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Now You Don’t See It, Now You Do.

This January I received an e-mail from a former student who had just returned from a dive trip to Roatán. There’s a new activity for dive travelers in the Caribbean. He reports:

“The highlight of the trip was getting to participate in the spearfishing of the invading Lionfish. They haven’t taken over the reef, but there were a lot.”

This may turn out to be “The Year of the Invasives” for the oceans and freshwaters. Lionfish are getting the lion’s share of the publicity right now. Lionfish in the Atlantic and Caribbean are photogenic as well as posing a direct danger to the reefs and to people, making them prime subjects for reportage. Their sting is very painful, and in addition to being starkly beautiful they seem to not mind modeling for snapshots. It is thought that Lionfish were introduced into our New World seas as escapees or even releases from Florida aquariums. However they got here, Lionfish are now found throughout the Caribbean and on the Atlantic seaboard as far north as Long Island. They are beginning to show up in the eastern Atlantic as well. Lionfish are voracious predators themselves with very few known native predators on them, which makes them particularly worrisome as well as being naturally prolific.

But Lionfish are only one of the high profile invasive species in the public mind. Asian carp, another very prolific species with a ravenous appetite, were imported about three decades ago to clean catfish ponds; and— it should have been no surprise—they subsequently escaped from their ponds and into our rivers during floods. Asian carp are now moving north towards the Great Lakes through the waters of the Mississippi basin, and extraordinary means are being used to try to block their entering the Great Lakes.

Zebra mussels apparently first came to the United States in the late 1980s as larvae in the ballast water of transoceanic ships. They were first seen in the Great Lakes, but are now spread nationwide in rivers, streams, and lakes. The mussels take over entire ecosystems, often completely coating the bottom. In their new habitat, they coat boat bottoms, encrust pier pilings, and clog the intakes of water treatment and power plants. About the only thing good to be said about zebra mussels is that as filter feeders, they do a great job of clearing lake waters that we have marred up with the refuse of our civilization.

My favorite invasive species at the moment is the “immortal jellyfish,” *Turritopsis nutricula*, which appears to have originated in our own Caribbean Sea but is now spread throughout the world—again, probably by hitching rides in the ballast water of ships. It’s a small hydrozoan and is potentially immortal because it is able to revert completely to its juvenile colonial stage after having reached sexual maturity in its solitary medusa stage. Theoretically at least, this process of reversion upon reaching maturity can repeat forever. Since it does not have to die, its numbers are spiking worldwide.

In the aquatic plants kingdom, we have—just to pick three—hydrilla (another aquarium escapee), purple loosestrife (first seen in this country in the ballast heaps of eastern harbors), and water hyacinth (introduced as a pond ornamental).

That’s a very small piece of the list of invasives—a few that we divers are likely to know because they are aquatic. You can explore further by going to the US Department of Agriculture’s invasive species site:
There is also extensive information at the website of the Center for Invasive Species and Ecosystem Health: http://www.invasive.org/.

Some critters have been part of our life for so long and become so familiar that we hardly think of them as invasive anymore: Many were intentionally introduced. The ubiquitous House Sparrow or English Sparrow was introduced into the U.S. in 1952 when 50 pairs were intentionally released in Brooklyn. The common starling came to the U.S. when 80 birds were released in New York’s Central Park in 1890, supposedly by an Englishman who wanted to transplant all the birds mentioned in Shakespeare’s plays into the U.S.

It seems that we are almost as effective as species spreaders as we are as species eliminators.

We divers are privileged to be able to visit the aquatic realms. We all now realize that humankind is having a huge impact on those realms—invasive species, endangered species, pollution, messing with the ocean’s chemistry, we’re having an escalating impact.

Every diver should be persuaded that an active role in salvaging the aquatic world is each diver’s responsibility. Every diver should have at least the beginnings of an understanding of and appreciation for the aquatic web of life—not just some limited bits and pieces. Our *NAUI Scuba Diver* textbook has only slightly over three pages on marine life, and two-thirds of that is on “dangerous” marine life. As responsible instructors we need to do better.

If you are using NAUI’s eLearning program as a teaching/learning tool (and you really should try it; it is a very effective program), use some of your newly available extra time to develop a lesson plan and teach a really top-notch unit on marine ecology. You’ll enjoy the change, your students will love what they learn, and the oceans will thank you.

Good teaching, safe diving.
An Experience and an Opinion

After reading the editorial in Sources (second quarter 2010), I decided to write this letter. It is something I have been thinking about over the past five days.

First a little about me. I am a 54-year-old male, 6’5” and 190 pounds. I do not take any kind of daily medications and exercise three or four times a week. I got NAUI certified around 1981. Around 1984, I got my commercial diving certification and spent two years diving in the Gulf of Mexico. In 1989, I got my NAUI instructor certification through Hall’s Diving Center. I live in Wilmington, North Carolina.

Now for the reasons I am writing. Based on the divers I have seen on dive boats/trips, the main qualification for getting certified these days is: Can you pay for the lesson and buy lots of new equipment? I will give you examples from the two dive trips I took recently. I will not include all the mistakes, problems, bad divers I have seen over the years.

The first trip was out of Wilmington. The weather was 90 degrees, 90% humidity, not a cloud in the sky, and the seas were flat. The dive site was the wreck of the City of Houston, 48 miles out, 90-foot depth, 20 divers, two mates, and the boat captain. There were a large number of double tanks, lots of nitrox, spear guns, lobster poles, and wreck reels. This had me wondering, since there is very little of the wreck left at the City of Houston dive location.

I was buddied up with a young man in good shape diving nitrox in a 100 cu. ft. tank. I had an 80 and was diving air, so I let my buddy lead the dive. When we got to the bottom I found out what the wreck reels were for — the visibility was about 50 feet. Several dive teams had hooked their reels to the anchor and set out. I followed one of the lines for about 75 feet looking at the destruction to the reef/dive area. There were four teams using reels — easier to sell reels than teach navigation skills. One male diver (diving nitrox) did a decompression stop on oxygen by himself on both dives. Based on all the things that I saw brought back on board after the dive, I can tell you the dive saying “Take only pictures, leave only bubbles” is dead and buried on North Carolina dive boats.

The second dive trip was from the same boat, same weather, sea conditions. The dive sites were wreck dives on the Markham and the Hyde, 18 miles off shore, 85 feet deep. The divers on this trip were newer divers — basic open water certified, mostly two big dive clubs. They had tons of all the newest and best dive gear. Four divers were easily 40-50 pounds overweight, six or seven were overweight by 25-35 pounds, and the rest were normal to slightly overweight. Before the dive, one of the more overweight women saw me looking at her mask, an Oceanic Data Mask ($1,500.00). She showed me all its features and told me how great it was. Three others in her group had this mask. (They were also among the most overweight.) Twenty minutes before we even reached the dive site, six divers were suited up in full wetsuits and strapped into their BCs, ready to dive. One of the mates had to get out a hose and wet them down so they didn’t overheat while waiting for arrival, anchoring, and listening to the pre-dive briefing.

I got buddied up with a gentleman my age in fairly good shape. He told me he was a basic diver as were most of the divers in his group. The dive was good: visibility 60-70 feet, lots of fish — and Tiger sand sharks everywhere. Taking pictures, enjoying the dive, I checked my air — 2200 psi, I pointed at my buddy to see what he had — 800 POUNDS. To the best of my knowledge, this was the first time he had checked his air supply at all. It was definitely the first time he let me know how much air he had. We made it back to the anchor, did a two-minute safety stop instead of three, and got back on the boat. We had a long talk about checking air supplies and letting each other know. Due to these events and our talking, I didn’t pay much attention to the rest of the divers getting back on board.

Our second dive went much better. Every time I looked at my buddy, I got an air supply report. We finished our dive and hung on the safety line waiting to get on the boat. The four overweight divers were trying to get onto the boat ahead of us. The seas were one to two feet. Struggling to get her fins off, one diver put her foot on the dive platform so the mate could take her fin off for her. The platform rose up, flipped her over backwards, came down, and almost hit her on the head. The four divers rolled around trying to get their fins off. The sight looked like sea otters cleaning themselves as they tried to help each other. One got both fins off and struggled up the ladder with the help of both mates. The other three ended up climbing the ladder with one or both fins still on. The mates had to drag/dump them on the deck. It reminded me of landing a marlin without the gaff hook. Had the seas been bigger, we would have had a huge problem.

There was a 12-year-old diver on this dive trip. On the first dive, he was seated on the bench strapped into his BC. When asked by the person diving with him if he was ready he said “yes”: he had no mask, it was still in his dive bag. Someone dug it out of his bag, it was given to him, and he put it on. When he tried to stand up he couldn’t because his tank was still burdened in place. Released from the bungee, he discovered his air wasn’t on, so they turned on his air. But then it was seen that his power inflator hose wasn’t connected. His regulators hadn’t been checked, and his air pressure hadn’t been checked. While correcting all these problems for the “ready” diver, his mask fogged up. This child was the poster boy for why children shouldn’t be allowed to dive.

I have a question: What has happened to snorkels? On the first trip, four out of 20
divers had them; and on the second, three out of 20. My guess is new students have a hard time mastering this skill so it is easier not to teach it.

Think about it: All the things I listed happened in just four dives! There’s no telling how many other things I missed.

As I stated at the beginning, I believe all these problems go back to making money: lower the physical requirements so more people can take lessons. Lower the diving skill requirements, and you create more gear-buying divers. Lower the diving age, and you can push out even more divers spending more money.

I realize this will not change; greed will not allow it. Therefore, I humbly ask that NAUI make a Solo Diver Certification. The first requirement would be to hold at least a Divermaster rating. That way I could go back to enjoying my own diving experiences instead of babysitting all the so-called divers being certified these days.

Guy Beech, NAUI 11087
Wilmington, North Carolina

Kudos for Instructor Robert Bunch

As a NAUI Course Director I am privileged to work with aspiring Instructors who come from a wide range of personal, professional, and diving backgrounds. They also come to me with a wide range of the degree to which they are prepared for their Instructor Training.

I have just completed a NAUI ITC that had a NAUI Assistant Instructor, (Alan Beasley, NAUI 51137) who had been taught by Robert Bunch, NAUI 18663.

I have been a NAUI Course Director for 11 years; I have NEVER had a student so well prepared for their ITC process.

I wanted to publically acknowledge the excellent job my fellow NAUI Instructor Robert Bunch did in preparing Alan for his ITC and encourage Robert to consider becoming an Instructor Trainer and eventually a Course Director.

Chris Richardson, NAUI 17055
Forsyth, Georgia

Excellent Preparation

This e-mail is to commend on the excellent training that I received by Jeff Heim. His training and promotion of NAUI to me as a new diving instructor was top notch. His instruction and teaching were excellent.

Antony Soto, NAUI 52003
Brooklyn, New York

I’m Breathing Easier

I recently took a Nitrox course from Harvey Morash, who owns and operates Louisbourg Scuba in Cape Breton, Nova Scotia.

I wanted to pass on to NAUI that Harvey is an excellent instructor. As a new diver I was really unsure about taking this course, and Harvey made it understandable and very accessible. His emphasis on safety was what really made the course for me; it made the idea of breathing enriched air a lot less scary for me because of Harvey’s excellent instruction.

Katie Grist
Nova Scotia

Broadcast Yourself with a NAUI Homepage!

Set up through the Members’ Area of www.naui.org

You can link to Twitter, Flickr, YouTube accounts
A link to your NAUI Homepage will appear in your Member Locator entry
Wayne Mitchell became a NAUI Instructor in 1973. He was a longtime member of our Board of Directors, serving on the Board from 1998 through 2007 and again from 2008 until his death in 2009. As a Board member Wayne was a strong advocate of teaching scuba to persons with disabilities and was instrumental in the development of NAUI Worldwide’s Adaptive Scuba program. He was also a supporter of the creation of NAUI’s wholly-owned subsidiary, NAUI Services Group, our for-profit arm responsible for the business matters of our Association.

In his “day job” Wayne was Senior Safety Administrator for Walt Disney World in Orlando, retiring after 30 years of service. He developed and wrote many training and safety manuals for Walt Disney and for NAUI. He was the recipient of many awards from aquatics, safety, and health organizations, including NAUI’s Outstanding Service Award and Continuing Service Award (three times).

After his retirement from Walt Disney World, Wayne began commuting to the Bahamas where he partnered in a new business, Abaco Dive Adventures in Marsh Harbour, which served small groups and also operated in conjunction with The Disney Cruise Line offering Disney guests opportunity to dive the pristine reefs around Disney’s Castaway Cay.

In Marsh Harbour, Wayne became involved with Friends of the Environment in Abaco. Friends (www.friendsoftheenvironment.org) had its beginnings in the 1980s, and over the years it has been dedicated to preserving and protecting the terrestrial and marine environments in order to achieve sustainable living for the wildlife and the people of Abaco, Bahamas. Friends has implemented a wide variety of successful initiatives including permanent moorings on local reefs, mangrove restorations, and initiating recycling programs. In 2006, Friends began an artificial reef program, and their first “reef balls” were built by Abaco students and installed on Mermaid Reef. The reef balls are made with a pH-neutral concrete that is conducive to coral and sponge growth.

Last year, NAUI Instructor Michel Craun of Orlando had the idea of placing a memorial to Wayne in the waters of Abaco. Working with Tim Higgs, Wayne’s old business partner in the Bahamas, he developed the idea of a memorial reef ball with a commemorative plaque, planned an event, and put all the details together. In October, Michael Craun, Wayne’s brother Sandy Mitchell, Wayne’s best friend from college Don McDonald, and Elizabeth Travis representing NAUI Worldwide, went to Marsh Harbor, Abaco, to meet Kristin Williams and Olivia Patterson from the Friends of the Environment. There they attached the plaque to finish off the reef ball and placed the commemorative ball at Mermaid Reef, a favorite dive site.

Along with the plaque for Wayne that is mounted on the reef ball, several pieces of
Several of those in the Friends of the Environment with whom Wayne worked have written remembrances of him:

“I used to love it when Wayne would stop by and visit us in the office. He never just breezed through; he always took the time to stop and chat and wanted to hear about how our programs were going. He was always looking for a way he could help, specifically with the marine component of the education program. The artificial reef ball project was his brain child and now 21 launched reef balls and dozens of field trips later, the program has proved to be a successful one. Wayne’s passion for the water was infectious and he always gave us a healthy dose of inspiration during his office visits!”
— Kristin Williams, Executive Director, Friends of the Environment.

“Each day I walk into our office and see the bronze NAUI plaque on our wall, I am reminded about Wayne’s passion for educating Abaco children about our beautiful coral reefs. He was very passionate about NAUI’s reef education program and wanted us to increase NAUI’s presence here. He personally trained me and a community volunteer as NAUI Skin Diving Instructors so that we could take out school children to snorkel on Abaco’s reefs. His wealth of knowledge, cheerful smile and words of wisdom to care for our reefs will be greatly missed.”
— D’Shan Maycock, Education Officer, Friends.

“My biggest impression of Wayne was the importance of getting kids out in the marine environment. He helped get our snorkel field trips going, getting us connected to the insurance to make it possible and getting D’Shan the training so they could do the field trips. He was passionate about getting kids in the water so they could see the beauty beneath the surface.”
— Lindsey McCoy, past Executive Director of Friends.

memorabilia, including pictures from Wayne’s grandchildren were placed in a capsule inside the ball.

Sinking the reef ball was an adventure. The Friends of the Environment have tried several ways to get reef balls from the dock to their final resting place. In the past, they have usually rolled them across the beaches into the water. This time a fork lift hauled the reef ball to the dock, and it was gently lowered into the water with lines. Buoys supported the ball until it reached its destination, where it was put in place, joining other reef balls of the Friends’ project on the bottom of the ocean.

Wayne was much loved by the community in Abaco. They all called him “Mr. Wayne.” The Friends of the Environment Reef Ball Project at Mermaid’s Reef is a program that Wayne helped establish and this is where his reef ball will rest so that he can watch over it forever.
**NAUI 2010 Awards Announced**

NAUI’s annual awards were announced and presented at our Awards Ceremony at the industry trade show in Las Vegas. Those who were not able to attend have received or will be given their awards at other special events.

**NAUI Service Awards**

NAUI recognizes the contributions of its members with our Service Awards, which are presented for significant service to NAUI and to sport diving. An instructor who is a first-time awardee receives the NAUI Outstanding Service Award. Any subsequent awards to the same person are designated for “Continuing Service.” NAUI Diversmasters, Assistant Instructors, and Skin Diving Instructors can also receive special recognition for their service through the NAUI Training Support Award. This year there were eight recipients of NAUI Service Awards: six first-time outstanding service recipients and two continuing service recipients. The awards consist of specially designed bronze castings, appropriately mounted on a recognition plaque.

**With great pleasure we recognize:**

**Outstanding Service Award**

Simon M.P. Lam, NAUI 11140, Kowloon, Hong Kong

With sincere appreciation for outstanding service to NAUI and sport diving as NAUI’s official representative in Hong Kong and through conduct of NAUI courses—diver through instructor, and technical diver through technical instructor, in the Pacific Rim.

Lonnie Sharp, NAUI 18514, San Diego, California, USA

With sincere appreciation for outstanding service to NAUI and sport diving through his tireless efforts in taking IB Divers to new levels of success, as well as delivering exceptional service to the US Navy in San Diego, California, USA.

Paul O’Malley, NAUI 10257, Stafford, Queensland, Australia

With sincere appreciation for outstanding service to NAUI and sport diving as NAUI’s official representative in Queensland, Australia, and through conduct of NAUI courses—diver through instructor, and technical diver through technical instructor, in Australia and the Pacific Rim.

Barry Moore, NAUI 6790, Pullman, Washington, USA

With sincere appreciation for outstanding service to NAUI and sport diving through conduct of NAUI courses—diver through instructor as an Instructor Trainer at Washington State University in Washington, USA.

Greg Johnson, NAUI 15585, Brunswick, Maine, USA

With sincere appreciation for outstanding service to NAUI and sport diving through conduct of NAUI courses in the state of Maine, USA.

Carrie Nebit, NAUI 21833, Brunswick, Maine, USA

With sincere appreciation for outstanding service to NAUI and sport diving through conduct of NAUI courses in the state of Maine, USA.

**Continuing Service Award**

Terrence M. Rioux, NAUI 5958, Woods Hole, Massachusetts, USA

With sincere appreciation for continuing outstanding service to NAUI and sport diving through conduct of NAUI diver courses at the Woods Hole Oceanographic Institution in Massachusetts, USA.

Marshall Gross, NAUI 1969, Orange Park, Florida, USA

With sincere appreciation for continuing outstanding service to NAUI and sport diving through conduct of NAUI diver courses in Florida, USA.

All NAUI members are eligible for the Service Awards, although traditionally they are not given an individual in immediately sequential years. Nominations may be made by any individual, entity, or group. If you know a NAUI member who deserves recognition for service to the association, recommend them for an appropriate award. The award nomination form can be found on the NAUI website.

**Environmental Enrichment Award**

The 2010 Environmental Enrichment Award was presented to Captain Charles James Reid Moore in recognition of founding the Algalita Marine Research Foundation in Long Beach, California, in 1994 and for being an international voice for reducing plastic pollution in the oceans and worldwide.

