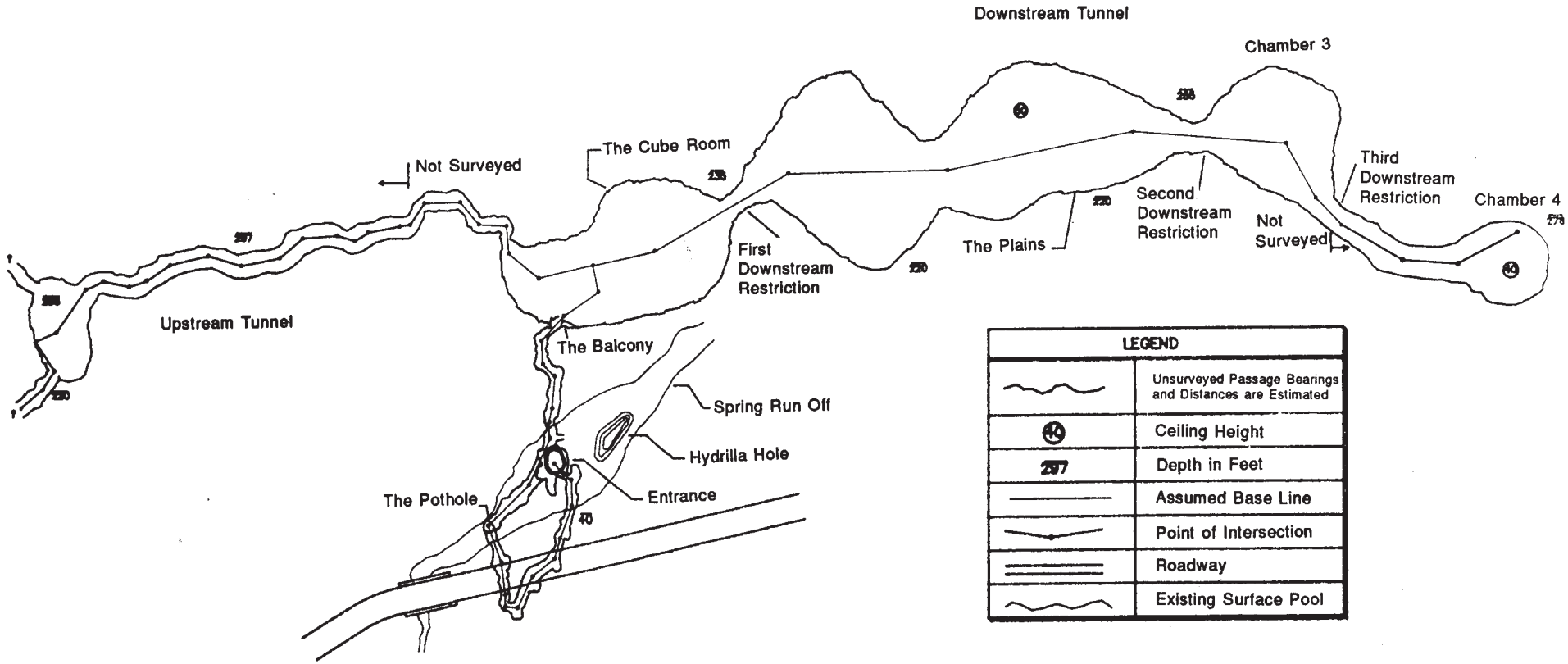
UNDERWATER SPELEOLOGY

National Speleolgoical Society • Cave Diving Section
March/April, 1992 • Vol. 19, No. 2



SALLY WARD SPRING

WAKULLA COUNTY, FLORIDA

DEEP BREATHING SYSTEMS
P. O. Box 4220
Sevierville, TN 37884

Information Provided by: United States Deep Caving Team and Bill Stone

See article p. 12

UNDERWATER SPELEOLOGY

The official publication of the Cave Diving Section of the National Speleological Society, Inc.

P.O. Box 950, Branford, FL 32008-0950

Editor: H. V. GREY
P.O. Box 12, Nokomis, FL 34274-0012
813-484-7834, 813-484-6665 (fax)

TABLE OF CONTENTS

Magazine Submissions — We welcome all news items, articles, Letters to the Editor, photos, slides, cartoons, and other items of interest or importance to the cave-diving community from all members, subscribers, and other interested parties. They should be sent directly to the Editor (see address on left column). We can also use text processed in most IBM-compatible formats. (Please contact the Editor directly for details and arrangements.)

Advertising — The NSS-CDS Board of Directors has approved the reinstitution of paid commercial advertising for *Underwater Speleology*. Please contact the Editor for information and arrangements (see address on left column).

The NSS and Cave Diving — Founded in 1941, the National Speleological Society joins together thousands of individuals dedicated to the safe study, exploration, and conservation of caves. The first cave-diving information ever published in the United States was in a 1947 *NSS Bulletin*. In 1948, NSS divers were responsible for the first cave dives in the United States using scuba. Prior to 1973, cave diving within the NSS was on a purely local level. That year saw the creation off the NSS Cave Diving Section to provide a vehicle for information exchange. Today, with over 750 members, the Cave Diving Section promotes safe cave diving through semi-annual workshops; cavern- and cave-diving training programs; warning-sign installations; search, rescue, and recovery through the National Cave Rescue Commission; cave exploration and mapping; several texts and publications on cave diving; and the bimonthly magazine, *Underwater Speleology*.

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 either by writing directly to its main office (National Speleological Society, Inc., Cave Avenue, Huntsville, AL 35810) or to the Cave Diving Section. Annual membership is $25.00 and includes subscription to the NSS's monthly magazine, *NSS News*, as well as voting privileges and discounts on publications and conventions.

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 Cave Diving Section is open to anyone who is a member in good standing of the NSS. Annual membership is $5.00 per year and includes subscription to the CDS's bimonthly magazine, *Underwater Speleology*, as well as voting privileges and discounts on publications and workshops.

Subscription — If you do not wish to join the NSS and CDS, but would like to keep current on cave-diving events, exploration and technology, you are invited to subscribe to *Underwater Speleology* for $15.00 per year.

GROWING PAINS: THE ADMINISTRATIVE CRISIS WITHIN THE CDS — Editorial

Over the past ten years membership in the Cave Diving Section has grown more than 500%. Training services, publications, maps—practically every aspect of the CDS's activities has expanded by an almost commensurate amount. Unfortunately, because of our wide geographic dispersement, it is sometimes difficult for program coordinators, board members, and other volunteers to physically assist each other. We have reached a crisis stage where our key volunteers are being completely overwhelmed by their volunteer jobs for the Section.

The problem is further complicated by the fact that the jobs are increasingly complex and specialized. The Treasurer's position is a case in point. This is a reasonably complex, time-consuming job that requires someone who is well versed with financial/business procedures. (We are, therefore, extremely fortunate to have banker Bill Foote currently carrying that heavy responsibility!) The Secretary's position is specialized in another direction: towards heavy computer operation, data-base fluency and keyboarding, and strong letter-writing skills. (Both Lee Ann Hires and Joe Prosser deserve engraved medals for tackling both jobs at once!)

Both the Secretary, Treasurer and Training Chairman have been authorized for several years to engage part-time secretarial assistance to handle the heavy volume of repetitive tasks that come their ways. Unfortunately, however, the old adage that it is oftentimes much faster to do a thing yourself than to try to explain it to someone else still holds true. It is also the case that, frequently, the requests and problems to be handled are unique in nature and require the full working knowledge, judgment, and accumulated experience of a volunteer who is thoroughly familiar with the ongoing activities and policies of the organization. Unfortunately, when these already overworked individuals are unable to keep pace with the continuing onslought of volunteer work, CDS activities can come to a screeching halt.

Several of our key volunteers are also wearing several hats, and always seem to be the ones who have to step in when there's a gap, say, in producing a workshop, when they have already have their hands more than full with the other jobs for the Section. (Lee Ann and Lamar Hires, Bill Foote, Joe Prosser, Wes Skiles and many others deserve top marks for their long-suffering loyalties in these directions.)

The point is, a lot of them—a lot of us—are simply overwhelmed by the sheer volume of the tasks associated with even a single volunteer job description—even with additional part-time paid assistants. The handwriting is already on the wall. Something is going to have to give, as we "burn through" these volunteers at an ever-accelerating pace.

We are rapidly approaching a crossroads where we will have to make some serious decisions about our future functioning as an organization—or, in other words, **a crossroads where we are going to have decide just exactly what it's going to be that gives**, where we are going to have to decide what procedures should be changed.

There's a concept in business management that applies well here, that in any given situation, of the three "desirables"—*high quality, high speed, and low cost*—you can have a maximum of only two out of the three.

Right now, one of the three that we opted for is "low cost," by virtue of our "volunteer labor." In years past, when we were a small organization with more modest goals, this was highly desirable and for the most part, effective.

However, at our current level and volume of operation, to continue to insist upon this "low cost" in the form of primarily volunteer labor is to, of necessity, sacrifice either high quality, high speed, or—what is more likely—both.

One potential solution, of course, is to do what our parent organization, the NSS, has had to do long ago, and hire "real" full-time office staff. It has been observed in print many times that our $5 membership fee—which is less than the average cost of a single air fill for a set of doubles—doesn't even cover the cost of producing and mailing the newsletter, let alone anything else. Yet the CDS Board of Directors has consistently avoided raising dues because to do so always seemed like "adding insult to injury" in the face of the relatively high concomitant cost of NSS membership. We have been able to flourish as organization and to operate the newsletter essentially "at a loss" because of the unselfish contributions of our authors, workshop lecturers, filmmakers, mapmakers, T-shirt designers, instructors, directors and program coordinators, etc., and, of course, the generous outright cash contributions of our members and cave-diving business supporters.

As cave divers, most of us have invested several thousands of dollars in our cave-diving equipment. We know that our very lives depend upon the quality of our training and equipment, and that in most aspects of our sport there isn't any percentage in sacrificing quality for low price. In casually broaching the problem to various CDS members, their conversation and letters indicate that they would like to continue the high level of service they have been receiving and are more than willing to pay for it, even if it means a substantial (realistic) increase in dues.

Even a four-fold increase in dues would still be a drop in the bucket compared to the financial outlay in training and equipment required to cave dive safely. And not so terrible an increase in the face of the potential—or even likely—alternatives: drastic reduction in publications and training services available from the Section; a sporadic or nonexistent newsletter; processing of new memberships, correspondence and information requests to a snail's pace that will make our present rate of operation (slowed down by the fact that even a simple membership has to be unavoidably forwarded no less than **four** times to four different people for processing) seem like Mach 4 in comparison. Doubtless other solutions will be discussed at the next board meeting prior to the Workshop. With luck, swift responsive action by our board will keep CDS operations flowing smoothly. ■

SO!—WHAT EVER HAPPENED TO THE CAVE-DIVING MANUAL, HUH? — Editorial

By virtue of being newsletter editor, cave-diving manual co-editor, and a board member (a "triple threat"), it looks like I got elected—if only by default—to answer that question; to give a formal account to the membership as to why the cave-diving manual missed its second advertised publishing deadline.

I want to say first of all that, when all is said and done, the experience of past month has demonstrated to me once again just why it is that I like cave divers in general so much, and my six fellow board members in particular. They are all uniquely different, with individual strengths and abilities, but they have some very special and important qualities in common. I have a great deal of admiration, respect, and high regard for their unquestionable sincerity, maturity, their love for caves and cave diving, their dedication to the best interests of the cave-diving community, their loyalty to the CDS, and perhaps the highest of all compliments I can pay, their openness to reason.

