezed through the cave's entrance, a tight crack in basalt that led to a room just big enough to sit up in. From here they descended through another squeeze into a much larger room with massive boulders wedged in the ceiling. At the base of this room was a narrow 10-foot climbdown into a small room with a lead at the bottom. A 12-foot-long crawl connected this room to another small room with a second lead. This second lead was determined to be

the more promising of the two.

The foursome began to dig wet mud and rocks out of the lead. The removed material was passed through the 12-foot crawl and deposited in the room on the other side. Eventually the diggers decided to call it a day as they became tired and concerned about the stability of the headwall overlying the lead.

Goforth exited the cave first as the others collected their tools. Pansing was next to start working his way out. In the short climb up to the large room, he was passing tools ahead of him when his shoulder bumped a large boulder. The chunk of limestone and the mud behind it began to slide down into the chimney. Pansing attempted to hold it in place while he wedged other rocks under it. As he started to back down to warn the others, the boulder slipped and wedged Pansing's head between it and the wall. Van Note was still in the crawlway when he heard a shout. He made his way to below Pansing to find that Pansing "was simultaneously trying to pull free, keep his footing, and not bring what looked like a very unstable situation down onto himself and everyone else." Pansing was trying to get free by undoing his chinstrap, but he could not get it to release. He asked for a knife to cut the strap. As Van Note was passing him the knife, Pansing suddenly broke free, along with a large amount of debris that fell into the room below. The boulder had not fallen through; it simply wedged itself in the chimney, trapping the cavers below.

After 20 minutes, Goforth re-entered the cave to see why the others had not come out. They told him they were trapped by the boulder and carefully slipped a crowbar up to him. Goforth enlarged the chimney and was able to apply leverage to move the boulder out of the way and into a more stable position. The other three cavers were then able to carefully ascend the chimney and exit the cave without further incident.

1. Mike Van Note, Incident Report, 12 September 2013.
2. Mike Van Note, "Trapped!...An Incident at Raspberry Cave," *Cave Crawlers Gazette*, October 2013, pp. 12–14.
3. Adam Zipkin, personal communication, 16 November 2013.

Comments: "Everyone involved was an experienced caver, which made the entire episode much less stressful than it might have been with less experienced individuals. The trapped trio knew that Goforth would come looking eventually and that the wise thing was to sit and wait rather than try to dig or ascend a tight spot through shifting rock," said Van Note in his report. He concludes with this insight: "Still, being trapped, even for a short period, is an unpleasant experience best avoided."

5 September

Alcove Pit, New Mexico fatality, difficulty on rope

Two men hunting in the vicinity of Weed encountered 35-foot-deep Alcove Pit. Locally known as a sinkhole, the lower part of the feature is vertical and overhung and is described by cavers as a pit. The men decided to explore the pit using a lightweight nylon or cotton (reports vary) utility rope tied to a tree or their ATV. The men did not possess caving equipment and were not wearing helmets. One of the men, Brett Smith (40), descended the rope partway into the pit but either became stuck or decided to ascend before he reached the bottom. His companion attempted to use the ATV to pull Smith up, but the rope broke, and Smith fell 20 to 30 feet to the bottom of the pit.

Rescuers arrived from the James Canyon Volunteer Fire Department, the Sunspot Volunteer Fire Department, Lincoln National Forest, Cloudcroft Emergency Medical Service, the New Mexico State Police, and the New Mexico Office of the Medical Investigator. Smith was pronounced dead at 10:00 p.m., and his body was recovered from the pit by the James Canyon Rope Rescue Team.

1. Duane Barbat, "Lovington man falls in sinkhole, dies in Lincoln National Forest," *Carlsbad Current Argus*, 5 September 2013.

2. Jason Walz, phone communication, 23 January 2014.
3. Chris Berst, phone communication, 5 February 2014.
4. James Canyon Volunteer Fire Department, phone communication, 11 February 2014.

Comments: The two men had neither the proper equipment nor any experience in vertical caving.

21 September

Scroll Cave, Arizona

exhaustion, no injury, aid

Since 2010, the Western Mappers group has been mapping caves in southern Arizona one weekend every month. In September 2013, three three-person survey teams were in Scroll Cave in southern Arizona.

A team of Bob Zimmerman, Sarah Truebe, and Ted Janecki had moved slowly throughout the day and decided to head out at 3:30 p.m., a little earlier than planned. An early exit would allow them more time to negotiate the entrance climb. The entrance is a 60-foot-deep vertical slot that can be free-climbed but is exposed, so many cavers prefer to rig it.

One of the other teams passed them on the way out, and shortly after it became clear that Janecki was struggling. Before reaching the entrance, he ran out of water and what little food he had brought with him. He also did not bring kneepads, which made the hands-and-knees crawls much more difficult.

When they got to the entrance climb around 6:00 p.m., Janecki was tired but willing to climb. Zimmerman offered to climb first so that there would be someone at the top if Janecki needed help; Truebe would then climb last. Janecki forgot his Croll ascender, so he attempted to climb with a makeshift frog system. Ten feet up the climb, he was exhausted and began slurring his words. Truebe suggested that he down climb back to the floor. At this time, the last team arrived and provided Janecki with the last of their water and food.

At the surface, Truebe piggybacked a 2:1 haul system onto the main line using the only other rope the group had, 50 feet of 9mm. By this time, the last three cavers had exited the pit using the free-climbable route, so the haul team had enough people. Janecki climbed about 20 feet but again began to tire, so the readied team hauled him the rest of the way out. Everyone was out of the cave by 8:50 p.m.

1. Sarah Truebe, Bob Zimmerman, Incident Report, undated.

Comments: Janecki continued to have problems with his vision and muscle cramping even after he finally ate and drank, but his symptoms eventually subsided. Several days are often required to recover from severe dehydration. Dehydration can often take one by surprise, and severe dehydration can be a life-threatening emergency. Just as running low on lights might end a cave trip prematurely, so should running low on water.

Kneepads should be considered essential safety gear for nearly every caving trip, especially a cave like Scroll that features hundreds of feet of mandatory crawling, climbing, and stemming.

23 November

Binkley Cave System, Indiana

fatality, medical issue

Two cave divers and seven support cavers entered the Binkley Cave System via the Blowing Hole Entrance with the intent of exploring a water-filled passage deep in the cave. After traveling approximately two miles through stream passages, tight squeezes, and over large breakdown piles, support caver Tim McLain (49) suddenly collapsed. After checking his airway, breathing, and circulation, his companions began CPR. After 15 minutes, Adam Haydock and Nick Benton left to start a call out for

rescue. Leaving most of their gear behind and traveling light, they were able to exit the cave in about one hour. Besides calling the local authorities, Haydock also phoned several rescue-trained cavers. The cavers still in the cave continued CPR for an hour but were unable to revive McLain.

More than 50 volunteer cavers responded from Indiana, Kentucky, and Georgia to bring McLain's body out of the cave. Through their coordinated efforts and a strong commitment to their fallen friend, the recovery operation was completed less than 12 hours from the time of the incident.

1. Adam Haydock, "Blowing Hole Cave Underwater Survey Trip-Rest In Peace Tim McLain," adamhaydock.blogspot.com, 27 November 2013.
2. "Caver who died in Harrison is remembered as skilled expert," www.courier-journal.com, 29 November 2013.
3. Dave Everton, Incident Report, 4 December 2013.
4. Dave Everton, e-mail communication, 11 February 2015.

Comments: Friends report that Blowing Hole Cave was one of McLain's favorite caves. He participated in the trip that connected Binkley Cave to Blowing Hole, making the Binkley Cave System the 11th longest cave in the U.S. After his death, the Binkley cavers decided to name something yet to be discovered after McLain. In June 2014, a discovery was made of a large river passage. During the next trip to survey it the following month, a large room was also discovered. It was decided that the room and passage were worthy of his name; the room has been named McLain Mountain, and the passage is named McLain River.

23 November

Neffs Cave, Utah

caver fall, injury, no aid

Brent Schvaneveldt (51) and others were making their way up from the bottom (~1,163 feet) of Neffs Cave when Schvaneveldt fell 8 to 10 feet while climbing up a narrow ledge. He landed hard on his right foot. Despite some pain and discomfort, Schvaneveldt made it out of the cave and down the mountain under his own power. A photo taken the following day showed extensive swelling and bruising of his foot, ankle, and toes.

1. Brent Schvaneveldt, Incident Report, 5 December 2013.

Comments: Incidents involving sprains, strains, and minor contusions are not often reported to ACA. However, these injuries are probably the most common. If more reports of these types of injuries filled these pages, would it change what you carry in your first aid kit? Please report all incidents and carry appropriate first aid supplies.

15 December

Pettyjohns Cave, Georgia

caver fall, injury, no aid

A 20-year-old male was crossing a narrow ledge when he slipped and began to fall. The man grabbed a fixed rope that served as a traverse line, but when the rope received his full weight, it broke. He fell about 20 feet, landing near another large drop. A member of his group lowered him a harness, and the group was able to extract him using another rope. He was able to make it out of the cave under his own power despite a cracked sternum and several abrasions.

1. James Long, Incident Report, 18 December 2013.

Comments: Relying on ropes you find already rigged in a cave should always be considered with a great deal of caution. The report did not mention why a harness was not used where a fall hazard was present, even though one was available. Perhaps the group did not trust the traverse line enough to clip into it?

2013 Cave Diving Accidents and Incidents

11 February

Sistema Sac Actun (Cenote Calimba), Quintana Roo, Mexico

fatality, out of air

Bernard Reeves (48) of Montreal, Quebec, Canada, died 11 February near the Cenote Calimba exit of the Sac Actun Cave System near Tulum. The cause of death was drowning due to running out of air before reaching the surface.

The Sac Actun Cave System is highly complex, with guidelines leading to a number of passages. There are three exits in close proximity: Cenote Calimba, Cenote Box Chen, and Cenote Ho Tul. Another line, the Paso de Lagarto line, can be followed all the way to the more distant Grand Cenote exit. Some of the guidelines begin as "T" intersections, with the two directions connected, and some are "jumps." In a jump, the line leading through the side passage is not connected, and the divers are supposed to make a connection using a jump reel to maintain a temporary continuous guideline to the surface. In a complex system such as this, markings can be very confusing. Line arrows are supposed to point to an exit, but multiple exit points create confusion as to which exit an arrow may be pointing. Cave divers use personal markers at potential points of confusion to ensure that they follow the correct path when exiting.

Reeves was an experienced and trained cave diver. He was part of a group of seven, but he elected to do his dive as a solo diver while the rest of his group operated as two teams of three. They entered through Cenote Calimba. Before the dive, he was observed listening to another team talking about diving in the direction of Cenote Box Chen, and he told the rest of his group that he was going to follow that plan as well. He had never been in that section of the cave before. He entered the cave shortly ahead of the rest of the group.

During their dive, one of the groups observed the equipment that Reeves used to mark his path, and after the recovery it was noted that he had picked up that equipment during his attempted exit. His computer was also analyzed. Consequently, even though he was diving alone, it is possible to determine his complete path accurately. At the "T" intersection for the Paso de Lagarto line, he placed a personal marker (wooden clothes pin) on the Cenote Calimba side of the intersection to mark his exit direction, and continued on the Paso de Lagarto line. At the jump intersection leading to Cenote Box Chen, he used a jump reel to connect to that line, but he did not put a personal marker on the Cenote Calimba side to mark his exit direction. At that point, there is a permanent line arrow pointing toward the distant Grand Cenote exit.

Reeves continued toward Cenote Box Chen until his turning point at 40 minutes, at which point he headed back the way he had come. He pulled out his jump reel and reached the Paso de Largarto line, but he mistakenly followed the line in the wrong direction, heading toward Grand Cenote. He continued in that direction for 800 feet, realized his mistake, and turned around. His unexpected detour used too much of his air to allow him to reach his exit, and he was found in 19 feet of water only 200 feet from the Cenote Calimba exit, his air completely consumed.

1. Bil Phillips, Incident Report, 5 May 2013.

2. "Perece buzo canadiense por ahogamiento," <http://www.poresto.net>, undated.

Comments: An analysis by Phillips, who led the recovery, suggested the following as factors contributing to the accident: an overly complex dive plan, unfamiliarity with this section of cave, and unclear or insufficient directional referencing at the Paso de Lagarto/Box Chen jump.

8 August

Devils Eye Spring, Florida

fatality, used wrong gas

Carlos Fonseca brought a standard 80 cubic-foot tank to Florida from Canada, marked as oxygen, and labeled MOD 20. This means the Maximum Operating Depth of the tank was 20 feet, as oxygen is toxic below that depth.

He was preparing the tank to take into the cave and use it as an extra "stage" bottle to extend his penetration distance when one of his dive buddies pointed out the markings of MOD and oxygen. Fonseca told him not to worry about it because he knew it was air and that he had filled it himself in Canada. No one saw Fonseca analyze the tank that morning. He used this tank to travel about 400 feet into the cave, to a depth of about 90 feet. At that point, he began having seizures.

The buddy team attempted a rescue, and several people heard the surface team shouting for help. They responded and assisted getting Fonseca ashore. Unfortunately, the high oxygen level caused too much damage and he later died at the hospital.

1. Jim Wyatt, www.decostop.com, undated.

2. Forrest Wilson, e-mail communication, 5 December 2013.

Comments: After the incident, the tank was analyzed by two cave divers and at least two members of the Gilchrist County Sheriff's Department. The analyzers read 98% oxygen. His back gas doubles were analyzed as 30% oxygen (which was safe at that depth).

9 October

Volusia Blue Spring, Florida

one fatality (drowning), one injury

Samuel Slack (36) and Daniel Vansickle were diving in Volusia Blue Spring when Slack made a "throat slash" motion, indicating that he was having difficulty breathing. Vansickle removed his own regulator and passed it to Slack so that the two men could take turns using it, a technique called buddy breathing. Vansickle reported that when Slack would not return the regulator, he had to yank it away, then swim to the surface for help. Once 911 was called, Vansickle returned to Slack, but found him floating motionless in 100 feet of water. By inflating Slack's vest, Vansickle was able to bring him to the surface. Paramedics on scene were unable to revive him. Vansickle was treated for decompression sickness in a hyperbaric chamber and later released.

1. Patricio G. Balona and Mark I. Johnson, "Edgewater diver in fatal Blue Spring dive may have had equipment failure," www.news-journalonline.com, 11 October 2013.

18 November

Jackson Blue Spring, Florida

used wrong gas, injury and aid

A diver (38) was injured but successfully rescued by his buddy in the Jackson Blue Spring cave in Merritt's Mill Pond in Marianna on 18 November. The diver and his buddy were using rebreathers while diving to a depth of approximately 96 feet in the cave. A rebreather recirculates the air the diver breathes, scrubbing out carbon dioxide and adding new oxygen as needed. Another cylinder carrying what is called "diluent" allows the rebreather mechanism to dilute the amount of oxygen in the air as needed, and the diver can manually flush the system with it when appropriate. A bailout bottle is another cylinder taken to use in case of emergency, giving the diver a chance to use an open-circuit system in

case the rebreather does not function properly.

The two divers' plan was to do a short dive for photography purposes and then return to the surface for a more serious second dive. Because they were planning only a short dive, they did not take their normal diluent tanks with them. They left those on the surface and used their bailout bottles for both diluent and bailout. They went into the cave with dive propulsion vehicles (DPVs, or scooters). They navigated the shallow cavern area and then descended the chimney, a narrow opening leading down to the floor of the cave at about 96 feet. They were approximately 400 feet from the mouth of the cave when one of the divers signaled he was having trouble. He shut off his rebreather regulator, spit it out, and reached for his bailout regulator. By then his buddy had gotten to him with his bailout regulator. The buddy later reported that the patient did not take the regulator effectively, but the buddy held it in his mouth anyway.

The buddy then exited the cave with the patient, using his DPV for a rapid ascent. Upon surfacing, the buddy called 911, and help soon arrived. The patient was unconscious at that time. The patient was evacuated, recovered in the hospital, and was released after several days.

While the patient was being evacuated, a scuba class being taught by Edd Sorenson exited the cave. Sorenson is the individual who normally deals with diving accidents and rescues in the area. Sorenson recovered and examined the equipment used. The analysis of the patient's diluent/bailout showed that it contained 52% oxygen. The tank had been accurately marked at 52% prior to the dive, and personnel from the Cave Adventurers dive shop indicated that they had filled the tank, with an oxygen mix between 50–55%, as requested by the diver. The bailout gas his buddy used during the rescue was analyzed at 38% oxygen.

1. "Diver Critical Following Blue Springs Mishap," www.wjhg.com, 19 November 2013.

2. John Adsit, e-mail communication, 6 December 2013.

Comments: Although the practice is not universal, most rebreather divers use both bailout and diluent gas mixes designed to have safe oxygen levels for the deepest point of their dives. If too much oxygen is used while the diver is under increased pressure, it is possible to have central nervous system oxygen toxicity, which can lead to a seizure. Opinions on the normal safe level for oxygen partial pressure usually vary from 1.2 to 1.4. At 96 feet, that level of partial pressure would come from a breathing mix with between 31–36% oxygen. A mix of 52% will have a partial pressure of about 2.0 at that depth, which is much too high to be considered safe.

10 December

Jailhouse Cenote, Quintana Roo, Mexico fatality, medical issue

Brent Cooper (44) of Missouri died while diving in the Jailhouse Cenote near Tulum on the Mexican Yucatan Peninsula. Cooper was diving with three friends, and they were just beginning the second dive of the day, with Cooper in the third position on the team. One hundred feet into the cave at a depth of 35 feet, Cooper stopped swimming and sank to the bottom of the cave. His team members evacuated him immediately and began CPR. After 50 minutes, paramedics arrived and determined that he could not be revived.

1. Paul Heinerth, Incident Report, undated.

2. Alejandro Almeida, "Tourist drowns?" <http://dqr.com.mx/index.php/tulum>, 10 December 2013.

Comments: Cooper's rebreather and other gear were examined and found to be in good working order. The cause of death was determined to be from a medical disorder.

25 December

Eagles Nest, Florida

two fatalities, out of air

A father and son testing out new diving equipment received as Christmas gifts died in the Eagles Nest Cave System when they apparently ran out of air deep in the cave. The father, Darrin Spivey (35), was certified as an open-water diver with no known advanced training or cave certification. His 15-year-old son, Dillon Sanchez, had no diving certification. Postings on social media indicate that they had been diving before in Eagles Nest and other cave systems that do not have the means of checking certification before entry. Pictures posted on social media show them wearing appropriate cave-diving gear in a standard configuration.

The Eagles Nest Cave System is considered one of the most advanced and challenging cave-diving sites in North America. The entrance is a small opening at the bottom of a spring. That opening leads to a narrow passage descending into a very large room called the Ballroom. The top of a debris cone there is 130-feet deep. From the Ballroom, passages lead to both the upstream and downstream segments of the cave system.

When the two did not return home after the dive, an informal recovery team gathered at the site. Not knowing where in the system they would need to look or how complex the recovery effort would be, a recovery diver looked briefly into the Ballroom and saw Sanchez immediately. The team then recovered both bodies from the Ballroom. Sanchez was found positively buoyant on the ceiling near the top entrance to the Ballroom; his father was found on the debris cone below. The father's long hose regulator had been deployed, suggesting that Sanchez had run out of air during the dive and the two had shared air until the father ran out as well. There were two full tanks on the debris cone, indicating that the tanks had been left there awaiting their return, but they expired just before reaching them.

