

# Underwater Speleology

*Journal of the Cave Diving Section of the National Speleological Society*

## **INSIDE THIS ISSUE:**

**Mexico: To The Blue Abyss**

**Visit with A Cave:  
Photographing Ginnie Springs**

**Understanding The Effects  
Of Sea Levels**

**Cathedral Sink Work Day**

**Improvements At  
Cow Springs**

*Volume 40 Number 3  
July/August/September 2013*

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**Underwater Speleology  
Volume 40 Number 3  
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**contents**

*Featured Articles*

**Mexico: To The Blue Abyss**  
By Luis Sanchez, Ricardo Castillo and Alfonso Caballero.....6

**Understanding The Effects Of Sea Levels**  
By Lee Boop.....12

**2013 Workshop**  
.....14

**Above The Waterline.....**  
Photographer: Barbara am Ende.....15

**Great Suwanee River Clean Up**  
By Fritz Olsen.....16

**Cathedral Sink Work Day**  
.....18

**Visit With A Cave: Photographing Ginnie Springs**  
By Gene Page.....20

**Meet Bruce Ryan**  
By Bruce Ryan.....36

**Improvements At Cow Springs**  
.....37

*Columns*

**From The Chairman**  
By Bert Wilcher.....5

**Midwest Underground: A Bridge To Nowhere**  
By Chris Hill.....22

**Skills, Tips & Techniques**  
By Georges Gawinowski.....25

**Conservation Corner**  
By Kelly Jessop.....27

**The Loop**  
By Joe Citelli.....28

**Cave Diving Milestones**  
By Shirley Kasser.....31

**Instructor's Corner**  
By Carl Griffing.....33

**Off To The Side**  
By Rob Neto.....35

**It's Like Laying Line: A Little Bit Of Fun**  
.....38

Cover Photo: Jill Heinerth enters The Eye at Ginnie Springs.  
Photographer: Gene Page

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# Editor's Notes

***I am only one, but I am one. I cannot do everything, but I can do something. And I will not let what I cannot do interfere with what I can do. ~Edward Everett Hale***

We are making progress. This year there are three workshops, a clean up and mini social at Cathedral Sink, a clean up and social at Cow Springs, the improvements at Cow Springs and a clean up is in the works for School Sink early next year. We have amended the By-Laws and elected five new BoD members. Welcome to Joe Citelli, David Jones, Terri Simpson, Bert Wilcher and Jim Wyatt. And we will be improving communication with a newsletter.

The organization also lends its support to the Great Suwanee River Project among others. And I am happy to report that members have been stepping up and contributing to the UWS. We have two new columnists this issue, Georges Gawinowski and Carl Griffing, and Mexico is being represented with a series of articles from the group at *Rango Extendido*.

Volunteers are the backbone of the organization and the more members that participate, the more we can do. We all have lives outside of cave diving, hard as it is to believe. Two of our editors are celebrating milestones. James Dalgarno has just graduated from the University of Vermont and started his new job at *Golf Digest*. Congratulations, James! Russell Edge is now married and included his diving family in the celebration. Congratulations, and much love and happiness in your new life together Russell and Lynn.

Location doesn't matter. There is always something you can do to participate. ***If you think you are too small to be effective, you have never been in bed with a mosquito. ~Betty Reese***

We can't, and don't, thank and appreciate our volunteers enough. THANK YOU to everyone who has and is making these things happen.

I hear Telford is on the mend.... I think I hear the Telford Monster calling me. Let's go diving!

Dive Safe,

Cheryl

To Our Members,

I wish to thank everyone who placed their faith in me to be your new board chairman. I look at this as an exciting time for the NSS-CDS. My first official duty is to thank the outgoing board members---Frank Ohidy, Tom McMillan, Forrest Wilson, and Gene Melton---for their exemplary service to the organization. Through their leadership, several tough decisions were made and implemented for the benefit of our membership. These characteristics are hard to find.

As the new board members are incorporated into the leadership of the organization, I promise that we will work diligently to act like the organs of the human body; separate entities working together for the good of the whole. This is my pledge to you, our members. I will be open to feedback from any member, cave diver or concerned party to make this the best organization that it can be.

We have just completed our annual conference for 2013 in Wakulla, Florida and wish to express our appreciation for all who attended, the vendors who supported us and the presenters who helped with our mission of education. As a volunteer organization, we could not fulfill our mission to our members without the support and tireless dedication of our volunteers.

Jim Wyatt will be our 2014 Workshop Chairman. Please contact him if you have any questions or can help with the workshop.

**[trainingdirector@nsscads.org](mailto:trainingdirector@nsscads.org)**

The challenges ahead of our organization are daunting. It will take a concerted effort by the BoD, our membership and outside resources to help us fulfill our mission. I invite every member to join us on this exciting trip.

Sincerely,

Bert Wilcher



*Pet Cemetary*

# MEXiC*o*

By: Luis Sanchez  
Ricardo Castillo  
and Alfonso Caballero  
[www.rangoextendido.com.mx](http://www.rangoextendido.com.mx)



Above: Directional sign

This is the first in a series of five articles on cave diving in Mexico. Located on the Yucatan Peninsula, in the state of Quintana Roo near the walled Mayan city of Tulum is the Sac Actun system, considered one of the largest underground rivers in the world, extending 222 km below the ground. Among the cenotes located in this system is the cenote Pet Cemetery, named for the remains of animals that are seen inside.

It is one of the most decorated cenotes of Mexico and therefore the world. Travel depths are between 20 and 50 feet and the temperature is close to 76F.

To get to the Blue Abyss, you leave Playa del Carmen and head towards Tulum. You pass the entrance to Xel-Ha Park and take the entrance to the



*Drop into the Blue Abyss*

cenote Dos Ojos. From there you continue along the dirt road for about 20 minutes, passing the entrance to another well known cenote, The Pit, and when you get to a sign that says 'Sac Actun' you turn left and follow it to the end. It is private property but you can pass.

For your journey to Blue Abyss, after a few dives to familiarize yourself with the cenote, it may be necessary to carry a stage to reach your destination.

You begin at Pet Cemetery. Inside the cenote there is a gold line that is used for open water scuba diving or snorkeling as well as orange ribbons hanging from the stalactites leading to a small air filled cave which has a platform used for snorkeling. The bottom of the cenote is very white, hence the name Sac-Actun (white cenote), but in the cavern the roots of the palm trees turn it brown and silty.

You have to locate two large directional arrows, one yellow and one blue, and from there make a jump of about 20 feet to white cave line tied to a stalagmite.

Following the line for about 150 feet you will find two arrows pointing the way back to the entrance you just came from, Pet Cemetery. Just past here is a slate indicating the jump to I-Hop cenote.