The NAUI Environmental Enrichment Award was created by NAUI in 1992 to recognize individuals and organizations for achievements in environmental conservation. The award is for work that has caused an important and recognizable improvement in the aquatic environment, provided significant protection for the aquatic environment, or educates and inspires others to protect and conserve the aquatic environment. The actions affecting the aquatic environment may include any efforts that improve or preserve any part of the global hydrologic cycle. The award can be presented in two categories, one to recognize the efforts of an individual and one to recognize organizational entities. The award may recognize one event or a lifetime of achievement.

**Charlie Brown Memorial Award**

The 2010 Charlie Brown Memorial Award was presented to Dr. Allen Dekelboum, M.D., NAUI 6715, who has distinguished himself by
contributing unselfishly to the field of sport diving. Dr. Dekelboum is an ENT physician and has served as a consulting physician for DAN, Scubadoc’s Diving Medicine, and others.

The Dr. Charlie Brown Memorial Award recognizes a worthy individual who has distinguished him- or herself by unselfish contributions in a volunteer capacity to the field of recreational diving. The award was created to honor and commemorate the contributions made by Dr. Charles V. Brown of Laguna Beach, California, who dedicated himself to service to the sport diving community. A non-diver himself, Dr. Brown made himself available in every way to serve divers and diving safety. He lectured at Instructor Courses, made presentations at NAUI conferences, wrote articles and support materials for diver training, served as NAUI’s medical advisor, and did this unselfishly on a volunteer basis.

Announcing an New NAUI-Logo Clothing Resource

NAUI has a new clothing resource available for shirts and outerwear. NAUI apparel is now available from the NAUI’s Lands’ End Company Store. The link to the NAUI store is: http://ces.landsend.com/NAUI. This selection of shirts and outerwear will carry the NAUI logo. The new Lands’ End store is a third party feature, so all orders are processed entirely by Lands’ End Business Outfitters and not by NAUI Worldwide. All questions about Lands’ End Clothing products and orders must be directed to Lands’ End Customer Service at: 800-587-1541.

The NAUI eBusiness Center continues to offer our line of NAUI and NAUI Tec logo T-shirts, baseball caps, knit watch caps, and Chammyz brand hooded pullovers and jackets. Go to the Apparel section of the NAUI eBusiness Center to see the selection.
The New Year brings four new faces to NAUI’s team of North American regional representatives. Jill Wentworth and Jim Larsen were appointed in December as NAUI representatives for the far West, joining Kenny Wheeler and Lonny Haynes, who came on board in September and represent NAUI in mid-America. Chad Barbay and Angelo Fiore continue as our reps in the East, with John Fulop as the Caribbean (including Mexico) and eastern Canada representative.

NAUI representatives have many responsibilities: promoting the growth of NAUI in their territory, supporting NAUI affiliated businesses and NAUI members, recruiting qualified dive centers to join in NAUI’s mission, preparing and qualifying NAUI Course Directors, and marketing new NAUI products are only the more obvious. They are the first resource to which NAUI members and businesses can turn for ready assistance. As a team, our representatives come from a variety of backgrounds in diving, and each brings a special expertise to his or her position.

Mid-Central Territory Representative Kenny Wheeler (NAUI 9063) has been a NAUI Instructor since 1985. Working through the Louisville Dive Center in Louisville, Kentucky, he moved up the training ladder to become a NAUI Course Director in 1989. Kenny received the NAUI Outstanding Service Award in 1992. He has an Associate Degree in Business Management from Lindsey Wilson College in Kentucky and a Bachelor of Science Degree in Business Administration from McKendree University in Lebanon, Illinois. He has also worked in retail for over 40 years. Kenny has over 5,000 dives with extensive experience in both fresh and salt water and especially enjoys shipwreck and wall diving.

Kenny believes strongly that there should be a partnership between the dive operator and the representative. This partnership’s primary purpose should be not to just increase the sales of a particular product but to work together to improve the entire business of the dive operation. Kenny also realizes that no one knows their business better than the dive operators themselves and would never presume otherwise.

Kenny lives in Shelbyville, Kentucky. He can be contacted at kwheeler@naui.org or 502-210-9110.

South Central Territory Representative Lonny Haynes (NAUI 34658) has been a NAUI member since 1998 and became an instructor in 2002. He has been an accomplished photographer for more than 20 years, being published in many fashion/news magazines throughout Texas. His recent occupation was marketing/sales manager for an established HVAC contractor with duties that included web design and direct advertising. In addition to teaching scuba, Lonny and his wife, Marcia (NAUI Divemaster 34971) enjoy traveling as much as possible, including leading dive trips (and getting married underwater). To complete the NAUI diving family, their daughter Megan is a NAUI Advanced Diver. Lonny’s other passions include riding his Harley Davidson and raising two rescued dogs.

Lonny lives in Flower Mound, Texas, and can be contacted at lhaynes@naui.org or 214-914-1074.

Jim Larsen (NAUI 7203) is our new North West U.S. Territory Representative; he is also responsible for western Canada. Jim was certified as a NAUI diver in 1981. He earned his NAUI instructor rating and became a dive center owner in 1983, operating Dolphin Too, a NAUI Pro Facility in Fairbanks Alaska (1983-1987) and Vancouver Washington (1987-1999). Jim became a Course Director in 1991, running his first NAUI ITC for 10 candidates with a staff of six. Jim helped develop and organize the Scuba Dive Educational Conferences in the Northwest for six years in the mid 1990s, promoting Dive Safety through Education. In 1994 Jim received NAUI’s Outstanding Service Award. In addition to running dive programs in the Pacific Northwest, Jim has run Instructor programs in the Bahamas and Puerto Penasco, Mexico. He spent seven summers in Saudi Arabia teaching for the returning student program for Aramco (the Saudi Arabian Oil Company).

Jim’s passion, other than scuba, is working as the Commodore for the Sea Scout program in the Portland area. This is a program for youth ages 14-21 that promotes better citizenship and improves members’ boating skills and knowledge through instruction and practice in scuba diving, water safety, boating skills, outdoor, social, and service experiences, and knowledge of our maritime heritage.

Jim and his wife Judy live in Vancouver, Washington, with their two huskies. Contact Jim at jlarsen@naui.org or 360-921-8894.
Tong, Flahan, Edmiston Elected to NAUI Board of Directors

For more than 50 years, NAUI Worldwide has remained a true membership association. Our standards, policies, and ethics are governed by the Association’s Board of Directors, who are themselves NAUI members, and are elected through a democratic election process—each instructor member gets a vote in their Association! The election is your opportunity (and responsibility) to select those of your fellow members who will serve on our Board of Directors.

This year, for the first time, our Board of Directors annual election was conducted via the internet. Instructor members received a postcard containing a user name and a password needed to participate in the election. Logging in to the site (hosted by a third party: “eBallot”), they could then review the candidates’ information, biosketch, and answers to the three questions posed to the candidates by the Election Committee. Then, using the eBallot form voters made their selections and transmitted their vote to a third party for tabulation.

The experiment in online voting was a success. After the “polls” closed on November 22, the results were tabulated and submitted to the Election Committee in early December. The results were then passed to the Board, which announced the winners of the 2010 Board of Directors’ Election.

Michael Tong and Mark C. Flahan were elected to standard three-year terms, and Dallas Edmiston was elected to a two-year term, filling the position made vacant by the death of Wayne Mitchell.

The tally of votes was:

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Tong, NAUI 78655</td>
<td>515</td>
</tr>
<tr>
<td>Mark C. Flahan, NAUI 2080</td>
<td>437</td>
</tr>
<tr>
<td>Dallas Edmiston, NAUI 4099</td>
<td>350</td>
</tr>
<tr>
<td>Simon Yu, NAUI 11146</td>
<td>331</td>
</tr>
<tr>
<td>Jeff Heim, NAUI 10880</td>
<td>287</td>
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<tr>
<td>Nicoletta Codiferro, NAUI 41377</td>
<td>250</td>
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<tr>
<td>Brandon Brooks, NAUI 34299</td>
<td>247</td>
</tr>
<tr>
<td>Jean-Marc Clae, NAUI 40992</td>
<td>206</td>
</tr>
<tr>
<td>Woo Hyoung (Jason) Kim, NAUI 19167</td>
<td>196</td>
</tr>
</tbody>
</table>

Congratulations to our new and re-elected Board members, and we thank them for their service and dedication to the success of NAUI Worldwide and its members.

Nominations Sought for the 2011 Board Election

Nominations are now being accepted for the 2011 Board of Directors election. To be considered, all nominations must be received by the Election Coordinator at NAUI HQ no later than April 30, 2011, and include as much contact information as possible for the nominee and the nominator. To be eligible to stand for the Board, a nominee must have been an Active Instructor Member for three years prior to the election date, be in good standing with the Association, and be current in their financial obligations to the Association.

Please send your nominations via e-mail to nauihq@naui.org or by mail to: Election Coordinator, NAUI Worldwide P.O. Box 89789 Tampa, FL 33689-0413 or by fax to +1 813-628-8253.
The NAUI Magical Adventure Contest...

NAUI launched the “Magical Adventure” Contest in November at the Dive Industry Show in Las Vegas! We want to reward the Boy Scouts of America for earning their NAUI Scuba Certification with a chance for their troop to win a NAUI exclusive Disney adventure!


Boy Scouts just need to visit their participating NAUI Dive Center or Instructor and sign up to earn their NAUI Scuba Merit Badge and complete the Entry Form, which will qualify their troop to win an exclusive “Merit Badge Monday” dive at DiveQuest at The Seas at Epcot in Walt Disney World Orlando, including park admission, camping accommodations and a campfire cookout at Disney’s Fort Wilderness Campground and Resort.

Participating NAUI Instructors and Dive Centers must apply with their local Boy Scout Council to become a Merit Badge Counselor. Please go to the scouting links below for information and to locate your local council. It is easy and it’s free!


Local Boy Scout Council locator: http://www.scouting.org/scoutsource/sitecore/content/Scouting/LocalCouncilLocator.aspx

- mail any questions to: magicaladventurecontest@naui.org

Send Your Nominations for NAUI Awards

NAUI has many awards to recognize the contributions of persons and groups to NAUI and to diving. Each year we recognize the special efforts put forth by selected members and non-members, and each year we ask you to send us the names of possible honorees. As a democratic association, we joyfully recognize those who represent the best in NAUI, our mission, and sport diving in general in such a way as to deserve special merit and attention.

You probably know at least one person who has made a significant difference in scuba education, in NAUI’s programs, in environmental consciousness, or in diving safety. Take some time to reflect on the deserving people you know and submit nominations for an appropriate award. There is a whole range of NAUI awards to recognize our peers and others for outstanding service or a special act. They are outlined below. One is just right for that diving ambassador whom you know.

Help us keep the NAUI Awards Program achieving what it has been designed to do—give special recognition to those special persons who deserve our thanks. It only takes a few minutes to prepare a nomination, but the award will live on forever. Full descriptions of the awards as well as an easy-to-complete nomination form are available on the NAUI website.

Look over this list. You can make nominations for any of the following awards:

**NAUI Hall of Honor:** Honoring those who have been a NAUI Instructor for at least 20 years and have made outstanding contributions to the development of diving education, especially to NAUI.

**NAUI Outstanding / Continuing Service Award:** For NAUI Members who have distinguished themselves for outstanding service to the Association in any year or combination of years.

- Outstanding Training Support Award:
  - To recognize long-term service as a NAUI Divermaster, Assistant Instructor, or Skin Diving Instructor.

- **Lifetime Achievement Award:** In recognition of long-term service by a member on behalf of NAUI.

- **Dr. Charlie Brown Memorial Award:**
  - For voluntary, unremunerated service and contributions to diving.

- **Albert Pierce Medal for Heroism:**
  - For personal valor above and beyond the call of duty as exhibited during a lifesaving or rescue operation.

- **Environmental Enrichment Award:**
  - For work causing or promoting improvement or protection of the aquatic environment. This award is open to organizations as well as individuals.
2011 Membership Renewal Application

First/Given Name Middle Initial Last/Family Name

Title (Mr./Ms.) NAUI # Date of Birth (dd/mm/yyyy) / / Country

Address

City County State/Prov. Zip/Postal Code

Home Phone Business Phone FAX
(International numbers - if known, please provide country and city code)

E-mail address: (Must have on file with NAUI to access the Members Only section of the website)

Instructions:
1. Read the NAUI Annual Membership Renewal Requirements.
2. Check one membership level* and status, write in the amount enclosed and indicate payment method below. Checks or money orders must be made payable to NAUI Worldwide in U.S. Dollars.
3. Currently enrolled Lifetime Members must check one membership level* and status and return the application form. "Members are required to renew at the highest level achieved."

NOTE: Membership dues are not tax deductible as charitable contributions in the U.S.A. However, they may be tax deductible as ordinary and necessary business expenses. Please consult your accountant. A portion of your dues is applied toward the association magazine subscription.

Note: Demonstrating financial responsibility, that is, acquiring liability insurance coverage, is a requirement of active status NAUI membership. (Assistant instructors excepted, see reverse for details).

Submitting this application to NAUI confirms that you have read and agree to the terms of the Membership Agreement below and is binding upon acceptance by NAUI. Per resolution of the NAUI Board of Directors no signature is required.

○ Automatic Renewal
By checking here, your membership will renew in November each year so long as NAUI membership dues do not increase more than six percent of the regular dues per annum. If at any point the increase exceeds six percent, regardless of renewal period, you will be asked to reconfirm automatic renewal participation. The credit card information you provide will be used annually. For complete program details visit www.naui.org.

Lifetime members please check desired status.

○ American Express ○ Visa ○ MasterCard ○ Check#: """" ○ Money Order# " "

CREDIT CARD # EXPIRATION DATE
(3 digit code on reverse of VISA/MC or 4 digit code on front of AMEX)

Cardholder name and signature Date

NAUI Membership Agreement
This agreement is made and entered into by and between NAUI Worldwide and its subsidiary companies, hereinafter referred to as "NAUI", and the membership applicant named above, hereinafter referred to as "I." I hereby declare I have read and I understand and accept the terms of the NAUI Membership Agreement and Renewal Requirements listed below and on the reverse of this application, which includes financial responsibility and professional growth policies. The information I have provided is accurate to the best of my knowledge and belief.

1. I understand that I am not an agent, employee, or legal representative of NAUI.
2. I understand that my NAUI membership is not to be construed as a partnership, joint venture or joint enterprise nor does it establish an agency relationship between me and the Association or its subsidiaries.
3. I understand that my membership renewal is not solely based upon submission of the renewal application and fee (if applicable). NAUI Membership renewal is subject to annual review and acceptance by NAUI.
4. I am expected to pay accounts due to NAUI. Pursuant to the NAUI Bylaws, a failure to pay accounts within sixty days will result in collection proceedings, and potential loss of NAUI Member status.

(Continued on reverse)

NATIONAL ASSOCIATION OF UNDERWATER INSTRUCTORS HEADQUARTERS
P.O. Box 89789, Tampa, FL 33689-0413, Phone: 813.628.6284 Fax: 813.628.8253 Web: www.naui.org

© 2010 NAUI Worldwide
I agree to contact NAUI Worldwide HQ with status changes i.e., address, eligibility, insurance.
A NAUI Member who does not renew his membership annually, loses NAUI Membership, and may have to meet special renewal requirements before renewal will be considered.
I agree to maintain and provide access to any and all such student records as are required by NAUI; original records to remain property of the member or dive facility, and true, accurate and complete student contact information when registering them for certification cards.
I understand that I will be subject to a quality assurance monitoring process conducted by NAUI.
I agree to save and hold harmless NAUI, its officers, directors and assigns for any loss, claim or damage resulting from action, error or omission of me, or my agent, students or assigns.
I agree that if I become aware of any event, act, error or omission that might reasonably be expected to be the basis of a claim or suit against me, or any NAUI Instructor/Leader, agent or affiliate, or NAUI itself, written notice shall be given to the NAUI corporate attorney as soon as practicable and I will cooperate to the best of my ability with said attorney.
I agree to notify NAUI Headquarters if I have previously been convicted of a felony or crime of moral turpitude (i.e., honesty, integrity, morals). Conviction of such a crime may render me ineligible for continued membership, application for membership or renewal of membership.
I agree that I have not previously been or am not currently subject of any investigation, action or proceeding brought by any scuba diving association or organization. Should I become the subject of any such investigation, action or proceeding during the term of this agreement NAUI may, in its sole discretion, suspend my membership pending outcome of the investigation or actions of the Membership Review Process.
I authorize any other scuba diving association or organization with which I am affiliated to release to NAUI any and all records and other information pertaining to any investigation, action, or proceeding involving me.
I understand that NAUI Membership Cards issued by NAUI Worldwide are the property of NAUI and must be surrendered upon request by the Board of Directors or their representative(s).
I understand that use of the acronym/tradename nau, the NAUI Trademarks "NAUI" and "NAUI Worldwide" by NAUI members is subject to the following conditions:
- The acronym nau shall not be used as part of web site URL's or in e-mail addresses such as NAUINstructor.com, naucareer.com, naumember@earthlink.net or other variations.
- The word "member" must appear under the trademark(s) and/or tradename(s).
- The NAUI trademark(s) and/or tradename(s) shall be reproduced as received from NAUI without alteration except for overall sizing. It may not be used within or as a part of any other symbol or mark.
- NAUI trademark(s) and/or tradename(s) shall be used by members only on correspondence or other printed materials or electronic media used to market or promote NAUI courses or programs.
- NAUI trademark(s) and/or tradename(s) shall not be used as part of the sale or manufacture of goods without written authorization from NAUI.
- Use of the trademark(s) on the World Wide Web or other electronic service requires linking to the NAUI web site and such use shall contain written acknowledgment of sole and exclusive ownership by NAUI.
- NAUI may withdraw trademark(s) and/or tradename(s) use permission at any time.
- Misuse of the NAUI trademark(s) and/or tradename(s) violates the NAUI Code of Ethics.

**NAUI Annual Membership Renewal Requirements**

**Instructor**
For Emeritus status, a NAUI Instructor must:
- Maintain a valid mailing address with NAUI WWHQ, and
- Pay applicable dues* and any debts owed NAUI WW
- Submit a NAUI Worldwide Membership Renewal Application.

For Sustaining status, a NAUI Instructor must:
- Maintain a current mailing address with NAUI WWHQ, and
- Pay applicable dues* and any debts owed NAUI WW
- Submit a NAUI Worldwide Membership Renewal Application.