I also understand, as a result of this past month, why the CDS will continue to flourish in the future under the same kinds of conditions that would cause other kinds of nonprofit, volunteer organizations to crumble due to unreconcilable goals and personality clashes. We may some of us get a little hot under the collar and even be considerably "annoyed" with each other, but I am impressed once again with how each of the "combatants" in the cave-diving-manual "battle" has gotten up, dusted himself off, and climbed back into the ring, never forgetting our mutual long-term goals. Gentlemen, I take my hat off to you! But enough of generalities.

The first publication date, the 1991 Winter Workshop, was missed because we were still lacking a couple of vital and unsubstitutable chapters. However, no one but Joe Prosser could possibly have gotten such a lengthy book with so very many contributing volunteer authors so close to completion in less than a year, so it wasn't such a terrible pill to swallow. And the chapters, when they did arrive, were excellent and well worth waiting for.

The "launch window" for our second publication date, the 1992 Spring Workshop, has, unfortunately, but necessarily, also been missed. At the eleventh hour (or more precisely, at "5 minutes of 12"), at "T minutes 72 hours and counting," literally on the Friday before the Monday when I was planning to deliver the book to the printer, when my co-editor, Joe Prosser, and I had it in writing from the Chairman that all systems were go, certain last-minute reservations were raised by some concerned board members, and by majority board decision, the book countdown was officially put on hold with a formal fax letter addressed to Joe Prosser late that Friday afternoon, pending further review of the final draft.

It was initially hoped that these reviews could be conducted expeditiously enough to allow the final version to still be delivered to the printer in time for delivery for the Spring Workshop. One editor even stayed up all night preparing and copying versions and made plans to personally fly the copies to the board members. But this final review process took—and in fact, at this writing, is still in the process of taking—longer than we had all hoped, and the deadline has long since past. But everyone is agreed that it is important that the people who have been intrusted with conducting the affairs of the CDS be satisfied before we proceed with the book.

It must be stressed again that everyone involved with the process understands that these board members were all acting strictly out of a deeply felt and completely sincere sense of obligation and responsibility to the CDS and its members to ensure that the very large financial investment in the book was made wisely. The editors—who had, of course, also been acting strictly out of a deeply felt and completely sincere sense of obligation and responsibility to the CDS and its members to ensure that the very large financial investment in the book was made wisely—naturally felt a very keen disappointment at this last-minute letdown, after the considerable personal sacrifices and sustained fever-pitch pace that had been maintained in order to try to meet the deadline. But it is again to the credit of the other boards members that they have tried to be somewhat understanding of and, in some cases even moderately sympathetic to, the depth of the editors' disappointment that all of these personal, professional and financial sacrifices and other efforts to meet the deadline were ultimately in vain.

The present status of the manual is that there is still one copy out for review, and a few last small hurdles to be dealt with, researched, and decided on the other copies already returned to the editors. While it would be utter folly for the editors attempt to make any more predictions or promises about the exact, or even approximate, date of production until they have an "irrevocable" go-ahead on the book from the other six CDS board members, we do hope that it won't be too long in being achieved.

Just for you skeptics out there who may not think there really even is a manual, prior to the call for an additional review, the manual was some 420 pages, 5-1/2" x 8", set in 9.5 type (just slightly smaller than the typesize used in the old manual—*this* exact typesize, as a matter of fact). The final version will be a few pages shorter because of a decision to leave out the full outlines of training courses, as these will doubtless be changing over the coming years while this edition is still in circulation. We have some spectacular front- and back-cover color photos by John Zumrick and Jamie Hempstead, which are already in the hands of the printer. Some additional black-and-white photos by Jamie Hempstead appear in the text, and Wayne McKinnon's beautiful drawings provide the bulk of the technical line-art illustrations.

Our contributing authors have outdone themselves and we have been very pleased with the quality of their efforts. We have also had some very fine assistance by our formal early-draft reviewers and proofreaders, Frank Howard, Lamar Hires, Bob Duncan, Mike Miles, and Danny Brass. (Bob and Mike in particular put in some tedious hours proofreading the

decompression tables!) Due to the nature of the manual, however, the editors have had to made certain changes to the contributed chapters to satisfy the multifarious criteria that had to be met by such a manual.

Last but not least, I want once again to express our (Joe's and mine) appreciation of the hundreds of members who gave donations to make the book a reality. Their encouragement, faith—call it "moral support"—was deeply appreciated by us throughout the long and occasionally discouraging hours of drudgery involved in producing the book. Without both our contributors' financial and psychological assistance, the manual would never gotten this far. With intelligent cooperation, I am hoping that in the next issue of the newsletter it will be possible to print a firm publication date, and maybe even to include an order form! Keep your fingers crossed—but don't hold your breath. ■

EDITOR FOR UWS STILL SOUGHT — Editorial

We are still seeking a new editor for *Underwater Speleology*. Interested members should get in touch with either the Chairman or myself, the present Editor, for further information (see inside front cover for contact information).

Pressing personal and professional obligations make it impossible for me to continue to devote the amount of time required to produce the newsletter on top of my other duties as a CDS Board member. I very desperately need for this to be my last issue.

Because of this lack time to devote to the newsletter, it has been necessary to streamline the format as much as possible in order to produce even this issue. You will probably note, for example, that it has a new, simplified appearance. In the four issues he did, our previous newsletter editor, Harry Averill, had created for us a very attractive and upgraded professional-looking style. Within the limitations of vastly different computer hard- and software, experience, and time availability, I made considerable effort to try retain the elements of Harry's state-of-the-art format where possible. That format, however, did pose for me some complex, awkward, and highly time-consuming typographical problems. The time to spend on such luxuries simply no longer exists. ■

NEW NSS GROTTO IN FLORIDA

Our parent organization, the National Speleological Society, has announced the formation of a new dry-caving grotto, the "Dead Cavers' Society," in the Orlando, Florida area.

Evelyn Bradshaw, Chairman of the NSS Internal Organizations Committee, explained that this "unusual choice of name came after a trip into White Cliffs Cave in Ocala. The cavers left a signed release form at the cave entrance, as suggested by an FSS member. Some local kids removed the form and reported to local police that the group was lost in the cave. Not only that, but local authorities contacted relatives with reports of this alleged disappearance. Actually, the group did notify appropriate individuals about their safe departure from the cave, but the name, 'Dead Cavers,' has stuck."

The grotto president is Kevin Young and mail may be sent to the group in his care at 532 Pawnee Trail, Maitland, FL 32751. Congratulations, Dead Cavers, and good luck! ■

CAVE DIVING WITH "THE ENEMY"

by Jill Yager (NSS #19089)

Cuba—the forbidden island.... In March I had the opportunity to travel to Cuba with a group of professors from Antioch University to study higher education. While I was there I met with members of the Cuban Society of Speleology. Although gasoline was in short supply, they managed to obtain a vehicle with enough gas to get us out into the countryside. We spent a delightful day visiting several caves around Havana. The caves were air filled, with shallow surface pools. I spotted blind cave fish as well as small troglobitic shrimp, and a few bats.

Cuba is about 66% karst topography—cavers' paradise. And not just for the air cavers—there are submerged caves everywhere! After looking at various maps and conversing with members of the Speleology Society, I was convinced that superb cave diving was to be had on the island. The French have been there, as well as a team of divers from Czechoslovakia. Seeing my enthusiasm, the Society members arranged for me to visit the Caribbean coast at Playa Giron, also known as the Bay of Pigs. There I met Angel Roca and Julio Cesar Ruiz, two CMAS divers who operate a dive shop at the only hotel in the area. The dive shop is fully equipped with a new compressor, about 40 new tanks, regulators, BC's, etc. Although our government does not allow us to travel freely to Cuba, no other country has such a restriction, and the place was packed with Canadians and Europeans.

Angel and Julio are untrained cave divers. The two frequently explore the many submerged caves around Playa Giron. The two divers have placed permanent line in several caves and unfortunately they have been taking tourists on cave dives. There are no twin-valve manifolds on the island, or good reels, or any other cave-diving equipment or information. At least Angel and Julio use line and put stage bottles along the route when they explore. I talked to them about safety aspects and the necessity for more training. So far, they have been lucky.

Four caves were visited. I snorkeled two and dove one. Cuban speleologists have explored around the entrances of most of them, but little scientific work has been done. The morphology of the caves is varied, but all seem fairly deep (over 100'). The one I dove was formed as the result of a slump fracture. Although I did not encounter any remipede crustaceans, the habitat is definitely there, and I want to return.

Getting to Cuba "legally" is not easy for U.S. citizens. We need special permission from the State Department and an official invitation from the Cubans to do research. Once in the country you have to be part of a package tour because there are few restaurants or hotels. Although you can rent a car, gasoline is not always available. At this time it is not easy to go cave diving in Cuba. However, if the U.S. relaxes its visitation restrictions, the potential is great for Cuba becoming another cave-diving location like the Bahamas and Yucatán.

I found Cuba to be a fascinating place to visit. There are few cars, many bicycles, and no smog. Streets are clean; everything is recycled. I saw no homeless persons, no one begging. Now that the Soviet Union has collapsed, Cuba is struggling to make its economy more self-sufficient. Our economic embargo against them is making them more determined to succeed, although it is causing hardships for the people. They are trying to grow food for themselves, rather than solely for export. Although food seemed plentiful for tourists, certain items are rare. Cubans have had to change their diets during this austerity program.

There is free medical care and a doctor for every 100 persons (one of the highest number of doctors per capita in the world). Education is free from day-care through university, and the literacy rate in Cuba is one of the highest in the world (around 98%). All of this sounds great, but there is still a lack of democratic government and civil liberties. However, for what it's worth, their human-rights record is better than many of our allies and trading partners, such as Mexico and Brazil. Our government is trying its best to bring down Cuba through an economic blockade—you aren't supposed to trade with "the enemy." The Cuban people are warm, friendly, and open. They are proud of their country. Cavers and cave divers are welcome!!

The second Congress of Latin American and Caribbean Speleology will be held the first week in September. It will be in Vinales, in the western part of the island. This area is mountainous and has huge, beautifully decorated caves. Although there would be no cave diving, I highly recommend a vacation in Cuba to attend the Congress. I went to the first Congress in 1981, and it was well organized and attended.

At last count there were over 100 persons from 12 countries planning to attend this year. The price for seven nights, eight days is $266 US. This includes all hotels, transportation, and three meals a day. The flight from Miami to Havana is about $230 round trip. If you want more information please write or call:

Jill Yager
513-767-6373 (office)
513-278-6845 (home)
c/o Biology Dept.
Antioch College
Yellow Springs, OH 45387 ■

Be sure to read Bufford Pruitt, Jr.'s excellent 7-page article, "M2 Blue Cave," all about exciting new cave exploration along Florida's Withlacoochee River, in the April 1992 *NSS News*. Individual issues are $1.50 apiece and may be ordered by contacting the National Speleological Society, Inc., Cave Ave., Huntsville, AL 35810.