*Above: Pet Cemetery bones*

*Right: Pet Cemetery Cavern*





Approximately a foot from there is the route to Dark Side Of The Moon (a dive for a different day) and no more than 20 feet from there you will look back towards the entrance, on your right side at about a 45 degree angle, and find the line that leads to Blue Abyss where you will tie in with your spool.

You will be running almost parallel to the line for Pet Cemetary and soon change direction. After about 20 minutes you will come to the King Pong restriction a silt free zig zag route. The panorama is spectacular with hundreds of columns of all sizes.

After about a 45 minute swim the line turns 90 degrees to the left. Before this turn is a jump marked by two line arrows, and on the right and 15 feet below you will see the line to the Blue Abyss. Taking the double arrow jump you have 300 more feet to your destination. You will come to a passage highly decorated in all directions, with a small canyon though which you pass "flying."

*Left: Dark Side Of The Moon*

*Below: Passage between Pet Cemetary and I-Hop*





*I-Hop*

There is one last restriction before you get to the Blue Abyss. With less than 100 feet to go you pass a seashell buried in the sediment and you finally arrive. The entrance extends downward and the line is tied to two small stalagmites. The line goes up and then drops down out of sight. Here you are at the top of the Blue Abyss, completely black with a depth of 255 feet. This is one of the most spectacular caves in the world.

If you want to dive this cenote, we recommend making two or three dives to familiarize yourself with the route; measuring your time and getting a good idea of gas planning to the Blue Abyss. Remember that safety and conservation are primary concerns.



*System map*

## Understanding The Effects Of

# Sea Levels

By Lee Boop, PhD cand.  
NSS #59401

In a general sense, we can say that water forms caves. Of course, there are different forms of speleogenesis and several ways to define a cave, but we can generally say that coastal limestone caves are formed by corrosive water. Mixing corrosion is typically the most active speleogenetic process occurring in coastal limestone. Two waters may be saturated, but when mixed, the new solution is undersaturated. Mixing corrosion is the reason that two passages may become much larger after they run together. This process also occurs when infiltrating precipitation mixes with groundwater at the water table, or when fresh and saltwater mix at the halocline. Most cave divers are probably well aware of the corrosion notch that typically accompanies the halocline. Speleogenesis in coastal environments may also occur as infiltrating precipitation dissolves limestone in the vadose zone during its downward movement to the water table, or by rising waters from more unique processes.

The position of the water table or the interaction of fresh and saltwater is expressly dependent upon the sea level. It follows that coastal speleogenesis is also dependent upon sea level. Cave divers can attest to multi-level passages that correspond to different sea level stands; the following is a brief discussion of sea level in an effort to put these multilevel cave systems into context.

Currently, Earth's climate is warmer than in the geologic past, meaning that there is less land ice and more water in the ocean basins. During lowstands, water level drops as water is stored as ice during periods of cooler climates. Because of fluctuations over time, caves may be created in the phreatic (below water table) zone. They are then drained during a lowstand, allowing the formation of speleothems, then being flooded again for your cave diving splendor.

Early twentieth-century geomorphologists studied wave-cut notches and beach terraces as evidence of sea level fluctuations in the last few hundred thousand years. Looking for petroleum deposits, exploration geologists observed that sedimentary deposits recorded sea level fluctuations by preserving depositional environments in the ocean or on land. In the late 1970's, researchers in the petroleum industry published approximate sea level curves over the past 200 million years, with maximum excursions of approximately 300 m above and 200 m below present sea level (Vail et al., 1977). Projections further back in time are more difficult because assumptions must be made regarding the shape of the oceanic basins; about 200 million years ago, Nevertheless, sea level discussions sometimes extend to 2.5 billion years before present (for reference, the Earth is 4.5 billion years old).



Figure 1.

The sea level curves constructed from petroleum exploration seismic studies include clear cycles through high- and low-stands; some cycles operate over hundreds of millions of years, others over thousands of years. The longest cycles occur due to changes in ocean basin volume, while shorter cycles are attributed to climate cycles caused by changes in the amount of sunlight that reaches the Earth.

The resolution of a sea level estimate depends on the resolution of the proxy used. At present, we may monitor sea level fluctuations at different rates across the globe using tide gauges, or look at historical studies of plant communities marching toward the shore because of sea level rise. Proxies for the recent geologic past (thousands of years before present) include tree rings, speleothems, ice cores, and sediments, which all record climate data. To investigate hundreds of thousands of years into the past, we may consult speleothems, ice cores, sediments, and coastal deposits, which record huge fluctuations in ice volume and therefore sea level.

It is worthwhile to note that aside from the polarizing political issue of human activities contributing to an increase in atmospheric temperature and therefore causing the melting of land ice, we have also altered land use (increasing runoff) and extracted groundwater reserves, sending our wastewater downstream to the ocean. Some authors attribute up to 1/3 of the current sea-level rise observed at tide gauges to human activities.

Researchers continue to resolve differences between records in an effort to pinpoint the elevation of a sea level stand. Sometimes, there are issues with the age of the deposit, either because of analytical errors, tectonic effects (raising or lowering of the proxy) or because a deposit has been reworked (an older fossil is found in a younger deposit). But, it is also known that sea level does not fluctuate uniformly throughout the globe. Indeed, it varies by meters. At present, some tide gauges record rising sea level, while others record falling sea level.

Without a doubt, sea level studies are complicated and controversial. The Earth system acts without regard to humans, but is certainly impacted by human activities.



Figure 2.

#### References:

Vail, P.R., Mitchum Jr., R.M., Thompson III, S., 1977. *Seismic stratigraphy and global changes of sea level: Part 4: Global cycles of relative changes of sea level*, in: Payton, C.E. (Ed.), *Seismic Stratigraphy - applications to hydrocarbon exploration*. The American Association of Petroleum Geologists, Tulsa, p. 516.

Figure 1: Students hunt for fossils of warm-water fauna at the Cala Pudent at a MIS 5e beach deposit exposure along the southern coast of Mallorca (Spain).

Figure 2: The MIS 5e (approximately 120,000 years old) calcite band in Cova des Pas de Vallgornera on Mallorca is approximately 2.6 m above current sea level. The widest area of the encrustation corresponds to mean tide position, with the width of the encrustation tapering down toward the extremes of the tidal range. These phreatic overgrowths on speleothems can be precisely dated, and also give the elevation of the sea level stand.

Lee is a doctoral candidate at the University of South Florida, where she studies karst geochemistry and paleoclimatology primarily in Mallorca, Spain. Lee is the President of the Karst Research Group at the University of South Florida and is a member of the Social Networking Team for the National Speleological Society. She is an active member of the Central Connecticut, East Tennessee and Tampa Bay Area Grottos of the National Speleological Society. Email her at [liana.m.boop@gmail.com](mailto:liana.m.boop@gmail.com).

