

Underwater Speleology

Journal of the Cave Diving Section of the National Speleological Society

INSIDE THIS ISSUE:

Adding Depth to Photos

Solo Diving Report

**NSS-CDS Constitution and
Bylaw Changes**

**Volume 39 Number 1
January/February/March 2012**



DEEP INTO THAT
DARKNESS PEERING,
LONG I STOOD THERE,
WONDERING, FEARING,
DOUBTING, DREAMING
DREAMS NO MORTAL
EVER DARED TO DREAM
BEFORE.

-EDGAR ALLEN POE

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information on the TecRec Cave
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**Underwater Speleology
Volume 39 Number 1
January/February/March 2012**

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Photographer: Gene Page

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Submission Deadlines

Issue	Deadline
Jan/Feb/Mar	December 1st
April/May/June	March 1st
July/August/Sept	June 1st
Oct/Nov/Dec	September 1st

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Underwater Speleology (UWS) is printed quarterly (four times yearly) by the NSS-CDS, 295 NW Commons Loop, Suite 115-317, Lake City, Florida 32055.

UWS is a membership benefit. Information on membership fees and registration can be found at www.nsscds.org.

Please send address changes to NSS-CDS, 295 NW Commons Loop, Suite 115-317, Lake City, Florida 32055.

Please submit letters and articles to UWS EDITOR, 295 NW Commons Loop, Suite 115-317, Lake City, Florida 32055.

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Hart Springs Winter Workshop

January 14-16, 2012

Cost: \$35

Registration 8AM
Coffee and donuts
and Lunch included

Diving at Hart Springs



Must show proof of DAN insuras to dive
9AM - Noon

Larry Korhwak UF.On nitrates and nitrites loading.
On the aquifer.

Pete Butt- slideshow and narration on water sampling.
New BBC video of Hart Springs.
GUE new exploration by Jarrod and or Casey.

12:30-4:30PM

Bob Schulte on Manatee Springs extension
and mapping with Marius Frei.
Al Bearfoot diver and Jim Cutler Mote Marine
researcher on offshore caves in Gulf of Mexico.
Video and stills of Black Diamond, Mega Dome,
Glory Hole and AJ Hole.

Story Telling All Are Welcome to Join In
Wayne Kinard - Rescue at Cow Springs
and Screaming Diver at Hart Springs.
Marius Frei - The connection of Harper Tunnel
to Florida Room

Guided Dives

Full Cave with less than 100 dives in Little Hart
Full cave with Abe Davis or 100 dives in Black Lagoon



gene melton

from the Chairman

“Any intelligent fool can make things bigger and more complex... It takes a touch of genius - and a lot of courage to move in the opposite direction.” Albert Einstein

Thank you to DiveRite, Hollis, Light Monkey and Shearwater for sponsoring last year's workshop. Without your support the workshop would not have been the success that it was.

The booth at DEMA was staffed by volunteers Cheryl Doran, Riana Treanor, Barbara Dwyer, Rick Robinson, Forrest Wilson and yours truly. I did not see anything new at this year's show that was a must have for cave divers.

Reminder: Currently there is still no paper registration for CDS members on the NSS website. You can register online at:

<http://caves.org/info/membertypes.shtml>

The paper registration form can be downloaded from the CDS website:

http://www.nsscds.org/test/drupal/files/forms/join_cds.pdf

The Hart Springs Social is quickly approaching. If I understand correctly the Hart Spring's management has updated it's policy and Abe Davis is no longer required to dive. DAN insurance is still necessary. All registration will be on site.

Workshop Chairman, Bobby Franklin says the program for the 2012 Workshop is in full swing. Michael Angelo is planning to have a photo/art salon (contest) this year. Photographers and artists, now is the chance to display your artwork.

We had a lot of fun at the Midwest Workshop. I purposefully took no dive gear to test the Roubidoux jinx. Sure enough, Roubidoux Spring flow was down and everyone (else) had good dives. Next year, I'll try again. Brendan Nappier was one of the fortunate divers.

Sadly, Brendan succumbed to carbon monoxide (CO) poisoning several weeks later exploring a new cave system in Cozumel. Our condolences go out to Brendan's family. He will be missed by all who knew him. Brendan was meticulous in his dive preparation and planning only to fall victim to CO poisoning. Let us learn from Brendan's tragedy. Future expeditions to other countries should take CO analyzers and test each cylinder for CO prior to using it.

All who attended the vertical rope clinic got to try out the rope walker and frog climbing systems as well as several methods for descents.

More depositions have been taken but other than that there is nothing new to report on the lawsuit.

As far as I know, we are still planning to attend Beneath the Sea in March and share Susan Gero's, Exploration Design Studio booth. Visit XDS NSS-CDS and cave diving jewelry and other fine artwork.

<http://www.explorationdesign2.com/index.html>

Dive safely,

Gene

FROM THE BACK OF THE CAVE.....

A Little Cave Diving History

The Beginnings of Underwater Speleology Magazine

Longest Underwater Cave
Closed

Fin Straps For
Cave Diving

Indiana's Deepest Pit
Cave Is All Wet

New Cave Diving
Equipment Safety
Innovations

Above: Article titles from the first year of Underwater Speleology Magazine

Right: Cover of first issue of what has become Underwater Speleology Magazine.

The first issue of the CDS newsletter was printed in March of 1974, the month following the NSS's formal approval of the CDS. Five pages long and without a name yet, it was mimeographed and sent to 21 members in 10 states across the US.

Sheck Exley wrote the first chairman's column and the five pages of content were lively and varied.

The brand new CDS Constitution was printed as well as several proposed amendments, invitations were extended for divers to join various expeditions and projects, and there was to be a Spring Workshop at Tiburon Cave, California.

After three no-name issues were printed, the following names were voted on by membership:

The Submerged Caver, the Phreatic Explorer, Newsletter of the NSS Cave Diving Section, Bulletin of the NSS Cave Diving Section, Guideline, The Phreatic Troglodyte, Phreatus, Cave Diver, The Aquaspeleologist, Underwater Speleology and the Preatodyte.

The first issue under the banner of *Underwater Speleology* was printed in June of 1974.

During the first year, articles included the latest news, such as Florida's new dive flag law, the new NAUI and YMCA cave diving certification programs (NACD and PADI were the only other certifications available as the NASDS certification was inactive at the time and the CDS had not formed theirs yet), the closing of the "longest underwater cave" (Peacock Springs) by Cattle Breeders, Inc. and the "newer safer scuba configuration...the ideal manifold and the buddy hose."

You could also find information on equipment tips and innovations, exploration, world records, rescues, and diving accidents around the world.

THE ? ? ?

OFFICIAL NEWSLETTER

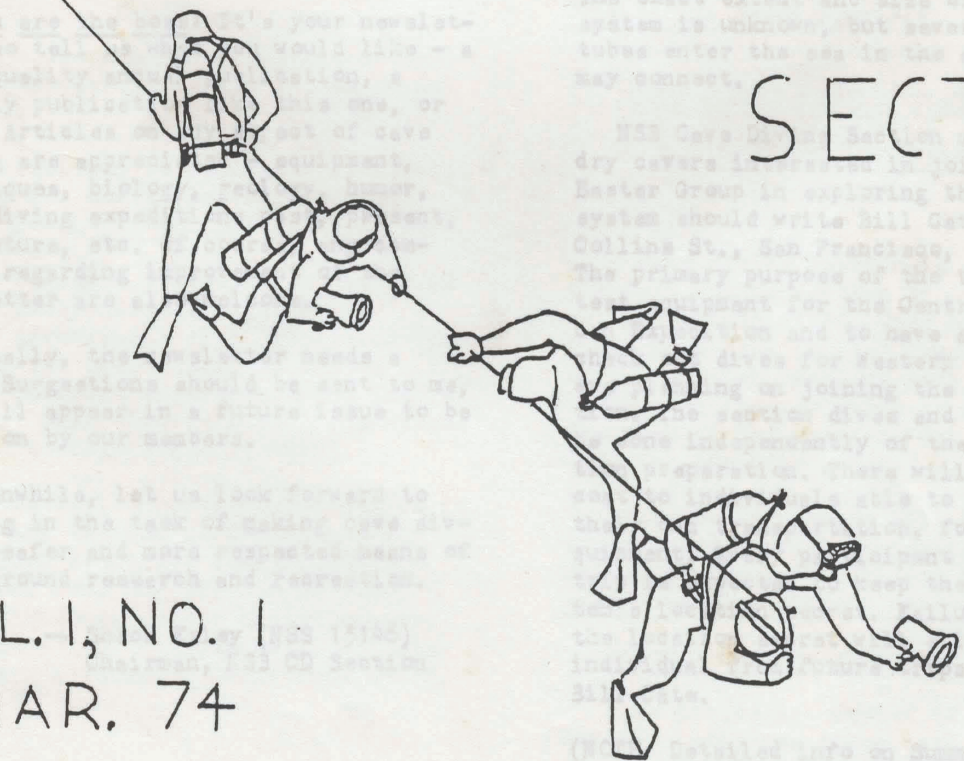
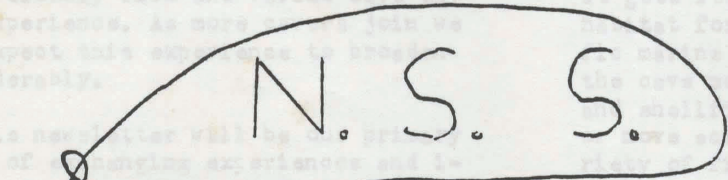
OF THE

N. S. S.

CAVE

DIVING

SECTION



VOL. I, NO. 1
MAR. 74

NSS NEWSLETTER, Mar. 1974



Adding Depth To Photos: Off-Camera Strobe Lighting

By: Liz Rogers
<http://photographyunderpressure.com>

....For larger caves and careful buddies, backmounted twin tanks are the perfect place for extra strobes....



