Underwater Speleology

Journal of the Cave Diving Section of the National Speleological Society

Volume 34 • Number 2
March - April 2007

UNDERWATER SPELEOLOGY

Volume 34 Number 2
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About the Cover

The Gallery of Ginnie Springs as a diver's light would illuminate the passage. Although this image appears as people envision the cave during a dive, it actually took five strobes, a tripod, video light and two minute exposure to achieve. Photo by Jill Heinerth. This photo and others can be purchased through Jill's website www.IntoThePlanet.com

CDS Membership – As a sub-organization or 'section' of the NSS, the Cave Diving Section is subject to the bylaws and ethics of the NSS. Membership in the CDS is open to anyone in good standing with the NSS. Annual membership is $20 and includes a bimonthly subscription to this publication, ***Underwater Speleology***, as well as voting privileges, publications and seminar discounts. Please, send membership requests to Sandy Fehring at the NSS-CDS main office. Make checks payable to: NSS-CDS.

Chairman's Column

by Gene Melton

Please remember for this year's workshop ***pre-registration is mandatory or you will not get lunch***. Lunch will be in the same room as the presentations. If you are not going to join us for lunch Live Oak is approximately six miles away. If you want to stay at Camp Weed, contact them directly. Camp Weed, 11057 Camp Weed Place, Live Oak, FL 32060; 904-356-1328 ext 16. For a tour go to: http://www.campweed.org On Friday night there will be a night dive available at Peacock Springs after normal park hours and the social at Dive Outpost. Sunday's workshops will be at locations other than Camp Weed.

Bill Oigarden sent out an email to all current members with a link to a sample on-line PDF version of Underwater Speleology. About 15% of the emails were returned to Bill. If you did not receive the email your address is incorrect and you need to send a correction to Sandy. CDS-Manager@nsscds.org

We are sending out membership renewal reminder postcards. Bill Rotella is currently taking care of this task. Thank you Bill! The renewal script looks 30 days ahead and 60 days back for membership expiration from the date it is run . There is normally a delay time between when the notice labels are printed and the database is updated with your renewal information. A reminder that your membership expiration date is printed in the upper, left-hand corner of your UWS mailing label.

The Missouri workshop scheduled for the weekend preceding the NSS Convention Saturday, July 21st in Poplar Bluff, MO is shaping up. The NSS Convention is in Marengo, Indiana, July 23-27.

The pre-released version of the video, *Blue Spring - Into the Unknown*, was viewed at last year's Missouri workshop. It is a film about the exploration of a spring system located in Arkansas. The movie shows the spring's surface and underwater beauty. Blue Spring addresses the culture and Native American history associated with it for thousands of years. The *Blue Spring - Into the Unknown* DVD is a must have for your cave diving video collection and is available at the NSS-CDS on-line store.

At the last BoD meeting a Social Committee was established. Heather Choat-Armstrong was appointed the Committee Chair and she is working on the spring social. Welcome aboard Heather! The dates and location of the social will be posted on the website. Heather also has other socials in the works for the CDS.

Cindy Butler has volunteered to be editor of *Underwater Speleology* when Bill Oigarden retires after the May/June 2007 issue. Thank You! Cindy. The BoD has been giving consideration to a PDF version of UWS which would be available online to members. The PDF version would allow members to see UWS completely in color. A questionnaire is in the works. Think about how you would like to receive UWS.

This year's workshop Chair, DeWayne Hyatt, has appointed David Schott as the Exhibit Recruiter. Thank you David for your help and go get'em.

Sheriff John McDaniel has been a supporter of the cave diving at Jackson County and is as fine a person as you could know. His wife and a deputy were killed by two assailants who were also killed. Our condolences to Sheriff McDaniel and families of the Sheriff and deputy.

There is potential for the property over downstream Alachua sink to be donated to the NSS-CDS to preserve the land over the cave. I will attend to a meeting soon to discuss this. Cross your fingers.

Emerald Sink Project Update. After a lot of labor by a dedicated group of volunteers, the steps are nearly complete. As I write this only the top boards on the step handrails are missing. Those four boards should be installed this weekend. Then, Sandy Cook, the Park Manager, will call for the final inspection. Contact Kelly Jessop for more info about the application process to dive at Emerald. The steps are a work of art and a heartfelt, thank you! to all who helped with the project. Let the diving begin!

Construction has started on the steps at Cathedral. The posts for the walkway, platforms and steps are set. Currently the work only needs a few people. Todd Leonard will let us know when a larger work crew is needed. We will post the request on the website.

The dairy is moving forward with the spray fields. It seems the dairy constructed two new barns without permits which may result in fines but not stop the project. Local residents have commented on seeing pipes discharging the wastewater directly and not being sprayed as required. They have been requested to provide photos. The flow at Falmouth is now just a trickle. There is no noticeable flow when diving. The dairy's well permits are for pumping more water out of the aquifer than the spring is flowing. The spring will have no means to recover once the pollution starts in ernst. Potentially the longest explored underwater cave system in the state, Falmouth will be known as he longest polluted underwater cave system in the state.

The NSS-CDS Board of Director members will not respond to postings on internet forums. If you have a matter that you would like brought to the attention of the NSS-CDS BoD, please contact one of the members of the BoD by phone, or email. The board members contact information is listed in the front of each issue of *UWS*.

By the time you read this, NSS-CDS rebreather training standards will have hopefully been approved. Rebreathers are seeing more use every day. The training standards for open-circuit cave diving were developed to prevent accidents that were occurring. With the wisdom gained over time the rebreather training standards were developed to prevent rebreather accidents. In 1977 I was the Chair of a cave diving workshop held at Shands teaching hospital in Gainesville. I displayed two BioMarine CCR-1000's from the Harbor Branch Foundation. I went out on a limb and made the statement that "This will be the future of cave diving." When I made that statement I had not considered the rules I would use to dive CCR. Thirty years later the problems of decompression and electronics reliability have been solved. There are many CCR models to choose from and now the NSS-CDS has

CAVE DIVING SECTION OF THE NATIONAL SPELEOLOGICAL SOCIETY
CAVE DIVING AROUND THE WORLD
34 TH ANNUAL WORKSHOP

training standards to help us prevent cave diving CCR accidents. Congratulations to the Training Committee.

The problem of moving lines and markers has resurfaced. The last time I mentioned this issue, I attempted to use satire by stating that moving guide lines could ruin someone's dive. It seems the attempt at satire was lost and the practice continues. Moving guidelines and markers can and has killed cave divers. There is no excuse for this behavior. Guideline committees have been set up for caves shared by many and the committees need to agree to the line change before it occurs. The lines have been routed for safety or conservation reasons. Moving lines reduces or removes the reasons for the line placement. Changing lines and/or markers without working with the committee is criminally negligent behavior. If someone dies because of this behavior, the individual(s) responsible should be prosecuted the same as if they physically committed a direct action which resulted in the persons death. Line committees have no authority to request the landowners restrict the access of suspected individuals. The committee should discuss with the owner conservation and safety issues. If the individual moving lines is an instructor, the line committees shall take the problem to the agency which certifies him/her. The only time a landowner can be approached using the name of an agency other than for conservation and safety which directly affects the landowner is when the agency Board of Directors passes a resolution authorizing the action. Misrepresentation of agency permission by an instructor is an ethics violation and can result in his/her removal from instructor status. Owners have the right to control access to their property. As individuals, line committee members have the right to discuss their concerns with the property owner so that he/she fully understands he nature of the problem. Complaints to the authorities may have a positive outcome but will in all likelihood result in the caves being closed. I can only hope that it does not take a fatality to stop the negligent behavior of moving guide lines without working with the committees who organized the placement.

The by-law revision attempt failed dismally. We wanted to save membership money by including the by-law revision in Underwater Speleology and mailing the vote. Less than 3% of the membership voted. Because the attempt to save money failed, the by-law revision will be included in the upcoming election ballot. Including the by-law revision will increase the printing cost by approximately $1000. That money could have been put to better use with projects and/or socials. The by-law revision is necessary for the Section to comply with Florida Law and to clarify many issues in the existing by-laws. You can find the by-law revision on the NSS-CDS website. When the ballot goes out this March, please take the time to vote. You have 3 ways to vote and all are easy, US Post, Fax and electronic via the website. Protect the NSS-CDS (it is your organization) and approve the by-law revision.

The by-laws can easily have minor revisions at any point in the future. The process is simple, however the requirements are the same as for a complete rewrite as well as this revision. Paragraph changes, additions, deletions can be approved by the BoD and submitted to you for approval at any time. The overall process can take about three months since a two month notice is required prior to voting. The by-law revision was two years in the making. When your ballot arrives - Do not delay - Vote!

Gene

Gas Planning for CCR Cave Divers
A Case for Self Sufficiency
text and photos by Jill Heinerth

In Open Circuit (OC) cave diving, the "Rule of Thirds" has been established as a standard for gas management and planning. The intention of this rule was to ensure that any diver could assist an "out-of-gas" colleague and get them safely to the surface at any time during a dive. Debate continues within our community about how much gas a Closed Circuit Rebreather (CCR) cave diver should carry as adequate bailout for emergencies.

IANTD has developed a guideline that advocates that each CCR cave diver should complete their dive with one third of the starting oxygen supply and adequate team bailout to get one and a half divers to the surface.

The Training Committee of the NSS-CDS is currently grappling with creating standards for CCR cave divers. As discussion continues, I would like to suggest a simple and independent approach for CCR cave divers to reflect upon.

Considering that several different rebreathers are gaining popularity in the marketplace and considering that many divers are utilizing home-built models and modified units, I contend that CCR cave divers should conduct their dive planning on a very conservative basis, most of the time planning for independent self-rescue.

Although rebreathers allow for considerably extended bottom times in caves, most cave dives are still relatively short durations and therefore, a prudent CCR cave diver can independently handle adequate bailout gas for their dive.

Pre-Dive Planning

The CCR cave diving team should begin by determining the limits of their dive.