# 2013 Workshop

Thanks to Samantha Auyeung, David Jones and Doug Bzotti for sharing their pictures with us.





# ABOVE THE WATERLINE....

Photographer: Barbara am Ende



When diving in the Wakulla Springs area, if you have some free time, the River Boat Tour at Edward Ball Wakulla Springs State Park is well worth the trip. The tour lasts about 40-60 minutes and provides outstanding wildlife viewing and photography opportunities.

Park rangers lead the tour and often pointing out wildlife along the way and include stories of history, local lore and cave explorations.

The tours run 365 days a year, weather permitting, and begin at 9:40am and run throughout the day with the last tour at 4:30pm EST (5:00pm during daylight savings).



# GREAT SUWANEE RIVER CLEAN UP

By: Fritzi Olsen  
Photographer: Laura Line



*Current Problems volunteers set the critters free then bag and weigh the trash.*



*Eastside student with mastodon tibia. one of the big finds of the day.*

The 2012 Great Suwannee River Cleanup finished up on Dec. 7. As some of you know, a decision was made to begin adding in the tributaries last year, starting with the Santa Fe River. However, we had a few cleanups on the Withlacoochee as well. Looks like we are on our way to becoming a Great Suwannee River Basin Cleanup!

Forty-three cleanups were scheduled. In 2012 it was different than the past two years in a number of ways. First, the water was so low at some places that people were leery of registering for many sections. Then Debby came and suddenly there was too much water! And it was too fast and too dark.

By the time September rolled around the water levels were fine, but the water was very dark and still moving very swiftly. This meant no dive cleanups for a good while. We were finally able



*Pete's trailer, loaded with some of the trash collected.*

to conduct one in mid-November on the Santa Fe. Ginnie Springs wasn't able to do theirs until February of 2013!

Since conditions were still too bad for divers, the Great Suwannee River Cleanup Kick Off Celebration, held on Sept. 8, conducted a float cleanup that day from the 47 Bridge up to the shoals. Still, 251 pounds of trash were collected, dark water and all.

While we had more cleanups this year overall, much of the Suwannee had many sections left open. Our guess is that conditions on the river contributed to this. It certainly contributed to the lack of dive cleanups. Many people had other more pressing things demanding their attention and time. Remember the flooding? That changed many folks' plans and demanded their time.

Finally the Santa Fe cleared and a dive cleanup was held from Pete Butt's down to Kim Davis's on Nov. 17<sup>th</sup>. We had a wonderful day on the water! Nine divers managed to remove 807 pounds of trash, all of it bottles and cans except for 2 tires, a battery, and a few vinyl rafts. That's a lot of bottles and cans! All told, we had 24 people helping out in one way or another – canoes, power boats, land support, and the cave divers.



*Pete Butt*

Then, when we got to Kim Davis's, she had a fantastic lunch ready for everyone. Chili, hamburgers, hot dogs, veggie burgers, chips and sweet goodies were waiting for us, along with a nice fire for warming up. It was a good day.

Pete Butt always engineers our dive cleanups. Not enough can be said for his efforts, allowing the cleanup to go off without problems. Ginnie Springs helped out with disposal, canoes, and boat put-in, so we are grateful to them, too.

In the end, we had removed 10,082 pounds of trash when Dec 7 rolled around. Some 357 volunteers turned out to help.

For the 2013 Great Suwannee River Cleanup, we will encourage all to register for a section of one of the rivers, if they would like. We will choose a few hot spots along the river to tackle, and we also will conduct a few small dive cleanups at ramps or bridges where trash is particularly bad.

Current Problems only allows cave certified divers to dive at our cleanups. It's a great way to prevent safety problems, knowing we never have to worry about the cave divers. We are very lucky to have so many of you in our area and willing to help clean the rivers and springs. Thanks to each and every one of you. We hope you will choose to join us again in 2013. [www.currentproblems.org](http://www.currentproblems.org)



*Jenny Adler and Greg Owen.*



# Cathedral Sink Work Day

On April 20, 2013, the skies cleared and the weather was cool.... great day for a clean-up at NSS-CDS property, Cathedral Sink. Eleven volunteers braved the brush, vines and poison ivy to change the Cathedral property from over-grown to great. Power tools helped make quick work of the tangles of brush and weeds, and a bar-b-que of hotdogs, hamburgers and veggie burgers followed. The day was topped off by some great door prizes.

Special thanks to our sponsors for their donations. Dive Outpost was most generous, including the deco cookies appreciated by all. NSFA, NACD, Cave Excursions and Jacqueline Tregre generously supplied door prizes, and Tony Flaris, Li Loriz, Sandy Robinson, David Obi and Cheryl Doran donated needed supplies to the clean-up and social.



Off to tackle some vines.

Thanks again to the volunteers: David Obi, Katie Bernard, Howard Smith, Lee Ann Waggener, Mike Gibby, Sandy Robinson, Forrest Wilson, Li Loriz, Tony Flaris, Tim Bevin, Cheryl Doran and Bubba.

There are plans for a work-day yearly at each of the NSS-CDS owned properties. Hope to see you there.



Preparing for war on the poison ivy.



Women at work.



There were Deco Cookies...Yum!!



He just never quit.



Men at work.



Before....



After.....



Refill time.



Bubba helped too, he moved or destroyed all of the sticks.



Tim was happier than he looks...



Thanks to David Obi and Tony Flaris for donating the new deco ball and line.



Repaired fencing.... Thanks Sandy!



Cleaning the sign...



All the condiments necessary.



Good burgers....



A highly motivated, half Belizian, with a machete... I think.



It is possible "someone" put the wrong gas in one of the power tools.....



Work Crew.



*Divers Richard Black and John Katerenchuk swim in The Gallery with The Lips behind them.*

## Visit With A Cave: Photographing Ginnie Springs

By Gene Page



*Tracy Niesent swims through a smaller side tunnel of the Catacombs. Fellow photographer Dan Wright scouted and selected this passageway for this day's shoot due to its formation. Seven lights were used for this image, which takes time to set up and takes a patient model.*



*Jill Heinerth swims in a section of the Catacombs at Ginnie Springs for a photo shoot. This is a good shooting location as it's close to The Eye and The Ear, and it has some beautiful winding passageways.*

It has often been said that divers should take their time getting to know the front parts of a cave and not feel the need to rush to the back. There are a number of reasons for this, and most are just plain common sense. But, when you do a specific dive with photography in mind, it makes even more sense to stay near the front. Who wants to lug extra gear further back than you need to? Plus you can spend more time shooting when you aren't swimming so far. And if anyone needs to call the dive for any reason during your shoot, you're closer to the exit, not to mention added deco concerns the further back you go.