CDS INSTRUCTOR ROSTER

TRAINING CHAIRMAN: Lamar Hires, #191

Rt. 14, Box 162, Lake City, FL, 32055, 904-752-1087 (bus), 904-755-5913 (res)

***NOTE:** The designation **"Cave" Instructor** is a higher ranking which encompasses **"Cavern" Instructor**. The designation **"Sponsor"** indicates that the Instructor is qualified to instruct and sponsor new instructor aspirants. This list is current as of April 15, 1992.*

Averill, Harry, *#218, Cave Instructor & Sponsor, Pro Dive - Bahia Mar Resort, 801 Seabreeze, Ft. Lauderdale, FL, 33316, 305-761-3413 (bus)*
Bailey, Jr., Lloyd W., *#172, Cave Instructor & Sponsor, Lloyd Bailey's Scuba, 3500-F N.W. 97th Blvd., Gainesville, FL, 32605, 904-332-0738 (bus)*
Berman, Steven J., *#219, Cave Instr. & Spon., Ginnie Springs, 7300 N.E. Ginnie Springs Rd., High Springs, FL, 32643, 904-454-2202 (bus), 454-4811 (res)*
Booth, Brenton C., *#241, Cave Diver Instructor, 7300 N.E. Ginnie Springs Rd., High Springs, FL, 29527, 904-454-2202 (bus)*
Booth, Christina S., *#242, Cavern Instructor, Myrtle Beach Scuba, 3307 Longwood Ln., Conway, SC, 29527, 803-448-2832 (bus), 248-5403 (res)*
Bowden, James L., *#226, Cave Instructor & Sponsor, P. O. Box 49461, Austin, TX, 78765, 512-928-4727 (res)*
Bozanic, Jeffrey E., *#181, Cave Instructor & Sponsor, P. O. Box 3448, Huntington Beach, CA, 92605-3448, 714-846-5220 (bus)*
Brady, Kelly, *#216, Cave Instructor & Sponsor, Cartography Instructor, P. O. Box 4278, Gainesville, FL, 32613, 904-372-3819 (res)*
Bromenschenkel, Jay, *#222, Cave Instructor, P. O. Box 2445, High Springs, FL, 32643, 904-454-1639 (res)*
Broome, Gene, *#225, Cave Instructor & Sponsor, Branford Dive Center, P. O. Box 822, Branford, FL, 32008-0822, 904-935-1141 (bus), 904-935-0146 (res)*
Burge, John W., *#221, Cave Instructor & Sponsor, Surveyor Instructor, 11711 Chanticleer Ct., Pensacola, FL, 32507, 904-492-2232 (res)*
Butler, Daniel B., *#195, Cave Instructor & Sponsor, 61 Golden Shower Ln., Dededo, Guam, 96912*
Butt, Peter L., *#186, Cave Instructor & Sponsor, P. O. Box 1057, High Springs, FL, 32643, 904-454-3556 (bus), 904-497-4823 (res)*
Clesi, Dustin M., *#199, Cave Diver Instructor, DPV Pilot Instructor, P. O. Box 385, Branford, FL, 32208-0385, 904-935-2283 (bus)*
Coke, James G., *#193, Cave Instr. & Spon., Recovery, Surveyor, & DPV Pilot Instr., Akumal Dive Shop, Postal 1, Playa Del Carmen, Q. Roo, Mexico, 77710*
Conlin, Lorie Beth, *#246, Cavern Instructor, Postal 1, Playa Del Carmen, Q. Roo, Mexico, 77710*
Dabbs, Joseph R., *#145, Cave Instructor, 1815 Inspiration Ln., Huntsville, AL, 35801, 205-534-8668 (res)*
Dadestan, Kamran, *#250, Cavern Instructor, 189 Shoaf St., Tarentum, PA, 15084, 412-265-4187 (res)*
DeRouin, Terry, *#238, Cave Diver Instructor, Divers' Supply, 1196 Will Scarlet Dr., Macon, GA, 31210, 912-474-6790 (bus), 912-471-9730 (res)*
Doviat, Stush, *#211, Cavern Instructor, Scuba South, 2727 Banksville Rd., Pittsburgh, PA, 15216, 412-531-5577 (bus)*
Exley, Sheck, *#101, Cave Diver Instructor, Recovery & DPV Pilot Instructor, Cathedral Canyon, Rt. 8, Box 374, Live Oak, FL, 32060, 904-362-7589 (res)*
Eyring, Marc W., *#228, Cave Instructor & Sponsor, 8268 Burgos Ct., Orlando, FL, 32819, 407-352-5649 (bus & res)*
Forman, Steve,, *#106, Cave Instructor & Sponsor, 5400 Struthers Rd., Winter Haven, FL, 33884, 813-657-2822 (bus), 813-324-6052 (res)*
Fox, A. Dale, *#163, Cave Diver Instructor & Sponsor, 10700 Marlborough Rd., Fairfax, VA, 22116, 703-591-8053 (res)*
Gabriel, Jim, *#244, Cavern Instructor, P. O. Box 2257, High Springs, FL, 32643, 904-454-3556 (bus), 904-454-8571 (res)*
Gerrard, Steve, *#192, Cave Instructor, P. O. Box 20006, Tallahassee, FL, 32316-0006*
Gonzalez, Kevin, *#220, Cave Instructor, 1667 S. Hwy 17-92, Longwood, FL, 32750, 407-695-0991 (bus)*
Gum, Darel, *#251, Cavern Instructor, P. O. Box 3044, Merrifield, VA, 22116, 703-255-2984 (res)*
Harmon, Chip *#236, Cavern Instructor, 6401 N.W. 54th Way, Gainesville, FL, 32606, 904-378-1253 (res)*
Heinerth. Paul, *#165, Cave Diver Instructor, Scuba West, 8109 New York Ave., Hudson, FL, 34667, 813-863-6911 (bus)*
Hempstead, Jamie, *#194, Cave/Cavern Instructor & Sponsor, P. O. Box 6774, Columbus, GA, 31907, 404-323-9363 (res)*
Howard, Frank, *#234, Surveyor Instructor, 334 Portico Ct., Chesterfield, MO, 63017, 314-469-6133 (res)*
Iliffe, Dr. Thomas, *#156, Cave Diver Instr., Dept. of Marine Biology, Texas A & M University, Galveston, TX, 77553-1675, 409-740-4540 (bus), 763-8707 (res)*
Jay, John D., *#247, Cavern Instructor, Ginnie Springs Resort, 7300 N.E. Ginnie Springs Rd., High Springs, FL, 32643, 904-454-2202 (bus), 904-454-7604 (res)*
Jubb, Peter S., *#158, Cave Diver Instructor, 1901 W. Bay Dr., Largo, FL, 34640, 813-585-0938 (bus)*
Kolczynski, L. J., *#223, Cavern Instructor, 17 Sea Bass Ln., Ponte Vedra Beach, FL, 32082, 904-285-4022 (res)*
Kristovich, Ann, *#239, Cavern Instructor, P. O. Box 49163, Austin, TX, 78765, 512-480-8840 (res)*
Leonard, Mark D., *#169, Cavern/Cave Instructor & Sponsor, Recovery & DPV Pilot Instructor, Rt. 14, Box 136, Lake City, FL, 32055, 904-752-1087 (bus)*
Lins, Daniel F., *#254, Cavern Instructor, P. O. Box 221, Ocala, FL, 32678-0221, 904-629-9749 (res)*
Maufroy, Robert, *#152, Cave Diver Instructor, 11225 S.W St., Miami, FL, 33176, 305-253-9065 (res)*
Menke, Ronald, *#209, Cave/Cavern Instructor, Kissimmee Pro Dive Center, 406 E. Vine St., Kissimmee, FL, 34744, 407-933-5090 (bus)*
Miller, Marianne, *#252, Cavern Instructor, 15204 Omaha St., Hudson, FL, 34667, 813-869-2939 (res),*
Mims, R. Lynn, *#237, Cave Diver Instructor, The Dive Buddy, 334 Hoover Cir., Toney, AL, 35773, 205-852-6467 (bus)*
Murphey, Milledge, *#190, Cave Diver Instructor, 1815 N.W. 7th Pl., Gainesville, FL, 32603, 904-392-0584 (bus), 904-373-9234 (res)*
Nicholson, Henry, *#148, Cavern/Cave Instructor & Sponsor, Recovery Instructor, 5927 Hyde Park Cir., Jacksonville, FL, 32210, 904-786-6363 (res)*
Odom, Jr., Joseph L., *#261, Cave Instructor, 13002 Coy's Dr. S.E., Huntsville, AL, 35803, 205-882-0955 (res)*
Oestreich, Bill, *#253, Cavern Instructor, 8585 N. Pineneedle Tr., Crystal River, FL, 32629, 904-563-2763 (res)*
Page, E. Eugene, *#245, Cavern Instructor, 205 S.E. 16th Ave. #2-C, Gainesville, FL, 32601, 904-371-3990 (res)*
Power, Robert A., *#166, Cave Diver Instructor, P. O. Box HM 1643, Hamilton HMGZ, Bermuda,*
Purchase, Dale J., *#140, Cave Diver Instructor, 4181 S. Wayside, Saginaw, MI, 48603, 517-791-1707 (res)*
Questel, Kelvin, *#235, Cavern Instructor, 938 Madison Ave., Wooster, OH, 44691, 216-262-3483 (res)*
Rhea, David W., *#233, Cave Diver Instructor, Rhea's Diving Services, 313 Whitecrest Dr., Marysville, TN, 37801, 615-977-0360 (bus)*
Sirota, Philip, *#182, Cave Diver Instructor, Rt. 2, Box 211-U, Wellborn, FL, 32094, 904-963-2904 (res)*
Sugden, Jr., Herbert John, *#256, Cavern Instructor, 2150 Kurt Ct., Apopka, FL, 32703, 407-880-2584 (res)*
Sutton, Carl, *#243, Cavern Instructor, 3454 N.W. 49th Ave., Gainesville, FL, 32605, 904-373-0215 (res)*
Tasso, Eric P., *#255, Cave Instructor, 3535 N.W. 54th Ln., Gainesville, FL, 32605-0808, 904-378-5207*
Teixeira, Mark W., *#260, Cavern Instructor, 3501 S.W. 24th Ave. #65, Gainesville, FL, 32607, 904-377-2822 (bus), 904-378-6615 (res)*
Watson, Patton E., *#227, Cave Diver Instructor, P. O. Box 250174, Montgomery, AL, 36125, 205-265-2335 (bus), 205-264-3313 (res)*
Williams, Dennis, *#118, Cave Diver Instructor, 5385 Sand Lake Dr., Melbourn, FL, 32934, 407-724-4922 (bus)*

THE SAFETY LINE

by Wendy Short (NSS #30802), Safety Coordinator South

Trust me.

"Trust me, the check is in the mail."

"Trust me, the dog is housebroken."

"Trust me, I'll respect you in the morning."

"Trust me, my family will love you."

"Trust me, I'm from the government and I'm here to help you."

"Trust me, the computer says the part will fit."

When we hear these comments, we usually do not believe what we hear. But what about "Trust me on this dive, I know what I'm doing . . ."

Have you ever led, or followed, on a "trust-me" dive? A trust-me dive can happen in several ways. You may be following someone who has a greater knowledge of jumps in a system than you have, and are trusting that knowledge to get you out. Maybe you're being towed by a scooter for a deeper penetration that you've made before. You are trusting someone else's equipment and ability. While you were in training, you were trusting your instructor's knowledge. It is easy to rely on someone else to figure your air turnaround, decompression time, etc.