For Active status, a NAUI Instructor must complete all requirements for Sustaining status, and:
- Maintain good health and fitness. Should health changes occur, members must refrain from teaching and supervising diving until they meet NAUI leadership medical requirements for diving.
- Continue professional development each year by earning at least one Professional Development Unit (10 contact hours = 1.0 PDU) in a NAUI approved diving, teaching, boating or business subject.
- Meet Financial Responsibility Requirements:**
- Make at least 12 open water scuba dives and complete at least one of the following:
  - As a candidate, auditor, staff member, or lecturer, participate in a NAUI course.
  - Attend, staff, or lecture at a NAUI IQ or other diving seminar, symposium, clinic, conference or workshop.
  - Be a member of the NAUI Board of Directors or Advisors, a NAUI committee, HQ Staff or a NAUI Representative.
  - Take or teach a course in diving, lifesaving, swimming, first aid, boating, speaking, teaching or a science related to the aquatic environment.
  - Be professionally employed in aquatics, diving, teaching or boating.
  - Complete a postgraduate thesis in a teaching or diving subject.
  - Author a formal paper related to diving which is published by NAUI, an academic journal or national periodical.
- Complete at least one of the following teaching options:
  - Teach a NAUI course and register the students as NAUI divers.
  - Serve on staff and lecture at a complete NAUI training program.

**Assistant Instructors, Skin Diving Instructors and Divers**
Emeritus or Sustaining Status:
- Maintain a valid mailing address with NAUI WWHQ, and
- Pay applicable dues* and any debts owed NAUI WW
- Submit a NAUI Worldwide Membership Renewal Application.

**Active Status**
- Assistant Instructor — assist with at least one complete NAUI course.
- Skin Diving Instructor:
  - Teach or assist with at least one complete NAUI diving course.
  - Meet Financial Responsibility Requirements:**
- Divermaster:
  - Organize and conduct at least two open water dive experiences.
  - Meet Financial Responsibility Requirements:**

**Lifetime Members**
- Pay no annual dues but must complete the current NAUI Membership Renewal Application and apply for their desired status.
- Instructors, Divers and Skin Diving Instructors teaching or supervising U.S., Canadian or Australian citizens are required to have instructional liability insurance, and must:
  - Obtain instructional liability insurance as offered by NAUI or
  - Obtain a similar instructional liability insurance policy and provide a copy of the Evidence of Insurance and policy wording for NAUI’s review and approval. Instructors who are covered by government or private institutional insurance must request in writing an exemption from the insurance requirement. Military personnel who teach diving solely as part of their military duties may be exempted from the insurance requirement by providing a letter from their commanding officer verifying such duty and requesting the exemption.

**Status Changes**
Contact a NAUI Representative or the Training Department at NAUI Worldwide HQ.

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**Electoral Notice**
As you renew your NAUI membership, please take a moment to consider your uniqueness within the diving industry. Only NAUI members have the right to elect those individuals, the NAUI Board of Directors, who speak for them in planning NAUI's future. Review the candidate information and then complete and send your ballot to the Electoral Auditors either by mail, courier or fax no later than the deadline published in the election materials each year.

It is not too early to consider the election for next year. Nominations should be sent to the NAUI Headquarters Election Coordinator no later than March 1 each year and include the nominee's name, NAUI member number and reason for nomination.

**THIS IS YOUR BEST CHANCE TO HAVE YOUR VOICE HEARD. IT IS YOUR RIGHT AND RESPONSIBILITY. PLEASE VOTE!**
New 2010 Guidelines for CPR

New consensus guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care were published in October/November. The 2010 guidelines build upon the previous 2005 International Consensus. They were promulgated following the 2010 International Consensus Conference convened by the International Liaison Committee on Resuscitation (ILCOR) in February in Dallas, Texas. The conference was the culmination of a two-year, in-depth review and evaluation of relevant peer-reviewed articles and studies on CPR.

The conclusions and recommendations of the 2010 ILCOR conference as well as more specific performance guidelines are published in “Circulation” and “Resuscitation,” the journals of the American Heart Association (AHA) and the European Resuscitation Council (ERC). There are links to both sets of reports and guidelines on the ILCOR website: http://www.ilcor.org/en/home/. Consult these AHA and ERC publications, especially the “Guidelines,” for details and rationales for the new CPR protocols.

The strongest emphasis and most of the sections of both the reports and the guidelines concern basic and advanced life support procedures for victims of sudden cardiac arrest; there are significant changes from the 2005 guidelines. Other special circumstances, such as drowning, hypothermia, hyperthermia, and poisoning are covered in a special chapter on “Cardiac Arrest in Special Situations.”

The most significant difference in the basic life support sequence for victims of sudden cardiac arrest is a shift from “A–B–C” (Airway, Breathing, Chest compressions) to emphasizing “C–A–B” (Chest compressions, Airway, Breathing). In the A–B–C sequence, chest compressions are often unduly delayed by the preliminary steps. By changing the preferred sequence—after the initial check for unresponsiveness and absence of normal breathing—to C–A–B, the important chest compressions will be initiated sooner and ventilations only minimally delayed. Also the bystander lay rescuer, who may be unable or unwilling to provide ventilations, is more likely to at least perform chest compressions. Especially in a patient with witnessed arrest, the critical initial elements of CPR are chest compression and early defibrillation. (Chest compressions on an adult are now to be to a depth of at least 2 inches / 5 cm)

For victims of drowning and other likely asphyxial arrest, the situation is different. Respiratory arrest precedes cardiac arrest, and the new guidelines are specific in providing that “it is reasonable for healthcare providers [including lifeguards and scuba professionals] to tailor the sequence of rescue actions to the most likely cause of arrest” (AHA Guidelines, page S642). “The most important and detrimental consequence of submersion is hypoxia; therefore, oxygenation, ventilation, and perfusion should be restored as rapidly as possible” (AHA Guidelines, page S847). In view of the hypoxia, CPR for drowning victims should use the traditional A–B–C sequence. Victims with only respiratory arrest usually respond after only a few rescue breaths.

The new 2010 CPR protocols are in effect now. The details for performance will remain unchanged in relevant NAUI Worldwide materials, e.g., NAUI First Aid and NAUI Scuba Rescue Diver. In the meantime, everyone with an interest in the proper performance or teaching of cardiopulmonary resuscitation where witnessed arrest will be the most likely first aid scenario should familiarize themselves with the relevant guidelines as published by the AHA and ERC and include the modified procedures in their teaching.

Submit your NAUI PDU Quiz Answers Online

Many NAUI members fulfill their annual professional development requirements by completing the NAUI Home Study PDU quizzes that are included in each issue of Sources. Remember, you can send in your answer sheets by using online submission procedure through a web site that Training Ventures has set up. As all your banks and vendors say these days: Go Green, Go Paperless!

To use this service, simply log on to http://pdus2u.com and follow the instructions you will find there. You can submit answers for up to five PDU quizzes at a time.

Complete the front page personal information, choose which Sources quiz you are answering, and click the radio buttons to answer the quiz questions. Be sure to review your answers for correctness. Clicking the “submit” link will take you to the payment page.

Training Ventures’ fee for grading your answers and submitting your Professional Development Units to NAUI Worldwide is only $6.00 US per quiz. Payment may be by PayPal or credit card.

Training Ventures will score your quiz, notify NAUI of the appropriate PDUs, and e-mail a transcript to you.

The prior mail-in submission remains possible, but you will find the new online system an convenient improvement.
Do birds blow up from eating rice thrown at weddings? That's easy to spot as a myth. You just observe that birds regularly eat raw rice in the wild in rice paddies. Some popular myths about people breathing oxygen are as easy to understand, by actual observation.

Does breathing 100% oxygen help football players? Help hangovers? Help migraines? Make you feel good during hyperbaric therapy? Make you feel good after nitrox dives? Help libido? All the statements are myths except one.

**Oxygen Myths**

**Football.** You may see or hear about football players breathing 100% oxygen believing it will help athletic performance and recovery. Short athletic events like sprinting and tackling don’t need oxygen, they use fuel stored in your muscles. These events are, for that reason, called anaerobic. Oxygen supplementation only minimally increases blood levels since your blood already carries almost all the oxygen it can hold and unless you are very ill or at altitude, your blood oxygen levels stay almost completely saturated. Any small increase in blood oxygen saturation with bottled oxygen will be gone by the time players get back to the field and aligned in formation.

Several studies substantiate oxygen’s lack of effect before or after short intense efforts. One such study by the Department of Internal Medicine at Baylor University was reported in the *Journal of the American Medical Association*. Researchers found no advantage of breathing 100% oxygen on recovery from exhaustive bouts of exercise, no difference in performance during a second bout after breathing 100% oxygen, and that the professional athletes who served as subjects could not identify whether they were breathing 100% oxygen or room air. In other studies, a percentage of subjects who were told they were breathing oxygen but received room air reported elevated mood.

**Hangover.** Anecdotes circulate about people trying to alleviate hangovers with oxygen. Understandably, people will try just about anything. However, oxygen does not influence the course of a hangover. You oxidize alcohol at the rate of only five to ten milliliters per hour (5-10 ml/h) no matter what you do. You can’t change that rate with coffee, showers, fresh air, or oxygen.

Oxygen’s lack of effectiveness against alcohol after-effects has been demonstrated experimentally, and is so well established that oxygen is used as a placebo in studies of alcohol withdrawal treatments.

**Headache.** One of the mechanisms proposed for at least one stage of migraine and cluster headache is enlarged and inflamed brain blood vessels. The most common therapies involve vasoconstricting pharmaceuticals, ice hats, and oxygen. Breathing 100% oxygen constricts brain blood vessels. Hyperbaric oxygen therapy has been under investigation for years for effects in aspects of some kinds of headache.

Migraine and cluster headaches are distinct from alcohol hangovers. However, of the classic food triggers for migraine, two are...
red wine and beer. Substances that sometimes trigger or aggravate cluster headaches include those that enlarge blood vessels, like alcohol. The resulting headache often takes a day to bloom. Oxygen has no effect on the hangover but may relieve the migraine or cluster bomb that was confused with, or appeared concurrently with a general hangover headache.

**Hyperbaric Treatment.** Divers receiving treatment in a hyperbaric chamber for various illnesses or diving accidents are often puzzled when the happy feeling they expect never comes. Some ask when they will start their “high.” It’s an apparently common misconception that hyperbaric oxygen treatments influence mood. A possible clarification is that sickness or injury compromise your oxygen carrying and delivery system and make you feel ill, and decompression sickness causes pain and other effects. Physical feelings of wellbeing, and, consequently spirits, improve after treatment restores adequate oxygenation or relieves decompression symptoms.

**Nitrox Diving.** Some divers using oxygen enriched air or nitrox, report feeling better after dives than after comparable profiles on regular compressed air. An underlying factor may be decreased nitrogen, not increased oxygen. With Nitrox, the proportions of both oxygen and nitrogen are altered. Beware of automatically crediting only the change in oxygen with your results.

Regular compressed air diving also dissolves more oxygen in your body than occurs from breathing at the surface. If you enjoyed the dive, you may have high spirits, but not specifically from increased oxygen partial pressure.

Why do some people say they feel better with oxygen-enriched air? High nitrogen burden has been speculated to be one of the culprits in fatigue after dives. Extreme fatigue is sometimes classed as a subtle indicator of mild decompression illness. Reducing nitrogen burden reduces likelihood of nitrogen related fatigue.

**Libido.** There is no evidence of any physical aphrodisiac capability of oxygen for someone of general good health. That doesn’t mean that you don’t feel good at the idea of an interpersonal event. Just that you are probably doing the effect yourself, not through use of supplemental oxygen.

**Oxygen Facts**

Scientific inquiry so far agrees that breathing supplemental oxygen benefits athletic performance if breathed during long duration heavy exercise. Heart rate and blood levels of lactic acid decrease, and time to exhaustion during treadmill tests increases.

Carrying oxygen tanks while jogging or hiking presents practical problems. If you want to get more oxygen to your cells for greater long distance ability, there is an inexpensive practical way to do it yourself. Regular aerobic training enhances your body’s entire oxygen carrying and using system.

Oxygen is good, no doubt. Many purported properties are fiction. Now you know them. Some are real. With regular exercise, you will have greater oxygen-carrying and delivery system built in to your own body with many healthful effects. You can feel good about that.

Dr. Jolie Bookspan is the author of Diving Physiology in Plain English, the Board Exam guide books in hyperbaric medicine for physicians, chamber nurses and technician, and other health and medical books. More about diving medicine and physiology on the author’s web site
Mixed Gas Diving: Breathing Mixtures

By Tim O’Leary, NAUI 10144

All breathing mixtures other than air attempt to optimize the fractions of gas within the mixture in order to maximize the reduction of physiological insult with respect to four critical physiological factors for the diver.

The first factor would be for an optimal gas mixture to reduce or eliminate the negative effects of inert gas. This would include nitrogen narcosis as well as the high pressure nervous syndrome (HPNS). The second factor would be to maintain sufficient oxygen levels throughout the dive in order to both accelerate decompression and reduce the dangers associated with high partial pressure oxygen. The third factor with an optimal gas mixture would be to facilitate and/or accelerate off-gassing. The fourth factor would be to minimize the work of breathing (WOB) and reduce carbon dioxide build up.

This has always been and will likely remain a physiological balancing act between oxygen and the inert gases (the diluents) used in the mixture. This is done by selecting the appropriate fractions of gas for the exposure and workload for the diver as well as the gas switches that must be made during the dive operation in both the descent and ascent phase of the dive.

There are a variety of special gas mixtures that have been and are being used in diving today, and in all cases the diver must track Oxygen Tolerance Limits (OTL) and Oxygen Toxicity Units (OTU) more closely during his/her pre-dive planning.

Terms applied to standard gas mixtures include:

1. Nitrox is a mixture of air and oxygen providing a reduction in the amount of nitrogen in the breathing gas. Reducing the amount of nitrogen in the breathing mixture addresses some of the problems caused by hyperbaric nitrogen.

2. Technical nitrox means nitrox that is being used to extend time and depth beyond traditional recreational limits. Examples would be using an EAN28 mix for a dive to 140 fsw (43 msw), or nitrox used as a travel gas (to or from a depth where trimix is being used) or a stage gas: for example, using EAN50, as a decompression gas at 70 fsw (21 msw) or a high FO2 nitrox, such as EAN40 or EAN50, used for bottom gas.

Technical nitrox requires a higher level of dive planning than the traditional nitrox role.

3. Heliox is a mixture of helium and oxygen. There are a number of standardized military and commercial tables that have been available since the mid-1960s for heliox applications.

4. Trimix is any mixture of oxygen, helium, and nitrogen. It was first developed to reduce the effects of HPNS for deep commercial diving applications by adding small fractions of nitrogen into the more standardized heliox mixture. Sport divers first began partial pressure blending oxygen, helium, and air for special gas mixtures in the early 1990s. With the advent of less expensive mixing panels and boosters, special mix technology is becoming more commonplace.

5. Heliar is a mixture of air and helium producing a trimix of oxygen, nitrogen and helium. Heliar mixtures began appearing in the sport diving community in the 1980s as it was practical and less expensive to partial pressure fill scuba cylinders with helium and then stack air on top to produce common mixes. The usual mixtures were 16% O2/24% He/60% N2, 14% O2/33% He/53% N2, and 10% O2/50% He/40% N2.

6. Helitrox is a hyperoxic mixture of nitrox and helium producing a trimix of oxygen, helium, and nitrogen where the fraction of oxygen is greater than 21%. The applications began in the late 1990s with the advent of less expensive boosters and entrainment mixing systems for nitrox.

7. Hydreliox is a mixture of hydrogen, helium, and less than 4% oxygen (due to flammability) and was first used by COMEX in the commercial community. Hydrogen is easiest to breathe because it is lighter than helium, permitting nose breathing deeper than 1500 feet (457 meters). It acts to relieve high pressure nervous syndrome (HPNS), but when deeper than 500 feet (152 meters) hydrogen narcosis produces psychotropic or hallucinogenic-like effects similar to LSD. This gas is no longer used in commercial diving applications; Remote Operated Vehicles (ROVs) are now used in lieu of sending divers to depths greater than 500 feet.

Applied Gas Concepts for Optimal Mixtures

There are important formulas for determining the best gas mixtures for a given dive. They can be modified in various ways to express...
or solve for a given variable (such as Depth or Pressure).

Determining Gas Pressures for Special Mix Technology:

This is a mnemonic diagram that can be used to set the formula for determining pressures and gas fractions for a mix. In this case, the general formula \( P_g = F_g \times P_{total} \) has been set up to determine information about the oxygen in a mixture (\( P_{O2} \) = partial pressure of oxygen; \( F_{O2} \) = fraction of oxygen in the mix; \( P_{ata} \) = total pressure of the gas mixture). The diagram is used by covering the quantity to be determined.

To determine the absolute pressure at which a mix would reach a \( P_{O2} \) of 1.4 ata, cover \( P_{ata} \), and the horizontal line then means that the \( P_{O2} \) (1.4 ata) is divided by the \( F_{O2} \) of the mix (such as 0.21 [air] or 0.32 [EAN32]) to find the applicable absolute pressure. This absolute pressure can then be converted to a depth using:

\[
D_{fsw} = (P_{total} - 1 \text{ atm}) \times 33 \text{ fsw/ata}.
\]

\[
D_{msw} = (P_{total} - 1 \text{ atm}) \times 10 \text{ msw/ata}.
\]

A similar diagram can be drawn for nitrogen or any other gas in a mixture.

Maximum Operating Depth

The maximum operating depth is always calculated to assure that the diver does not exceed his/her \( P_{O2} \) limit as well the PN\(_2\) narcosis limit.

The bottom mix oxygen partial pressure limits have been reduced over the years from the NOAA limit of 1.6 ata to the current NAUI limit of 1.4 ata. It is important to remember, however, that these are limits that run through a physiological grey area that includes the increase of carbon dioxide and cold water exposure as well as some other minor factors. Remember, too, that the major factor is individual susceptibility or variation, and this is a subject that we know little about. There are no prescribed predictors for individual susceptibilities to oxygen toxicity, which can vary at different times. So we come to the risk/benefit analysis. What benefit does the diver receive by diving to the limit versus the risk associated with CNS toxicity?

A Maximum Operating Depth is always calculated to assure that the diver does not exceed his/her set \( P_{O2} \) limit of 1.4 ata for bottom gas.

The MOD for oxygen can be determined by:

- Using an MOD chart.
- Using the OCEANx calculator
- Using the MOD formula

The MOD formula determines the absolute pressure at which the set \( P_{O2} \) limit will be reached using:

\[
P_{[total]} = \frac{P_{O2}[\text{limit}]}{F_{O2}}
\]

and converting that pressure to a depth using:

\[
D_{fsw} = (P_{total} - 1 \text{ atm}) \times 33 \text{ fsw/ata}.
\]

Or

\[
D_{msw} = (P_{total} - 1 \text{ atm}) \times 10 \text{ msw/ata}.
\]

Let’s look at the MOD limits for nitrogen.

In 1935, U.S. Navy physicians Albert R. Behnke, Robert M. Thomson, and E. Preble Motley noted that changes in behavior, impaired neuromuscular coordination, and slowed mental activity had been reported in divers deeper than 66 fsw (20 msw), and...
using subjects breathing air at four atmospheres of pressure in normal surroundings (a warm, well-lighted hyperbaric chamber) they were able to demonstrate that these changes were due to the nitrogen. When diving one can add the factors of carbon dioxide buildup, workload, water temperature, visibility, etc., but once again the unpredictable factor is the individual susceptibility.