Triggerfish sensor attached to an inon Z240 strobe



Slave sensors from left to right: homemade, Heinrichs Weikamp RSU-SUN, triggerfish

One of the greatest differences when moving from ocean diving photography to cave diving photography is that the background sunlight has been taken out of the picture. Unlike the movies---and unless you are playing in the cavern zone---the only light underground is that which you bring with you. While the darkness provides great opportunities to try new lighting techniques, it also presents a few difficulties. I'm going to briefly outline the tricks I've used over the last two years to get some of my favourite cave diving photos.



Backmounted strobes firing into the camera as the diver swims away.

As underwater photographers already know, strobe light doesn't travel very far from the source. In caves, if your only strobes are the ones attached to your camera, this limits you to lighting things within approximately 10 feet. The distance here depends heavily on strobe power and water clarity, and practically it often means the second diver in the shot is a pair of eyeballs and possibly some tank valves floating in the blackness.

Strobes attached to the camera are convenient and necessary but usually not sufficient for great cave photos. In particular, using only one camera strobe means that all of the light in your picture is coming from one direction. This makes for flat photos which can be otherwise technically perfect, have interesting subjects and great composition, but are somehow missing that wow factor.

Adding off camera lighting to your shot is the way to go. Luckily, this is easier than it used to be with several manufacturers making remote slave sensors. Ikelite has proprietary ones for their strobes, and I use the triggerfish sensors. Heinrichs-Weikamp also sells the RSU-N, which works well in complete darkness. These sensors are connected to the off camera strobe with the same cable you would use to connect that strobe to the camera. The flash from your on-camera strobes is detected by the sensor, which triggers the off camera strobe and lights your picture.



Brian Kakuk has his hands free to retrieve a jump in Tank Cave, Australia with off camera strobes on his back and one placed in the background.

This system works reliably for me without requiring a physical connection between the strobes and the camera. As long as the sensor can “see” the camera flash, and isn’t overwhelmed by being too close to a primary dive light or ambient sunlight, the off-camera strobe fires. Once you’ve got your set-up working, the next step is thinking about placement of the strobe, and direction and power of the light it produces.

Adding more strobes to your picture does increase the difficulty level. A strobe pointed at the camera, or one that is too close to a diver or wall and creates a giant hotspot can ruin an otherwise perfect picture. Strobes that point straight down the middle of really large tunnels with black walls might as well not have gone off. Getting the right amount of strobe light in the background of your shots is half of the battle, and here’s where your buddy comes into the picture.

For larger caves and careful buddies, backmounted twin tanks are the perfect place for extra strobes. By running



Tank Cave, Australia. Only the rocks at the top and bottom of the shot are being lit by the camera - the rest of the lighting is from the off camera strobes carried by the divers.

the cable over your model’s shoulder and hooking it into the front of their harness arrangement, no extra hands are required. By looking at where your diver is pointing, you know which direction the light will be in. You can safely take photos of his or her smiling face, with the backmounted strobe lighting up the tunnel or second diver behind. Depending on the trim of the diver and of the camera the strobe may well be entirely hidden in your photos.

Unfortunately taking photos from above and behind the diver becomes impossible, as most strobes have a light sensor built in to the face of the unit that will trigger a flash. Once you’ve experimented with placing strobes on different parts of the diver, the next option for greater flexibility in camera angles is to give the strobe to your buddy to hold. This reduces the chance of your strobe impacting the roof, but introduces a whole new set of challenges for your model. They now need to co-ordinate



Grant Pearce entering a tunnel in Engelbrecht’s Cave, Australia, holding an off camera strobe to light the shape of the entrance.

the direction of the sensor towards you and the direction of the strobe away from you, while holding the setup in such a way that often they won’t know if the strobe has fired or not.

When diving with well-trained, knowledgeable and patient underwater cave models (not that I’m asking for much!), hand held off-camera strobes give great results. You have the flexibility to light specific features of the cave, to take photos of your divers from any angle, and to take advantage of opportunities for great backlighting. On the other hand, you’ve just increased the task loading on your buddy and reduced the number of hands they have available for dealing with routine cave diving tasks, such as communication.

To get successful photos from these dives, patience, co-operation, and understanding are required on both sides. Discuss your day’s goals to determine if your buddy really wants to commit to a photographic dive, or would prefer

to swim around and enjoy the cave. Once you're both on the same page, discussing the shots you'd like to get and working out the essential (one-handed) signals in advance will make a big difference to your results.

From here, of course, there are lots of variations for achieving great lighting effects. Have fun and experiment, and remember not to ignore your gauges in search of the perfect shot.

* All Photographs by:
Liz Rogers



Off camera strobes firing reliably as divers swim towards the camera in Tank Cave, Australia.



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What Is Goethite?

Frequently when cave diving we have difficulty identifying what we are seeing. Often a rock on the floor is just a rock, and we ignore it, or in a high flow cave, we might regard it as something that can be used to pull on for forward propulsion. But when is a rock not a rock? When it is a mineral that has some dynamic characteristics.

Goethite is a black textured rock that typically appears on the floor, many times in large piles, but sometimes standing alone. It is not uncommon to see a large room in which goethite surrounds the whole perimeter, and the debris cone has a black formation covering the entire surface. There seems to be no order as to where it appears (with the exception of sandy surfaces). It is randomly scattered around the cave systems.



Goethite is a black textured rock...

So what is goethite, and how did it form there? Evidence suggests this is a speleothem, since it is formed in the cave system, but its genesis is different from the typical speleothems such as stalactites or stalagmites, which formed in air filled passages. Goethite has a dark appearance due to its high iron content (ranging from 48%-72% from some samples studied).¹ Formation of goethite may be due to bacteria from a chemoautotrophic reaction or bacteria deriving their energy from oxidation of inorganic material versus sunlight. One study noted “fuzzy white growth on oxyhydroxide crusts.”² It is common to see troglobitic species mixed among these goethite mounds. Some scientists initially believed that these afforded protection from predators; others have hypothesized that these are feeding sites due to the bacteria present.



...break, leaving a tan colored fracture site

As cave divers, we avoid making physical contact with the cave. This is critical when we encounter goethite. It is fragile and doesn't handle contact well. When it is touched, it can break, leaving a tan-colored fracture site. When laying line, this is not the best choice for tie offs or wraps and should be avoided to prevent damage.

Next time you go cave diving, take note of these speleothems from a cautious distance. You are seeing something very unique and poorly understood.



...not the best choice for tie offs or wraps, and should be avoided...

1 Harris, Martin. 1990. "Phreatite: A Speleothem Formed in Phreatic Limestone Conduits", *Underwater Speleology*, Vol 17 No6

2 Brigmon et al. 1994, "Biogeochemical Ecology of *Thiothrix* spp. in Underwater Limestone Caves", *Geomicrobiology Journal*, Vol. 12



By Jason Richards

Notes From the Field: Fall 2011

Jasper Intake Town Creek

Photograph: Jason Richards

The dives at Jasper Blue Spring started as a ridge-driving trip in southern Tennessee, looking for the little spring markers on topo maps and the gazetteer, stopping at every one, and talking to land owners. We had visited the spring near Jasper, Tennessee the year earlier after some very successful dives in the area, and were looking for more good luck. We never saw the spring, as it was surrounded by a 10-foot chain link fence topped with razor wire and scary looking signs about felony trespass. It turns out that the spring is the water source for the entire town of Jasper, Tennessee, and they were protecting it with a vengeance.

The Tennessee Department of Environment and Conservation (TDEC) got wind of our other underwater cave mapping projects and expressed interest in having Chrissy and me take a look at Jasper Blue Spring, hoping that we might help confirm a recently completed watershed study. Through Chrissy's contacts at the Tennessee Department of Transportation (TDOT) and TDEC, she drafted and submitted the permits to dive at Jasper Blue Spring. As I languished in Afghanistan, Chrissy completed the "hard part," leaving only the exact timing of the dives undecided. We resolved to take a quick look during my two week R&R leave in October, which happened to coincide with the annual TAG Fall Cave-In.

We arrived at the site late on a Wednesday night just as the sun was setting, intent on taking a quick look at the site, of which I had only seen pictures. The night operator at the water plant happily met us at the gate, and seemed to have no problem with our diving at night. Chrissy and I took our first look at the site, to get an idea of what we were in for. The main spring produces a shallow run, thick with silt, hydrilla, and other aquatic weeds. A huge concrete platform 15 feet above the spring supports the three pump motors with steel tubes dropping down into the spring. Where the tubes meet the water the cave entrance is obvious, a deep blue crack about 3 feet wide where the floor of the run turns into a large rock dropping down and the ceiling sets back into a long undercut. About 200 feet away, over a small bluff behind the spring, is a long, narrow pool at the base of a 40 foot tall rock bluff - very reminiscent of a Mexican cenote. The smallest breakdown on the sloping floor of the pool disappears into the blue murk, showing approximately 15 feet of visibility, with no indication of how far back the pool would extend before hitting a wall or where it might continue into the mountain. It was obvious that the bluff pool and the spring would connect - the bluff pool points directly at the spring, and there is even some flow in the pool in the direction of the spring, though the two had never been connected; even though the station operator had mentioned divers