- What is the maximum depth and turn time?

Decide on gas management and emergency procedures.

- How will gas be shared in the event of a catastrophic loop failure?

- Does the diver carry their own gas to reach the surface on open circuit?

- Will the out-of-gas diver need to receive gas from their buddy?

Consider rebreather and bailout/stage bottle configurations.

- Can the divers exchange cylinders?

- Are the tank clips compatible?

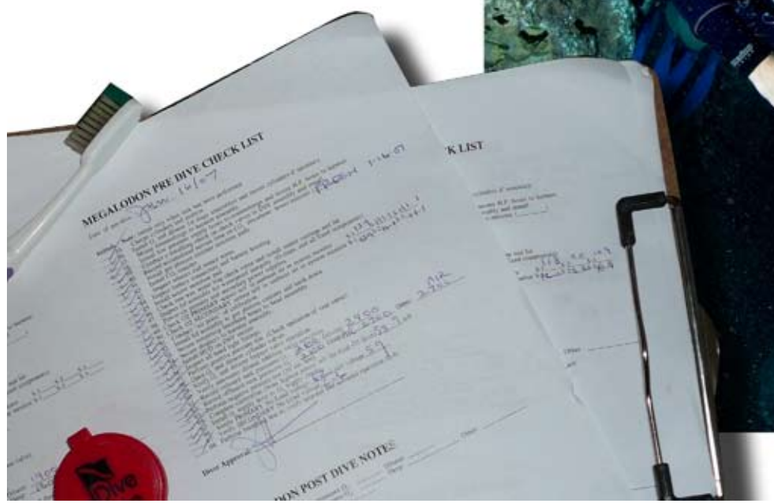
- Are tanks of like-size and composition?

- Will buoyancy be affected by loss, exchange or exhaustion of a stage bottle?

- Are offboard connectors compatible for switching tanks with another diver?

- Are the contents of each divers' bailout tanks the same?

- Are bailout cylinders strictly reserve tanks or do they supply diluent to the rebreather or inflation to the dry suit?



Compare gas consumption rates.

- Plan your diluent supply using the open circuit consumption rate of the diver with the highest Respiratory Minute Volume (RMV).

- Plan your oxygen supply based on your oxygen metabolic rate.

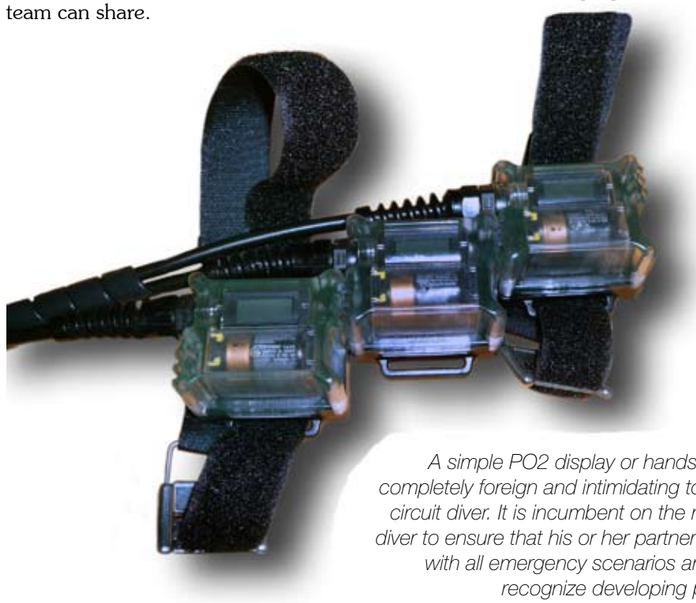
In their Tek CCR Dive Manual, IANTD states, "In a dive team, if a diver has loop failure. The "off the loop diver" will go to their OC bailout. Then once 50% of the bailout gas is used, they will switch stages with another diver until 50% of this gas is used, and so on." (p25)

On most cave divers, the act of switching stages can be eliminated by having each diver carry an amount of gas that will allow them to reach the surface in open circuit. By carrying independent bailout, this also eliminates buoyancy issues, clip configuration compatibility differences and gas compatibility issues associated with sharing bailout responsibilities.

When a lengthy cave dive is planned by a team of CCR divers, they can choose to stage additional cylinders in the cave. For those dives, the team may choose to share those gas depots and plan appropriate gases, clips and connectors that the team can share.

What does it look like?

On most cave divers, the ideal CCR cave diver carries two bailout tanks (a pair of 40's or a pair of 80s) with a volume that is adequate to reach the surface on open circuit from maximum penetration. For decompression dives an oxygen tank is stashed or carried depending on the rebreather configuration. On lengthy penetrations, the team prepares additional aluminum 80s to drop as gas depots. Extra deco gas is stashed.



A simple PO2 display or handset can be completely foreign and intimidating to an open circuit diver. It is incumbent on the rebreather diver to ensure that his or her partner is familiar with all emergency scenarios and how to recognize developing problems.

Mixed Teams

When CCR cave divers and OC cave divers dive together, they are referred to as a Mixed Team. More and more mixed teams are being seen at dive sites across Florida and likely worldwide, yet there are no formal guidelines for these people to dive together. Ideally, the NSS-CDS will incorporate basic rebreather and mixed-team lecture into introductory cave dive training in the future, but in the interim these things should be considered when diving in a mixed team.

Open circuit divers are often "shy" about asking a CCR diver about how dive procedure may differ. It is incumbent on the CCR cave diver to ensure that gas management and emergency procedure are clear prior to entering the water.

Give the OC cave diver an overview of the function of your rebreather.

- Describe how it is clipped on and how it can be removed. Demonstrate how the wing is inflated and if it is attached to the diluent cylinder, discuss how this limited supply could easily be exhausted during a rescue. Determine whether oral inflation or the wing by the buddy is possible.

- Discuss how problems can be recognized.

- Demonstrate various warning lights. Describe light configurations that indicate life-threatening oxygen level in the loop.

- Describe the significance of a vibrating mouthpiece.

- Describe how and when it might be necessary to close the loop and why preventing a loop flood is critical for buoyancy.

- Practice sharing gas supplies. Determine whether sharing a long hose or passing off a stage bottle will be a better decision.

Gas Planning

Ask about RMV of the OC diver and plan appropriate gas volumes to ensure their sare exit using your open siciurt bailout gas.

Select bailout gas that is compatible with the OC diver's; decompression plans.

Plan decompression gases to accommodate all emergency scenarios.

Discuss whether the team stays together when they reach decompression stops. The CCR cave diver will likely complete their deco much earlier than the OC cave diver. Will a diver be left alone to complete deco? If a CCR cave diver leaves early, will they be leaving any of their gas supply behind for the OC cave diver?

Modified S-Drill

Describe what to look for during the bubble check. Then rehearse gas-sharing scenarios prior to entering the cave.

Conclusions

On most recreational cave dives, a rebreather diver can easily carry adequate bailout gas to reach the surface independently while still maintaining a streamlined unit. If CCR cave divers strive to maintain this level of conservatism and independence, then safety and flexibility are benefited. Self rescue is assured and buddy rescue of a CCR or OC diver is also probable.

Editors Note:
This article is one instructor's explanation of gas planning for CCR divers and Mixed teams with an emphasis on Self Sufficiency. No risk analysis has been performed on this technique nor is it part of any NSS-CDS training program, Standards and Procedures or policy. It is presented for the sake of discussion. Diving safely is your responsibility. Obtain proper cave diving instruction and dive within the limits of your equipment and training.