*Jill Heinerth swimming through a passageway in The Catacombs.*

For our normal photo dive at Ginnie, we enter The Ear and swim to our locations, either sticking to one for the entire time or moving to another as we did with The Gallery to The Lips shoot. For the images from the Catacombs, we pre-planned, covering everything as best as we could, before submerging. We would then swim to the tunnel we wanted to shoot in and start lighting it. We would usually exit The Eye, and sometimes shoot there too.



*Kristi Bernot and Marius Clore swimming through one of my favorite shooting locations at Ginnie Springs; the main Catacomb passageway between The Ear and The Eye. On this shoot, it took Dan Wright and me 30 minutes to light and then we took turns photographing our ever-patient models. Six lights were used with this photograph.*

As the still photographer for "The Walking Dead," almost nothing makes me as happy photo-wise as being on that set shooting zombies and the actors dispatching them. However, I find it extremely fun and challenging to go into a beautiful part of an underwater cave and carefully take the time to light it and then do a photo shoot. Just like you would on location somewhere or in a studio.

These photos were all taken in the front part of the Devil's System at Ginnie Springs, from The Lips to the cavern zones. The divers are Jill Heinerth, Tracy Niesent, Kristi Bernot, Richard Black, John Katerenchuk and Dan Wright, who also helped light many of these. (I first met Dan on the Warner Brother's film "Music and Lyrics" in New York. He does lighting on major films there). In the photographs on these pages, Dan did the majority of the lighting with the exception of the images of Jill. We would "scout a location," and then proceed to light it, using a number of strobes, which would sometimes take up to an hour just to set! We would then take turns photographing our very patient models, keeping a close eye on everyone's air.



*Tracy Niesent and Dan Wright swim through a small Catacomb passage near The Lips.*

# Midwest Underground

By: Chris Hill

## A Bridge To Nowhere



Here in the central Midwest, we've been in a historic drought the likes of which haven't been seen in 80 years. This has provided huge opportunities for cave diving and exploration that many divers have taken full advantage of. Now spring is here, and with it has come the much-needed rains. Overhead diving has all but stopped. Divers have to get creative to keep themselves satiated with the wet underworld and provide themselves with adequate challenges to keep skills honed. Enter the Old Kimberling City Bridge.

Granted, this dive is in open water, but still provides a challenging opportunity to utilize and rely on our overhead and technical skills. While it has no "hard" ceiling, this dive will generally have a deco ceiling and it's in a heavy boat traffic area, so direct ascents are definitely not recommended. Visibility is limited to 5 – 10 feet and reliance on navigational aids, such as lines, permanent structure and compasses is needed. Due to depths with poor vis, good lighting is required and buddy awareness and communication are challenging.

In 1927, a bridge was built to cross the White River just south of Kimberling City, Missouri, replacing a ferry system used to help horse & buggies cross. Thirty years later, in 1957, the Table Rock Dam was in place to create Table Rock Lake, and a new higher bridge had been built to cross the future lake at Kimberling City. According to legend, the old bridge was in process of being disassembled. But the lake filled too fast, and half of that old bridge had to be left as a permanent part of the lake's depths. There it exists to this day, much to divers' delight.

Accessing this dive site can be done via boat or shore. With a boat, there are various methods of finding the bridge and getting a line secured. Most ways involve some sort of grappling method, and you just hope that when you descend the line you don't discover you've only snagged a tree 130' down! Depending on the time of year, boat traffic can be heavy. You'll be tossed about quite a bit.

Diving from shore is equally challenging due to the distance you'll have to travel to reach the submerged bridge. You'll be able to park on a nice rocky shore on the south side of the lake right next to the water, and the slope is very gradual so entrance and exit from the water is easy. However, once in the water you'll probably want a scooter to travel the distance of about 700ft to the new bridge crossing the lake, then another 500ft out to the center bridge pylon where a line is secured about 20 – 30 ft below the surface leading to the submerged bridge. Again, where the new bridge crosses the lake is a major thoroughfare for boat traffic. It is therefore prudent to use underwater navigation to traverse from pylon to pylon until reaching the center pylon where the guideline is attached. From here there is a heavy nylon rope leading about 500 ft out and down to the submerged bridge. That's a total of about 1700' to travel just to reach the submerged bridge – you might want a travel bottle!

When cave diving in turbid conditions on a scooter, one has to pay strict attention to maintaining visual contact with the



line at all times, else risk having to exercise a lost line drill. When following the 500' line out to the bridge, the same applies. It's an eerie feeling to be in a 3D environment with very low vis and descending to a significant depth, and the only reference point you have is a nylon rope. If you're swimming, this isn't much of an issue and you can just maintain some touch contact. But if you're on a scooter, you really need to maintain that visual contact. Just peek away for a moment and you can quickly find yourself out in never-never land...and there's no lost line drill to fall back on. You might get lucky and see a buddy's light, or you could get lucky and run back into the line, but if not, you're going to make a free ascent into boat traffic ('hope you brought your spool



stops.

This is definitely an advanced dive and obviously one that warrants use of mixed gas, decompression planning, dry suits and multiple tanks. As all tech divers know, narcosis affects different divers in different ways, at different depths, on different days, etc. I think it's safe to say, most Midwest divers would agree that narcosis is more obvious and comes on quicker and harder diving the lakes in this area. The depth, the cold, the limited visibility and the darkness all play a role in that. It can feel much more confining than many caves. I certainly know that diving 150 feet in a warm ocean on a wreck with clear visibility seems like a cake walk compared to diving

the old Kimberling Bridge.



Once on the old bridge, it's really neat to follow the structure and explore the bridge in its entirety. A lot of big fish tend to hang out on structures, just like the ocean, so keep your eyes peeled for a trophy bass. There's a lot of history there as well and it's definitely not your typical purposely placed sunken object for lake divers to play on. A lot of divers head to Missouri to try out the caves, but if you need more options or the cave conditions aren't too great, then you might consider adding this site to your list.

and lift bag for a controlled ascent and visual aid for boats to avoid).

Whether accessing by boat or land, you definitely want to be able to retrace your route to return to the surface. Once on the bridge you can utilize the bridge structure for guidance, although vis is limited to 5 or 10 ft, it all looks very similar and there is plenty of sediment to stir up –so pay attention and buoyancy control is advised. You might even consider deploying a reel for exploration on the bridge, but with all the metal edges, it might not be that dependable. Depending on lake levels, the top of the bridge structure could be between 110' & 130'. The bridge deck is about 20' deeper and the floor of the lake in this area is around 150' to 170'. Light does not penetrate that deep in the lake, and with the low vis, good lighting is essential for communication and sightseeing. Temps at depth will be in the mid-forties. Temps near the surface will depend on the time of year and will be between 40 and 80+, so consider that for your deco

Much like plaques and memorials we find in caves, chained on the upper bridge structure you can find a large bell. My understanding is that this is a memorial to a person who spent about 3 years searching for this bridge and finally found it back around 2000. He passed away shortly thereafter and his buddies had this bell made with an inscription on it, then hung it on the bridge. So if you make the dive, be sure to read the inscription and ring the bell in his remembrance.



