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FROM THE PRESIDENT

Steve Sellers

In the spring of 2003, East Carolina University was the host of the AAUS Symposium, and I was the local coordinator. Since Greenville, North Carolina, is considered by many to have an excellent view of the "End of the Earth", I decided I needed to include something a little out of the ordinary as part of our meeting to try to distract my well-traveled peers from the view. One of the activities I selected to include was a ropes course—a series of directed problem-solving exercises and physical challenges designed to open lines of communication, build trust, and promote teamwork. For those of you who have never participated in one of these, I highly recommend the exercise. As I sit in my Miami hotel room at 5:00 a.m. thinking about the strategic planning discussion at yesterday's 2007 DSO meeting, my mind reflects back to one of the ropes-course exercises my group participated in, and I find a metaphor for AAUS and its journey.

Fifteen to twenty of us were faced with a thin metal cable suspended a foot or so off the ground. The cable zigzagged through the woods linking a series of stable posts. The goal we were given was to get the entire group from the beginning of the cable to the end of the cable without anyone touching the ground or receiving physical help from someone touching the ground. We were also restricted by the fact that once someone reached the end of the cable and stepped down, they could only watch and offer verbal suggestions. Oh, and lest I forget—if one person fell to the ground, we all had to start the whole thing over. The total distance we had to cover was seventy to eighty feet, but when we stepped up on the cable it felt like thousands, and looking around the group I didn't see Karl Wallenda anywhere. What I did see was a collection of men and women of wide-ranging size, age, condition, experience, and attitude. The task was daunting.

The concept to solve to the problem was simple. We just needed to establish a human chain along the route that we could use to shepherd everyone from the beginning of the tightrope to the end. The first few steps were pretty easy; you could hold on to one post and reach the next by yourself or maybe with the assistance of one or two other people. It wasn't until we reached about the third or fourth position that things really started to get interesting. The gap between the poles increased from post to post. When we got to the third post, we had to traverse about four body lengths to the next stable point. To span this gap, we had to get someone across the chasm so they could reach back and provide a stabilizing force for the people making the journey. Then there was the next section, where the wire V'ed back on itself at an angle of about sixty degrees and the distance to the fifth safe point almost doubled.

Our first few attempts to pass this initial crux failed. None of us had the skill to just walk across the tightrope to the fourth point, and even when we got three people linked together with the lead person possessing the best balance among us, we would fall and have to start over. We needed a combination of stability, balance, and risk or we would never reach the Promised Land.

The solution came when we had a grizzled old Diving Officer skilled in T'ai Chi step up and provide a stable base at the crux post. This guy provided the rock we built on, but even this base needed help, and we failed several times before we got the right combination of people in the mix. On our successful attempt, we were convinced we were about to fall again when the young lady on the pointy end of the problem turned loose of the chain and quickly danced the last few feet to the safety of the next post. This leap of faith left the other two people linking the chain to our rock gyrating and struggling to maintain our balance. When our heroine made her dash, we were convinced she had made a mistake that would cause us to fail again, but we managed to get dragged back closer to our last safe point where we were able to gather ourselves and plan how to solve the next challenge: the longer wire after the V.

As it turned out, the long section after the V was actually an easier problem to solve than the gap we had just negotiated. We were able to use the people moving through the crux problem to help provide the stability we needed to span the longer gap.

There are great similarities between this ropes-course experience and the journey of AAUS. Each contains problems that appear daunting and goals that seem unattainable. Both require an agreed-upon plan and teamwork to reach the desired goals. As with the first really difficult section of the wire problem, AAUS keeps running into the same problems again and again until we finally figure out a slightly new twist to solve a crux problem and follow through. We have to build on the foundation and experience of those that

(continued next page)

come before, but we also have to have trust and to allow those who come after us the freedom to solve the problems as best fits the circumstances from their perspective. We have to be willing to look at issues from a variety of viewpoints and choose a solution that can work for everyone. We have to solve our problems in a logical, measured fashion, and we have to address them one step at a time. If we can do this, we will eventually navigate the challenge and reach our goals.

> > > AAUS ELECTION < < <

EIGHT CANDIDATES are offered for three Board positions. The AAUS Board of Directors requires each potential candidate to supply a brief biography. This allows the voting membership (2007 paid full voting members only) to make a more informed decision when voting. In the following pages, the biographies for each of the candidates precede their answers to the BOD's questions, described as follows.

The AAUS Board of Directors designed three questions to help the membership better understand where each candidate stands on critical AAUS issues. Each candidate was asked to respond to these questions.

BOD QUESTIONS

1 In your vision, in what direction should the AAUS be heading in the next decade?

2 Article 1 Section 1 of the AAUS bylaws lists five purposes and goals for the Academy (listed below). Please rank these in order of importance and provide a brief description of how you would address each purpose/goal (**i–v**).

AAUS Purposes and Goals:

i Develop, review and revise standards for safe scientific diving certification and the safe operation of scientific diving programs.

ii Collect, review and distribute statistics relating to scientific diving activities and scientific diving incidents.

iii Conduct symposia and workshops to educate the membership and others in safe scientific diving programs and practices.

iv Represent the scientific diving interests of the membership before other organizations and government agencies.

v Fund, research, educate and development of safe scientific diving programs and practices.

3 What relationships/networks/professional contacts/non-profit board experiences do you have that will benefit AAUS by having you on the AAUS BOD?

CANDIDATES AND THEIR ANSWERS

FOR THE OFFICE OF PRESIDENT ELECT

CHRISTIAN McDONALD

As the Scientific Diving and Small Boating Safety Officer for the Scripps Institution of Oceanography (SIO) at the University of California, San Diego, I'm tasked with managing the oldest and one of the largest and most active scientific diving programs in the United States. Initially trained as a scientific diver by Don Canestro and Nicole Crane in 1994 as an undergraduate at UC–Santa Cruz, I was able to develop further experience as a field assistant working on Sea Otter/Sea Urchin/Kelp Forest ecological dynamics on Shemya Island in the outer Aleutian Islands. Upon my return and subsequent completion of my undergraduate education in Marine Biology, I was recruited into another cold-water environment as a scientific diver working on marine toxicology issues based at McMurdo Station, Antarctica. From 1997 until 2002, the vast majority of my time was spent in and around the Antarctic working as a scientist and cinematographer with notable researchers and filmmakers. I also worked at McMurdo Station and aboard NSF-contracted research vessels as a commercial diver, marine technician, and diving supervisor for the United States Antarctic Program's (USAP) support contractor, Antarctic Support Associates and Raytheon Polar Services Company.

In 2002, I left the USAP to take a position at SIO as the Diving Locker Supervisor. After two years of providing diving and technical support, diver and small boat training, and project oversight for a variety of SIO students and researchers, I assumed the role of Diving Safety Officer. In the three years I've been in this position, I've successfully brought in over $200K from federal and private sources facilitating significant renovation and revitalization of our operational and training capabilities.

I've been a NAUI Instructor since 1996 and completed training as a Wilderness EMT and DMT in 2000. Additional advanced diver training and experience include Full Cave, Mixed-Gas, CCR, and Surface-Supplied diving modes. I've served on the NSF Office of Polar Programs Diving Control Board since 2004, responsible for science diving activities supported by the NSF in polar regions, and have served on the AAUS Board of Directors (BOD) as an appointed Director and Chair of the Statistic Committee since early 2006.

1 My Vision of Directions for AAUS During the Next Decade

AAUS has been subject to significant growth in the last decade. A review of past *SLATE* articles and BOD's meeting minutes indicate that the Academy has been wrestling with the pains associated with this growth since the early 90s. Some of the issues include addressing Scientific Diver and Diving Safety Officer qualification and "certification," mechanisms to ensure and verify quality implementation of our standards by the Organizational Membership, initiatives to better include the diving scientist in the Academy's function, and the clear need to reduce the burden of running the Academy on the backs of a volunteer board have been brought to the forefront time and time again. Past and current administrations have done an admirable job via a "strategic planning" process to further define these issues and, more importantly, map a tentative course to their resolution.

AAUS finds itself at an implementation phase in its development. There are clear challenges associated with diversifying and growing the Academy's resources (without inappropriately burdening membership), but as the Academy finds ways to meet these challenges, it will be better positioned to meet the needs of the diving scientist and remain on solid ground as the national standard bearer for Scientific Diving.

In my vision for AAUS in the next decade, I believe that the Academy should look at further developing our two-tiered model to membership. Access to the resources and expertise provided by our diverse community can and should be made available to interested individual members, developing scientific diving programs, and the diving scientist at an introductory membership level. Organizational Membership would require further vetting and subsequent accreditation. Site visits and program evaluation by regional AAUS leadership, currently detailed in Article III, Section 1(a)(v) of our Bylaws, could provide significant guidance to member organizations as well as provide powerful advocacy for scientific diving program support in this day and age of shrinking budgets. The process of reciprocity, arguably the most significant benefit to membership, would be strengthened as accredited organizations would have their programs verified. There exist numerous model organizations (American Zoological Association, UNOLS, etc.) that have demonstrated this to be an effective mechanism to maintain quality control within their respective communities.

Of course, AAUS must remain vigilant in all areas detailed below as the fundamental "purposes and goals" of the Academy.

2 Ranking and Addressing Purposes and Goals of AAUS

i *Develop, review and revise standards.* Continued development and review of safe scientific diving practices and the implementation of immerging diving technologies remains the cornerstone of the AAUS. Though currently a small component of our total scientific diving activities, advanced diving modes (CCR, Mixed-gas, Surface-supplied) allowing our researchers safe access to greater depths will become increasingly important in the coming years. As our community experience grows in these areas, further evaluation of existing standards may become vital to ensure we remain as proactive as is possible in these more challenging environments.

ii *Represent the scientific diving interests before organizations and agencies.*

iii *Collect, review and distribute statistics.*

Points **ii** and **iii** are intimately connected. As we all know, AAUS was initially organized in the effort to retain autonomous regulation and oversight over scientific diving activities within the scientific diving community. The success of this effort was based almost entirely on the ability of the small group of dedicated diving scientists and diving officers to effectively and articulately lobby federal regulators with data that clearly demonstrated that their community was in fact appropriately and safely self-regulated. AAUS must remain prepared to represent the interests of its members, and the most effective argument for continued autonomy lies within AAUS's existing and future diving and accident/incident statistics. Recent efforts to better vet and classify accident/incident reports to more accurately represent the realities of our activities is valuable. Careful monitoring and analysis of activities utilizing new and more advanced technologies is also quite important.

iv *Conduct symposia and workshops.*

v *Fund, research, educate and development of safe scientific diving programs and practices.*

Again, I find that points **iv** and **v** are connected. Communication and dissemination of information is vital to the success of any diverse community or organization. A successful annual symposium, coupled periodically

with targeted workshops addressing the relevant issues of the day, should continue to be a fundamental goal of the AAUS. The Academy's growth and the subsequent workload of keeping the organization running may have affected its vision to identify and conduct relevant workshops in recent years. As AAUS's administrative infrastructure develops, it will become increasingly important to look again at this critical role. Successful collaborations are to be actively sought as many of the various diving communities are interconnected and wrestling with similar issues.

3 Relationships, Networks, Professional Contacts and Board Experience

As previously mentioned, I currently serve on the Diving Control Board for the NSF's Office of Polar Programs and on the Board of Directors for AAUS. In my years as a working scientific diver, I've had the privilege to work with a diverse community of diving scientists, marine cinematographers and explorers, and technical and commercial divers. I do believe that we have much in common with and much to share with all the various diving communities. As the Diving Safety Officer at SIO, I liaise with and advise a variety of national diving entities. I've also recently returned from an International Polar Diving Workshop conducted in Ny-Ålesund, Svalbard, where significant connections were established with representatives of diving programs and hyperbaric physicians from the UK, New Zealand, Australia, Finland, Norway, Germany, and the United States.

RICK RIERA-GOMEZ

University of Miami, Rosenstiel School of Marine and Atmospheric Sciences, Diving Safety Officer

I was born and raised in Coral Gables, Florida (a suburb of Miami), and spent a lot of time in and around the water while growing up. I started diving back in the early 1980s with my friends. With the nation's best reefs just off the coast, strangely we managed to do most of our diving in the canals around Coral Gables, looking for golf balls and practicing spearfishing by shooting mullet.