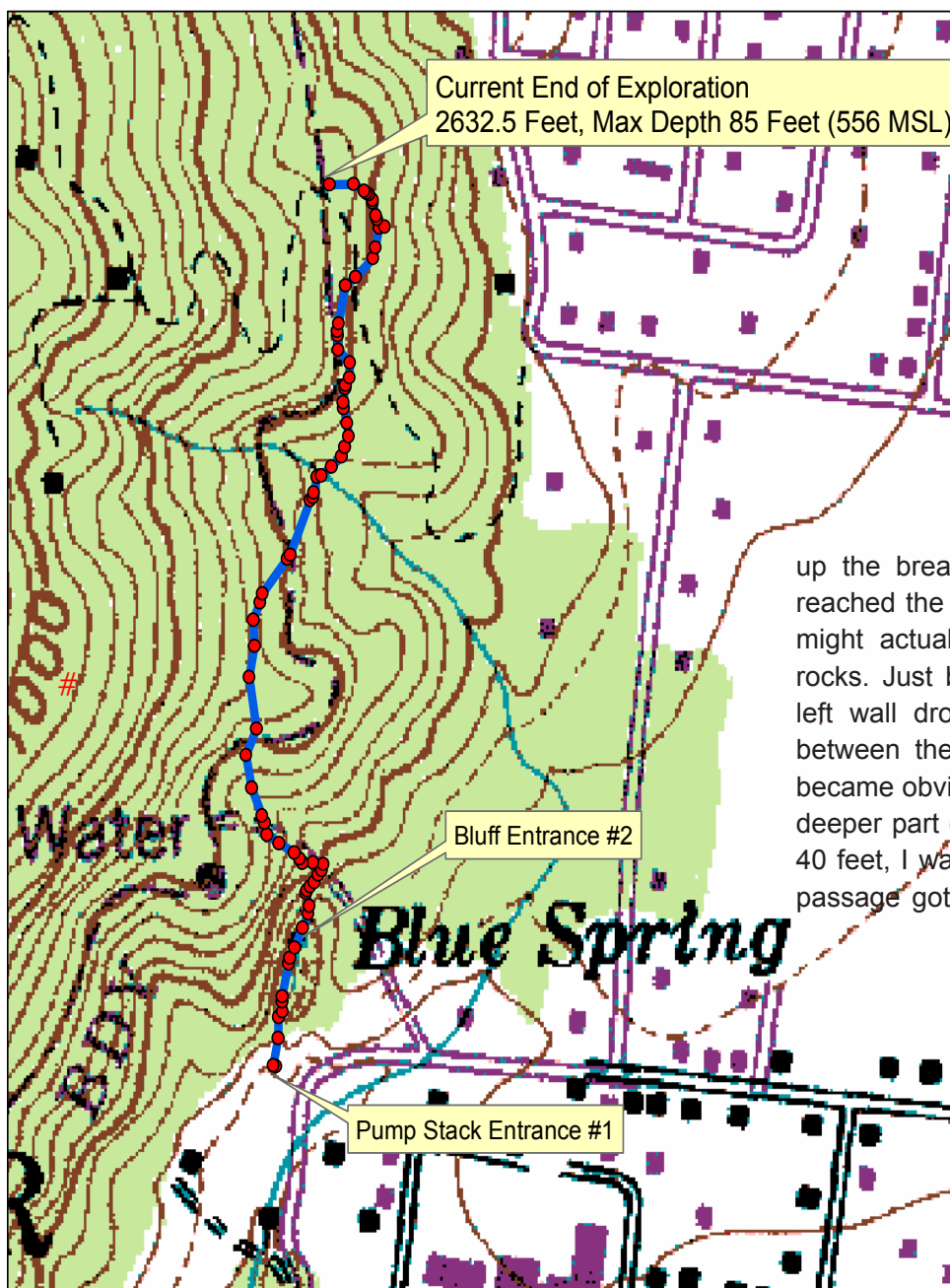
some 15 years ago.

Chrissy and I lugged our large tanks down the bank into the spring pool and prepared for our dive. The 54 degree water temperature was a shock from the 73 degree temps we encountered in Jackson Blue the day before, but no surprise for our usual Tennessee diving. As we submerged into the spring, the smallest of the three pumps announced its presence by starting its whining operation, audible throughout the spring pool area. I made a quick tie off at an old pipe near the pump inlet and dropped into the cave. The visibility proved to be approximately

15 feet, which is very good by Tennessee standards, and we were happy to see both the floor and ceiling at once, and occasionally both walls. There was little evidence of new human debris in the cave, a couple of large felled trees that had obviously fallen into the bluff entrance and washed downstream, and a couple of old car parts. The passage continued to a maximum of 20 feet of depth, and in about 150 feet, began to come shallow to about 5 feet of depth, where I started looking for the surface air. I continued up into the closest end of the bluff entrance, surfacing on the rocky bank and made a tie off on a large rock above the water. From there, the real question was:

JASPER BLUE SPRING

Exploration and Survey 5-7 October 2011
Marbry Hardin, Chrissy and Jason Richards
GIS: Jason Richards



would the cave continue at a size where we could get into it, or would the entrance be blocked by breakdown?

We continued swimming along the bluff entrance, the back wall creating a small tunnel with a full ceiling, the right wall opening up into the pool, keeping the two caves technically connected as one, as we could remain below the ceiling for the entire traverse. Grainy silt covered the floor with obvious flow marks but very little breakdown within the actual passage. After about 400 feet of swimming across the bluff pool, the floor started to slope shallower up breakdown slope, indicating that we had reached the far end of

up the breakdown slope, indicating that we had reached the far end of the crack, and that the flow might actually be coming out from between the rocks. Just before we reached the bitter end, the left wall dropped back, revealing a dark fissure between the breakdown and the left wall, and it became obvious that we would be able to get into a deeper part of the cave. As the depth increased to 40 feet, I was getting more and more excited. The passage got larger - we could just barely see the

ceiling and floor now, as the breakdown retreated and solid cave walls appeared on both sides of the passage. The floor became a beautifully sculpted maze of highly carved stacked bone-like scallops 4-6 inches deep in a clayey layer on the floor. Across the ceiling a

continued on page 15

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fine fissure was visible, providing the weakness along which the cave had been carved. In about 150 more feet the passage stopped. I was at a loss - what little flow we had been in had disappeared, and the sidewalls came together at the visible fissure which descended down the front wall of the room to the carved floor. I knew that this meant the flow had either come from passage directly above, or directly below. My first inclination was to look above - I had encountered many passages in Florida that dead-ended only to find myself at the bottom of what amounted to a huge pothole. I swam up to the ceiling to find a solid surface, and slowly sank back down to the floor, where Chrissy was patiently waiting, shining her light along a narrow fissure in the sculpted floor. I had initially dismissed it, as it appeared that there was no way out of the fissure, but Chrissy proved otherwise, as she had already looked under the ledge, to see a low, wide passage leading away from the crack in the floor. I slid through the crack and into the new passage, now at 50 feet of depth, and looked around amazed as the passage changed in character to an extremely wide trunk passage, almost 60 feet wide in places, and approximately 8 feet tall throughout. The center of the floor is made up of gently rippled heavy grain sand which not only shows the direction of flow, but identifies the center of the main passage. As you move to the edges, a fine layer of silt develops into a thick bank



Jasper Blue Hole
Photographer: Jason Richards

on either side, sloping upwards into the ceiling. Staying in the center of the passage provides ample tie offs among the horns and ridges formed by the clayey layer. Progress was made quickly as we dumped two reels of line into the passage and turned the dive. Chrissy and I returned to the now-black spring pool and set our tanks on the hydrilla, listening to the soft chirping of crickets and frogs in a warm southern night. Subsequent number crunching over a Mexican dinner in nearby Jasper would prove that we had laid (and surveyed) 1300 feet of line on our initial dive into the system. In addition, we had located and increased the known range of the Tennessee cave fish and seen several species of cave crayfish, cave adapted isopods, and even three cave adapted amphipods, a rare sighting in Tennessee, and unknown in this area.

The following day, Chrissy and I returned to the cave and emptied another reel - some 650 feet of additional line in the cave, following the obvious flow marks and wide passage. Towards the end of the dive, the cave changed character and went through some large breakdown areas, weaving back and forth through large blocks and up and down over others - the cave walls disappeared completely, and it is very possible that we missed side passages or other features. In addition, an occasional fissure in the ceiling would reveal the clayey layer we had crossed through to enter the cave, and large rooms were able to be seen above. We explored none of these leads, but they are likely cross fissures in the system, and could quite possibly lead to whole new areas of the cave. At the end of the dive, the passage pushed down to 85 feet of depth. With little or no tie-offs in the immediate area, as I had run out of line right at 80 feet, I retreated back to a shallower depth and made the final tie-off.

It would be two more days before we would return to the spring, and this time Marbry Hardin would be with us to lay some line. Chrissy opted out of the dive, so Marbry and I continued on to the deep spot where Chrissy and I had stopped. The deep spot turned out to be a temporary deep dip, a vertical kink in the passage, and the passage would quickly resume its 60 foot depth. There were a couple of places both before and after where the cave

became very wide and the way on was not quite as obvious - places where flow marks crossed, and there might have been other passages feeding into the main passage. We continued on for another 600 feet of passage and ended as Marbry hit thirds on gas.

Many questions about the cave remain, and there is a lot more to explore both close to the entrance and farther into the cave. We plan on returning in January, when I return again from Afghanistan.

Jason Richards
NSS 41539 LF

Skills, Tips & Techniques

By Jim Wyatt

Line Safety Officers

The NSS-CDS started the "Okaying the lines" program in early 2008 and it is composed of several volunteer members of the CDS keeping their eyes & ears open regarding the safety of our caves. The web site for this program can be found at:

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

For the most part we have had very good response from our safety officers, and the lines and signs in our caves are in pretty good shape. We have replaced lines in many of our local caves and have supported line additions and replacements in overseas caves, also.

As the safety officer for the NSS-CDS I have sent out e-mails to all of our safety officers asking them to report the condition of the lines, signs, and directional arrows in the caves they have volunteered to take care of. As of this writing I have received a few answers, but we are looking for more responses and information. Safety Officers, if you have nothing to report, please send a message that says: Nothing to report.

The safety committee also encourages each of you to help us take care of the lines, signs and directional arrows in all of our caves. If you see an issue that needs to be addressed, please contact the safety officer for that cave and let them know what the problems you see are.

Some of the common problems we deal with are signs that can no longer be read, or are deteriorated and in need of replacement. The CDS has ample signs, so if any are in need of replacement just let us know. Other problems include directional arrows/distance markers missing or unreadable and, of course, guidelines that are frayed, loose, or just in need of adjustment or replacement.

If you would like to be the safety officer for a particular area or a specific cave, please contact me to discuss it. If you have ideas how to make the caves safer, the lines better, or any other thing we can do to increase safety, please let us know.