Image by Doug Vahrenberg generated using Humminbird Side Imaging Electronics

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# Skills, Tips & Techniques

By Georges Gawinowski

Mastering buoyancy in cave diving is like having a cup of iced tea in a hot summer day, it is so sweet!

Whether you are a new cavern diver or experienced cave diver, buoyancy and swimming techniques have to be mastered. Remember, when cave diving we need to pay attention in order to minimize the negative impact we could have on our selves, fellow divers and surroundings. Other divers and the cave will appreciate it!

Mastering buoyancy will help us to:

- Reduce gas consumption,
- Reduce the risk of over exhaustion,
- Reduce the risk of loss of visibility,
- Reduce the risks of decompression sickness,
- Reduce the risk of aeroembolism,
- Reduce the risk of O2 toxicity.

## Personal Evaluation

In a cave system, things can change dramatically because of human error. All of us can make mistakes when our buoyancy is not what it should be. Every time we dive in a cave we need 100% awareness and focus on our buoyancy while also keeping the dive and our buddy in mind. Ideally, we should anticipate problematic situations and avoid them by being aware of any changes in our breathing, posture, swimming pattern or depth.

One of the best ways I have found to evaluate my buoyancy is simply by practicing in an open water area.

## A simple practice and evaluation drill:

- Lay a line on the bottom,
- With your body centered in the middle on the line, swim over the top it
- While swimming, make a 90 degree turn, then a 120 degree and a 180 degree turn without any changes in posture.
- Practice for 30 minutes or more and see if your technique remains consistent.

Once you are comfortable with your buoyancy, practice on a cave dive with one mission in mind: to maintain perfect trim at all times.

Each time you notice a problem, surface and discuss the mistakes that were made. Find solutions to improve your

technique and avoid the mistake next time.

I truly believe that some dives should be dedicated to perfecting certain skills. It doesn't mean that you won't have fun during the dive; in fact, your enjoyment will be greater in the long run.

## Some Helpful Tools

- Gear configuration is an important factor. Remember your training, look around and ask other divers why they use a specific type of equipment or configuration. Be open-minded.

- Tanks should be well balanced and positioned.

- If you dive a rebreather, you may find it hard to keep your legs up. Some have found it beneficial to add some weight to balance their trim. These can eventually be dropped with practice and repetition.

- Use some visualization techniques to help you create a positive mental picture of your buoyancy, like athletes visualizing their race. Your mind can be a powerful tool.

- Start the dive on the "right foot". An in-water check is a great time to adjust for perfect buoyancy.

- Be relaxed and control your buoyancy with your lungs first, followed by your wing and dry suit. When diving CCR the loop volume should be optimum on the way down.

- Go slowly when you practice your tie offs or jumps. Make sure your buoyancy is controlled before you tie your line.

- Find a good trajectory during the dive to decrease buoyancy changes.

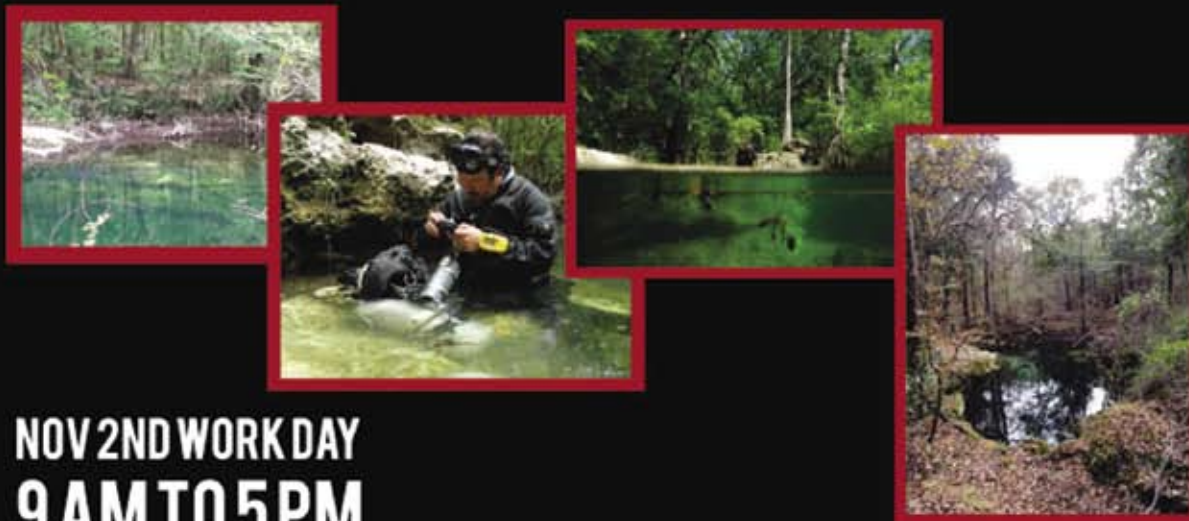
For a cave diver, good buoyancy is an important skill to master for safety and to make sure that we have the least impact possible on the fragile cave environment.

Out of respect for our buddies, the cave diving community and the cave systems we should improve our techniques and become better cave divers. As my buddy says "the day I stop learning something in cave diving I will stop cave diving!"

Safe cave diving to all.



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# Conservation Corner

By: Kelly Jessop

## Leave No Trace

In caving generally, and cave diving specifically, we focus on minimizing impact to the cave, through different techniques which we acquire through training and mentoring. What about the surface area that is a conduit to our cave exploration? Do we use the same conservation mentality? What do we do to minimize evidence of our presence?

When I was a scout, we were always taught to leave the site better than it was when we arrived and later, in dry caving experiences, this lesson was strongly reinforced because we didn't leave until the surface site was pristine. Evidence of trash, waste and other items would be removed even if it wasn't ours. This is evidenced by "Leave No Trace," which is a nonprofit organization which provides a set of trail ethics, [www.usscouts.org/advance/LeaveNoTrace.asp](http://www.usscouts.org/advance/LeaveNoTrace.asp).

What does this mean to us as cave divers? We visit sinks and springs not just to enjoy the karst environment, but for the opportunity to visit a unique natural environment which unto itself imparts enjoyment and satisfaction. Often, when confronted with a natural environment that has trash deposited or even worse appears to be a dumping ground, the beauty of the site is gone and the visit is less than satisfactory. As conservation-minded cave divers, and having concern for landowner relations, we have a need to clean the site of our impact and anything else that was there before our visit. There have been several cave diving sites that cave divers saved from closure because we expended effort to clean up the mess of others. This saved the landowner the personal expense and gave cave divers positive recognition.