1. Tony Marrero and Dan DeWitt, "Father, son die in Christmas Weeki Wachee cave diving excursion," www.tampabay.com, 26 December 2013.
2. "Father, Son Die in Cave Diving Accident," www.theledger.com, 26 December 2013.
3. Holly Gregory and Ferd Zogbaum, "Authorities: Divers were trying out new equipment before fatal accident," www.baynews9.com, 26 December 2013.

Comments: The cave system is more than 300 feet deep in places. The cave is recommended for highly experienced and trained cave divers only, especially those with training in the use of trimix (breathing gases used in deep diving containing high percentages of helium) and in the decompression procedures and equipment needed to ascend safely from those depths. Spivey and Sanchez attempted the dive using only air for their breathing gas, and they did not have the normal equipment or breathing gases for decompression.

Analysis of a computer used on the dive showed a maximum depth of 233 feet, indicating that they must have left the Ballroom and run out of air during their return. Diving at that depth for as long as they did demands a significant need for decompression stops during the ascent, and it is doubtful that they would have been able to complete those stops with only the two extra tanks, even if they had reached them in time.

2013 Caving-related Accidents and Incidents

17 March

unspecified cave, Tennessee stuck on cliff, aid, no injury

During a cookout, a 40-year-old Tennessee man spotted some small caves among nearby cliffs. One cave appeared to have buzzards roosting in it. Wanting to "go in [the cave] and check it out," he began climbing the cliffs to explore the caves. Eventually he reached a point where he was unable to continue climbing higher, but he also could not get back down. A local Search and Rescue group rappelled from the top of the cliffs down to him and safely lowered him to the ground.

1. Chris Conte, "Crews Rescue Man Trapped On A Cliff," www.newschannel5.com, 17 March 2013.

Comments: Novice climbers and cavers are often surprised that climbing up some pitches can be easier than climbing down. Know your abilities and stay within them.

10 April

Thurston Lava Tube, Hawai'i fell into lava tube, aid, no injury

A 15-year-old boy who was practicing "urban gymnastics" on a guardrail fell into a lava tube near the Hawai'i Volcanoes National Park visitor center. The boy fell approximately 20 feet, but rescue crews determined that he had no significant injuries.

1. "Teen survives 20-foot fall down lava tube," www.hawaii247.com, 10 April 2013.
2. "Teenager Survives Fall into Hawaii Lava Tube," <http://cavingnews.com>, 11 April 2013.
3. Stephen Smith, e-mail communication, 23 April 2013.

20 April

Clarksville Cave, New York caver fall, injury and aid

Two dozen cavers turned out for a cleanup and conservation project at the Northeast Cave Conservancy's Clarksville Cave Preserve. During the cleanup of downed trees and debris from tropical storm Irene, cavers noticed two women hiking in the direction of one of the cave's entrances. Twenty minutes later, emergency vehicles arrived and an officer asked the cavers the location of a woman reported to be trapped in a cave.

The cavers escorted law enforcement officers to the cave's multiple entrances and found one of the women at the Wards Entrance. She reported that her friend had fallen into the cave and was unable to get out. Onesquethaw Volunteer Fire Company crew members pulled the woman out, placed her on a stretcher, and transported her to a waiting ambulance. She dislocated her shoulder in the fall.

1. "Northeast News," *Northeastern Caver*, June 2013, pp. 37–38.
2. Chuck Porter, e-mail communication, 15 May 2013.

Comments: The women had no caving gear and did not intend to enter the cave. The article concludes, "The passage of thousands of cavers has made the limestone at the Wards Entrance as slick as polished steel." Ironically, caves that attract thousands of visitors often become more and more challenging as limestone gets polished over the years, and hand- and foot-holds become rounded and smooth.

early May

unspecified lava tube, Hawai'i murder victim found in lava tube

The body of 44-year-old Dennis Nolan was discovered in a lava tube on Oahu's north shore. Nolan had been living in the cave for about eight months.

1. Manolo Morales, "Murder mystery surrounds death of man found in cave," www.khon2.com, 23 May 2013.

Comments: Honolulu Police have not identified a suspect and ask that anyone with information call Crime Stoppers at 808-955-8300.

7 June

Sótano Golondrinas, Oaxaca, México fatality, fell into pit

On 7 June, members of Espeleo Rescate México (Mexico Cave Rescue) rappelled into Sótano Golondrinas, looking for Sergio Morales who had not been seen since 30 May. Morales's cap was found at the edge of the pit, suggesting that a search of the pit was warranted. Rescuers discovered his body at a depth of 400 feet. Once the authorities were notified, the body was packaged and brought to the surface.

1. Espeleo Rescate México, Operativo de Rescate en Las Ruinas, Municipio de San José Tenango, Oaxaca: Reporte General, undated.
2. Bill Mixon, e-mail communication, 5 September 2013.

Comments: This sótano is in the state of Oaxaca. The more famous one by the same name is in San Luis Potosí.

16 July

unnamed cave, Kentucky dog stranded in cave

After four days of searching for his hound dog named Rat, who disappeared while chasing a raccoon, Delbert Hawkins and volunteers became hopeful when they heard barking in a cave. Since they were unable to reach the dog through a small passage, a backhoe was brought to the site to try to "dig up a sinkhole." As they got closer to the dog, "An expert cave crawler, armed with scraps of bologna, helped coax Rat out of the cave." Rat was reported to be in good condition after several days underground.

1. Kristen Kennedy, "Missing Garrard County dog freed from cave, reunited with owners," www.wkyt.com, 19 July 2013.

15 August

unnamed sinkhole, Missouri trapped under ATV in a sinkhole, injury and aid

Mary Crowell (28) was injured when the all-terrain vehicle (ATV) that she was riding fell into a sinkhole. The vehicle, with driver Michael Kohlfeld, was being driven across a field to check compliance for food plots Kohlfeld had planted. Crowell is an employee with the Agricultural Stabilization and Conservation Service. According to Perry County Sheriff Gary Schaaf, the grass they were traveling through was tall and Kohlfeld didn't see the sinkhole. The vehicle fell into the sinkhole and turned over, trapping Crowell underneath. First responders, including the Bieble Fire Department and Perry County Sheriff's Department, were able to extract Crowell from underneath the vehicle and remove her from the sinkhole. She was transported to Perry County Memorial Hospital with non-disabling injuries.

1. The Southeast Missourian, "Ste. Genevieve woman trapped in sinkhole," www.semissourian.com, 15 August 2013.
2. James Vandike, "Movement of Shallow Groundwater in the Perryville Karst Area, Southeastern Missouri," *Missouri Department of Natural Resources Water Resources Report Number 40*, 1985.

Comments: According to the Missouri Department of Natural Resources "Much of Perry County east of Interstate 55 is intensely karstified. The surface contains thousands of sinkholes ranging from a few feet to nearly a mile in diameter and a few feet to over 100 feet deep." Fortunately, this incident involved a small sinkhole and resulted only in non-disabling injuries. Although the ATV driver was familiar with the area, he still did not see the sinkhole and failed to avoid it.

1 September Sinking River, Colorado dog found in cave

Cavers Mel Eady-Pumplin, Rich Pumplin, Mary Klaus, Jon Schow, and Becky Coffman went to Sinking River with plans to bounce Colorado's deepest pit (169 feet). Since it is a blind pit that usually has water in the bottom, their plan was to send in one person at a time to rappel, change over, and climb back up. Pumplin descended first and the others could hear him talking in the pit below. Eady-Pumplin remarked it was the same tone he used when talking to their dog and assumed he had found a chipmunk or other small animal. Pumplin returned to the surface and told the others "Put on your small-party rescue hats. There's a dog down there!"

Klaus describes what happened next: "I quickly volunteered to be the one to go down and 'play' with the dog. I took a large backpack, some supplies to tie a harness, and scrounged together some cave snacks that were dog-appropriate and rappelled down. Luckily the water was low so there was a beach where the dog could get out of the water and I only got a little wet crossing to get to her. She was a small black-and-white cattle dog (maybe 30 pounds) and she was very happy to see me. Amazingly, she had no injuries that I could find. Since she was well tempered, uninjured, and small enough, I decided to try to get her into the backpack, but I found I couldn't do that without help. Rich came back down to help and we got her in the backpack. We had talked about hauling her up but that would have been a bumpy, terrifying ride for her. She was small, so I decided just to climb up with her on my back. She was so calm for the ride I started to wonder if she was still alive; I think she was enjoying the relative warmth of the backpack! After we got to the top and off rope we let her out of the backpack. She was so incredibly happy to see the sun again, and she showed us by rolling around in the dirt in delight. We tried to get her to follow us back to camp, but she seemed to know where her home was and headed off in the opposite direction. We hiked back the next day to check on her, but there was no sign of her or the cows that had been in the area the day before, so we think she found her home!"

1. Rich Pumplin, Incident Report, 11 September 2013.
2. Mary Klaus, e-mail communication, 13 September 2013, 16 October 2013.

Comments: Six weeks later, another group of cavers was in the area and ran into the same dog and her owner. The owner said he had seen his dog fall into the pit and just assumed the worst. Then, three weeks later, he heard a familiar bark and came out of his home, quite surprised to see his missing dog.

11 September

Unspecified littoral caves, Manitoba, Canada illness while searching for caves, aid, no injury

During a trip to relocate some wave-cut caves along the southern shore of Dawson Bay on Lake Winnipegosis, a 71-year-old caver on the trip suffered an episode that resulted in acute memory loss.

The incident occurred while a group of four cavers was paddling in two canoes along the shore of the large lake, some six miles southeast of their campsite. Shortly after the first cave came into view, located on a sheer 80-foot-high cliff, the wind came up and forced them to take shelter around a bend. As the two canoes pulled together to determine how to deal with the growing wind, the 71-year-old caver in the front of one of the canoes began asking the other bowman where they were and what they were doing. Recognizing that something was wrong, the bowman signaled to the others that they had to make landfall immediately.

Once on land, the gravity of the situation became apparent as the confused caver not only couldn't remember much of anything from the last few years, but also kept forgetting any new information he was given within a matter of seconds.

Although the group had a Spot Messenger, they decided to use their cell phones to try to call for assistance. While the oldest friend of the injured caver stayed with him, the other two made their way to the top of the cliff they had canoed past earlier. From there, with the help of a long branch and a speaker phone, they were able to contact 911.

Despite giving exact GPS coordinates of the location, the two spent many minutes and precious battery life trying to explain to the operator exactly where they were. They were informed that rescuers were going to come by boat and that they should wait on the cliff to signal them. After relaying the information to the others, they settled in and watched as dark clouds blew across the lake and occasionally sprinkled them with a light rain.

Meanwhile back on the water's edge, the disoriented caver "entertained" his friend by asking him the same questions, "Where are we? What are we doing?" every minute for hours on end.

Three hours later, three policemen from nearby Sapotaweyak Cree Nation arrived in a small boat. They mentioned their delay was attributed to the 15-foot-high waves they encountered on their way over from the other side of the lake—likely caused by the storms that were observed from the cliff. The caver and his friend were loaded into the boat, while the other two cavers each manned a canoe in tow. A slow pace was set toward a boat launch about five miles to the south.

Ten minutes into the journey, the boats were intercepted by a larger Manitoba Conservation boat carrying two Natural Resource officers, an EMT, and a Royal Canadian Mounted Police (RCMP) officer. The ill caver, who was now finally beginning to regain his memory, and his friend were then transferred to the larger boat, which quickly sped off to a waiting ambulance. Meanwhile the two canoes were detached from the smaller boat as it returned home. This left the remaining two cavers paddling solo to the boat launch until the Manitoba Conservation boat returned to pick them up along with their canoes.

The ill caver was taken to a hospital a couple of hours away and underwent a battery of tests, but by the time the other cavers arrived, he had regained his memory, save that day's earlier events, and was already released. The patient made a full recovery.

1. Scott Falkingham, Incident Report, 17 September 2013.

**16 September
unnamed sinkhole, Missouri
fatality, fell into sinkhole**

Curtis Powelson (31), a Marine stationed at Fort Leonard Wood, fell to his death into a recently opened sinkhole. Around dusk, Powelson told his wife that he just shot a deer and was returning to the woods to try to track the animal. When he failed to return home, his wife reported him missing to the Pulaski County Sheriff's Department. Law enforcement officers and firefighters then began a late-night grid search, which ended shortly after 3:00 a.m. when Powelson's body was discovered at the bottom of a sinkhole near his home. The sinkhole is described as about the size of a car at ground level and is estimated to be 65- to 70-feet deep. Authorities believe that tall vegetation along with low light conditions made the sinkhole very difficult to see.

Pulaski County Assistant Coroner Michael McCart and a firefighter were able to rappel the pit to retrieve Powelson's body. According to McCart, the sinkhole appeared fresh and was likely a result of recent rains: "From the looks of the sinkhole itself and the lack of debris that's in the sinkhole, it's fairly new," McCart said. "We had several firefighters and deputies that almost stepped into it themselves, just out there wandering around looking for him last night."

1. Waynesville Daily Guide Staff, "Sinkhole envelops local hunter/marine," www.waynesvilledailyguide.com, 17 September 2014.

Comments: Most cavers know of a pit entrance that is difficult to see from even a short distance, and maybe even thought, "I could almost fall into this pit if I wasn't careful." This incident involves a young Marine, who presumably was fit and had good reflexes, good eyesight, and good situational awareness. Walking in karst terrain, especially through vegetation or under low-light conditions, calls for vigilance.



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33520	Petzl Stop D09	140.00
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33100	BMS Micro Rack Short Frame	79.70
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33401	SMC 6 Bar Stainless Rack	111.90
98002	Petzl Frog Ascending SYS ..	235.04
20700	GGG Frog system w/ascen ..	269.90

**28 September
unspecified caves, Washington
missing while ridgewalking, presumed dead**

Kristopher Zitzewitz (31) and a friend set out to search for caves in the Big Lava Bed area of the Gifford Pinchot National Forest on a Saturday morning. They became separated around 2:00 p.m. When Zitzewitz's friend could not locate Zitzewitz, he called 911. Despite being hampered by record amounts of snow and rain over the next few days, more than 100 people searched from vehicles, motorcycles, helicopters, and on foot with canines.

The search resumed the following summer, but to date, Zitzewitz has not been found.

1. Stuart Tomlinson, "Ground search for missing Beaverton spelunker Kristopher Zitzewitz to resume Saturday," www.oregonlive.com, 4 October 2013.
2. Patty Hastings, "Heading for the wilderness? Heed these cautionary tales," www.seattletimes.com, 29 July 2014.

Page 33: Bluff that Kirsten Alvey-Mudd fell from in an uncontrolled rappel on Nov. 8 2009 while accessing a cave below, in Missouri.



2014 Caving Accidents and Incidents

4 January Marbo Cave, Guam fatality, drowning

Marbo Cave is a freshwater coastal cave with clear, cold water. It is well publicized on the Internet and a popular attraction for locals and tourists. On 4 January, Larry Lujan (38) was pulled unconscious from the water. CPR performed on the way to the hospital did not revive him. No information was given to the cause of drowning.

1. Oyaol Ngirairikl, "Man pulled out of cave: Marbo 'drowning incident' 1st water-related death of year," www.guampdn.com, 5 January 2014.
2. Kevin Kerrigan, "Marbo Cave Drowning Victim Identified as 38 Year Old Larry Lujan," www.pacificnewscenter.com, 7 January 2014.

28 January Jewel Cave, South Dakota other, injury, no aid

Blase LaSala (26) and three other cavers were on a survey trip in Jewel Cave on 28 January. A short time into the trip, LaSala pinched his finger between a hand-line and the rock wall. He informed the trip leader but determined that he would be able to continue with the trip.

After four hours of caving, which included going up and down a number of hand-lines and ladders, LaSala took off his glove and noticed swelling and discoloration. He and a nurse in the group re-examined the finger and, due to its flexibility and lack of pain, did not think it was more than sprained. About 11 hours after the incident, the group exited the cave without further issue.

Concerned that the injury could impede his abilities on an upcoming cave trip, he consulted a doctor over the phone the next day and came to the conclusion that it was not broken. A week later when the swelling went down, he noticed that the tip was crooked and got an x-ray. The finger was broken but had already healed incorrectly. It was too late to fix without having to break it again.

1. Blase LaSala, Incident Report, 29 October 2014.

Comments: LaSala reports that his grip and flexibility have not been affected and that his crooked finger will help to remind him to be more careful next time.

31 January unnamed karst feature, Tennessee trapped, injury and aid

After a day of surveying in one cave, Marion Smith (72) and Jim Fox (44) discovered another karst feature nearby. Fox worked to enlarge the discovery just enough to enable Smith to enter. Smith determined that the feature had no leads to explore and, while attempting to exit, found that he was having difficulty getting back out of the tight hole. He requested that Fox rig a rope and pass down a foot ascender to help him get out.

During this time, Smith noticed a loose sandstone rock and commented that it was big enough and heavy enough to possibly trap him if it came loose. The boulder did come loose and trapped Smith by his thighs and hips. Working together, Fox and Smith realized that they could not push the rock down past Smith's legs or bring it up past his ribcage. Fox then tried digging a parallel hole to tunnel over and remove the rock, but they abandoned this plan when Smith felt other rocks beginning to shift.

Local agencies and cavers were called and came to assist. Another parallel hole was dug, and this time cavers, with rock-removal tools, were able to work their way underneath Smith. He was in a lot of pain by this time and was given an IV by medical personnel. Smith was wrapped in blankets, and the cavers performed some microblasting work on the wall

around the boulder. Clinton Elmore thought it would be possible to place a small shot in the rock that was pinning Smith, since his experience with that particular type of rock showed that it does not fracture and produce flying projectiles. While drilling the hole in the rock, the percussion from the rotary hammer drill moved the rock enough that Elmore could hold it up just enough for Smith to climb out past it. After being trapped for six hours, he was flown to a local hospital where he checked himself out a few hours later. He has since made a full recovery.

1. Anne Elmore, www.facebook.com, 1 February 2014.
2. Jim Fox, personal communication, 1 February 2014.
3. Marion Smith, phone communication, 3 February 2015.
4. Clinton Elmore, e-mail communication, 3 February 2015.
5. Scott McCrea, Incident Report, 3 February 2015.

Comments: Smith remarked that he had checked and dug open so many holes that the odds finally caught up to him.

13 February McBrides Cave, Alabama stranded, aid, no injury

Four cavers entered McBrides Cave to do a pull-down through-trip. At one of the drops, they encountered more water than expected and decided it was not safe to proceed. Having already pulled the ropes behind them, they had no choice but to wait for assistance. When they missed their callout time, their surface watch notified authorities. Members of the Chattanooga Hamilton County Rescue Service responded, hard-rigged the cave, and located the missing cavers. Although cold and wet, everyone was able to exit under their own power.

1. Brad Tipton, personal communication, 12 July 2014.

Comments: As always, a surface watch can make a big difference in rescue response time.

27 February Natural Well, Alabama stranded, aid, no injury

Two men sport-rappelling in Natural Well became stranded when they were unable to ascend back out. A third person who did not enter the pit called for help. Rescue crews had the two men out within an hour of arriving on scene. No information was available as to why they were unable to ascend.