You can reach me at:

SafetyOfficer@nsscads.org



Carl Sexton circa 1971
Advanced Cave Diving Seminar, NSS Convention

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Challenges Of Cave Diving In the Midwest

By: Chris Hill



Cannonball Hill - By: Chris Hill - Diver walking down the dreaded hill

Cave diving is a sport with many variables, and different regions around the world each have their own nuances when it comes to participating in this activity. The Midwest has a good variety of cave and mine diving to offer. However, if you want to dive this region, there are some challenges you have to be willing to deal with.

One of the first things you'll notice about Midwest cave diving is cold water. Water temps fluctuate in some systems, while others, like mines, tend to stay more constant. Temps in the spring fed systems can range from 40's in mid-winter to 60's in the heat of the summer. While there are some hardy souls that will dive in wet suits, I'd venture to say most dive dry suits (especially for longer bottom times). In addition to a dry suit, you're going to want a good base layer to wick away sweat and a 400 g jump suit. You'll probably also want an argon setup to fill that dry suit. If you're planning significant deco time, a suit heater might be in order. In summer months you'll be suiting up in 80 – 100 degree air temps. During this time, you have to be cognizant of hydration and overheating, not to mention the sweat that is occurring topside is going to have a cooling effect during the dive (thus the need for a good wicking base layer).

Interestingly enough, the best conditions for cave diving tend to be in the winter months when rainfall is at a minimum. Thus you wind up suiting up in the cold and exiting to the cold. A sunny 50 degree day tends to be optimum for cave diving in the Midwest.

Overhead environments in the Midwest can get deep quickly. One of the most popular systems to dive is Roubidoux Spring in Waynesville, Mo. The first 350' of penetration runs about 45' deep. Then you hit the "1st Drop Off" which drops straight down to 140'. From there

the system continues at depths ranging from 150' to 260' with a mapped distance over a mile. This aspect of depth presents many Midwest challenges. One is the need for trimix fills – good luck with that. I'm aware of two dive shops in Missouri and one in Oklahoma that give trimix fills. There may be more, but the point is they are far and few between. Many divers will elect to build their own fill stations, thus adding to the cost and maintenance of dive related equipment. Add to this the need for O2 and argon fills, which is the same problem. So you can see that performing significant lengths of dives in the Midwest is not only challenging, but can be quite expensive. In Roubidoux a 2000' penetration averages around 160' in depth. To make that dive on a scooter will probably require two trimix stages, one 50% deco bottle, an O2 bottle and of course argon. It's easy to spend \$100 on one dive (not to mention the cost of gasoline to get there – more on that later).

Related to trimix is argon. If you're not a trimix or cold water diver, this may not be obvious to you. Using trimix to fill your dry suit is counterproductive. Helium is a good conductor of heat which will strip the heat from your body. Argon is a poor heat conductor and goes a long way to help contain the body heat.

Deep means decompression time, which ties to the cold factor. As cave divers we all build in redundancy, but there is no backup for warmth. If you get a serious suit leak, such as a wrist seal tear, and you have a lengthy deco schedule in front of you... you get the point. At best you can suck it up, but you may also be faced with exiting the system well before your deco is complete and dealing with the fallout. This brings up the point of having a solid deco plan that considers this very possibility and having an emergency plan already in place to deal with it. Having the proper thermal protection to start with will mitigate the problem.

One of the best Midwest systems, in terms of visibility and



Cannonball hill - By: Chris Hill - Diver walking down the dreaded hill to the lake that contains the spring system

cave features, is Cannonball near Poplar Bluff, Mo. This system is unique in that the entry is 30' deep at the bottom of Lake Wappapello. The vis here can be as good as 50' or better and cave karst looks similar to Florida. There is a good amount of cave to explore without going deeper than 50'; however, there is a deep section descending beyond 280'. For those venturing deep, you can incur some lengthy deco obligation. So take note... if you deco in the summer, you're 20' stop will be in 80 – 90 degree water and in the winter the 20' stop could be under 40 degrees!

If you're up for dealing with depth and cold in the Midwest, next you'll have to deal with getting to the locations. I love diving Florida for many reasons and one of those is the dense population of cave systems. Unfortunately, overhead systems in the Midwest are quite spread out. For instance the distance between Roubidoux and Cannonball is 170 miles - 3 hrs drive time! It could easily be an overnight stay just for a couple of dives! Some dive sites are in quite remote areas. And for most sites you won't find nice parking areas, steps into the water, tank racks, signs, etc. You may be in a field or in the woods. You may not have cell service for emergencies. At Cannonball, you're going to be hiking down a long steep hill (it's a killer but worth it), then you'll look out over the lake and wonder where to find the cave (better go that first time with someone who knows).

So you're still up for the task? What else could there be?

Conditions can change within just a couple of days. Vis can drop to zero and flow can shoot up to raging speeds. Elevation changes combined with rainfall quickly cause flow to increase. Of interest is that many Midwest springs rise just below tall rock bluffs. All this makes knowing conditions ahead of time a crap shoot.

Go into about any local Midwest dive shop and mention cave diving. Pay attention to the strange stares. Ask them for a cave fill – ha! Watch the confused gazes on that set of doubles with the strange threaded valves and that 3rd middle knob. Always carry your own DIN to Yoke converter. There are a couple of shops I know of who are coming around, but it takes time and someone willing to work with them and build trust. In Florida cave country you just drop by the dive shop and gather lots of pertinent cave information. In the Midwest?

How do you overcome these obstacles? Connecting with other cave divers is key. Word of mouth, internet forums, clubs, and organizations are the best ways to make connections. There are 3 good internet forums for the Midwest and a number of organized groups. The Ozark Cave Diving Alliance (OCDA) is one such organization. This group contains good local knowledge and experience dealing with the challenges of overhead diving in the Midwest. There's always someone on the team who wants to go diving, so finding compatible buddies isn't an issue.

Still up for the challenge? Then pack up and join us in the Midwest for some challenging cave diving!

Chris Hill
OCDA Team Member
Chill99@sbcglobal.net
www.OCDA.org

Three internet sites for info on Midwest cave diving:

- www.cavediver.net – get permission to access the Ozark Cave Divers forum
- www.midwestdive.com – access the Caverns, Caves & Mines forum
- <http://groups.yahoo.com/group/midwestcavedivertalk/> - a Yahoo email list



Roubidoux when clear - By: Cyndi Lessard - Roubidoux when the system is diveable.



Roubidoux when flooded - By: Chris Hill - Contrasts with photo left showing Roubidoux when it gets flooded after several solid days of rain



200 feet looking down on Main Line Color pencil and crayon on paper. 12' x 16"

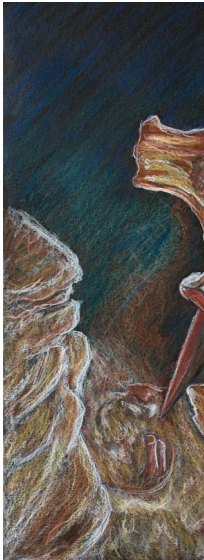
Drawing the System

By: Michael Angelo Gagliardi

In 2010 Michael Young asked me if I would come to Cozumel Mexico and draw the cenotes of the island, and in particular, Sistema Cocodrilo. We talked in great detail about the "artifact room" and its varying wealth of artifacts from the Mayan to the Spanish era. He also told me about the beautiful formations throughout the vast system.

I agreed and this past fall I documented the cenotes in color pencil and crayon, amassing a unique perspective of the caves. We then used the original drawings to enhance landowner relations by gifting them to the individual landowners. Many had never seen what lay beneath the surface of their property and the artworks were well received and greatly appreciated.,

While other team members (led by Rob Neto) are surveying using traditional methods to compile information and produce a detailed map of the system, I have been using Video Mosaic techniques to mosaic the system.



Broken Formation pencil and crayon on paper



* *Formation by the Deep section* Color pencil and crayon on paper. 12' x 16"



* *Three Mikes in the Dome Room* Color pencil and crayon on paper. 12' x 16" Michael Wright, Michael Bartlett, and the artist. Michael Young was the fourth diver on the all Mike team.

um of the Crocodile



Michael Young in Dome Room Color pencil and crayon on paper. 12' x 16"



st the Air Dome Color pencil and crayon on paper. 12' x 16"

So far we have over 6 hours of video decompiled into 80,000 individual J-pegs. I am combining these j-pegs into mosaics of the system. By combining individual pictures a visual portrait of the length of the cave is produced. These mosaics will provide a pictorial map of the system adding detail not normally available from your average surveying project. With luck, we will have a map of the system complete with a system overview map with detailed distance and depth information as well as a visual reference map to follow along.

The drawings you see here were drawn from Mosaics of the system. We plan to sell signed, numbered giclee prints of the first four of these works with all profit going the continued exploration and mapping of this island's unique systems.

* Prints will be offered, one each month and you can contact www.cozcaves.org for more information.



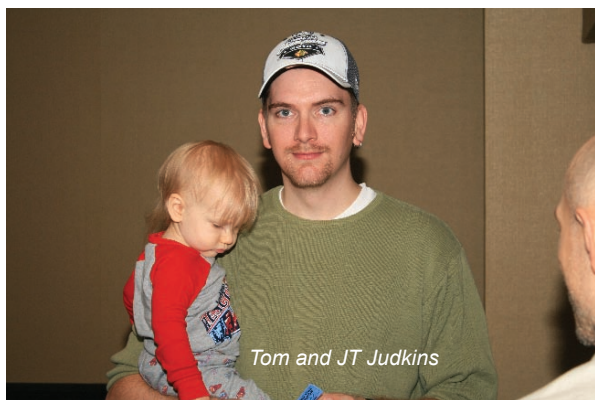
* *Formation in the Air Dome* Color pencil and crayon on paper. 12' x 16"



* *Formation Upstream of Air Dome* Color pencil and crayon on paper. 12' x 16"

20 Mid Work

By: Bob Bost



The 2011 Midwest Workshop was held on September 17 in St. Louis, Missouri. Almost 50 people of all certification levels packed into the meeting room at Sybergs to listen the line-up of presentations. The goal for this year's presentations was to try and take a step back, and get back to basics. With the number of people getting certified in recent years soaring, we figured now would be a good time to educate some and review for others, some of the basics of cavern and cave diving.



