E-SLATE

American Academy of Underwater Sciences (AAUS)

EDITORIAL BOARD NOTE – May 2009

Distributing the E-Slate in Word form was intended to make it easy for readers to access hyperlinks. Thanks to Sean Sheldrake, we have learned that hyperlink access is supported in portable document format (PDF) as well. Converting to PDF should reduce the file size, addressing a concern expressed by some readers. The change is timely with this, our largest issue, which includes board candidate bios and full text of their responses to standard questions.

Please let us know if you have any problems with the new format or suggestions for us. The E-Slate is a newsletter from and for the scientific dive community. We welcome news, announcements, job positions, new citations, and images with captions of underwater work. Please email submissions to aaus@disl.org. Current and past issues of the E-Slate are available at www.aaus.org.

NEWS/ANNOUNCEMENTS

AAUS Publications – Electronic Release

The AAUS board of directors recently confirmed a policy to speed the release of electronic forms of all Academy-published material. As part of this effort, first authors recently received high resolution PDFs of papers published in the 2006-2008 AAUS proceedings. Anyone can download complete proceedings at no charge from the AAUS website (http://aaus.org). Individual papers can be requested from the authors or found on the Rubicon Foundation website - AAUS Collection (http://archive.rubicon-foundation.org/dspace/handle/123456789/4238).

Standards Reminder – Diver Medical Authority

AAUS medical evaluation forms have a space for MD/DO (medical doctor/doctor of osteopathy) signatures. Current standards do not provide signing authority to nurse practitioners, physician assistants or any other medical personnel.

Call for Papers and Student Posters – Oceans '09

The OCEANS'09 MTS/IEEE Biloxi Conference will be held in Biloxi, MS, on October 26-29. This is the annual Marine Technology Society (MTS) conference. Take this opportunity to present your technical paper or student poster. Abstract deadline is June 1. For more information visit: http://oceans09mtsieeebiloxi.org/index.cfm.

SEI Diving

The YMCA held the first national Instructor certification course in Chicago in 1959. On the cusp of their 50th anniversary the national leadership of the YMCA decided to discontinue the scuba program, effective December 31, 2008. Since a number of Dive Safety Officers (DSOs) were certified as Instructors under the YMCA Scuba Program, it is important to know that a new organization has taken up the mantle of the former YSCUBA program. Tom Leaird, Ken Nemeth, and Dan Marelli, leaders in the national YSCUBA program for some time, formed Scuba Educators International (SEI Diving) in October 2008 to carry forward the standards and mission of the former YSCUBA program.

SEI Diving is committed to knowledge-based training with a mission statement of "Through the highest industry standards in quality scuba diver education, Scuba Educators International trains people for a lifetime of underwater experiences." The main office is in Muncie, IN and there is also a satellite program development office in Tallahassee, FL. SEI Diving offers a wide variety of certifications from Open Water Diver through Course Director, and also offers an equivalency certification through CMAS. SEI Diving is the only U.S. recreational scuba agency that is able to issue CMAS certifications. All curricula meet or exceed the minimum training standards of the Recreational Scuba Training Council (RSTC) in terms of materials presented and ratios of Instructors to students. Visit the SEI Diving website at www.seidiving.org for information on course offerings and training opportunities.

Although SEI Diving is a recreational training agency, it is working to create certification paths in three specific areas: scientific diving, public safety diving, and technical or extended range diving. Curricula are being developed that will lead a diver to additional training in the professional or technical realm.

SEI Diving has created a seamless renewal process for all former YSCUBA leaders who were current through 2008. Instructors who were not current in 2008 can also be updated. SEI Diving will also replace lost YSCUBA certification cards on an equivalent basis. For more information, contact Thadeus Bowden, Program Administrator, at info@seidiving.org.

DAN Diving First Aid for the Professional Diver

Provider level courses are being offered by Divers Alert Network at several locations this year in conjunction with Diving Unlimited International (DUI) DOG (DUI Owners

Group) Rallies. The course simplifies tracking occupational safety training requirements by including several Occupational Safety and Health Administration (OSHA) required topics in one course: Workplace CPR, Bloodborne Pathogens Exposure Protection, Automated External Defibrillators, and First Aid for Hazardous Marine Life Injuries.
For a full course description, see:
www.diversalertnetwork.org/training/courses/index.asp
For a list of training locations and the registration form:
www.diversalertnetwork.org/events/download/672_DAN_Training_DUI_regform.pdf

AAUS Caribbean Trip Offer

Katie Kovitvongsa, a graduate student member from Boston University won the Dive Trip for two to the Cayman Islands during the AAUS Symposium Ocean Enterprises Raffle. Unfortunately, she will not be able to use this trip because of airfare and hotel costs. She would like to offer the trip to readers for a cash or gear trade. The package includes three days of diving for two people through Red Sail Sports, a retail value of $720. The expiration date is December 15, 2009. Contact Katie at kovitvon@gmail.com if you are interested.