So what can we do? Carry plastic trash bags, latex gloves and perhaps a reacher to pick up items that may be a safety issue. At the end of a dive take a few minutes and police the area and then deposit the refuse at the appropriate place. What about when we are in the water in a sink, river or spring run and we encounter some refuse? I will grab a couple items with a free hand and then place them in the trash. Taking these few extra minutes will have a lasting effect on the sites we visit and will also promote positive landowner relations.

# The Loop

By Joe Citelli

## Did You Ever Wonder?

Did you ever wonder what separates an instructor from an instructor trainer? Did you ever wonder what qualifies an instructor to be an instructor trainer?

Well I did, so I contacted Doug Ebersole, one of the Instructor Trainers for KISS rebreathers and the staff KISS IT (Instructor Trainer) for Add Helium. Doug also happens to be an MD whose specialty is Cardiology. Who better to learn about rebreathers from? From the perspective of an observer, the Instructor Trainer is an instructor who possesses an above-the-norm deep knowledge and understanding of the unit he trains on. He thoroughly knows and understands not only the operation of the unit, he also knows and can explain all of the nuances and quirks of the unit, no matter how slight or insignificant they may be. His job is to not only to train the instructor, but more importantly, to pass on all of that intimate, detailed knowledge and minutia to his students.

The KISS family of rebreathers includes the Classic KISS Explorer CCR (Closed Circuit Rebreather), their latest addition, the KISS Gem, a rather unique SCR (Semi Closed Rebreather) and the KISS Orca Spirit, another CCR. The first task of the instructor candidate is to demonstrate a thorough working knowledge of the unit(s) he is going to instruct on and to give a thorough presentation for the trainer. This requires ordered, methodic breakdown and reassembly or “build” of the entire unit, simultaneously explaining the function of each component in a manner which could be understood by even the most novice student, all of this while adhering to a checklist. This procedure was followed for all three units. Everything from the relationship of regulator interstage pressures and how they affect the function of a sonic orifice needed to be discussed and explained in detail.

The Classic KISS Explorer was the original KISS rebreather. It was the first commercially produced (non-military) CCR that used a sonic orifice in place of a solenoid to achieve CMF (Constant Mass Flow) to bring Oxygen into the breathing loop. A sonic orifice is one which maintains a constant, non-varying flow of gas as long as the supply remains above a given pressure. The initial intent of this type of unit was to offer a product which appealed to divers who were not comfortable mixing electronics with water. Additionally, as offered, the unit would be simple (KISS – Keep It Super Simple) and easy

to maintain. From the factory, the unit is depth-limited to the depth at which the surrounding water pressure equals or exceeds the regulator’s interstage pressure. To accomplish this the O<sub>2</sub> supply regulator must be modified to become one that is non depth compensating. If a depth-compensated regulator (i.e.: a normal scuba regulator) was used the orifice would maintain a constant flow but the density of the gas (Oxygen) would increase. This renders the system unstable and greatly increases the potential for Hyperoxia (a dangerously high partial pressure of Oxygen that is toxic). The unit also has backmounted counterlungs and an axial scrubber.

The KISS Gem is an SCR rather than a CCR. SCR’s maintain the breathing loop oxygen levels by adding fresh gas to the loop as it vents an equal amount into the water. The GEM, unlike other SCR’s, vents the gas through the mouthpiece in addition to an over-pressure valve on the scrubber head. It is being sold as a recreational-level rebreather since it requires no oxygen addition. The unit has no solenoid valve or oxygen addition orifice and operates off a single gas supply which feeds a mechanically operated orifice, very similar to the way a second stage demand regulator works. As the unit vents gas in a controlled manner, the loop volume diminishes and the counterlungs collapse, thus activating a demand valve which injects an appropriate amount of fresh gas into the loop, replacing that which was vented. The unit is designed to operate with various nitrox mixtures. Students are taught that there is a drop in loop ppO<sub>2</sub> (partial pressure of Oxygen) when compared to the expected ppO<sub>2</sub> derived from the FO<sub>2</sub> (Fraction of Oxygen) in the supply bottle and to account for that in their dive planning by assuming a 3 to 5% drop in the FO<sub>2</sub> of their inspired loop gas. The GEM comes in both a back mount and a side mount version, the latter being of great interest to cave divers looking to push exploration or for a bailout rebreather.

The KISS Orca Spirit is the latest addition to the KISS family of rebreathers and an updated version of the KISS Classic Explorer. Among other things it features a “bi-axial” scrubber. A bi-axial scrubber is an axial design scrubber with dual compartments, one flowing into the other. Tests reveal that the area of the scrubber canister that does the most work is the face. The bi-axial design doubles that area, making the system very efficient. The other nice

feature of this unit is the wraparound counterlung design which features a low profile and low work of breathing.

The above is the condensed version of the detailed information Doug required his student instructor to present and explain to his student diver, a female new to rebreathers. I was quite impressed with the meticulousness of the entire session and appreciated his diligence in using checklists and acronyms as learning tools. This is the type of information one acquires only after years of dedicated diving and observation of a particular unit and is what makes the Instructor Trainer such a valuable part of the total rebreather diver training equation.

For the next quarters issue I will report on the actual dives done and the procedures employed to ensure that all participants receive maximum benefit from their training.

On another note I must give kudos to Bob Hollis and Hollis Rebreathers for reading the last issue's article on the Prism 2 rebreather and taking the time and interest to contact me to discuss the few small criticisms I had of the unit. I was told they would investigate my critiques and if they deemed them valid, they would address them appropriately. That, in my opinion, is what the industry should be doing on many levels.



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# MILESTONES

By: Shirley Kasser

It's that time of year again! This year's cave diving milestone awards were announced at the annual workshop. Those present received a certificate, marking this exciting high point in their cave diving career. The remaining recipients will receive their certificates by mail.

Two divers, Peter W. McCumber Jr. and Tom Percy, reached the one thousand dive mark, earning the highest award offered, the Sheck Exley. Well done!

Carl B. Griffing, Jr, completed five hundred cave dives, earning his Henry Nicholson Award: Congratulations, Carl!

Three divers earned their Abe Davis International Award by making one hundred cave dives across at least five countries: Thomas Feiden, Min Ho Lee, and Trace Malinowski. Excellent work!

Forty-five divers qualified for the Abe Davis Award by reaching their one hundredth cave dive safely: Larry Anta, Kristi Bernot, Sean Boggness, Scott R. Brooks, Douglas Cain, Brandon Cook, Sean Costabile, Bruce Parker Culbert, Cora David, Michael David, Kristi Draper, Charles Matthew Fletcher, Jeffrey Edward Frank, James Garrett, Michael Gifford, Roger W. Holmes, Jr., Thomas R. Howarth, Ph.D., Tim Kennedy, Michael S. LaBarge, Gabriel Lamarre, André Lange, Allison Lee, Robert Lee, Rachel Logan, Steven Mann, Jim Marshall, Sylvester J. Muller, Tracy Niesent, Katherine L. Pruden, Scott Reese, David Reiterman, Roy J Reynaud, Tara Rodgers, David Scott Sanders, James M. Starr, Tamara L. Storm, Steven Thacker, Michel Therrien, Timothy J. Thomas Sr., Louis Towles, Michal Turek, Mark A. Vlahos, Gregory M. Watson, Chris Wickman, and Xenia Mountroudou. Congratulations to you all!