Trust-me dives are inherently dangerous. They almost always force someone of lesser skill and knowledge to dive beyond his abilities and limits, often unknowingly. Many times these trust-me dives have visual gaps or improper line protocol is used. If you are making a circuit or traverse, set it up properly yourself by swimming both sides, instead of taking someone else's word for it that you'll have enough air, or a certain line leads out, etc. Don't dive beyond your level of training or ability just because your buddy happens to be an "expert."

Don't push people of lesser experience to dive on your level. Work patiently with them and eventually they'll be on your level. Always dive with the thought that you need to be self-reliant and may have to lead the team out yourself. Don't trust someone else's judgment—use your own! Do you just believe you can trust the other person, or do you KNOW you can? There is a difference!

Trust-me dives can present an opportunity for a diver to become familiar with a cave and take advantage of a greater experience level available. But safety should always be the most important factor. Here are some questions to ask the leader before even considering doing the dive:

- How frequently has he done this dive?
- When was the last time this dive was made?
- Do you know anyone he has taken on this dive before?

Then check the information out.

- How well do you know the leader? Do you trust your life with him?
- The dive should be thoroughly explained and occur EXACTLY as planned.

If you hear any of the following answers, avoid making the dive:

- "I know where I'm going, I've done this before" or "I won't steer you wrong, I was there the other day" (and you are unable to verify this).
- "I was told about this by a friend of a friend who knows someone."
- "We're just going to check it out a little way. If it doesn't go where I think it does, we'll turn around. No problem."
- "Don't worry about the small O-ring leak. I'll keep my eye on it."
- "We don't need to run a line."

No one should think less of you if you decline to go on a trust-me dive. And others may even respect you for it in the morning. Trust me, I know what I'm talking about! ■

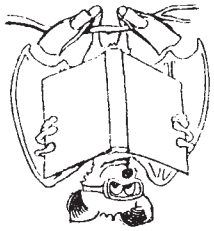
THIS IS NOT A PULL-AND-GLIDE CAVE!

by Curt Schuster (NSS #33998)

I read with excitement the story by Ed Stoner of a mountainous sinkhole in central Florida. As I read the first few lines I tried to picture this wondrous place. Then it struck me: I, too, have seen this sink. I, too, have marvelled at the beauty of the contrast between sparkling white cave wall and reddish brown mounds of untouched silt. I have extolled this beauty to many others. But I will respect Mr. Stoner's decision not to name this place.

The day I read Mr. Stoner's article I was waiting at my diving partner, Curtis Holley's, Army Surplus Store for a call from Woody Jasper. We had told him about this wonderfully light cave very close to us and he wanted to dive it.

The call came from Woody and we met at a local dive shop. After airing up we set off to dive. It was late in the evening (7:30 pm) when we finally entered the sink pool. The cool water felt great after my billy-goat impersonation. We descended the sink to a large log and tied off to the permanent line. I noted the new stop sign. Very nice. I hope it stays



BOOKS

NSS Cavern Diving Manual

by John Zumrick, M.D., Joe Prosser & H. V. Grey

The standard reference work on cavern diving. Covers most of the underlying principles behind safe cave diving as well. NSS-CDS, 1988. 5½" x 8½", 121 pages, softcover.

Item Number 40100
Non-Member $15.00
Member $13.00

Basic Cave Diving - a Blueprint for Survival

by Sheck Exley

Updated fifth edition of a classic. Extremely clear presentation of the basic rules of cave diving derived from accident analysis. NSS-CDS, 1986. 5½" x 8½", 46 pages, softcover.

Item Number 40200
Non-Member $7.00
Member $6.00

NSS Student Cave Diver Workbook

by Mark Leonard and Lamar Hires

Student workbook for Full Cave Diver training. Contains Cavern, Intro to Cave and Full Cave course outlines and tests — plus numerous in-depth articles, appendices and maps of the most popular systems. Even if you are already a certified Full Cave Diver, this book is worth the modest price for the articles and maps alone. Comes with protractor for student mapping exercises. NSS-CDS, 1989. 8½" x 11", 82 pages, softcover, spiral bound.

Item Number 40300
Non-Member $15.00
Member $13.00

Hand Signals for Diving

by Claudette Finley, Jamie Stone and Carol Vilece

The original book on underwater communications. Still valuable today. NACD, 1977. 5½" x 8½", 38 pages, softcover.

Item Number 40400
Non-Member $8.00
Member $7.00

To be Released at the
"SOON" — WE HOPE
The Cave Diving Section's New

NSS CAVE DIVING MANUAL - AN OVERVIEW

Basic Underwater Cave Surveying

by John Burge

Everything you could possibly want to know about surveying underwater caves. Sets the standard for the survey course and all cave-survey procedures. NSS-CDS, 1987. 6" x 9", 134 pages, softcover.

Item Number 40500
Non-Member $15.00
Member $13.00

Recovery Diver Operations Manual

by Capt. Henry Nicholson and Joe Prosser

Standard text and reference for the Rescue/ Recovery course.

NSS-CDS, 1988. 8½" x 11", 16 pages, softcover.

Item Number 40600
Non-Member $12.00
Member $10.00

Deep Into Blue Holes

by Rob Palmer

A profusely illustrated (many photos in color) account of the British expedition to Bahamian blue holes by one of the world's leading cave divers. Unwin-Hyman, Ltd., 1989. 7" x 10", 164 pages, hardcover.

Item Number 40700
Non-Member $45.00
Member $40.00

The Cave Diving Group Manual

Edited by F. B. Balcombe, J. N. Cordingley, R. J. Palmer, R. A. Stevenson, and B. Bedford

The official British manual on cave diving, covering all aspects of the British tradition, from history, equipment, and techniques, to photography, sump-diving logistics, and mixed-gas use. Lots of diagrams and photos (many in color). Castle Cary Press, 1990. 6" x 8½", 268 pages, softcover.

Item Number 40800
Non-Member $45.00
Member $40.00

Cave Diving Communications

by Joe Prosser and H. V. Grey

Comprehensive, illustrated text covering all forms of communications in underwater caves — light signals, hand signals, sound signals, touch contact and slates, with a special chapter on the use of lines and reels. NSS-CDS, 1990. 5½" x 8½", 68 pages, softcover.

Item Number 40900
Non-Member $8.00
Member $7.00

NATIONAL SPELEOLOGICAL SOCIETY CONSERVATION POLICY

The National Speleological Society believes that caves have unique scientific and recreational value; that these values are endangered by both carelessness and intentional vandalism; that these values, once gone, cannot be recovered; and that the responsibility for protecting caves must be assumed by those who study and enjoy them.

Accordingly, the intention of the Society is to work for the preservation of caves with a realistic policy supported by effective programs for: the encouragement of self-discipline among cavers; education and research concerning the causes and prevention of cave damage; and special projects, including cooperation with government and other groups similarly dedicated to the conservation of natural areas.

The NSS believes that all contents of a cave — formations, life and loose deposits — are significant for its enjoyment and interpretation. Therefore, caving parties should leave the cave as they find it. They should provide means for the removal of waste; limit marking to a few, small, removable signs as are needed for surveys; and, especially, exercise extreme care not to break or soil formations, disturb the life forms or unnecessarily increase the number of paths through an area.

Scientific collection is professional, selective and minimal. The collecting of mineral or biological material for display purposes, including previously broken or dead specimens, is never justified, as it encourages others to collect and destroys the interest of the cave.

The NSS encourages projects such as establishing cave preserves; placing entrance gates where appropriate; opposing the sale of speleothems; supporting effective protective measures; cleaning and restoring over-used caves; cooperating with private cave owners by providing knowledge about their caves and assisting them in protecting their cave and property from damage during cave visits; and encouraging commercial cave owners to make use of their property to aid the public in understanding caves and the importance of their conservation. Where there is reason to believe that publication of cave locations will lead to vandalism before adequate protection can be established, the NSS will oppose such publication.

It is the duty of every NSS member to take personal responsibility for spreading consciousness of the cave-conservation problem to each potential user of caves. Without this, the beauty and value of our caves will no longer remain with us.

MAPS

CAVE	Florida County	Blueline	Laminated
Blue Hole (Jug Hole)	Columbia	70001	71001
Blue Spring (Madison Blue)	Madison	70002	71002
Bonnet Spring	Suwannee	70003	71003
Cow Spring	Suwannee	70004	71004
Green Sink	Lafayette	70005	71005
Little River	Suwannee	70006	71006
Peacock Springs	Suwannee	70007	71007
Rock Bluff	Suwannee	70008	71008
Twin Springs	Jackson	70009	71009
Telford Spring (lower section)	Suwannee	70010	71010
CAVERN			
Ginnie Spring	Gilchrist	75001	76001
Morrison Spring	Walton	75002	76002

MAP PRICES	Blueline	Laminated
Non-member - any quantity	$8.00	$10.00
Member - single map order	7.00	9.00
Member - 2-3 maps per order	6.00	8.00
Member - 4-5 maps per order	5.50	7.50
Member - 6 or more maps per order	5.00	7.00

MAP SIZES

NSS-CDS maps are available in two formats: poster-size bluelines and notebook-size laminates. Having NSS-CDS maps of Florida's most popular cave and cavern systems enhances the planning, safety, and enjoyments of your dives.

CERTIFICATION REQUIREMENTS

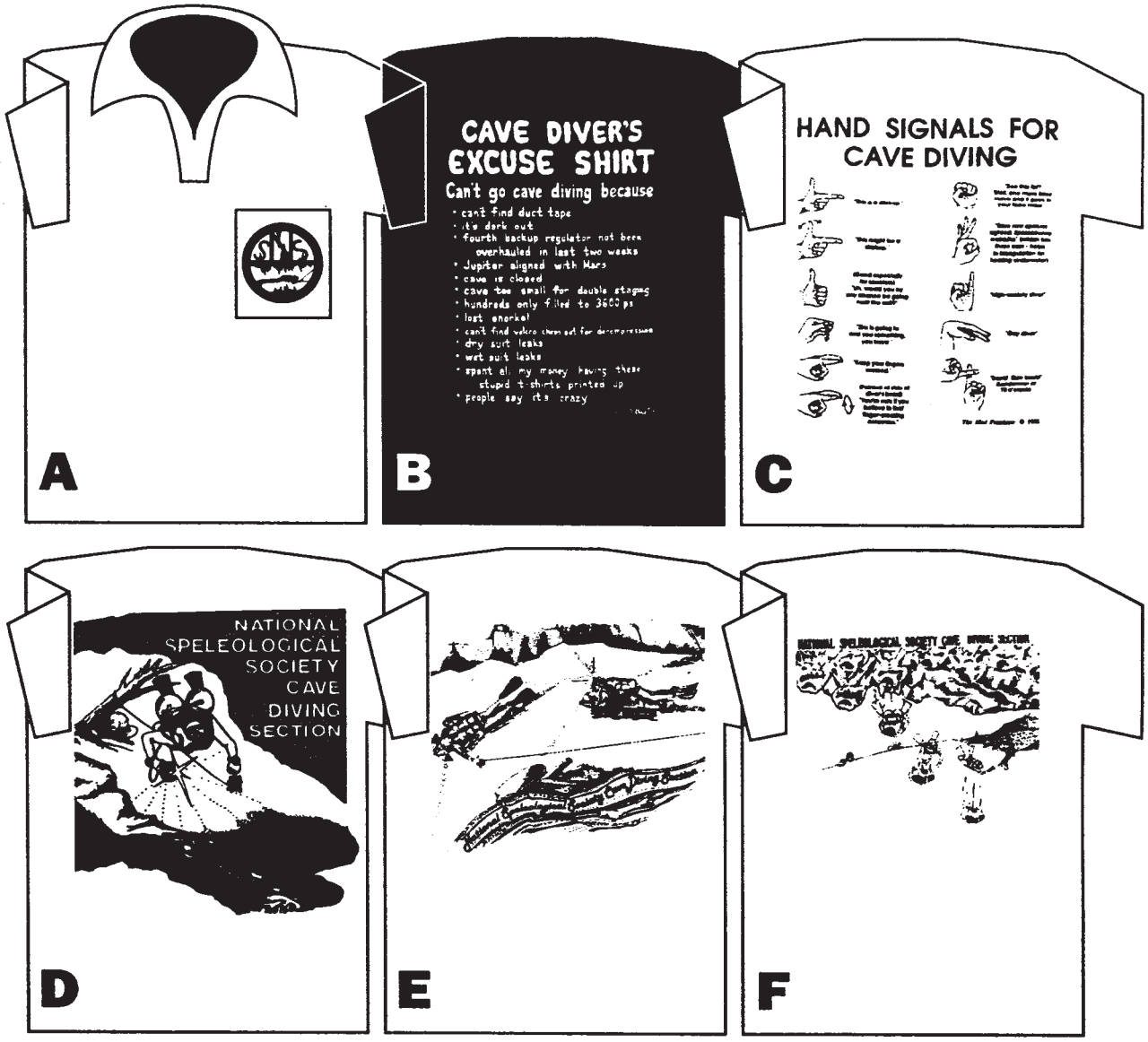
The maps are available to all certified cave divers (certified cavern divers may order either of the two cavern maps). Just **enclose a photocopy of your C-card** with the convenient order form you'll find on the back page.