1. [waff.com](http://www.waff.com) staff, "Two Rescued After Being Trapped 150 Feet Underground," www.waff.com, 27 February 2014.

7 March Cave of the Bells, Arizona caver fall, injury and aid

A group of Venture Scouts went out for a weekend of camping and caving in southern Arizona. The Scouts had been to another Arizona cave a few times before, and one leader had visited Cave of the Bells once before, but none were experienced cavers.

They picked up the key from the Forest Service and were reminded that everyone in the cave should wear a helmet. At the cave, Venture Scout leader Mitch Hamilton (39) was the only one with a helmet; the other three adults and three boys had forgotten theirs. Hamilton remembers thinking, "Well, I guess I'll be the dork with the helmet."

The group explored the cave, and on their way out, one of the boys had trouble getting up through a tight section. Another boy tried a differ-

ent way around to go help him. Hamilton followed the second boy. While negotiating this new section, Hamilton lost his footing on a traverse and slipped about 15 to 20 feet into a nearby pit. He lost consciousness for about 10 minutes. One of the leaders exited the cave and drove a short distance to get cell phone service and called 911 at 10:35 p.m.

The Sonoita-Elgin Fire Department responded and was at the cave entrance at 11:46 p.m. The patient was found to be awake and mobile by the time the first rescuer rappelled to his location, but he was suffering from a concussion and broken ribs. He was placed on a spine board and brought out of the cave before 1:00 a.m.

1. Kelly Ricard, e-mail communication, 17 March 2014.
2. Kevin Venos, Joseph DeWolf, and Jen Huss, phone communication, 30 October 2014.
3. Mitch Hamilton, phone communication, November 2014.

Comments: Fortunately, Hamilton was “the dork with the helmet,” since he was the one that ultimately needed it the most. Without it, his brain injury could have been much worse. While it is impossible to reach every group that is interested in caves, cavers should make an effort to engage with local Scout and youth groups to ensure that their curiosity about caving can be satisfied in a safe and ethical way. In some caves, not wearing a helmet is a violation of permit conditions. Such violations and/or rescues ultimately jeopardize everyone’s access to these managed caves

16 March
unnamed cave, Pennsylvania
caver fall, injury, no aid

Seven cavers entered a cave that they had recently been surveying and digging in a little after 10:00 a.m. After traveling almost 2,000 feet toward their destination, Chris Hill (66) became frustrated with the slow pace and many rest stops. He went ahead of the group, carrying a case of drill bits in his right hand. Crawling over a series of fissures in the floor, his neoprene glove slipped on a sloping, sand-covered ledge, and he fell forward into a narrow fissure. Hill’s right shoulder, right knee, and mouth all struck rock as he fell 10 feet. The walls closed in tight enough to stop him from falling the remaining 5 feet to the bottom. Despite the tight quarters, Hill was able to get his feet under him and climb back out. He checked his injuries and found nothing that seemed out of alignment. He also checked to make sure he had all of his teeth and was happy to discover he did.

Hill decided to continue with the trip but found the contortions needed for surveying painful. At 3:25 p.m. he and two other cavers decided to head for the entrance. One of the other cavers was already very tired and moving slowly, so rest stops became more frequent and longer in duration. As Hill waited each time for the slower caver, his shoulder would stiffen and have to be stretched and loosened before continuing. Hill and his team exited the cave at 7:30 p.m.

1. Chris Hill, Incident Report, undated.

Comments: In his report, Hill acknowledges two actions as contributing to his accident: allowing frustration (over the pace of the team) to lead to a lack of caution, and not taking extra care while carrying heavy equipment where maintaining points of contact is especially critical.

4 April
0-9 Well, Texas
caver fall, injury, no aid

Laura Battle (30) had been caving for a little over a year when she visited 0-9 Well for a second time as part of an eight-person team. She entered the cave second, traveling with the third caver. The first caver had gone ahead to rig a drop, and five more cavers would be following.

On this particular day, the water was much lower than on Battle’s first trip, and in the Waterfall Room she could not locate the passage they intended to take. She found a muddy funnel with markings as if someone else had gone down it. She decided to see if this was the route and proceeded to climb down.

Battle soon realized that the funnel was slipperier than she thought. She slid 5 to 10 feet down and through an unseen hole at the bottom. From there, she fell another 10 feet down to a stream passage, the one she had been looking for. She located the opening she should have come through and called directions to her companion.

After assessing her condition, she found that she had lost a chunk of skin from under her chin and her tailbone was very sore. She continued with the trip, and another caver gave her a piece of duct tape for her chin. After the trip, one of the cavers drove her to a clinic where she received five stitches in her chin.

1. Laura Battle, Incident Report, 7 April 2014.

Comments: Battle discusses several ways her accident may have been prevented in her report, including waiting for others who knew the route to catch up, and not chimneying down a muddy slope without knowing where it went. She concludes that the most valuable lesson learned is to remember the seriousness of this accident not by the severity of her injuries, but rather by the severity of the possible injuries.

12 April
unspecified cave, Virginia
caver fall, injury, no aid

A group of Virginia cavers was one hour into a recreational cave trip when a 54-year-old male slipped and dislocated a shoulder. Members in the group used a SAM® Splint, elbow pads, and tape to fashion a splint for the patient after an attempt to reduce the dislocation was unsuccessful.

Once the cavers exited the cave, they had to make a decision as to how to get back to their vehicles; they could either climb rope back up a 50-foot cliff with another steep slope above that, or they could hike out across private property. Although the hike out would be gruelingly steep and technically trespassing, it would not require ropes or vertical gear. Several cavers in the group had recently completed NCRC’s Orientation to Cave Rescue training and decided it would be safer to have the patient walk out rather than haul him up a cliff. The patient determined he was strong enough for the hike and agreed with the choice. He was belayed with webbing up the steepest slopes but otherwise was unassisted. Four and a half hours later, his shoulder had been reset at a hospital and his discomfort greatly minimized.

1. Doug Duncan, personal communication, 16 July 2014.
2. Mark Boland, e-mail communication, 23 October 2014.

Comments: These cavers properly applied their cave-rescue training, as “horizontal” solutions are generally preferred over more complex vertical ones.

4 May
Paradox Cave, Tennessee
rock fall, injury, no aid

Matt Robinson (34) was on rappel in a waterfall in Paradox Cave when a section of the lip at the edge broke free. Several large rocks fell, striking Robinson. He suffered a compound fracture and severed tendons to one of his hands. With the help of his caving partner, he applied a tourniquet to stop the bleeding and exited the cave without further assistance. Robinson notes that it was a long trip to the hospital but that he had the necessary medical supplies to keep himself stable.

1. Matt Robinson, Incident Report, 6 May 2014.

Comments: Tourniquets can be risky if not applied correctly and removed soon enough. However, tourniquets have recently been used with success by the military in Afghanistan and Iraq and are now regaining some favor within the emergency medical community. Severe bleeding must be stopped, and sometimes a tourniquet may be necessary. Cavers should obtain proper training before attempting any risky medical intervention.

24 May

Cemetery Pit, Georgia

equipment problem, no injury, no aid

A group of cavers with varying amounts of vertical experience visited Cemetery Pit for a recreational trip. A female in the group, who had ordered a new seat harness for the trip, asked for someone to check her gear before entering the cave. While in the cave, another caver thought her harness "looked extremely loose," and he suggested that she tighten it. Later in the trip, she asked for another gear check before ascending back up a 160-foot pit. The gear check revealed that none of the three straps on her harness was doubled back.

1. Christopher Lafferty, Incident Report, 14 July 2014.

Comments: This incident highlights the responsibility of cavers to be familiar with their own gear and know how to properly safety-check it. Relying on a "buddy check" was only 50% effective on this trip and is no real substitute for knowing your gear and doing a personal safety check before committing at each rope. Along with this caving example of a faulty buddy check, there are other recent tragedies and near misses from other vertical disciplines. In 2009, a wildland firefighter fell to his death from a helicopter because his rappel device was connected to his harness by a rubber O-ring and nothing else. His gear had been checked by three other people prior to the failed rappel.

2 June

Speedwell Cave, Virginia

stuck, aid, no injury

A 19-year-old woman was part of a North Carolina group reportedly doing a training exercise in Speedwell Cave. While negotiating a crawlway with a crevice in the floor, the woman slipped and became wedged from mid-thigh to mid-abdomen in a section of the crevice approximately 8 inches wide. When her group was unable to extricate her, they called for help around 3:30 in the afternoon. Rescuers first attempted to put her in a harness, rig a pulley as a directional, and haul her vertically out of the crevice. When she experienced pelvic pain during this operation, the rescuers decided that the crevice would first have to be enlarged. A chisel and sledge hammer were used to remove some of the rock around the patient's body until she could be hauled out more easily. Due to medical concerns, she was then placed in a litter for transport. A short haul was needed for one steep section of passage. Despite being stuck for six hours, she showed no signs of obvious injury but was flown to a hospital as a precaution. The reports did not state what type of training exercise the group was performing, but it did mention that all members of the group had helmets and headlamps.

1. Staff, "19-year-old trapped for hours in Wythe County cave: Teen was with North Carolina group," www.wxii12.com, 4 June 2014.
2. Calvin Pynn, "Trapped spelunker rescued from cave in Speedwell," www.southwesttimes.com, 5 June 2014.
3. Bill Keith, Incident Report, 27 January 2015.
4. Bill Keith, e-mail communication, 27 January 2015.

Comments: Following this incident, the local grotto and Speedwell EMS participated in an Orientation to Cave Rescue training course through the NCRC.

7 June

County Line Cave, New Mexico

flooding, no injury, no aid

John Lyles led four cavers on a survey trip to County Line Cave in the gypsum plains of Chaves County. Major thunderstorms were predicted for this and two bordering counties on the day of their trip. Since the forecast covered such a large area, and it was before the traditional monsoon season, the cavers thought the chance of a storm hitting their location was small, so they continued with their trip. Before entering the cave, they checked the forecast again. Storms were still predicted, but the weather appeared calm in their area.

Shortly after entering the cave around 10:00 a.m., Lyles pointed out two skylights, and the cavers discussed their use by the local bats. Continuing through the cave, they negotiated several low crawls. Jen Foote raised some concerns about the cave possibly flooding, but she was reassured that it was a big cave and it would take a significant storm to produce flooding. The group continued on and found a debris line from a previous flood over their heads. A little farther on, Foote decided it was time to leave. She exited the cave alone while the others stayed to survey. They surveyed for four hours before turning for the exit.

When the cavers reached the skylight area, they found the floor of the cave littered with golf ball-sized hailstones. Not only that, but the entrance was taking water, threatening to make it impassable. Fortunately for the cavers, Foote, after waiting out the storm in a vehicle, had rigged a handline for the cavers through one of the skylights. Although it was a difficult climb, with no handholds and a width too great to chimney up or straddle, the cavers managed to climb out.

On the surface, the cavers found their two vehicles battered by the hail, with cracked windshields and broken side mirrors. Water flowed over the surface of the gypsum plain, obscuring the two-track road. In his report, Lyles stated, "The cave exit turned out to be the least of our problems," and provided a lively description of their drive out of the area. Fourteen tornadoes were recorded during this storm, including one that touched down only 18 miles from the cave.

1. John Lyles, "GypKaP Report: County Line Cave, Chaves County, NM, June 7, 2014," *Southwestern Cavers*, 53(1), January–February, 2015.

Comments: Recent droughts had created conditions that exacerbated flooding during the storm. While we now have the benefit of hindsight, it is difficult to ignore the fact that the cavers entered a flood-prone cave on a day when intense storms were predicted for the area. Fortunately, they exited before any major cave flooding occurred. Also fortunate is that Foote exited early and had a handline waiting as an option to avoid the flooding entrance crawls.

20 June

Waikapala`e Cave, Hawaii

fatality, drowning

A Pittsburgh man (27) drowned for unknown reasons while swimming with others at Waikapala`e Cave. The cave and others nearby are publicized on the Internet. An enticing description of this cave reads, "This particular cave has an unusual effect for those who want to brave the ice-cold water. It is called the Blue Room. At the back of the main cave is a small opening into another, smaller room accessible only by swimming. Once inside the smaller chamber, look toward the main opening. The sunlight reflecting off the freshwater makes everything around you turn blue. Viewing in the Blue Room is best during high tide as the sunlight has a narrower opening into the chamber and more of the blue color is reflected."

1. Staff, "Visitor from Pittsburgh dies after apparent drowning in Haena," www.hawaiinewsnow.com, 21 June 2014.

2. "Waikapalae Wet Cave Kauai," www.hawaiiblog.com/waikapalae-wet-cave.html

Comments: Any kind of sea cave exploration such as that mentioned in the cave description must be carefully calculated for surf, tidal fluctuations, and undercurrents, and persons must be equipped with appropriate safety gear. Never underestimate the power of the sea.

28 June
Laurel Caverns, Pennsylvania
caver fall, injury and aid

A participant on a wild cave tour in Laurel Caverns fell about 2 feet and broke his right leg. The Fairchance Fire Department responded along with members of the Mountaineer Area Rescue Group (MARG). The Allegheny Mountain Rescue Group (AMRG) was put on standby should more resources be needed. The patient was out of the cave four hours after his accident.

1. Douglas Moore, e-mail communication, 30 June 2014.

Comments: Both MARG and AMRG are wilderness search-and-rescue teams with several rescue-trained cavers in their groups. They have established dispatch systems and are integrated with other public safety agencies. This has allowed both groups to provide initial response teams to cave-rescue incidents. All of the 911 centers in northwestern West Virginia and in western Pennsylvania have been advised to contact MARG and AMRG, respectively, for assistance if they have a cave-rescue incident. These two groups then contact the local grottos to get caver resources involved. This level of pre-planning and coordination becomes invaluable when an incident happens.

28 June
Wind Cave, Pennsylvania
stuck, injury and aid

A 33-year-old woman was reportedly exploring Wind Cave with a companion when she fell into a crevice 30 feet from the entrance. Details of her injuries were not reported, but rescue crews said she was having difficulty breathing. Using slings and ropes, rescuers brought the woman to the surface and carried her one mile through the woods in a litter to an ambulance.

1. P.J. Reilly, "A woman was rescued from a cave in Martic Township Saturday night," <http://lancasteronline.com>, 28 June 2014.

Comments: Wind Cave, aka Cold Cave, is one of several caves locally called the Cool Caves. In 2010, there were two separate rescues in Wind Cave. The caves were reported as abandoned mines and the incidents therefore classified as caving-related incidents in the 2009–2010 issue of *American Caving Accidents*. They are in fact tectonic caves.

28 June
Lechuguilla Cave, New Mexico
illness, aid, no injury

A team of Andy Armstrong, Bonny Armstrong, Jose "Chino" Gomez (46), and Karel Hilversum entered Lechuguilla Cave on a rigging trip intended to last about 12 hours. The cavers carried 610 feet of new rope between them, cut into specific lengths for replacing old ropes on five pitches in the Northwest Passage, a side branch of the Western Borehole. Once there, the cavers spent about 2.5 hours derigging and rerigging the passage and then began the return trip to the surface, carrying out the old ropes.

The team had a snack at EF Junction and then split into teams of two traveling about 10 minutes apart. Andy and Gomez were in the second

group. Soon after this, Gomez succumbed to an apparent attack of dehydration and exhaustion. He first reported feeling not quite right near the C-71 Traverse, about 1.5 hours from the entrance but still below Boulder Falls and other pitches. After a short break at C-71, all seemed well again until the bottom of Glacier Bay. Here Gomez stopped and vomited into a Ziploc bag several times. After some water, he said he was feeling somewhat better, and he and Andy traveled on. At the bottom of the handline at the base of Colorado Room, Gomez explained that he needed to stop for a rest. Andy could hear the others up at Pack's Peak and went to go inform them of the situation. Gomez then began vomiting again. When he was finished, he had lost a significant amount of fluid.

Once everyone traveled down to Gomez's location in the trail at the bottom of Colorado Room, Hilversum, who is bilingual (Gomez is a native Spanish speaker) and a Wilderness First Responder (WFR) instructor, took over as medic. Hilversum immediately began treating Gomez for shock, elevating his legs and providing a Mylar® bivouac bag for warmth. It soon became necessary for the others to provide extra heat to Gomez by lying down next to him, as he was cold and shivering.

Hilversum began a wilderness-rehydrating protocol where Gomez took one mouthful of water every 10 minutes. Gomez would doze off in between sips but always drank every 10 minutes. After two hours of this, the team wanted to see if Gomez could move up to the base of Boulder Falls in order to assess his ability to self-rescue. However, as soon as Gomez sat up, he vomited all of the water back up. (Throughout the entire ordeal, all fluids were contained in bags and cave kegs. None was spilled in the cave.)

At this point, the team realized that Gomez would not get out of the cave on his own power—at least not soon. After some deliberation, the team decided to send for help, as Gomez would need to be rehydrated intravenously. Gomez was too "shocky" to be hauled vertically in his harness, so the team decided that he would need to either be hauled out in a litter in a horizontal configuration or be rehabilitated in the cave. Since the litter rescue option sounded terrible to everyone, including Gomez, the team decided to go for and bring back medical help and rehydrate Chino intravenously in the warm, dry cave.

The team moved Gomez to the west of Pack's Peak at the base of Boulder Falls, where he was able to sleep comfortably in the warmer, less breezy alcove there. At this point, the team had been in the cave for about 15 hours.

Andy and Bonny left the cave and reached the surface at 3:00 a.m., Andy to call for help, and Bonny to retrieve the three liters of water that were stashed at the entrance. Bonny re-entered the cave with the water. Andy hiked to the trailhead and then drove until reaching cell service and called for help at 4:22 a.m.

After responders drove from Carlsbad, and gear was assembled and packed, the team left Carlsbad Caverns National Park headquarters at 7:30 a.m., reaching the cave entrance around 9:00 a.m. Andy re-entered the cave with local caver/paramedic Nate Skelton and Carlsbad Caverns National Park cave resource office staff Stan Allison and Shawn Thomas. Skelton carried IV equipment and other drugs. The others carried vertical rescue gear, food, stoves, Gatorade, water, and bivy gear. Thomas quickly made contact with the team at the bottom of Boulder Falls and was relieved to hear that Gomez was stable and that all three cavers had slept comfortably in the 68-degree cave for the last five hours.

Skelton treated Gomez for dehydration by administering nearly three IV bags over the next two hours. Gomez showed almost immediate improvement once the IV was started. The other cavers worked to rig a counterbalance haul on 150-foot Boulder Falls for when Gomez was ready to go. Every so often, Allison would ascend to the surface to communicate with the NPS Incident Commander (IC) by park radio. Each time, Allison would assure the IC that the situation was under control and that they did not need additional resources.

At about 1:30 p.m., Gomez awoke from a two-hour nap and announced that he was ready to climb to the surface. He had made almost

a complete recovery due to the fluids he received. The counterbalance was attached in case he needed assistance, but Gomez climbed under his own power. By 4:45 p.m., all team members reached the bottom of the entrance pit. As it was 105 degrees in the desert above, the team waited out the hottest part of the day in the entrance pit, but all reached the surface by 6:00 p.m. Gomez had been in the cave for 33 hours.

1. "Overnight rescue in Lechuguilla Cave brings volunteer to safety," www.currentargus.com, 1 July 2014.
2. Shawn Thomas and Stan Allison, Incident Report, 12 July 2014.
3. Andy Armstrong, Carlsbad Caverns National Park Trip Report, 16 August 2014.