As technical divers, we must once again look at the risk/benefit to the allowable Equivalent Narcosis Depth or nitrogen partial pressure. Lowering the fraction of nitrogen within the gas mixture is always a plus for lowering the narcosis level during the operational phase of the dive. Some later tests indicate that a nitrogen partial pressure of 3.18 ata (100 fsw/30 msw on air—the study depth of Behnke et al.) is the threshold at which all divers begin to experience some level of narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis. Whatever limit you choose, it should be less than a PN2 of 4.0 ata, but a lower narcosis.

Example: A diver would like to find his/her optimal gas mixture for a dive to 150 fsw (46 msw). The dive will be based on a maximum PO2 of 1.4 ata and a maximum PN2 of 3.2 ata.

Imperial units:
P ata = (D fsw/33 fsw) + 1 ata
(150 fsw/33 fsw) + 1 ata = 5.54 ata

For a PO2 of 1.4 ata
FO2 = PO2 / Pata
1.4 ata / 5.54 ata = 0.25 or 25% O2

For a FN2 of 3.2 ata
FN2 = PN2 / Pata
3.2 ata / 5.54 ata = 0.57 or 57% N2

Total gas pressure (100%)-(FO2 + FN2)=FHe
100% - (25% + 57%) = 18% He

Metric units:
Pbar = (D msw/10 msw) + 1 bar
(46 msw/10 msw) + 1 bar = 5.6 bar

For a PO2 of 1.4 bar
FO2 = PO2 / Pata
1.4 bar / 5.6 bar = 0.25 or 25% O2

For a FN2 of 3.2 bar
FN2 = PN2 / Pbar
3.2 bar / 5.6 bar = 0.57 or 57% N2

Total gas pressure (100%)-(FO2 + FN2)=FHe
100% - (25% + 57%) = 18% He

Equivalent Narcosis Depth
The formula for Equivalent Narcosis Depth (END) is analogous to the formula for equivalent air depth, but the fraction of nitrogen is now the basis—established by subtracting the fraction of both the oxygen and the helium in the mix.

Imperial formula:
END=[(1 – (FO2+FHe)) x (Depth + 33 fsw)]/33 fsw
0.79

Metric formula:
END=[(1 – (FO2+FHe)) x (Depth+10 msw)]/10 msw
0.79

Helium Gas Divin g
Helium diving is not difficult to learn. In fact, learning how to use helitrox (hyperoxic trimix with reduced fraction of nitrogen) is very similar to learning how to use nitrox. Everything you know about oxygen and nitrogen still applies; you need only factor in the helium. Much like nitrox, helitrox is not a deep-diving gas. It is used only in moderate depths and in the shallows where reduced nitrogen levels are desirable. The mix is widely used as a diving gas to 150 fsw (46 msw), as a travel gas for deeper diving, and as a bailout and decompression gas.

Although helium diving is somewhat more expensive than diving air, the benefits it brings with deeper diving far outweigh the cost. As previously noted, some of the benefits and considerations would include:

- With the added helium, you can reduce the signs and symptoms of narcosis as helium is 1/4 as narcotic as nitrogen
- The added helium with its properties requires very careful planning and a strict compliance to the plan.
- The smaller helium molecule is less soluble and will ongas and offgas 2.7 times faster than nitrogen.
- For longer bottom times and extended range, the lesser solubility of helium is a dominant factor in gas build up and outperforms nitrogen in staging a deep dive.
- Skills in carrying multiple cylinders (back gas and a stage bottles) and in buoyancy/trim are essential, as helium diving usually involves some staged decompression obligation.
- The smaller, lighter molecules of helium also allow the breathing gas to be less dense and easier to breathe at depth.

Some of the disadvantages of diving helium-base gases would include:

- The cost of obtaining trimix.
- The amount of time required to plan for a deep trimix dive.
- The diver must be a much more skilled waterperson.
- Making exact staged-decompression stops will require fine-tuned buoyancy control.
- The higher the fraction of helium coupled with the deeper depth of the dive may require team-based diving.

Mixed gas diving can be a rewarding adventure for those who choose the dedication and discipline to do it right.
Cold Water Diving: An Introduction to Ice Diving
By John Heine, NAUI 5924

Cold water and ice diving can be extremely challenging and rewarding experiences for the adventurous diver. Diving in these environments requires thoughtful planning, preparation, training, and the utmost dedication to safety. The rewards are many, including excellent water visibility, having a calm surface platform to work from, the sense of accomplishment by performing an extreme challenge, and the enjoyment of being outdoors in cold weather.

Cold water diving is defined as diving that takes place in water that is below about 40°F (4.5°C). Many lakes and ocean regions have water temperatures this low in seasons other than winter. While this is obviously not freezing water, it is sufficiently cold to require special thermal protection and regulator care. Hypothermia and equipment malfunction are special risks associated with cold water diving. Considerations for low surface temperatures, thermal stress, equipment malfunction, and logistics increase the complexity of this special type of diving.

Diving under ice is a special situation that increases the dive complexity, with the presence of a ceiling overhead for divers. This requires a team of surface tenders and special procedures to ensure that divers are able to return to the entry hole, as well as deal with any emergencies that might arise.

Ocean temperatures can be extremely variable, depending upon such factors as latitude, climate, winds, and currents. Some areas show quite a remarkable seasonal pattern in temperatures, while others, especially in the far northern and southern oceans, have a more stable cold water environment. In the Arctic regions, new ice forms in the winter and melts during the following summer. In the Antarctic, the same happens, but the seasons are reversed, and new ice generally forms in March-November (the austral fall and winter) and melts in December-February (the austral summer), although this is highly variable depending on the latitude and weather.

Fresh water is at its maximum density at a temperature of 39°F (4°C). When this happens at the surface, this water sinks, displacing warmer water to the surface, where it becomes chilled. This continual mixing occurs, and the colder, less dense surface water freezes and floats on the surface.

Seawater will freeze at a lower temperature than fresh water, due to its salt content. At a temperature of 28.6°F (-1.9°C), small crystals called “frazil” begin to form. The dissolved solids are excluded from the frozen crystals, so that sea ice with lower salinity will float on the surface. If conditions are calm, the slushy sea ice will form into a thin frozen sheet. Wind and wave action can break this up into pancake ice, which are small disks of ice about 1-3 feet (0.3-1 m) in diameter. With further freezing, these disks can join together to form floes. Pack ice can be up to 6 feet (2 m) thick. Multi-year ice can be up to 12-20 feet (4-6 m) thick.

For further reading and complete procedures see:

On a recent ship delivery to Brazil, everyone in the wheelhouse, myself included, believed that something was wrong with the navigation equipment. After coming down the Gulf of Mexico from western Louisiana, through the Yucatan Channel, rounding the west coast of Cuba, heading east across the Caribbean through the tail end of Hurricane Tomas and a nasty side sea, when everything worked just fine, the plotter and GPS went screwy after passing through the Galleon Passage between Trinidad and Tobago.

Of course, we have several GPS receivers aboard, and I routinely carry a handheld battery operated backup offshore, but they were all wrong on that last leg. No matter what we did, we kept drifting off the course line. I recalibrated all the GPS receivers. I reset and recalibrated all three gyro compasses, and waited a day for them to resettle, and checked them and the compasses against solar azimuths to make sure they were right, and they were, and we weren’t! We were still drifting off, and at every change of watch, oncoming crew or off-watch personnel had to redraw the course line, set a new course, and get us back on track.

Now, I’d come aboard after the original captain of the trip had set everything up, became ill, and had to be replaced. But the third man in the wheelhouse had been aboard throughout. He’d been there when the trip was planned, when the original publications and charts were laid out, waypoints set and loaded. An experienced person with thousands of sea miles behind him, including a recent trans-Atlantic trip from Africa to South America, and author of a custom designed navigation spreadsheet, his competence was evident. Still, after exhausting all of the possible vessel-related errors in the instruments, the only thing left was to go back to the original plot.

Checking the chart, the pencil work was impeccable, clear, and authoritative. Neatly laid out, the waypoints appropriately labeled, the morning’s report was going to have to include a request to be met by an electronics technician the following week when we were set to make port to sort out the problem.

Then, I took the dividers and triangles, and just for the hell of it, re-plotted the waypoints, and compared my numbers to those he’d written down, and we’d programmed into the plotter. On this leg, although we were going to the right point on the chart, the latitude and longitude plotted and entered were wrong by about 50 miles, the source of the difficulty holding the vessel on course over the prior 400 nautical miles, crossing the east coast of Venezuela, Guyana, Surinam, French Guyana, the mouth of the Amazon and the Equator. It wasn’t the current, the alluvial delta, the rivers, the satellites, magnetic or celestial anomalies, electrical issues, the weather or the seas, or data entry; it was once again a simple human error with a pretty low tech implement: a pencil. And it was a mistake with latitude and longitude, the difference between which narrows to nil when on the equator. Here’s why.

We all know we live on an oblate spheroid. For the convenience of navigation, and without getting into all of the different kinds of ingenious cartographical solutions to presenting the irregular world in an easily understood two dimensional fashion on a nautical chart, or any map for that matter, the most fundamental grid system we use is based on latitude and longitude.

Latitude is the distance north or south of an arbitrary line drawn horizontally around the center of the world (not New York!), called the Equator, “Q.” Longitude is the distance east or west of another arbitrary construct, the Prime Meridian, a vertical line drawn between the geographic north and south poles, through Greenwich, England, site of a famous observatory in the western nation that codified the modern grid system in its quest for trade, treasure, and territory—a byproduct of which is our country. Other systems existed before, and do now, but latitude north and south, and longitude east and west, are the most widely used for terrestrial navigation purposes.

Since the basic reference points are arbitrary, one might think that they could be anywhere or anything, but because a system of measurement for distance was required, there had to be a rational, consistent means of determination. Simply, a nautical mile needed to have some standardized reasoning behind it; it had to represent something that could be inferred reliably from the world. Not having standardized measurements would be chaotic, butcher’s
thumbs on scales notwithstanding. What if a bar of pressure was different everywhere? In boating, latitude and longitude are that fundamental.

The solution was to relate the earth’s girth at Q to the standard geometric figure it most, though not exactly, resembles—the circle. So, since a circle is divided into 360 degrees, longitude to either side of the prime meridian totals 180 degrees. On the other side of the earth, the prime meridian, the vertical slice going through Greenwich and the poles, is called the International Date Line, a fine example of eurocentrism—you couldn’t have crossing the street in an English town be a trip to another day, but you can sail from today to tomorrow or yesterday by tacking across the dateline depending on the direction you were traveling, east or west.

Coming up with that was a function of relating the passage of time, specifically the 24 hour day to longitude. In fact, it’s why it’s evening in London as I write this in the afternoon in East Hampton. Since the sun rises in the east, day broke in England hours earlier there. How many hours relates to what we know as time zones, simply slices through the earth that represent the passage of the sun over the earth in one hour at the equator. 24 zones around the globe, around 12 hours of daylight on each side at the prime meridian and the date line.

These meridians, the vertical lines on the globe, converge at the poles, but remain nicely evenly spaced at Q. So dividing the degrees into 60 minutes, as mathematicians have been doing since Ptolemy and before, and dividing that into the circumference of the world, we wind up with a standard nautical mile that is somewhat similar to a statute mile, but about 15% longer: 6,076 feet (1,852 m.) as opposed to 5,280 feet (1,609 m.). That’s it: the standard measure of distance in most two dimensional navigation at sea.

The problem is how to figure the north and south distances or even the easts and wests, realizing that meridians converge at the poles. If you look at the globe, you’ll notice that there are lines of latitude drawn on most that are standardized. Slicing planes through the earth horizontally, parallel to Q, these lines are the touchstone for distance on nautical charts. The only time a minute of longitude, the standard as we’ve seen, is equal to a minute of latitude is at the equator. North or south towards the poles, the minutes of longitude in distance are shortened by meridian’s converging at the poles. As a result, the regular horizontal parallels on any chart, each minute equaling one nautical mile as standardized at Q, or a provided scale, are the only things to use to measure distance on a nautical chart.

Mariners say, “a mile a minute” (of latitude) to remember to use the latitude scale when measuring, and unless using the smallest scale charts, the lat/lon grid system appears to be a windowpane. (On really small scale charts, everything is curved, and the projection or mapping system used to flatten the earth out (sic) is often different.) And thus, starting your measurements significantly off the equator can really screw you up when you get there, or cross it. It can make you lose sleep, at least, or lose a big ship if you’re not careful. As with diving, make your own plans every time…

I reset and recalibrated all three gyro compasses…and checked them and the compasses against solar azimuths to make sure they were right, and they were, and we weren’t!

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### Two New Instructors and an IT/CD for Massachusetts

Pictured left to right at the Bay State Council Dive Outing in Gloucester, Massachusetts, are: Mike Lodise (NAUI Instructor/ICC Staff Support), Henry Veix (Course Director), Peter Buston (new NAUI Instructor), Ted Manney (New NAUI Instructor), Vin Malkoski (New NAUI Instructor Trainer/Course Director). Not pictured: Alex Dulavitz (NAUI Course Director/Staff Support).

NAUI Course Director Henry Veix has always found multi-level training programs to be an effective and efficient use of time, as well as providing practical experience at the required levels of training. Thus, when he received a request from two instructors for an ICC Program and another request from a former NAUI IT/CD for an upgrade to his former level of recognition, it was a no-brainer to combine the training into a comprehensive program for all three candidates. The result—two new NAUI instructors, Peter Buston, a biology professor at Boston University, and Ted Manney, a marine biology instructor at Salem State University, plus an additional NAUI IT/CD Vincent Malkoski, a senior marine fisheries biologist with the Massachusetts Division of Marine Fisheries for the New England area. All of these programs were conducted and coordinated, under the supervision of NAUI Regional Representative Angelo Fiore.

### Newest NAUI Member for New England

Will Goldenheim, the newest NAUI instructor in New England is flanked by Course Director Fred Calhoun (left) and Instructor Trainer Peter Donahue (right). Will just completed his instructor course on December 5 in Gloucester, Massachusetts. We welcome him to the NAUI family.

### ITW Held in Orlando, Florida, for Two World Travelers

Pictured left to right: Chad Barbay, Anita Laurence, Dave Laurence.

Chad Barbay, NAUI National Territory Manager, hosted an ITW for Dave Laurence of Alaska in Orlando, Florida. Dave Laurence, a long time NAUI Instructor, and his wife Anita have left Alaska and are currently outfitting their 43-foot sailboat in Florida. When the boat is complete they will begin a lifetime dream of sailing around the world and hosting diving classes for friends from the United States and whomever else their marketing efforts may bring them. They will start in the Caribbean and eventually end up in the South Pacific. Dave completed the ITW and has already begun training instructors. His wife Anita is completing her Master Scuba Diver course and will begin working on her NAUI Instructor rating. Anita participated in the ITW in order to help prepare her to become an instructor. The classroom was hosted by DAYO Scuba of Winter Park, Florida. You can follow Dave and Anita’s adventures when they begin at www.artfulwater.com.

### Two New NAUI Instructors in Honduras

Pictured left to right: Course Director Dr. Jami Betbeesepstein, new NAUI Instructors Megan Schlobohm and Ernie Schlobohm.

Ernie and Megan Schlobohm became NAUI instructors in October, one year after they arrived in Honduras. Ernie is a boat captain on a private yacht and Megan is the chef. The couple will be working on their own charter boat in the British Virgin Islands in 2011.
NAUI Grows in Georgia

NAUI has four new Instructors in Georgia. NAUI Course Director Chris Richardson, NAUI 17055, recently completed a course for three full Instructor Candidates and one Crossover Candidate in Macon, Georgia. Capt. Michael Dick and Scott Boyd will be using their new expertise with the Savannah, Georgia, Fire Department where they are currently Instructors for the Savannah Fire Department’s Swift Water Rescue Team. Alan Beasley and Daniel Covey will be teaching in the central Georgia region.

NAUI Tec Invades Chile

From left to right: Alejandro Pena, Patricio Barna, instructor Peter Den Haan, Santiago Gutierrez, and Eduardo Merry.

Peter Den Haan conducted the first ever NAUI Tec Inspiration/Evolution Rebreather Course in Chile, South America, at Diving Services, a commercial Diving Company located in Valparaiso near Santiago. The course was organized by the owner and Navy commander Alejandro Pena, who received his MK 16 CCR training with the US Navy. Alejandro will be coming to the U.S. to start his NAUI Instructor training with Den Haan to be completed in March in Chile.

All the students enjoyed the NAUI training and plan to continue on with Mixed Gas training after meeting the required hours.

ITW and ITC in Coeur d’Alene, Idaho

Left to right: New NAUI Instructor Dallas Thomas, new Instructor Trainer Jim Flodin, Melissa Flodin, and Course Director Matthew Den Haan.

Jim Flodin, NAUI 47268, completed his NAUI Instructor Trainer Workshop, making him the only current NAUI IT in Idaho. Jim and Melissa Flodin are the owners of NAUI Pro Gold Center: Diverswest in Coeur d’Alene, Idaho. Dallas Thomas, NAUI 45916, from Alberta, Canada, completed his ITC bringing NAUI’s high standards to Anderson Aquatics in Lethbridge, Alberta. Matthew Den Haan, NAUI 45155, who is the owner of Northwest Sports Divers in Linwood, Washington, was the Course Director.

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A New Generation of Instructors at Hart House

The torch has been passed to a new generation of NAUI Instructors at Hart House, University of Toronto, Ontario, Canada. On September 26, five new NAUI Instructors were welcomed to the NAUI family where they will continue the tradition of NAUI instruction at the Hart House Scuba Club. Instructor candidates Courtney Gibson and Sarah Gibson were joined by crossover candidates Sharon Reid, David Reid, and Martin Bonert. All successfully completed requirements to become NAUI instructors. This distinguished group will represent NAUI well in the Toronto metropolitan area. The NAUI ITC/ICC was led by NAUI Course Director Dallas Edmiston, along with the staff including Darryl Edmiston, NAUI 19630, Linda Edmiston, NAUI 44163 and Rebecca Metcalf, NAUI 32766.

Old-style ITC held in Pullman, Washington

The ITC was a traditional 10-day program in Washington last August. The first half of the ITC was held in Pullman, where most of the academic portions and all of the confined water work were completed. The course then moved to Potlatch on Hood Canal where the academics were finished and open water sessions conducted. The ITC was sponsored by Clearwater Scuba of Pullman, Washington. Barry Moore, owner of Clearwater Scuba, runs the scuba program at Washington State University and at the University of Idaho in Moscow. Staffing the ITC were Jim Larsen, Course Director, Barry Moore, Ariel David, Preston David, David Sancewich, Tom Hemphill, and Dennis Lucia. All three candidates are students at Washington State University.
NAUI IQP Held at Bill Jackson’s, Pinellas Park, Florida
Left to right: Rocky Welch (NAUI Instructor Trainer), Bill Monroe (new NAUI Instructor), Chad Barbay (Course Director), Doug Jackson (NAUI Instructor Trainer) and Mike Love (NAUI Instructor Trainer).