Thank you all for participating in this important program highlighting safe cave diving. This year's awards represent seven THOUSAND three hundred safe cave dives. Kudos!!

Watch this space in the next issue for stories of these great milestone dives. What's your story? Email your milestone stories and photographs to me at [abedavis@nsscads.org](mailto:abedavis@nsscads.org), or snail mail them to me at 1228 Gina Court, Apopka, FL 32703.

Shirley Kasser

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# INSTRUCTOR'S CORNER

By Carl Griffing

## Cave DPV Pilot

Among my most memorable cave dives, my first few DPV pilot cave dives rank very high. I vividly remember the dives from my DPV pilot course that I completed in the Riviera Maya, diving cenotes such as Sistema Chac Mool, Dos Ojos, Ponderosa, and Nohoch Nah Chich. It was a fun, exciting, and challenging experience that opened up new possibilities for my cave diving.

Since that time, I have completed dives that would have been much more logistically challenging without the use of a DPV. DPVs can enhance and extend your cave diving, but using a DPV also presents more risks and can have a much greater impact on the cave environment. To minimize those risks while reducing impact on the caves, I am a proponent of proper instruction.

For experienced, responsible cave divers, who have interest in using a DPV (commonly called a scooter), the NSS-CDS offers the DPV Pilot course.

Here's the DPV Pilot course description from the NSS-CDS website:

*The purpose of the DPV (Diver Propulsion Vehicle) Pilot specialty course is to expose the trained cave diver to the basic fundamentals of the safe operation of diver propulsion vehicles in underwater caves while under the direct supervision of a qualified DPV Pilot Instructor. The student is able to build practical experience in the field under controlled conditions. Safety practices, procedures and techniques common to most DPVs used in the unique environment of a cave are covered. Conservation considerations such as low-impact operation are emphasized. Potential emergency situations are simulated and practiced.*

To enroll in the course, the prospective student must have NSS-CDS Cave Diver level of training or equivalent and have at least 50 logged cave dives beyond the Cave Diver level, not including training dives.

Topics covered and skills practiced during the course include types and history of DPVs, DPV operation and maintenance, proper rigging techniques, cave conservation, gas management, DPV diving protocols,

guideline use, emergency procedures, and towing procedures. There are many more topics covered and skills completed during the course, so this list is not all-encompassing.

The instructor will present the topics and skills practice so that the students understand the procedures, get skills practice, and perform the dives, so those who meet the requirements can be qualified as a DPV pilot.

There is a lot more to the DPV Pilot course than one may realize. Piloting a DPV into a cave is considerably more complex than it immediately appears. Be aware that there are a few cave diving sites that require DPV Pilot certification to use a DPV at those sites, and that DPV use in some sites is prohibited. DPV Pilot cave diving can open up new possibilities but also increases risks. With proper knowledge and training, being a responsible cave diver is emphasized, the impact on the caves is minimized, risks are managed, safety is enhanced, and enjoyment is maximized.

Check out the NSS-CDS Instructor listing in this issue of Underwater Speleology or on the NSS-CDS website at [nsscds.org/instructorlist](http://nsscds.org/instructorlist) to find an instructor who can teach the DPV Pilot course. You may find the DPV Pilot course to be one of, if not the most, interesting and fun courses you have ever taken.



Photographer: Andrew Fritz



[www.cavecountrydiving.com](http://www.cavecountrydiving.com)

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# OFF to the Side.....

By Rob Neto

The third tenet of the NSS-CDS is education. While the NSS-CDS is involved in several aspects of cave diving (the last two columns were about conservation and safety), we all know education is a major focus of the organization. Now, many of you may be thinking about your cavern or cave classes. While I feel that is an important part of the organization's mission, and I believe divers should take classes from qualified instructors so they learn procedures properly, that's not the type of education I'm referring to here.

We need to distinguish between training and education. The NSS-CDS has a well-established training program that covers cavern through cave, including several specialties, such as the sidemount cave class. But education is more than just training. One example would be educating the public about what we do and see in underwater caves. Education is also teaching other cave divers about what sidemount divers specifically do and see.

As a cave diver, the most common comment I hear when non-divers find out what I do is, "I couldn't do that. I'm too claustrophobic." I then explain to them that many caves are not small at all. In fact, I've been in passages that could hold a couple of semi-trucks side by side and there would still be room to swim around them. That gets them thinking differently about underwater caves.

As a sidemount diver, the impression many backmount cave divers have is that all we do is dive small restrictions, where we have to remove cylinders just to squeeze through. And while I've done my share of that, as I'm sure quite a few sidemount divers have, that's not true of all dives. A common theme among new sidemount divers is that restrictions that once looked small look inviting now that they are in a lower profile configuration. As more experience is gained, some may even move onto the restrictions that require cylinder removal. But that's not necessarily what sidemount diving is about.

For some of us, me included, it's about saving aging joints and spines that don't like the compression that comes along with donning 100+ lbs. of steel and brass, even for a short walk to the water. For others, it's about the greater stability we feel in the water in sidemount, or the added redundancy of having independent dual cylinders. Some of us have completely different reasons for choosing sidemount as a primary gear configuration.

Whatever your reason for diving sidemount is, it's your responsibility to educate others. There are some divers who have a negative opinion of sidemount divers for one reason or another. Some think sidemount isn't necessary or that we shouldn't be penetrating passages too small for backmount. Some think all new cave divers should complete their training in backmount, and after gaining some experience in the caves, then transition to sidemount. It's our responsibility to educate these people why we dive sidemount. Granted, we won't sway everyone. Some people

will continue to hold fast to their opinions. That's fine. But others may learn something new and have a better outlook on sidemount diving.

If you've done much diving in backmount, I'm sure you can recall a few times when you were stopped on a hot summer day, walking to or from the water with a set of heavy doubles on your back, only to be stopped by someone asking what you see in the caves. Most of us were taught to be courteous and answer questions. Be friendly. After all, you never know whether the person you're talking to might have private access to a spring. Well, in sidemount this becomes a much easier thing to do. Your tanks are probably in the water so you don't have that 100+ lbs. load on your back. Take the time to talk to curious onlookers and educate them. This way those who are still carrying doubles around can get in the water and get neutral and keep their spines and joints from suffering too much!