My involvement in scientific diving started in 1990 at the Caribbean Marine Research Center (CMRC), a NURC facility (now also an AAUS OM) on Lee Stocking Island, Exumas, Bahamas. Originally employed at CMRC as a research diver for a PhD student and later as a staff researcher, I spent most of my time (two years) on the island as the Diving Safety Officer. There I learned the "ins and outs" of what it took to run a scientific diving and small boat program. With the lab being a NURC facility, I also became intimately familiar with NOAA Diving regulations. The experience I received there was invaluable and helped prepare me for my current position as Diving Safety Officer at the University of Miami.

I have been with the University of Miami for the past 13 years. In this time, I have experienced just about everything a DSO can, from wonderful research cruises and spectacular dives to funding cuts and divers getting injured. UM's program is one of the largest and most active in AAUS with divers operating in just about every environment, using all modes of diving and enduring all weather conditions.

The variety of diving conducted at UM has required me to be involved with AAUS at every level. When I first got to UM, I got involved with the Standards committee to help me understand how the AAUS standards were developed and become more familiar with the different OMs, new and old. At the time (sometime in 1995), AAUS was also looking for a Membership Chair for the BOD. I spoke to then-president John Heine about it and was later appointed Membership Chair. This experience allowed me to really see how AAUS worked. Since coming off the Board in 1998, I have participated on several committees such as the Decompression Standards committee and Mixed Gas Standards committee. And as many of you know, I wrote the AAUS Cave and Cavern Standards. I was also host for the 2007 AAUS Symposium in Miami.

When I'm not diving, I am probably spending time with my wife, Betsy; son, Trey; and daughter, Claire. I stay active playing soccer but have also raced in several triathlons and adventure races.

1 My Vision of Directions for AAUS During the Next Decade

My vision for AAUS in the next decade is for AAUS to try to become a more valuable resource for the scientific diving community by providing more support to the organizational membership and diving officer position. To do this I think, as discussed at the Symposium, AAUS should continue to explore the development of a training/qualifying group/committee, whatever you want to call it, to train diving officers and scientific divers to the high levels needed to work safely and efficiently. I would also like to see AAUS establish and promote to each OM the value and credibility of the diving officer position and the diving programs. This credibility would help programs gain the support necessary to conduct a safe and productive diving operation.

2 Ranking and Addressing Purposes and Goals of AAUS

i *Develop, review and revise standards for safe scientific diving certification and the safe operation of sci-*

entific diving programs. This will continue to be accomplished by the development of a training program for diving officers and scientific divers.

ii & iii *Represent the scientific diving interests of the membership before other organizations and government agencies. To do this, AAUS must collect, review and distribute statistics relating to scientific diving activities and scientific diving incidents.*

I put **ii** and **iii** together because they are equally important. Number **iii** helps support and justify number **ii**. I would continue the collection of statistics, maybe tweaking what information we would be collecting.

iv & v *Fund, research, educate and development of safe scientific diving programs and practices. Conduct symposia and workshops to educate the membership and others in safe scientific diving programs and practices.*

I also listed these together because they are accomplishing the same thing. I would like to see AAUS continue the workshops such as the Reverse Profiles Workshop and revisit some of the old workshops such as the computer workshop.

3 Relationships, Networks, Professional Contacts and Board Experience

Some of the experiences I have with non-profit organizations include being on the AAUS Board and seeing the inner working of AAUS. I am also presently on the board of a local community center. This board deals directly with the city government by seeking out financial support from local businesses and groups. As for professional contacts, being in south Florida has allowed me to develop relationships with manufacturers and recreational training agencies.

FOR THE OFFICE OF SECRETARY

CAPT. NATHAN T. SCHWARK, MS

Shannon Point Marine Center, Western Washington University

I am 33 years old and have been working at Shannon Point Marine Center (SPMC) for the past 7 years. I hold Bachelors and Masters degrees in Biology. I was first introduced to scientific diving as an undergraduate while taking a field biology course in Bermuda. I professionally utilized scientific diving while working on my thesis studying cnidarian physiology and zooxanthellae symbiosis in Papua, New Guinea. Since then I have collaborated on many other projects utilizing scientific diving and would say my experience is equally split between eutrophic and oligotrophic environments. My time is currently divided between DSO responsibilities, skippering research vessels, and working as a marine technologist. The SPMC director supports my nomination for AAUS secretary.

After being a member for many years, SPMC lost its AAUS affiliation in 1996 when "the DSO shall be an active underwater instructor from a nationally recognized agency" standard went into effect. I became an instructor in 2003, and SPMC reapplied for organization membership. We have a growing scientific diving program with faculty, staff, graduate, and undergraduate students diving. Recently, SPMC was designated as the responsible authority for all scientific diving at the University, and my activities as DSO have expanded accordingly. I am very thankful for the significant mentorship I've received from many AAUS members since taking on DSO responsibilities.

1 My Vision of Directions for AAUS During the Next Decade

In my vision, AAUS should be the unquestioned industry standard for scientific diving. I am excited about the development of the standards and the additions to Volume Two. I am eager to push forward with formally seeking federal (and other) funding and believe this is a good mechanism to reconcile what AAUS *wants* to do with what AAUS *can* do. I'm all for DSO/scientific diver "qualifications" and the production of training materials, but I am only mildly dissatisfied with my current strategy of cherry-picking materials from other programs and various training agencies.

2 Ranking and Addressing Purposes and Goals of AAUS

When asked to rank the five AAUS purposes and goals, it's hard for me (having spent the last half-year as a standards co-chair) not to list standards at the top. However, I believe the interconnectedness of all the purposes and goals prevents meaningful ranking and would rather rank the importance of individual projects. Many projects affect multiple goals. However, not meaning to wiggle out of answering the question, I rank the list of five in the following order.

i *Develop, review and revise standards…*

ii *Represent the scientific diving interests…*

iii *Conduct symposia and workshops to educate…*

iv *Fund, research, educate and development of safe…*

v *Collect, review and distribute statistics…*

AAUS currently has committees tasked in each of these areas. I feel that the current approach of creating, populating, and empowering standing committees is good; however, (except for Alma) AAUS is still populated with individuals whose real job usually requires over 100% of their time. I believe it has been an incredible step in the right direction to assign an AAUS employee with some of the job of keeping the ship afloat, thereby allowing the AAUS Board of Directors and committee members to focus more on what AAUS wants to do.

One trend that surprised me while skimming through historical executive board meeting minutes is the continued recurrence of common issues. In 1986, "training certification" was an item of new business up for discussion. It's still an important agenda item. AAUS has accomplished a lot in the last twenty-plus years, but I believe the current threats and opportunities facing AAUS have the potential to either sink the ship in port or allow it to set sail. Each purpose and goal would benefit by shifting more day-to-day responsibilities to a paid position, thereby further empowering individuals and committees to work on the wants.

3 Relationships, Networks, Professional Contacts and Board Experience

I bring a small-university perspective to AAUS; I know how increases in dues can affect a small budget, how to get things done without a large budget, how hard it can be to comply with standards, and why it's so important to do so. Neither my undergraduate nor graduate institutions are AAUS members, yet I was involved in scientific diving through both places. There are five institutions in my area all conducting scientific diving who choose not to be members of AAUS. Are we really the industry standard? There are many potential organizations not yet members of AAUS, and I believe AAUS can grow without jeopardizing its standards. I enjoy science, and work to stay current in my field. I enjoy learning how scientific diving is utilized in other fields. I can relate to scientists and understand why it is so important that their work be done in an effective, efficient, and safe manner. I am not intimidated by working with people more experienced than myself, and I am not afraid to call them out when needed. Oh yeah, I can type at 60 wpm.

PAUL A. WORK

I am an Associate Professor of Civil and Environmental Engineering with the Georgia Institute of Technology (Georgia Tech). My office is at the Savannah Campus of Georgia Tech, and I serve as the Associate Chair of the School as well as Associate Director for the Savannah Program.

I received my BS and MS degrees in Civil Engineering from the University of California–Berkeley and my PhD in Coastal and Oceanographic Engineering from the University of Florida. I am a licensed Professional Engineer in SC, GA, FL, and NC, with some work experience outside of academia, engineering consulting experience while within academia, and I have worked at three different universities since obtaining my PhD: Clemson University in South Carolina; Bogazici University in Istanbul, Turkey; and Georgia Tech. My CV and additional details can be found at http://www.gtsav.gatech.edu/cee/work/cv.pdf.

My research focuses on the movement of water and sediment in the natural environment, particularly the coastal environment, and many of my projects have included field data collection, so my interest in diving should not be a surprise. I learned to dive in graduate school and went through the AAUS certification process in 1988. My work-related diving increased in frequency when I moved to Savannah in 2002. At that time, I renewed my AAUS certification with the University System of Georgia and have been actively diving for my own projects and also to assist with projects initiated at the Skidaway Institute of Oceanography in Savannah. I have also worked with divers from NOAA (Grays Reef National Marine Sanctuary) and the South Carolina Institute for Anthropology and Archaeology.

I have tried to continue to improve my diving knowledge and credentials over time. As a result I have been certified for drysuits, decompression diving, advanced nitrox, and semi-closed circuit rebreathers. Two years ago I was certified as a PADI instructor and have provided classes for some of my colleagues at Skidaway and also for some of our students. My work has exposed me to a wide range of diving environments throughout the world, including locations ranging from Alaska to the Black Sea to the blackwater rivers of South Carolina.

I have attended several AAUS symposia and presented a paper last year in Friday Harbor. I have enjoyed my interactions with the members and would like to maintain, and increase, my involvement. Serving as a faculty member at a research university, and having an administrative role within the institution, I think I would bring a somewhat different perspective to the Board of Directors. At this point, I have nearly fifteen years of experience teaching, soliciting research funds, and overseeing the completion of sponsored research projects.

1 My Vision of Directions for AAUS During the Next Decade

The types and purposes of the diving done by AAUS members differ from the activities undertaken by most for-profit entities that might make use of diving. Scientific diving involves specialized skills that differ in many ways from the skills required for non-diving research projects—skills that are not simply acquired through a one-semester course. AAUS needs to be viewed as an important and valuable entity that leads to both safe diving and also innovations that can help advance science. This implies both a regulatory mission and a research mission. The regulatory mission is a moving target, as technology advances.

I am not suggesting that AAUS needs to issue Requests for Proposals for sponsored research projects, but I can use rebreathers as an example: there are AAUS members already using trimix in closed-circuit rebreathers to what I would call "significant" depths. These divers are in the process of discovering and developing procedures to make their dives safer and more productive, using, arguably, new technology. This process needs to be captured and incorporated into the diving protocols mandated by AAUS.

The administrative personnel at many research institutions are not aware of the demands and constraints of scientific diving. I've met people from research institutions that manage to solicit millions of dollars per year in external funding, yet are hesitant to invest in even basic maintenance of their diving operations. I think that increasing the visibility and stature of AAUS could help address this type of problem.

I'd like to see more student involvement within AAUS. I know that there are many students diving under the auspices of AAUS, but I'd like to see them more involved on the national level. I think that working to increase the number of conference presentations, and possibly requiring papers, and some level of peer review of the papers, could help achieve this.