Comments: This incident served as a good learning experience for all involved and confirmed the idea that training and commitment to rescue readiness leads to more positive results in real rescues. These factors did not just fall into place; they are the result of a years-long commitment by Carlsbad Caverns National Park, their volunteer cavers, and cave rescuers in the Carlsbad City Fire Department to work toward safer caving and a more effective rescue environment.

On this incident involving seven people in the cave, made up of the original team plus the local responders, three were NCRC Instructors, and four were NCRC Level 3. In addition, there was one paramedic and two Wilderness First Responders. The Incident Commander was attentive, should the team have required additional resources, but did not flood the limited space of the cave environment with unneeded gear or personnel. Considering that the temperature was 105 degrees on the 1.5-mile-long hike to the cave, this was a wise move for rescuer safety. Limiting the number of rescuers underground contributed to a calm working environment free of chaos. This benefitted both rescuer and patient morale throughout the incident.

Because the members of the caving team are trained in small party assisted rescue (SPAR) and have actually conducted a SPAR from the same cave, it was very tempting to want to just haul Gomez the rest of the way out of the cave once he became incapacitated. This impulse was reinforced by the desire to get out of the cave after a long trip. Fortunately, the team was able to see the error in this approach considering Gomez's condition. Instead, they let the medical situation drive their decision making, leading to a good outcome for Gomez. Focusing on what is right for the patient tends to lead to patient improvement. Focusing on being in a cave rescue tends to prolong the cave rescue.

Last but not least, it cannot be stressed enough to keep an eye on your teammates. The team feels that spending two days in 109-degree desert heat before the trip may have contributed to the incident, causing Gomez, who lives in the tropics, to become dehydrated before the trip even began. Don't hesitate to ask about team members' food and water consumption, even when things appear to be going well. Everyone on the trip saw Gomez drinking water, but no one asked him *how much* water he had been drinking, because he was caving so quickly and efficiently.

24 July

Boy Scout Cave, Idaho other, injury, no aid

Marc Ohms led an Orientation to Cave Rescue training for employees of Craters of the Moon National Monument and Preserve and local cavers. On the final day of the training, participants were conducting a mock rescue at Boy Scout Cave. A 28-year-old law enforcement ranger was repositioning himself from a kneeling to standing position to help maneuver a patient in a litter when he felt three pops in his knee. This occurred at the cave's entrance. He moved out of the way and others brought the mock patient out of the cave. Several of the newly trained rescuers applied ice to the new "for real" patient's knee and transported him to a vehicle in a wheeled gurney.

1. Bonny Armstrong, Incident Report, 25 July 2014.

Comments: The ranger said he had knee problems during his tour in Afghanistan in 2009, but this was the first time it had given him trouble since returning to the States. Moving a loaded litter in a cave environment is hard, demanding work, and rescuers often overstretch or otherwise overdo it. Care must be taken to first ensure rescuer safety, before that of the patient. Fortunately, this was only a practice, so the "for real" injury did not increase the complexity of the rescue by then having two patients to carry to the trailhead.

28 July

Bryant Mountain Cave, Tennessee caver fall, injury and aid

Two 18-year-old males and two 20-year-old females set out to explore Bryant Mountain Cave without helmets and with only two lights between them. Near the end of the cave, Conrad VanOrder climbed down 4 feet to a ledge overlooking a 30-foot-deep pit. When he tried to climb back up to the others, he slipped and fell to the bottom of the pit.

One of his companions left the cave to call for help. The local Fire Department and EMS responded and extricated the patient within two hours. He had broken both bones in his lower right leg.

1. Robert Stevenson, "Teen rescued from Blount Co. cave," www.myfoxal.com, 28 July 2014.
2. Conrad VanOrder, phone communication, 10 September 2014.
3. Scott McCrea, Incident Report, 16 December 2014.

Comments: After falling down a 30-foot drop with no helmet, the patient is very fortunate that his injuries were limited to his lower leg.

2 August

Fulford Cave, Colorado rock fall, injury, no aid

Marty Reames(39) took a few new cavers into Fulford Cave, an easy horizontal cave in Colorado. After she climbed down a short webbing etrier, the next caver accidentally kicked some rocks down as he was crawling to the etrier. The largest rock, approximately softball-sized, fell 10 feet, ricocheted off the wall and hit Reames in the mouth. Fortunately, the worst of her injuries was a sore lip for a couple of days.

1. Marty Reames, e-mail communication, 4 August 2014.

Comments: Reames said, "From this experience I learned even when you're on an easy horizontal cave trip you should still teach all new cavers to yell 'ROCK' if they dislodge anything that could fall on someone else. Now I'll probably overwarn people for a while." Never stand in a fall zone, even if the drop is only 10 feet.

8 August

Lucifers Lair, Utah equipment problem, injury, no aid

Three cavers entered Lucifers Lair on 8 August to continue pushing leads in the bottom of the cave. The primary goal of their explorations was to connect with Main Drain Cave, a cave directly below with 1,300 feet of explored depth. At a 20-foot drop, two cavers descended without incident. The third caver (50) rerigged the drop to better pad a potential rub point. He tied a figure-eight knot, wrapped the rope around a rock projection, but forgot to clip the figure-eight to the rope with a carabiner. He attached his rappel device to the rope and leaned back over the edge. The caver and the rope fell to the bottom of the pit.

The other cavers, who had gone ahead, heard a thud followed by groaning sounds. When they reached the injured caver, they found him

unconscious and having difficulty breathing. He was lying on his back with one leg twisted unnaturally under him. When he regained consciousness, he showed signs of a concussion and significant damage to one shoulder and a leg. Subsequent medical examinations showed the main injuries to be a shattered shoulder blade and minor compression fractures in the back.

Stranded at the bottom of the pit, the cavers discussed what to do next. They ruled out attempting to free-climb the pit due to the hazardous nature of the climb. Two other cavers were on the surface in camp, but they might not come looking for the cavers for several hours. The two cavers (one of them the patient's son) eventually lassoed a rock projection near the edge of the pit. By ascending the rope and then free-climbing a short section, the first person up rerigged the rope.

The injured caver was able to ascend the rope and one other rope with some assistance from the others. A difficult section of cave passage called Slither Squeeze proved to be more difficult. Unable to pull, push, or properly orient himself to get through the restriction, the injured caver relied heavily on assistance from the others. Out of the cave, he slowly limped down the mountain to their campsite.

1. Chris Erickson, Incident Report, 28 February 2015.

Comments: The patient describes himself as experienced and generally cautious and still expresses disbelief at his mistake. One method to prevent rappelling accidents is to stay clipped into an anchor while testing your rappel device. If something is wrong, it should be apparent before you commit to your rappel device. In this incident, the caver may have noticed the faulty rigging if he had clipped into it as a safety.

20 August Ophir Cave, Montana stranded, injury and aid

Two 18-year-old males and one 18-year-old female entered Ophir Cave at 6:00 p.m. None of the three had a helmet, and they had only one light source apiece. They were dressed with few insulating layers. Their vertical system to negotiate the two in-cave drops of 30 and 60 feet consisted of 1.5-pound folding kayak watercraft anchors as grappling hooks and cotton-core utility rope with a working load of 200 pounds that they had purchased at Walmart. Before leaving for the cave, one of the teens "jokingly" told a coworker that if he didn't show up the next morning for work, it was because he was stuck in a cave.

When they reached the first drop, they placed a boat anchor in a wedge of rock and tied overhand knots for the entire length of the rope. The males proceeded down the overhung drop hand-over-hand while the female waited at the top. The next drop immediately followed, and they used the same method to descend the next 60 feet. At some point, one of the teens accidentally kicked some rocks on his friend, causing minor injuries to the friend's shoulder and arm. When it was time to ascend, neither teen was able to climb the rope. They made voice contact with the female, who without the guidance of the other two, spent the rest of the night trying to find her way out of the cave.

The next morning, when one of the males failed to show up for work, his coworker remembered the offhand remark and drove to the teen's house to look for him. Not finding him there, the coworker then drove to the cave and found his truck parked nearby. The coworker went a short way into the cave and found the female, who was still trying to find her way out of the cave using her phone as a light (her exit should have taken only 15 minutes). The coworker called 911.

Duncan Adams and Kathy Weigand of Lewis and Clark Search and Rescue made up the initial response team and entered the cave to assess the situation. From the top of the first drop, they were able to make voice contact with the two teens and found that they were not seriously hurt but were just cold and hungry. Other rescuers arrived and rigged a rope at the cave's entrance that made it to the bottom of the first drop. A

second rope was tied to this and one rescuer rappelled to the stranded teens with extra harnesses. Here the rescuers discovered that the teens had cut their rope and burned it in 6-inch-long segments so that they would "have something to burn to keep us warm."

The cave was rerigged with haul systems, and the teens were brought up the drops and escorted out of the cave. They had spent 24 hours in the cave; the rescue was completed in four hours. After an on-scene medical evaluation, the teens were released to their parents.

1. Alexander Deedy, "Officials rescue men trapped in cave," <http://helenair.com>, 21 August 2014.
2. Duncan Adams, Incident Report, 22 January 2015.

Comments: The teens said they had successfully used this "vertical system" once before in the cave. Hopefully now they understand the limits and dangers of their system and will seek out appropriate vertical caving training.

3 September Pettyjohns Cave, Georgia stranded, aid, no injury

Three men entered the popular Pettyjohns Cave for a day of recreational caving. When one of the men was unable to negotiate an 8-foot climb on the way out, one of the other men left the cave to call for help. Rescue crews responded to the 2:00 a.m. call, already exhausted from fighting a fire for most of the day. Once the man was helped up the climb, however, he was able to exit under his own power.

1. Josh O'Bryant, "Man rescued from Walker County cave," www.northwestgeorgianews.com, 3 September 2014.
2. Hannah Smith, "Man rescued from Pettyjohn's Cave in Walker County," www.timesfreepress.com, 3 September 2014.

Comments: A local Walmart, which normally closed at 11:00 p.m., opened its doors to supply water for the rescue crews. Walker County CERT coordinator Mary Perry said, "We have been building relationships with restaurants and businesses here and this is the first time we had to use it and it worked."

11 September Sausage Cave, Tennessee caver fall, injury and aid

When a 59-year-old caver slipped and fell 10 feet in Sausage Cave, six agencies responded. A staging area for rescuers was established, but a mile of travel was still required on a hiking trail to a steep ravine.

The cave's entrance is located in a bluff with a short, steeply downslowing horizontal crawl ending at a 15-foot vertical drop. The reporting party met the rescuers at this drop and led them to the patient, who was located two drops further into the cave. The patient was located at the bottom of a 12-foot pit and appeared to have pelvic injuries. As a medical team assessed the patient, plans were made for extrication.

A narrow, 30-foot vertical slot presented the biggest challenge, so a team was assembled to begin microblasting the tighter portions. This work began at 11:30 p.m. and was completed around 1:30 a.m. the following morning. This was especially dangerous work for the team, as the blasting was done in very tight quarters.

Patient transport began around 2:00 a.m. The patient was hauled up the 12-foot pit with a counterbalance raise. The next section of cave was a horizontal, but narrow, canyon. It took one hour to move the patient less than 50 feet through it. A 3:1 haul system then raised the patient up the 30-foot slot. This too was slow going due to the considerable space constrictions. Even after two hours of blasting, some sections were only 20 inches wide.

After being raised up the 15-foot pit, the patient was out of the cave shortly before 5:00 a.m. and placed in the care of waiting EMTs. He was later diagnosed with two pelvic fractures and a broken rib.

1. Bill Mitchell, "Hamilton County Volunteers Help in a Cave Rescue," www.wdef.com, 12 September 2014.
2. Brad Tipton, Incident Report, 23 September 2014.

Comments: This incident highlights the importance of having skilled microblasters as an available cave-rescue resource. This technology in skilled hands can help to make the impossible possible.

30 September unspecified cave, Texas equipment problem, injury, no aid

On 30 September, Jim "Crash" Kennedy (53) and Bill Larsen (57) went to a cave in Bexar County on a scientific work trip to collect invertebrates. Both cavers were well-prepared for the trip, and they had more than 40 years of caving experience each. Larsen had been to the cave before, and Kennedy had not. The gated cave entrance is at the base of a sinkhole and has a short 25-foot drop just inside the gate. Cavers typically rig the pit outside the cave, then run the rope through the gate and down the pit. Kennedy and Larsen rigged the pit in this way and then clipped the rope through an existing deviation that would allow the rope to hang in the middle of the pit.

The deviation was rigged with a carabiner and a piece of webbing; the webbing was anchored in a ceiling crack—possibly to a chockstone. Neither Kennedy nor Larsen got a good look at the anchor in the ceiling, but Kennedy tested it several times, then weighted it and found that it held. Kennedy proceeded down the drop and had gone less than 10 feet when the deviation anchor failed. This caused him to swing hard into the wall, then slide and scrape down it for a few feet as the slack from the deviation came out of the rope. Kennedy was using a mini-rack rappel device and did not lose control of the rappel. He stopped and did a quick self-assessment, found that nothing was broken or dislocated, then continued to rappel to the bottom of the pit.

The impact was so hard that it shredded Kennedy's right elbow pad and tore his t-shirt across his back. He had severe contusions and abrasions on his right elbow and left triceps as well as scrapes to his back. Larsen, who was still at the top of the pit, asked Kennedy if he was OK and if he wanted to leave the cave. Kennedy thought that he could continue, but he then encountered bad air after traveling only about 15 feet. Since they would have to leave the cave anyway, Kennedy ascended the pit, and he and Larsen derigged the rope and left the cave. Kennedy cleaned his scrapes at home and did not seek medical treatment. Larsen did not remember the deviation from his previous trip to the cave, but said it was possible that it could have been there. The cave is gated, and access is restricted, but the cave does see some traffic, generally by experienced people. Kennedy and Larsen felt they had no reason to suspect bad rigging.

1. Jim Kennedy, Facebook post, 2 October 2014.
2. Jim Kennedy, phone communication, 5 February 2015.

Comments: This accident could have been worse if Kennedy had not maintained control of his rappel. A less experienced vertical caver may have let go with the brake hand after such an impact. Kennedy's elbow pads also prevented his injuries from being worse. When using existing rigging, inspect the anchor and be sure that you trust it. Kennedy did test the deviation before rappelling on it, but the anchor still failed partway into his rappel. If he and Larsen had been able to inspect the anchor in the crack, they may have decided not to trust it. It is not known what the anchor was and what exactly failed. Deviation anchors can see significant forces and should be inspected before use.

3 October

Butler Cave–Sinking Creek System, Virginia caver fall, no injury, no aid

During a survey trip to push leads in the Complaint Section of the Butler Cave–Sinking Creek System, Tony Canike (51) left his group to check a lead. He found a 10-foot climbdown with a big passage below. Since the climb looked easy, he proceeded down, maintaining three points of contact. At one point, both of his feet occupied the same foothold, 6 feet above the floor. The foothold broke and Canike fell, landing on his back. Unhurt, he was able to climb out and suggest that his team rig a handline before exploring that section further.

1. Tony Canike, Incident Report, 11 January 2015.

Comments: Maintaining three points of contact for safety comes naturally to experienced cavers. But as Canike points out, "The three points of contact rule doesn't help much if both feet are on the same hold, one hand is on a not-very-positive hold, the other hand is finding a new hold, and the foothold breaks."

12 October Run to the Mill Cave, Tennessee lost, no injury, no aid

On the last day of the 2014 TAG Fall Cave-In, nine cavers with varying amounts of vertical experience visited Run to the Mill Cave on a permit from Southeastern Cave Conservancy, Inc. One caver elected to remain on the surface while the other eight entered the cave at 4:00 p.m. The cave starts with four short drops followed by a 100-foot-long passage filled with waist-deep water and a 30-foot drop—all before arriving at the cave's biggest drop of 167 feet, which is known as Tilted Well. Some of the cavers planned to turn around after the last drop, while others would continue to explore the river passage beyond the bottom of Tilted Well.

After the waist-deep water, one caver became very chilled and decided to turn back. She left the group, leaving seven people in the cave. After all seven had rappelled Tilted Well, one male and one female caver decided to start climbing out. A second female decided to climb out also, but this may not have been communicated to the other two cavers. The four cavers at the bottom waited until they heard the last climber call off rope at the top. They then traveled farther into the cave. After their explorations, they began climbing out, pulling up the ropes behind them and carrying them out of the cave. When they reached the surface, they realized that the second woman who had ascended Tilted Well was not accounted for.

At this point, the cavers were not sure if the missing caver was lost in the dark on the surface or still in the cave. The group split into teams to search the surface and check the cave. One person was stationed at the entrance. The two cavers entering the cave focused their search on side passages between the entrance and the top of Tilted Well. A little past 2:00 a.m., the two-caver search party in the cave made voice contact with the missing caver. She was off the main route and the two cavers could not find a way to get to her. While one caver continued to try and reach her, the other went to the entrance to inform the others that she had been found. Upon his return with an extra caver, they found the missing caver being escorted out. She was tired and cold but moving under her own power.

The other cavers helped her get on rope at each of the drops, and although she had trouble with some of the lips, she made it out unassisted a little after 4:00 a.m.

1. Compiled from trip reports sent to Buddy Lane, Run to the Mill property manager.

Comments: When the missing caver reached the top of Tilted Well,

the two cavers in front of her had already gone ahead. She found her way to the next rope and ascended to the top but got lost between there and the water section. It is not clear if the male leading this small group knew he was leading two other people out. The female in the middle was inexperienced and probably did not know to communicate this or stay in voice contact with the female behind her. When large caving teams start to break up and go separate ways or head for the surface at separate times, it is good for everyone to be clear on the plans and make sure every caver is accounted for in the new plans.

23 October
Happy Top Horror Hole, Tennessee
rockfall, no injury, no aid

Jon Mnich (28) and Noah Landreth were anxious to get back to the surface after a 10-hour day of surveying. While negotiating his way sideways through a narrow shale canyon, a large piece of the wall dislodged and landed on Mnich's shoulder. Landreth helped him remove it so that it would not fall further onto Mnich's legs.

1. Jon Mnich, Incident Report, 27 January 2015.

Comments: Mnich had been through this passage several times before without incident. He attributes being in a hurry and putting too much force on the shale as contributing factors.

9 November
Fault Cave, Colorado
stuck, aid, no injury

A student from the Colorado School of Mines entered Fault Cave while hiking with a group and became stuck. The Golden Colorado Fire Department responded and had the student out within 45 minutes. This is a popular cave with the locals.

1. Web staff, "Student stuck in cave in Clear Creek Canyon rescued safely," <http://kdvr.com>, 9 November 2014.

28 November
Raccoon Mountain Caverns, Tennessee
caver fall, injury and aid

A woman on an off-trail caving tour fell and broke her arm in a section of the cave called the Elvis Room. Rescue crews brought her out of the cave in less than four hours.

1. WRCB staff, "One person rescued from cave on Raccoon Mountain," www.wrcbtv.com, 28 November 2014.

2014 Cave Diving Accidents and Incidents

28 June
unspecified karst spring, New Mexico
other (difficulty exiting), no injury, no aid

To explore a karst spring in Sandoval County, cave diver Bill Mason was accompanied by an open-water diver and three cavers for support. Mason dove to minus 60 feet in less than 30 minutes. After his dive, he had a great deal of difficulty exiting the spring.