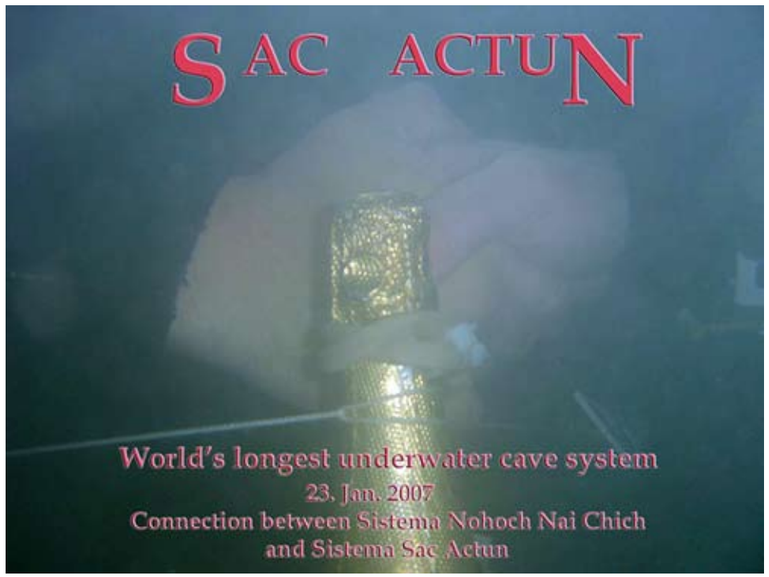
Call for Presentations
NSS-CDS

Spring Workshop

Cave Diving Around the World

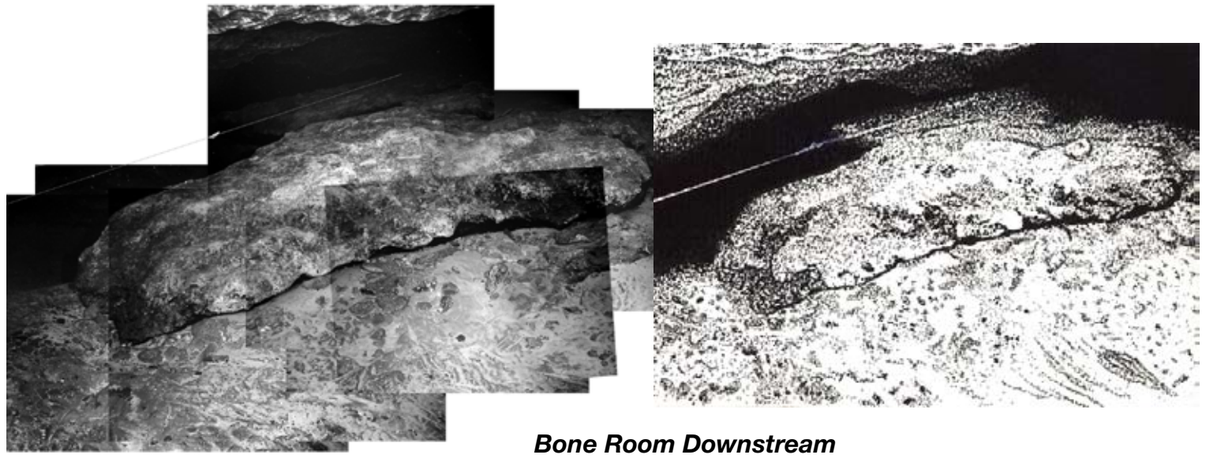
May 25-28, 2007

Contact:
Forrest Wilson
404-292-5613
16fw@bellsouth.net

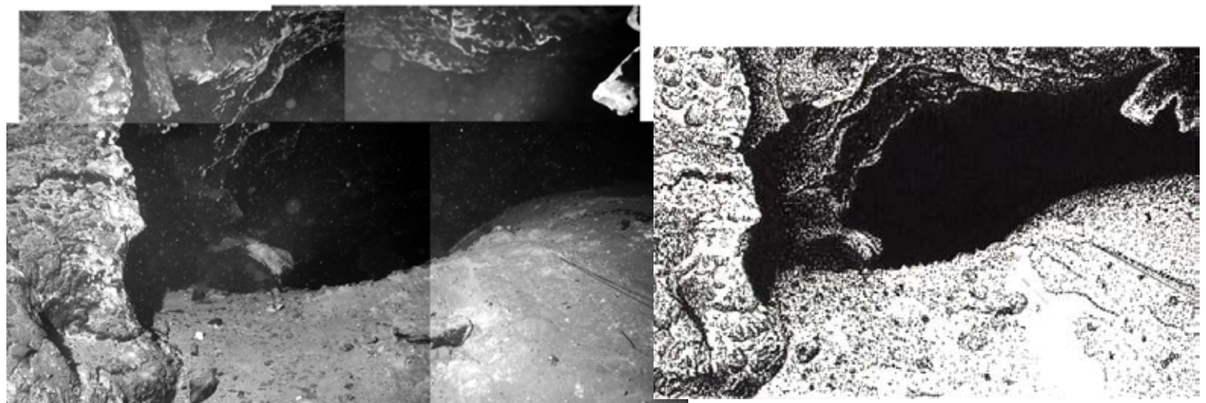


25 January 2007

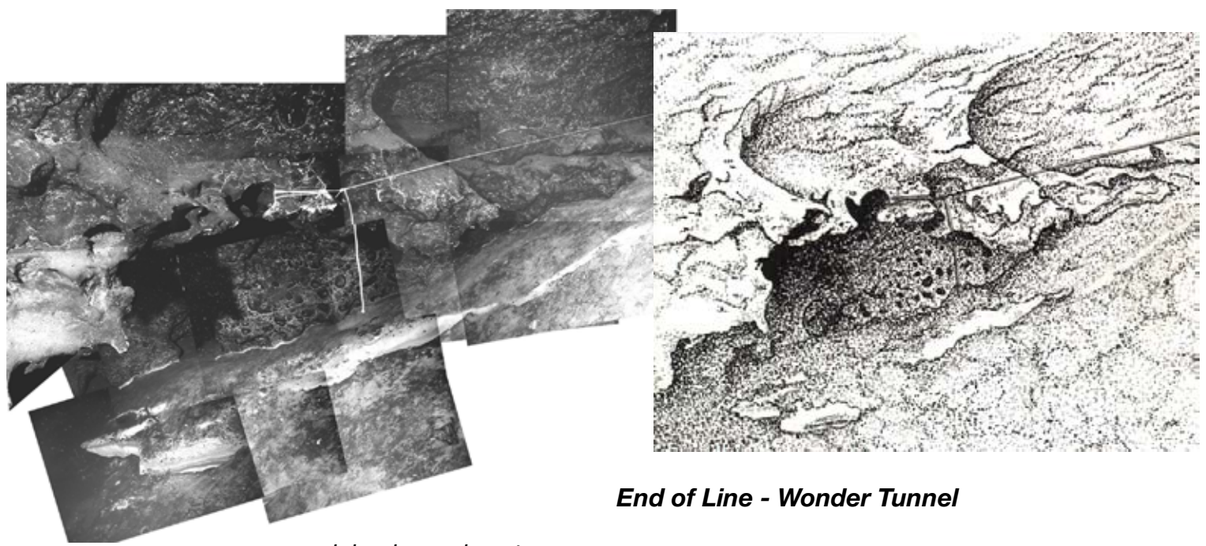
After three years of dedicated exploration, Sistema Sac Actun is now the longest underwater cave in the world, and Mexico's longest cave. The final connection between Sistema Nohoch Nah Chich and Sistema Sac Actun occurred between the Muul Ha region in Sac Actun, and the Cenote Manati region in Nohoch Nah Chich. Cenote Por One, a rather small and uninviting cave, is positioned between these two areas. Given eight months of sidemount exploration, Por One was connected to Sistema Nohoch Nah Chich last week. Four successive days of exploration dives by Steve Bogaerts and Robbie Schmittner led to the final connection between Sac and Nohoch. As Sac Actun was 14,300 meters (47,000 feet) longer than Nohoch Nah Chich at the time of connection, the explorers have named the entire cave Sistema Sac Actun.



Bone Room Downstream



Exiting the River Intrusion Room



End of Line - Wonder Tunnel

www.michael-angelo-art.com

The Cave Diver's Forum 5th Annual Social was held on Saturday, December 30th, 2006 at Ginnie Springs (Little Devil's pavilion). It started at 8 AM and continued until closing. We tried a little different approach this time with a "Pot Luck" meal. Sodas and beverages were supplied by the Cave Diver's Forum and Ginnie Springs Outdoors. Both lunch and dinner were served.

At noon, the 4th Annual "Great Scooter Race" began in the headspring at "Little Devil". Eric Utigard, from Canada, completed his run with a Gavin Scooter in 2 minutes and 58 seconds to take first place. Tom Johnson (tj) presented Eric a large trophy for winning the race.

Three other contestants also participated. Second place was won by a diver in a sidemount configuration (3 minutes and 15 seconds) using a Silent Submerge Scooter. Russell (Sludge), with a red DV-3X scooter, timed in at 3 minutes and 18 seconds for third place. Mark Ashley (mfascuba), with a red and black DV-3X scooter, completed the course in 3 minutes and 48 seconds.

Thank you to TJ and everyone who brought food to share. We had plenty of food for everyone. Thank you to the Sponsors (Ginnie Springs Outdoors & Staff, Dayo SCUBA and Cave Excursions East)! Lastly, thank you to everyone who attended and the people who worked to help make this event successful.

Chip Wuerz (Chip)

Photo Essay by
Ray Eccleston flstingray@yahoo.com
Ray uses a Nikon D-200 camera enclosed in a Ikelite housing with an 8" dome Ray's strobe is a Ikelite DS-125.

4th Annual Cave Diver's Forum
"Great Scooter Race" Winner
Eric Utigard completed his run with a Gavin Scooter in 2 minutes and 58 seconds.
photo by Tom Johnson (tj)

March 9-10, 2007 - 2007 Florida Cave Cavort- Hosted by the Central Florida Cavers *www.centralfloridacavers.com* This year the cavort will be held at Ginnie Springs. For more information *www.centralfloridacavers.com/cavort_2007.htm*

May 25-28, 2007 - NSS-CDS Annual Workshop – Live Oak, Florida - The rustic splendor of Camp Weed *www.campweed.org* will serve as the backdrop for the 2007 Annual Cave Diving Section Workshop. The theme for the 2007 event is Cave Diving around the World, and will highlight the global growth of the sport of cave diving. Located off U.S. Hwy 90 between Live Oak and Lake City, Camp Weed is in the heart of "Cave Country". A short drive in any direction will lead divers to many well-known cave diving destinations. The event will get under way on Friday night with a social hosted at the Dive Outpost *www.diveoutpost.com* in Luraville. Saturday will feature presentations, special interest sessions, and displays of the latest in dive equipment presented by a number of top manufacturers. Sunday will provide members with additional special interest mini-workshops in addition to guided dives at some of the area's most pristine locations. Guided dives will also be available on Monday. Camp Weed offers a variety of lodging options to suit most needs and budgets. From hotel rooms, to private cabins, to primitive camping, this location offers it all. All reservations for lodging should be made directly with the Camp Weed Staff (386) 364-5250. For more information visit the *www.nsscds.org* or contact the Workshop Chairman: Dr. DeWayne Hyatt *BamaCaveDiver@fuse.net* or Forrest Wilson *16fw@bellsouth.net*

July 21, 2007 - NSS-CDS Missouri Mini Workshop - Poplar Bluff, Missouri - Mini Workshop to be held in Poplar Bluff, Missouri. Cave diving available nearby. For more information visit the *www.nsscds.org*