NOT FOR RESALE

The maps may not be offered for resale by dive stores, instructors or other individuals or organizations.

DECALS • PATCHES • STICKERS • MUGS • CERTIFICATES

Description	Item No.	Non-Member	Member
NSS-CDS 2-color adhesive Decal	50001	$ 3.00	$ 2.50
NSS-CDS 4-color cloth Patch	50002	4.50	4.00
"I Support Safe Cave Diving" Bumper Sticker	50003	3.00	2.50
Wall-size Training Certificates *(attach a copy of your CDS certification card for level of training requested)*	50004	12.00	10.00



T-SHIRTS • LONG-SLEEVE T'S • COLLARED SPORT SHIRTS

	Description	Item No.	Non-Member	Member
A	Collared Sport Shirt (White)	60110	$20.00	$16.00
	Collared Sport Shirt (Blue)	60210	20.00	16.00
B	Cave Diver's Excuse T-Shirt (Short Sleeve)	60310	13.00	11.00
C	Hand Signals T-Shirt (Short Sleeve)	60410	13.00	11.00
D	Single Diver T-Shirt (Short Sleeve)	60510	15.00	12.00
	Single Diver T-Shirt (Long Sleeve)	60520	17.00	14.00
E	Two Divers on Scooters T-Shirt (Short Sleeve)	60610	20.00	16.00
	Two Divers on Scooters T-Shirt (Long Sleeve)	60620	20.00	16.00
F	"Where do Cave Divers Come From?" T-Shirt (Short Sleeve)	60710	20.00	16.00
	"Where do Cave Divers Come From?" T-Shirt (Long Sleeve)	60720	20.00	16.00

(Please list several colors in order of preference — if we have them in stock we will try to accommodate your color preference.)

NSS Cave Diving Section

Membership Application & Publications Order Form

— Send completed forms to —

P.O. Box 950 • Branford, FL 32008-0950

Date:_____ *Please print clearly — Include check or money order, payable in U.S. funds to NSS-CDS*

Name:_____ Phone: _____

Address:_____

_____

City:_____ State:_____ Zip: _____

(Please use 9-digit Zip if known)

NSS # (if applicable):_____ Expiration Date:_____

NSS number and expiration date or membership application must be included to qualify for member discounts.

Item Number	Size	Description (please print clearly)	Qty	Cost (each)	Total

	SUBTOTAL	
Florida residents add 6% sales tax or include copy of resale certificate.	**TAX**	
Foreign orders add 10%	**SHIPPING**	
NSS MEMBERSHIP (annual) — includes 12 issues of the NSS caving magazine, *NSS News*; 1 issue of the *NSS Technical Bulletin*; NSS voting privileges; and publications and convention discounts. Read the NSS Conversation Policy on page 2. Open to any interested individual. "I have read the NSS Conservation Policy, and in support thereof, I hereby apply for membership." ***SIGNATURE:***	**$25.00**	
NSS FAMILY MEMBERSHIP (annual) — includes voting privileges, publications and convention discounts. Read the NSS Conversation Policy on page 2. Open to any interested family member of an NSS member. "I have read the NSS Conservation Policy, and in support thereof, I hereby apply for membership." ***SIGNATURE:*** ***Name, NSS #, & kinship of NSS Member:***	**5.00**	
CAVE DIVING SECTION of the NSS MEMBERSHIP (annual) — **must be an NSS member** — includes 6 issues of the CDS magazine, *Underwater Speleology*; voting privileges; discounts on publications and safety/information workshops. Open to any interested individual.	**5.00**	
CAVE DIVING SECTION of the NSS FAMILY MEMBERSHIP (annual) — **must be an NSS member (family membership or better)** — includes voting privileges, discounts on publications and safety/information workshops. Open to any NSS member who is family of a full CDS member. ***Name, NSS #, & kinship of CDS Member:***	**1.00**	
MAGAZINE SUBSCRIPTION ONLY (annual) — 6 issues of *Underwater Speleology*	**15.00**	
FOREIGN POSTAGE SURCHARGE for CDS Membership or Newsletter Subscription outside of U.S.	**10.00**	
	TOTAL	

NON U.S. CHECKS - Include an additional $10 bank processing fee for checks or money orders drawn on non-U.S. banks. Such orders will also be delayed until the check or money order clears.

RUBBER CHECKS - Checks returned for insufficient funds must be covered promptly. In addition, you must reimburse the Section for any bank ISF check charges it incurs (currently US $20). Two or more ISF checks from an individual or organization will result in our requiring cash or guaranteed funds on all future orders.

MAP POLICY - Please refer to the map order page for NSS-CDS policy regarding cave map orders.

DELIVERY TIME - Please allow 6-8 weeks to process orders.

SHIPPING - Prices include shipping in U.S. via 4th-class mail.

longer than the one placed there by the NACD. It was stolen after about two weeks.

At this point I traded places with Woody so he could have the best view going in. Into the downstream side we glided, passing the entrance restriction with barely a puff. We got ourselves oriented on the line and proceeded onward.

I was struck—almost amazed—at the changes I saw in the first room. There was a bare sand spot on the floor where there had once been a big pile of silt. The only thing that could have done this is the passage of divers. Onward we swam down Peacock-size passage. Everywhere there were signs of divers. I am not talking about the small bits that mark the floor which are dislodged by our bubbles. That's unavoidable. But I saw a broken fossil or piece of the wall lying on the floor. This is not a pull-and-glide cave!!! This is one of the most fragile caves I have ever seen.

The plan for the dive was for Woody to go to the end of the line, and Curtis and I to wait until our thirds. If he returned prior to our thirds we would explore some other passage. I reached thirds and made my exit.

I returned to the cavern to begin a long decompression. It had been a long dive, so there I sat, alone with my thoughts, thinking how this little cave was changing. Wondering how the upstream side was doing since my last visit.

I opened my eyes when lights were around me. I assumed they were Woody and Curtis returning, but to my utter amazement, they turned out to be two other divers heading down. I was shocked. It was 9:45 pm on a Thursday. Who would be diving here now? But I resigned myself to the fact that this wasn't the little-known cave that I first dove a year ago. It had been found. Found by many. Some are very good divers; I know one who is remapping the cave. But there are a great many poor divers entering this sink. Mr. Stoner spoke of some. I've seen others and it frightens me.

This is a very technical dive. Technique must be extremely good because visibility can be lost very quickly. It's not a forgiving place and lives have been lost. There is no safe place in it for the untrained to be. The cavern has many metal pipes and wires to entangle the careless diver, and glass and cans have been thrown into the water by uncaring surface dwellers over the years.

It is not a pretty open-water or cavern dive, but it is one of the prettiest cave dives I've ever seen. Given the current status of all other sites around Orlando, it's the only dive around. The point of all of this is not to point fingers at open-water divers, but to bring a level of awareness to the many people from the Orlando area diving here that **we must protect this cave from damage. And protect the area around it.**

We can go about our diving in relative anonymity—compared to the motorcycles that are also using the land. But if a diver is hurt it will be only a matter of time before the cave is lost again. I don't want to be the cause of it. I like taking much more experienced divers here and hearing the same exclamation after the dive: "That's a pretty cave!!!" Right, Woody, Bill, Eric? It would be a shame for the beauty to be spoiled. I am sure the people who have been there know the cave of I am speaking of, but this could be *any* cave we dive, so let's all work together.

[Editor's Note: Curt Schuster is the Historian for the new NSS dry-caving grotto, the Dead Cavers Society, in the Orlando/Maitland, Florida area.] ■

HOW TO BE YOUR BUDDY'S BEST FRIEND! The DAN Oxygen First-Aid Course

by Bob Maufroy (NSS #21506)

Since the inception of the sport, cave divers have been at the forefront of diving safety. Many of the numerous safety items used by sport divers today originated in a cave diver's imagination. Likewise, Divers Alert Network (DAN) from its inception over a decade ago, has been an advocate for all aspects of diving safety. An area of special importance in the management of diving emergencies is providing emergency-oxygen first aid to victims of a variety of diving-related maladies, including decompression sickness, arterial gas embolism, and near drowning.

DAN and an ever-increasing number of knowledgeable diving physicians agree that emergency oxygen is the single most effective first-aid measure for DCS, AGE and near drowning. Depending on the specific malady encountered, the mechanism of relief is different. However, the 1986 American Medical Association CPR Guidelines state that oxygen should be provided to anyone suspected of suffering conditions resulting in hypoxia.

As described in the most recent edition of the *DAN Underwater Accident Manual,* oxygen is important in treating even the mildest symptoms. Symptoms may completely resolve through quick and efficient use of surface emergency oxygen for apparently injured divers. The likelihood for permanent residual damage may be minimized and the injured diver may recover more rapidly. This procedure is intended to minimize or eliminate permanent disabilities, and is not a substitute for seeking evaluation and treatment at the nearest available medical facility.

All scuba instructional associations address the benefits of on-site emergency-oxygen administration in their text books and instructional programs. Support for the use of oxygen has been positive throughout the diving community, but until recently, access to instruction in the use of oxygen equipment for the general diving public has been seriously lacking. As

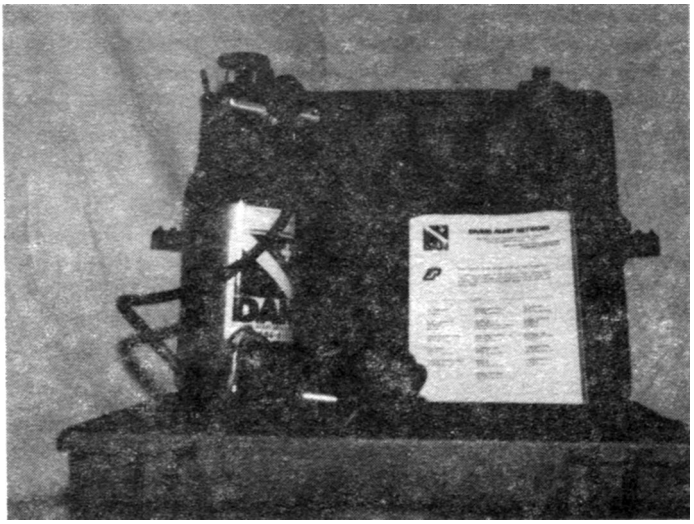
part of its mission to promote diving safety, DAN has initiated a major effort to provide training for the general diving public in the administration of emergency oxygen in the field and has developed an emergency oxygen unit which contains equipment allowing qualified personnel to provide emergency-oxygen first aid to dive-accident victims.