2 Ranking and Addressing Purposes and Goals of AAUS

I have re-ordered the goals in the list below in terms of highest to lowest priorities.

i *Develop, review and revise standards.*

This seems to be AAUS's *raison d'être,* and I think it will continue to be important. Scientific diving is different from commercial diving and needs to be regulated differently. Standards need to be revised as technological advances occur, and as new knowledge (for example, of physiology) is developed.

ii *Fund, research, educate and development of safe scientific diving programs and practices.*

I take exception with the first verb here—fund—because I don't think that AAUS is in a strong position to fund research, and I am not sure that they want to try to get to that point. I do think that it is important that they focus on the development and refinement of safe diving practices in research settings, and to educate those within (and in some cases outside of) the membership regarding these issues. Most AAUS members are involved in research projects that are already funded via some other means, not necessarily related to diving, per se. But these funds represent the means by which some new diving-related discoveries are made, and this needs to be captured and reflected in updated standards and practices.

iii *Conduct symposia and workshops.*

The symposia and workshops represent the best venue for interaction of members on a national level. As I noted above, I think that some changes to the way the symposia are run will affect their desirability and respect. I'm not trying to be critical—I've enjoyed my participation much more than most meetings I attend—but I'm thinking about how the stature of the organization can be enhanced. The symposia give me ideas not only about safe diving practices but also research topics and techniques or tools that I can employ in my projects.

iv *Collect, review and distribute statistics.* I think this is an important component of item 1 above (development and maintenance of standards). But there is already a well-respected and better-known American organization that maintains statistics on diving accidents—DAN. It would seem that it might be possible to partner with them when refining the scheme by which statistics of accidents related to scientific diving are maintained and distributed.

v *Represent the scientific diving interests before organizations and agencies.*

In my experience, the agency that most scientific divers working within research institutions have the most trouble with is their own. By this I mean that their institute does not want to invest in training or equipment upgrades or maintenance. I am fortunate in that I am generally able to solicit the funds that I need to maintain my diving equipment, and to upgrade when necessary, without approval from others, once the project is funded (and if it is not, there's no need to dive). Many of those who run diving operations are dependent on a budget provided by others. It would seem that an administrator would have a difficult time saying no to annual servicing of life support gear, but I get the impression that it is not uncommon. A better awareness of the rules and

requirements for safe diving, and AAUS, could help in this regard.

3 Relationships, Networks, Professional Contacts and Board Experience

I am presently the Chairman of the Diving Control Board for the South Carolina Institute of Anthropology and Archaeology, based at the University of South Carolina. We meet annually to review their diving program and safety-related issues, typically at the South Carolina Aquarium in Charleston, which is also an AAUS member. The Institute is involved in research and regulations associated with underwater "cultural resources" within the state of South Carolina. I have participated in several of their research trips.

I interact regularly with researchers at other institutes who are involved in scientific diving, particularly Skidaway Institute of Oceanography and Grays Reef National Marine Sanctuary (NOAA), both in Savannah, Georgia.

Through my research, I have worked with colleagues at a number of federal agencies that employ divers: the US Army Corps of Engineers, the US Geological Survey, and the US Navy, among others. I also interact frequently with a number of engineering consulting firms that work on coastal issues and make use of diving and divers.

As I noted in my bio sketch, I think I would bring a somewhat different perspective to the Board of Directors, for several reasons:

I am a tenured faculty member at a research university. I have, among other things, an administrative/supervisory role within my institute. I am an engineer (and have served as an expert witness on multiple court cases). Most of my research diving has been related to projects in the coastal engineering, physical oceanography, or marine archaeology realms, as opposed to a biological focus that I have seen for many of the projects discussed by other AAUS members.

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FOR THE OFFICE OF DIRECTOR

BRETT RAMEY BLACKBURN

Education: Bachelor of Science in Biological Sciences, University of Central Arkansas, 1996; Master of Science in Biological Sciences, University of Southern Mississippi, 2000. *Experience:* Assistant Diving Safety officer under Bradley Randall at the University of Southern Mississippi's Gulf Coast Research Laboratory, 1998–2000. Lead Diver at the Gulf Coast Research Laboratory Gulf of Mexico Stock Enhancement Program. GCRL and Mote Marine Laboratory, 1998–2004. AAUS-Recognized Diving Safety Officer at Mote Marine Laboratory since 2002. PADI professional since 1992. PADI Dive Master 1992–2001. Participated in approximately 150 PADI Certification Classes. PADI IDC Staff Instructor with approximately 1,000 scuba certifications as lead instructor since March 2001. DAN Oxygen Administration Instructor since 2001. Red Cross and Emergency First Response Instructor since 2002. Director of Dive Operations at Mote Marine Laboratory 2004–present. Established the Dive Operation Program at Mote Marine Laboratory. Established the Mote Marine Laboratory Scientific Diver Training Program. Established Mote Marine Laboratory as a PADI Recreational Diving Training Center. Lead Diver on various research diving projects including the following: Pulley Ridge Exploration; Blue Holes of the Gulf of Mexico Research Project; Red Snapper Enhancement off the coast of Sarasota, FL, and Ocean Springs, MS; ongoing evaluation of Artificial Reef System Productivity in the Eastern Gulf of Mexico; artificial reef construction and evaluation off the coast of Sarasota, FL, and Ocean Springs, MS. Member of AAUS since 2002, Scientific Diver since 1998, participated in approximately 2,500 scientific dives as lead diver or participant diver.

1 My Vision of Directions for AAUS During the Next Decade

A Since its inception, the organization has continually refined and defined the role of the scientific diver and scientific diving operations to participant organizations, legal authorities, and governmental agencies. The continual evolution of the participant sciences and technological advances require that we the members have to maintain the highest standards of care in order to maintain our respected position. AAUS has promoted scientific diving through the establishment of safe diving standards, which have evolved with technology and scientific needs of the member organizations. Technological advances have broadened the scope of scientific diving programs throughout the world.

As the scope of scientific diving increases, recreational diving agencies are relaxing training standards to reflect the current economic and entertainment climate. In some cases these relaxed training methodologies are sound, but they do not adequately prepare the young divers for increased task-loading that working scientific divers face. As recreational diving standards become more lax, the role of the diving safety officer becomes

increasingly more difficult, because of the fact that new scientific diving recruits require increased training, which was originally covered during recreational scuba courses. AAUS will be challenged with finding and maintaining adequately trained Diving Safety Officers. Other than the training programs offered at yearly AAUS Symposia, there is little or no training for incoming or new DSOS. The current standards do not allow the individual OMS to use untrained divers to conduct scientific diving operations, so why should we place the full burden of scientific diver training on untrained dive safety officers?

The status of AAUS is dependent on our ability to continually evolve in the face of changing science, technology, and legal climates. Without a defined training program or central oversight of our sponsored DSO, we could be restricting our potential as an organization. Training and oversight of the DSO position could ultimately be required from governmental agencies, or legal standings due to litigation. We have the benefit and responsibility to enact the DSO training and evaluation by our own decision and not as a mandate. Recognition of this need and self imposing this action, will allow AAUS to maintain a respected position and record among various federal and state governments that govern the health and safety of employees.

B We also have to begin looking at individual liability of each OM's diving safety officer. The majority of diving safety officers use their instructor liability insurance carriers to ensure training and evaluation of scientific divers. Most of these policies do not cover any training outside of the defined standards set forth by the training-agency sponsors. As these agencies' certification requirements relax, the OM DSO will be required to teach more and more outside of the base standards defined by the training organization in order to qualify entry-level scientific divers. If we are to face this challenge, we must also face the liability issues this imposes. As an organization, we have an excellent reputation for maintaining safety of our divers. When looking at the number of dives completed, there have been very few accidents and problems. This gives the organization a solid foundation to approach a carrier and petition for liability coverage for all diving safety officers. If we do not face liability issues, we could be severly restricting our effectiveness as an organization.

The other question that the organization is facing over the next 10 years is, What defines a scientific dive? This could easily be defined as any dive that is directly involved in the collection of scientific data. However, the question becomes, How do you classify dives that are directly in support of science but are not involved in data collection? These dives are an important part of any scientific diving operations but may or may not directly involve the collection of data. We are faced with the challenge of redefining the nature and scope of scientific diving. Diving in support of scientific data collection could very easily be defined by commercial standards and not fall under standards of scientific diving. We have to redefine what entails a scientific dive so that the variance reflects scientific diving and dives in support of science.

2 Ranking and Addressing Purposes and Goals of AAUS

i *Develop, review and revise standards.*

AAUS has always maintained the highest standards of scientific diving certification and the safe operation of scientific diving programs. OSHA variances for scientific diving are based on this principle. It is our responsibility to ensure that we maintain the prescribed standards outlined in the AAUS Scientific Diving Manual. With the recognized limitations of the recreational dive training agencies, we have to establish a defined training program for our diving safety officers. Diving safety officers are the primary educators and mangers of scientific diving operations at most institutions. The DSOs are not solely responsible for their OMs' scientific diving programs, but they are the ones who disseminate standards information to the scientific divers under their supervision. AAUS will need to establish a living guideline for DSO education. This will allow the first and principal goal and responsibility of organization to be met and maintained.

ii *Conduct symposia and workshops.*

The current symposium format works well but should be further developed to provide broader education and evaluation seminars for current and new diving safety officers. Development of a defined education system for DSOs could easily be conducted as part of the symposiums. Defined regional training events could also be scheduled to provide broader training opportunities. The idea of a mentorship with an established DSO program defined as an accepted guideline. Mentorship could be further refined to include new organizational membership so that a new entity could come to speed more efficiently. There also has to be a defined oversight of scientific diver training at all institutions by the organization. Without some form of control and oversight, we cannot guarantee that all scientific diver training meets a central standard. Oversight meetings could easily be conducted as part of the symposium.

iii *Collect, review and distribute statistics.*

The current Web-based data-entering protocol seems to be adequate for entering and maintaining the current diving statistics. I believe that we should broaden the data collected to include a new category. We should include data for dives conducted in support of science. By separating this information out of the normal diving statistic information, we would be able to keep an ongoing record of support activities that we could use to justify the redefinition of scientific diving.

iv *Fund, research, educate and development of safe scientific diving programs and practices.*

Fund-raising activities appear to be adequate in order to maintain current activities. If the membership wishes to pursue a defined diving safety officer, some form of additional support may be needed. This could be offset through tuition for these classes. Increased revenue would also allow for broader scientific diving research projects, which could be used to broaden the overall scope of the academy. Education programs would then directly instill safe scientific diving practices and programs to a broader audience than is currently available.

3 Relationships, Networks, Professional Contacts and Board Experience

I have established a long term working relationship with PADI as an instructor and a dive education coordinator. I also have solid working relationships with several gear manufactures including XS Scuba, Aqualung, Pinnacle Wetsuits, Mares, and Oceanic. My attachment to Mote Marine Laboratory, University of Southern Mississippi Gulf Coast Research Laboratory, and the scientific community has granted me various contacts which could be useful to the organization in the future.

ROB CHADWELL

Deep Sea Mooring Technician, University of Alaska Fairbanks; AAUS Diver and Member of DCB at the University of Alaska Fairbanks; Advanced Diver Medical Technician, NOAA EMT/DMT Course; 3000 Ton USCG Captain, Celestial Endorsement; Master of Marine Affairs, University of Rhode Island, "Regulatory Environment of Oceanographic Research Vessels"; my academic advisor was Dennis Nixon, NSF-funded legal counsel to the UNOLS Fleet; Assistant Instructor, University of Florida Academic Dive Program; Captain and Deck Officer of Various UNOLS Vessels; Relief Chief Officer of University of Miami Research Vessel *FG Walton Smith;* attended three courses, one graduate level, in the Scientific Cold Water Diving program at the University of Alaska Fairbanks; Captain of 100-ft live-aboard sport diving vessel Gulf Stream Eagle, Bahamas; YMCA Divemaster.

1 My Vision of Directions for AAUS During the Next Decade

I believe the primary goal of AAUS is to *safely* support and facilitate the science of the diving researcher. One of the most important practices in facilitating scientific diving is reciprocity. I have been involved in several scientific diving projects where the lack of AAUS divers has negatively affected the experiment. While I understand the intentions of having a qualified instructor as a diving safety officer, it seems to me that a saturation of professional sport-diving instructors into the organization has resulted in a shift towards education and training. The recent proposals that AAUS become a certifying agency concern me. Our goal should be to *safely* facilitate the science and not obstruct the researcher with bureaucracy. The center of gravity should remain with the scientists and institutional members.

2 Ranking and Addressing Purposes and Goals of AAUS

i *Develop, review and revise standards.*

My understanding of the birth of AAUS was to offer alternative compliance to OSHA commercial diving regulations. I ranked this first because I believe providing industry standards is the foundation of AAUS.

ii *Collect, review and distribute statistics.*

I ranked this second because these data support the first goal. The statistics prove the safety of the AAUS program and provide justification for continued exemption from commercial diving regulations. When the data indicate a negative trend in safety, a change in standards is justified.

iii *Fund, research, educate and development of safe scientific diving programs and practices.*

This goal is closely related to the first goal of promoting safe diving programs. The organization was begun as a reaction to the regulatory process; however, developments in diving technology and technical diving programs mean that AAUS should be pro-active in developing standards for emerging advanced diving practices.

iv *Represent the scientific diving interests before organizations and agencies.*

If you had asked me this question the year before AAUS was started as an organization to address the OSHA problems, I would have ranked it first. Having already achieved the goal of the commercial diving exemption, promoting a safe diving program should preempt further regulatory interference.

v *Conduct symposia and workshops.*

I ranked this last because I believe the best forum for educating the membership is through promulgating standards reflected in the Scientific Diving Safety Manuals.