Gene Melton was our first speaker, giving us a brief history lesson on the NSS-CDS, and some of the projects the CDS has been a part of.

Bill Harrison was next in line with a great presentation on cavern diving and the tools and equipment needed to get started on the path of cave diving, along with an excellent video demonstration on situational awareness.



Another of the goals for this year's workshop was to showcase some of the local cave diving. As much as we here in the Midwest love to drop into Peacock, Ginnie or Little River, that just isn't an everyday option. The OCDA (Ozark Cave Diving Alliance) showed a tremendous video of the exploration of Roubidoux Cave system in Waynesville, Missouri. Chris Hill was the lead speaker and other team members



11 West shop



Gene Melton and
Forrest Wilson



Ken Elliot

joined in adding information during the presentation.

Next up, we imported Florida nice guy Rob Neto for an informative overview and explanation of DPV use in the caves.

Skip Kendrick, Mark Wenner and Forrest Wilson followed providing an array of details and information on some of the caves in the Tennessee and Alabama area.

After a short break, the seminar was concluded by Forrest Wilson with a slide show of his adventures down under.

The really cool thing I noticed about this year's conference was that after each speaker, there was a lot of talk and chatter about the presentation whether it was Bill's attention awareness video, the cave opportunities in Tennessee and Alabama, or the use of DPVs, it seemed like the interest and information was shared by all. Even some non-cave divers commented that, while this diving wasn't for them, they really enjoyed seeing all the videos, pictures and presentations.

I want to thank all the attendees, sponsors and speakers for their time and efforts. None of this would have been possible without them.



Ed Pavey



Steve Cocriell



Mark Wenner



Rob Neto



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CHANGES:

For Membership Vote

By: Forrest Wilson

As was previously announced, in January of 2010, a committee was appointed to review the NSS-CDS Constitution and Bylaws. The committee was composed of current and past NSS-CDS officers, and after nearly a year of review and discussion, they proposed changes to both the Constitution and Bylaws. These new documents are posted on the web site for review, and will go out for voting by the membership.

There are no major changes to either the Constitution or Bylaws; however, some wording was changed for clarity and some examples and excerpts follow.

The Constitution hasn't been updated in many years, and was full of minor errors from previous cut/paste type of corrections.

One example is that at the time the requirement for members requesting a special meeting was last changed, it was supposed to change from one fourth (1/4) to one eighth (1/8), What ended up in the Constitution was one eighty-fourth (1/84). The new version will read "one eighth (1/8)".

Other changes in the Constitution include removing articles that are covered in the Bylaws. The Bylaws are meant to cover things that might change, and the Constitution shouldn't ever have to be changed.

We also removed language that required printed notification and ballots for elections. This will make it possible in the future to have electronic voting.

In the bylaws, we added a statement requiring directors to read Florida law governing not-for-profit agencies so directors cannot claim they did not know the Florida laws that apply to the NSS-CDS.

The timeline for director elections was changed from calendar dates to dates relative to the annual workshop since that date moves a little from one year to the next.

Some wording was changed in the requirements for check signing to allow for electronic signatures. We will not switch to electronic signatures until an inexpensive secure method becomes available.

The requirements for Life Membership were changed to reflect the requirement of Life Membership in the NSS as well as the CDS.

We also copied the NSS requirement for expulsion of members for not paying dues or other things such as failing to follow the NSS-CDS Conservation Policy.

The current NSS-CDS Constitution and Bylaws can be viewed in their entirety on the CDS website at:

<http://nsscds.org/taxonomy/term/40>

Please review these changes and if you have any questions contact a current BOD member.

Cave Diving Section
Of The
National Speleological Society, Inc.
Constitution

ARTICLE I: The name of this organization shall be the Cave Diving Section of the National Speleological Society, Inc. (hereafter referred to as the NSS-CDS).

ARTICLE II: The purpose of the organization shall be the same as that of the National Speleological Society (hereafter referred to as NSS), with the additional purpose of organizing NSS members who are interested in cave diving so that they may better promote the objectives of the NSS. These objectives include 1) promotion of the conservation, exploration, and study of underwater caves; and 2) education for increased awareness, safety, and skill in cave diving.

ARTICLE III: Membership in the NSS-CDS ~~Section will shall~~ be limited to current members of the NSS.

ARTICLE IV: ~~The NSS-CDS Section shall be governed by a Board of Directors consisting of seven (7) members, who must shall be current members of the NSS-CDS Section. Six (6) members. Members of the Board shall be elected by the general membership of the NSS-CDS Section, three each year, for a term of two years. The seventh, as outlined in the Bylaws. One Board member of the Board, who shall also serve as the Training Chairman-Director, shall be an active a cave diver-diving instructor, and shall be elected biennially by those active current NSS-CDS cave and cavern diving instructors sanctioned certified by the CDS Section and current with the CDS. instructor. The Board shall annually elect, from its members, the officers of CDS Section. These officers shall consist of 1) Chairman, 2) Vice-Chairman, 3) Secretary, 4) Treasurer, and 5) Leadership Director. If appropriate during any year, two office roles may be combined and filled by a single board member. Any combined roles would have to be reaffirmed each year. NSS-CDS, as outlined in the Bylaws.~~

ARTICLE V: The Board shall ~~meet a minimum of once each quarter at such times and places as it deems appropriate, with a December/January meeting for the installation of new Directors. The terms of new members of the Board shall commence at the December/January Meeting. The Board shall solicit nominations for members of the Board from the membership through Underwater Speleology or direct mailing prior to October 15th of each year.~~

~~ARTICLE VII: the board shall~~ have the power, and responsibility to conduct the business of the Section-NSS-CDS, including financial, policy, organizational, and operational matters. The powers, and responsibilities of the Board of Directors of the NSS-CDS Section shall be further specified within the Bylaws of this Constitution. Directors of the NSS-CDS shall be held harmless, and not personally responsible for actions taken on behalf of the NSS-CDS provided the Directors were acting in good faith, and within the limits of the law, and the Bylaws of the NSS-CDS.

~~ARTICLE VIII: A petition signed by one eighth fourth (1/84) of the membership of the CDS Section will require that the Board hold a mandatory special meeting for the purpose(s) addressed in the petition. This meeting shall be carried out within 45 days of receipt of the petition~~

~~ARTICLE IX: ARTICLE VI: This Constitution may be added to, or amended by approval of greater than two thirds (2/3) of the membership of the NSS-CDS who cast ballots Section on a written ballot following a minimum of sixty (60) days written notice to all members. A minimum of one fifth (1/5) of the total membership must cast ballots to qualify as a valid polling of the NSS-CDS Section. Written notice. Notice of proposed amendments must be provided to all members either by direct mail or via Underwater Speleology a minimum of sixty (60) days before the ballots are Miled. Mailing od proposed amendments in either manner shall constitute due notice, as of the date of delivery of materials to the Postal Service made available. Amendments may be proposed by the Board, or by a written petition of one eighth (1/8) of the membership. The same procedures shall be required for amending or changing of the Bylaws of the CDS Section.~~

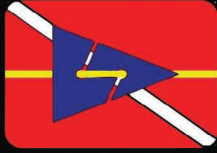
ARTICLE ~~X~~ VII: The Cave Diving Section of the National Speleological Society shall be incorporated as a tax-exempt, under the provisions of Section 501(C)3 of the Internal Revenue Service code, non-profit organization with its Charter filed in the State of Florida, and shall operate within the laws, and regulations of this State.

ARTICLE ~~XI~~ VIII: The Constitution, and Bylaws of the NSS shall be binding on the NSS-CDS Section. Any actions of the Board, NSS-CDS, or its agents inconsistent therewith will be illegal; therefore, null and void.

ARTICLE ~~XII~~ IX: The life of the NSS-CDS Section shall be perpetual, or until terminated by greater than two thirds (2/3) of the voting membership upon the recommendation of the Board of Directors.

ARTICLE ~~XIII~~ X: Any property of the NSS-CDS shall revert to the NSS-National Speleological Society (NSS) in the event of the dissolution of the NSS-CDS Section.

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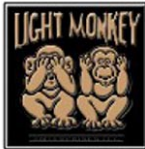
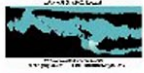


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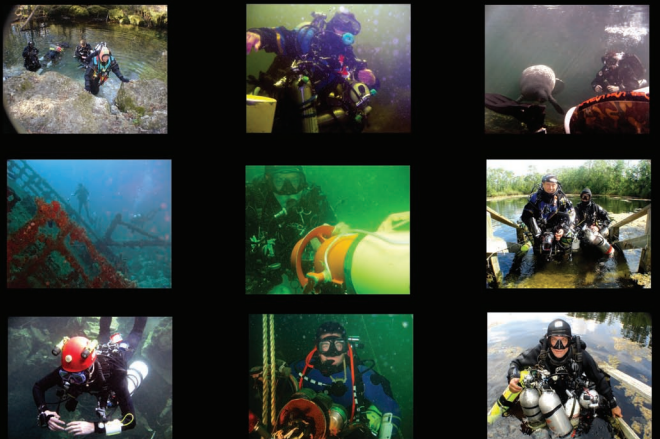


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BYLAWS
of the
CAVE DIVING SECTION
of the
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Article I: Purpose and Powers of the Corporation.

NO CHANGES

Article II: Membership

A. General Qualifications. Membership in the NSS-CDS shall be limited to members in good standing of ~~NSS~~ the NSS in the class of membership and whose dues to NSS-CDS are paid current.