The entry-level DAN course, "Oxygen First Aid in Dive Accidents," includes both lecture and practical training experiences. The lecture portion of the course addresses the recognition and first aid for major diving emergencies (DCS, AGE and near-drowning) and the benefits of oxygen administration as supported by the current medical literature and the most recent DAN diving-accident statistics. Participants learn the benefits of and cautions for using emergency oxygen at the scene of a diving accident, including legal considerations. There currently exists no contraindications in the medical literature for providing oxygen to dive-accident victims.

The second portion of the course involves extensive hands-on experience with all component parts of the DAN Oxygen Unit. Participants learn how to administer oxygen into both breathing and non-breathing victims. Practice sessions involve the use of live "buddies" and manikins in a variety of simulated scenarios. The course concludes with a written examination. All successful participants receive a DAN Oxygen First Aid Provider wallet card and recognition materials.

The program has met with immediate acceptance and support throughout the diving community. Since the introduction of this course at DEMA '91 in Las Vegas, over 700 DAN Oxygen First Aid Providers have been trained. The training is extremely valuable for divers of all certification and experience levels. A scuba instructor qualified as a DAN Oxygen First Aid Provider at DEMA was recently able to apply his skills in an actual dive emergency and the reports indicate that the results were dramatically positive.

Cave divers have historically been interested in all technical aspects of diving and diving safety. Cave divers and all other divers interested in taking advantage of this opportunity to provide a valuable service to the diving community are invited to contact the author, Bob Maufroy, an NSS Cave Diving Instructor, at Divers Training Institute, 11225 S.W. 128th St., Miami, Florida, at 305-253-9065. They may very well turn out to be *their buddies' best friend!* ■



The Divers Alert Network Field Oxygen Unit

FIELD NEUROLOGICAL ASSESSMENT AND EMERGENCY OXYGEN

by Robert R. Clemons (NSS #33105)

At the 1991 Spring Workshop I offered a program of two related courses, "Field Neurological Assessment" and "Emergency Oxygen Administration." Few knew what these were and, by the time I got a chance to explain during the Saturday session, it was so late that most attendees had left. Those who heard my presentation reacted favorably, but most already had other commitments, and didn't make the course. Several members asked if I would offer it again at the Winter 1991 Workshop, and I said I would. I submitted materials for the Winter Workshop, but my class was not included among the offerings.

A phone conversation with Chairman Frank Howard cleared up some misconnects, but again demonstrated a lack of understanding about these courses and their content. Frank invited me to offer the program at the Spring 1992 workshop, and asked that I write a piece for *Underwater Speleo*, explaining what it is all about. This is that article.

Cave divers typically dive deeper and stay down longer than open-water sport divers. Despite intensive training and constant emphasis on safe diving practices, barotrauma—embolism, emphysema, pneumothorax or DCS—remains possible.

The tragedy at Eagle's Nest, reported in last Winter's *NACD Journal*, give a graphic example: a two-man video team was filming researchers on DPV's. It was a deep dive, but relatively short. The divers were well qualified and experienced, and surface tenders were in place. After the end of filming, the camera man turned to the light man—who had been performing perfectly—to signal to surface, and saw him hanging unconscious in the water.

The camera man hauled his buddy to the surface—a fast, rough trip he knew would leave him bent—and passed the light man to the surface tenders. Neither of them knew CPR nor was oxygen available. The tenders got the property manager, who got two sheriff's deputies, who got paramedics. The paramedics knew CPR and had equipment, but got there

too late to save the light man (they did treat the camera man, who had severe DCS). No oxygen, no training, one dead diver, one bent hero.

We must all know how to respond to diving emergencies. Almost all of us carry first-aid kits and emergency oxygen, but in many cases training is incomplete or out of date. Field Neurological Assessment is a Lifeguard Systems program that teaches how to recognize problems, how to diagnose those problems, and how to determine the correct treatment, including ***when and why*** to administer O_2.. Emergency Oxygen is taught to the standards of both Lifeguard Systems and Divers Alert Network, and teaches how to select, assemble and use emergency oxygen equipment, and *how* to administer O_2. Both courses emphasize hands-on training and drills.

Lifeguard Systems (LGS) is an innovator in state-of-the-art diving rescue equipment and techniques. Butch Hendrick and his associates are famous for programs taught in eight countries. Divers Alert Network (DAN), an activity of the Duke University Medial Center, is world renowned for its contributions to safe diving and diving medicine. DAN has taken great pains to make optimal oxygen systems available to scuba divers, and to teach the use of such systems.

For years the diving industry has told us to administer oxygen; LGS and DAN teach when, why, and how. The two programs are complementary, but need not be taken together. There are no mandatory prerequisites for either, although CPR and First Aid are highly recommended. In addition to LGS and DAN certifications, the programs can provide Continuing Education and Professional Development credit for NAUI and/or the YMCA, plus PADI recognition. I teach these programs for LGS and DAN in addition to being a CPR Instructor-Trainer for the American Heart Association and providing a full range of scuba programs.

These courses are logical and necessary extensions of CPR and First Aid for divers. They can help save lives and reduce lasting injury. There is also a significant impact on the ability of instructors to aid injured students, and on the liability incurred by those instructors.

For more information contact the author Bob Clemons, an NSS Cave Diving Instructor, at P.O. Box 475715, Garland, TX 75047, 214-205-7344 (bus), 214-240-2774 (res). ■

LESSONS LEARNED FROM THE CHAMBER

by James F. Asimenios (NSS #33624)

My dive buddy, Bill, and myself, both being "full-cave" certified, were looking forward to another Florida trip for some diving. Unfortunately, the drive was long, about 14 hours. We left Maryland about 7:00 pm and on the way down we gulped a couple of "brewskies" to relax, and took turns driving while the other (tried) to sleep.

At this point, I had had only about 5 hours sleep in the past 24 hours. My nose was starting to run, indicating a cold was on its way. It was early morning when we arrived outside of Jacksonville. We stopped at a convenience store and picked up some cold tablets, then headed for the nearest restaurant for breakfast and coffee.

By 10:30 a.m. we were at Orange. As usual, we went and looked at the dive site and evaluated the situation. We then planned our dive: to go down to the entrance to the lower-lower room, enter, go down, look around (max depth planned was 160'), and come back up. We wrote down on our slates the dive profile, along with decompression stops, hang time, etc.

We suited up and entered the water. After doing our safety drill and pre-dive check, I noticed that in my rush, I had tied my swim trunks too tight! Thinking to myself that the dive would be a short one, I decided not to worry about it.

After looking around the lower-lower room, Bill signaled that we were to head up. We turned around and started heading up. As I approached the exit, I noticed two legs dangling at the exit. I grabbed an ankle. Nothing! I did it again. Still nothing! My God, I thought to myself, there is a dead diver blocking the way out! My heart started to race and thoughts of what to do ran through my mind. Then I saw his fin move. I again tried to signal the diver that we were trying to get out by grabbing his fin and shaking it. But he still stayed right there blocking our exit. So, in desperation, I grabbed a hold of the cave wall and rammed myself into him, pushing him out of the way.

As I exited through the restriction, I turned to check on my dive buddy, Bill. He was winding in his jump reel, trying to get around this diver, who again had positioned himself at the exit! I was furious and I could feel my heart pumping! As Bill finally got around this diver and exited, I pointed at the diver, then pointed at my rear end, then made a circle with my hands indicating my feelings towards him.

We ascended to where we had left our drop weights (35-40'). I picked mine up and thought I had clipped it to my weight belt. Nope! I had dropped it. We looked for it for about 4-5 minutes, but to no avail. Bill signaled that we should forget about it and head for our hang, which I agreed to as the pain around my waist was getting worse and worse due to the tight trunks.

We did our 19-minute hang as planned and headed to the surface. As I floated there for a couple of minutes, all I could think of was getting those damned trunks off! Upon surfacing, my left leg started tingling. Now what?! I thought to myself. After a couple more steps, the leg went completely numb. Bill looked at me and asked if I was all right. I replied with "I think I'm bent!"

If it had not been for the quick actions of Bill, the Park Ranger, and those wonderful hyperbaric techs at Shands Hospital in Gainesville, this would have been written in a wheelchair!!

Why did I get bent? Being tired was one reason. The tight swim trunks cutting off circulation was another. A third reason was the diver that blocked our exit and by doing so, put us onto a longer decompression schedule (which we did not know until later). Our dive time was calculated for 20 minutes, but we turned sooner. Due to the blocked exit our dive was 21 minutes (1 minutes longer than planned).

Each and every factor taken into play made Boyle and Dalton sit up in their graves. Needless to say, I came out lucky.

If you are tired, don't dive! Always plan for a longer dive! And if nothing is going right, call the dive! Diving is a fun sport, but it can also be a deadly one! ■

HYDROGEOLOGICAL STUDY, SALLY WARD SPRING, WAKULLA COUNTY, FLORIDA

by William L. Wilson (NSS #12231 Fellow) and Victor P. Sparks

INTRODUCTION

On Oct. 19-20 and 24-25, 1991, a series of eight science dives were conducted at Sally Ward Spring, located at Florida's Edward Ball—Wakulla Springs State Park. The purpose of these dives was to collect hydrologic and geologic information in preparation for a proposed dye trace. The objective of the dye trace was to establish a hydrologic connection between the deep Downstream Tunnel of Sally Ward Cave and Wakulla Spring, which is located approximately 3,500 feet to the southeast.

Deep Breathing Systems of Sevierville, Tennessee, and Deep Springs Exploration Group of Nashville, Tennessee, combined both personnel and resources to perform these dives. The project was conducted for the Florida Department of Natural Resources (DNR) and was authorized by Mr. Jon Dodrill, District 2 Administration, Division of Recreation and Parks, DNR.

Diving at Wakulla Spring and Sally Ward Spring is allowed by permit for research purposes only in order to protect the unique and fragile resources of these natural features. Please respect the management policies of the DNR. Unpermitted diving will hurt the credibility of the entire diving community.

The following article documents the gas mixtures and decompression models used for diving during the project, describes the methods utilized to collect information, and presents the results of the investigation. This article is a summary of a comprehensive report submitted to DNR on Nov. 27, 1991.

Dive Procedures and Mission Profiles

Missions conducted during the Oct., 1991 series of dives utilized standard procedures regarding air management, line protocol, partial replacement of nitrogen with helium to reduce the affects of nitrogen narcosis at depth, and decompression using oxygen-enriched air (OEA or nitrox) and pure oxygen to enhance outgassing.