July 23-27, 2007 - NSS Convention - Marengo, Indiana – *www.nss2007.com* Nestled in the scenic hills of Southern Indiana, Crawford County is the "Postcard Perfect" destination for recreation, relaxation, and caving! Crawford County expands from the shores of the Ohio River at the town of Leavenworth, to the shores of Patoka Lake. Thousands of acres of county, state, and federal forest create a haven for the naturalist. The caves and karst of Crawford County, and most of south-central Indiana, are developed chiefly within the thick limestones and dolomites of the mid-Mississippian-aged Blue River and Sanders groups. Caving at Convention will range from tight and sporting stream crawls, to huge walking passages, to well-decorated grottos. Underground adventures will also include multi-mile systems, survey and exploration opportunities, family and hardcore trips, and cave diving. The town of Marengo is located in Crawford County and is home to one of the finest commercial caves in the United States. Marengo Cave was designated a US National Landmark in 1984 by the Department of the Interior as the most profusely decorated cavern...with speleothems of the highest quality. Also in Crawford County, near Leavenworth, is Wyandotte Cave, one of the oldest and largest commercial caves in the country. Lesser services are available in Marengo and Carefree. Canoeing, 100' cliff rappelling, hiking and other surface recreations are within 15 minutes of the convention site. And of course, there are over 1000 caves in Crawford and surrounding counties. It has been 15 years since the Convention was hosted in Indiana... so it is time to welcome all Cavers Back Underground in Indiana! NSS 2007 Convention Registration c/o Jaime Fee, 342 N Meridian Street, Greenwood, IN 46143. If you have a question concerning this year's Convention, feel free to e-mail me anytime. Please put "NSS" or "Indiana 2007" in the subject line. My email is *registration@nss2007.com*

August 13-19, 2007 - International Conference on Karst Hydrogeology and Ecosystems (Karst 2007) at Western Kentucky University. The meeting is hosted by the WKU Hoffman Environmental Research Institute, and this conference is a joint meeting of the four major international karst research groups: 1) the UNESCO International Geoscience Program (IGCP) Project 513: Global Study of Karst Aquifers and Water Resources; 2) The International Association of Hydrogeologists (IAH) Karst Commission; 3) the International Geographical Union (IGU) Karst Commission, and 4) the Union Internationale de Spéléologie Commission on Karst Hydrogeology and Speleogenesis. This follows two successful similar meetings held at WKU in 1998 and 2003. The conference website can be found at *www.hoffman.wku.edu/karst2007/k2007.html*

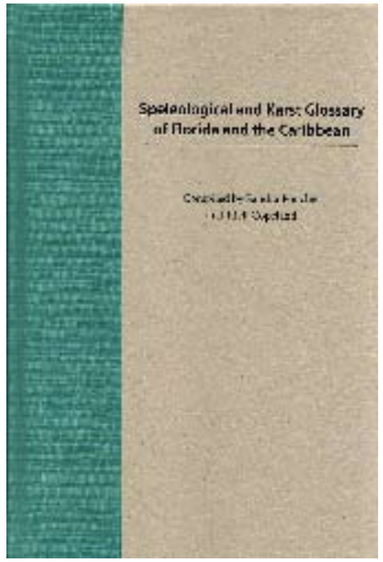
October 4-7, 2007 - 30th Annual TAG Fall Cave-In - Lookout Mountain, Georgia, Hosted by the Dogwood City Grotto, 200 Arizona Avenue NE, Suite 108, Atlanta, Georgia 30307 Yes, there is cave diving in TAG. Guided dives are usually available. *www.tagfallcavein.org*

October 8-12, 2007 - 2007 National Cave & Karst Management Symposium - Cave & Karst Conservation in the Ozarks. The 2007 Symposium will be held at the Holiday Inn SW & Viking Conference Center, 10709 Watson Road, St. Louis, MO 63127. Nearby is the Missouri Department of Conservation's beautiful Powder Valley Nature Center, where a free public event will be held on Tues. Oct. 9, including a cave photo exhibit and a speaker panel, followed by refreshments in the lobby. Optional pre and post-symposium field trips are being organized to see the nearby Illinois Karst and the Perryville Karst. Roadlogs for self-guided trips to Missouri's scenic karst will be available. See *http://www.nckms2007.org* for further information.

November 16-18, 2007 - NACD 39th Annual World Seminar & Conference - Gainesville Florida *www.safecavediving.com* contact *manager@safecavediving.com* for more information.

SPELEOLOGICAL AND KARST GLOSSARY OF FLORIDA AND THE CARIBBEAN (2006)

by Sandra Poucher and
Rick Copeland (eds.).
University Press of Florida,
Gainesville.
Hardcover, 196 pages, 6¼" x 9¼"
format, ISBN 0-8130-3006-4.
Available for $34.95.



Reviewed by Danny A. Brass.

This volume brings together representative terminology from several distinct fields of study, notably caving and cave diving, speleology, geology, biology, hydrology, legislative and regulatory, toxicology and environmental monitoring, surveying, and resource management (as well as various miscellaneous terms that don't seem to conveniently fit into any category). At first glance, these may seem to be very disparate disciplines; however, they do share a common ground in that they all relate to the scientific study, conservation, and long-term management of caves and underground water resources. Wise stewardship of these valuable and irreplaceable resources requires the coordinated efforts of a variety of dedicated professionals, each of whom must have at least a general knowledge of the roles played by the others. As such, this glossary should serve as a useful source of information for individuals needing definitions of various terms that may only be tangentially related to their own particular area of expertise, but which are still closely allied—to one extent or another—to the overall study of karst hydrogeology.

Definitions used in the text have been taken from a variety of sources—some more authoritative than others—which are referenced after each entry. When a term is commonly used in more than one context, multiple definitions are provided. Another useful feature is that frequent reference is made to other text entries that may be synonyms, antonyms, or otherwise closely related to a given term. Because of the technical nature of a large percentage of entries, various definitions rely on the use of yet other technical terms—many of which are themselves defined elsewhere in the text. However, the latter is not always the case and some definitions are based on specialized terms that remain undefined anywhere in the text. Of course, this can make it rather difficult to tease out the meaning of some words. In this regard, it should be noted that all definitions are terse and to the point. Coverage is not encyclopedic in nature and no significant attempts seem to have been made to clarify (or simplify in lay terms) difficult concepts for the reader not already well informed about a particular field of study. Thus, the ease of fully understanding many of the more technical definitions will vary with one's familiarity with the subject to begin with or else with one's motivation to delve more deeply into other resources. It should be noted, however, that this is not necessarily a shortcoming of the book itself. It is, after all, meant to be a glossary and not a comprehensive encyclopedia of terms. In this sense, readers should appreciate that this detailed compilation of terms will serve admirably as a springboard to direct one's attention, should additional information be required.

In gathering together in one place such a diverse set of terms, this work represents a long-overdue first step in breaking down the barriers to interdisciplinary communication caused by widespread use of specialized jargon and scientific terminology—definitions of which sometimes require considerable legwork to track down.

Underwater Speleology

UWS welcomes your submission. We assume that anyone submitting photos and/or graphics has obtained proper permission from the cartographer/photographer for reproduction of such material in UWS.

If you have an idea for an article please contact:

Bill Oigarden, Editor
321-331-7313
bill@oigarden.com

Submission Deadlines

Issue	Deadline
January/February	December 1
March/April	February 1
May/June	April 1
July/August	June 1
September/October	August 1
November/December	October 1

Advertising – Contact Louis Barson, 610- 668-DELI or *delidiver@aol.com* for information with respect to advertising pricing and requirements.

NSS Membership – The National Speleological Society welcomes the interest of anyone who has a sincere concern about the safety, study, exploration and conservation of caves, wet or dry. You may join the NSS by writing to 2813 Cave Ave., Huntsville, AL 35810 or by contacting the Cave Diving Section. Regular membership ($36.00) includes discounts on publications and conventions as well as the NSS News and Directory. Limited membership ($15.00) does not include NSS News. Both would be eligible to vote in all NSS elections.

CDS Membership – As a sub-organization or 'section' of the NSS, the Cave Diving Section is subject to the bylaws and ethics of the NSS. Membership in the CDS is open to anyone in good standing with the NSS. Annual membership is $20 and includes a bi-monthly subscription to this publication, Underwater Speleology, as well as voting privileges, publications and seminar discounts. Please, send membership requests to Sandy Fehring at the NSS-CDS main office. Make checks payable to: NSS-CDS.

11/1/2005

I had a fateful encounter with a wonderful gentleman by the name of Scott Ensminger (Niagara Frontier Grotto) while assisting Marcus Buck on the Olmstead Cave dig he organized. While Scott and I laboredly removing pail after pail of dirt, he mentioned some other karst leads he had in the area. Scott was unable to follow up his initial foray into the area in order to search for this rumored karst .The initial foray was stopped by a severely flooded drainage area and an over eager guard dog freely wandering. As I lived very close to this area and Scott realized my motives were good he gave me this lead to follow up. I should add here that I was severely injured in a work accident and part of my recovery involved walking as much as I could. With this in mind I had ample time to explore while in this recovery period and this would come into play as a benefit later on.

My initial foray to the river bed began in the winter of 2004, when I took some bearings and photographs. In the spring of 2005 I began approaching landowner's to gain permission to this river basin and within a week I was relatively successful gaining this permission. I began searching the river basin for karst features and I was immediately amazed to find larger karst pavement areas hidden not 100 ft from the major roadways. I began walking the entire length of properties bordering this watercourse where I had permission. I began finding more and more sink points and grikes along this area over a period of 3 weeks (everyday) and I was excited to say the least. I took many photos and contacted fellow Toronto Caving Group members both to share the news and rely on their lengthy experience regarding the viability of a cave dig. I arranged a meeting with Scott Ensminger and Michael Gordon in order to tour the site and assess possibilities for digging.