Congratulations to Bill Monroe — NAUI Instructor 50805! Bill completed his instructor certification at Bill Jackson’s Shop for Adventure in Pinellas Park, Florida, on October 14th. Bill is an employee of Bill Jackson’s and has been doing his NAUI intern training for more than a year. Bill did great in his NAUI IQP and will be a big asset to NAUI and Bill Jackson’s.

Diving Academy in Romania Conducts First NAUI DM Course
In October and November, Diving Academy in Bucharest organized its first NAUI Divemaster Course. The course was conducted by NAUI Instructor Dan Croitoru (NAUI 51646). The two participants, Rares Gheorghe and Andrei Babyas successfully solved many difficult situations during the confined water sessions and open water sessions. The practical application dives in November were held in the Black Sea. After two diving days with very good visibility at the dive sites known as Capul Turcului in Eforie Sud and Digul Spart in Mangalia, there followed the real challenge—dives inside the bay of Agigea Harbor with barely 3 meters of visibility.

Buffalo, New York, has Three New Instructors
Left to right: New NAUI Instructors Jerry Czebiniak, John Coddington and Michael Hanchak.

On November 7, Instructor candidates Jerry Czebiniak, John Coddington, and Mike Hanchak successfully completed their ITC, and NAUI gained three new members. Course Director, Dallas Edmiston, NAUI 4099, along with staff instructors of Linda Edmiston, NAUI 44163, and Darryl Edmiston, NAUI 19630, conducted the course. All three new instructors are anxious to begin teaching students at Discover Diving located in Buffalo, New York. We welcome them to the NAUI family.

Green Diver Initiative is a Sponsor of Trashy Diver Contest
The NAUI Green Diver Initiative, Roddenberry Dive Team, and the Island of Oahu are combining forces to sponsor the “Trashy Diver” Contest. The kick-off for the contest was held in Oahu right after the DEMA Show in Las Vegas. Patrick Price of Pearl Harbor Divers in Honolulu attended to represent the Green Diver Initiative. The contest will run similarly to the NAUI Just Dive Photo Contest, but with a twist: Participants will submit photos of trash they have removed from the aquatic environment. Each photo of removed trash will be an entry in the contest. Monthly prizes will be given by the Roddenberry Dive Team and the Green Diver Initiative. At the end of the year, a Grand Prize will be awarded, which will include a five-night stay in Oahu. Look for additional details in the next issue of Sources and in your NAUI e-mail communications.
Left to right: Mike van Niekerk (NAUI Representative), Johan Jacobs (New NAUI Instructor), Werner Jansen van Rensburg (Course Director), Wayne Roberts (New NAUI Instructor).

Left to right: Back row: Ruan Viljoen (Staff), Ileen Eloff (New NAUI Instructor), Kieran Ennis (New NAUI Instructor). Front Row: Karen Tredger (Course Director) Rene Viljoen (Instructor Trainer).

Left to right: Charl Viljoen (Course Director), Billy Engelbrecht (New NAUI Instructor), Karen Engelbrecht (Staff).

From left to right: New Course Directors Dylan Johnson and Patrick Price with Peter DenHaan.

Dylan Johnson and Patrick Price, owners of Pearl Harbor Divers, Honolulu, Hawaii, successfully completed their Course Director Workshop with Peter DenHaan. They are quickly becoming a major NAUI presence in Hawaii and presently are conducting their second ITC with two candidates in less than six months. Considering that the weather is warm all year round, they plan to be a NAUI destination center for training instructors. Their motto is that NAUI trains Astronauts.
Woke up. Ate breakfast. Walked to the ‘office’. Greeted my students. Went scuba diving. Saw tons of fish… and they call this work!? 

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The results are in for the annual "Just Dive" photo contest! Thanks to all who participated for sharing your amazing photos and incredible stories of how you are living and loving the "Just Dive" lifestyle! Your photos about exploration, friendships, memories, and experiences were incredible and great examples of why we are divers! Judging was extremely difficult due to the number of wonderful photos that we received. If you didn’t win this year, look for the 2011 “Just Dive” Photo Contest and enter again!

NAUI thanks the following diving companies for their generous prize donations and for their support of the "Just Dive" lifestyle: Alton’s Dive Center, Atomic Aquatics, BARE Sports, Blackbeard’s Cruises, Ikelite, Kosrae Nautilus Resort, Roddenberry Dive Team, St. Moritz Watch Corp., Sea & Sea (TUSA), and Stuart’s Cove Dive Bahamas. Please support them whenever possible!

2010 Contest Prizes!
- Weeklong SCUBA Adventure aboard Blackbeard’s Cruises!
- Five nights and 3 days of diving at the Kosrae Nautilus Resort in Micronesia!
- 3 Days of 2 Tank Dives for 2 plus Sea & Sea Point & Shoot rental (one-time) for 2 from Stuart’s Cove Dive Bahamas!
- Momentum Dive Watch by St. Moritz Watch Corp!
- YS-O2 Lighting Package from Sea & Sea!
- Six (6) PC Series LED lights from Ikelite!
- Atomic SubFrame Mask, Atomic SplitFins and Atomic SV1 Snorkel from Atomic Aquatics!
- 3/2 Velocity Wetsuit from BARE Sports!
- NAUI Scuba or Advanced Course for 2 or 10 Dives for 2 from Alton’s Dive Center in Utila, Honduras!
- Each category winner will receive a Roddenberry Dive Team Membership!

And the winners are....
Best Overall Photo capturing the "Just Dive Lifestyle": HSU Night Dive by Richard Alvarez
Best Aquatic Life: Peek-Boo by Hilliard Dean
Best Dive Site: Little River by Brandon McWilliams
Best Sense of Humor: Diving in the Rain by Karl Anderson

Best NAUI Product: Diving with NAUI by German Ayala
Best Diver Shot: Posing by Paul Lipsky

Honorable Mention: Island Diver Sunset by William Goodwin
The 14th NAUI Brazilian Instructors Meeting happened in Jundiaí, São Paulo state, on August 18th to 22nd, 2010. Each year NAUI Mercosul gathers NAUI Instructors from all over Brazil for their Encontro NAUI de Instrutores de Mergulho to update NAUI members, present courses and seminars, and encourage the exchange of information between dive leaders—as well as promote the Brazilian diving market generally. With the presence of around 150 active NAUI members, the 2010 event was a complete success and demonstrated the confidence of Brazilian instructors in their future and in the strength of their regional office. This most recent meeting had the added significance of celebrating the fiftieth anniversary of NAUI Worldwide.

During the first three days, courses were offered in First Aid Instructor, Underwater Photography Instructor, a Commercial Experience course, Mixed Gas Blender, and Oxygen Service Technician. In addition, representatives of the most respected brands of diving equipment held workshops, clinics, and presentations.

The weekend was devoted to lectures and roundtable discussions covering topics of technical and administrative activities pertaining to diving instruction.

Governmental agencies were represented. A representative of the Brazilian Navy gave a lecture on preparing for rescue of crews of submarines. Representatives from ABETA (Associação Brasileira das
Empresas de Ecoturismo e Turismo de Aventura / Brazilian Association for Ecotourism and Adventure Tourism) gave a presentation on the growth of the Brazilian market in adventure tourism.

NAUI Instructor Major Elton Moura, who is an officer of the Pernambuco State Fire Department, explained about the updated protocols for victims of drowning. Lectures on rebreather and the RGBM mathematical modeling enriched the conference. And the presence of world freediving record holder Karoline Meyer added a celebrity presence.

One of the highlights was a lecture by the governamental representative Dra. Silvana Canuto, president of Brazil’s ICMBio (Chico Mendes Institute for Biodiversity Conservation), who is a NAUI scuba diver. Dr. Canuto made clear that recreational diving and governmental agencies are side by side with the same goals on the preservation of the environment.

Closure of the conference included a member update by Randy Shaw, NAUI Worldwide Training Manager, and a presentation by Alvanir Silveira de Oliveira, NAUI Training Representative for Brazil, who reviewed the past year and gave projections for the coming year.

Among all the activities: courses, clinics, lectures, and social events, this 14th NAUI Meeting revealed a group of dedicated professionals interested in enhancing their skills, improving the teaching of diving, and contributing to this activity of scuba diving—signaling a promising future for NAUI in South America.
Kuwait Dive Team Examines Coral Bleaching

In September, The Kuwait Dive Team, “Guardians of the Sea,” resumed their inspection studies of the most important coral reef locations in the sea of the south of Kuwait. The purpose was to investigate closely the present state of area coral reefs and determine the percentage of bleaching in each individual study location in addition to the corals’ general health condition, and the most affected species of coral.
KDT realized that all locations of coral reefs in the southern parts of Kuwait’s sea (some 70 km of coastline in the southern border area of Kuwait) were affected by bleaching. The survey sampled different sites at each study location and depths ranging from one to 13 meters. The general percentage bleaching was determined based on the corals’ color variation (ranging from blue-white to beige) within sample areas of approximately 20 square meters in each site/location. Additionally, the team recorded partial damage. “Damage” is used throughout the report to indicate an abnormal state of corals (e.g. bleached, dead, or unhealthy in general). “Partial damage” means that parts or edges of coral colonies suffered from bleaching or losing part of the coral colony’s natural color.

The identified damage percentage depended on the surveyed number of each type of coral and the unaffected number. The stated types named herein are those that have considerable spread in the study locations.

**Qitaat Benaya Reef—Khairan:**
The overall percentage of damage to the reef in this area in the far south of Kuwait is approximately greater than 95% of the entire location and affects the entire colony, from the coral’s top, 30 cm below the surface to the depth of approximately 30 meters; the water temperature is 33° C (91.5° F). The *Porites compressa* species, which features huge sizes, dominates the south and west sides of the colony. The smaller-sized bright blue corals are relatively unaffected, but are fewer in number. The *Platygrya daedalea* type, characterized by the huge domed shapes, dominates over the mid-eastern area corals; they are affected 100%. There are also other species, such as *Pavona decussata* and *Acanthastrea echinata* that are about 60% affected. Nevertheless, brown, bright blue, and black sponges are growing regularly and naturally.

**Raas Al-Zour Reef:**
Damage percentage exceeds nearly 97% for the *Porites compressa* species, which dominates the whole colony and is aligned in huge blocks (except the far fewer ones of bright blue color). Also, there are large areas of coral colonies that are affected by bleaching but that have various types of fungi growing on them, indicating that they were affected before others. The water temperature here is also 33° C.

**Qaruh Island—Southern and Western Area:**
General damage percentage is approximately 80%, but damage to the *Platygrya daedalea* and *Porites compressa* species (except those of bright blue color, which are unaffected but far fewer and smaller) and the *Pavona decussata* and *Acanthastrea echinata* species is about 97%. On the other hand as regards the Acroporidae, the percentage of partially damaged corals is about 60% and of overall damage is about 20%. Water temperature is 34° C (93° F).
Qaruh Island—Northern Area:
General damage exceeds nearly 90%, and the corals are medium and small-sized. The damage increases on the eastern side of the area.

Qaruh Island—Eastern Area:
General damage is about 85%, but 100% of the Platygyra daedalea type is damaged as is 97% of the Porites compressa type. Water temperature is 34° C.

Umm Deera Reef
(13 km to the North of Qaruh Island):
General damage exceeds about 95% and the types damaged are the same as around Qaruh Island.

Taylor Rock (9.5 km to the East of Kobar Island):
General damage is about 93%, including all types, but the bleaching percentage is less. Water temperature is 34° C.

Kubbar Island—Western Area:
General damage is about 95%, and the Platygyra daedalea species exhibits 100% damage. There is a good population of the Favia pallida species, especially the grey-colored variety that was not affected by the bleaching phenomenon. Additionally, some colonies of Green Thawanthed, which is similar to corals but does not build solid structure, were seen on the reefs in good conditions as well as some types of sponge.

Camp Arifjan Military Base Area:
General damage is about 90% and the location’s conditions resemble other locations. However, there are some types of Platygyra daedalea that were not affected completely by bleaching and still maintain their color, although it appears to be fading. It was noted that there are large areas on the seabed over which a brown sponge has spread.

Notes:
• No dead fish or any living creatures that normally co-exist with the coral reefs were seen; a few dead fish were recorded that are not normal coral reef inhabitants.
• Increase in water temperature above normal was clearly felt.
• The Favia pallida corals, especially the grey-colored ones, were not affected by bleaching. They are of smaller size and are spread all over the investigated sites, but density varies from location to location.
• The bright blue Porites compressa type was seen in nearly all locations, but they are of few numbers, dispersed, and of smaller sizes.
• There are many corals suffering from complete bleaching.
• There are some damaged corals whose color seemed brown, but on investigation the colonies were found to be dead, and the brown color was due to fungi growing on the coral skeleton.
In conjunction with PEAMA (Program for Adapted Motor Sports and Activities), NAUI members in Brazil held a scuba experience in Jundiaí, São Paulo, for people with special needs. The program was held in the pool of the Escola Superior de Educação Física de Jundiaí (Jundiaí School of Physical Education).

PEAMA is a program of the City of Jundiaí. It was founded in 1996 to serve those with physical, intellectual, visual and auditory disabilities. PEAMA offers many athletic and sports activities including basketball, cycling, dancing, soccer, swimming, and adventure sports. There are currently about 230 persons enrolled in its programs.

About 20 people came to the scuba event and had the special opportunity to experience the sensation of diving and to use scuba equipment. They were all part of the PEAMA group linked to swimming and other water activities, which greatly facilitated the process of their scuba experience.

According to Munior Caesar, General Coordinator of PEAMA, the activity was very important, and scuba can help a lot with the motor development and well-being of the participants. Caesar also commented on the professionalism and experience of the NAUI instructors and divemasters who participated in the activity.

A second scuba experience for PEAMA is already being prepared, and any NAUI member in active status, who wishes to participate will be welcome. Contact NAUI Mercosul at naui@naui.com.br or +55 11-4497-0031.

The NAUI Team included: Instructors Jefferson Beloddi, Sylvana F. Paiva, Marcos do Valle, Alvanir S. Oliveira "Jornada"; Freediving Instructor Archimedes Garrido; and Divemasters Márcio Solcia, Roger Fabris, Rafael Freitas Marin, and José Aparecido Cipriano.
The crisp, clear water of Spring Lake (at Aquarena, San Marcos, Texas) has long been used for scuba diving. On any given day, scuba divers are seen by visitors aboard the Aquarena glass bottom boats. Often, onlookers harbor an inward wish to join these divers and experience the unique ecosystem seen around the bubbling springs that create Spring Lake and the San Marcos River.

Four to five times a year, an extraordinary group of scuba divers visit Spring Lake. These divers are here for their open water certification training dives. This dive group is the Warrior Adaptive Scuba Program (Warrior Program)—soldiers wounded or injured during active duty. The Warrior Program is a formal scuba diving therapy program developed under the leadership of John Duggan in 2005. John Duggan is the owner of Duggan Dive Shop of San Antonio, Texas. Scuba diving therapy is one part of the overall therapy offered to injured service men and women being treated in San Antonio.

As a former Air Force Officer, the use of scuba diving as a type of physical therapy for injured military personnel was a natural development as part of Duggan’s dive services. Duggan’s first classes in 2005 consisted of himself and six soldiers. Their class was hosted at Brooke Army Medical Center in San Antonio. During that time, the open water dives took place at Balmorhea State Park in West Texas. In 2007, the Center for the Intrepid was built and the Warrior Adaptive Scuba Program had a new home. The Center and Warrior Program cooperatively serve military personnel who have been catastrophically disabled in operations in Iraq and Afghanistan, as well as veterans severely injured in other operations and in the normal performance of their duties.

With new facilities for soldier scuba diving classes, the Warrior Program now consists of sixteen dive students per class and a staff of five instructors. The support staff during open water dives has also expanded from one instructor to a partnership of instructors. Partner instructors come from other dive shops and organizations, such as Oak Hill Scuba of Austin and the Red River Valley Fighter Pilots Association.

In 2007, Duggan brought the Warrior Program to Aquarena for their open water certification, also called “check-out dives.” Due to the cooperative agreement of Aquarena Center, proximity of Spring Lake to the Center, and the wonders of Spring Lake, the program continues to return here. The soldiers are taught the same scuba skills as other divers as well as how to achieve the skills within their abilities (Machacek 2010).
The diving class for these soldiers is completely funded by the Red River Valley Fighter Pilots Association (Red River Rats). The Red River Rats is a fraternal organization of fighter pilots. Funding covers the training and books as well as money to send the graduates of the scuba program on a dive trip. Aquarena Center provides the training area for check-out dives at no cost, while the instructors and divemasters volunteer their time and efforts in the training process.

Another relationship in the Warrior Program is the support offered from Texas State University Veterans Advisory Council of Texas State University and Veterans Alliance (a student organization). In 2009, Texas State was named among the nation’s top “military-friendly” schools. The university’s convenient location, and Military and Family Support Initiative has attracted many military personnel seeking degrees. Texas State’s military students continue to foster their bonds with fellow soldiers through campus activities. The Veterans Alliances plan to match up their student members with the Warrior Adaptive Divers during their 2010-2011 academic year.

The next time you board the glass bottom boats at Aquarena take a moment to give thanks to the veterans and the Wounded Warrior dive program helping them enjoy the freedom of the clear, clean water below.

To donate funds or gear to the dive program, contact Air Warrior Courage Foundation, POB 1553, Front Royal, VA, 22630. Specify BAMC Troop Support. Donations are also accepted by Disabled Sports USA at www.dsusa.org.

Photos By: George Cummings, Oceanic Expeditions, www.oceanicexpeditions.org

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Special thanks to Ron Coley, Director of Aquarena Center, for his guidance and support.
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The Life of a Dolphin in Captivity

By: LeRoy French, NAUI A50

If you think you are having a bad day, stop and think of what kind of a day a dolphin in captivity is having. Believe me, your day, no matter what you think, is far better. Nobody ever considers the dolphins’ life when they see them performing their various tricks in a show. You don’t in all honesty believe that a dolphin does these things naturally: jumping through rings, tail-walking, coming out of the water and lying on the side of pool. These are all unnatural acts for this animal. Here are some thoughts on how dolphins are treated in captivity.

The very nature of these animals makes them unsuitable for confinement. In the wild dolphins live in very tight family units with strong bonds. These family bonds often last for years. The sea to dolphins is like the air to birds—a three dimensional environment where they can move in all directions. Dolphins seldom come to shore and are always swimming, even while they sleep, swimming as much as 40 to 100 miles per day. In a pool they are swimming in circles. Fifty-three percent of dolphins who survive their violent capture die within 90 days. Their average life span is 45 years (in the wild). In captivity the average is only five years. The tanks they are forced to live in are in many cases filled with chemicals and bacteria causing many health problems including blindness. Furthermore, when dolphins are trapped together, males become agitated and pecking orders are created which is unknown in the wild, and unprovoked attacks on each other occur. Though fights in the wild do happen at least a dolphin is able to escape.