3 Relationships, Networks, Professional Contacts and Board Experience

My professional contacts include research vessel captains and DSOs. More importantly, my academic advisor for graduate course work was the NSF-funded legal advisor for the UNOLS fleet. I have occasionally consulted for an admiralty attorney in Florida on sport-diving accidents and speak to his office for informal legal advice on a variety of maritime legal issues.

KEVIN FLANAGAN

BA Marine Biology, UC Santa Cruz; Asst. Diving Safety Officer, Training Coordinator; University of Hawaii Diving Safety program; Scientific Diver since 1989.

NAUI Instructor Trainer; Inspiration CCR; DAN Instructor Trainer for DFA for Pro Divers, BLS Pro, Oxygen, Advanced Oxygen, Haz marine Life, AED, Remo, Neuro; IANTD Trimix; Trimix, Nitrox Gas Blender; O_2 Service Tech; PSI Inspector; Halcyon SCR; Dolphin SCR; Lar V CCR; NASA Fire Hazards in Breathing Gas Systems; Chamber Operator, Attendant; DOI Motorboat Operator; 4,000+ Lifetime dives.

1 My Vision of Directions for AAUS During the Next Decade

I believe that AAUS has a unique clientele with unique needs and specific goals. To meet these needs, it would best if we were not dependent as an Academy on outside training agencies. AAUS should be able to educate, train, and develop safe, effective scientific divers without recreational scuba agencies or emergency response training agencies. Developing training materials, a DSO certification, and our own certification for scientific divers should be a priority of the Academy in the next decade. This can be done while still serving the needs of organizational and individual members. I am also fully supportive of the idea of having a full-time administrative employee and eventually a CEO. As discussed at the DSO meeting in Miami, this presents a unique set of challenges. However, no problem is without a solution. If the Academy continues its trend of growth these are, in my opinion, necessary steps to facilitate that growth.

2 Ranking and Addressing Purposes and Goals of AAUS

First off, I feel free that the Academy is already meeting these goals quite well and that is a primary reason for the success we've seen. However, if they must be ranked...

i *Fund, research, educate and development of safe scientific diving programs and practices.*

As science evolves, so will scientific diving. It's up to us to stay ahead of the curve. So as new technologies, methodologies, and protocols develop, we should be in the spotlight facilitating. As a board member, I would do my share by immersing myself in any new advances and staying atop of developments within the community. I would like to see the current scholarship program expand, as it's probably the most popular individual membership benefit. I would also like to see more workshops at symposia.

ii *Conduct symposia and workshops.*

Again, I feel we are already doing a great job of this. However, as mentioned previously, I would like to see more workshops at symposia. I very much enjoyed the concurrent sessions in Miami, and I believe we as an organization should strive to continue this practice.

iii *Represent the scientific diving interests before organizations and agencies.*

The OSHA exemption is the lifeblood of AAUS. Currently our statistics show that is well deserved, and I believe the days of "looking over our shoulder" are past. The primary other government agency with which we need a strong working relationship is NOAA. Continuing the reciprocal agreement between us is a key to future endeavors.

iv *Develop, review and revise standards.*

As new technologies are developed, we will need to address these within our standards. As a member of the standards committee, I believe we as an Academy have done an excellent job with the rebreather and overhead environment standards in the past. However, my personal philosophy is to keep the standards to a minimum, allowing the organizational members the most flexibility to meet their needs.

v *Collect, review and distribute statistics.*

The only reason this is last is that we've done such a great job with statistics collection. Other than streamlining the criteria off an accident/incident and seeing better reporting by the membership, I think the statistics are in good shape for the future with an excellent statistics committee chair.

3 Relationships, Networks, Professional Contacts and Board Experience

I think my strongest contacts are other diving officers. Keeping in touch with diving officers from both coasts

would allow me to make decisions based on their input. Overall, I would do my best to serve AAUS and to assist the Academy with its growth and future needs.

BOB HICKS

I am a 62-year-old, retired 30-year attorney (admiralty, dive law, and insurance defense) working for the past 6 years as dive officer and vessel safety officer at the Alaska SeaLife Center, a combined marine-research/aquarium facility. I am a PADI, NAUI (inactive) and IANTD instructor with various specialties, a certified cave and CCR (Prism) diver, volunteer operator at the Catalina Hyperbaric Chamber, and active deep wreck diver (primarily Lake Superior). I am the adjunct dive instructor at U of Alaska, Anchorage. I am an appointed AAUS director and am pro bono legal counsel to AAUS and to NSS–CDS. Relevant publications include "The Jury's In: A Defense Lawyer's Perspective on Risk Management and Crisis Response" (2000), "The Legal Scope of Scientific Diving" (1997), and three pending publications: AAUS Proceedings from Legal Workshop on Scientific Diving (Chair and Ed.), and both "Cold Water Cave Diving" and "Cave Diving Risk Management and Incident Management" for the new NSS–CDS Cave Diving Manual. I received my BA at Stanford University and my JD at Harvard Law School. I am married (41 years this month) and have two adult children and one granddaughter.

1 My Vision of Directions for AAUS During the Next Decade

AAUS must continue to facilitate the development of safe and productive scientific divers through education, research, advocacy and the advancement of standards for scientific diving practices, certifications and operations. But AAUS has grown to a new threshold, where a volunteer board can no longer effectively administer these traditional functions for ~105 OMs (and ~30 pending applicants), ~330 individual full voting members, and ~730 other members. AAUS needs a staff. AAUS needs to ensure that this broader array of OMs shares the longstanding commitment to quality DSO staffing, and to quality training of scientific divers. AAUS cannot retain the trust and confidence of OSHA without AAUS growing administratively and substantively to ensure future oversight and supervision of safe and healthful scientific diving, uniformly among a greatly expanded membership. My vision for AAUS during the next 10 years is an evolutionary path toward developing a full-time staff financed by grants, developing curriculum standards for scientific diver training, and developing systems and programs for recognizing the status of DSOs who choose to engage in voluntary continuing education.

2 Ranking and Addressing Purposes and Goals of AAUS

My ranking and explanation of importance of goals reads as follows:

i *Develop, review and revise standards.* The diving we know today will continue its past half-century of innovative technology, increasing insights into dive-physiology, and improved diving techniques. AAUS Standards are the American "community standards" for safe scientific diving, and hence the top priority of AAUS should be to continue to balance (a) keeping actively abreast of new knowledge, improved designs and changing trends, while (b) remaining cautious of changes to our solidly based, effective national sci-diving standards.

ii *Collect, review and distribute statistics.* AAUS organizers obtained the OSHA partial exemption for sci-diving because they could show a persuasive, documented history of prudent and cautious diving policies and practices. Accurate and complete statistics are essential to accident analysis and to reassessing standards for future prevention. These statistics also establish the data and proof that the sci-diving community is responsible and trustworthy in ensuring the health and safety of its divers.

iii *Represent the scientific diving interests before organizations and agencies.* I focus specifically on federal and state OSHAs. AAUS develops standards and collects statistics primarily to monitor and ensure healthy and safe sci-diving. If AAUS fails to communicate this successful self-regulation to the agencies entrusted with enforcing health and safety of employee-divers, the beneficial effects of the conscientious efforts in Nos. **i** & **ii** above are lost.

iv *Conduct symposia and workshops.* It's hard to say this is "less important" than Nos. **ii** or **iii** above; I'd rather say that if we had to abandon one goal, this should go before the above goals. Human intelligence is never in a state of equilibrium. We are always either learning or losing a subject matter. Education is an integral part of healthy, safe diving.

v *Fund research and development of scientific diving programs and practices.* If we have the means and the money, this goal is one important facet of that broader need for "education"—essential to safe and healthful diving.

3 Relationships, Networks, Professional Contacts and Board Experience

I have worked with the AAUS board of directors as legal counsel since 1994, and I presently serve as a board member. I co-authored (with Don Harper) the draft bylaws that form the basis of the present AAUS Bylaws. I serve

similar legal functions with another non-profit dive-related corporation, the Cave Diving Section of the National Speleological Society. I have worked with corporate boards of varying types and sizes for over 35 years.

As a dive lawyer, a technical diver and now a dive officer, I have developed relationships, networks and professional contacts with many people across America in dive certifying agencies, dive manufacturing, dive retailing, instructors, aquariums, marine research facilities, and across a broad community of individual technical cave/wreck/CCR/mixed-gas divers.

I believe I bring to the AAUS board of directors a unique perspective, a new combination of skills, and perhaps some valuable insights.

MICHAEL LOMBARDI

I have been involved in scientific diving under various AAUS programs since 1998. Since 2000, I have intermittently served as the Diving Safety Officer and a Dive Control Board Member at NOAA's Caribbean Marine Research Center, which includes supervising more than 6,000 scientific dives from very shallow to over 300 feet using mixed-gas, rebreathers, in caves, and submersible operations. My personal interests in technical/advanced diving for science largely evolved through this tenure at CMRC. In 2002, I drafted standards and procedures to enable first scientific mixed-gas exploration program under NOAA's CMRC program auspices, and among the first within the AAUS. This largely influenced the presently adopted AAUS mixed-gas and decompression diving standards. An extension of cave exploration conducted there in 2002–2003 included drafting standards for, and earning subsequent approval to make the first CCR dives under NOAA's CMRC program auspices in 2004, including using CCRs for cave exploration. In 2005, I drafted a proposal for, and earned blanket approval, allowing routine mixed-gas decompression diving and rebreather diving under NOAA–CMRC/Perry Institute liability insurance policy. In 2004 and 2005, I served as an external reviewer for the NOAA CCR Manufacturing Performance Standards and AAUS rebreather standards. I am currently employed as an Undersea Specialist and serve as a Dive Control Board member for Fathom Research LLC and work as a freelance photojournalist, most notably as a contributing author to *The Summit Journal*. Additionally, I recently (2006) authored the "Deep & Computer Diving Specialty Course Instructor Guide" for Scuba Diving International. In 2003, I started a grassroots non-profit organization called "Ocean Opportunity" to incubate my many entrepreneurial interests in ocean technology and biotechnology. Among recent successes included facilitating the world's first ventilator-dependent and wheelchair-bound diver by creating a successful public relations, marketing, and fundraising campaign. This marked a significant advancement for the adaptive scuba and muscular dystrophy communities. This story was featured on NBC's *Today Show* in January 2007.

1 My Vision of Directions for AAUS During the Next Decade

In the next decade, I believe that the AAUS should continue to evolve its strengths in three principal areas. First, improve upon a process by which DSOs are held responsible for upholding the AAUS standards, particularly in the areas of scientific diver training and granting authorization to dive. This has implications in addressing "certification" issues within the scientific diving community. Second, increase community outreach and stewardship activities to improve upon the brand-name recognition and notoriety of the Academy, which will reflect in increased membership and more influence with ocean/environmental policy makers. Lastly, I believe the AAUS should work towards specific endorsement of its organizational members to aid in creating a more unified and consistent voice to the non-scientific diving community. This is possible with both active and passive modes of marketing and public relations activities.