B. Classes of Members.

- b. Associate (17 and under ~~or full-time student~~)
- c. Life (One-time payment)

v. Must be a Life member of the National Speleological Society (NSS)

~~-2.-2.~~ Family Membership

- b. Family Associate (17 and under or ~~full-time student~~)

v. Must be a current Family Life member of the National Speleological Society (NSS)

NOTES

2. Upon death of Individual Life member, a Family Life member(s) converts to Individual Life at no charge.

C. Meetings and Voting Privileges of Members

2. Notice of the date, time, place and list of activities of the annual meeting or of a special meeting of the membership shall be given to the membership either in a NSS-CDS publication of general membership circulation, or by posting on the NSS-CDS website, at least ~~ten~~ fifteen (15) days before the meeting occurs. Attendance of a member at a meeting, either in person or by proxy, constitutes waiver of notice and waiver of any objection to the place, time or manner in which it has been called or convened, unless the member attends the meeting solely for the purpose of stating, at the beginning of the meeting, every objection to the transaction of affairs.

D. Expulsion Of Members

1. A member not exempt from paying dues shall be automatically dropped for failure to pay.

2. By a five sevenths (5/7) vote the Board of Directors may expel a member for disregard of accepted safety or conservation practice or the rights of a cave owner or for other conduct detrimental to the NSS-CDS or the NSS. A member subject to expulsion is entitled to a private hearing before the Board.

Article III: Board of Directors

A. Number and Terms. NSS-CDS shall be governed by a board of directors consisting of seven (7) members elected by the membership for a term of two (2) years, or appointed to fill a vacancy as provided below. No board member ~~can only~~ may serve more than three (3) consecutive terms.

C. Election of Directors. Six (6) directors shall be elected by the general membership of NSS-CDS: three each year, for a term of two (2) years. The one (1) director serving as Training Director shall be elected biennially by current and active NSS-CDS cave and cavern diving instructors in good standing. The election of new directors shall be conducted annually as follows:

1. On or before ~~January 10 of each calendar year six months prior to the annual membership meeting~~, the Chair shall appoint a nominating committee consisting of three (3) or more NSS-CDS members in good standing responsible for identifying candidates for election to the board of directors. No sitting director shall be a member of this nominating committee, and no member of the nominating committee may become a candidate for a directorship in that election. The nominating committee only solicits and universally accepts all candidates – without screening, except to ensure the candidate is a member in good standing.
2. On or before ~~January 10 of each calendar year five months prior to the annual membership meeting~~, the Chair shall appoint a fair and impartial administrator of the election. The administrator of the election need not be a NSS-CDS member or employee. No sitting director or NSS-CDS employee may serve as administrator of the election, and no administrator of the election may become a candidate for a directorship in that election.
3. On or before ~~February 1 of each calendar year four months prior to the annual membership meeting~~, the nominating committee shall solicit recommendations for nominees from NSS-CDS membership through a publication of general membership circulation, or the NSS-CDS website, or by direct mailing. The solicitation shall include an address for returning a nomination.
4. On or before ~~February 15 of each calendar year fourteen weeks prior to the annual membership meeting~~, the nominating committee shall select and submit to the administrator of the election a list of qualified nominees.
5. On or before ~~February 28 of each calendar year twelve weeks prior to the annual membership meeting~~, each nominee shall submit to the administrator of the election a candidate-platform statement of size and format determined by the administrator of the election.
6. On or before ~~March 15 of each calendar year ten weeks prior to the annual membership meeting~~, the administrator of the election shall post on the NSS-CDS website, and shall mail as hard-copy to every NSS-CDS member in good standing, a ballot and the platform statements of the candidates. Every ballot must contain a serial number. Website voting shall include sufficient protections to ensure at least the same level of electoral integrity established for hard-copy ballots. Ballots shall not be mailed if the number of candidates is less than or equal to the number of seats open for election.
7. Completed ballots must be received by the administrator of the election on or before ~~May 15 of each calendar year two weeks prior to the annual membership meeting~~, in order to qualify as a legal vote.

E. General Standards for Directors.

~~3. All directors shall, within one month of assuming a position on the Board of Directors, read in it's entirety the Florida Statutes which govern Not For Profit Corporations: Title XXXVI Business Organizations, Chapter 617, Corporations Not For Profit.~~

G. Meetings of the Board of Directors.

5. Meeting Procedures. The presiding director (the Chair or in his or her absence or disability, the Vice Chair) shall conduct all board meetings in accordance with the current edition of Roberts Rules of Order. ~~Revised, except as relaxed in his or her sole discretion. These Rules shall be used to conduct all board meetings and the business of the NSS-CDS in all cases to which they are applicable and in which they are not inconsistent with these bylaws and any special rules of order the NSS-CDS may adopt.~~

Article IV: Officers

B. The Chair. The Chair is the chief executive officer of the corporation, and shall perform the following duties for the corporation:

13. ~~prepare and file in a timely manner ensure~~ all reports, forms and documents required by law to maintain the corporation current and in good standing with the State of Florida,

F. Program Directors. The Chair shall, assign specific ~~standing~~ committees to one or the other specific program director for performance of the following duties by each respective program director:

1. identify and recommend to the Chair potential candidates for appointment by the Chair as coordinator of each assigned ~~standing~~ committee
2. assist in the training and development of new appointees to each assigned ~~standing~~ committee
3. set goals, encourage and supervise activities and the progress of each assigned committee
4. report to the board of directors at quarterly meetings, or as needed, the progress of and problems encountered by each assigned ~~standing~~ committees
5. act as the liaison between each assigned ~~standing~~ committee and the board of directors,

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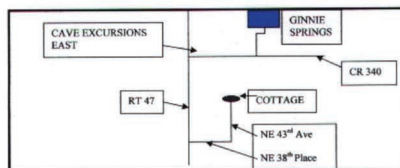


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6. ensure that the coordinators for each assigned ~~standing~~ committee provide to the Chair a written report in sufficient time prior to each annual membership meeting to enable the Chair to integrate a summary of that report in his or her report to the membership.

7. Will assist members in pursuing new project applications, and gather reports for on going projects for quarterly meetings of the board of directors

~~8. Monitor and report on other non standing committees created by the board of directors~~

G. The Training Director. The training director shall perform the following duties for the corporation:

1. Appoint and Chair a training committee consisting of not less than five (5) ~~active~~NSS-CDS ~~current~~ instructors in good ~~membership~~ standing ~~with the NSS-CDS~~. The training committee shall convene once a quarter ~~prior to the board of directors meeting~~, and the Chair shall submit the training committee meeting minutes to the board of directors at the next board of director meeting. The Training Committee shall adhere to the Training Committee Operating Policies and Procedures as approved by the Board of Directors.

5. Oversee the issuance of training completion materials to divers successfully completing NSS-CDS ~~dive~~ training courses.

8. Report to the board of directors at each meeting a summary of training activities broken down by ~~instructor and~~ levels of training

~~9. Shall maintain a permanent historical records of all instructors past and present, either in electronic and/or paper form with copies to safeguard the information.~~

H. Resignation or Removal of Officers of the Corporation.

Article V: ~~Standing committees~~Committees

A. The Chair shall appoint, with board approval, NSS-CDS members in good standing to serve ~~as the committee~~ coordinators ~~of standing committees~~. The Chair may also appoint other NSS-CDS members in good standing to serve on the ~~standing committees~~committees and work under the supervision of ~~the it's~~ coordinator. All appointees to ~~standing~~ committees serve at the pleasure of the Chair. At least two weeks prior to the annual membership meeting, all coordinators of ~~standing~~ committees shall provide to ~~the their respective~~ Program Directors a written report of the activities of their respective programs during the past year.

B. The following ~~standing permanent~~ committees shall be established and ~~remain~~ active each year:

8. Award Awards Committee. This committee shall oversee the awards of the NSS-CDS including, but not limited to the Abe Davis Award, the Nicholson Award, the International Safe Cave Diving Award, and the Outstanding Service Award. Shall develop and bring to the NSS-CDS board of directors ideas and criteria for new awards. ~~Shall maintain a permanent records of awards, either in electronic and/or paper form with copies, to safeguard the information.~~

2. All checks and other documents of withdrawal (including secure electronic transfers) of funds from a NSS-CDS corporate account shall be signed (~~manually, or electronically~~) by two (2) officers of the corporation, from among the Chair, Vice-Chair, Secretary and Treasurer, provided however that the board of directors may provide from time to time for withdrawals of not more than a specified amount with only the one (1) signature of an officer of the corporation. The board of directors may authorize the payment of reoccurring expenditures, not to exceed \$150.00 each, with a single signature of an officer (Chair, Vice-Chair, Secretary or Treasurer) as authorized by the Board of Directors.

Article VII: Amendments

These Bylaws may be modified or amended by approval of two-thirds (2/3) of the members who return ballots in the election on the matter, provided at least one-fifth (1/5) of the total NSS-CDS membership in good standing has cast ballots in the election on the matter. ~~Written notice~~ Notice of proposed amendments to the Bylaws must be presented to the members, ~~either by direct mail or via Underwater Speleology~~ a minimum of 60 days before ballots are ~~mailed~~. ~~Delivery of proposed amendments by either manner shall constitute due notice as of the date of delivery to the Postal Service, made available.~~ Amendments may be proposed by the Board of Directors or by written petition of one ~~fourtheighth~~ (1/48) of the membership in good standing. 3. set goals, encourage and supervise activities and the progress of each assigned committee

4. report to the board of directors at quarterly meetings, or as needed, the progress of and problems encountered by each assigned ~~standing~~ committees

5. act as the liaison between each assigned ~~standing~~ committee and the board of directors,

6. ensure that the coordinators for each assigned ~~standing~~ committee provide to the Chair a written report in sufficient time prior to each annual membership meeting to enable the Chair to integrate a summary of that report in his or her report to the membership.

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Cave Divers Score Emmy Award for “Nest” Feature

By: Barbara Dwyer



Becky Kagan Schott and David Schott, owners of Liquid Productions, LLC, have each won an Emmy Award from the National Academy of Television Arts and Sciences. The awards were presented on December 3, 2011, at Ft. Lauderdale, FL. Becky and David won in the category of Feature News Report for their work in Eagle’s Nest Cave, where they have been filming for several years.