AAUS 2009 ELECTION - CANDIDATE Q&A

In 2009, AAUS will elect a President Elect, a Secretary, and one of three elected Directors to serve on the AAUS Board of Directors. The President Elect will serve a two-year term as President Elect starting January 1, 2010 and ascend to a two-year term as President starting January 1, 2012. The Secretary position will serve a two-year term starting January 1, 2010. The elected Director positions serve three-year terms and their service period is staggered to promote a degree of consistency and institutional memory as other members rotate on and off. The Director elected this year will serve January 1, 2010 through December 31, 2012.

The election is open to Full Voting Members (individual and OM Reps) of the Academy in good standing (dues paid, etc.). Balloting opens May 1 and closes June 30, 2009. Ballots are accessed via the AAUS website, www.aaus.org, by logging into your individual account, highlighting 'Community', selecting 'Polls', and clicking on '2009 AAUS BOD Election.'

Candidates were required to submit a biographical sketch (maximum 500 words) and answer three questions within specific maximum wording limits:

1. In your vision, in what direction should AAUS be headed in the next decade? (Maximum 300 words)
2. Rank in order of importance the six focus areas listed in the AAUS Strategic Plan for 2008 through 2011 (Administration, creditability, membership services, scholarship, standards & training, and statistics), provide comment on the items listed under each area, and describe a goal and strategy for meeting your top three ranked focus areas. (Maximum 600 words)
3. What relationships/networks/professional contacts/non-profit board experiences do you have that will benefit AAUS by having you on the AAUS BOD? (Maximum 300 words)

Candidate biographical sketches and question responses are presented in alphabetical order by last name and position (President Elect, Secretary, and Director). The only edits made to the information submitted by the candidates relate to font type and size and basic paragraph formatting for consistency.

AAUS thank the members of the 2009 Nominating Committee (Steve Sellers, East Carolina University; Elizabeth Kintzing, University of New Hampshire; James Hayward, UC Berkeley; and Derek Smith, Hawaii Institute of Marine Biology) for their efforts in compiling this year's slate of candidates. The Academy also thanks all the candidates for this year's election for their willingness to serve AAUS and the scientific diving community; it is through their dedication and hard work that AAUS will continue to progress in its mission to facilitate the development of safe and productive scientific divers through education, research, advocacy, and advancement of standards for scientific diving practices, certifications, and operations.

President Elect Candidates:

MICHAEL A. LANG
Smithsonian Institution
Office of the Under Secretary for Science
202-633-6887; langm@si.edu

Michael began diving for science in 1978 and was employed as a staff marine biologist and curator of invertebrate collections at San Diego State University from 1982-1989, where he also served on the Diving Control Board. Michael participated in the 1980 OSHA scientific diving exemption hearings in Los Angeles, is a past-President of AAUS (1987-1988, and 1991-1993), chaired multiple AAUS scientific symposia while serving in various AAUS Board capacities, and co-chaired the AAUS medical review panel (2000). Michael has for several years advocated for an AAUS quality control mechanism through the establishment of a Diving Officer and Scientific Diver certification program. Lang was recruited in 1990 as the Smithsonian Scientific Diving Officer and since 1998 has concurrently directed the pan-institutional Smithsonian Marine Science Network in the Office of the Under Secretary for Science. Lang served as senior science staff member to the Smithsonian Science Commission (2001-2003), and as technical representative to the National Academy of Sciences study of Smithsonian science (2002). His leadership efforts in diving safety research have produced diving proceedings volumes and consensus standards on dive computers, ascent rates and safety stops, repetitive diving, polar diving, enriched air nitrox, reverse dive profiles,