2 Ranking and Addressing Purposes and Goals of AAUS

i *Develop, review and revise standards.*

The AAUS Scientific Diving Standards are well written and evolve well given the nature of its contributing membership. I believe that one fault is strict upholding of standards, particularly in the area of "certifying" scientific divers and holding those authorized to dive responsible to consistently meeting or exceeding these standards. I believe that a peer-reviewed method to recognize degrees of qualification should be developed and implemented to hold DSOs accountable for meeting minimum training standards.

ii *Represent the scientific diving interests before organizations and agencies.*

Today, progress and evolution for any organization is largely enabled through politics and public policy. With the many critical issues affecting the environment and our oceans specifically, the AAUS has a voice that needs to be heard by policy makers, as we are the community that actually goes underwater to do the work! The AAUS would benefit considerably from a strategic alignment with an agency such as NURP or NOAA Ocean Explo-

ration, for example, which has direct and routine access to inform policy makers.

iii *Conduct symposia and workshops.*

The annual symposium continues to grow, which shows promise. The AAUS might also consider sponsorship of science-specific symposia, to aid in its stewardship of scientific diving to the greater scientific and research communities.

iv *Collect, review and distribute statistics.*

With today's power of the Web and various software applications, it should be possible to create a more user-friendly interface to upload and download statistics. I am proficient with .html programming, and have a professional network in the programming community that might aid in developing such an interface. In the future, I envision an entirely Web-based system for logging and verifying dives throughout the year, with a 100% automated statistics system both for filing with AAUS and for the individual organizational members' records.

v *Fund, research, educate and development of safe scientific diving programs and practices.*

It may be interesting to investigate the benefit of the AAUS endorsing specific programs or initiatives. Rather than fund specific programs, perhaps create a model such as the Explorer's Club, where programs carry the "AAUS Flag", to lend credibility to their program. This credibility can then be leveraged by the specific program or project to generate external funds. The AAUS commitment to increased name-brand recognition and both horizontal and vertical marketing initiatives is a necessary step both to raise funds to support such activities, and more importantly to create an attractive brand that does lend credibility to a sponsored program or project.

3 Relationships, Networks, Professional Contacts and Board Experience

Professional Affiliations: 2003: Board of Directors, Ocean Opportunity (a 501c3 non-profit organization); 2004: Guest Faculty, University of Rhode Island; 2005– : Contributing Author, The Summit Journal; 2004–2006: Diving Control Board, Perry Institute for Marine Science; 2005– : Diving Control Board, Fathom Research LLC.; 2005– : Advisor, Advanced Diving Council, NOAA's Undersea Research Program (NURP); 2004–2007: Program Coordinator, Diving a Dream (www.divingadream.org); 2002– : Project Manager/Founder, Project Innerspace (www.projectinnerspace.org); 2003– : Project Manager, Origin Life Science Group; 2006– : Project Manager, Exploration Technologies Group; 2007– : Independent Instructor, Subsurface Solutions (ITI Facility #1002234)

Professional Memberships: American Academy of Underwater Sciences (AAUS) member/Scientific Diver; Association of Diving Contractors (ADC) member/Commercial Diver & Tender; Marine Technology Society (MTS) member; National Speleological Society (NSS) member #55211.

< < < GO VOTE! > > >

AAUS 2008-2011 STRATEGIC PLAN

The following is a draft strategic plan from the AAUS Board of Directors submitted for review by the AAUS membership. The review period will last until the end of July. At that time, final modifications will be made prior to review by the AAUS Past Presidents. It is anticipated that the final form of the plan will be completed and approved by the Board no later than the Board of Directors Meeting to be scheduled in conjunction with the DEMA Trade Show of 2007. Please direct comments and suggestions to any or all of the AAUS Board of Directors: Steve Sellers, sellerss@ecu.edu; Jeff Godfrey, jeff.godfrey@uconn.edu; Marc Blouin, marc_blouin@usgs.gov; Mike Dardeau, mdardeau@disl.org; Christian McDonald, cmcdonald@siomail.ucsd.edu; Casey Coy, ccoy@flaquarium.org; Chris Rigaud, crigaud@maine.edu; Neal Pollock, neal.pollock@duke.edu; Bob Hicks, bob_hicks@alaskasealife.org; Nathan Schwarck, schwarn@cc.wwu.edu; Liz Kintzing, ek@cisunix.unh.edu.

Thank you in advance for your review and input,

The AAUS Board of Directors

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AAUS Strategic Plan for 2008 Through 2011

MISSION

The mission of the American Academy of Underwater Sciences (AAUS) is to facilitate the development of safe and productive scientific divers through education, research, advocacy, and the advancement of standards for scientific diving practices, certifications, and operations.

HISTORY AND FUTURE PLANS

Training programs in scientific diving were first organized with the advent of SCUBA in the early 1950s and grew rapidly. AAUS was officially chartered in California in 1983 by individuals and organizations that had fought for nearly a decade to obtain the scientific diving exemption to OSHA commercial diving standards. From the original six organizational members AAUS has expanded to over a hundred organizations ranging from Colleges and Universities, State Agencies, Museums, Aquaria, Environmental and Archaeological Consulting Firms, to Community Science Groups. The common thread between these organizations is the concern for the health and safety of their scientific divers and the use of diving as a research tool. In addition to its Organizational Membership (OM), AAUS represents nearly eleven-hundred individual members in the form of Full Voting Members, Full Non-voting Members (OM based), Associate Members, and Student Members.

During the past twenty-five years, AAUS has produced consensual standards for the training and certification of scientific divers, and the operation of scientific diving programs. Viewed as the industry standard for scientific diving in the United States, they have been adopted by numerous scientific diving organizations around the world. The Academy has conducted annual symposia as well as sponsored and co-sponsored focused workshops of interest to the scientific and general diving communities. With the help of its organizational membership, AAUS has compiled one of the most complete datasets available dealing with scientific diving logs and incident rates. Results of these annual statistical submissions continue to show scientific diving as the safest of the diving communities. In addition, AAUS has supported research and the development of the next generation of diving scientists through the funding of annual student scholarships.

Earlier Boards have solicited advice on long-term planning and addressed the purposes and goals of the Academy in a series of meetings. The current Board of Directors does not anticipate a major shift in its purposes and goals within the next three years. It has, in fact, identified many of the same issues as previous Boards, and efforts of past Boards are built upon and strengthened with the creation of an official strategic planning document readily available to the AAUS leaders and membership.

GOALS AND STRATEGIES

AAUS will pursue goals and strategies in the following focus areas over the next three years.

ADMINISTRATION

- Develop the necessary funding to increase the AAUS administrative assistant position to a full time position.
  - Centralize contracted duties to the AAUS Office and divert these monies to help pay for the administrative assistant position.
- Expand the Financial Base
  - Secure funding from non-AAUS sources
  - ◊ Submit a grant application to NSF based on the UNOLS model
  - Increase revenue from the OM base
  - ◊ Increase OM dues to $500 effective January 2009
  - ◊ Increase OM base to 110 by the end of 2009 (a review the recent OM applications indicate this increase is achievable within the normal application trends)
  - Increase revenue from IM base
  - ◊ Increase Full Voting membership dues to $40 by January 2009
  - ◊ Increase Full Voting membership to 750 people by January 2009
  - Improve functional efficiency of the AAUS office & Web site
  - ◊ Empower ad hoc committee to review and redesign the AAUS Web site and online database.

STANDARDS & TRAINING

- Develop a DSO training & certification program
  - Pre-symposium pilot program 2008
  - Apply for CA Sea Grant funding to aid in program development costs

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- Develop an accreditation and compliance program for AAUS Organizational Members
  - Formalize self-audit process
  - Establish accreditation template
  - ◊ Review comparable organization efforts
- Review and revise core competencies for scientific diver certification
  - Review and revise Sections 4 and 5 of the AAUS Scientific Diving Standards
- Expand Professional Development for DSOs and Scientific Divers
- Develop scientific diving standards for specialized diving modes
  - Define aquarium working diver standards
  - See below

CREDIBILITY

- Improve AAUS meetings, workshops, and publications
  - Reestablish a standing committee for meetings and publications
  - ◊ Rewrite Bylaws
  - ◊ Expand AAUS office support for meetings and publications
  - Establish repository of AAUS publications at Scripps, Duke, and Rubicon Foundation
- Improve/expand our collaborative efforts
  - Partner for Dive Rescue Workshop, 2008
  - Participate with DAN on Technical Diving Workshop 2008
  - Explore possible collaboration concerning DAN's First Aid for Professional Divers course
  - Explore collaboration opportunities with NOAA
  - ◊ AAUS/NOAA scientific diver training materials project
  - ◊ Development of AAUS and NOAA acceptable minimal standards for Bluewater, Overhead, and Cold Water Diving
  - Increase advocacy for the concerns of the scientific diving community
  - Public Outreach
  - Develop an accreditation and compliance program for AAUS Organizational Members
  - Review Organizational Membership criteria and process to ensure applicants are a good fit for the Academy

MEMBERSHIP SERVICES

- Development of comprehensive training materials
  - Development of training materials for scientific diver instruction based on NOAA Diving Manual
  - Development of a standardized scientific diver examination (to be used as a core test that can be supplemented)
- Development of online and database tools
  - Web-based and OM-based Dive Log and Statistics program, distribution to coincide with increase in OM dues
- Development of a specialty area training and support network

STATISTICS

- Collect, review, and distribute statistics related to scientific diving activities
  - Review and refinement of statistical submission criteria
  - Review and refinement of incident submission and review criteria

SCHOLARSHIP

- Expand scholarship opportunities available from the Academy
  - Establish a non-profit foundation specific to AAUS Scholarship
  - ◊ Establish a 501C3 entity
  - ◊ Identify and empower Board
  - Establish endowed awards programs
  - ◊ Define requirements for endowment
  - Improve fundraising activities
  - ◊ Initiate a Capital Campaign
  - ◊ Diversify funding streams

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STAFFING PLAN		2008	2009	2010
Office Manager		0.5	0.75	1.00
Executive Director		0.00	0.00	0.00
Total		**0.5**	**0.75**	**1.00**

FINANCIAL PLANS

Operating Budget

Revenue (base year)	**2007**	**2008**	**2009**	**2010**
Interest	$50	50	50	50
OM Dues	30,800	35,000	55,000	57,500
OM Application fees	3,250	3,000	1,500	1,500
Individual Member Dues	10,010	10,000	10,000	10,000
Student Dues	2,500	2,500	2,500	2,500
Sales	350	1,000	1,000	1,000
Scholarship Raffles	6000	0	0	0
Symposium Income	25,000	30,000	30,000	30,000
Total Revenue	**$77,960**	**$81,550**	**$100,050**	**$102,550**
Expenses				
Bank Charges	$1,500	1,700	2,500	2,700
Dues	550	550	550	550
Web site Fees	4,000	4,300	4,600	4,900
Insurance	750	750	750	750
Admin IDC	2,000	2,715	4,338	6,489
Office Manager (contract employee)	9,009	17,680	28,500	42,840
Scholarship Payments	7,000	0	0	0
Symposium Expenses	20,000	22,500	22,500	22,500
Taxes	10	100	100	100
Meetings	6000	1,000	1,000	1,000
Printing	10,349	5,000	5,000	5,000
Travel	3,000	5,000	5,000	5,000
Office	1,600	1,700	1,800	2,000
Telephone	1,100	1,300	1,600	2,000
Freight	0	500	500	500
Services (reflects audit in 2009)	10,000	1,500	5,000	1,500
Misc.	1,092	2,000	2,000	2,000
Contingency	0	13,255	14,312	2,721
Total Expenses	**$77,960**	**$81,550**	**$100,050**	**$102,550**

AAUS Reserve Fund

	2007	**2008**	**2009**	**2010**
Starting Balance	$148,000	$101,100	$107,467	$124,891
Interest	3,112	3,112	3,112	3,112
Deposits to Reserve Fund	0	13,255	14,312	2,721
Reserve Expenditures				
Scholarship fund investment	50,000	0	0	0
Dive Rescue Workshop	0	10,000	0	0
Workshop TBA	0	0	0	10,000
Ending Balance	**$101,112**	**$107,467**	**$124,891**	**$120,724**

AAUS 26th Annual Symposium

Hosted by

The University of California–San Diego

Scripps Institution of Oceanography

La Jolla, California

March 11–15, 2008

All persons interested in underwater sciences or scientific diving are invited to attend. Scientists, Dive Safety Officers, Students and Diving Technicians are invited to contribute and present papers or posters describing recent research, underwater esearch diving techniques, or technological developments related to scientific diving. **Abstracts may be submitted on line at www.aaus.org and must be submitted by December 1, 2007.** Further information may be found at http://www.aaus.org or by contacting Christian McDonald, cmcdonald@ucsd.edu, phone 858-534-2002.

March 11–12	**Workshops TBD**
March 13	**National DSO Meeting**
March 14–15	**Symposium**
March 15	**Awards Banquet**

AAUS 2007 SCHOLARSHIPS

The American Academy of Underwater Sciences will award two $2,500 scholarships in 2007. These will go to graduate students engaged in, or planning to begin, research projects in diving science or in which scientific diving will be a principal research tool.