“We were thrilled to work on this story for CBS and show the public the allure of caves and why divers travel from all over the world to dive here,” Becky told me. “David and I are honored that our peers awarded each of us an Emmy and we hope to work on more cave stories in the future.”

Liquid Productions worked with CBS News reporter Preston Rudie and photojournalist Kevin Carlson on this feature story, which aired in Florida last July. Local media often portray cave diving as reckless, the caves as “killers,” and fatalities as a sure thing. This video shows viewers why and how we dive Florida’s magnificent aquifer, but it does not sugar coat the risks. The narrators highlight the geology, the water clarity, and the thrill of exploration. They also emphasize the need for training and preparation and underscore that this is not a beginner’s cave dive. Further commentary and perspective are provided by Larry Green and Brett Hemphill (Brett and Billy Fowler assisted with underwater lighting).

Congratulations, and thank you, Becky and David, for your fine work and for educating people in a way that cannot fail to capture their imaginations.

See the video here:

<http://www.liquidproductionsllc.com/index.php/videos>



SOLO DIVING:

Safe or Deadly?

By: Skip Kendrick

Never swim alone; never dive alone. This simple mantra has been at the heart of scuba diving training since the inception of certification agencies. We are taught to never, ever dive alone. Recently, solo diving has gained some attention and several agencies now offer solo diving certifications (although the major agencies do not). Many agencies, including those involved in cave diving training, do not recognize solo diving, or if they do, it is not endorsed, but left to the discretion of the individual diver. More recently, in a report to the cave diving community, Accident Analysis for the New Millennium (J. Bozanic, 2008), solo diving was suggested as a new correlate of diver deaths along with the traditional (guideline, air rule, depth, training, lights), and some additional new ones (inappropriate gas mixtures, new technology, medical problems, equipment maintenance, and skill maintenance).

The recent attention to solo diving motivated the current study in which an opinion survey concerning solo diving was posted online and divers at all levels of training were invited to respond to the questions. The purpose of the study was to determine the “average” diver’s attitude about solo diving. Nearly 300 divers filled out the survey. There were 260 males and 36 females (although some did not respond to all items). Cavern and cave divers made up 204 of the divers, while 237 were wreck divers (some people were both cave and wreck divers).

The survey asked the diver to evaluate scuba

diving, buddy diving (2 divers), group diving (3 or more divers), and solo diving on a scale of 1 to 10 where a 1 means totally unsafe and a 10 means totally safe. For example, one question was “How safe do you consider scuba diving?” And most of the responses were 8, 9, or 10, indicating a general consensus that scuba diving is very safe.

Scuba diving was considered safe by the participants, with means ranging from 6.09 to 8.04 (5 indicates somewhat unsafe and 6 indicates somewhat safe). Diving with a buddy was rated to be safer [M = 7.66, SD = 1.856] than diving with a group [M = 6.92, SD = 2.08], where $t(251) = -7.973$, $p < .001$. Solo diving [M = 6.98, SD = 2.24] is considered less safe than diving with a buddy [M = 7.66, SD = 1.856], where $t(256) = 4.197$, $p < .001$. One interesting finding was that training as a solo diver [M = 7.73, SD = 2.95] could result in being considered just as safe as diving with a buddy [M = 7.66, SD = 1.856], where $t(268) = -0.174$, $p = .862$ (indicating a statistically nonsignificant difference, or simply no difference).

Men differed from women on only one question, the one regarding group diving (group defined as 3 or more). Women said group diving was less safe than men (women’s mean [M] was 6.09, with a standard deviation [SD] of 2.363 and men’s mean rating was 6.94, with a standard deviation of 2.046) and $t(265) = 2.189$, $p = 0.029$.

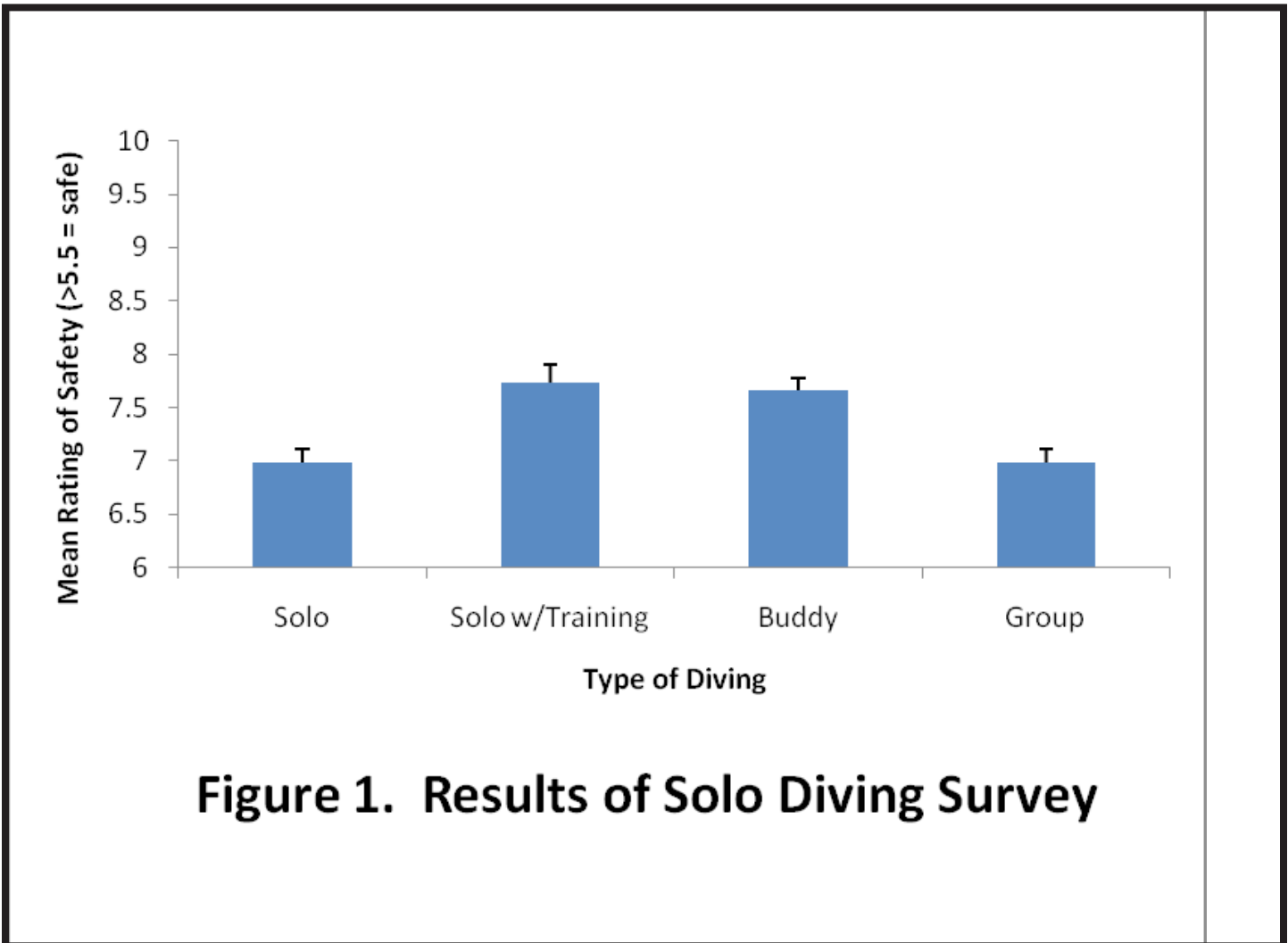
One additional finding of interest concerns age. We found that as divers age they view diving with

a buddy as less safe, $r(274) = -0.152$, $p = 0.012$. No other correlations with age were significant

Overall it appears that cave and wreck divers view solo diving as somewhat less safe than diving with a buddy; however, solo diving was considered “somewhat safe” while buddy diving was considered “safe.” Solo diving was not rated as unsafe or even as “mildly unsafe.” And with training, solo diving went from “somewhat safe” to “safe;” indeed, just as safe as buddy diving.

These findings suggest something of a disconnect

between accident analysis and the general view of divers regarding solo diving. Bozanic's (2008) accident analysis suggested that solo diving was a leading cause of divers' deaths, yet the typical diver does not consider solo diving to be any less dangerous than diving with a buddy, and safer than diving with a group. It may be that the majority of deaths of solo divers were more due to the nature of the dives, exploration and survey for example, than to solo diving per se. Whatever the reason, it is clear from the current findings that divers consider, with training, diving solo in open water, wrecks or caves to be just as safe as buddy diving.



The Loop

Rebreather Bailout Strategies: A Dynamic Process

By Joe Citelli

During its infancy, the sport diving of rebreathers embraced many different bailout philosophies including Alpinism, bailout rebreathers, and, of course, conventional open circuit scuba. For the non rebreather diver, "bailout" refers to a system or method employed to get off the rebreather should it malfunction or should you suspect a malfunction.

Most of the rebreather aficionados employing these methods were pioneers of the units we enjoy today. The units were usually completely home built designs or home modified commercially produced military units. The original design intent of these was typically single or limited purpose and not for broad spectrum sport applications. They lacked many of the safety features and design enhancements we take for granted in today's modern rebreathers.

For these people bailout had an entirely different connotation. They knew that, unlike modern units which are extremely reliable and rarely if ever fail, their cobbled together equipment was often a bailout drill waiting to happen. Consequently, they gave far more thought to bailout than the modern day diver who often blindly follows the protocol s/he was taught. These protocols can vary from instructor to instructor and from agency to agency. They can be somewhat confusing, sometimes inadequate and often impractical, especially for the newer diver.

Philosophical Differences

We mentioned three different bailout philosophies so before we proceed, let's explain each of them. Alpinists believe all problems can be solved on the rebreather and therefore carry no bailout. Aficionados of this system are confident in both their rebreather and in their expertise to solve all possible problems while remaining on the unit. Of course this method is mentioned for no reason other than academics and for the sake of completeness. Rebreather diving with no bailout is abject insanity and should not be tried by even the most proficient diver.