advanced scientific diving methods, and he has contributed to the UNESCO Code of Scientific Diving Practice, the NOAA Diving Manual, and Bennett and Elliott's Physiology and Medicine of Diving. Lang co-edited science symposium volumes on Methods and Techniques of Underwater Research (1996), Fishery and Market Potential of Octopods in California (1997), Smithsonian Contributions to International Polar Year Science (2009), Smithsonian Marine Science Contributions (2009), and the Haldane Symposium (2009). Further, Lang's non-profit governance experience as Board member includes former Director of the Coral Reef Alliance (2000-2002), Our World Underwater Scholarship Society (1996-2000), Divers Alert Network (1996-2002), Ocean Futures Foundation (1996-1998), National Geographic Society Sustainable Seas Project Technical Advisory Committee (1998-1999), U.S.- Japan Natural Resource Council Diving Physiology Panel (1986-2004) and co-chair of the Undersea and Hyperbaric Medical Society Diving Committee (1996-2004). Lang served as NAUI Elections Committee Chair (1992-1997), on the Board of Advisors, and International Underwater Foundation (1991-1994). Michael is quinquilingual and an internationally requested speaker. He is the recipient of the 1991 DAN/Rolex Diver of the Year, the 2000 UHMS Craig Hoffmann, and the 2008 Conrad Limbaugh Scientific Diving Leadership Awards. Lang has been an active NAUI (1980) and IANTD (1991) scuba instructor. He was Organizing Committee Chair of diving fieldtrips for the 8th International Coral Reef Symposium (1996) hosted by the Smithsonian Tropical Research Institute, and served as external diving consultant to The Nature Conservancy (1996-2001), the USGS-Biological Resources Division (1996-1999), The U.S. Coast Guard (2006-2007), and the National Science Foundation Ocean Science Section on shipboard scientific diving safety (1991-1993), and Office of Polar Programs where since 2001 he serves as Polar Programs Diving Officer through an Interagency Agreement. Lang's work has been supported by grant awards from Sea Grant, NOAA, DEMA, AAUS, DAN, and NSF. Michael was featured in Smithsonian Magazine (2001, 2004, 2007) and Smithsonian Spotlight on Science on Smithsonian Channel.

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

In March 2009, David Helvarg's Blue Vision Summit (www.bluefront.org) took place at the Carnegie Institution and George Washington University. It struck me that such events are the organizational networking setting and interface that I believe needs to be part of the next evolutionary phase of AAUS. Every conceivable ocean-related organization was represented and although a conservation focus prevailed, policymakers, Hill staff, marine scientists and executives participated in large numbers. AAUS represents the trained underwater scientists' point of view on the ocean; this should not be a well-kept secret, but promoted aggressively among the ocean conservation community and federal agencies. It is my sense that as an organization we need to reconnect more tightly with our constituents and programmatic reason for being: the underwater scientist. Our Board of Directors should consist of a more balanced reflection of our community: Diving Officers and diving scientists. This shift should not only prove helpful to Diving Officers with recalcitrant scientists in their programs, but also to integrate better the scientific community's support needs for its diving programs. The ocean is a global interconnected system and, as such, our international focus needs broadening with closer formal relations to the European community (as we have with New Zealand and Australia) and others as our international collaborations and scientific diving projects expand. There is a place for AAUS to continue as a leader in diving safety research given the level of diving programs we conduct and the programmatic supervision and control we provide for our captive diving population. A management transition needs to be enacted to allow the Board of Directors to strategically focus on the big picture policy, versus day to day operations. In this regard, creative, entrepreneurial initiatives need to be started to acquire the resources to meet administrative and membership needs of the Academy.

Rank in order of importance the six focus areas listed in the AAUS Strategic Plan for 2008 through 2011 (administration, credibility, membership services, scholarship, standards & training, and statistics), provide comment on the items listed under each area, and describe a goal and strategy for meeting your top three ranked focus areas.

In order of importance I rank the first tier: standards and training, statistics, credibility, and the second tier: administration, membership services, scholarship.

Standards and training: In general, the AAUS standards are far too detailed and now triple the size of the ADC commercial diving standards, industry regulations from which we were granted an exemption from in the first place. An initiative should get underway to sort out the actual scientific diving regulation elements from the "how to" material currently in the standards that should be appropriately placed in guidelines. Intricately worded, verbose standards are not always an institution's or an industry's best ally as we have seen in some recent mishaps where not following a standard to the letter can expose the organization to a significant amount of liability. The probability of scientists actually reading diving standards increases in direct correlation with decreasing numbers of pages.