The sinking stream found by M. Buck and D. Hynes.
Photo by M. Buck

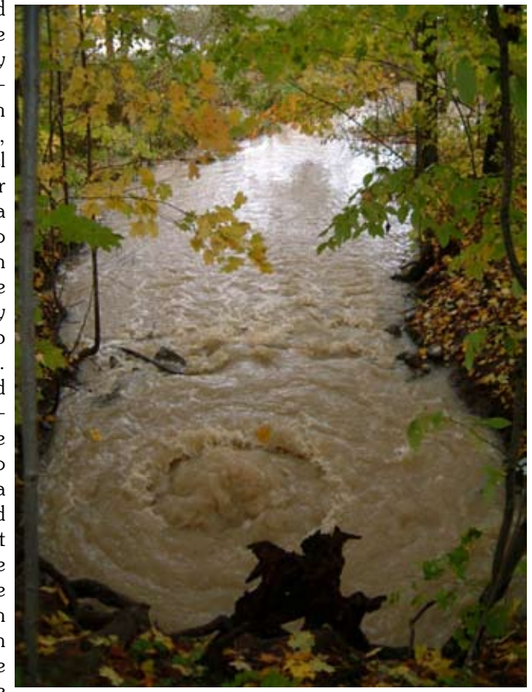
Michael Gordon and Scott Ensminger on the first exploratory dig. Photo by Doug Hynes

After the tour of the area in which we were all severely afflicted with stinging nettle a small foray dig began. We opened up a massive pile of flood debris and found a small going grike that might have potential. We were all somewhat sure that the passages would only be very low bedding planes so we finished up for the day. I contacted Marcus Buck after this and he cleared some time from his very busy schedule to assess the site and give me his professional opinion regarding a dig and Marcus recorded the features accurately with my assistance. Little did I know how important this trip would be!

The flow worn bedrock exposed photo by D. Hynes

We exhausted the features I had found and Marcus felt that while there was passage, it would be very small. Marcus recorded observations of glacial scouring while on our search. Before calling it quits, we decided to look around parallel to this watercourse just to satisfy our curiosity. When we came out into a field of clover we were intrigued to see a gently sloping depression with burdock growing in the center. We investigated and found it was actually a large sinkhole at least 10 ft deep with an active soil pipe in the bottom. With excitement we scanned the field through the blazing sun and ANOTHER sinkhole of equal size was in the distance!!. We excitedly carried on to the next feature while recording data and wandered into a small forested area. EUREKA!!! We had found what is very elusive in this area, a large sinking stream. We hurried down the embankment and congratulated each other on such a great find. We both knew from the site that virgin cave awaited our exploration and we were very confident a dig through fencing and flood debris would quickly gain us access. We noticed that there was no flood debris above this blind valley so it appears that the stream drains here quite efficiently without overflowing, suggesting a good sized cave for Ontario!!!!

The property owners had been very co-operative so I confidently approached them about our find and coordinating a dig .I was shocked when the owners stated they preferred us to not alter the site. This was shocking because when I initially approached them and suggested we may want to dig they had no problems with it, they just wanted to be told when we would start and finish. I did not badger them further as they would not give any reason to why they changed their minds. I thought that maybe fearing the unknown cause's people to sometimes avoid issues. I made up a comprehensive flier along with liability waivers and presented it to the owners, unfortunately they have remained against exploration. I was disappointed to say the least but I respected their wishes.



Sleepy Hollow resurgence in only ¼ flood
Photo by D. Hynes

While exploring the area I befriended two wonderful gentlemen who have been instrumental in further finds .The first person is Joe Gos, a land owner with many karst features on his land, including visible subterranean drainage. When listening to stories of the area in the past I was struck with something odd. Many times an "elusive" well casing was mentioned that had geysers of water issuing forth of up to 6 ft high during floods. I was intrigued and Joe was kind enough to head me in the right direction. After approaching countless more property owners I finally found the property that had this well. With the owners blessing I searched for days until I finally found this well casing. It seemed innocuous at first and I made coordinate recordings in order to witness it during the spring melt floods.

While walking around I stumbled upon something even more exiting. Three very large resurgences aligned on a diagonal to the surface watercourse I was exploring. These springs were all about 8 to 10 ft deep with a diameter of about 18 ft. Each spring was at the end of a 40 ft long run leading to the main creek. All three spring orifices were blocked with large rocks but I knew there is great dig potential. I spoke to the land owner again and he did not even know such a thing existed on his property. He was very agreeable to my digging there so I began immediately. All the other club members were occupied with their own project's so I toiled away solo for a couple of weeks. I had managed to eliminate two of the springs as secondary and began a full on assault of the main spring. With much digging I exposed

both a leading worn edge of limestone and the water table.

I then realized we had a potential cave dive in a place where cavers never would have expected. I am a past trained cave diver through the NSS-CDS so I was very excited at this prospect and continued on.

In the meantime, Greg Warchol who has shown me so much in the digging realm came out to tour the area. We began looking around various properties where we had permission (I was at 35 properties by then). We began finding even more big sinkholes and other karst features and I think we both began to realize the large scope of this newly found area of karst. I then notified Dr. David Sawatzky of our discoveries. I have always respected David immensely and have learned a lot from him while assisting on one of his large/ multi year digging projects. He was excited and agreed to help with the dig.

Dr. Sawatzky after emerging from the first penetration to a body length with Greg Warchol looking on as I help derig.
photo by D. Hynes

Doug Hynes digging in the resurgence
Photo by Dr. Sawatzky

While I waited for us to coordinate, it happened to rain quite a bit so I quickly made my way to the springs to photograph the springs while they were flowing. I was ecstatic at what I found, the spring was flowing full bore across the run and a boil 1 ft above the water surface was present. I was not expecting this much flow so I only had my regular caving suit on. I froze while getting some great pictures and video. I emailed Dr. Sawatzky the videos and

He immediately made arrangement to dig with me. After digging for part of a day, we broke into what we thought was going passage. Dr. Sawatzky in his immense experience felt we had great potential for entering a dive able conduit but wisely overestimated the amount of digging we would have to do. At this point, a hunter showed up and he did not seem happy at us being there.

Unfortunately for us he went to the landowner's wife and incited some unnecessary concerns and we were promptly asked to leave the property. I was crushed, since this site has such amazing potential and it was at our fingertips. However, I felt it could be rectified so I returned later to speak to the gentleman who owns the property and had given me permission; he apologized for the misunderstanding. He agreed fully to allow us to continue and is excited about the find. We were back on and both Dr. Sawatzky and I scrambled to get our digging and cave diving gear ready for the next day. Greg Warchol being the man of his word also came out and assisted with ferrying pails of rock on the surface and with some micro-blasting.

Laying line
photo by D. Hynes

After two hours of digging in zero visibility 11 degrees C (50 degrees F) water I felt my arm break into a tunnel horizontally. I was only in a wetsuit so Dr. Sawatzky began his assault on the passage and with great feats of strength he wrestled huge slabs of breakdown out of the clay conglomerate bottom. After many hours digging I took my turn again and managed to back myself half a body length into bedding plane passage. I normally dive using an Armadillo side-mount set up but I did not bring it and only had a backpack on as I thought we would be digging much longer. It is just as well I did not as I am just learning the Canadian/British harness system Dr. Sawatzky uses and with the zero visibility in a tight squeeze the system is probably one of the most difficult sites going.

Oh yes! I forgot to say that Dr. Sawatzky managed to clear some more debris once in the passage and he reports 5 ft wide GOING passage at 16 to 18 "inches high!!!! Based on his observations he feels with confidence we will intersect a larger and deeper main drain. Eager to explore this site in depth, Dr. Sawatzky and I returned to the site for two consecutive days in order to clear breakdown blocking further "easy" passage. The first day was very productive with Dr. Sawatzky hauling large slabs of stone out from the passage. In the zero visibility cold water he wrestled 3 ft long x 3 ft wide by 4 inch thick slabs up the muddy embankment for me to carry away form the dive site. Once he re-entered the passage with a crowbar to remove some precarious flakes; forward progression was resumed. The torturous passage had produced a drysuit leak so after a couple of hours with a sodden chill the diving was ended for the day. Forward progress that day added 20 ft and began to approach an area with a rather unstable bedrock ceiling.

One of the flakes removed
Photo by D. Hynes

We returned the next day armed with waivers for the landowner, a come-along and Dr. Sawatzky 's usual comprehensive compliment of digging gear .With the landowner concerns placated by the waivers, Dr. Sawatzky resumed digging where he left off the day before. For most of the previous evening, he had mulled over the prospect of how to remove a huge slab blocking further progression. In a brainstorm, he came up with an idea to use the come-along with large industrial C-clamps in order to haul the slab out. With this ingenious plan and a lot of hauling this massive slab relented its

grasp on the cave.

Removal of this rock took many trips by Dr. Sawatzky to re-attach the clamps to the stone and re-tie the choker to the hauling line. The C-clamp kept breaking chunks off of the rock. Eventually, with Dr. Sawatzky prying underneath while I hauled, we finally succeeded in moving the slab to the entrance. Then, it became apparent that the slab was actually larger than the entrance. This was solved with numerous underwater swings of a sledge-hammer. As Dr. Sawatzky man-handled the sections up to me I laughed out loud due to the immense size of the stone I saw appearing!!! At the end of this struggle, the sections of stone combined measured almost 9 ft in length at a width of 5 ft. The thickness varied from 3 to 4.5 inches!!

After Dr. Sawatzky warmed up from this struggle he resumed entry once again armed with his explorer reel. After he had passed what he believed to be 40 ft of passage he came to the unstable area. Plodding on through the zero visibility he penetrated to around 60 ft. I was enthused to see his bubbles once again appear at the entrance and when he broke water I was filled in on the journey. Dr. Sawatzky described passage with silt banks on both sides of the passage about 4 inches deep sloping up to the pinched down bedding plane sides. He mentioned having to weave a path through broken down slabs and a somewhat broken ceiling at about 30 ft where air bubbles disappeared above .Heading forward from the ceiling slots, the passage began to widen to about 10 ft wide and about the same height.

At the end of clear passage; breakdown and more digging was encountered. Once more the passage was entered; this time armed with the end of a 100 ft measuring tape. When forward progress was halted and earlier arranged tugging signals were felt I recorded an actual penetration distance of 59.8 ft. Not a bad effort at all considering the extremely adverse conditions and we both will return to 'earn" more passage. Dr. Sawatzky has plans to return into the passage when it is in full flood in order to manually agitate the silt banks!! With luck this will improve visibility, which is so poor that on one dive Dr. Sawatzky returned and passed me his dual Dive Rite 10 watt HID system as he could not see any light whatsoever!!!