The awardees will typically be one doctoral student and one master student, at the discretion of the review committee.

Application packages must be submitted online (http://www.aaus.org). The application deadline is June 30. Packages must be complete by the deadline and meet all requirements to be considered. Scholarship winners are announced October 1.

Candidates accepting the awards must agree to write an article for The SLATE describing the proposed research and to present the results of their research at an AAUS symposium or other scientific meeting within one year of the project's completion.

If you have questions, please contact Neal W. Pollock, PhD, Center for Hyperbaric Medicine and Environmental Physiology, Duke University Medical Center, PO Box 3823, Durham, NC 27710. neal.pollock@duke.edu; http://hyperbaric.mc.duke.edu

NEW SCHOLARSHIP

Dr. Carl R. Beaver Memorial Coral Reef Scholarship Fund

Center for Coastal Studies, Texas A&M University–Corpus Christi

Do you want to help coral reefs of the future? What better way to do that than by training the next generation of conservation-minded coral reef scientists?

Carl Beaver was a respected researcher, co-worker, and mentor. He had a great passion and love for coral reefs and dedicated his life to the education, research, and conservation of these delicate ecosystems. Carl received his Masters degree in biology from Texas A&M University–Corpus Christi and obtained a doctorate in wildlife and fishery sciences from Texas A&M University–College Station. He was an Associate Research Scientist, Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute and project manager of the Coral Reef Evaluation and Monitoring Project for the Florida Keys National Marine Sanctuary from 2003 until his untimely and unfortunate death in late 2006. The memory and spirit of Carl and his love for coral reefs and teaching will be long remembered through the students who will benefit from the memorial scholarship established in his name by his family, friends, and colleagues. The scholarship will fund graduate student research on coral reefs in the long-established (since 1976) Coral Reef Ecology Program at Texas A&M University–Corpus Christi where Carl studied and assisted with the Coral Reef Ecology class and field program for ten years. If you are interested in supporting this worthy cause, we are raising $10,000 to establish an endowment, so that the scholarship will exist in perpetuity. We are currently at $4,000 and seek your assistance to raise the final amount. Any amount would be appreciated. Make your check to Texas A&M University–Corpus Christi and mail to John W. Tunnell, Jr., PhD, Director, Center for Coastal Studies, Texas A&M University–Corpus Christi, 6300 Ocean Drive, HRI 318, Corpus Christi, Texas 78412.

DIVING AT THE END OF THE EARTH

Dr. Katrin Iken (while at UAB, currently at UAF) under brash ice with a bag of goodies.

All photos by the author unless otherwise noted.

By Bill Baker,
Department of Chemistry, University of South Florida–Tampa

Drs. Katrin Iken and Chuck Amsler (UAB) preparing to dive under annual ice in an open area off the Palmer Station dock created by the recent departure of a research vessel.

Palmer Station, located at 64° South latitude, sits on a rare spit of Antarctic land that is not ice covered; indeed, ice covers 98% of the frozen continent. Scuba diving in such an extreme environment presents both challenges and rewards. Water temperatures fluctuate around the freezing point of water, –2° to +2°C. Air temperatures can be tens of degrees lower than that. Operated by the United States National Science Foundation, Palmer Station is among a handful of coastal Antarctic research stations that support research projects that require scuba diving.

The peninsular region around Palmer Station abounds with marine life, from the top of the food chain—orcas and leopard seals—to the sea floor where invertebrate and algal life is abundant. Our team, composed of ecologists from the University of Alabama at Birmingham (UAB) and chemists from the University of South Florida (USF), is here to study the latter; specifically, we are interested in the role of mesograzers in structuring the benthos. Unlike more temperate ecosystems, fish predation on sponges and algae is uncommon in Antarctica. Sea stars are known to be keystone invertebrate predators in some Antarctic regions; but at Palmer Station, mesograzers in high densities appear to be responsible, one small bite after another, for much of the invertebrate and algal predation.

Stipe, holdfast, and basal branches of the large, perennial brown alga Desmarestia anceps. *These plants often cover 100% of the bottom with standing biomass comparable to giant kelp forests.*

Algae dominate the top 100 feet of the Palmer benthos with dense assemblages of brown macroalgae such as *Desmarestia* spp. and *Himantothallus grandifolius.* Below the algal zone, sponges are the major invertebrate, including the bright yellow *Isodictya erinacea* and *Dendrilla membranosa.* Pigments from these two sponges are tryptophan catabolites, degradation products that might ordinarily be recycled back into primary metabolic

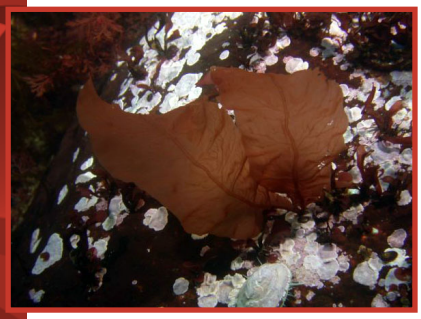
Bright yellow sponge Isodictya erinacea, *the source of a molt-inhibiting natural product.*

Yellow sponge Dendrilla membranosa *among bryozoans and sea star* Odontaster validus.

cycles but instead are accumulated, resulting in the conspicuous coloration we observe. Some of these same tryptophan catabolites play a role in molt regulation in the crustacean mesograzers often found associated with benthic invertebrates. The similarity of sponge pigments to crustacean molt-regulatory metabolites led us to investigate the bioactivity of the pigments in a molt bioassay. The predatory amphipod *Orchemene plebs,* fed a diet of sponge pigment, displayed reduced molting and proportionally higher mortality relative to a control group. Thus sponges, and perhaps other benthic organisms currently under study, may be capable of defending themselves from a major predator by interfering with a physiological pathway specific to that predator. Natural products such as these sponge pigments contribute to the ecology of the Antarctic benthos by mediation of many predator–prey relationships.

Natural products produced by polar organisms are increasingly of interest to bioprospecting programs. Although the Antarctic is largely under-explored with regard to its chemical diversity, there are two notable examples of pharmacologically significant Antarctic natural products. The most advanced drug candidate originates in the circumpolar sponge *Kirkpatrickia variolosa,* which produces the alkaloid variolin B (a name derived from that of the producing species). Variolin B is in late-stage clinical trials for multi-drug resistant intestinal carcinoma. Our own research has found that the peninsular tunicate *Synoicum adareanum* produces a compound, which we have named palmerolide A ("palmer" in recognition of the location from which the producing organism was collected, "olide" as a chemical term denoting an aliphatic ester). Palmerolide A has potent activity toward melanoma cells in vitro and is advancing in pre-clinical studies. Both variolin B and palmerolide A are amenable to laboratory synthesis, a key component of any Antarctic bioprospecting effort because the Antarctic Treaty forbids commercial exploitation of living resources.

Dr. Chuck Amsler (front) and the author (behind) returning from a shore dive in the brash ice. (Photo: Dr. Jim McClintock, UAB)



The red alga Delesseria lancifolia *and limpet* Nacella concinna. *Both the rock they are on and the limpet are covered with encrusting red algae.*

Besides the science, the excitement of "diving under the ice" never loses its edge. Visually, the biodiversity of peninsular Antarctica can be dramatic, even without penguins and fur seals dancing in the background. Veritable old growth forests of stunning biomass compose the shallows, and the vertical walls are covered with sponges, corals, and tunicates to rival the coral reefs. Meanwhile, the silence is broken by the inexplicable buzzing, ticking, whistling, chirping, and thumping of the Weddell seal, while icebergs crack, pop, and occasionally explode. Some of the most satisfying dives in remote locations such as Antarctica occur when making visual observations of sites few humans have ever seen. Among the Palmer Station archipelago, our dive team has likely found every deep wall (to 130 feet) within the boating limit. Nonetheless, a dive on our Hermit Island wall, for example, might find us on a part of the wall we have never seen, despite dozens of man-dives. Perhaps human eyes have only at that moment taken in this geographical feature. Similar excitement attends the observation of rare animals; surely, if others have recorded *in situ* the rare and unusual Cnidarian *Candelabrum penola,* for example, the reports are difficult to obtain. These elements of Antarctic diving, taken with the boldness of the cold water, make diving at the end of the earth a truly exhilarating experience.

A group of six Candelabrum penola *feeding (?) on a sea whip.*

Oregon Zoo Research News

By JoEllen Marshall, JoEllen.Marshall@oregonzoo.org

Oregon Zoo divers are collecting fecal samples from our 2 male Steller sea lions as part of a research study using near infrared spectroscopy (NIRS) and DNA identification as methods of prey detection. NIRS is being investigated to improve the accuracy of prey identification in sea lion scat. Zoo Stellers are fed glass marker beads along with specific fish species. Their scat is subsequently collected by divers and submitted to the researcher for analysis. After this initial phase of the study to calibrate NIRS equipment, the researcher will continue scat analysis of wild sea lions congregating at Bonneville Dam and near the mouth of the Columbia River. Use of NIRS may more accurately determine prey species consumption. The zoo portion of the study is scheduled to continue through August 2007.

JOB OPPORTUNITY

Assistant Dive Safety Officer; Requisition ID 23845
Wrigley Institute, Catalina Island, University of Southern California

Assistant Diving Safety Officer (ADSO) for the Wrigley Marine Science Center (WMSC) on Catalina Island. The ADSO must be able to provide on-site dive planning, training, supervision and emergency management. The ADSO must be able to recognize unsafe diving practices/environmental conditions and stop diving operations that do not comply with WIES diving policies or are deemed unsafe.

Salary Range: $32,500 - $33,500

RESPONSIBILITIES

The ADSO will assist in check out dives, approve dive plans and run day-to-day operations of the Diving safety program as designated by the DSO. The ADSO will also assist with classes offered by the Diving safety program. Additionally the ADSO has responsibilities for safety of staff, researchers and guests in the waterfront area and in their use of the WMSC's small boat fleet. The ADSO also Inspects facilities and/or radioactive material packages to ensure safety and compliance with University and regulatory policies and requirements. Trains and gives guidance to less experienced technicians. Assists with audits, sampling efforts, safety training and emergency exercises. Maintains records and files on all program-related activities, as required.

MINIMUM QUALIFICATIONS

Must have a current AAUS scientific diver certification. Dive instructor status is beneficial but not required. Small boat operating skills required. Coast Guard Master 50 ton license is very desirable.

PREFERRED QUALIFICATIONS

The successful applicant must have excellent teaching/training skills and be able to work with a diverse group of people including scientists, students and guests of all ages. Must be willing to live full time on Catalina Island.

The University of Southern California values diversity and is committed to equal opportunity in employment.

Employee Recruitment Services, 3535 S. Figueroa Street, Suite #100 Los Angeles, California 90089-1260 Mail Code 1260 (213)740-7252

For additional information, contact Gerry M. Smith, Diving Safety Officer, Waterfront Manager, USC/Wrigley Marine Science Center, One Big Fisherman Cove, box 5069, Avalon, CA 90704. 310-510-4022 (office), 310-346-2000 (cell), 310-510-1364 (fax).

MIT & URI student engineers collaborate to develop rebreathers for science

By Michael Lombardi
Ocean Opportunity, PO Box 603319, Providence, RI 02906. explore@oceanopportunity.com

The Exploration Technologies Group, a new collaborative spearhead by non-profit "Ocean Opportunity", has created a strategic plan to engage student engineers in the development of rebreather technologies in-line with NOAA's Manufacturing and Performance Requirements for closed-circuit rebreathers (CCRs). The collaborative represents a consorted effort of academia and industry.

Michael Jordan Stanway, a Master's candidate in ocean engineering at the Massachusetts Institute of Technology, has been involved in the project since conception nearly 3 years ago. "Jordan" currently acts as the Chief Engineer for the project and has been mentored through the design and modeling of several CCR core technology components using Solidworks software. Jordan first started working on the project as a sophomore engineering student through MIT's Undergraduate Practice Opportunities Program (UPOP). Opportunities are offered every summer through the UPOP program to participate in this project.

MIT Student Engineer Jordan Stanway programs a mill to begin prototyping rebreather parts.