The opening to the spring at ground level measures about 1 by 4 feet. Four feet below the surface is a ledge that a person can stand on. The ledge creates another constriction before the passage bells out, dropping 7 feet to the water below. When Mason attempted to climb back up the funnel, he found that without gravity on his side, he could not get up the lower constriction with his tanks on. Due to CO₂ bubbling up from the water, it was not safe to remove his equipment and breathe the air in the pit. After several attempts, he decided to drop his PFD and hand his tank up to Dave Decker while still breathing from the tank. Decker had to hold his breath as he reached down to grab the tank.

One hour later, Mason completed another dive but had a plan for an easier exit. This time he dropped his tanks and used a pony bottle air tank at the surface with a 7-foot-long regulator hose for the climb out.

1. Dave Decker, personal communication, 14 July 2014.

4 November
Jackson Blue Spring, Florida
other, aid, no injury

Two cave divers survived an incident in which a navigation error almost caused them to run out of breathing gas before making an exit. The two were using dive propulsion vehicles (DPVs, or scooters) to propel themselves into the cave. They were carrying their main two tanks in side-mount configuration, and they were also carrying two additional tanks in what are called stage bottles to extend their gas supply.

Their planned return trip was to be on the main line, which is also called the gold line. Florida caves usually have a gold-colored line running through the main portion of the cave to guide divers in and out. Side

tunnels that have been explored have white lines that usually do not connect to the main line so that divers exiting in reduced visibility will not be confused as to which line to follow. When divers intentionally go to a side tunnel, they connect this "jump" with a temporary line that they bring with them.

Approximately 2,300 feet from the cave entrance, in a section of the cave called the Trash Room, the gold line takes a sharp left turn, and there is a jump straight ahead called the Rabbit Hole bypass. It is a rarely used jump that is not on most maps. It is a tight and silty passageway that requires advanced cave-diving skills. Traveling with scooters, the two divers lost track of the gold line during their exit and continued into the Rabbit Hole bypass without realizing they had made a jump.

The first part of the passage is much like the main passage and is easily navigated with scooters, but when the divers reached a restriction, their scooters and four tanks each were too much for the space. The environment is very silty there, and the two divers caused a silt cloud that reduced visibility to zero. The lead diver found himself in a position in zero visibility where he could not navigate back with all his gear. The second diver was able to exit the side passage, where he returned to the main line and exited the cave in hopes of getting help. After a while, the visibility cleared slightly, and the lead diver was able to get back to the gold line and begin his exit.

Not certain that he had enough breathing gas left to make the exit, he went to where he knew another diver had stashed a safety bottle. He found it and continued his exit. As he was about to enter the cavern zone, he was met by diver Edd Sorenson, who had been called to assist. The lead diver and Sorenson were later joined by his original buddy, who also returned to help. The three exited the water without further incident.

1. Oliver Albrecht, e-mail communication, 31 December 2014.
2. Edd Sorenson, phone communication, 1 February 2015.
3. Interview of lead diver by John Adsit, 11 March 2015.

2014 Caving-Related Accidents and Incidents

14 February

New Hall Cave, Jamaica

attempted murder, injury and aid

A 17-year-old boy who had been missing for two days was found severely injured in a cave near Maggoty. The boy reported that two other teenagers had first tried to drown him in the cave. When that failed, they stabbed him, set him on fire using kerosene and a tire, and left him to die. Two youths were soon taken into custody. Later reports suggest that the boy and the accused may have been involved in a "lottery scamming" scheme that turned violent.

1. Alicia Sutherland, "Monstrous cave attack!" www.jamaicaobserver.com, 21 February 2014.
2. Staff, "Bunting says Manchester cave attack linked to lottery scamming," www.jamaicaobserver.com, 22 February 2014.

4 March

Pertle Spring Research Cave, Missouri

infant found dead

Two biology students from the University of Central Missouri were conducting research on wintering snakes in a cave in the Pertle Springs Recreational Area when they discovered a broken lock to the cave. Inside they found a pile of burned trash and reported the vandalism to police. The police took a statement from the students but did not investigate further. Two days later the students returned to their research site and noticed an "awful smell." On further inspection of the trash, they discovered the remains of an infant's body.

Nineteen-year-old Latasha Wilson and 20-year-old Zakary Carter were charged in the case.

1. Heather Staggers, "Infant's body found near University of Central Missouri campus," www.kctv5.com, 6 March 2014.
2. Staff, "Two arrested after baby found dead in cave," www.kake.com, 8 March 2014.

Comments: It is unfortunate that the police did not investigate the cave break-in and vandalism themselves. One of the research students reportedly was traumatized by the gruesome discovery.

17–24 May

multiple caves, Colorado

various injuries

During the NCRC National Seminar in Divide, Colorado (at 9,000 feet elevation), students and one instructor received minor injuries during the course of the eight-day cave-rescue training. Reported problems include headaches due to altitude, a minor ankle sprain, an arm sprain, exacerbation of a chronic back problem, and a puncture wound to the hand from a branch while traveling to the caves. There were also reports of a lingering respiratory infection and a case of iritis (inflammation of the iris of an eye) after the seminar, although it is not clear if these conditions are related to the seminar. According to Dr. Stephen Mosberg, Medical Coordinator for the NCRC, this seminar had fewer injuries and illnesses than usually occurs at these seminars.

1. Dr. Stephen Mosberg, NCRC Medical Coordinator Follow Up Report for the 2014 National Seminar.

Comments: The national seminars of the NCRC typically involve around 80 students and 30 instructors working in difficult and challeng-

ing situations, both above and below ground, throughout the week. Instructors and students make safety the highest priority and work to mitigate risk all week, but minor injuries are always a possibility.

3 June

Swimming Hole Pit, New Mexico

attacked by Africanized bees

Ken Harrington (70) and Dave Belski (77) were examining a series of sinkholes in Eddy County. The sinkholes are formed by water coming up from below and dissolving gypsum, leaving pits or collapses. When they arrived at Swimming Hole Pit, Harrington worked his way down to the water while Belski explored the other side of the pit. Belski called for Harrington to join him to see some deep crevices where the edge of the pit was calving off.

As Belski slid down into one of the cracks, he stirred up an unseen nest of Africanized bees. They first began to chase and sting Harrington, and then they went after Belski. Both men ran for the safety of their truck and proceeded to kill the bees that had followed them in. In his trip report, Harrington quotes Belski: "I got stung four times. One on the lip, two on the arm, and one on the top of my head. I swallowed one and had several try to take up residence in my ear." Luckily neither man had an allergic reaction.

1. Dave Belski and Ken Harrington, "Round Pit and Swimming Hole Pit, Eddy Co. June 3, 2014," *Southwestern Cavers*, 52(4), July-August, 2014.
2. Ken Harrington, e-mail communication, 12 January 2015.

Comments: Harrington and Belski have mapped more than 500 cave and karst features in Eddy County, and have run into bees only one other time. In both incidents, the bees pursued them all the way to their vehicle and continued to swarm even when they were inside the vehicle. Africanized bees can be extremely aggressive and even deadly to persons who may have an allergic reaction to their stings. Africanized bees are spreading across the southwestern United States; see <http://www.ars.usda.gov/Research/docs.htm?docid=11059&page=6> for more information.

26 July

Retirement Cave, Jamaica

body found in cave

A 73-year-old-man with Alzheimer's disease was missing after he wandered away from his home on 12 July. On 26 July, a family member found the man's slippers at the edge of a pit. The man had fallen, or was pushed, and was 150 feet down in a tight spot, deceased. When the local fire department could not remove the body, they contacted the Jamaica Caves Organization. Due to lack of room to maneuver and the body's state of decomposition, even the cavers could not help. Authorities decided that the body would be brought out at a later time.

1. Staff, "Man's decomposing body remains stuck in cave," www.jamaicaobserver.com, 26 July 2014.
2. Ronald Stefan Stewart, e-mail communication, 19 October 2014.

17 August

Lamberts Cave, Minnesota

stranded, injury and aid

"The smoke built up. I was burning everything I could find down there. I was in and out of consciousness the entire time."

Travis Bungum (18) was looking for Lamberts Cave with friends when they left him without any gear or supplies. Using only his cell phone and two lighters to light his way, he fell down the 20-foot-deep entrance shaft.

He somehow managed to get a cell phone signal and call his girlfriend moments before his battery died. While rescuers searched for the cave, Bungum said, "I scavenged for whatever I could burn to start a fire for heat. I was trapped. I was fighting to survive." The fire filled the cave with smoke and raised the levels of carbon monoxide.

First responders tried to contact local cavers for advice and assistance, but the incident occurred during the weekend of the Minnesota Speleological Society's annual "Corn Feed" get-together, and all of the cavers on the call-out list except one were at the event in a deep valley with no cell phone coverage. The one caver who did not attend had his phone turned off for the evening. When St. Paul firefighters arrived, they were able to pull Bungum out without much difficulty.

Bungum was taken to the hospital and treated for a fractured arm, cuts, bruises, smoke inhalation, and carbon monoxide poisoning.

1. Megan Stewart, "Young Minnesota Man Trapped in 300-Foot Cave Rescued by Firefighters," www.kaaltv.com, 17 August 2014.
2. Melissa Turtinen, "Teen rescued from St. Paul cave thought he was going to die," <http://bringmethenews.com>, 19 August 2014.
3. Calvin Alexander, e-mail communication, 19 August 2014.
4. Greg Brick, e-mail communication, 16 January 2015.

Comments: Lamberts Cave is an artificial cave in the St. Peter Sandstone. It was used both as a silica mine and for growing mushrooms before being abandoned more than 30 years ago. The entrance to the cave is described as very easy by local cavers; one can freely climb in and

out, and there are several handlines rigged to trees. In the dark, however, Bungum did not see the cave and fell in. Building fires in caves is generally not a good idea and has led to fatalities here in the past.

12 October

Smugglers Cave, California

stranded, injury and aid

Three people who were illegally cliff diving from Sunset Cliffs could not exit the water due to waves and backwash. They were able to take refuge in a sea cave known as Smugglers Cave and wait for rescue. With the tide rising, rescue crews had to rappel to the stranded swimmers. Two were lifted in harnesses, but one swimmer was injured and was hauled up in a stretcher.

1. Staff, "Sea Cave Provides Refuge for 3 Struggling Sunset Cliffs Jumpers," <http://obrag.org>, 13 October 2014.
2. Dominic Garcia, "3 rescued from sea cave near Sunset Cliffs," www.cbs8.com, 13 October 2014.

Comments: One local noted that "*Smugglers Cave, also known as Pirates Cave, once had a manmade entrance tunnel that led up to the parking lot. It was filled in by the city many years ago. If that entrance had remained as a locked gate, then the massive amount of manpower and rescue gear wouldn't have been needed on Sunday. Just one person with a key would have been needed to let the swimmers out of the cave.*"

Previously Unreported Caving Incidents

12 March 1963

Nickajack Cave, Tennessee flooding, aid, no injury

On 12 March, 1963, several southern states were hit simultaneously with tornados and floods. States affected included Mississippi, Alabama, Tennessee, Kentucky, and Virginia. In a summary of the destruction, The Spokesman-Review mentions that a group of Boy Scouts needed rescuing from Nickajack Cave. The nine Scouts from Atlanta were trapped by rising floodwaters but were eventually rescued by the Tennessee Highway Patrol.

1. Associated Press, "Damage High in Kentucky: 12 Are Killed in Floods, Tornado Lashes Alabama," *The Spokesman-Review*, no.303, 13 March 1963.

Comments: Four years after this incident, a significant portion of the cave was permanently flooded after completion of the Nickajack Dam and creation of Nickajack Lake.

1970

Knox Cave, New York equipment problem, no injury, no aid

Brad Smith (20) was climbing a rope ladder in Knox Cave when it suddenly became untied at the top. Smith fell 18 feet and landed on his back. Fortunately, he landed on his pack, which was stuffed with a wetsuit, and he sustained no injuries. Smith said the incident most likely occurred due to someone changing the rigging.

1. Brad Smith, Incident Report, 15 July 2014.

1982

unspecified cave, Alabama stranded, injury and aid

Melanie Felker recalls one of her first caving trips with a group of 20 people from Auburn University. Early into the trip, one male twisted his

ankle and was unable to exit the cave without a 12-foot handline. The group leader suggested that Felker, who was the only female on the trip, stay and "take care of" the patient while everyone else exited the cave to get help. The leader also took the patient's and Felker's only light sources, since "they wouldn't need them." Felker and the patient sat in total darkness for more than two hours until the group returned with a handline.

This experience left Felker "not very fond of caves."

1. Melanie Felker, personal communication, 15 July 2014.

1995

Solution Rift, Tennessee acetylene-related, injury, no aid

In 1995, a group of cavers using carbide lamps was attempting a through trip in Solution Rift. At some point during the trip, unbeknownst to him, Tom Kocher's carbide dump bag leaked in his caving pack, which also contained his wetsuit. Kocher put his wetsuit on for a particularly wet section of the cave and then started a 186-foot rappel down Confederate Well. Partway down the drop, he felt a terrible burning sensation. At the bottom, he hastily removed his wetsuit to find severe burns covering his arm. Ron Adams provided him with two nylon football jerseys (Adams's preferred clothes for caving) since Kocher's caving shirt was also contaminated. This incident left Kocher with permanent scarring.

1. Ron Adams, Incident Report, 16 July 2014.

14 July 1996

Newell Street Cave, New York stranded, aid, no injury

In July of 1996, two young men vandalized a brick wall to gain entrance to a cave system under Watertown, New York. When their only flashlight died, they became lost. For the next two days, the men crawled around (backward to avoid dropoffs), trying to follow the sounds of traffic. They burned \$70 worth of bills to light their way, but still could not

negotiate the last 175 feet of passage to the entrance. Police eventually found them and led them out, hypothermic and wet. The cave system was again sealed to prevent future accidents.

This incident escaped the attention of *American Caving Accidents* in 1996, but a recent occurrence brought it to light. Members of the Niagara Frontier Grotto recently approached the city of Watertown to request special permission to survey the caves under the city. During their first trip in September 2013, cavers discovered a very old wallet containing a learner's permit for Joseph P. Sweet. The cavers remembered hearing of two men who had been lost in the caves years before and knew the wallet must belong to one of them. They contacted Sweet, and his wallet with all of its contents was returned to him—17 years after he last saw it.

1. Craig Fox, "For 16 years, local man's wallet was buried in one of Watertown's caves," www.watertowntdailytimes.com, 10 September 2013.
2. "Man Trapped In Cave In 1996 Reunited With Wallet," www.wwnytv.com, 16 September 2013.
3. Chuck Porter, e-mail communication, 17 September 2013.

Comments: Newell Street Cave has also been known by the names Beer Cave and Ice Cave.

July 2001 unspecified cave, Kentucky caver fall, injury, no aid

Terry Chambliss (19) was on one of his first caving trips during the 2001 NSS Convention at the Great Salt peter Preserve. As Chambliss was about to exit a crawlway, the caver in front of him stood up and stepped on Chambliss's hand. When Chambliss pulled back, he lost his balance and slid 15 feet down a mudbank. In the process, he sprained an ankle and dislocated his left shoulder. His companions helped him out of the cave, and an EMT on the trip was able to reset his shoulder once they exited the cave.

1. Terry Chambliss, Incident Report, 14 July 2014.

Comments: Despite this unpleasant experience at his first NSS Convention, Chambliss has attended all but one Convention in the last 14 years.

3 November 2005 Continental Country Club Bottomless Trash Pit, Arizona skunk encounter, no injury, no aid

Members of the Northern Arizona Grotto led a number of new cavers from Northern Arizona University on an introductory caving trip. The grotto president led the way with three young women following her. They entered through the cave's small entrance and began working their way down a 150-foot-deep crevice, using numerous ledges to work their way down.

A caver/wildlife biologist removes a skunk from Continental Country Club Bottomless Trash Pit in Arizona after it was accidentally knocked from its ledge to the bottom of the cave. Photo by Bob Goforth.



Along the way, one of the women dislodged a striped skunk that was occupying a ledge. The skunk fell on her helmet and then tumbled further down the passage. The inconvenienced skunk then filled the cave with its spray. Cavers still at the surface heard screams, which were immediately followed by the telltale smell of skunk wafting from the entrance. One of the new cavers happened to be a wildlife biology student who was studying rabid skunks. He entered the cave and removed the skunk.

1. Bob Goforth, e-mail communication, 13 June 2014.

Comments: Striped skunks can spray with incredible accuracy up to 16 feet. Their spray is a mixture of sulfur-containing chemicals; being sprayed in the eyes can cause burning and temporary blindness. Skunks do not generally spray their entire supply the first time and are capable of spraying multiple times. It is generally unwise to handle wildlife, and some attempts to "rescue" wildlife from caves can be misguided.

8 November 2009 unspecified cave, Missouri lost control on rappel, injury, no aid

"Thirty feet is not enough time to react."

Kirsten Alvey-Mudd and five others were visiting caves in Pulaski County. Their plan was to first visit a cave in a bluff that requires an 80-foot rappel to access and then to rappel another 30 feet to the base of the cliff, pull the rope, and hike to other nearby caves.

For the second rappel, Mudd got on rope using a Petzl Stop bobbin-style rappel device. Although she was more familiar with a rappel rack, she had used a bobbin at least a dozen times before. When Mudd weighted the rope, she free-fell to the bottom. Upon hitting the ground, she rolled another 20 feet to the river's edge and was stopped with a quick snap when the bobbin caught the knot at the end of the rope. Believing her injuries to be minor, she encouraged the others to continue with their trip while she and one other person made their way back to the vehicles, where they would wait.

When they reached the vehicles, Mudd pulled off her boot to examine her foot. When she removed the SealSkinz sock that she was wearing, she found her foot soaked in blood and bleeding profusely. Her companion left a note for the others and drove her to the nearest hospital. Mudd spent the next nine days in the hospital and has undergone more than a half-dozen surgeries to repair fractures and a crushed heel and to deal with vascular complications. She also suffered second- and third-degree rope burns on both hands.

A later inspection of the bobbin revealed it to be in working order. Mudd contacted the manufacturer, who suggested that her chest may have depressed the bobbin's handle, preventing the auto-stop feature from engaging. Mudd warns that other "bigger-chested" women should be conscious of this.

1. Kirsten Alvey-Mudd, personal communication, 16 July 2014.

Comments: Mudd was operating the Stop without a braking carabiner, which would have created more friction. When using a bobbin-style rappel device, maximum friction is achieved by pulling upward on the brake end of the rope against the braking carabiner.

16 February 2011 Barton Creek Cave, Belize fatality, drowning

Barton Creek Cave is a popular tourist cave where the tourist portion of the cave consists of a canoe ride that goes 0.6 miles into the cave and then returns by the same route. Each canoe holds either two or three people, and each person is given a hardhat and a life vest. A 25-person tour group, organized by Cayo Adventure Tours, was split into four smaller

groups, each with its own guide. At 11:30 a.m., one canoe crashed into a rock embankment and capsized about 1,200 feet from the entrance of the cave. Canadian Mildred Ilene Lines (83), who was not wearing her hardhat or life vest, drowned. Her canoeing companion was rescued.