Next is the bailout rebreather. The idea is to carry a second smaller and totally independent system for bailout purposes. Little has been done to advance this concept, though there are some prototypes and at least

one commercially available unit on the market. I would be remiss in any discussion of rebreather bailout if I did not mention the TP2000 home built bailout rebreather designed by the late Will Smithers, an innovator and pioneer in rebreather diving. The TP2000 was a homebuilt unit worn in front of the chest. It used an old AUL acrylic light canister as a scrubber housing, a 5" motorcycle tire tube for counter lungs and rolls of toilet paper inserted into the inner tube as a water trap. To quote Will "... the "TP" in TP2000.....is a roll of standard-issue toilet paper in each counterlung to act as a water trap. While funny, this proved to be extremely effective, although I later added a plastic reinforcing tube (pink hair rollers) to the inside of each roll of TP to prevent collapse. Wonder if you're leaking? Just squeeze the Charmin - if it's mushy, you're taking on water. I did notice that cheaper brands are actually better than the more expensive ones, because the sandpaper-grade stuff tends to be rolled more tightly". Will was a true innovator and his passing undoubtedly set rebreather diving back at least a decade.

Of course the most widely used rebreather bailout systems depend upon open circuit scuba. The premise is that if you suspect a problem with your rebreather you should get off it, or bail out to a more predictable, reliable and totally redundant system, namely open circuit scuba. And herein begins the problem. Divers tend to have their own definitions of "a problem" and one diver's "problem" is another diver's "inconvenience". Factor in the complexities of being in a cave and the confusion and lack of clarity is overwhelming. While most if not all would agree that a diver needs to carry enough open circuit gas to exit the cave, that is where the agreement ends and the vagaries begin. Some say 1.5 times the gas needed to exit the cave, others say twice that. Some advocate team bailout. Others abhor the notion. So, how much is enough and how to we determine that?

When Enough is Enough, Or is It?

Let us examine what we are doing and why we might do or not do it any particular way. If you survey most RB divers, they will almost universally say that they want to carry enough open circuit gas to be self sufficient on cave exit should they need to bailout. How individuals arrive at this volume of gas is where the confusion

begins. Obviously, no one wants to intentionally carry too little gas.

In the classroom divers are taught to calculate their SAC (Surface Air Consumption) rate or their RMV (Respiratory Minute Volume) and extrapolate from those numbers to arrive at a gas volume for a given dive. This is an excellent academic exercise and every diver should know how to do this (or at least have a firm grasp on the concept). In reality, this has little or no bearing on the problem we are trying to solve. Recognize that every dive and diver is different and therefore bailout schemes must be tailored to fit the dive, and, more importantly, the individual divers. So where do you begin?

First, do your calculations. Know them and understand them. Then throw them out because they cannot possibly reflect reality. What they reflect is an ideal situation, far from reality but a good reference point. The only way to see and understand reality is to actually do a bailout drill under the same set of conditions in which you will be diving. By drill I do not mean swim 200 feet at depth and do a calculation. I mean really bail out to the surface from a point of maximum penetration. This will give you a true idea of what your gas requirements will be to get out of a cave alive and unscathed. Now take those requirements and double them because usually bailing out is the first in a series of negative events for which you will need to be prepared. How you double them depends upon whether you subscribe to team bailout or not.

Second, honestly evaluate yourself and your team, if applicable. Is your experience level and persona such that needing to bailout is an annoyance more than it is an "I'm gonna die!" moment? If it is the latter you need to do more drills and carry even more reserve gas.

Third, realistically assess your dive and dive plan. Aside from the obvious, what else can go awry? High flow, siphon, poor visibility and tight passages are all factors which would alter the game plan. Is getting lost, stuck or separated a real possibility? Stuck in a restriction in zero visibility is not the time to realize that you should have, could have or would have brought more bailout.

That's all there is to it, right? Well not really. A leisurely dive in a deep cave with wide passages and clear water might require significantly less bailout gas than a shorter dive in a shallow cave with tight passages and poor visibility. Exploration dives by their very nature will also require extra gas reserves. In short, know what is necessary to stay alive and tailor your bailout plan to get you to the surface in the shortest time possible, dispensing with luxuries such as deep stops. For bailout scenarios they are not only unnecessary, they are dangerous and counterproductive. Remember, you can fix DCS (Decompression Sickness). You can't fix dead. Common sense rules!

Team Bailout or Every Man For Himself?

We often see divers cringe when the term team bailout is

used. The typical reaction is one of "Well, I'm not going into a cave unless I know I am self sufficient and I have enough gas to get myself out." The point is well taken and I do not argue with that. But let's think a bit outside the box here. The agencies that teach team bailout state it as a minimum standard to which a diver must comply. Briefly stated it says that a team must have a *minimum* of 1.5 times the amount of gas required to get the team member with the highest SAC rate out of the cave. I have no issue with anyone who chooses to use that formula. For a highly disciplined team in a circumstance where it is not possible or feasible to take more gas this method works just fine and is actually safer than the age old rule of thirds. I will not go through the math here but suffice it to say that the rule of thirds gives the exact amount of gas needed with no margin for error while team bailout provides a 50% margin for error, provided you don't lose your buddy.

To maximize safety and functionality, every dive should incorporate team bailout. The often perceived error here is that the word "team" implies skimping on gas. It does not. It is a means of maximizing resources. If you are in the water with someone, you should be functioning as a team. Team bailout protocols mandate that bottles should only be breathed down to 50% of their fill volume and then switched with a buddy's full bottle. When that one is drained to 50% it is switched again, the idea being that no diver is ever carrying an empty or near empty bailout cylinder.

Adapting To the Situation

Probably the most valuable asset any diver can have is the ability to recognize a given situation and adapt to it. A forty minute dive in deep, open cave 100 feet from an exit and staged deco gas requires far less bottom mix bailout than a 20 minute dive in shallow, tight cave 500 feet from an exit. Conventional wisdom often states the exact opposite. Deep means more bailout and is dangerous while shallow means less bailout and is safe. Strategies must factor in things other than bottom times and depths. Unfortunately, there is no simplistic formula for calculating this, each situation being different and every diver and team unique. Succinctly stated, bailout strategies must be dynamic.

There is no one single solution or plan that will work for every situation. While undoubtedly, bailout rebreathers are the wave of the future (at least for exploration), open circuit bailout still remains the preferred and most common method of redundancy. Know its limitations and learn how to maximize your resources with proper and dynamic planning.

Disclaimer: the opinions expressed in this article are solely those of the author and are not necessarily those of the CDS or any other training agency.

DEMA 2011 Wrap Up: Taking the Dive Industry's Temperature

By: Barbara Dwyer

The NSS-CDS joined the dive industry for DEMA, held in Orlando November 2-5, 2011. Safety, training, and cave conservation were our themes, as always. Divers from around the world stopped by to chat, share projects, and purchase a training manual or T shirt. The CDS gained a few new members and provided "Grim Reaper" signs for caves as distant as Sharm el-Sheik, Egypt.

This year's DEMA wasn't the largest or most newsy in recent memory, but it confirmed several trends:

- Cave and technical diving has arrived big time. Our booth fielded questions not only about cave training, but rebreather applications, who's teaching what, and how/where to learn.
- Gear's less gaudy, occasionally more functional. Much of what's old is new again, or maybe has a few more D rings added. We didn't see many substantive changes in basic gear.
- Travel agencies were represented in abundance, probably accounting for more than a third of vendor booths.
- Divers are interested in health and safety seminars, particularly those addressing chronic illnesses or other factors (such as age and fitness) that influence dive safety. The Divers' Alert Network (DAN) continues to sponsor clinical studies and education in this respect. We'll report more in subsequent issues.
- Rebreather diving's the wave of the future, according to the the worldwide dive training agencies. But is it ready for prime-time? Is it appropriate for recreational divers? There's a lucrative market for technical dollars, and the mainstream follows the money.
- There's no shortage of ultra-cool photo and video gear for every level of diver.

Other events ranged from the usual parties to a prayer-power breakfast. Seeing old friends was a great deal of the fun.

Thanks to CDS volunteers for assembling and staffing the booth: Cheryl Doran, Gene Melton, Forrest Wilson, Barbara Dwyer, and Riana Treanor.



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From The Editor

Be at war with your vices, at peace with your neighbors, and let every new year find you a better man. ~ Benjamin Franklin~

The holidays wind down and a new year begins. I am approaching it with hope. I hope it is a safe and happy year for everyone. I hope I never stop learning, loving or laughing. I hope I get to dive more.

I received a box from Arizona filled with past issues of UWS and have already learned something (and gotten a few laughs). *From the Back Of The Cave on page 6* offers some history of the very first issue of UWS Magazine, back before it even had a name and Sheck Exely typed it up and mimeographed it off for members of the newly formed Cave Diving Section of the NSS. I hope you enjoy it. and this becomes a recurring feature in UWS, filled with a variety of cave diving history in stories and pictures.

Jason Richards is once again sending in *Notes From The Field* and I look forward to hearing more from him. Check out his Fall 2011 "notes" beginning on page 12.

And the Midwest will be represented with Chris Hill regularly reporting in from the north, his first installment begins on page 18.

I am excited that Liz Rogers is sharing some of her photography tips with us. Congratulations to her are in order for winning first and second place in the 5th Underwater Festival™ 2011 Photography Competition - Freshwater Section - with photos of the Cathedral in Piccaninnie Ponds and Ewens Ponds. I hope she continues to share her knowledge with us.

This issue also contains information for the upcoming Hart Springs Workshop and the 2012 Workshop taking place in May in Live Oak, Florida. Please don't forget your proof of full cave and DAN Insurance if you plan to dive Hart springs at this event.

And finally a sneak preview of the 2012 Workshop in Live Oak.

Let the new year begin!

Dive safe,

Cheryl

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