Andrew Valainis, a sophomore ocean engineering student at the University of Rhode Island, has developed a mathematical algorithm to model carbon dioxide scrubber bedlife based on a number of physical canister characteristics and various environmental conditions. This algorithm is being further developed in MATLab for integration into new technologies to monitor scrubber bedlife during a dive.

The Exploration Technologies Group is excited to be contributing to the development of CCR technologies with specific utility value in the marine sciences, and the group anticipates a fluid development track to support the present and future needs of the marine science and ocean exploration communities. Work to-date has been funded by the generous financial support of Ocean Opportunity and the Rhode Island Foundation.

For more information about the collaborative, visit www.explorationtechnologiesgroup.com.

NOAA Hydrolab Plaque Unveiled

At the unveiling of the NOAA Hydrolab Plaque by Drs. Moore and Bunkley-Williams, and the inauguration of CCRI, 12 March 2007, are (left to right) Dr. Nilda Aponte, Director of the Department of Marine Sciences; Dr. Barbara Moore, Head of the National Undersea Research Program, NOAA; Sr. Anibal Acevedo Vila, Governor of Puerto Rico; Dr. Lucy Bunkley-Williams, Chair of the Biology Department; and Dr. Richard Appledoorn, Director of the Caribbean Coral Reef Institute (CCRI). *Photo by Dr. Mike Dowgiallo*

AAUS PUBLICATIONS

Repositories and Availability

Neal W. Pollock, PhD

One of the most important achievements of AAUS on behalf of the diving and diving research community is our contribution to the scientific literature. The publications list includes a large number of proceedings from regular scientific meetings and special topics workshops. Such materials, however, are not as accessible as regular journal items. Individuals with interest in particular topics will often procure specialty publications, but journal availability is greater over time. This is a huge loss given the wealth of information in each document. Improving access is of value both to the individual authors and editors and the Academy as a whole.

Addressing the issue of availability, AAUS has partnered with the Rubicon Foundation Inc. (http://rubicon-foundation.org) to make all AAUS publications more than two years old available electronically.

Rubicon is a nonprofit organization operating as a research repository and archive, created to make underwater medicine and research documents more accessible. The initial effort, now having prepared over 3,500 documents, is supported by volunteers and a growing number of partners. Partners include Duke University Medical Center (DUMC), Undersea and Hyperbaric Medical Society (UHMS), Global Underwater Explorers (GUE), Divers Alert Network (DAN), Professional Association of Diving Instructors (PADI), and now AAUS.

Electronic materials prepared by Rubicon will be available to all at no charge through their site. The AAUS collections homepage can be found at http://archive.rubicon-foundation.org/4238. AAUS will retain all copyright authority.

AAUS publications less than two years old will continue to be held exclusively by AAUS. Currently, electronic versions of these documents are made available to members at no charge. Bound forms of all documents will continue to be available from AAUS.

The original material provided to Rubicon will be passed on to Duke University to enhance the diving collection. The collection has grown dramatically in recent years with the relocation of the UHMS library to Duke. Scripps Institution of Oceanography has also offered to serve as a repository of Academy materials. In addition to publications, this will include a range of unpublished documents to preserve the 30-year historical record of the organization. The consistently strong ties between AAUS and Scripps make this a natural fit.

Further developments will be announced in *The SLATE*. You can expect calls for a treasure hunt to find missing pieces as they are identified.For additional information, please contact Neal Pollock: NPollock@dan.duke.edu.

37th Annual
BENTHIC ECOLOGY MEETING
Providence, Rhode Island, April 9-13, 2008

The National Shellfisheries Association and Benthic Ecology meetings are being held back-to-back in Providence, RI, next year. AAUS has been invited to host a session on scientific diving for the Benthic Ecology Meeting on Thursday afternoon, April 10, 2008. For further information, contact Ted Maney at e.maney@neu.edu.

General NSA and BE meeting information may be obtained from
Dr. Sandra Shumway
1080 Shennecossett Road
Groton CT 06340
sandra.shumway@uconn.edu
Tel 860-405-9282

BEAMR Benthic Ecological Assessment for Marginal Reefs

By Amy Buchar, Coastal Planning & Engineering, Inc.

Marine biologists are developing an alternative benthic biological assessment method, BEAMR (Benthic Ecological Assessment for Marginal Reefs).

Marginal reefs make up a large percent of Florida's coral habitat (Figure 1). AGRRA, ReefCheck, and similar biological assessment methods use indicators to quantify change to coral reef habitat, but typical indicators such as coral or calcareous algae are not prominent components of marginal reefs. Marginal reefs are defined

- in a statistical sense near the extreme of community characteristics or environmental variables;
- by proximity to a known, or reasonably assumed, biogeographic or physiological limit; and
- in terms of organism and community condition (from Guinotte *et al.,* 2003).

Figure 1 Typical indicators such as coral or calcareous algae are not prominent components of marginal reefs.

The methods tailored for "classic" coral reefs do not collect enough data for meaningful change-detection analyses on marginal reefs. In the absence of established habitat quality indicators for these reefs, the Coastal Planning & Engineering, Inc. (CPE) Marine Science and Biological Research department determined that a broad, holistic, data collection method was needed.

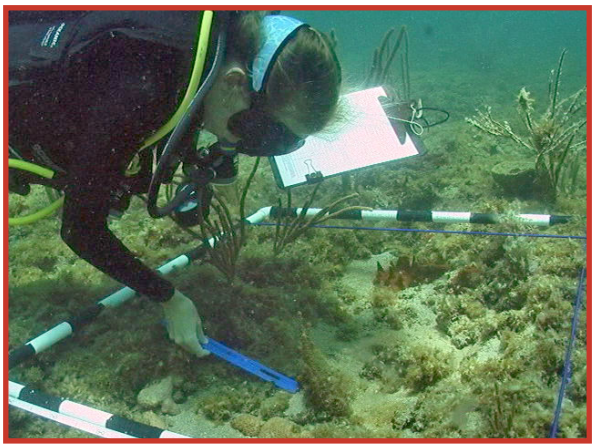


Figure 2 CPE Marine Biologist Stacy Prekel collects data from marginal habitats.

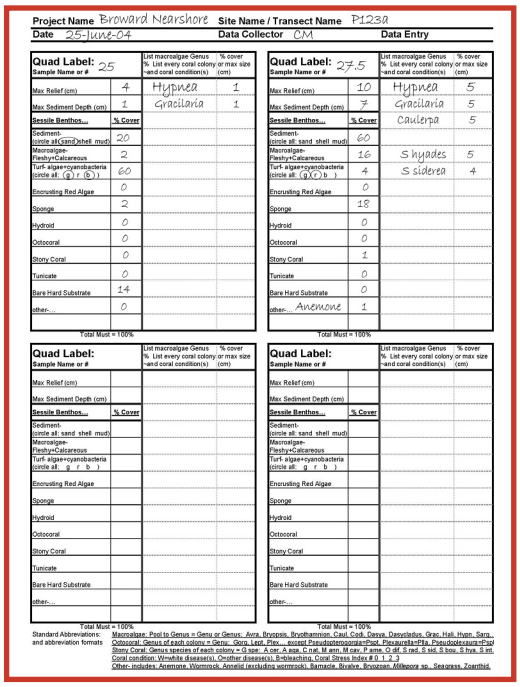
CPE biologists identified the need for an *in situ* assessment method specifically tailored to characterize these marginal habitats (Figures 2 and 3). The biologists reviewed five proven indicator-based benthic measurement methods:

- Atlantic and Gulf Rapid Reef Assessment Method (AGRRA);
- Florida Department of Environmental Protection (FDEP) modified AGRRA;
- Reef Check;
- Caribbean Coastal Marine Productivity Program (CariComp); and
- Coral Reef Evaluation and Monitoring Program (CREMP).

The result, BEAMR (Benthic Ecological Assessment for Marginal Reefs), is a synthesis of these well-established reef-assessment methods and selected parameters that have proven most useful for assessment and community change detection, and they are scaleable to the sampling-intensity requirements of different projects.

The CPE developed BEAMR, a quadrat-based benthic sampling method, which combines synoptic field-data collection of scientifically robust datasets with efficient quality-assurance and quality-control procedures surpassing most requirements for government-sponsored, changed detection studies. BEAMR data collection is holistic and includes information on the status of all sessile benthos, with enhanced information on the status of reef indicator biota, sediment depth, and relief. The method is designed to use a simple datasheet (Figure 4), printed on underwater paper, which accommodates up to eight (8) quadrats per page. The use of a standard data sheet simplifies complete data collection at each quadrat

Figure 3 CPE Marine Biologists Angela Delaney and Matt Lybolt conducting marginal reef assessments.



Project Name Broward Nearshore Site Name / Transect Name P123a
Date 25-June-04 Data Collector CM Data Entry

Quad Label: 25 Sample Name or #		List macroalgae Genus ~and coral condition(s)	% cover % List every coral colony or max size (cm)
Max Relief (cm)	4	Hypnea	1
Max Sediment Depth (cm)	1	Gracilaria	1
Sessile Benthos...	% Cover		
Sediment- (circle all: sand shell mud)	20		
Macroalgae- Fleshy+Calcareous	2		
Turf- algae+cyanobacteria (circle all: g r b)	60		
Encrusting Red Algae	0		
Sponge	2		
Hydroid	0		
Octocoral	0		
Stony Coral	0		
Tunicate	0		
Bare Hard Substrate	14		
other-...	0		

Total Must = 100%

Quad Label: 27.5 Sample Name or #		List macroalgae Genus ~and coral condition(s)	% cover % List every coral colony or max size (cm)
Max Relief (cm)	10	Hypnea	5
Max Sediment Depth (cm)	7	Gracilaria	5
Sessile Benthos...	% Cover	Caulerpa	5
Sediment- (circle all: sand shell mud)	60		
Macroalgae- Fleshy+Calcareous	16	S hypades	5
Turf- algae+cyanobacteria (circle all: g r b)	4	S siderea	4
Encrusting Red Algae	0		
Sponge	18		
Hydroid	0		
Octocoral	0		
Stony Coral	1		
Tunicate	0		
Bare Hard Substrate	0		
other-... Anemone	1		

Total Must = 100%

Quad Label: Sample Name or #		List macroalgae Genus ~and coral condition(s)	% cover % List every coral colony or max size (cm)
Max Relief (cm)			
Max Sediment Depth (cm)			
Sessile Benthos...	% Cover		
Sediment- (circle all: sand shell mud)			
Macroalgae- Fleshy+Calcareous			
Turf- algae+cyanobacteria (circle all: g r b)			
Encrusting Red Algae			
Sponge			
Hydroid			
Octocoral			
Stony Coral			
Tunicate			
Bare Hard Substrate			
other-...			

Total Must = 100%

Quad Label: Sample Name or #		List macroalgae Genus ~and coral condition(s)	% cover % List every coral colony or max size (cm)
Max Relief (cm)			
Max Sediment Depth (cm)			
Sessile Benthos...	% Cover		
Sediment- (circle all: sand shell mud)			
Macroalgae- Fleshy+Calcareous			
Turf- algae+cyanobacteria (circle all: g r b)			
Encrusting Red Algae			
Sponge			
Hydroid			
Octocoral			
Stony Coral			
Tunicate			
Bare Hard Substrate			
other-...			

Total Must = 100%

Standard Abbreviations and abbreviation formats: Macroalgae: Pool to Genus = Genu or Genus. Avra, Bryopsis, Brythamnion, Caul, Codi, Dasya, Dasyaladus, Grac, Hali, Hypn, Sarg., Octocoral: Genus of each colony = Genu. Gorg. Lept. Plex ... except Pseudopterogorgia=Pspt, Plexaura=Pla, Pseudoplexaura=Pspl Stony Coral: Genus species of each colony = G spe. A cer, A aga, C nat, M ann, M cav, P ame, O dif, S rad, S sid, S bou, S hya, S int, Coral condition: W=white disease=s, O=other disease=s, B=bleaching, Coral Stress Index # 0, 1, 2, 3
Other- includes: Anemone, Wormrock, Annelid (excluding wormrock), Barnacle, Bivalve, Bryozoan, Millepora sp., Seagrass, Zoanthid.

Figure 4 Standard BEAMR datasheet prompts biologists to search for all benthos and reduces the potential for errors or omissions during data collection and data entry.

and reduces the potential for errors or omissions during data collection and data entry.