1. "83 Year Old Tourist Dies," www.7newsbelize.com, 16 February 2011.
2. Marion Ali, "Tourist drowns during cave expedition," www.chanel5belize.com, 16 February 2011.

Comments: Michael Simmons, owner of Cayo Adventure Tours, said life vests were offered to all members of the group, but Lines was one of a few who refused to wear the vest. He said that Lines and the other occupant of the canoe had paddled ahead of the group against the guide's instructions. The victim apparently tried to avoid a collision with the walls of the cave, but when she tried to push herself away from the wall, she caused the canoe to flip, and she fell into the water.

October 2011 War Eagle Cave, Alabama difficulty on rope, no injury, no aid

Two groups of cavers met up for a day trip to War Eagle Cave. At the entrance, two people decided to remain on the surface while four cavers descended the 120-foot pit. After a short trip downstream, a male and female caver decided to climb out first. The other two cavers, Glen Kuehner and Mike Peery, headed upstream while they waited for their turn on rope.

After caving for 45 minutes, Peery and Kuehner returned to the bottom of the drop and heard shouting. The male caver had ascended the pit first and was shouting to the female. She was 20 feet off the floor on a ledge. The echo in the cave made communication difficult. Peery and Kuehner were able to decipher that she was experiencing a migraine headache and was attempting to eat to alleviate the symptoms. At this point the group determined that she would not be able to exit the cave under her own power.

Getting on rope to ascend to her location did not seem to be a good option, as the lower weight would pull her from the ledge and possibly make the situation worse. Peery and Kuehner proceeded to talk her through a changeover, though communication was difficult due to the echo. Once on the bottom, the woman was fed and hydrated. Kuehner climbed out to build a haul system. Peery remained with her to help her get on rope safely and to provide a tag line to keep her away from the ledges during ascent.

Kuehner had a small party rope kit with enough gear to create a 9:1 mechanical advantage haul system. The woman's companion argued that the haul system be changed to a 3:1, and Kuehner eventually conceded. However, this required the topside cavers to assist with the haul. Rope pads placed at three significant rub points would not stay in place, and the friction made the hauling difficult for the four cavers. Inspection of the Talon rope after the woman was removed from the pit showed significant sheath wear, but Peery was able to ascend the pit without incident.

1. Glen Kuehner, Incident Report, 30 October 2013.

Comments: Kuehner, an NCRC instructor, and Peery, a former NCRC instructor, were able to effect an efficient small party assisted rescue

(SPAR) response for the incapacitated caver. The equipment needed to build the haul system came from one caver's pack.

2012 Blue Spring Cave, Tennessee caver fall, injury, no aid

Donna Cobb (45) and others were heading out of Blue Spring Cave after an eight-hour trip in the early winter of 2012. As Cobb was exiting a long crawl, she leaned out to hand her pack to her companion Kelly Norwood. As she leaned forward, she slipped and began to fall headfirst. During the 12-foot fall, she somehow managed to flip over and land on her feet. Norwood described the scene by saying that Cobb "flipped in mid-air and landed on her feet like a monkey."

Cobb felt like she had sprained her right knee, but she was able to hobble the rest of the way out of the cave. Later that evening, she wrapped her knee in an ACE™ bandage and iced it down. Two weeks later, she was still limping, so she went to her doctor for an x-ray. The images showed she had fractured her tibia. She was on crutches with a soft cast from mid-thigh to ankle for the next 40 days.

1. Donna K. Cobb, Incident Report, 15 July 2014.

Comments: Exiting a crawlway feet first where the crawlway opens into vertical space may be better than head first, but it is always an advantage to have the reflexes of a monkey.

12 April 2012 Mill Creek Pit, Tennessee rockfall, injury, no aid

Michael Tenant (42), Ben Miller, Dan Lamping, Clinton Barber, and Cody Munday were surveying a 90-foot-deep side pit in Mill Creek Pit. When Tenant rappelled into the pit, he noticed that the walls appeared to be unstable. Thirty feet down, after passing through a panhandle-shaped slot, he heard "the unmistakable crack of rocks popping off the wall." The slot above him helped protect him from most of the estimated 50 to 80 pounds of rock that fell. However, several rocks did hit him, and he was knocked upside down while on rope. Attaching his upper ascender and QAS, he was able to right himself, although this was difficult due to extensive injuries sustained by his left arm and hand. After performing a changeover using only one hand, he was able to slowly climb out and exit the cave unassisted.

1. Michael Tenant, Incident Report, 9 July 2014.

Comments: Changeovers are considered an essential skill for vertical cavers, because practicing them teaches you how your gear works and some of the ways that it does not or cannot work. The weight transfers inherent in a changeover are the building blocks of the skills needed to cross knots and rebelays and to perform pickoffs. Cavers rarely have to perform changeovers in real situations, but this incident is a good example of why you might need to. Tenant was surely familiar with his gear and how it works, since he was able to safely perform a changeover and climb out one-handed. Practice pays off.

Previously Unreported Cave Diving Accidents and Incidents

14 June, 2008 Devils Ear, Florida fatality, unknown cause

On the morning of June 14, a dive instructor and his student checked in at the desk at Ginnie Springs. The student was taking a Basic Cave

course, so both he and the instructor were required to sign a student liability waiver for the site. The two of them did two short training dives that morning. At about the same time, Shannon Lewis (20) went to a local dive shop, rented some equipment, and had her tanks filled with 32% nitrox. She then went to the Ginnie Springs desk and registered there as a Basic Cave diver.

At the Ginnie Springs site, Lewis met the instructor and his student. Whether that meeting was planned is in dispute. The instructor was also Lewis's instructor when she completed her Basic Cave certification the previous December.

All three divers entered the water near the steps leading to the springs and completed the standard pre-dive safety drills there. They then proceeded to the spring known as the Devil's Ear to enter the cave. The Ear is an opening that descends straight down into the cavern area to a depth of approximately 50 feet. It then turns toward the cave and slopes at a gentle angle until it reaches the main line of the cave. The distance from the chimney to the main line of the cave is about 60 feet, and the depth at the stop sign is about 70 feet. Near the top of the Ear, at a depth of about 18 feet (depending upon the level of the river at the time), a log lies horizontally across the opening. It is regularly used by divers completing their dives as a resting place to do decompression or safety stops. Some people refer to it as the deco log.

The student was leading the dive, Lewis was second, and the instructor was in the rear. The student entered the sloped area and was heading toward the main line in the cave section when he noticed a flashing light signal. He turned and saw Lewis pointing to her ear, which normally indicates trouble equalizing the pressure. He returned to the area just outside the chimney and waited while the instructor accompanied Lewis into the chimney area. The instructor's computer later indicated that he went to the base of the chimney area, and he said that he watched Lewis reach the log above him, where she turned and waved to indicate that he could go. The instructor and student then continued with their training dive.

When the instructor and student were done with the dive, they surfaced to find that Lewis had been found by others unresponsive at the log and had been taken to the hospital. Police activity ensued, as the investigation began and statements were taken. During this time, police opened Lewis's car and found that she was taking prescription medications for inner ear infections in both ears. After a number of days in the hospital, Lewis died.

Previously Unreported Caving-Related Incidents

4 February, 2004

Hutchinsons Hole, Jamaica fatality, fell into pit

In early January of 2004, the Jamaican Caves Organization (JCO) was contacted by a landowner about exploring a deep cave on the landowner's property. In the initial e-mail, the landowner casually mentioned that there was a rumor of a body in the cave. The JCO was interested in visiting the cave but suggested that the landowner first contact the police. The police claimed that firefighters had already rappelled more than 500 feet into the cave and still could not see the bottom. The JCO highly questioned this, as they knew the cave (which is well known for historical reasons) to be closer to 325 feet deep.

In case they did encounter a body, the JCO tried to procure a body bag. The police did not have any, and a funeral home would give them one only if it was granted the funeral business. The cavers did not really expect to find a body, so they did not pursue this.

On 1 February, cavers Ivor Conolley, Mark Bellinger, Delroy Williams, and Ronald Stefan Stewart assembled at the entrance to the cave. Crowd control quickly became an issue as dozens, then hundreds of spectators gathered around the entrance pit. Stewart rappelled first, and 60 feet from the bottom, he knew that there was in fact a body in the bottom. While trying to overcome nausea from the smell, Stewart waited for Conolley to join him. The body of Carlton Rose had probably been in the cave for three months.

At the request of the police, the cavers removed a piece of evidence for identification purposes. However, they were unable to remove the body with the equipment on hand. They returned on 4 February with a body bag (supplied by a funeral home) and brought Rose's remains to

1. Monica McLeod, Incident Report, 4 January 2014.
2. This report was researched and written by John Adsit, who interviewed several persons involved with this incident, including the dive instructor, the student, the dive shop owner, and an expert witness.

Comments: This incident has created a heated debate among the cave-diving community. Some claim that Lewis was a student of the instructor at the time of the accident and that he should therefore be liable for making sure she exited the water safely. An instructor with a student has a very different responsibility legally than an instructor diving with a certified diver who is tagging along. According to her certification dates and the paperwork she signed the morning of the incident, there is no indication that Lewis was a student on 14 June, 2008. All indications are that she was a solo diver and was following the other group.

2009

Guy James Cave, Tennessee equipment problem, no injury, no aid

Christina Richards was helping to survey Guy James Cave when she experienced a problem with her right regulator. A defective O-ring on the regulator's swivel unexpectedly caused free-flowing bubbles to envelop her face. She describes the event as, "Suddenly it was like being underwater in a hot tub, on high." When she began to panic, her dive buddy assisted and helped her switch to her left regulator. The swivel was later recalled due to many incidents of a similar nature.

1. Christina Richards, Incident Report, 15 July 2014.

Comments: Richards said this incident is a good reminder for divers to practice for gear failures underwater.

the surface.

1. JCO Press Release, "Removal Of Remains Of Carlton Rose From Hutchinsons Hole, Bensonton, St Ann, On Feb 4/04," www.jamaicancaves.org, 8 February 2004.
2. Ronald Stefan Stewart, e-mail communication, 19 October 2014.

December 2012 Sótano de las Guaguas, Mexico fatality, suicide

A man in his 20s was part of a tour group visiting Sótano de las Guaguas in the state of San Luis Potosí, Mexico. The man exited the tour bus, milled around a bit, then took off running toward the sótano, not slowing down until he hit the bottom. The body recovery was done by Cesario Cadillo and his group of cave guides. Cadillo is the local authority and guide for the area. Someone took gory photos of the body and then sold the photos to Mexican equivalents of the *National Inquirer* magazine. This put cave-rescue personnel in a bad light, as they were appearing to profit from the incident.

1. AMCS Activities Newsletter, p. 27, number 36, June 2013.
2. Bill Mixon, e-mail communication, 4 March 2015.

Comments: Cave-rescue personnel have been given bad publicity in the U.S. after someone naively talked with the media. Only designated information officers should speak with the media concerning rescue events.

Dehydration Underground

Roger Mortimer, MD NSS 26529

In this year's *American Caving Accidents*, there are two different incidents involving dehydration. In one, a group lacked enough water for a trip, and one person got to the point of mental status changes, but the group was able to organize itself and conduct a self-rescue. In the other, a medical issue prevented someone from rehydrating, which necessitated a rescue being called out, and the patient required intravenous (IV) fluids given underground.

This year is not the first time that dehydration has been a core incident in an ACA report: caving is a setup for dehydration-related medical problems. Mild dehydration in cavers is common. None of us wants to cave with a full bladder. None of us wants to carry a heavy water bottle. None of us wants to pee in the cave. None of us wants to carry a bottle of our own urine, and certainly we don't want to carry anyone else's. So we often limit what we drink to a minimum at the same time that we are physically exerting ourselves and sweating. Although anyone starting a cave trip at a water deficit might well have problems keeping hydrated underground, sometimes our common dehydration crosses a line and becomes severe.

In addition to dehydration created by caving, a stray stomach bug or a spoiled cave snack can worsen it by inducing nausea, vomiting, and diarrhea. Underground, these symptoms may hit while we are already mildly dehydrated and have fewer reserves. When we lose large volumes of water while caving, we often cannot replace it during the trip. Not only that, but when we are vomiting or having diarrhea, we also lose key electrolytes. While using dilute sports drinks or commercial rehydration solutions helps to replenish the other bits of what we are losing, they are often not easily available during a trip.

Prevention of dehydration is key. We should bring enough water to keep us hydrated during a trip. How much water is required for health is hard to say. A pint per hour is a guideline if you are exerting yourself, but requirements vary a lot depending on temperature, build, activity, and dress. A solid guideline is that if you're on a multi-hour trip and you don't need to pee, you're not drinking enough. Clear and copious urine is a sign of health underground as well as in the desert. Also, be sure that your water source is not polluted. Drinking water from inside the cave may be convenient, but it may not be safe. Bring a filter or other means to purify the water if this is your plan.

Proper clothing management also helps to maintain healthy hydration levels. Dress

in layers that adjust easily. Strip down while moving; add layers back when you stop. You want to aim for being just a tiny bit cold. People who are hot sweat a lot and lose water through evaporation. In addition to the risk of dehydration, sweating also cools the body very effectively, greatly increasing the risk of hypothermia once you stop. Hypothermia makes your kidneys eliminate more water than usual, so a person who first sweats heavily and then becomes chilled is doubly at risk for dehydration.

Monitoring your teammates is crucial to catching and treating dehydration issues early. Encourage liberal water breaks and speak to someone if you think they are sweating dangerously heavily. A badly dehydrated person will act confused or clumsy in a way that we usually associate with hypothermia. They also might feel nauseated due to the dehydration. When you see these signs, immediate action is crucial. Stop and have everyone drink. Assess how much water everyone has, and encourage appropriate sharing. Consider turning around. Bear in mind that with those nauseated by dehydration or other illnesses, small sips of water may stay down when large volumes might come back up.

Sometimes conservative measures are not enough. Packaged rehydration salts are an effort-effective way of carrying sports drinks, but they require sufficient water to activate them. Medications that help nausea and vomiting can make a huge difference. Over-the-counter medicines like bismuth subsalicylate (Pepto-Bismol) can help with nausea and even diarrhea. Others, like dimenhydrinate (Dramamine) or meclizine

(Antivert), can help with nausea but may make you drowsy. Consider getting prescription medicines like oral metoclopramide (Reglan), ondansetron (Zofran), prochlorperazine (Compazine), or—for when things are really bad—prochlorperazine suppositories. Ask your physician which medication is appropriate for you, and keep a few in your first aid kit. Anything that will help keep fluid down can save a life and prevent a rescue.

As we have seen, dehydration can be bad enough to force a called-out rescue. A well supplied medic with appropriate protocols may be able to give someone nausea medicines if they haven't been tried. Helping a patient rehydrate so that he can leave under his own power is the best outcome. If this is not feasible, then fluid may have to be given by vein. This is not easy. IV fluid is just as heavy as water bottle fluids. By the time a called-out rescue is in progress, a dehydrated patient is going to need a lot of fluid. Getting IV access will be challenging even for the experienced medic. By the time a rescue team has been called in, the chances of hypothermia are high if it has not been actively prevented. Rapidly infused cave-temperature IV fluid has the potential to drop core temperature even more. Warming IV fluid to an appropriate temperature underground is tricky.

Although IV fluid given underground can save lives, it won't arrive quickly, so the best strategy is to work hard at preventing dehydration. Take enough water when you cave. Drink water, even when you don't want to. Plan to include pee bottles as a normal part of your caving gear, and be prepared to deal with them when filled up. Match your layers to your anticipated activity level. Include antinausea and antidiarrhea medicines appropriate for you in your first aid kit. Stay hydrated, and stay safe.

New NSS Bookstore Experiment at Convention 2015

The NSS Bookstore will be exploring a new type of member service at this year's Convention: FREE SHIPPING. This year we plan on bringing the usual shirts, pins, stickers and other goodies but we'll only be bringing sample copies of each publication.

You'll be able to order your books, pay for them and we'll ship them to your home when you arrive back from Convention. If you're going straight home from convention, we'll have the books shipped when you arrive. If you're on an extended return trip, let us know and we'll ship based on your arrival date.

Some members will recognize the Society is experimenting with something that has become standard practice in other professional organizations. The practice of having books shipped has been the norm for several years for those organizations.

If the experiment goes as planned, the Society will save on shipping books to the convention and save on shipping unsold ones back to Huntsville. The cost of providing free shipping to members should be about equal to the savings. We anticipate the big benefit will be for members who don't have to lug their purchases back to their tent; cram them in the carry-on for the flight; or find room in the already packed car for the return trip home. So, let's see how this works. It will be a different shopping experience for each of us and new things often feel strange. After this year's convention we'll evaluate the experiment; if members like it, we'll look to improve it and offer even better service in coming years.

Cavers Fall

Tony Canike, 44230 RL

"The 'one chance in a million' will undoubtedly occur..., however surprised we may be that it should occur to us."

—R. A. Fisher

We know cavers fall. We have seen it happen. And "caver fall" is consistently the leading incident type as reported in *American Caving Accidents (ACA)* for at least the past 15 years. Almost every issue of ACA over that timeframe contains statements like "*caver falls were the primary cause of injury and aid rescues*" and "*falls remain the leading type of incident or accident.*" Again, you know this; anecdotes and personal experience will likely corroborate the ACA data for most of us.

Yet caver falls, their causes, and their prevention are not widely discussed outside of very basic literature directed to beginning cavers. This article aims to fill this gap by summarizing the data from 2000–2014, discussing the causes of caver falls, and presenting techniques and best practices for preventing caver falls.

Many, but clearly not all, caver fall incidents involve novice or informal cavers. Though experienced cavers are likely to be familiar with practices and techniques to prevent caver falls, leaders of beginner caver trips can use this information to make their trips safer.

WHY DO CAVERS FALL: ACA DATA ON CAVER FALLS 2000–2014

The term *caver* is used in the ACA, and in this article, to refer to anyone in a cave, regardless of their experience; and the term *caver fall* is defined as any fall by any person in a cave.

From 2000–2014, there were 172 caver fall incidents reported in the ACA. Most of those incidents did not involve issues with technical vertical techniques. In fact, these 172 incidents reflect a substantial number of falls. Considering that the majority of falls was not likely reported, it is not difficult to imagine that the actual number of caver fall incidents is significantly greater than 172 for this time period.

Caver Falls 2000–2014	
Fatality	13
Injury and Aid	111
Aid, No Injury	5
Injury, No Aid	43
No Injury, No Aid (No Consequence)	4
Total	172

In reviewing the accident reports from 2000–2014, the following common themes emerged:

- Slipped or stumbled and then fell (by far the most common)
- Hold broke, or floor gave way
- Lost grip on hand line (often climbing hand over hand)
- Stepped into a hole

In addition, the following contributing factors emerged:

- Slippery slope or flowstone
- Climbing without belay
- Took harder or more difficult or exposed route
- Tired or fatigued
- Distracted or inattentive
- Jumping
- Climbing with heavy pack
- Inappropriate footwear (typically sneakers)
- Inadequate ladder or vertical equipment
- No safety tether near edge
- Loose rock shifted under foot
- Inadequate lighting.

In reading the accident reports, it becomes clear that most, if not all, of the accidents could have been avoided or mitigated through the use of safer techniques. It therefore follows that most future accidents can be averted through the proper use of safer techniques, which can often be as simple as slowing down and paying better attention.