From the sinking stream and visible

by Doug Hynes

A small portion of the big slab removed from the passage photo by D. Hynes

subterranean flow upstream to the spring is a distance of 1.8 km. So we have going cave diving exploration and virgin cave near Hamilton Ontario to explore. I have named the cave diving site Sleepy Hollow Resurgence as the site is very reminiscent of the movie with a gnarly tree full of twisted roots standing as a sentinel above the entrance. The other two springs I have named Peter's springs in honor of the owner of the land. All three of us were in agreement of these monikers.

Dr. Sawatzky fully kitted up and ready to re –enter Photo by D. Hynes

I will close with mention of another local gentleman who has been very helpful as well. Len Packam grew up on the land where we found the sinking stream. In talking with him on various occasions he has provided me with a wealth of information. From this information I now know that there are two MORE sinking streams like the one we found and on the same property, as well as a 20 ft deep grike He has shown me who the real owner of that property is (the other farmers rents it) and is assisting in negotiations. Information given to me by other locals have led to me find more springs along another creek and a rumor of a filled-in cave you could walk upright in.

I am amazed that such a large amount of karst has sat close to roads, farms and urban housing without discovery and I thank all those that helped me succeed in this exploration. There are still many going leads for dry caves and the cave dive will continue for some time I am sure; both of which will produce maps we can publish at a later time. Besides the success in finding these caves we have above all found a karst area we can hopefully protect from being developed. Marcus Buck continues with the accurate land feature survey with my assistance and I hope to publish more reports in a short time.

Dr. Sawatzky digging his way in with Greg Warchol hauling endless pails photo by D. Hynes

UPDATE

In the time that has passed since I wrote this article some advances have been made. The upstream end of this karst system has produced a cave aptly named "Wired-in-XS" as entry and the initial dig was through a large pile of steel wire fencing deposited by the farmer. Mick Gor-

Doug Hynes digging Photo by Dr. Sawatzky

Self photo
D.Hynes on the initial solo dig

don and I dug initially then Greg Warchol joined us for the final dig and micro blasting. After a few -30C days of digging we managed to break into a nice tiny phreatic tube lined with shards of fencing wire.

This small tube resurges at the overflow spring we have called "Sleepy Hollow" and we have pushed the cave for a short distance (upstream) only to be stopped by a sump. This sump is unfortunately only 12" high but there is compacted silt on the bottom. We plan to try pushing through the silt mid summer when we can slim down sans drysuits. The echo we get from the air space is a very nice indicator of some decent passage to come. Ultimately the system runs for 1.8 KM so much more passage should be present once we gain access. Marcus Buck and Mick Gordon surveyed the small amount of passage we did traverse, we will return!

I tried 2 different solo pushes in "Sleepy Hollow" using a Martyn Farr harness only but my 46" chest prevented much progression. Dr. David Sawatzky and other future divers will hopefully push this system further. If we can make some sort of Cave radio a rough line plot can be recorded as the visibility will allow no other method.

In the end we have identified yet another important karst area within the reach of urban planning/construction. With the information we have gained perhaps this area can be protected in a similar manner to the Eramosa Karst which is roughly 5 miles away .While I love the search and ensuing exploration of new caves, the possible karst protection is ultimately the most satisfying part.

D. Hynes, first entry to Wired In XS
Photo by M. Gordon

Cave safe,
Doug Hynes
Toronto Caving Group
NSS #38701

I must take this opportunity to thank all the passionate and dedicated cavers and my fellow club members who have mentored me and selflessly taught me.

Without them and their commitment to our passion I would not have been able to enjoy such a discovery. I must also say thanks to all the original cave explorers, whose amazing feats and accomplishments I have read about over the years in The Canadian Caver/NSS and NSS -CDS publications. Without these stories to motivate me and spark an interest I would not be where I am today. I tip my hat to all the successful, courageous explorers in Canada and Worldwide! Thank you Marcus Buck for mentioning my find and for all the time and effort sharing your knowledge and answering my endless questions!! I do fully appreciate it.

I would also like to thank Dr. David Sawatzky for sharing so much knowledge in regards to cave diving in Canada and the techniques required. While this project is tiny in comparison to his 11km system near Ottawa or as harrowing as dives such as Little Stream and some of the British Columbia systems, I am happy to have shared the lead and spent time learning from a true explorer! I feel fortunate to have befriended him and met some of the top truly exploring cavers.

Marcus Buck preparing to survey
Photo by D. Hynes

In 2006 Mike and Sandra Poucher were driving to Peacock Springs to go diving, and they noticed the "For Sale" sign on the property north of Peacock Springs State Park. They are friends of mine, we go way back, to my cave diving days. I was a cave diver for over 15 years, and served 11 years as the CDS Admin Manager. Mike and Sandra were concerned about the property being developed so near to the state park. So they called me.

I work at the Trust for Public Land and Mike and Sandra know what I do now and they made the call. Doug Hattaway was assigned the project as Project Manager. And thank goodness, because he is one of our most skilled, and he managed to close the project and convey as an addition to Peacock Spring State Park very quickly.

We hope to work with cave divers in the future regarding this kind of transaction, hence why we are considering a sponsorship at this year's workshop. So we can get the word out and tap into our resources to protect these properties. Cave Divers know where the land that needs protection is!

Press Release
FLORIDA COMPLETES PURCHASE TO EXPAND PEACOCK SPRINGS STATE PARK

--480-acre addition protects springs, expands recreational opportunities--

TALLAHASSEE - The state today completed the purchase of approximately 481 acres from The Trust for Public Land that will expand Florida's award-winning state park system. Located in Suwannee County, today's purchase will more than double the size of Peacock Springs State Park, which now will offer more than 750 acres of land for visitors to enjoy.

"With this purchase, we are protecting one of Florida's vital springs and cave systems by incorporating it into one of our award-winning state parks," said Florida Department of Environmental Protection Secretary Colleen M. Castille. "Through programs such as Florida Forever and the Florida Springs Initiative, we can ensure our precious natural resources are preserved, while still providing public access and recreational opportunities."

Peacock Springs State Park includes two major springs, a spring run and six sinkholes - all in near pristine condition. The park is home to one of the longest underwater cave systems in the continental United States. Approximately 28,000 feet of underwater passages have been explored and surveyed by cave divers, including the property just purchased. The springs and cave system attract local, national and international visitors for scuba and cave diving. The park also provides areas for picnicking and grilling, and includes hiking trails with signs that describe the underwater cave system beneath visitors' feet.

"Florida's freshwater rivers and springs are some of our most precious - and most sensitive - natural assets," said Andy McLeod, interim director of The Trust for Public Land's Florida office. "We were very pleased to work with the state to ensure Peacock Springs' preservation, and particularly pleased that Floridians have had the foresight to approve the Florida Forever program so that critical lands like these can be acquired."

Florida's state park system is one of the largest in the country with 159 parks spanning more than 725,000 acres and more than 100 miles of sandy white beach. From swimming and diving in rivers and springs to birding and fishing or hiking and riding on natural scenic trails, Florida's state parks offer year-round outdoor activities for all ages. Battle re-enactments and Native American festivals celebrate Florida's unique history, while art shows, museums and lighthouses offer a window into Florida's cultural heritage.

The 10-year, $3 billion Florida Forever program established by Governor Bush and the Florida Legislature in 1999 conserves environmentally sensitive land, restores waterways and preserves important cultural and historical resources.

The Florida Springs Initiative, established by Governor Jeb Bush in 2001, is the first comprehensive, coordinated plan to restore and protect Florida's more than 700 freshwater springs. Last year the Florida Springs Initiative set aside more than $300,000 to protect spring ecosystems, water quality and flow within Florida's award-winning state park system.

The Trust for Public Land is a national nonprofit land conservation organization that conserves land for people to enjoy as parks, gardens, historic sites, rural lands, and other natural areas, ensuring livable communities for generations to come.

In Florida, TPL has protected more than 300 sites, many of which focus on preserving water quality and public access to the state's lakes, rivers and springs. For more information about TPL, go to www.tpl.org/florida. For more information on the Florida Forever program, visit www.FloridaForever.org. For information on Florida State Parks, visit www.FloridaStateParks.org.

by Mark Wenner

July, 25 2005
Mark Wenner, Marbry Hardin
Sump-mount Steel 45 cu/ft cylinders. Max depth 20'

Espey Cave is a marvelous natural wonder located near Murfreesboro Tennessee. With 31,000 feet of explored/surveyed passage, its possibilities are still endless. Considering all the time and energy spent by volunteers to map the known passage, I felt honored to be lead to this perfect pool of water, without having to swim a mile to get there. I asked Marbry that morning, "how many time's you been in here?", His reply was, "Oh, about 90 times, and most of that was survey work."

If you think most of our diving up here in TAG country is all planned out, and executed in advance, think again. With an early morning call to arms, we met up and made the drive into the hills and up a beautiful country road along a steep ridgeline. We found our pull-off, parked, and began assembling the gear we'd haul down the notoriously steep embankment that leads into the sink. As a kid, I had a paper route in Minnesota. With solid ice under my feet being a constant, so I consider my balance to be better than average. However, with tanks and gear hanging, I was on my butt with a gash in the palm of my hand within 20 feet of our decent. Diving in this type on environment is 99% getting there and back, with the dive being a calm moment.

It's obvious this cave is well visited, as the earth is heavily trafficked and smoothed with footprints. You wouldn't think that there'd be a stone left unturned or a passage unexplored. We found the cave register and it was filled to the brim with names and NSS numbers of those who had spent some time pondering the next turn. Looking further into the notes we found Brian Williams and Becky Dettorre's names, with Brian's comments asking where was the water! It wasn't long till that question was answered after negotiating approximately 1500' of breakdown and low overhead passage.