Here is the cruel and sad part of the dolphins’ plight. In order for a trainer to get the animal to perform various tricks, a Pavlovian regime is introduced. Quite simply the dolphin is kept hungry in order to perform. Once the animal performs a trick it is then given a piece of fish. Tricks are not performed because the dolphin enjoys doing them. First the trainer finds out how much they will eat and still work. After that they condition the dolphin to associate certain hand signals with certain tricks resulting in the dolphin receiving a reward. If a dolphin is not working properly it is locked away on its own. They are put in a pen and ignored. It’s like psychological torture, just like a human held in solitary confinement. When this happens the dolphin eventually loses its communication ability; despair and suicidal behavior and unnatural aggression set in brought on by intense claustrophobia. As the dolphin uses its communication powers (sound) to hunt fish in the wild, in a pool the need for this is nil, and as a result the skill degenerates. Some scientists claim that dolphin brains shrink up to 42% in captivity.

Once in captivity they may also attempt to starve themselves to death, therefore force feeding may become necessary. Over thirty years ago Jacques Cousteau witnessed his captive dolphins hitting their heads against the edge of the pool until they died. This prompted an anguished Cousteau to recommend that the animals be left in their natural environment.

Dolphins are one of nature’s most intelligent animals. If you have never seen or swam with one in the wild then you are missing an incredible experience. I have had dolphins swim right next to me while scuba diving. I have had them follow the boat for miles playing in the wake. I have also seen them in marine parks and dolphin encounter programs. They belong in the ocean!

Most of us have seen or heard about the film “The Cove.” The film depicts cruelty to dolphins that goes beyond words. This creature with its superior intelligence does not deserve this type of treatment and certainly should not be imprisoned.
Our world is quickly getting smaller as computers and technology continue to advance. Change can be good, but some not so good. The highly invasive Lionfish has found its way to the Caribbean, courtesy of “human beings.” This Indo-Pacific fish has found a home where basically it is free of predators (even parasites) and it’s raising havoc with native species and divers alike. This alien fish can be seen in the Bahamas, Jamaica, Cuba, Belize, and Cozumel as well as a recent discovery in the gulf near Texas. Scientists have determined these ambush hunters cannot be eradicated. Their best hope is that “human beings” can assist in the control of these voracious carnivores.

For the “not so good” part, Lionfish are in the Scorpion/Stonefish fish family (genus *Pterois*) and can live up to fifteen years averaging twelve inches in size. They range from shallow reef systems up to 600 feet of depth. Though this non-aggressive fish is territorial, Lionfish communities can reach upwards of 200 adults per acre. Lionfish sexually mature in less than a year. One spawning female can reproduce every four days, resulting in more than two million eggs spread in the currents every year.

For the “good part”: becoming acutely aware that these invaders are threatening North America’s only natural reef, I feel we could usefully have a Lionfish Specialty Program card that will teach divers how to safely identify, capture, and harvest these creatures (they are edible). Most divers are ecologically minded and are always looking for a way to do their part in helping sustain the watery environment that we all enjoy. After speaking with Dr. Randy Shaw in the NAUI Training Department, it seemed wise to sit down and write a teaching outline for instructors. A good instructor always encourages their students to participate in “continuing education.”

The instructor outline is very basic and intended to allow each instructor to embellish and adjust to the needs of individual locations. Areas covered include a small glossary of information about the fish itself, such as behaviors and venom locations, safety issues and warnings, information on habitat destruction, an exam, information on obtaining a permit to dive in the marine sanctuary areas (SPAs) in Florida, equipment requirements for hunting, reporting, carcass disposal, and contacts, plus links.

**Caveat:** Divers who wish to hunt Lionfish in marine sanctuary areas must take a sanctioned NOAA class to secure a permit to take this fish only. Divers need to understand that spearguns, pole spears, and Hawaiian slings are prohibited. If a diver is out of sanctuary and has a chance to spear any size Lionfish, they are free to do so. One Key West commercial diver killed twelve in one area of Key West Harbor. Key Largo held their first Lionfish Roundup, netting 534 fish in one day.

It is obvious that scuba divers are going to be playing a large role in helping to control this invasive species and instructors can be the catalyst to jumpstart this specialty.

For more information on the course Jan has developed, contact him at jan5150@hotmail.com or he’s on Facebook under Jan Henry. You can also contact George Smith at Eco Scuba in Key West for assistance. He’s aware of the project and able to advise: george@ecoscuba.com.
Scuba Crossword

Try your skills
Have a Puzzle Party with your students

Across
5. A major risk factor of recompression chambers
7. If depth limits are exceeded, this can occur during mixed gas diving
8. This gas level is thought to predispose to decompression sickness
10. Diving here without decompression adjustments can lead to injury
11. Measured by depth and time
12. Signs of decompression sickness sometimes lead a diver to do this
13. The accuracy of a depth gauge depends upon this
14. Dive computers use these to predict decompression
18. This type of bubble detector is used in decompression studies
19. Haldane was of this nationality
20. This type of sound is used in bubble detection

Down
1. A state in which decompression risk is thought to increase
2. In excess, a subtle symptom of decompression illness
3. Achieving this gas level can help treat decompression sickness
4. Adding this gas to a breathing mix can increase bottom time
6. Haldane’s work on decompression theory was to be used by this navy
9. Almost all recreational dives are of this type
15. The tiny lock of many multi-lock recompression chambers
16. An experimental animal in early decompression research
17. Said to be 98% complete in ____ increments

Answers on page 64
I looked at my depth gauge and saw that I was 30m deep, leading a group of international divers on a wall that rises up more than 3 km from the ocean floor. I had a smile so big that I almost lost my regulator—I knew that this was a special place and that I was lucky. This luck was not due to the fact that I was diving the Bassa Da India atoll, which is situated between Mozambique and Madagascar, a two day sail in the middle of nowhere. No, it was because of the rollercoaster ride that I had been on for the last six months, which changed my life. Little did I know that it would also change the lives of divers all over the world who thought that their diving careers were over.

I am the editor of a dive magazine in South Africa, and for the last 12 years diving has been the biggest part of my life. I worked at Technicons and universities in South Africa as an IT BCom lecturer for seven years, but in the early 2000 I had had enough of living a normal life and decided to make diving my full-time career. This underwater world that was my hobby and my passion then became my world and a full-time job. As all of my friends say, I am the luckiest man in the world because I get to travel all over the planet and dive. But the best thing of all is that I get paid for it. Yes, I agree with them that I am lucky, but one morning last year it all changed, and I thought that I would never dive again. I thought that it was the end of my diving career, but what happened to me not only changed my view on life, it has also changed the lives of many people across the world who have said goodbye to the underwater realm.

Diving Bassa Da India had been a dream of mine for a long, long time. Over many years I tried and tried to get there but with no success. A dive destination halfway between Mozambique and Madagascar, the tiny coral atoll of Bassa Da India sits perched on the edges of an underwater volcanic mountain that rises 3000 meters from the ocean floor of the Mozambique Channel. Few people had heard of Bassa Da India and even fewer have had the chance to go there because it could only be reached by a private charter yacht. And at last, I was invited to go and dive Bassa Da India…but then everything went horribly wrong.

After one of my other trips twelve months ago I got sick—and I mean really sick, and I had to go for an operation. I was diagnosed with diverticulitis—in simple terms, your lower intestine has little pouches or bulges in it, and these little pouches or bulges trap small amounts of digested food and pips, which grow bad bacteria and can form an abscess. This then presents as terrible abdominal pain, fever, and nausea.

My doctor, Dr. Norbert Welkovics, told me that I could go for a laparoscopic operation and after two weeks I would be back on my feet again. Okay, that was fine if everything went according to plan, but even with one of the best doctors in the world on my side, my luck ran out.

Because of infection and an abscess, the laparoscopic operation couldn’t be performed and I had to walk around with a drain hoping that the infection would clear. But then I got sepsicemia and Dr. Welkovics had to do a Hartmann procedure (which involved removing the diseased part of my colon and doing a colostomy). After two months of hell in the hospital and six operations later because of wound sepsis caused by the sepsicemia, I walked out of there (crawled is probably the better word), but the worst of all was that I had a colostomy bag. (A colostomy is a surgical procedure that involves connecting a part of the colon onto the anterior abdominal wall, leaving the patient with an opening on the abdomen called a stoma).

Now what about diving? I immediately thought that this was the end of my diving career. But like they say, every dark cloud has a silver lining. The doctor told me that it would not be permanent and that the colostomy bag could be removed after six months. That wasn’t so bad. I would be dry for six months with no diving…I thought that I would be able to survive six months on land, but again that changed when one of my clients asked me why I was so skinny and...
I told him what had happened. He then told me that his dad had the same problem, yet he got a permanent colostomy bag, and one of the saddest things was that his dad was busy with his scuba diving course when he became sick and could not finish it.

In South Africa there are approximately 200,000 people that need colostomy bags, not to mention the number affected around the world. With me contemplating a future without diving, it got me thinking about how many people in the world also thought that they couldn’t dive? That got me thinking: Why can’t you dive with a bag. If I can show divers that they can still dive, how many people’s lives can I change? I started searching the internet and phoning some doctors. The dive doctors and the surgeons said they didn’t see a problem with diving with a colostomy bag, but they didn’t give me the go ahead. Yet when I asked what complications there could be when diving with a colostomy bag, I got some scary answers.

I even contacted Divers Alert Network (DAN) and they said that they also didn’t see a problem with me diving, but they weren’t too sure. I found an old article on the internet that DAN published in one of their magazines in 1997 that stated the following: “DAN is seeking information from divers about their personal experiences of diving after a colostomy or ileostomy,” and, “Medical tests say ‘yes’ to diving and suggest obtaining a new ostomy appliance prior to the dive. Most advice ends there.”

There had been no update since 1997! I think that many divers out there have had the same problem, but I realized that people who have the same problem don’t want to talk about it and are shy and embarrassed about their colostomy bag. From a personal perspective, yes, it isn’t too much fun having a colostomy bag, but there is absolutely nothing to be embarrassed about. My bag was a life saving device—it was either the bag or a coffin, and I wasn’t ready for the coffin. It was going to be part of my life for six months, and I had to deal with it; but what about those who have to have a colostomy bag for the rest of their lives? I had to make a plan, and if I could get it right the world would need to know!

Being a Technical Course Director I know about diving, complications during diving, and what the restrictions of gear are. So one morning I started looking at my gear and saw that I had to make some changes. Luckily I always dive with a harness and wings—the normal sport BC would go over the stoma and that is a problem. So I set my harness so that the belt would be underneath my stoma. The second problem was the weight system, and again the belt would give me problems; so I moved my integrated weight pockets to the back, and I was fine. But then came the wetsuit… I contacted Marco from 360 Degrees Wetsuits and they were prepared, without any questions, to sponsor a wetsuit for me and custom design and change it to fit my needs for diving with a colostomy bag. It worked out better than I could ever have expected.

All my gear was fine, so it was then time for me to talk to the doctors. I asked them again if I could dive and again they said that they didn’t see a problem with it. When I got out of hospital I phoned all the top dive doctors in the country and asked them the same question, and again they told me that they were sure that it would be okay. But they still didn’t give me a concrete answer or let me know of anyone who had attempted diving with a colostomy bag before.

So that step was out of the way and the last thing to do was to get a decent nurse who worked with this to sort of thing to help me out, because I had endured endless problems with my bag and flange. I phoned the Cancer Society in Pretoria and they told me to see a nurse who had her own practice in Pretoria as she specialized in this area. So I booked my session with Naomi Neethling, and after 20
minutes with her, I knew that I would be able to dive and that I would have no problems. She showed me the ins and outs of everything and then showed me the product that I should use for my lifestyle—Coloplast. The next minute I was talking to Coloplast and they informed me that they would sponsor all the products for me if I could tell them whether it was possible to dive with a colostomy bag or not. I knew that this was an opportunity that I couldn’t let pass and a sign that I had to start diving—remember, I am not a doctor or a scientist, I am only a diver who wanted to get back in the water.

As is the case with any new diver, I went back to the swimming pool, and with the help of a couple of friends I tested all the products and the gear. Everything went well, and I was able to go to 18 meters at Miracle Waters, and not long afterwards I found myself at 60 meters in caves with full technical gear on and playing underwater hockey with no problems. In these last six months I have done over 50 dives up to 60 meters without any hiccups. I went on dive trips and had a normal life because I told people about my condition and I dealt with it. I knew that the colostomy bag was a life saver and that it is part of me, but most importantly, I discovered that I could dive with this condition and I could continue with my training and still work on the magazine.

I am lucky that my colostomy bag could be removed after six months—and I still have the battle scars to prove it—but what about those thousands of people in the world that permanently have one? Having a colostomy bag is not the end of the world, only the end of sitting on cold toilet seats.

**Tips when diving with a colostomy bag:**

- Replace flanges before every dive or check them.
- Make sure that you use the right product. I used Coloplast and everything was 100%.
- You can use waterproof plasters to secure your flange to your body and Coloplast has an elastic band that you can use to make it even more secure.
- Either design a special wetsuit or dive with a vest. You don’t want anything tight against your stoma.
- Use a technical BC (harness and wings) so the cummerbunds don’t run over your stoma.
- Don’t use a weight belt.
- Use integrated weights and move them away from your stoma all the way to the back.
- Check that everything is okay every couple of minutes during a dive.
- Before ascending make sure that there is no air in the bag, and if there is, just dump it before ascending.
- Don’t dive with a dry suit.
Kuwait Dive Team Lifts Wreckage of 40 Ships

By Youssef Al-Tattan (Kuwait News Agency)

The Kuwait Dive Team has undertaken lifting wreckage of 40 ships off the northern shore of Ushairij in Doha area with the help of the cleanup team of the Cabinet, Coast Guard Directorate, and Kuwait’s Municipality.

Head of the dive team Walid Al-Fadhel said that the project aims at lifting the wreckage of 40 sunken wooden ships “which inflict an environmental damage to the coast and a marine pollution, besides the risks posed to navigation in Kuwait’s bay.” Al-Fadhel added that the cleanup team provided necessary machines that will carry out the mission with special drills for recovering relics, in addition to cooperation with the Municipality for mopping up the site from all equipment of the project and the Coast Guard Department, which ensured the marine security of the operation.

The project was expected to last about 14 days, and the working team’s goal was to lift about 70 tons a day of the total wreckage, estimated at 440 tons.

Al-Fadhel also said that following these lifting operations, the diving team will organize voluntary campaigns, including school students and those with special needs, to pick up wastes from the beach, asserting that, “This will energize the spirit of patriotism and voluntary work with the aim of protecting and cleaning up the environment.” He also stressed that this project is the “biggest” to be carried out by the team since its formation in 1986, and “it expresses the profound cooperation between the governmental and voluntary bodies for developing Kuwait and protecting its environment.” There are many risks obstructing the team’s work, including heavy weight of the ships, the silt seabed, and the multiplicity of ships and wreckage, “though the resolve of youth and the national will go beyond such obstacles.”
Long before satellites and cameras in space could zoom in on every house, maps were used to guide ships from port to port. Navigation on the high seas was by dead reckoning using hourglass and compass, then by progressively more accurate navigational devices such as astrolabes, quadrants, octants, sextants, then radio signals, and finally GPS. Long before GPS, mapmakers used reports of previous explorers to draw coastlines to scale. Those maps led to still greater and greater discoveries. Cartography was and remains an art although the use of maps is rapidly being replaced by hand-held Global Positioning devices that track location with signals from a worldwide array of satellites orbiting in geostationary positions.

Dr. E. Lee Spence is a marine archaeologist and modern pioneer of underwater exploration. He has a lifetime fascination with maps and, as he tells it, “I read Treasure Island and was fascinated by its tale of pirates and buried treasure. I started burying coins for others to find, imagining the thrill it would give the finders. As I got older I started drawing maps that could be used by others to find some of my small caches of treasure. What I was doing then was similar to the geocaching games of today.”

Dr. Spence’s propensity for hiding coins continues to this day. Since he is one of the world’s most famous shipwreck hunters and an acclaimed marine archaeologist, his zest for finding is coupled with his legacy of leaving coins and artifacts behind for future generations.

“Not long ago I went looking for a jar of silver coins that I buried in the dirt floor of our family carport when I was a child and we were living in Georgia. It was money saved from my paper route. I still had the map I had drawn showing where I buried those coins, but the house and carport are gone. All of the locators or ‘signposts’ I had recorded on my ‘treasure map’ are long gone.”

Times have changed since Lee was a kid. “I could buy antique maps for twenty-five cents. That was half my weekly allowance,” he proclaimed from his treasure-filled offices outside Columbia, South Carolina. A bank building with a three-foot thick vault door serves as his repository for many of the shipwreck coins and valuable artifacts Lee has discovered under the oceans of the world. He still buys antique maps but has sometimes paid thousands of dollars for them.

Lee pursued mapmaking studies and eventually a lucrative career finding shipwrecks, and making shipwreck maps and charts. “When I went to college there were no programs in underwater archaeology, so I started out in civil engineering. I later took a number of cartography courses including one in interpretation of aerial photography and another in computer mapping.”

Of course not all of Lee’s early map making was the romantic stuff like plotting positions of sunken galleons or pirate ships laden with booty. Lee worked for the engineering firms of Davis & Floyd and then G.W. George in Charleston. “I drew all sorts of site plans and maps. Davis & Floyd is now a major firm, but at that time I was the only real cartographer they had. My favorite was making topographical maps or topos. I could do every aspect of a topo survey, from pulling chain to turning angles and running levels, from reducing the field notes to drawing the finished plat.”

Undaunted by the routine, Lee avers, “I love drawing maps. A lot goes into it. How you draw a map greatly affects people’s perception. On a flat map of North of America, Greenland is gigantic in comparison to the...
way the same island appears on a globe. Depending on who is drawing a map, it might be used to twist realities and affect political or other goals. In the old days maps were used to convince people to explore and settle the interior of our country. Look at a highway map versus a map made for commercial interests; they can be vastly different. A lot depends on who is paying for the map and where they want to direct your attention and your tourist dollars.

“I was fascinated by *National Geographic* Magazine’s shipwreck charts. Some showed shipwrecks. Some of my maps show you how to get to specific shipwrecks that I have already found, while others are based largely on the historical records of shipwrecks rather than fieldwork. Some deal with a special period like the Civil War. Others cover hundreds of wrecks spanning hundreds of years. Maps I draw for publication are usually decorative and meant for people to hang on a wall.”

One of Lee’s most popular maps has sold over 30,000 copies. It is a chart of Civil War shipwrecks in the vicinity of Charleston. “For each wreck on my map, *Shipwrecks of the Civil War*, I used a small, very simple sketch showing the type of ship to represent its location. The pictured wrecks included ironclads, steamers, and sailing vessels, and in most cases I showed their rig so you could differentiate between a schooner and sloop. Those are some of the individuality and choices a cartographer puts into his work.”

Lee has authored many books as well as his seafaring charts based on his meticulous research. “People buying my Civil War shipwreck maps are not just buying my art. Most of them like my maps for the history they portray. The inclusion of shipwrecks, with their lure of sunken treasure, is usually a large part of their appeal. I enjoy making maps, like my books, they allow me to share my knowledge. But the best part is they are a lot faster and cheaper than a book to produce.”

Some of Lee’s most extraordinary maps are those that he hand-colors using techniques map makers of old originated. Lee showed me two early charts that had been hand-colored to compare to his work on a Civil War shipwreck map. One map was dated 1758, the other 1790.