A total of eight deep-diving missions were conducted as part of the hydrogeological investigation of Sally Ward Spring. Jim King, President of Deep Breathing Systems, participated on one dive with members of the Woodville Karst Plain Project in Wakulla Spring on Oct. 20, 1991. The results of that dive were reported under separate cover by the Woodville Karst Plain Project.

Each deep-diving mission consisted of a team of two divers. Two missions were conducted per day. The pairs of deep-diving teams were assisted by one team of two support divers, who were responsible for staging tanks (placing bottles of gas where needed by the deep divers) and retrieving them after the dives.

A typical deep dive involved exposure to depths of 240' to 296' for bottom times of 36 to 48 minutes. Decompression times ranged from 168 to 252 minutes (2:48-4:12 hrs.). The total time in water ranged from 204 to 300 minutes (3:24-5:00 hrs.). Water temperature was 68°F, and drysuits were required to minimize the effects of hypothermia.

The participating divers and scientists were:

(Deep Breathing Systems) Chris Brown, Larry Green, Jim King, Richard Nicolini, Jim Schlesinger, Gordon Watkins, and Bill Wilson; (Deep Springs Exploration Group) Terrence Fails, Wayne Gamble, and Victor Sparks.

BREATHING MIXTURES

Three specific gas mixtures were utilized, along with compressed air, during diving operations. Missions below 130' of depth utilized a bottom gas composed of 15% oxygen/50% helium/35% nitrogen (trimix 15/50). Trimix 15/50 was chosen as the bottom gas in order to minimize the risk of an oxygen-toxicity reaction and the narcotic effects of nitrogen at the anticipated mission depths. The breathing gases used during decompression consisted of 51% oxygen/49% nitrogen (Nitrox 51) at stop depths between 70-30' and 100% oxygen at 20-10' of depth.

The bottom gas mixture of trimix 15/50 exposed the divers to a maximum partial pressure of oxygen (ppO_2) equal to 1.32 atmospheres (ATA) at a depth of 240', which was the nominal operating depth for the dives. Studies conducted by the United States Navy (USN) have indicated that a diver, at work, can breath a gas mixture with less than 1.4 ATA ppO_2 for an unlimited amount of time, with negligible risk of an oxygen-toxicity reaction. The equivalent air depth (EAD) for trimix 15/50 at a depth of 240' is approximately 90'. This means that a diver breathing this mixture at 240' experiences the same degree of nitrogen narcosis experienced by a diver breathing air at 90' of depth. The trimix 15/50 was very ef-

fective at reducing nitrogen narcosis and allowed divers to function without significant impairment from narcosis.

Decompression stops utilizing Nitrox 51 exposed the divers to ppO_2 ranging from a maximum of 1.59 ATA at 70' of depth to a minimum of 0.95 ATA at 30' of depth. USN studies indicate that a working diver can be exposed to 1.6 ATA ppO_2 for 30 minutes without significant risk of an oxygen-toxicity reaction. During decompression utilizing Nitrox 51, divers at rest were exposed to 1.59 ATA ppO_2 for 4 minutes or less.

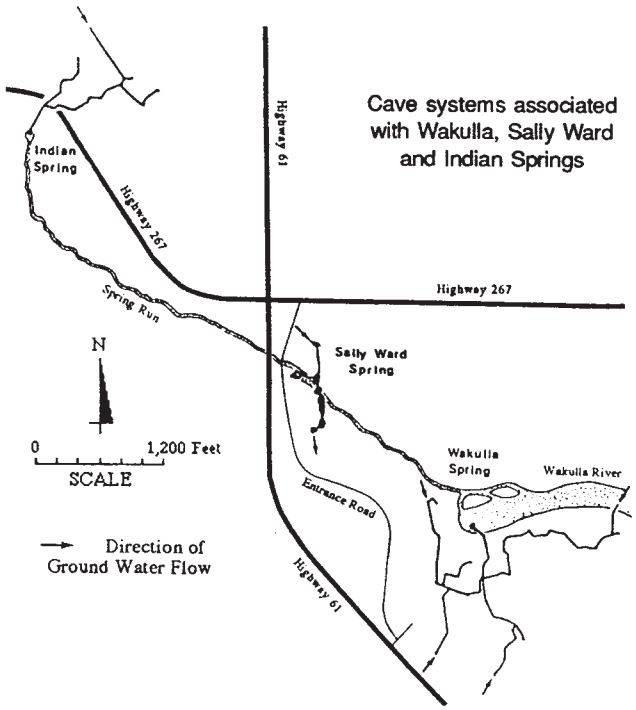
Decompression on oxygen was used at a depth of 20'. It was common practice for divers decompressing on O_2 to spend the combined stop times of the 10' and 20' schedules at 20'. This procedure eliminated the relatively extreme pressure gradient between 20' and 10' and minimized risk of decompression sickness by allowing for a more controlled release of inert gases.

To provide a higher level of safety for divers during these missions, an emergency trimix 15/50 depot was placed along the downstream permanent line on top of the Cube Room breakdown pile at 170' of depth. The emergency gas depot consisted of three 80cf tanks with attached regulators and pressure gauges. An additional single 80cf tank and regulator containing trimix 15/50 was present at the Balcony. These depots were placed during the first dive into the system and removed during the final dive.

DECOMPRESSION SCHEDULES

The decompression schedules utilized during diving activities at Sally Ward Spring were calculated using tissue algorithms developed by Dr. R. W. Hamilton of Hamilton Research Ltd. These decompression schedules were prepared by Jim King of Deep Breathing Systems. King is trained and licensed by Hamilton Research Ltd. in the use of these algorithms for preparation of decompression schedules.

Decompression following missions into Sally Ward cave system was performed using three different breathing mixtures and gases. Decompression stops below 70' of depth utilized the bottom gas, Trimix 15/50. Between 70' and 30' of depth, Nitrox 51 was used with 100% O_2 being breathed from 20' to the surface. Upon reaching the surface, the diver would take an additional surface stop of 5 to 10 minutes duration, prior to exiting the water.



RESULTS OF THE STUDY

HYDROLOGY

On Oct. 20, 1991, Victor Sparks, Terrence Fails, Gordon Watkins and Larry Green measured the cross-section of the first downstream restriction to establish a velocity measurement station for estimating discharge through the deep Downstream Tunnel. The passage, at a depth of 240', is approximately 7.8' high and 30' wide, and is approximately elliptical in cross-section. The cross-sectional area is 177 ft^2.

On Oct. 25, 1991, Victor Sparks and Terrence Fails measured the water velocity at the first downstream restriction by the particle-drift method, and found the flow to be 0.08 ft/s (1.3 mi/day). This indicates a discharge of 14 ft^3/s through the Downstream Tunnel (177 ft^2 x 0.08 ft/s). The average dimensions of the Downstream Tunnel are estimated to be approximately 30' high and 70' wide, which, for a discharge of 14 ft^3/s, indicates an average velocity, through this section of the cave, of approximately 0.0067 ft/s (0.11 mi/day). The average velocity and discharge in the downstream tunnel were much lower than expected based on descriptions by earlier divers.

On Oct. 26, 1991, Victor Sparks and Wayne Gamble measured the cross-section of the Upstream Tunnel at its junction with the Cube Room. The passage, at a depth of 275', is 16.9' high and 13.5' wide. It is approximately elliptical in cross-section, but the bottom is rather more rectangular. The cross-sectional area is approximately 204 ft^2.

On Oct. 26, 1991, Victor Sparks and Wayne Gamble measured the cross-section of the shallow passage, approximately 175' inside Sally Ward Spring, at a depth of 40'. The passage was 6.75' wide and 9.5' high, and was approximately elliptical in cross-section. The cross-sectional area at the measurement station was 57 ft^2. The water velocity, measured by the particle-drift method, was 0.2 ft/s, so the discharge through the passage was 11 ft^3/s.

It seems reasonable to infer that at least 25 ft^3/s of water issues from the Upstream Tunnel; 11 ft^3/s (44%) discharges through the shallow tunnel leading to Sally Ward Spring. The remaining 14 ft^3/s (56%) passes over the breakdown mountain and flows generally south through the Downstream Tunnel.

EXPLORATION

On Oct. 24, 1991, Jim King and Larry Green conducted a dive in the Downstream Tunnel for the purpose of looking for alternative dye-drop locations. Upon reaching the point of maximum penetration reported by Stone (1989) in the Third Chamber, the divers observed exploration line exiting the room on a southwest bearing at 260' of depth. The line continued in a passage that extends beyond the map published in the report on the 1987 project. The passage continued at an average depth of 270' for a distance of approximately 235'. The line terminated in a collapse dome, tentatively called the

"Fourth Chamber."

The Fourth Chamber is approximately 40' wide and 20' high. The ceiling occurs at a depth of 255' and the floor occurs at a depth of 275'. Breakdown was observed to cover the floor and no obvious passage was seen to exit the room. The end of the room is approximately 1,467' from the entrance. Total transit time for the divers from the entrance to the back of the Fourth Chamber was 17 minutes. The fourth chamber remains unsurveyed.

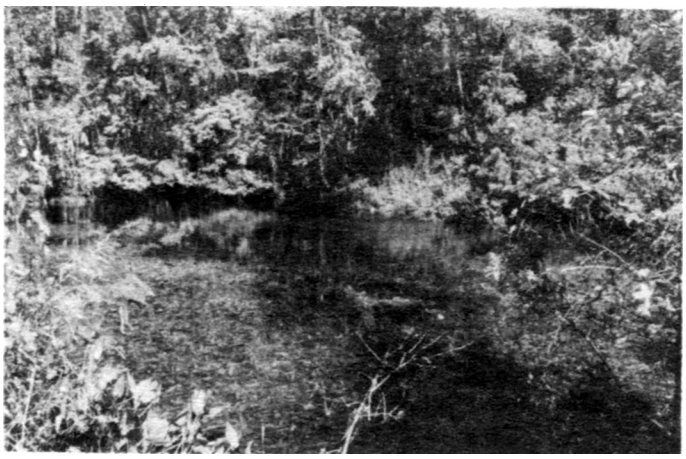
Termination of the Downstream Tunnel in the Fourth Chamber may explain the relatively slow flow through this section of the cave. Water may pass through small holes in between the breakdown along the edges of the room, through small solutional openings in the bedrock, and/or directly through the intergranular spaces of the bedrock. A hydrologic connection may exist between the Downstream Tunnel and Wakulla, but the travel time of the dye will be fairly slow.

Based on conversations between Jim King and Jon Dodrill, a decision was made to reconnoiter the deep Upstream Tunnel (280-290' of depth) to verify the information depicted on the 1987 map and survey the passage as time permitted. Jim King and Larry Green made this dive on Oct. 25, 1991. As indicated on the 1987 map, the tunnel rises vertically at the back of the last chamber to form a shear wall some 90' in height. Stone (1989) reported that the top of the chamber was blocked by breakdown.

King and Green followed an existing line up the wall to a northwestward trending tunnel approximately 5' high and 5' wide, at a depth of 210'. The line extended approximately 50' into the tunnel, with the tunnel continuing for an unknown distance. A distinctly noticeable current of water issued from the tunnel. The point of farthest penetration was 792' from the Cube Room and approximately 1,446' from the spring entrance (Figure 2).

King and Green observed a second tunnel containing no line on the opposite side of the vertical wall. The tunnel was approximately 5' high and 5' wide, extended approximately southeastward, and apparently continued for an unknown distance. The orientation of this tunnel indicates that it may connect to "D" Tunnel in Wakulla Spring. To do this, the tunnel would have to drop approximately 70' over a distance of approximately 2,760'.