To cave safely, the caving team needs to follow this four-point safety mantra:

1. **Train:** Be prepared and educated to use safe caving techniques. For example, learn how to belay a climber.
2. **Be aware:** Have the situational awareness to consider safer alternatives. For example, consider belaying a novice caver down a steep slope instead of letting him or her climb down without a belay.
3. **Decide:** Exercise good judgment in deciding when and how to use safer techniques. For example, decide to belay the novice.
4. **Take action:** Execute your decision to use a safer technique. For example, properly arrange a secure belay.

Most experienced cavers do all of this naturally; experienced cavers are encouraged to guide and coach newer cavers. Yet we all have moments when we get excited, tired, or distracted, so we need to remember to keep an eye on our fellow cavers, no matter how

Good judgement is the result of experience, and experience the result of bad judgment."

experienced they are.

Any preparation before a trip—such as selecting the team, choosing proper attire, or learning how to belay and spot others—can make the trip safer without slowing down the trip itself. Maximize your preparation; training, practice, physical fitness, preplanning, judgment, and knowledge all add no weight or bulk to your pack but can prove to be immensely more valuable than the newest fancy gear.

USING SAFE TECHNIQUES TO PREVENT CAVER FALLS

Most experienced cavers are already familiar with common techniques to prevent caver falls. Indeed, most of us will consider the information presented here to be common sense. However, novice cavers are likely to be unfamiliar with how to prepare for a trip and how to safely and efficiently move through a cave. Beginner and intermediate cavers may know some of the techniques and best practices for safe caving, but they may lack the experience to know how and when to use them or when to turn back if not properly prepared.

Trip leaders may find the suggestions presented here to be useful when leading trips with novice cavers. If you are such a leader, you may want to review this information before your trips and share appropriately with the participants.

BEFORE THE TRIP

Match cave trip objectives to participant experience and ability.

Well before the day of the trip, consider the cave and the objectives of the trip, and choose participants with the appropriate experience, ability, and equipment. It can be very difficult to tell someone they aren't able to go on a trip; however, consider the consequences of not achieving the trip's objectives, or worse, the consequences of an accident or injury.

Use appropriate personal gear and attire.

- Clothing and extra layers appropriate for the caver, the cave, and the trip objectives
- Appropriate footwear—Are the soles worn out, or are they new and grippy?
- Well-fitting and appropriate helmet and gloves
- Appropriate pack
- Sufficient food and water for the trip
- Sufficient, well-aimed lighting—Does your headlamp illuminate the ground in front of your feet? (Note that lights

much dimmer or brighter than the lights used by others on the trip can make it hard for other peoples' eyes to adjust properly.)

- Sufficient visual acuity—Can your eyes focus on the ground in front of you and also focus on objects in the distance (For the over-40 folks, do you need bifocals?)

Prepare for common contingencies.

Caver falls are common; are you prepared to manage the situation?

- Carry a first-aid kit to handle sprains, contusions (bruises), lacerations (cuts), and common fractures. Tape, ace bandages, SAM splints, and gauze can all be useful.
- Bring extra clothing, a pad to sit on, a trash bag and candle (for use as an emergency heat tent), a space blanket, and extra food can help prevent an immobilized caver from becoming hypothermic.
- Take a wilderness first aid course.

Prepare your brain and your body.

- Keep physically active and have an exercise program outside of caving. Trail running, backpacking, mountain climbing, rock climbing, bouldering, and hiking all build skills and fitness transferable to caving. Consider yoga, Tai Chi, or similar to improve your balance, flexibility, and coordination.
- Get a good night's sleep before caving (this is often easier said than done).
- If the trip will be long, borrow a technique from distance runners—carbohydrate loading—and eat more than normal the day prior to the trip to ensure your body's glycogen stores are full. You want to start the trip with a full tank of gas.
- Don't start the trip dehydrated or hungry.

Prepare to safely navigate the cave environment.

- Learn how to use etriers, cable ladders, and hand lines.
- Learn how to rig and give a quick belay.
- Learn how to spot a climber.
- Carry a 20-40' piece of webbing for quick hand lines and belays.
- Understand the cave and its potential obstacles. Does it have difficult climbs? Wet crawls? Is it cold and windy?
- How will the trip and its objectives affect you? Will you be lying in flowing water surveying and potentially getting cold, or will you be moving quickly down borehole for two miles and then working hard on a dig, potentially

getting hot?

Prepare the team.

- Inform the team about the trip objectives and the requirements of the trip.
- Take inventory of all medical and hypothermia-prevention supplies the team will be carrying.
- Check life-safety equipment, such as vertical gear and rigging material.
- Discuss the pace of the trip, timing of breaks, and the overall length of the trip.
- Discuss team objectives, alternate plans, and potential turn-around points.
- Give multiple people a copy of the map, and review the route as a team, including key passage junctions, difficult sections, hazards, rooms, and meet-up points.
- Discuss the importance of keeping the team together and what you will do to keep the team together. Discuss how everyone is to stay within visual and voice contact with the person in front of them and the person behind them.
- On trips with beginners, consider posting an experienced caver at the rear of the team to ensure that the team stays together.
- If appropriate, discuss situations where the team may spread out, and plan on how to handle it safely. For example, if there is a series of rope drops close together, will the whole team reconvene between each drop? Or will the person in front get on the next rope when he or she hears the second person safely get off the previous rope? Or perhaps you will plan to spread out in a long dusty crawl, but agree to all wait and meet up at the end of the crawl.
- Discuss and review voice communications for vertical work.
- Notify a responsible person of the trip plan and arrange a call-out time.

DURING THE TRIP

Let your brain and your body do their jobs.

- Fix things that bother or distract you (such as your pack, boots, layers, and so on) On one cave trip, I was trying out a new pair of knee pads that kept falling down to my ankles. I was distracted by my gear issues and did not move quickly or safely that day.
- Eat, hydrate, and regulate your temperature to keep your brain and body functioning optimally.
- Don't think or talk excessively about other trips, caves, hikes, or activities. Visualizing and describing your rim-to-rim Grand Canyon backpack trip last

summer while moving through a cave is a good way to distract your brain from a loose rock that you are about to step on.

- Look at and pay attention to where you are and where you are going. Even if you aren't consciously choosing each foot placement, your brain is still working to place your feet. When moving, keep your head aligned with your body to help you to see the terrain in front of you and maintain your balance. Stop moving if you want to admire a formation. Stop moving if the conversation gets involved or requires your full attention.
- Avoid sudden moves, like running or jumping.
- Stay together as a team. At a minimum, keep in contact with the person in front of you and the person behind you, and maintain awareness of their progress. If team members vary significantly in travel speed, consider putting the slowest people up front directly behind the leader, and have each caver watch out for and not get far ahead of the person behind them.
- Be aware of your team members' locations and their physical and mental states.
- Check your vertical gear and the rigging each time you get on rope. Double-check your teammates' equipment.
- When the terrain becomes more difficult, slow down, focus, and pay attention to your foot placements and hand holds. Climb like a rock climber, with a laser focus on your hand and foot placements. When you place a foot, look at where you want the foot to go, and eyeball your foot until it is placed securely on the hold.
- Use the three points of contact rule when climbing, especially when unbelayed. Move one limb at a time, keeping the other hands and feet secure on holds until the moving limb is firmly on the new hold. Hand and foot holds break, and feet slip; maintaining three points of contact may prevent a fall if a hold fails.
- Test hand and foot holds before committing your weight to them.

Work as a team to use safe techniques.

- Consider the varied skills and abilities of all the team members.
- Pay attention to yourself and your teammates. Are they eating? Overheating? Cold? Drinking? Fatigued? Struggling? Hesitant? Quiet? Anxious?
- Volunteer to help others—reach back and pull their packs through a squeeze or give them a spot, a knee, or a belay.

- Alert fellow cavers to difficulties, such as holes, head-knocking pendants, drops, loose breakdown, and slippery areas.
- Pass packs at obstacles to reduce struggling; the overall trip may go faster.
- Haul packs at climbs to take the weight off the climber and improve his or her balance.
- Spot each other when on short climbs, using spotting techniques from bouldering.
- Deploy a hand line.
- Rig and give a belay.
- Decide that single-rope techniques (SRT), a traverse line, or a cable ladder is necessary and rig it.
- Agree when to turn back and not take the risk.

Make good decisions.

Many safe techniques take time, equipment, and energy to use. It is not always obvious if a team should expend the time to, say, rig a hand line for a short climb. It takes experience to make good decisions; but considering the likelihood and potential outcome of a fall is a good way to think through the decision.

- **Likelihood:** Is someone likely to fall? Is everyone experienced with this type of terrain, or are they stretching their limits? Are people focused and alert, or are they distracted and tired? Are the footholds stable, big, and obvious, or are they loose, slippery, small, and hidden?
- **Potential Outcome:** What will be the outcome if someone slips? An embarrassing slow 5-foot slide down a muddy slope with no injury, or a 50-foot fall onto jagged rocks and a likely fracture? Are we near the entrance where someone can be evacuated quickly, or are we five hours into a cave with multiple squeezes, crawls, and drops between us and the entrance? Will a minor injury turn into a significant rescue? Will my friend end up on the cover of the next ACA in a stretcher?

In general, unless the likelihood of a fall is very low, or the outcome would be very minor, err on the side of caution, and make the situation safe. Give a belay, set up a hand line, spot the climber, rig the pit, or take a different route. Mountain climbers like to say, “the summit is optional, but getting home safely is mandatory.”

Decisions to take a risk, mitigate the risk with a safety technique (such as a belay), or avoid the risk (such as by turning around) are very personal. Listen to everyone’s concerns. If one person wants a belay or doesn’t want to take a risk, then the team should honor

that request and adjust accordingly.

Though it may not be intuitive, improbable incidents happen all the time. It’s improbable that you will win a lottery, but someone wins the lottery. Someday that person might be you. And just because you did something risky once, or even 20 times, and didn’t get hurt, doesn’t make what you did safe. You might have just been lucky that day, or you might have been lucky 20 times, but will you be lucky over your whole caving career?

CONCLUSION

In general, caver falls can be prevented through preparation, awareness, good decision-making, and appropriate actions, which are all tied together by this four-point safety mantra.

1. **Train** to maximize your preparation. Training, practice, physical fitness,

preplanning, good judgment, and knowledge add no weight or bulk to your pack but can prove immensely more valuable than the newest fancy gear.

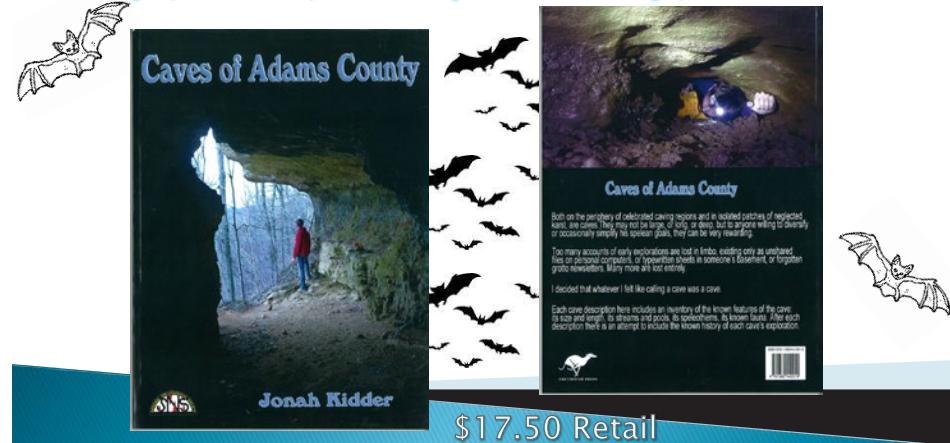
2. **Be aware** of your surroundings and your team’s abilities and consider safer alternatives. Pay attention, look where you are going, and maintain awareness of risks and the rest of the team.
3. **Decide** when and how to use safer techniques to avoid or mitigate the risks that you encounter.
4. **Take action** to use those safer techniques to greatly reduce your team’s risk of an accident.

Every one of us, from a first-time caver to a caver with decades of experience, has a role to play in preparing for the trip, paying attention, discussing concerns, and looking out for each other.

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NSS Convention 2015 Update

The NSS Convention 2015 will be held in Waynesville, Missouri July 13-17. This week-long event features daily symposia, guided cave trips, vendors, and major events each evening. Conventions are a great way to learn about caves in other regions, share new techniques, meet old friends, and make new ones. On Thursday evening, the auditorium will be packed for the Photo and Video Salons and awards, and Friday's Banquet features the annual NSS Award presentations. Convention activities will also include vertical contests, hydrology and geology field trips, a bat workshop, a cave biology workshop, and Salons encompassing craft and design, cover art, fine arts, print, symbolic emblems, t-shirt, and cartographic.

If you missed pre-registration for 2015 NSS Convention- Don't Panic! Registration Chairs Allison Chambliss and Jon Donaldson are pleased as punch to announce that on-site registration will be available beginning Saturday, July 11th at noon and will remain open around the clock until Monday, July 13th at 5:00 pm. Registration will also be available between 8:00 am and 5:00 pm Tuesday, Wednesday, Thursday, and Friday. Day Pass pricing is available.

Convention Central will be located at Waynesville Senior High School. This state of the art facility is only ten minutes away from the campground. Free wi-fi will be available. Sessions will be plentiful at Convention Central. No matter what your specific interest is you will find informative sessions. Sessions will cover Biology, Conservation, Human Sciences, Safety & Technology, Survey & Cartography, Speleophilately and more! Missouri will be well represented with several "hometown" speakers addressing their specialties. Historically, the U.S. and International exploration sessions are a big hit. We expect that tradition to continue at NSS2015.

Campground Chair Larry Abeln is ready to welcome cavers to their "home away from home" during Convention 2015. Pulaski County-Fort Leonard Wood Shrine Club Campground is top notch. Campers will find plenty of shaded, level spots, shower facilities, a large common area centered around one of Mid-Missouri's largest outdoor stages, a clubhouse (with wi-fi) and other amenities. Abeln is also excited that campers will be able to have small campfires at the campground.

Caving opportunities will be plentiful during NSS2015. A small sample of the caves that will be offered to attendees include: Skaggs, Perkins, Tunnel-Spring, Grempczynski, Pike's Peak, and Railroad Cave. Cave/cavern diving opportunities

are available to certified divers at Roubidoux Spring, Boiling Spring, and Bennett Spring. Several show caves across The Cave State will be offering discounted tours to Convention attendees. Kirsten Alvey-Mudd, Cave Chair, is particularly excited about the cave and float combo trips that are offered. "This is a quintessential Missouri caving experience- an experience that you do not want to miss while you are in the Ozarks for Convention 2015." Alvey-Mudd also added that concierge decontamination service will be offered nightly at the campground.

In addition to favorite, traditional Convention activities such as Howdy Party, Speleo-Auction, and Banquet, Activities Chair Alicia Wallace has coordinated with Pulaski County Tourism Bureau to offer attendees "local flavor"- including a tour of the Old Stagecoach Stop, a tour of the Frisco Depot Museum in Crocker, a paranormal investigation of one of Waynesville's oldest homes, and a BYOL (Bring Your Own Light) headlamp tour of the 1903 Route 66 Courthouse Museum. Self-guided driving tours of Route 66 and a walking tour of historic sites and points of interest in downtown Waynesville are available free of charge through the Pulaski County Tourism Bureau. Missouri Caves and Karst Conservancy (MCKC) will be serving up a Pasta Dinner Wednesday evening.

JSS highlights will include "Caving with the President", an evening bat flight experience, and the much anticipated Friday Night Pizza Party. The Junior Speleological Society will have youth activities scheduled throughout the week.

Fine Arts Salon Chair Carolina Shrewsbury has announced a Cave Writers Workshop to be held Friday, July 17th, 9 am- 5 pm. Some of the most skilled writers have been assembled to inspire you! A field trip will be offered Tuesday to Railroad Cave to explore techniques in collecting information for creating the figure in action in an exercise of life drawing. Join the Fine Arts section Thursday to have a hand in collaborative day! To celebrate this year's convention experience a long, prepared canvas will be worked on by anyone who wishes to join in. You do not have to be an artist!

Kris Nicolussi, co-chair of the 2015 NSS Convention, reminds cavers that the official 2015 NSS Convention "Hitchhiker's Guide To Missouri Caving" website is at <http://nss2015.caves.org>. #NSS2015 can also be found on Facebook, Twitter, and Google +. She and Waynesville Mayor Luge Hardman are "thrilled to show off Waynesville to cavers from around the globe."



PRE-CONVENTION CAVING CAMP

2015 NSS Convention Pre-Camp will be held July 9-11, 2015 in Brumley, MO. Brumley is home to historic swinging bridges and is only 20 minutes away from Lake of the Ozarks- offering tour caves, wineries, state parks, restaurants, & other popular attractions. Please contact Krista Bartel at kbartel1088@gmail.com for further details and information.

NSS POST CAMPOUT AND CAVING EVENT

SEMO Grotto is proud to host the "NSS Post Convention 2015" which will be held at Shannon's neighborhood, in Perryville, Missouri. This is the same location we held an MVOR in 2012 for 300 cavers, and it worked out quite well. The site is only 10 minutes away from the City of Perryville, MO where multiple amenities from restaurants, hotels, gas stations, and grocery stores are located.

- All cavers welcome. You DO NOT have to attend the NSS convention in order to come to this event.
- 200 acres of primitive camping Saturday, Sunday, and Monday nights, July 18, 19, and 20. We will be leading cave trips on Saturday, Sunday, and Monday.
- 3 ponds to go fishing
- A couple showers available on the grounds and a community center to hang out at.
- People should plan on arriving Saturday after 9am, and heading home whenever on Tuesday.
- Camping will be at: Shannon's Neighborhood - Address: 40 Cora Ln, Perryville, MO 63775
- Cost will be \$20 at the door for 3 nights of camping, or \$15 if you pre-register
- Deadline for pre-registration is July 1st .
- Make out checks to SEMO Grotto 2331 Belleridge Pike, Cape Girardeau, MO 63701
- To prevent the spread of invasive critters, please do NOT bring firewood from outside of the county. We encourage purchasing firewood from vendors within Perry County, and there is a firewood vendor just up the road from the campsite.
- If you have a wetsuit and/or vertical gear, we suggest bringing it, so you will have more options to go caving

- Those attending cave trips under the age of 18 must be accompanied by parent or guardian
- We will be offering trips to Tom Moore, Berome Moore, Crevice, Blackfathom River Cave, Rimstone River Cave, Grandpa's Hole, Fredenberg Pit, Running Bull, and possible pit bouncing trips.
- For more information, contact Robert "Bobcat" Kavaliauskas: robertrjck@sbcglobal.net
- Information flyers with detailed descriptions of cave trips and reg info can be downloaded from the Convention Web site postcamps page: <http://nss2015.caves.org/postcamp.shtml>

Carroll Cave Trips

The Carroll Cave Conservancy (CCC) will be offering guided trips into the cave throughout convention, including pre- and post-convention trips. Several trips will support ongoing projects, such as biology and survey trips. Group sizes will be limited to 6-8 people, depending upon the destination. Sign up will be on-line via the Convention website, but some spaces will be available for sign-up at Convention. Trip descriptions and other details will be provided online, but a couple of examples are given below. Hard, long trips will require contacting the trip leader to assure cavers are prepared for the demands. For all trips, cavers will need to be vertically competent and have their own vertical gear (seat harness, croll, chest harness, rappel device, back-up ascender, cowtail, tether for your pack, and carabiners) to descend the 124-foot Backdoor Entrance shaft. The shaft has a ladder, so a full climbing system is not required for ascending the ladder. We typically just use a croll attached to the rope while ascending. There is also a cable installed that uses cam devices and this may be available if the trip leader chooses to train cavers on its use. All trips will involve getting wet to the waist, but a wetsuit will only be required for one or two of the currently planned trips. For most trips, polypropylene and a cave suit will be sufficient. Bring a balaclava and an extra poly shirt, though, as it can get chilly waiting for people to climb the ladder. As a reminder, the cave air temperature will be 55°F, so please dress accordingly. Pee bottles are not necessary as we have plenty of flowing water, but bring burrito bags if you are on a longer trip.