*Sidemount diver above the remains of the Madison at Troy Spring.  
Photographer: Gene Page.*

# Meet Bruce Ryan



I am honored and privileged to serve, once again, as the NSS-CDS Administrative Manager.

I was the first in this position beginning in 1991 and served in this role for 11 years. An active cave diver for over 15 years, I retired for personal and medical reasons, but I still love cave diving and love the NSS and CDS.

I will do my best to help you solve those problems. I will either fix it myself, or put you in touch with those that can, and I will follow up with you to make sure you are taken care of. That is my task and my goal, and I love it.

Keep in mind please that if you call during the day, I do have a day job. But leave a message and I will get back to you. If you use email I will monitor it constantly so you are in touch with me quickly. Every member and instructor in CDS is a member of my 'family'. And I view it that way.

I look forward to serving you again in this capacity. Thank you for this opportunity. Please always feel free to call or email me anytime.

Bruce Ryan  
 NSS # 35175  
[cdsmanager@nsscds.org](mailto:cdsmanager@nsscds.org)  
 850-284-1849

As I used to say..."I am the "They"; when people say "They" lost my c-card, or "They" lost my order, or "They" never returned my call, etc... I am the "They"! I am the one you need to come to if you are having problems and

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# Improvements at Cow Springs

Photographer: Tony Flaris



Prompted by continuing erosion problems and injuries, a deck, walkway and steps are being installed at NSS-CDS owned property, Cow Springs.



The project was worked on by a small but diligent group of volunteers and progress has been made.

The stairs and decking are completed. Erosion control is being worked out. Thanks to all who helped or supported this project.



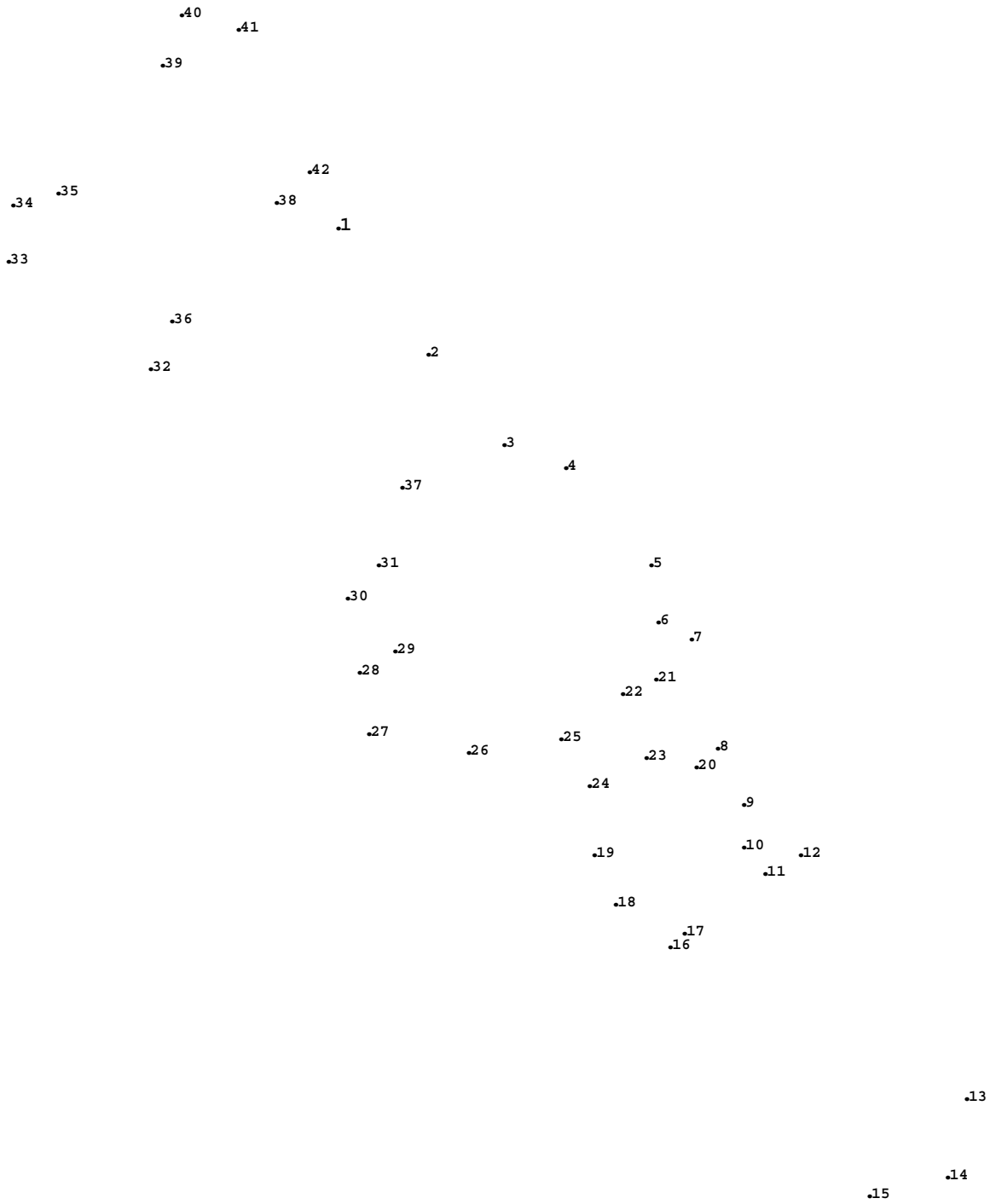
There will be a clean-up of the Cow Springs property this fall on November 2, 2013, followed by a Breakfast Social the next morning celebrating the NSS-CDS 40th Anniversary, with speakers, door prizes and, of course, socializing.

Contact Tony Flaris ([vicechairman@nsscds.org](mailto:vicechairman@nsscds.org)) or Cheryl Doran ([uwseditor@nsscds.org](mailto:uwseditor@nsscds.org)) to sign up or donate to the clean-up or social.

Check the NSS-CDs website where more details will be posted.

# IT'S LIKE LAYING LINE.....

Connect The Cave Dots



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# **The 2013 Midwest Workshop**

**September 14, 2013**

**9am - 4pm**

**Pezold Banquet & Meeting Center, St. Charles, MO.**

## **2013 Workshop Presentations:**

**Bill Harrison - Cavern Experience - This is to draw interest for non-cavers and will focus on pictures and videos showing the natural beauty on what can be found in the cavern zone.**

**Mike Young -**

**OCDA - Update on the added push of Roubidoux last year, along with pictures and video.**

**Forrest Wilson - Cave Diving in Europe. This includes diving five caves in the famous Lot River Valley of France, two caves in Wales, and also several dives in the famous Wookey Hole in England.**

**More information coming soon on the NSS-CDS website:**

**<http://www.nsscads.org>**