Lee describes his maps as a “natural byproduct” of the painstaking research he has done to locate sunken ships and their treasures. When researching Spanish galleons wrecked along Florida’s coast in the 1715 hurricane, Lee used 240-year-old eyewitness accounts left by survivors and salvors and plotted the locations they described on a modern chart.

“Distances from St. Augustine, Cape Canaveral, and other known points of the Florida coast were usually given in leagues or miles. But, such units of measurement were defined differently in different countries, and even the same country changed their definitions over the years. So, according to the nationality of each eyewitness, I converted...
Training

the distances to modern measurements before plotting them. In some cases the plotted locations matched up exactly with the location of an already-known shipwreck; in other cases they didn’t. But I suspect those wrecks hadn’t yet been found because in each case the plotted positions were in areas of deep sand. Overall, I was surprised by the accuracy of the early accounts, especially with respect to latitude. My plots confirmed my already held belief that one could use such accounts to find the since lost locations of valuable wrecks.”

“Figuring latitude has always been fairly simple. The angle of the earth to the sun changes throughout the year. But, as long as you properly take into account the daily change of that angle, you can determine latitude to the nearest degree using noon sun sights taken with just a folded piece of paper. Longitude is far more difficult.” Most of the discrepancies between old navigational charts from colonial periods were differences in longitude.

“In centuries gone by, each country used a different city to run their zero-degree line of longitude through. That line was known as the prime meridian, and its placement affected how all other lines of longitude were numbered. For instance, France ran their prime meridian through Paris, while England used Greenwich. Therefore, longitude on early French maps varies from that shown on those of England, Holland, and other countries. Further complicating it is that longitude can only be accurately determined with an extremely accurate knowledge of both local sun time and clock time at the prime meridian and calculating the difference. But shipboard accurate maintenance of clock time for the prime meridian was not possible until after the invention of the chronometer in the 1700s.”

Early navigation depended on maps made by the first explorers and their sailing masters. “Even thirty years ago, the best maps made for the government are often wrong. They could be off by hundreds of feet; in most cases those errors are really time keeping errors that resulted in longitude errors. Today with GPS we have precise positioning.”

Lee’s limited edition charts of Shipwrecks of Hilton Head and Vicinity, Shipwrecks of Wreck Valley: New York and New Jersey, are majestically framed and include bits of artifacts he has recovered from specific shipwrecks and are not only collector’s pieces but are coveted by museums.

His 1995 book, Treasures of the Confederate Coast: The Real Rhett Butler & Other Revelations, explained how his research revealed that the Rhett Butler character in Gone With The Wind was largely based on a real person. That was a real literary discovery because Margaret Mitchell had always claimed her book was pure fiction. Lee’s evidence was overwhelming.

The real Rhett was a tall, handsome, shipping magnate named George Trenholm from Charleston, South Carolina, who was much admired for his business acumen and his personal bravery. Trenholm’s Civil War shipping efforts earned today’s equivalent of over two billion dollars in gold in less than five years. It made Trenholm the most successful blockade runner and the richest man in the South.

Lee recognized Trenholm’s Gone With The Wind connection only after researching and finding the wrecks of several Trenholm-
owned steamers that had been lost while trying to run through the Union blockade fleet. He discovered and explored the rich wreck of Trenholm’s finest steamer, the Georgiana, and has written extensively about his discoveries on that ship.

Lee was the first person to discover the Confederate submarine H. L. Hunley, the submarine that attacked the United States steam sloop of war Housatonic and sank it on February 17, 1864. The Hunley and its entire crew of nine men disappeared without a trace, until Lee found the wreck 106 years later. The Hunley was the first submarine to sink an enemy ship in the history of the entire world.

The day Lee found the wreck, it was almost entirely buried. He could see only a narrow portion of her upper hull. Lee went swimming to the surface literally screaming underwater “I have found the Hunley, I have found the Hunley.” The seafloor in that part of the ocean is like an underwater dessert with constantly shifting dunes. The sands reburied the wreck within days.

Lee carefully plotted the location of his discovery and shared his maps with various government officials while seeking permission to dig her up and raise her. He eventually filed an admiralty lien on the Hunley in U.S. District Court, claiming ownership based on both the Law of Salvage and the Law of Finds. In 1995, at the official request of the South Carolina Hunley Commission, Lee donated his rights to the Hunley to the State. The entire wreck was eventually excavated and raised in 2000. The crew were removed and buried with military honors. The submarine is now undergoing study and conservation. It will eventually be placed in a museum for permanent display.

A map, which Lee published well before anyone else had gone to the site, is proof of his discovery. His “X” is at the exact position where the Hunley was located. “Just like on the old pirate maps, I used an ‘X’ to mark my spot and sent copies to the government and even included it my 1995 book,” Lee said.

“One once published its location, anyone who could read a map could go out and dig up the Hunley. That was one reason why I was so anxious that the Hunley be raised and properly preserved before it was destroyed by souvenir hunters,” he explained. He also drew several scale maps showing his discovery that he sent to various government agencies. In 1978, based on Lee’s mapped location, the Hunley was placed on the National Register for Historic Places.

Unrolling a print of a hand-drawn 1865 chart Lee said: “One of the best ways to find a shipwreck is to have a contemporary map. The original of this chart was made immediately after the Civil War to map the depth changes in the approaches to Charleston Harbor caused by both intentional and accidental shipwrecks during the war. The location of the Housatonic is shown and is actually marked by name. I found the original of this chart in a government office and had this copy made. I found it long after I found the Housatonic, so it didn’t help me with the discovery. But I was able to use it to find other wrecks shown on the chart. Some of the wrecks still stuck out of the water when this chart was made, and they were used as benchmarks for turning angles. Over 40,000 soundings with a lead line were made during the survey.”

Named for General Robert E. Lee, a distant relative, Dr. E. Lee Spence has family roots as far back as American history can be traced. He is a southern gentleman who has become a legend in his own time, a Renaissance man with discoveries in both archaeology and American literature, whose books and artistry with maps has preserved history for all time.

Photographs by Myriam Moran, copyright 2011.
Let’s Promote NAUI, and Let’s do it Right!

By Karl Anderson, NAUI 7005

There are multitudes of ways to promote NAUI, all of which will simultaneously keep the organization healthy and help you make a living!

And while the techno revolution has given us recent tools like CD-ROMs, DVDs, and e-Learning, there are some bygone items that did a great deal to keep people diving and thirsting for more courses that have not been available to us for some time—one of which were those embroidered emblems that symbolized a person’s achievements!

I’ve been teaching NAUI courses coast to coast for 30 years, and I think during that time I’ve gotten a pretty good feel for what works the best. Here are some of them.

Humans, as a species, all have at least a little bit of “sheep” in them—that is, they tend to follow things that are popular, trendy, and in demand. And they tend to want what others have. So in comes a couple to a dive club meeting, wearing jackets adorned with NAUI specialty tabs: rescue, deep, night, u/w photography, u/w hunter, cavern, wreck, and so on. Within minutes, the questions can be heard: “Where did you take that class? Where is that one being offered? How was it? Do you happen to know when it is being offered again?”

The Patch

As a NAUI Instructor, Divemaster, or Assistant Instructor, we wear our emblems with pride. Well, at least most of us do. I came across a NAUI Instructor last year who said “I don’t do the patch thing.” But for most of us, the NAUI emblem is a symbol of something we are proud of, something we have achieved, something special that we belong to, and something we like to share. What is the first thing wearing a NAUI emblem will get you?

Questions. Lots of them. What is the second thing it will get you? More students!

I have had more than one person come up to me, look at the specialty tabs on my jacket, and remark “How long would it take me to get all of those? I want them all! I love diving, and I want to take all the classes I can! What class are you offering next?”

And while we’re on the subject of patches—there were embroidered wreaths that held a number: 5, 10, 20, 35, 40. They signified how many years a NAUI leader has been an Instructor, Divemaster, or Assistant Instructor. And there were Instructor Trainer patches. I bought the last four IT patches that NAUI ever had in stock—back in 2000. After that, no more wreaths, IT patches, or specialty tabs. Poof. Gone.

Could it be that they were phased out because no one was buying them? And if no one was buying them, whose fault do you suppose that could have been?

Effectiveness

When I certify a student for any course, I like to present them with recognition materials, not just the card. I like to also give them a certificate, an embroidered patch, and a window decal or sticker. Why? Because students want to show off that same pride for what they have achieved! So the certificate gets framed and goes on their wall. The decal or sticker goes on the window of their vehicle. The patch goes on their jacket. And the card? It goes in their wallet where no one can see it—unless they take it out and show someone. People will see their jacket, their vehicle, and the framed certificate on their wall a thousand times more often than what they have in their wallet! And what is that? Advertising! Free advertising for you!

The Problem

Unfortunately, all the recognition materials I just mentioned are no longer available. You can give your students a certificate, a card, and a patch for Scuba Diver, Advanced Scuba Diver, Divemaster, and Assistant Instructor. But when it comes to the specialties, there are no longer any patches. Well, there needs to be. I went into a PADI shop about a month ago (don’t hold that against me, I was only getting airfills), and I saw gobs of embroidered red, black, and white specialty tabs for every specialty PADI offers! So what is wrong with that picture? What is wrong is that our competition is doing it, and it is working very well for them! We could either award one of the specialty tabs to our students with a certificate and their card, or we could make the specialty tabs available to them for sale. But if you give it to them, they have it, and most of them will start wearing them. Most people like to show off what they have accomplished; it represents time, experience, and education. Doctors, lawyers, and veterinarians have their diplomas, degrees, and licenses plastered all over their walls for the very same reason.

The Solution

I say “Let’s bring the patches back for NAUI!” That’s one solution! Who wears patches? Police, fire departments, the military, scouts, hospital staff, and many others. What do those patches say? They make the statement “I am a member of this team!” Should you feel any less so as a NAUI leader? I don’t. And the patch thing works for me. It will work for you, too! Students want what they see me wearing. They want to aspire to that. And I am here to offer them those opportunities. How are things in your town?
In my opinion, the most powerful promo item that NAUI ever created is the NASA Astronaut Poster. “NASA astronauts are all NAUI-certified divers. NASA demands the best. Shouldn’t you?” That’s what the poster sums up and that’s what I show my students at the beginning of every new class. In fact, I use one of the posters that I had laminated, because as much as it gets passed around, it needs to last! And that powerful tool needs to be on t-shirts as well.

**The NAUI Window Cling**

I’ve been using one of these 15-inch decals since the 90s, and I sure could use another one! It’s presented in the online catalog as a “door decal” for NAUI facilities, but I have one on my vehicle window. Again, it’s advertising, and it starts people thinking, asking questions, and signing up for classes! You can get one, and it’s well more than worth its very low price.

**Promoting Your Courses**

Before you are even one quarter into teaching your beginning class, your students should already know how important the NAUI Advanced Scuba Diver course is. If you have done a decent job of instilling this in them, six or seven out of eight students will commit! Infect your students with your passion for diving! And if you do a decent job in promoting NAUI courses in your Advanced Scuba Diver course, a few of those will already be thinking about aspiring to NAUI Master Scuba Diver—or Divemaster. And specialties? I have some students chomping at the bit to take each and every specialty course I offer.

**Signage**

This is the era of vinyl signage, or magnetic signage. That spells ongoing advertising for you. One of the ones I post around from time to time bears the words “FREE SEAFOOD” in large font, followed by my phone number or e-mail address. They generate calls. When they tell me they are calling about the free seafood, I ask them what kinds they like the best. Prawns, crab, lingcod, scallops, clams? Then I ask them if they are comfortable in the water. When I tell them what it costs to fill a scuba tank with air, they remark “that’s nothing” or “hey, that’s close enough to ‘free’ for me!” It works, so it’s one of the things I use.

**Be as Creative as You Want**

When it comes to promoting NAUI and your courses, there are so many things you can do. I have a personalized license plate that reads...
NAUI. And yes, I have a tattoo on my upper right arm that bears the letters NAUI, with a Giant Squid—you’ve seen it if you’ve ever seen me. They both evoke questions and they both have resulted in students many times over! One question I get occasionally on the tattoo is “What does that stand for?” My reply? “The National Association of Underwater Instructors. I’m a company man. And let me tell you what you can start experiencing in just six weeks! Do you like seafood? How about the freshest seafood—the kind you get yourself? Underwater photography? Exploring shipwrecks?”

The Most Powerful Campaign
You can run ads for classes in local newspapers and magazines, and they will bring you a certain number of sign-ups, but nothing will generate more students for you than word of mouth. Give someone the positive experience of a lifetime, and they’ll tell their family and friends about it until the cows come home for biscuits and gravy. But remember that the opposite holds just as true: Give them a bad experience and they’ll be sure to spread that word as well. The quality of your instruction, your ethics, and how you treat people will determine if you succeed or fail. And this applies not only to instructors but also to the managers and owners of dive shops. You have to be an effective promoter, deliver the goods you promise, be true to your word, and make people want to continue doing business with you at the same time. Having students take course after course from you is one way to know you are doing it right. Having them drive 60 to 70 miles in order to take a course from you—when there is a dive shop less than five miles from where they live—is an obvious indicator that someone out there must be doing something wrong. Which do you want to be? Or which are you already?

That Old Cliché
There’s an old cliché I’m sure many of you have heard: “Take care of your customers or your competition will.” I’ll bet you a month of chicken dinners that was first spoken by a savvy businessman who knew how to promote things ever so effectively and really cared about his clientele—not by some self-serving village idiot. I sincerely believe that NAUI needs to get back in the forefront by bringing back some of those proven promotional tools, and at the same time, instructors really need to use them! If you build it (and promote it), they will come…

From those Sheep
From those followers, or “sheep,” if you will—as we all were at one point to some degree—will emerge a percentage of leadership candidates—those who thirst to excel as much as the opportunity will allow—those who want to take the reins and stand at that forefront. A good number of those may very well become your next training assistants, and on their way up. They will be taking the courses required to qualify them for those levels. More business for you. And so it goes…or should go. How are things in your town?
I'd like to express my concern with the direction our Dive Industry is finning toward. While I understand eLearning is convenient, in vogue, cost effective and initially attracts new divers abroad, I do not believe we are as likely to retain these divers, and I believe they are too often not trained as well as divers who receive classroom academic training with an instructor.

To be fair some “E” divers are committed and become competent divers. As an instructor however I’ve had experiences with more than a few “E” divers who believed the “E” in eLearning stood for an “E”asy certification. eLearning does have a lot of merit. With eLearning typically students must complete an online quiz at the end of each chapter and are not able to go to the next chapter without having scored 100%. Additionally, they are typically not able to open the final quiz until they have done 100% on each and every chapter quiz. They really must review and do know the material.

eLearners probably know the material better than in my academic classroom, proven by my students not scoring as high as my eLearners—I hope it’s not a reflection of my teaching. My contention is of course that there is more than book-learning.

The question and answer opportunities, dialogue, shared fears/anxieties, and discussed real life scenarios of what the information really means is when learning occurs. True enough, when both eLearners and classroom students go through the physical, experiential pool and open waters everything solidifies and comes together. But does it come together completely? Does it come together fully?

I have a master’s degree in education. I don’t say this to impress but to point out educators are taught worldwide to recognize classroom discussion and instructor-student dialogue are cornerstones of learning. An educative foundation is built in the classroom. Relationship building and instructor-student bonding may be an issue with eLearning. Relationships bring back customers. Instructor-student bonding promotes trust. Relationships, bonding, and trust are forged in a classroom academic environment. Computers are wonderful things but so is a human instructor in a classroom academic setting.

Customer/consumer diver retention begins, and is strengthened, in the classroom. For us in the dive industry repeat customers mean our ranks grow; divers gain more experience each time they return, and when they come back to take specialty courses, competencies are attained. Everyone in our industry is concerned about acquiring, teaching and having safe divers.

Safety may be an issue with eLearning. When an eLearner does not experience classroom academic question-and-answer periods and does not experience classroom academic dialogue has he/she had a complete opportunity to fully understand safety issues and scenarios?

I inform my students that I clearly prefer they actively participate in classroom academic training when I tell them they have the optional choice of eLearning academics. I believe instructor-student classroom academic training furthers education and safety in comparison with eLearning.

eLearning is here to stay, but should scuba organizations, scuba magazines, instructors, and training organizations promote instructor-student classroom academic training and merely offer eLearning as an alternative mode of learning to the new student? Should scuba organizations, scuba magazines, instructors, and training organizations make it clear they prefer one over the other? Only if they feel this way.

Many scuba organizations, scuba magazines, instructors, and training organizations inform students of eLearning options but should they tell their students they prefer they participate in classroom academic training? Should they communicate to students that it is recognized classroom discussion and instructor-student dialogue are cornerstones of learning? Should they actively encourage an educative foundation built in the classroom? Only if they feel this way.

What direction is our dive industry finning towards? Best education practices and retained, safe divers? Or convenience, basic information, and divers who may not come back to the dive shop and to shore? I believe scuba organizations, scuba magazines, instructors, and training organizations should clearly articulate and promote a preference for active participation in classroom academic training when offering an optional choice of eLearning academics. But only if they feel this way.
Why use Training Aids?

By Bill King, NAUI 6297

To learn, students must be interested in the subject. Training aids help you gain and keep the attention of your students. Training aids are also fun.

Seeing is believing, and visual training aids increase student understanding. Abstractions become real. By simplifying your presentation and organizing the knowledge into understandable bits, training aids increase your students’ retention of key points and ideas. Training aids also make class presentations easier for you. It is normally easier to talk about something when students can see it for themselves. Students look at the object rather than looking only at you standing in front of the classroom. New assistant instructors will most likely want to begin their classroom teaching experiences with equipment presentations because it is easier to talk about “things” the students can see rather than “concepts” like gas absorption.

Believe it or not, your students are only going to remember about 25% of what you tell them. But they will retain up to 80% of what they see while you are speaking. As a diving educator, you have a responsibility to do everything you can to get students to learn as much as possible. Simply speaking to a class will not provide as much learning opportunity as employing a combination of methods and training aids in the classroom.

“Tell me, and I will probably forget. Show me, and I will probably remember. Involve me, and I will understand.”

Imagine employing the above statements to teach a complex skill to a group of scuba students, a skill they will need to know such as attaching a regulator to a scuba cylinder.

If you merely tell your students how to assemble the regulator to the cylinder, it is unlikely that any of them will remember. In fact, it is unlikely that any of the students will even be able to follow the directions as they are spoken.

If you show your students what you are talking about as you speak, your students will be able to follow the lecture more easily. Some will even be able to repeat the process if a great deal of time does not elapse between the demonstration and the actual exercise by the students.

Now, if you involve your students by allowing them to do the actual assembly as you give the directions and demonstrate the procedure, most, if not all, will be able to repeat the task without any guidance.

It is your responsibility to make student learning as easy, fun, and meaningful as possible. This can be done by directly involving students whenever possible. They will learn better, and remember longer.

To maximize your teaching effectiveness, you need to anticipate the teaching methods and training aids you will use to grab the attention of each person in the class. What can you do to keep the attention? What will you do so the students remember key points and concepts? What can be added to ensure that the students grasp the materials necessary to be safe scuba divers?