One or two short trips (about 4 hours) will be offered daily from July 11 to 17. These trips will include Thunder Falls, a small portion of the Carroll River passage, and the Convention Hall formations near the UL2 entrance in Upper Thunder. Longer and more difficult trips will also be offered, but most of these trips will occur early or later

in the week so that participants can enjoy the sessions, salons, and social activities in the middle of the week. The hardest trips will be pre-convention trips to and beyond the Breakdown Barrier and a post-convention trip to the 3M (Muddy, Meandering, Madness) side passage of UL2. Trips will also be offered to the 2nd Azure Pool in Upper Thunder River (6-8 hours) with a possible survey option in UL6, two biological observation trips in Upper Thunder River (5-6 hours), and the Carroll River arm (6-8 hours) if bats are not present. There may also be a pre-convention trip to Lower Thunder for those that like muddy, wet borehole.

The biology trips will be led by Dr. David Ashley (Professor of Biology, Missouri Western State University) and CCC member Bill Gee. These trips will demonstrate data collection methods used to monitor cave biota. An overview of the methods used by Dr. Ashley in several Missouri caves, including Carroll Cave, will be demonstrated. The intent is that the methods can be applied by participants to their own biological monitoring projects. These trips will be held near the beginning (7/13) and end of the week (7/17) to determine if the convention trips had measurable impacts on the cave biota in Upper Thunder River.

The trip beyond the Breakdown Barrier will be led by Bill Gee. The purpose of the trips will be to do a baseline biology survey near the end of Upper Thunder River. Participants will count and measure isopods, snails, fish, salamanders and any other biota found. If you participate in this trip, you should probably plan to camp at the cave both Friday and Saturday nights. The trip goes through a pile of breakdown which includes three pinch points (see photo); anyone over about 160 pounds may not fit. The trip will be 10 to 12 hours long and cover about 5 miles of cave for the round trip. You will need a wetsuit and plan for a hot meal break. You must be in very good physical condition! This trip could be canceled due to rain.

Bob Lerch
CCC President
NSS 45004



Shawn Williams negotiating a squeeze in the Breakdown Barrier. Photo by Bill Gee.

Driving Directions To NSS 2015 Waynesville, Missouri

Waynesville High School (Convention Central)
200 GW Lane
Waynesville, MO 65583

Pulaski County/Ft. Leonard Wood Shrine Club (Campground)
26920 Shrines Road
Waynesville, MO 65583

From St. Louis, MO

- Interstate 44 West to Exit 156
- North on Ichord Avenue
- East on GW Lane

From Tulsa, OK

- Interstate 44 East to Exit 156
- North on Ichord Avenue
- East on GW Lane

From Huntsville, AL

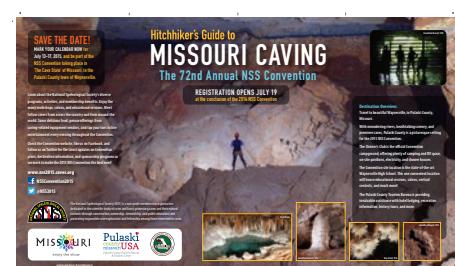
- Interstate 65 North to Interstate 57 North
- Interstate 57 North to Interstate 64 West
- Interstate 64 West to Interstate 44 West to Exit 156
- North on Ichord Avenue
- East on GW Lane

From Ely, NV

- Get on Interstate 15 in Millard County from U.S. 50 East
- Follow Interstate 70 East to MO 7 South in Harrisonville. Take Exit 157 from Interstate 49 South/U.S. 71 South
- Get on Interstate 44 East in Auglaize to Exit 156
- North on Ichord Avenue
- East on GW Lane

Convention Central To Campground

- West on GW Lane
- South on Ichord Avenue
- West on Interstate 44 to Exit 153
- South on Highway 17
- South on Shrines Road
- 5.6 Miles (apx. 10 minutes)



Convention brochure, available at <http://www.visitpulaskicounty.org/brochures/nss.pdf>

UNDERGROUND UPDATE

Jonah
Kidder

Central Indiana Grotto

April 2015, Vol. 59, No. 3

Ryan Cox and Chris Bell recently worked to reopen Breakdown Falls Cave, Crawford County, Indiana. Though the pair made plans to dig for several days, they were able to dig through the entrance collapse in one trip. Cox, Bell, and Larry Wyman, encouraged by the current of warm air, pushed through unstable breakdown and into large cave passage. The approximately 100-foot-long cave is formed along a shale layer, with sandstone roof and, at its lowest reaches, limestone floor. The source of the air could not be found, and the group left the cave with no plans to return.

The Electric Caver

Greater Cincinnati Grotto

April 2015, Vol. 56, No. 4

Ralph Mann is compiling photos of Great Salt peter Cave, Rockcastle County, KY for an album for visitors to Great Salt peter Preserve. He requests that anyone with photos of the preserve or cave, or of Felburn Foundation, Toyota Georgetown, Music in the Mountain, local school groups, Richard Mullins, or other relevant subject send them to darryl@darrylmarsh.com for inclusion in a pictorial history.

Huntsville Grotto Newsletter

February 2015, Vol. 57, No. 2

Gary Griner shares the history of Jackson County, Alabama's Birchfield Cave and the attempts to connect it to Midway Cave. The story began when Birchfield Cave was first visited by caver Randale Owen. A map showing 2351 feet of passage was produced in 1973, and the survey was evidently assumed to be finished until 1990. During a trip in that year, Gary Griner noticed a discrepancy between the flow over a waterfall and the flow leaving its base. Crawling under the cascade revealed a separate stream passage that eventually led to more than 4500 feet of new, pristine, decorated cave. This discovery led to hopes for another, much higher entrance, and the search for this entrance led to Jay Carpenter's discovery of Midway Cave. After several trips, including some solo efforts by Carpenter, 1137 feet of length and 250 of depth were surveyed in Midway Cave. No connection was made. See this issue for more interesting details about exploration and cave development in this area.

The Northeastern Caver

Northeastern Region NSS

March 2015, Vol. 46, No. 1

Seven cavers recount memories of Roioli Schweiker, who died on December 14, 2014. Roioli began caving in the 1950s and, with Richard Anderson, soon began the New York State Cave Survey and the huge task of compiling its files from various scattered sources. Roioli also wrote and edited several compilations and guides to northeastern caves. As her interests included many other outdoor activities, Roioli published books about canoeing and skiing after her most active years as a caver. Her caving legacy is carried by her daughter Vi, and her personal one in the memories of her friends.

John Dunham reviews the progress made in the search for new Vermont Caves in 2014. In total, he describes ten new caves, the largest of which is currently 170 feet long. All of these caves are active or potential dig sites, therefore the maps in this report are drafts or sketches.

SAG Rag

Shasta Area Grotto

January – February 2015, Vol. 34, No. 1

Caves in the Double Hole Lava Flow in Siskiyou County, California have been documented by cavers since the 1970s, and mild weather allowed these efforts to continue during the winter of 2015. Bill Broeckel describes seven caves and includes new maps of five (54 to 463 feet long). Two longer caves (over 1000 feet) have been recently visited, but still need to be surveyed. Besides these, many more caves in the Double Hole Flow remain unmapped. The total number of surveyed caves in the flow is now 106.

Windy City Speleonews

Windy City Grotto

April 2015, Vol. 55, No. 2

Jack "JT" Thompson died on February 13, 2015 at the age of 90. He began caving at 53 and made 94 trips to Blue Spring Cave, 27 trips to Fern Cave, and many more to TAG, the western US, and Mexico. Here are a few selected quotes from his friends that appear in this issue:

"He was an early riser who had no tolerance for lolly-gagging. On the other hand, he had good tolerance for photography... particularly when he was in the photos."

"Was a very loud-spoken person, with high energy and excitement in his voice. I think his mind was racing 100 miles per hour all the time."

"JT would walk up to strangers in stores, on the street, anywhere and proudly brag that he was a caver, and start talking about what was involved in caving. Strangers would look at him with amazement, and with fear."

"He just couldn't shut up."

"He was a truly engaging person with a huge personality. If you only got to know him briefly or superficially, rest assured, the tough curmudgeon was just a thin façade, one which was completely inadequate at hiding the huge heart that drove him."

"...I jumped ship and started caving with JT because JT started caving at 6 a.m., not 1 p.m., and drank V8, not Old Style beer. I truly became an advanced caver, climber, and backpacker through Jack's leadership and guidance."

"From his claim to be "the poor man's nobody," to his always challenging word puzzles, to his record-breaking number of trips into Blue Springs Cave, JT was one of a kind."

"For years he told how I got out of Dog Hill Donahue by standing on his head."

"...Jack was one of the good guys that made life fun. Jack had a strong back to help people and a warm heart. Thanks for the great memories."



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UNDERGROUND ONLINE

Buford
Pruitt

Mike Hodge corrected me about two projects he is working on that I mistakenly combined two columns back. The **Backdoor Dig** is a *Butler Cave Conservation Society* project aimed at getting into the **Chestnut Ridge Cave System**, Bath County, Virginia, in the Burnsville Turnpike area, and is about 70 feet down. The other project is at his house, called **Cedar Knob Cave**, Bath County, Virginia, is the one he has pulled about 6400 five-gallon buckets from.

The *Southeastern Cave Conservancy, Inc.*, (SCCi) Web site announced the winners of the **First Annual SCCi Photo and Video Competition** based around its new marketing campaign, 'Sharing the Secrets.' Contestants submitted four categories of images taken at SCCi preserves: Secret Beauty, Secret Adventure, Secret Life, and Secret Water. Winners were announced at the 2015 membership appreciation event, Frick's Cave Open House, on February 28th. Sean Roberts of Florida took first place in two of the four categories, Secret Beauty and Secret Water, while Dave Bunnell won the Secret Adventure and Caitlin Neal the Secret Life awards . The People's Choice award went to Theral Mackey and Best of Show to Amy Hinkle: tinyurl.com/k2d472u.

Sylvester Muller, Geary Schindel, Robert Schulte, and other cavers spoke against a proposal before the City of Alachua, Alachua County, Florida, to permit a large stormwater treatment pond directly above a fissure known to exist above a room in **Mill Creek Sink Cave**. The cave entrance is within the NSS-owned **Mill Creek Sink Nature Preserve**, and the cave follows a portion of a major regional lineament extending at least from **Alachua Sink** on **Payne's Prairie** to **Hornsby Spring** on the Santa Fe River. Payne's Prairie is a wet prairie that at 21,000 acres (85 km²) is arguably the largest sinkhole in the United States by area, and the Santa Fe is classified as an Outstanding Florida Water. The March 23 public meeting was attended by members of the Cave Diving Section. This stormwater pond was approved by the city council in 2008 for a Wal-Mart store, but Wal-Mart didn't build at that time. This new proposal was also approved unanimously, as reported on the NSS-CDS Facebook page on March 23: tinyurl.com/qhdqfxd.

Karen 'Kasey' Fiske related in her monthly email summary about Wisconsin caving that WNS has now been found in southwestern Wisconsin. A link is provided to the Wisconsin Speleological Society Web site discussion of WNS: wisconsincaves.com/nyktzmt.

org/WNS.

Hen Zakai of the Israeli Caving Club, his father, and a friend found two ancient silver coins stashed in an **unnamed northern Israel cave**, reported by CNN on March 10. The coins were minted in the time of Alexander the Great over 2000 years ago and were accompanied by pieces of silver jewelry, including an intricately detailed pair of earrings. The antiquities authority then mounted an expedition to the cave and subsequently discovered objects from even earlier periods, including the Chalcolithic ca. 6000 years ago: tinyurl.com/onnjc9c.

The March River City Grotto newsletter contains notices of planned caving trips and a summary of the 2015 **Florida Cave Cavort** that the grotto hosted. The newsletter also announced that the Cavort was attended well beyond its break-even point, and the grotto spent some of the profits to purchase 32 rechargeable batteries and a 16-bay recharger for loaner helmet lights: tinyurl.com/la4nz8q.

The Cassville (Missouri) Democrat via Caving News had an article on March 11 about vandalism at the 2000-foot-long **Crystal Caverns**, Barry County, involving at least 70 broken stalactites. Jonathan Beard, vice-president of the Missouri Caves & Karst Conservancy and assistant manager of the cave, reported the damage to the sheriff on February 13. The cave's entrance door was also damaged. In addition, there were mud marks on some formations and hammer marks on others. The most significant damage was done in the Queen's Attic where at least 30 formations, mostly draperies, were broken. Thirty-plus percent of the aragonite crystals in the Aragonite Passage were taken or damaged. The vandals' dog also pooped in the cave. The conservancy has leased the cave from the landowners since 1997. A \$500 reward has been offered for information leading to the arrest and conviction of the perpetrators. However, on March 20, the conservancy announced that if the vandals returned the broken formation pieces "quickly," they would not be prosecuted: tinyurl.com/odlkxgg.

Build 2015-03-17 of the **Walls Cave Survey Program** was released on March 17, according to Caving News. It incorporates the latest International Geomagnetic Reference Field (12th Generation) model, which was also recently added to Compass cave mapping software. Walls is freeware developed by David McKenzie and can be obtained from McKenzie's Web site: tinyurl.com/nyktzmt.

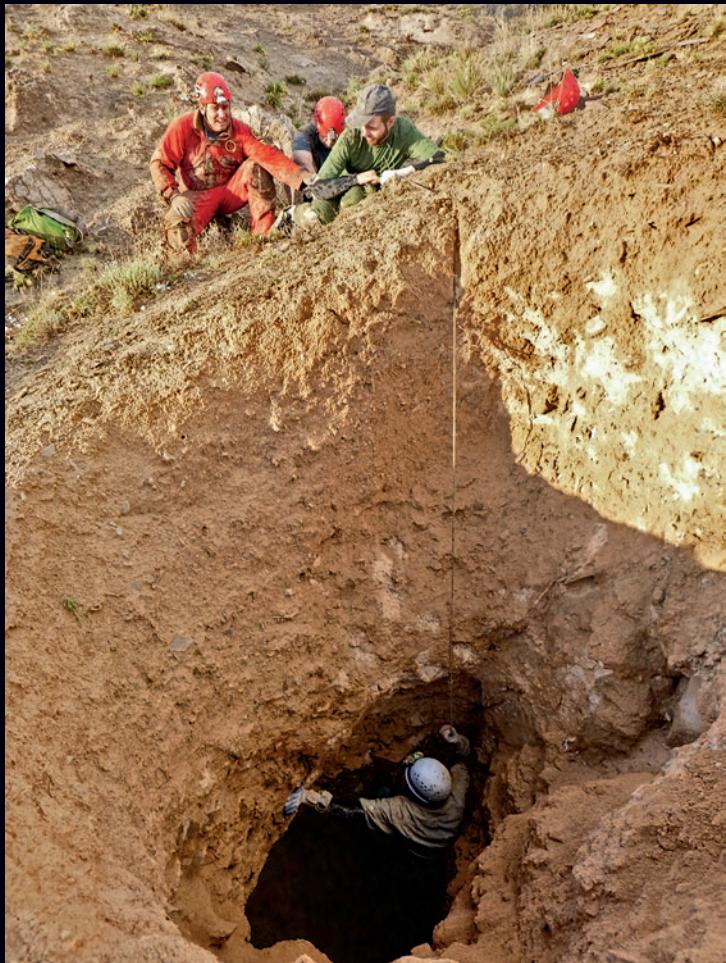
As if Cantabria doesn't have enough paleoart with six dozen or so already known sites, members of the Espeleoclub Sabadell, Spain, found yet another such resource in **Cueva Aurea** on March 3. They quickly notified the authorities, who closed the cave for the protection of the artifacts. Ten of the paleoart caves in this region have been granted World Heritage status by UNESCO, including **Altamira**: tinyurl.com/og9qngs.

Caving News found a YouTube video by Adam Sampson that shows how to upgrade a standard Leica Disto E7400X (Disto X310) laser distance meter into a **DistoX2** surveying tool. The 24-minute video tells you what tools you need and how to swap out components: tinyurl.com/mochfc8.

Caving News and other sources posted the sad story of two Spanish cavers dying after falling into a canyon during a caving expedition to Morocco. Gustavo Virues died in the fall and Jose Antonio Martinez survived with a head injury. How they fell was not explained. Fellow caver, Juan Bolivar, attended Martinez for six days until two Moroccan gendarmes arrived and sent down a stretcher on a rope. Martinez was placed in the stretcher and the two Moroccans then tried to pull him up by hand. However, the stretcher somehow stopped under an icy waterfall, and the gendarmes tied him off there and left the scene. Bolivar then listened to his friend's cries for help that night as he slowly drowned in the frigid water. It was over two hours before rescuers from the Civil Protection of Morocco arrived and hauled him up, dead by then. Bolivar was then instructed to walk downhill for four hours to a goat track, which he followed to a village where he was treated. Spain said it had offered on April 3 to send a plane with a team of experts to Morocco but only got permission to send the rescuers two days later. Martinez' friends believe his death is a homicide due to negligence and have initiated legal action: tinyurl.com/mm86lr4.

The Walker Mountain Tunnel blog of the Walker Mountain Grotto contains a report by Bill Grose on the bat count trip led by Ken Walsh to **Hancock Cave**, Smyth County, Virginia, on March 7. Walsh has been conducting the counts for several years, and this time was joined by Grose, Jason Lachniet, Zachary Taylor, LeeAnn Mullins, and Emily Graham. They found five tricolored bats and one big brown bat, the latter being the first that Walsh has seen in this cave (tinyurl.com/o6es2bp). That's three fewer than were seen in the 2014 count, according to Emily Lachniet in a Triangle Troglodyte trip report: tritrogs.blogspot.com/.

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Top 2 photos: see page 2 for captions.

Page 16: Mark Pansing exits Raspberry Cave, Arizona, shortly after having been pinned and trapped by a boulder. Photo: Bob Goforth.



Page 28: A portion of the rigging used by 2 stranded cavers in Ophir Cave, Montana. The kayak anchor was placed among rocks and the Walmart rope was knotted for handholds. No backup knot was used at the rope/anchor interface. The frayed end was cut by rescuers. Photo: Duncan Adams.



Page 26: Karel Hilversum and Bonny Armstrong bivy overnight in Lechuguilla Cave with Chino Gomez. The cavers used old ropes and their packs as improvised bedding. Photo: Shawn Thomas.

Page 34: An improvised 3:1 haul system used to extricate a caver from War Eagle Cave, Alabama. All of the gear came from the pack and personal vertical system of just one caver in the group. Photo: Glen Kuehner.