This terrain is tough, but it's twice as bad while bent over with 40 to 50 lbs of dead load. Making the turn into our last side passage, we abruptly came to a halt at the waters edge in a walled out room of a perfect sump. "Nice vis" was my first thought (with no HID light in my gear bag). Less is more on a sump trip with only two people to carry gear, especially when you don't know where you're going. Our briefings on most of these trips are short order, and I end up asking all the questions, although venturing into virgin territory, the answers are not always apparent.

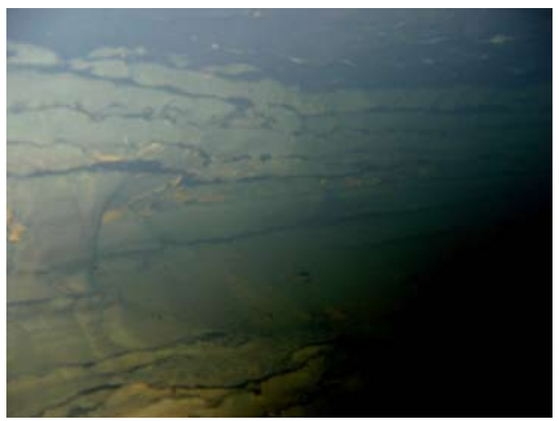
Marbry handed this dive to me on a silver platter, which struck me as odd with all the previous work he had done in this place. I would think his cat curiosity would be peaking about now, but too late, I was here and suited up ready to go. Donning his tanks, and hitting the water I instantly realized that I was without enough weight. There were a couple of seconds of concern, sitting in the quiet pool with my wetsuit filling with 58 degree water. But we just dumped my hip sack and filled it up with a few rocks and I was on my way. There seemed to be nowhere to tie off, and I learned the first important lesson out of the gate, as the "nice vis" went south. Tie off back in the dry section of cave or to someone's boot, if you want them to stick around. "Where's your car keys" Marbry asked…so I tied off to his boot.

Once submerged, and adjusted, the passage in front of me called out, with clear as a bell visibility and 4 to 6 ft wide, 3 to 4 ft high passage, lit with only my head lamps ! ?
Stunning. I love that feeling of calm, being at perfect peace, and the sensation of just weightlessly floating along looking for nice tie-offs. I was also ultra conscious and respectful of my presence in there. Looking back every 50 ft or so to view the way out, and observe the trail of percolation from the ceiling. Everything that looked like a solid tie-off rock was crumbling upon first touch, so I focused on nothing but the next person that would have to follow that line. Using mostly the bottom and loose rock on the floor, I dressed each point carefully, securely, and moved on.

Two Hundred feet in came my first moment of indecision. With no one else to bounce the decision off, I had to make a choice at an intersection that looked great in both directions. I sat for a brief moment listening to the cave and elected to go to the right. A short 75 ft later, at the end of that reel, I was making another decision in tight quarters and looking for a tie-off. I made a quick tie-off, cut the line and found myself attempting to clip my primary reel off to the D ring on the rear of my harness, which was gone.

As my dead end turned into a total silt-out I clipped off to another D-ring and turned into the fog. I remember coming out of the silt cloud following a straight line into clear water. When I got back to the decision intersection, I checked my air, then peered down the left side to somewhere while going for my next spool.

The water temp, and excitement was getting to me a bit, with that shiver that turns to a chill. I had a 150' spool left on me, my last line, and once again faced with a decision as I peered into the abyss of going cave passage. Listening to that voice that tells you when it's time to go I heard, "You've had fun, it's going cave, but it's time to turn". That's all I had to hear. I was 20 minutes into a perfect dive, and I wanted to keep it that way.



On July 25th, Brian Williams, accompanied by Marbry Hardin and Becky Dettorre returned to this section of cave with another set of 45's and commented: *"Sump # 2 is like Ginne Springs compared to # 1. Mark did a great job laying the line in there. The floor is covered in thin sheets of very friable shale-like rock. These thin sheets also project from sides of the passage but just crumble if you try to make tie-offs on them. The ceiling is flat, with a black bedding plane structure. Passage averages about 5 ft wide, 3-4 feet high. I got to the end of the line at the junction, about 300 ft in and was down on air after the first sump, so I flew to the end of Marks line and added on about 70 ft before having to turn the dive. The passage going left has no end in sight. There's a small silt mound to squeeze over to continue but I have the line tied off past that and the passage is getting larger again. It blows it out when you go over that hill, but it's not a problem as the passage is still wide at that point."*

That's the beauty of diving in this kind of environment. There are people that pave the way, and people that follow up on your efforts, and you can't help but feel honored by being link in the chain of the event. I'd like to thank my mentor's and the people that paved that way. Next time I'll write about a not so perfect cave dive effort, and how fast things can go wrong. Until then, safe diving!

Editors note:

Even though this sounds like an easy dive in great visibility, make no mistake this was still a very technical sump dive. The water is very clear until you set foot in it or have to squeeze through anything tight in no flow. Make no mistake, it gets very silty very quickly and you are in zero viz much of the time during the return trip. Sump exploration dives are considered extremely dangerous due to silt, unknown cave passage conditions, and the required dry caving skills and logistics involved.

Cenote Calimba Destroyed

Wednesday, December 27th, 2006 was a sad day for me as I was diving with Stefan Dreesbach of Germany. We stopped at Cenote Calimba of the Sistema Sac Aktun after performing a dive at Cenote Symbiosis and discovered the results of an attempt by the landowner to create an artificial swimming hole in the hopes to attract tourists for swimming and snorkeling. With a huge tractor on steel treads with a 24 foot boom arm using a huge four cubic yard bucket and a hydraulic chisel hammer, the ideal was to dig through the limestone to the aquifer. That attempt was successful, however the rubble and collapse of the cave ceiling has made entry into the cave system impossible and dangerous to dive. Good bye to once be a beautiful entry into a magnificent underwater cave system.

Greed destroys all things.

Maintain & Be Safe!

STEVE
stevegerrard@cavediver.com
www.steve-gerrard.com

Cenote Calimba Destroyed

2007

NSS-CDS Election of Directors

Notice

In 2007 there are 4 board positions up for election. 3 board members plus the training chairman.

On or before **March 15** of each calendar year, 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.

Completed ballots must be received by the administrator of the election on or before **May 15** of each calendar year in order to qualify as a legal vote.

All candidates shall be notified of the election results within seven (7) days after the close of the election.

At the next meeting of the board, the candidates who received the highest total number of votes from the voting membership shall be seated in place of the outgoing directors for their new terms as directors. At this meeting, outgoing board members shall turn over all NSS-CDS materials and files in their possession to the newly elected board.

The Training Chairman shall be elected biennially by current and active NSS-CDS cave and cavern diving instructors in good standing.

Calculating Turn Pressures with Different Volume Cylinders by Skip Kendrick

One of the important safety concerns in cave diving is making sure there is enough gas for all divers to return safely. We've all seen the math, and seen the tables, which allow conversion from psi to cubic feet, then from there to match turn pressures of tanks of unequal volumes.

You calculate your thirds, your buddy does too, and if you are diving different size tanks, you then convert to cubic feet, then the larger volume tank converts the smaller volume tank's cubic feet into psi "usable." Thus, we can be assured that the guy or gal with the larger tanks doesn't go beyond the thirds of the one with the smaller tanks.

These calculations are not fun to do, they are the bane of nearly every student, and are often done wrong! I know we've all seen divers in the water (especially, but not limited to students) calling out wrong numbers, being corrected, or re-figuring, until they come up with the right number! At least the number the instructor or buddy has determined is the right one. Two heads are better than one and this is another good reason to dive with a buddy!

I have worked up a one-page table of conversions that is a bit different from those presented in most classes and manuals and that I believe is more useful when actually diving (see Table 1). Here's the basic idea of this table: You first calculate thirds in pounds per square inch (psi), then with that number and the full volume of your tanks, you enter the table and it shows you the cubic feet (cf) at that psi. In that same row is the psi values for common tank sizes that correspond to the same cubic feet. The idea is that in one row you have all the information you need to convert (see) psi/cf and cf/psi for all common tank volumes.

Let's try an example. First, calculate each diver's usable gas for the dive. Then enter the table to match cubic feet. Diver 1 is using double 130's at 3500 psi, a Diver 2 is using 119's at 3300 psi, and a third diver is using double 98's at 2400. Diver 1 has 1100 psi for thirds (round down to 3300, then divide by 3). Diver 2 has 1100 for thirds (3300 divided by 3). Diver 3 has 800 for thirds (2400 divided by 3). From the table, 130's with 1100 psi is 40 cubic feet, 119's with 1100 psi is 37 cubic feet and the 95's with 800 useable is 29 cubic feet. So the team turn is 29 cubic feet, which is 800 psi for the 130's, 900 for the 119's, and 800 for the 98's.

With doubles, it's not 29 cubic feet, but 2x29, for 58 cubic feet. However, the turn pressures (psi) remain the same assuming the doubles are connected via a manifold. Even if independent doubles (e.g., sidemount), the turn pressures then apply to each tank, assuming the two tanks started with equal pressure, if not, simply calculate based on the tank with lesser volume (and thereby add a safety margin).

Another nice feature of this table is that you can look up turn pressures before you ever get in the water! For example, there is a 100 psi difference between E8 130's and E8 119's. So if those are the two volumes being used, you know that when you do calculate thirds (after S drills), that the diver with the 130's must subtract 100 psi from his/her thirds pressure in order to match the diver with the 119's. This is, of course, always true, so if you dive with the same buddy or buddies, and the same cylinder sizes, then you no longer need the table! I like tables that are self-eliminating!

Table 2 is presented to show the calculation of the tank factor values used to get the values in Table 1. Most cave divers are taught to round these factors to one decimal, but I used one or two decimal places, and or truncated, here, in the interest of under-representing the tank volume for small additional safety margin. For example, the 130cf tanks have 37.7cf at a pressure of 1000 psi. Should one round up to 38? I thought it best to truncate to 37, as shown in the table.