I have advocated for the concept of an AAUS DSO certification program primarily, and an AAUS Scientific

Diver certification secondarily, for some time specifically for the overarching purpose of achieving a measure of quality control (cf. Lang *et al.* 2007. AAUS Proceedings, Friday Harbor - *AAUS Diving Officer and scientific diver certifications: the need for quality control).*

AAUS must retain control of standards that affect scientific diving certification or it cannot fulfill its main purpose in support of scientific diving programs. In this regard, we have also advocated for a standardized "diving first aid training" for scientific divers (cf. Lang *et al.,* 2007. AAUS Proceedings, Miami - *Diving first aid training for scientists).*

The need for the development of an accreditation and compliance program for AAUS Organizational Member Programs cannot be overstated. As a standard-setting community and organization, such a tool is long overdue and there currently exists no such mechanism for the governing board to assure compliance by its member programs. A self-audit process, cyclical site inspections, and a review template would be key components of an AAUS quality assurance program. There exist adaptable examples of such QA programs in the science, diving, and research vessel communities.

Statistics: Coupled with standards, this is of utmost importance as a metric to determine the effectiveness of our standards, serve occupational health regulatory support, and as an enduring Academy record. It is recognized that the AAUS scientific diving statistics have suffered under non-uniform collection criteria since 1980 and an attempt is already underway to vet and characterize our exposures and outcomes according to standardized, OSHA-recognized criteria.

Credibility: Collaborative networking with ocean-related organizations opens up many opportunities for AAUS and to date has not really been achieved in a methodical, systematic fashion. Interdisciplinary, international diving safety workshops initially put AAUS on the diving community map and more importantly, gave our community operational answers to physiological, engineering, and operational questions where answers were not readily available. Useful peer-reviewed publications and the increase and diffusion of diving knowledge are most important. A stronger connection between the Diving Officer population and the working underwater scientists needs to be facilitated, because in the end, these are the clients that diving programs must support.

Administration, Scholarship, Membership Services: Increased funding is necessary to operate AAUS and meet its mission and goals. An entrepreneurial approach should be considered in this regard, including proposals and fund-raising as potential mechanisms. The Board of Directors should function as in any not-for-profit organization that I have experienced as a policy-setting, governing body. In this regard, administrative support needs should be analyzed and pursued. The web site is in need of some efficiency updates. Likewise, additional sources for scholarship collaborations might be found.

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

Administrative/Programmatic: Participated in the 1980 OSHA scientific diving exemption hearings in Los Angeles; Served as President of AAUS (1987-1988, and 1991-1993); Co-chaired the AAUS medical review panel (2000); Chaired multiple AAUS annual scientific symposia; Recruited in 1990 as the Smithsonian Scientific Diving Officer; Concurrently serves as Director of Smithsonian Marine Science Network (1998-date); Leadership efforts in diving safety research produced diving proceedings volumes and consensus standards on dive computers, ascent rates and safety stops, repetitive diving, polar diving, enriched air nitrox, reverse dive profiles, advanced scientific diving methods; Organizing Committee Chair of diving fieldtrips for the 8th International Coral Reef Symposium (1996); External diving consultant to The Nature Conservancy (1996-2001), the USGS-Biological Resources Division (1996-1999), The U.S. Coast Guard (2006-2007), and NSF/UNOLS on shipboard scientific diving safety (1991-1993; 1995); Serves as NSF Polar Programs Diving Officer through an Interagency Agreement (2001-date).

Scientific: Senior science staff member to the Smithsonian Science Commission (2001-2003); Technical representative to the National Academy of Sciences study of Smithsonian science (2002); Contributing author of the UNESCO Code of Scientific Diving Practice, the NOAA Diving Manual, and Bennett and Elliott's Physiology and Medicine of Diving; Co-editor of Methods and Techniques of Underwater Research (1996), Fishery and Market Potential of Octopods in California (1997), Smithsonian Contributions to International Polar Year Science (2009), Smithsonian Marine Science Contributions (2009), and the Haldane Symposium (2009); U.S.- Japan Natural Resource Council Diving Physiology Panel Member (1986-2004); Co-host of AT50Summit (2009).

Fiduciary: Non-profit governance experience as Board member includes the Coral Reef Alliance (2000-2002), Our World Underwater Scholarship Society (1996-2000), Divers Alert Network (1996-2002), Ocean Futures Foundation (1996-1998), Co-chair of the UHMS Diving Committee (1996-2004); Served as NAUI Elections Committee Chair (1992, 1997), Board of Advisors member, and International Underwater Foundation Board

member (1991-1994). Grant support from NOAA, DEMA, AAUS, Sea Grant, DAN, NSF, and Smithsonian.