Due to the additional time taken to examine the two passages exiting the top of the fissure, survey data was collected in a hasty manner during the exit. The survey was terminated upon reaching a section of line which did not contain knots for determining the distance between survey points.



Looking northeast across the Indian-Sally Ward Spring Run, from the usual point of entry to the water. Photo by Bill Wilson.

OTHER RELATED ACTIVITIES AND RESULTS

As Deep Breathing Systems and Deep Springs Exploration Group were conducting their investigation of Sally Ward Cave, Jon Dodrill was coordinating a related effort by members of the Woodville Karst Plain Project at Wakulla Spring. Water from the Downstream Tunnel in Sally Ward Cave was thought to pass most likely to the "D" Tunnel in Wakulla. Prior to releasing dye it seemed desirable to measure the discharge of the "D" Tunnel to determine that it was at least as much as the discharge in the Downstream Tunnel.

The necessary cross-section and velocity measurements were performed on a single dive by Bill Gavin and Steve Irving, who were accompanied by Jim King, who shot video. The selected measurement station in the "D" Tunnel was just beyond the "F" Tunnel junction, approximately 1,850' from the entrance at a depth of 280'. The dive was conducted on Oct. 19, 1991.

At the measurement station, the "D" Tunnel was 13' high, 35' wide and had a cross-sectional area of approximately 450 ft^2. Velocity was measured by the particle-drift method. Although the velocity was very slow, the divers were confident that the water was flowing 0.04 ft/sec (0.65 mi/day). Therefore, the discharge was approximately 18 ft^3/sec, or nearly 29% greater than the discharge in the Downstream Tunnel of Sally Ward Cave. The slightly greater discharge in the "D" Tunnel indicates that the Downstream Tunnel of Sally Ward *may* connect to the "D" Tunnel in Wakulla, but does not prove that a hydrologic connection exists.

VOLUNTEER EXPENSES AND VALUE OF LABOR

The total volunteer expenses and value of labor for the current phase of hydrogeological study of Sally Ward Spring is estimated at not less than $22,226. Deep Breathing Systems and Deep Springs Exploration Group incurred direct expenses of not less than $6,546 in the course of performing the hydrogeological study of Sally Ward Spring described in this report. If the deep divers, support divers and surface support personnel were to be paid at very low rates for commercial diving, then the value of labor contributed by these two organizations is not less than $15,680. The value of labor was estimated to be $65/hr. for deep divers, $50/hr. for support divers, $50/hr. for equipment tenders (surface support), $65/hr. for professional geologists, and $50/hr. for video camera operators.

CONCLUSIONS

The similarity of the discharges in the Downstream Tunnel of Sally Ward Cave and the "D" Tunnel in Wakulla Cave indicate that the two passages may be connected. A dye trace is required to prove that a hydrologic connection exists.

The first restriction in the Downstream Tunnel is an inappropriate place to release dye because of very low water ve-

locities (.0067 ft/s or 0.11 mi/day) in the large tunnel that extends downstream from the restriction. No greater flow velocities were observed elsewhere in the Downstream Tunnel, which was reconnoitered in its entirety by divers during the current project.

During the current series of dives, the Downstream Tunnel was found to end in a 20'-high, 40'-wide chamber, at a depth of 270', approximately 1,467' from the spring entrance. No obvious passage was seen to exit the room.

The Fourth Chamber in the Downstream Tunnel might be an appropriate place to release dye. The total transit time to Wakulla Cave, assuming that such a connection exists, is uncertain. If open conduits exist along the unexplored section of the connection, then the transit time could be as little as 26 hours. But, based on the slower observed velocities, the transit time could be 4 days or longer.

Discharge through the Downstream Tunnel of Sally Ward Cave is only 14 ft^3/s compared to 390 ft^3/s as the average discharge for Wakulla Spring. Water-tracing dye released in the Downstream Tunnel would undergo significant dilution. Based on the newly available hydrologic information, it seems plausible that 1 to 10 gallons of Rhodamine WT may be required for a successful water trace. These amounts represent the best- and worst-case scenarios, based on some educated guesses about distance of flow and dilution.

The recommended amounts of dye would produce an average concentration of approximately 1 part per billion at the mouth of Wakulla Spring. Rhodamine WT is invisible at concentrations of less than 4 ppb, but can be detected down to concentrations as low as 0.05 ppb with available equipment and given the typical background fluorescence of the spring water.

During the current project, divers reconnoitered the deep Upstream Tunnel and found two passages, each approximately 5' in diameter, at a depth of 206' at the top of the 90'-high fissure where the deep Upstream Tunnel ends. These two tunnels were previously unknown. Water flows out of the northwestern tunnel. Part of the water flows down the fissure into the deep Upstream Tunnel, whereas a portion of the water flows into the southeastward-trending unexplored passage. The southeastward-trending tunnel has the appropriate orientation to indicate that it may connect to the "D" Tunnel in Wakulla Cave.

The scientific study of Sally Ward Cave by divers, prior to attempting a dye trace from Sally Ward Cave to Wakulla Spring, was extremely helpful for documenting hydrologic conditions that will affect the outcome of the dye trace. Quantitative information about the flow rates is essential for planning a successful trace. The slower-than-anticipated flow and lack of a continuing tunnel in the downstream portion of Sally Ward Cave led to the dye trace being postponed while other alternatives were considered.

RECOMMENDATIONS

In order to more fully prepare for a successful dye trace between Sally Ward Cave and Wakulla Spring, Deep Breathing Systems and Deep Springs Exploration Group made the following recommendations:

1) Divers should, in a series of dives, carefully examine the breakdown around the edges of the walls in the Downstream Tunnel to determine if any concentrated point of outflow occurs. Such a point might be a suitable dye-release point.

Larry Green geared up. Photo by Victor Sparks.

2) The Fourth Chamber should be surveyed.

3) Divers should, in a series of dives, explore and map the two passages at the top of the fissure in the Upstream Tunnel to determine their extent and orientation. The southeastward-trending tunnel, at a depth of 210', might be a suitable dye-release point.

4) Divers could, periodically, measure the water velocity and calculate the discharge of Sally Ward Spring and the flow in the Downstream Tunnel, using the measurement stations established by the current series of dives. Discharge data would help to quantitatively establish the rank of Sally Ward Spring and its relative importance to the Wakulla Spring hydrologic system.

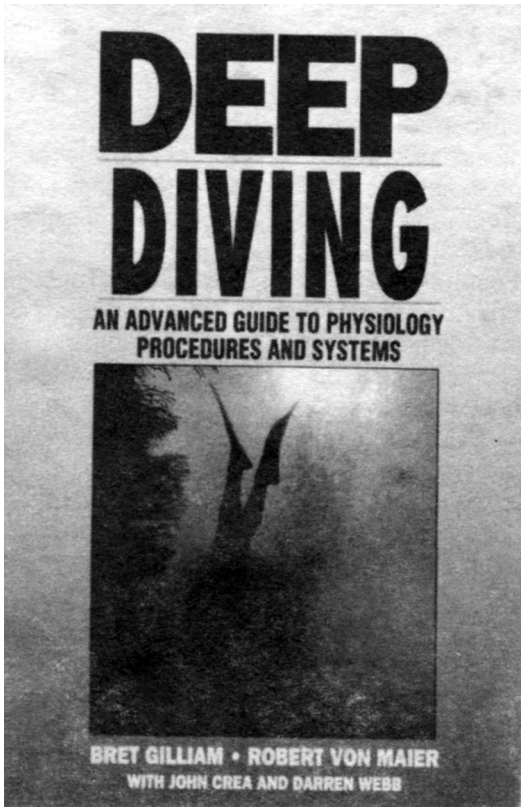
A proposal to implement the recommendations is being prepared by Victor Sparks. The earliest time at which the dye trace could be done conveniently would be late fall of 1992, when the water in Wakulla Spring usually clears.

Deep Breathing Systems and Deep Springs Exploration Group remain committed to working in a cooperative manner with the Division of Recreation and Parks and other government agencies and private organizations who seek to understand the hydrogeology of the Woodville Karst Plain.

REFERENCES

Stone, W.C., 1989, The Wakulla Springs Project: U.S. Deep Caving Team, Derwood, Maryland, 210 pp. ■

Deep Diving, by Bret Gilliam and Robert von Maier, with John Crea and Darren Webb



PRESS RELEASE: This collaborative work breaks new ground in many areas for a book aimed at noncommercial or scientific diving interests. For the first time, a technical and controversial subject like deep diving has been given an intellectual discourse that goes far beyond the typical lightweight treatment of traditional sport-diving texts. Written primarily by Bret Gilliam and John Crea, both men bring a wealth of experience and professional background to a difficult subject. Both are well-known technical experts with solid writing and symposia-speaking backgrounds and extensive practical deep-diving experience. Additionally, Gilliam is the current world depth-record holder and Crea is one of the leading experts in custom tables and decompression. It's an interesting and uniquely qualified author team.

The book is deliberately technical, but written in a style that advanced divers will find both readable and comprehensive. Great effort was made to provide first-hand perspectives and interview quotes on various aspects of deep diving by a wide variety of experts such as Dr. Bill Hamilton, Tom Mount, Sheck Exley, Gary Gentile, Dick Rutkowski, Jim Lockwood and the authors themselves. This makes for an interesting style of presenting some of the material and is particularly effective in developing the fascinating history chapter that opens the book.

Here the reader will find one of the most exhaustive compilations of diving history ever assembled. It chronicles the incredible record of dives of Exley and Gilliam to 881' on mixed gas and 452' on air respectively, through interviews with both men. A detailed history of deep diving and the individuals who pioneered this challenging and hazardous area of diving is then related, beginning with the earliest attempts at military applications through a myriad of special-interest groups including cave divers, wreck divers, saturation projects and the handful of women who made their marks in a diving arena more typically dominated by men.

It provides a balanced view of the fascinations and hazards of deep diving through extensive factual development of its technical chapters. They include: history, physiological and mental preparation, stress, inert-gas narcosis, oxygen toxicity, stage decompression, equipment and self-sufficiency, dive computers, scientific applications, nitrox, mixed gas, dive tables, and decompression-sickness theory and treatment including recompression chambers, field accident management, helicopter evacuation, oxygen systems, and in-water treatment protocols.

Peer review from the industry has been positive from all areas and reflects a sentiment that a book of this type is long overdue. Expert cave diver Tom Mount says, "This text is the only responsible source currently addressing the overall concept of depth. Many of the dives profiled in this book are discussed in detail for the first time. The wealth of information compressed into these pages bridges the gap from kindergarten to graduate school for most divers. This is a book whose time has come."

Sheck Exley notes, "I can think of no one who is more knowledgeable on the subject of deep air diving than Bret Gilliam. I strongly recommend this book to all persons interested in any aspects of deep diving."

The 256-page book includes over 75 photos and is illustrated with detailed graphics and tables. TO ORDER: Send check or money order for $20.00 (includes autographed copy, postage and packing) to: Ocean Tech, 3098 Mere Point Rd., Brunswick, ME 04011, 207-442-0998, fax 207-442-9042. ■

Cave Diving Section of the
National Speleological Society, Inc.
A nonprofit scientific and eduational organization recognized by the IRS
P. O. Box 950 • Branford, FL 32008-0950

NON-PROFIT ORGANIZATION
U.S. Postage
PAID
Nokomis, FL
Permit No. 91-148