You may also have noticed that in Table 1 the E8-series 130 and 119 tanks do not have volumes corresponding to the published statements from PST that the 130 and the 119 are the same volume as the low pressure 104's and 95's. They are close, but not identical, based on the rated full pressures and volumes. This difference may be due to several factors such as the use of two decimal places, rounding errors, intentional rounding of cubic feet to hundreds, fifties, and twenty-fives (done for convenience and for an additional safety margin), and that the relationship of gas volume to gas pressures is not a linear function, as traditionally calculated.

I hope you find this table useful and that it makes your diving easier, safer, and that matching turn pressures is no longer a chore before your dive! Dive safe and have fun.

Thanks to Forest Wilson, Sludge, Richard Blackburn, and others for comments and suggestions in the formulation of this table.

Skip Kendrick is a Cave Diver, a Member of NSS-CDS, and a Professor of Psychology at Middle Tennessee State University. Comments and requests may be emailed to the author at psyskip@mtsu.edu.

Table 1
Usable PSI (Turn Pressures) and Corresponding Cubic Feet (Cf) for Various Cylinder Volumes

	Cylinder Volumes in Cubic Feet										
Cf	130	125	121	119	112	104	98	95	85	80	72
45	1200	1000	1000	1300	1100	1100	1200	1250	1400	1700	1550
40	1100	900	900	1200	1000	1000	1100	1100	1250	1500	1400
37	1000	800	800	1100	900	900	1000	1000	1150	1400	1300
33	900	700	700	1000	800	800	900	900	1000	1200	1150
29	800	600	600	900	700	700	800	800	900	1100	1000
26	700	550	550	750	600	650	700	700	800	1000	900
22	600	450	450	600	550	550	600	600	650	800	750
18	500	400	400	500	425	450	500	500	550	700	600
15	400	300	300	400	350	400	400	400	450	550	500
11	300	200	250	300	250	300	300	300	350	400	400

*Note: These figures may not agree with other published tables due to slight differences in the formulae used to determine cylinder volumes, effects due to rounding of decimals, need to keep psi values in the realm of needle pressure gauges, and the desire to err on the side of caution.

Table 2
Tank Factor Calculations Used in Table 1

130 cf @ 3442 psi = 3.77 (3.7 cf/100 psi)	7.5 doubles
119 cf @ 3442 psi = 3.46 (3.4 cf/100 psi)	6.9 doubles
125 cf @ 2640 psi = 4.73 (4.7 cf/100 psi)	9.5 doubles
121 cf @ 2640 psi = 4.58 (4.5 cf/100 psi)	9.2 doubles
112 cf @ 2640 psi = 4.24 (4.2 cf/100 psi)	4.5 doubles
104 cf @ 2640 psi = 3.93 (3.9 cf/100 psi)	7.8 doubles
98 cf @ 2640 psi = 3.71 (3.7 cf/100 psi)	7.4 doubles
95 cf @ 2640 psi = 3.59 (3.6 cf/100 psi)	7.2 doubles
85 cf @ 2640 psi = 3.22 (3.2 cf/100psi)	6.4 doubles
80 cf @ 3000 psi = 2.67 (2.7 cf/100 psi)	5.3 doubles
72 cf @ 2475 psi = 2.91 (2.9 cf/100 psi)	5.8 doubles

NCKMS 2007, St. Louis, Missouri

Theme: "Cave & Karst Conservation in the Ozarks"

The National Cave & Karst Management Symposium will be held in St. Louis, Missouri, October 8-12, 2007. This is the first call for papers. For a preview of the NCKMS, see http://www.utexas.edu/tmm/sponsored_sites/biospeleology/nckms.html

By April 1, 2007, please submit a title and abstract of your paper or poster to Bill.Elliott@mdc.mo.gov . Submit now for a better chance of getting on the schedule. This also will help us decide how to formulate the sessions (see below).

Abstracts are limited to 250 words. Our theme is "Cave and Karst Conservation in the Ozarks", so expect to hear papers from Illinois to Oklahoma, but any paper or poster about cave and karst management, use or study is invited. There is always a national and international flavor to this symposium. However, your paper might not be accepted if you delay, the abstract is poorly written, or the subject is uninformative. Digital presentations are expected, but please avoid excessive use of graphs and tables, or any that are difficult to read on a typical projection screen. We do want the latest, cutting-edge information, so a revised title and abstract may be sent to me by the final deadline of September 1, and I encourage that.

This year we will require written manuscripts one month after the Symposium. We want your participation and newest technical presentation, but we want your manuscript too. I will edit the Proceedings with Tom Rea's assistance, and they will be published a few months later. The 2005 Proceedings just came out!

Contact: Bill Elliott, NCKMS Chair, Missouri Department of Conservation, Resource Science Division
P.O. Box 180, Jefferson City, MO 65109 573-552-4115 ext 3194 Bill.Elliott@mdc.mo.gov

Possible 2007 NCKMS Sessions

Ideas and requests for sessions are welcome.

1. *Innovations in Cave Protection*
2. *Cave Databases and GIS*
3. *Cave Management by Cavers*
4. *Groundwater Issues*
5. *Cave Life Studies*
6. *Managing Caves on Public Lands*
7. *Consultants in Action*
8. *Karst Regions of the World*
9. *National Cave & Karst Research Institute*

I learned about Cave Diving from that... *by Forrest Wilson*

Several of us were diving a "circuit" where the line loops back on itself. We were in teams of two. My buddy and I were the last team.

The plan was to place a jump reel where the line looped back, so we would have a continuous line. We were to turn back, if we hit thirds before the halfway point. One team hadn't been in before, but most had been in at least a couple of times before. The guide had been in many times. My buddy and I had been in a year earlier, and had plenty of gas to make the whole circuit at that time.

Just after the halfway point, my buddy showed me his SPG, he had already used two thirds of his gas. I let him go in front, just in case. The guide waited at the jump, to pick up the reel, and my buddy indicated his problem. We passed up one team, so we had extra gas in front of, and behind us.

In a few minutes, by buddy showed me his SPG, now in the red. Since I wasn't sure how much further we had to go, I unwrapped my long hose. I went on my backup, and held my main regulator, with the hose coiled. At about 200 psi, he held out his hand, and I gave him my regulator. He calmly put it into his mouth, and stowed his own reg.

I knew we had a couple of tight spots ahead, and started thinking about how we were going to get through them. None of this made any sense, because we had done this dive before with no problem. Then I remembered that when we geared up, my crossover was closed. I reached up and tried his crossover. I turned it, and got a long hissss, as the gas equalized. He looked back, and I showed him his SPG. He tried his regulator (holding onto mine) and once he convinced himself he was ok, gave mine back.

When we got back to the surface, I asked if anyone else had a closed isolator. It turned out the two other divers had found theirs off, which made over half of the team.

This makes the third time in 30 years that I have had to give up my regulator in a cave, and (knock on wood) none were really an OOA situation.

Analysis: My buddy should have monitored his SPG closer at the beginning of the dive, and we could have exited sooner. If he breathed the long hose, instead of stowing it, his SPG would have never moved, and that should have told him his isolator was off.

Moral: Check the isolator before every dive! While I agree, they rarely ever get shut off, there is always the possibility that a "trainee" may fill it, and close it by mistake. Practice buddy breathing once in awhile, you never know when you may need it, and it is much easier when it "second nature".

Letter to the Editor

It is no secret that there has been ongoing tampering with cave lines in Quintana Roo, Mexico, so it did not surprise me that the situation was mentioned in a paragraph in the November/December 2006 "Chairman's Corner" of Underwater Speleology. What did set me aback, however, was Gene's assessment of the situation: "Moving lines in popular caves can ruin someone's dive." The reality is moving of lines presents serious safety concerns.

As cave divers we typically use lines as navigational tools; although we should not be "line followers" the vast majority of us do not subscribe to navigation by progressive penetration. We consider lines leading to the nearest exit a necessity and understand that when a line is removed it is a cause for concern. On at least one occasion, however, the lines in Mexico have been moved with a dive team in the cave. (Presumably whoever is changing the lines is doing this during operating hours for the cenotes, so there may be other situations of which I am unaware.) Thankfully this team was familiar with the cave and knew the route to open water, but it is easy to envision another team having difficulties.

A problem of navigational misinformation also exists because whoever is changing the lines leaves a number of line arrows in the original position, so line arrows are not necessarily pointing to the nearest exit. Although many cave divers completely trust only the line arrows they place, obviously the best practice is for all arrows to point to the nearest exit. If a dive team becomes lost but happens upon a line they opt to use, they should have some degree of confidence in the arrows positioned on the line by others. Arrows in the wrong direction may also unnerve an inexperienced diver; no one needs to have any doubt whether they are on the right track. Arrows not indicating the shortest route to open water are truly a needless hazard.

The Quintana Roo Safety Officers Committee (QRSO) handles line changes for underwater caves frequented by tourists. The changes which have taken place were not made or sanctioned by this committee—and should, therefore, be taken just as seriously as changes not made by the Peacock Line Committee would be to the lines in Peacock Springs, Florida.

Although Gene did not mention this, cave divers planning a trip to Mexico should note that whoever is doing this is not content in just changing lines. There have been incidents where dive gear: stage tanks, reels, arrows, permanent lines (which have been pulled entirely, not merely moved), etc. has been removed from the cave. At least some of these incidents have been reported to cave diving agencies, but so far little—if anything—appears to have been done about it. If the situation persists, it will only be a matter of time before a diver is seriously injured or killed.

A spoilt dive is hardly the worst case scenario for a dive team encountering a changed line or missing gear, so I am baffled that the chairman of the CDS would assess the line-changing situation in such a way. I hope this is not the mindset of the board of the CDS and the boards of other cave diving agencies, but the fact that whoever has been engaging in the unsanctioned moving of the lines and the stealing of gear has not been identified and reprimanded leads me to believe that this might well be the case.

December 12, 2006
Donna Richards

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