The core of BEAMR is *in situ* estimation of percentage of cover of all substrate and sessile benthos, pooled to major functional groups: sediment, bare hard substrate, macroalgae, turf algae, encrusting red algae, seagrass, sponge, hydroid, *Millepora,* octocoral, stony coral, anemone, zoanthid, wormrock, sessile Annelid (excluding wormrock), sessile Arthropod, bryozoan, and tunicate. Data is supplemented by quantification of

- physical characteristics,
- macroalgae cover by genus,
- size and abundance of octocoral colonies, and
- size and abundance of stony coral colonies.

These data are often required by agencies, and since BEAMR is more rigorous than AGRRA, a BEAMR dataset frequently satisfies agency Requests for Additional Information and has been accepted by state and federal regulatory for resource characterization and project-effect determinations since development and implementation in 2004.

CPE marine biologists strive for high inter-observer accuracy through rigorous training, periodic re-qualification, use of the standard datasheet that prompts biologists to search for all benthos, scaling features in each quadrat, and 100% quality assurance checks on data once entered into the database. A major innovation of BEAMR is the seamless integration of field-data collection and data management using a customized MS Access database including built-in quality-assurance utilities (Figure 5). Data management using the database is superior to using spreadsheets by almost every measure and facilitates CPE's comprehensive data management and QAQC plans.

The BEAMR comprehensive *in situ* measurements of percent cover allow rigorous calibration of PointCount, a popular video based data processing tool suited for large area surveys. The method allows the researcher flexibility to expand the data collection to comply with additional needs and may be applied to any size area or quadrat without modification to the standard operating procedure, and can be expanded to assess additional organisms of concern, *e.g.,* bioeroding sponge vs. non-bioeroding sponge, with little or no alteration to the datasheet or data management tools.

In summary, BEAMR is a synthesis of well-established methods and typical agency requirements for marginal-reef evaluations. The method has been successfully deployed in eight nearshore hardbottom project areas around Florida. Training material and inter-observer QAQC ensure that data are consistently and accurately collected. Refined data management tools allow rapid and accurate QA checks of the database. BEAMR, as a complete package, combines efficient synoptic field-data collection of scientifically substantial datasets with built-in QAQC procedures surpassing most agency requirements.

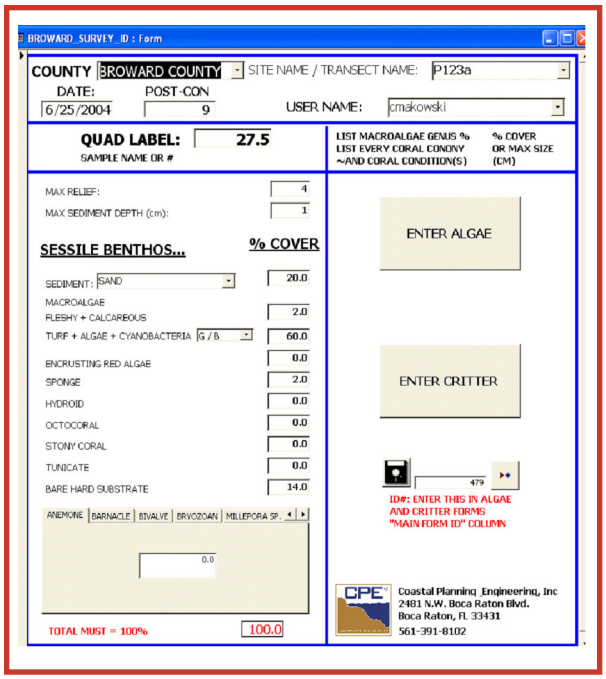


Figure 5 Customized MS Access database with built-in quality assurance utilities.

Amy Buchar, Coastal Planning & Engineering, Inc., 2481 NW Boca Raton Boulevard, Boca Raton, FL 33431; abuchar@coastalplanning.net; www.CoastalPlanning.net

By Jeff Godfrey

The Academy would like to thank the **Rosenstiel School of Marine and Atmospheric Science** at the **University of Miami**, Florida, for hosting a successful symposium. The facilities were beautiful, and the hospitality and hard work of the folks at the University of Miami contributed to a good symposium.

The workshops had 51 attendees. People whom I talked to appreciated the diversity of workshops offered, and the Academy appreciates the hard work of the organizers. We also thank **Eric Douglas**, Training Director for the **Divers Alert Network**, for his efforts in hosting the **Diving First Aid for Professional Divers Instructor Crossover** workshop. It was also great to have PSI, Inc. (**Professional Scuba Inspectors**) run another workshop for us. The new DSO workshop had 22 people registered, and while it was a long day for participants, the feedback from the workshop continues to be positive. **Bob Weisman** offered a workshop on boating-program organization. The workshop offered guidance to participants in establishing a boating safety advisory board (BSAB) and writing a boating safety manual. This workshop was particularly relevant to DSOs who have been tasked with running boating safety program or have been asked to serve on BSABs, and AAUS continues to solicit ideas from our members about relevant workshop topics.

The **DSO** meeting attendance was strong; 73 people registered, and discussion was lively as usual. The DSO meeting may have been the most important meeting of the symposium, and it was gratifying to see that the core of AAUS continues to support our mission by attending the meeting, expressing opinions, and working to form consensus on issues that affect us all. An important component of the DSO meeting this year centered on the strategic planning process. More information about the **strategic plan** is located in this issue of *The Slate,* and it is important that we stay engaged.

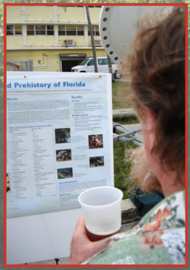
The Miami venue attracted a strong slate of speakers, and for the first time in several years, we had concurrent sessions during the symposium. There was a good mix of topics this year. Fourteen of the presenters were students, which indicates that the future of the academy looks promising. To close out the symposium, **Morgan Wells** gave a very engaging awards-banquet speech. AAUS is very grateful to **Kathy Johnston** for her donation of original art, depicting a Miami seascape. Her donations continue to support our **student scholarship fund**.











CORRECTLY IDENTIFY* everyone in these photos, and the photographers, and **WIN!!!! an ALL-EXPENSE-PAID TRIP** to beautiful ***Sopchoppy, Florida!*** Located in the Apalachicola National Forest near the enchanting ***Ochlockonee River,*** hiking distance to legendary ***Tate's Hell Swamp!*** See alligators, Florida panthers, cottonmouth moccasins, giant mosquitos, flesh-eating chiggers, wild hogs, dart-throwing Blountstown natives, deadly rattlesnakes, and more! ***It's the vacation of a lifetime!***

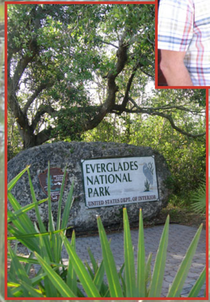
**Judge Jaap's decision is final.*





















Photos courtesy of Derek Smith and Alma Wagner

Helium-Based Diving Workshop was a Gas

By Doug Kesling, National Underwater Research Center, University of North Carolina–Wilmington

On March 5 and 6, AAUS hosted an "Introduction to Helium-Based Diving" workshop in conjunction with the 2007 Annual AAUS Scientific Diving Symposium. The workshop was planned and organized by Casey Coy (Florida Aquarium) and Rick Riera-Gomez (University of Miami). The purpose of this workshop was to introduce Diving Safety Officers and scientific divers to the techniques, skills, equipment, and diving theory needed to extend science diving to greater depths using staged decompression and helium-based breathing gases. National Underwater Research Center, University of North Carolina–Wilmington's (NURC/UNCW) Advanced Diving Technology Program was contracted to support the workshop's classroom and field diving component. Nine people participated in the training: Sam Sublett (University of Washington), Chris Rigaud (University of Maine), David Roberts (Post Buckley Shoe and Jernigan), Neal Stark (Seahorse Diving Services), David Eakin (Florida's Fish and Wildlife Research Institute), Paul Work (University of Georgia), David Jones (NOAA Fisheries/Rosenstiel School of Marine and Atmospheric Sciences), Nathan Schwarck (Shannon Point Marine Center) and Simon Talbot (University of Tasmania, Australia).

This introductory dive experience was conducted over a two-day period and included classroom, confined-water, and open-water training. The first day of the workshop was conducted at University of Miami–RSMAS and included classroom and pool training. Topics covered included alternate breathing gases used in deeper diving, decompression and mixed-gas dive planning, hazards and contingency planning for decompression diving, equipment used in deep diving and mixed-gas filling. Confined-water work included balance and fitting of "tek" rig, buoyancy and trim, propulsion techniques, "S-drill" and valve shut-down drills, surface marker-buoy deployment, and gas-switching techniques.

The second day of the workshop was conducted at the NURC/UNCW facility in Key Largo, Florida, and included two open-circuit Scuba decompression Nitrox dives to the wreck of the *Spiegel Grove* (max depth 130 fsw). The bottom mix selected was an EANx 28 %, and the decompression breathing gas consisted of a 50% EANx. The dives were led by NURC dive staff: Ross Hein, Otto Rutten, and Doug Kesling. Rick Riera-Gomez filled out the roster as an additional in-water technical diving instructor.

Decompression Profiles were generated with V-Planner decompression software with conservatism set at +3. The weather on the open water dive day was fairly calm, and the visibility on the wreck was in excess of 70 fsw. The participants found the workshop very beneficial and went away with a greater appreciation of the equipment, procedures, and theory behind conducting staged-decompression diving beyond 130 fsw and when breathing bottom gases other than compressed air or Nitrox.

USCG requirements for small boat operations

Dear NAML Directors:
I would like to know if you have been approached by your local Coast Guard about this issue so that we can see whether or how to deal with it at a national level.

We have run into a new issue with respect to the use of vessels at our USC marine lab and on the research vessels that we use through the Southern California Marine Institute (a separate non-profit). Because of a complaint by a private individual about another vessel operator (neither a university), the local Coast Guard, under direction from the National Office, has made a series of changes in the rules that govern the use of research vessels and other vessels at marine labs. The main aspect of this decision is that only graduate student research on a designated research vessel constitutes appropriate educational practice for a research vessel. All educational activities by graduate students and any activity of any sort by undergraduates, K–12 students or the public lead to the participants being considered as passengers. If these passengers have in any way paid a consideration to the marine lab (tuition, room and board, facility fee, lab rental, etc), they are considered as being passengers for hire. As passengers, the violate the terms for operating a research vessel and on all vessels, the vessel will have to be operated according to the rules that govern a passenger vessel carrying for-hire passengers. In most cases, this means a licensed captain and, if more than 6 passengers, an inspected vessel.

The Virginia Institute for Marine Science (VIMS) went through this exercise with the Coast Guard a few years ago and they got a different bit of advice about undergraduates on research vessels (but some of the guidance on skiffs was similar to the new rules). We have started this conversation directly with our local Coast Guard (for a variety of reasons) and we are now in a situation where the boat use by many of our groups and programs is no longer possible. I am working with the rules and the local CG officials to see where we can move to to be compliant with their regulations and still operate the lab. Obviously we cannot put a licensed captain on every skiff that an undergrad wants to take out to collect some algae. I am hoping we come to a solution of sorts (but frankly, I am not optimistic).

Our local CG folks say that this is a national issue and that it will come to all of you very soon. I am wondering if anyone else has heard or seen of this in their area. We may be the first with the new interpretation just because of the extremely large number of vessels and children that are carried on boats designated as RVs for educational programs in LA/LB and on Catalina (it may be as many as 200,000–300,000 students per year in the local area). When they applied the rules to these operators, some of them asked why we didn't have to obey them (of course we do, hence the attention). I am trying to get them to shift the major dividing line to include undergrads with graduate students and to include some measure of education in the designation of allowable activities on ORVs. Also, Mike Prince at UNOLS is looking into this from their perspective (they have seen this kind of conversation before).

Please let me know if you have insights. If this pushes too far in a direction that makes coastal science and education impossible, we may have to act as a community to try to set the standard at a more appropriate place either through interpretation of the statutes or creation of a new statute. However, before going there, I want to see how far along this is. If it us just us, we have a pretty reasonable group and we may be able to craft a local interpretation that gets shared as a national model. If we did that, I would like your input as well so that the model was more broadly applicable.

Cheers, Tony

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