Over the long term, even good students retain only about 25 percent of what they are taught. Imagine a former scuba student, armed with only a quarter of what they learned in class, heading out to make a dive after a period of inactivity. Students must learn and retain what they need to know, therefore, and this takes good instructor preparation. To prepare appropriate training aids for a class, try to think like a student as well as an instructor. Ask yourself, “What do students want to see, hear, and do, and what do I need them to see, hear, and do?”

Once it is determined what information the students need to know, it is up to you to convey it to them. To do this, the old teachers’ acronym K.I.S.S. (Keep It Simple, Stupid) can be changed to K.I.S.M.I.F, which stands for “Keep It Simple. Make It Fun.”

There are multitudes of very intelligent people in this world. How many of these can actually convey a complex idea to the average man or woman in simple, understandable terms? This is what teachers, whether of scuba or any other discipline, are facing every day; Scuba instructors must do all they can to convey their messages and make them stick.

To keep scuba on the forefront of your students’ minds, you might hand out assignments, graphs, charts, puzzles, etc. The more that your students are thinking about scuba, the better their questions and study habits will be.

Basic educational texts refer to the six “Laws of Learning” as Readiness, Intensity, Primacy, Exercise, Effect, and Recency. The first three laws are begging for you to use effective training aids.

**Law #1**, the Law of Readiness, indicates that students learn best when they are mentally and physically ready. Here is an opportunity for you to use effective training aids to gain and maintain the attention of your students.

**Law #2**, the Law of Intensity, states that the most intense or vivid experiences are remembered best, and increased sensory input means improved learning. Training aids can make your classroom lectures memorable. Those memories of classroom demonstrations and experiments will be far easier for students to recall than listening to a lecturer behind a podium.
**Law #3,** the Law of Primacy, says that people tend to retain their first learning experience the longest. So, if you can make sure your students’ first learning experience is a positive one, perhaps enhanced by effective training aids, your students are more likely to develop those desired safe habits that all instructors wish to see.

Rounding out the Laws of Learning, the Law of Exercise tells us that repetition contributes significantly to learning and mastery of skills. The Law of Effect occurs when students discover the value of what they have learned (A snorkel really can make surface swimming easier.) The Law of Recency identifies the most remembered information as that which was learned last. It is the Law of Recency that recommends summaries of key points in a lesson to increase retention.

Activities in which a person is involved result in greater interest and faster learning. Singing, dancing, and juggling may not be appropriate for most scuba courses, but an instructor with the active imagination might be able to identify a few new activities to try and involve students more actively in the learning process.

There are many reasons why your students chose to become scuba divers. Some want to dive for the beauty they find beneath the seas. Others will dive for the excitement of life found underwater. Challenges not found above water lure many divers to the watery world. Many people dive for the socialization our sport offers. The adventures of shipwrecks, photography, caving, night life, archeology, and so on call divers to explore. The awe and wonder of life below serve to rekindle the child in adults.

No matter what reasons your students bring to class for learning to dive, you need to fuel their desires to learn. What better way to create and maintain this desire than to effectively use a variety of training aids to reach their reasons for wanting to scuba dive?

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**Special for NAUI Members & Friends**

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The price for either is $30 plus postage. Postage for Treasures of the Spanish Main is $5; for Big Stuff in the Ocean, $3; for both together, $5.
Los Angeles County Rocks, Rips, and Reefs 2010: NAUI/Los Angeles County Instructors Wrap Up 2010 Season

By Jess Rosas, NAUI 18384 / L.A. County UICC 43

On Saturday, October 9, 2010, twenty-two members of the public descended on Nicholas Canyon County Beach located in the northwest section of Los Angeles County to take in the final 2010 session of the popular Los Angeles County public service program “Rocks, Rips, and Reefs.” Participants of this free program were treated that day to sunshine, great surf training conditions, and a trip on the Los Angeles County Baywatch Vessel to the outer reefs as well as an in-water demonstration of a live water rescue by the Baywatch crew.

In keeping with the tradition and philosophy of Los Angeles County scuba programs’ “Education, Diving & Safety,” the Los Angeles County “Rocks, Rips, and Reefs” (“The 3Rs”) program is a free public service program that has been offered to the public for over 30 years. The program is run under the auspices of the Los County Department of Parks and Recreation with joint participation by the Los Angeles County Lifeguard & Baywatch Division of the Los Angeles County Fire Department.

The 3Rs (Rocks, Rips, and Reefs) program is an entire series of half-day shore-based lectures and open water sessions designed to safely acclimate the public each year to popular Los Angeles County local near-shore marine environments for recreational skin, scuba, or freediving.

Conducted by volunteer staff and directed by volunteer certified Los Angeles County Underwater/NAUI Instructors, each 3Rs session includes a land-based lecture session covering local topography, swell and wave models, the impact of tidal variations, surf and surf zone dynamics, climatic variations in local weather patterns and their impacts on the local environment, up-to-date reports on local conditions, rip current terminology and dynamics, recommended techniques for safe shore-based entries and exits, and certain aspects of the local marine life environment.

Following the lecture, participants suit up, undergo a thorough gear check by staff, are placed in buddy teams, and then accompany the 3Rs staff to a pre-determined shore location where members of the Los Angeles County Lifeguard Division arrive on scene for a shore-side brief presentation by the Lifeguard Captains on local hazards noted, how to activate EMS for that particular site and a brief question and answer session. This is followed by an in-water demonstration and practice session that includes a skin-diving tour of the particular site with marine life ID conducted by the 3Rs staff.

Several sessions incorporate the involvement of the Los Angeles County Baywatch vessels and crew where participants are invited to board the vessel and receive a tour of the area as well as a briefing from the Baywatch crew on handling in-water emergencies.

The program is conducted one Saturday each month from May through October with each month featuring a different shore location with varying topography and near-shore bathymetry to provide the participants with a wide variety of conditions to learn and practice shore-based water entry and exit techniques on skin-diving gear only (No Scuba).

This was Jess Rosas’s 13th year working with the 3Rs and his seventh year as program director. This year saw an increase in participants who were not yet scuba certified as well as growing interest among experienced divers. In general, this year’s sessions averaged around 15 to 20 participants each. The Nicholas Canyon session was one of the larger groups this year. In 2009 some sessions had over 40 participants.

It is a great way for divers, new and experienced, to get out and see how the local shore environments have changed and to re-acclimate themselves to the local conditions, which can change weekly. The staff is in the water at these locations regularly throughout the year, and they know what is changing, how the weather patterns are changing, and this program is designed to communicate that information to the public while providing a controlled situation for them to learn about unfamiliar locations or learn about how their favorite location has changed from earlier in the year or the prior season. The 3Rs season incorporate a variety of locations that offer steep and shallow shores, rocky shores, wave refraction, and differing surf and rip current conditions. Participants can apply concepts learned during these sessions to anywhere they dive in the world.

The public is realizing that there is a growing need and appreciation for this type of program. Over time 3Rs staffers have noted significant changes to the swell and wave patterns to the local shore environments of Los Angeles County, and this year they successfully implemented a number of new initiatives designed to deliver this information in a more consistent format. Next year they are looking to expand the program further by recruiting, training, and adding additional staff to meet the needs of this growing program. Session numbers have been growing consistently, and 3Rs wants to be prepared for the growing interest. They are also looking at developing a
separate track for dive leaders (instructors and divemasters) from any agency who want more experience, training, and information in managing groups in shore-based diving environments that are exposed to swell and surf. They are also looking into developing expanded education presentation media for the public on the program components that can be delivered in different settings.”

The 3Rs program took a significant step this year in establishing and maintaining a consistent staff team that included leadership and non-leadership staff. 3Rs operates with a very tight schedule and time window, and it is only with the efforts of trained and passionate staff that they are able to pull off each session with the level of professionalism the public sees.

This year’s staff consisted of leadership and non-leadership staff who are the reason why this was one of our best years ever:

- **Cindy Rhode**
  (Assistant Director, L.A. County & NAUI Instructor)

- **Chris Niemann**
  (L.A. County & NAUI Instructor)

- **Dave Golden**
  (Retired NAUI & Los Angeles County Instructor)

- **Ben Jarvis**
  (NAUI Divemaster)

- **Walt Conklin**
  (L.A. County Instructor)

- **Ben Rhode**
  (NAUI Master Diver & Rescue Diver)

- **Mary Feuer**
  (NAUI Advanced Diver & Rescue Diver)

- **Gail Dolormente**
  (NAUI Master Diver & Rescue Diver)

Thanks go to the lifeguard and Baywatch staff and crew Los Angeles County Fire Department. Simply stated, they are the best. In this climate of strained resources and budget constraints, it is important for the public to be reminded of the vital role they play as stewards of public safety in our local ocean waters. We are particularly grateful to Oli O’Connell, our liaison with the Los County Fire Department Lifeguard Division — a Rescue Boat Captain and a Los Angeles County trained and certified Underwater Instructor; Gary Liebsack — Regional Recreation Director, South County Community Services Agency County of Los Angeles, Department of Parks and Recreation; and Bill Lidyoff — Director, Los Angeles County Department of Parks and Recreation Scuba Programs.

*Photos by Walt Conklin, Cindy Rhode, Gail Dolormente*
Scuba Crossword

Try your skills
Have a Puzzzle Party with your students

Across
5. A major risk factor of recompression chambers [FIRE]
7. If depth limits are exceeded, this can occur during mixed gas diving [SEIZURE]
8. This gas level is thought to predispose to decompression sickness [HYPERCAPNIA]
10. Diving here without decompression adjustments can lead to injury [ALTITUDE]
11. Measured by depth and time [PROFILE]
12. Signs of decompression sickness sometimes lead a diver to do this [RATIONALIZE]
13. The accuracy of a depth gauge depends upon this [SALINITY]
14. Dive computers use these to predict decompression [ALGORITHMS]
18. This type of bubble detector is used in decompression studies [DOPPLER]
19. Haldane was of this nationality [BRITISH]
20. This type of sound is used in bubble detection [ULTRASONIC]

Down
1. A state in which decompression risk is thought to increase [DEHYDRATION]
2. In excess, a subtle symptom of decompression illness [TIREDNESS]
3. Achieving this gas level can help treat decompression sickness [HYPEROXIA]
4. Adding this gas to a breathing mix can increase bottom time [OXYGEN]
6. Haldane’s work on decompression theory was to be used by this navy [ROYAL]
9. Almost all recreational dives are of this type [MULTILEVEL]
15. The tiny lock of many multi-lock recompression chambers [MEDICAL]
16. An experimental animal in early decompression research [GOAT]
17. Said to be 98% complete in ____ increments [SIX]
A score of 75% on the following question set will earn a total of 0.25 PDU for the 25 questions involved. Answers should be submitted to Training Ventures using the online submission form at http://www.pdus2u.com or the Answer Sheet form found in this issue.

**NAUI Professional Development Units Quiz**

1. The new NAUI Territory Representative for Alaska and western Canada is:
   a. Jill Wentworth.
   b. Jim Larsen.
   c. Lonny Haynes.
   d. Kenny Wheeler.

2. The reef ball memorial for Wayne Mitchell is in:
   a. The Seas exhibit at Epcot Center of Walt Disney World in Orlando.
   b. St. Kitts and Nevis.
   c. Abaco, Bahamas.
   d. the reflecting pool at NAUI Worldwide headquarters in Tampa.

3. The most significant change in the new 2010 CPR guidelines is:
   a. the shift of basic life support sequence to chest compressions first for victims of sudden cardiac arrest.
   b. the return to the performance ratio of 15 compressions to two breaths.
   c. the change of victim position from supine to prone.
   d. the requirement that the rescuer determine whether the victim is carrying a “Do Not Resuscitate” order before proceeding.

4. NAUI has arranged with ________ to be a resource for NAUI-logo shirts and outerwear.
   a. REI
   b. Land's End
   c. Wal-Mart
   d. Duluth Trading Company

5. The Grand Prize for the NAUI Trashy Diver Contest includes:
   a. five days of diving in the Great Pacific Trash Vortex.
   b. one week of diving at Los Jardines de La Reina, Cuba.
   c. a NAUI-logo baseball cap.
   d. a five-night stay in Oahu, Hawaii.

6. In their survey of Kuwait’s coral reefs, the Kuwait Dive Team found:
   a. the reefs to be healthy overall with little or no damage.
   b. the reefs to be slightly affected with bleaching damage less than 15%.
   c. the reefs to be moderately affected with damage to the study species of about 40% to 50%.
   d. damage exceeding 80% and on some reefs in the upper 90% range.

7. The 14th NAUI Brazilian Instructors Meeting in Jundiaí was attended by about _______ NAUI members.
   a. 50
   b. 75
   c. 150
   d. 200

8. John Duggan’s Wounded Warrior scuba program now has ______ students per class and a staff of ______ instructors.
   a. six, three
   b. eight, four
   c. sixteen, five
   d. twenty-four, six

9. Karl Anderson would like to see NAUI bring back some products that can be used to promote NAUI, such as:
   a. the full range of recognition patches for NAUI courses.
   b. wall certificates for certified divers.
   c. NAUI refrigerator magnets.
   d. limited edition certification cards.

10. Johan Boshoff writes that he discovered that one can safely dive with:
    a. a hangover.
    b. a colostomy.
    c. insulin dependent diabetes.
    d. sinus congestion.

11. Dr. E. Lee Spence, says John Fine, apparently discovered the real life model for Rhett Butler of Gone with the Wind, whom he identifies as:
    a. Plantation owner Joshua J. Ward of South Carolina.
    c. Confederate vice president Alexander Stephens.
    d. Confederate blockade runner George Trenholm.

12. The H. L. Hunley was:
    a. the Union warship that sank the CSS Virginia.
    b. the first submarine to sink an enemy ship.
    c. the Confederate sloop of war sunk in Charleston Harbor by incendiary rockets.
    d. the hospital ship that rescued the survivors of the Housatonic.
13. The goal of the Kuwait Dive Team’s salvage project was to raise _____ wrecks with a total tonnage estimated at _____ tons.
   a. 8, 60
   b. 15, 150
   c. 20. 275
   d. 40, 440

14. Rocks, Rips, and Reefs is:
   a. a hydrology course offered by UCLA Department of Oceanography.
   b. a shore and surf entry training program run under the auspices of the L.A. County Department of Parks and Recreation.
   c. an annual rescue seminar given by the Los Angeles NAUI Chapter.
   d. a farcical play with a scuba theme presented by the Catalina Theater Group.

15. Bill King says that students will retain up to _____ of what they see while you are speaking.
   a. 95%
   b. 80%
   c. 75%
   d. 50%

16. Visual training aids are especially useful, says Bill King, because they:
   a. can be handed around among students for a closer look.
   b. let the instructor talk less.
   c. increase student understanding.
   d. distract students from instructors’ peculiar mannerisms.

17. Effective training aids, he says, are particularly effective examples of three Laws of Learning: Readiness, Primacy, and:
   a. Intensity.
   b. Exercise.
   c. Effect.
   d. Recency.

18. Bob Kaschalk fears that over-reliance on eLearning:
   a. will lead to weakening of educational standards.
   b. will produce students who have inadequate knowledge.
   c. could adversely affect the relationship building and instructor-student bonding of traditional teaching programs.
   d. will ultimately produce a next generation of poorly qualified instructors.

19. Lionfish communities can reach upwards of:
   a. 24 adults per acre.
   b. 50 adults per acre.
   c. 200 adults per acre.
   d. 300 adults per acre.

20. In the Caribbean and Gulf of Mexico, the only natural predator on the Lionfish is:
   a. Pfiesteria piscicida.
   b. Moray eels.
   c. Reef sharks.
   d. It has no natural predators.

21. True or False: Dolphins in captivity do tricks for their trainers because the dolphins are naturally playful and have a fine sporting sense.
   a. True
   b. False

22. Technical nitrox means:
   a. the use of nitrox at depths where the oxygen partial pressure exceeds 1.6 ata.
   b. breathing nitrox when diving with a technical equipment configuration.
   c. nitrox that is being used to extend time and depth beyond traditional recreational limits.
   d. nitrox in which the oxygen fraction of the mix is accurately known to at least four decimal places.

23. To find the partial pressure of oxygen in a gas mixture:
   a. use the newly available NAUI Gas Blending Dart Board.
   b. multiply the fraction of oxygen in the mix by the total pressure of the gas mixture.
   c. divide the total pressure of the gas mixture by the fraction of oxygen in the mix.
   d. divide the fraction of oxygen in the mix by the total pressure of the gas mixture

24. John Heine defines cold water diving as diving that takes place in water that is below about:
   a. 32° F (0° C).
   b. 40° F (4.5° C).
   c. 45° F (7°C).
   d. 68° F (20° C).

25. In her article “Oxygen Myths” Dr. Jolie Bookspan says that the only one of the following that is true is:
   a. breathing 100% oxygen helps athletic performance and recovery in sports.
   b. breathing oxygen is a remedy for a hangover.
   c. breathing oxygen increases libido and is an effective aphrodisiac.
   d. breathing supplemental oxygen benefits athletic performance if breathed during long duration heavy exercise.
INSTRUCTIONS:
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You can submit your answers to the PDU Quiz electronically. Go to TRAINING VENTURES' site at http://pdus2u.com and follow the instructions.

If submitting by mail or fax:
1. Fill in all of the information requested to insure proper PDU credits.
2. Write the month and year of the Sources issue and indicate quiz subject, if appropriate (such as S&P questions). Or describe some other home-study origin for this PDU submission.
3. Using a soft pencil, black out the correct answer to each question in the answer section. If you change your answer, erase your previous mark.
4. Include a check or money order representing $6 for each separate quiz (in U.S. funds drawn on a U.S. bank) payable to “TRAINING VENTURES.”
5. Enclose the answer sheet and the check or money order in an envelope addressed to: TRAINING VENTURES, P.O. Box 1078, Crystal River, Florida 34423-1078, and mail it to Training Ventures.
6. Training Ventures will score the quiz, award the appropriate PDUs and return a transcript to you.
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Roatán, Honduras

April 16 – 23, 2011
Technical Instructor Workshop
Trimix I and II
Roatán, Honduras

May 26 – 29, 2011
Technical Instructor Workshop
Wreck Penetration
South Padre Island, Texas

August 14 – 20, 2011
Instructor Qualification Workshop
Wreck Penetration
South Padre Island, Texas

September 16 – 25, 2011
Dive Week on the Texas Clipper
South Padre Island, Texas

October 15 – 22, 2011
Instructor Qualification Workshop
Technical Nitrox, Stage Decompression, Helitrox, Heliair
Roatán, Honduras

October 22 – 29, 2011
Instructor Qualification Workshop
Trimix I and II
Roatán, Honduras

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Thirty years ago, NAUI broadcast the birth of the DAN scuba hotline with a simple article on emergency contacts. The article appeared in a special Diver Rescue issue of NAUI News (March/April 1981). In the beginning, DAN stood for Diving Accident Network. The name was changed to Divers Alert Network in 1983 to better reflect DAN’s broader mission.
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