DAVID F. PENCE
Diving Safety Officer
University of Hawaii
808-956-9643; dpence@hawaii.edu

Diving Experience:
University of Hawaii Scientific Diver, Depth qualification to 350 fsw.
-Endorsements for dive computer, nitrox, stage decompression, mixed gas, bluewater diving, shipboard diving, oxygen CCR, SCR, mixed gas CCR.
Lifetime Dives: Approx. 2500. Last Year: 112
Max. Depth Lifetime: 480 fsw Last Year: 308 fsw
OC mixed gas and CCR advanced mixed gas instructor
cavern diver, NSS-CDS, 1989
Scuba Equipment Repair Technician most major brands

Professional Experience:

1995 - Present	Diving Safety Officer, University of Hawai'i System
1993 - 1995	Research Associate, Hawai'i Ocean Time Series Department of Oceanography, University of Hawai'i at Manoa
1989 - 1993	Science Director/Assistant Program Director (Assistant Diving Officer) Newfound Harbor Marine Institute/Seacamp, Big Pine Key, FL
1989 - 1989	Scuba Instructor/ Science Instructor, Seacamp Association, FL
1983 - 1989	Scuba Training Assistant, Advisor NCSU Scuba Club Research Associate, Microbiology Dept., NCSU
1979 - 1983	Graduate RA and TA Department of Zoology, NCSU

Professional Associations:

AAUS Member	1990- Present
Board of Directors	1996-2000, 2008-Present
NAUI (Course Director)	1989-Present
TDI Technical Instructor	1997-Present
DAN (IT)	1993-Present
IANTD Technical Instructor	1999-2006
UHMS, Associate Member	

Education:
M.S. 1990 Microbiology, North Carolina State University
1979 -1984 Graduate Study, Fish Behavioral Ecology, Dept. of Zoology
North Carolina State University, Raleigh, NC
A.B. 1979 Zoology, Miami University, Oxford, OH

Current Scientific Diving Interests: Academic, technical, and research diving methods and diving safety. Ecology of deepwater seaweeds, fishes, and coral reefs.

Pertinent Recent Presented Papers:
Langston RL, Peyton K, Spalding HL, Fukunaga A, Pence DF. Preliminary Information on the Fish Fauna Associated with Deepwater Seagrass and Macroalgal Meadows in Hawaii. American Society of Ichthylogists and Herpetologists Annual Meeting, New Orleans, LA July 2006.

Pence DF, Peyton K, Spalding HL, Langston R, Fukunaga A, Runcie J, Smith CM. Exploration of the Ecology and Physiology of Deep-Water Macroalgal and Seagrass Meadows in Hawaii using Open-circuit Technical Diving and Closed-Circuit Rebreathers. ASLO Annual Meeting, Honolulu, HI, February 2006 (Peyton); AAUS Symposium, Friday Harbor, WA, March 2006.

Peyton K, Spalding HL, Langston R, Fukunaga A, Pence DF, Runcie J, Smith CM. Exploration of the Ecology and Physiology of Deep-Water Macroalgal and Seagrass Meadows in Hawaii using Open-circuit Technical Diving and Closed-Circuit Rebreathers, 2006.

Pertinent Publications:
Pence DF, Kesling DE, eds Rebreather Diving. In: AAUS Standards for Training of Scientific Divers and Operation of Scientific Diving Programs. Nahant, MA: AAUS, 2005.

Pence DF, ed. Staged Decompression and Mixed Gas Diving. In: AAUS Standards for Training of Scientific Divers and Operation of Scientific Diving Programs. Nahant, MA: AAUS, 2003.

Pence DF, Pyle RL. University of Hawaii Dive Team Completes Fiji Deep Reef Fish Surveys Using Mixed-Gas Rebreathers. *SLATE*, April: 1-3. Nahant MA: AAUS, 2002.

Hamilton RW, Pence DF, Kesling DE, eds. Workshop Proceedings on Assessment and Feasibility of Technical Diving Operations for Scientific Exploration, Nov 2, 1999. Nahant, MA: AAUS, 2000; 83pp.

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

AAUS is facing interesting times from a variety of sources. Recent accidents under the auspices of non-Academy institutions are focusing renewed interest on both our Standards and our safety record. Economic considerations are pressing many programs do more with less and to find less expensive means of achieving objectives. I strongly support most of the items laid out in the 2008-2011 Strategic Plan, and believe that many of the listed goals in

each focus area are well on the way to fruition. Much still needs to be done on other items and I expect to continue those efforts.

Rank in order of importance the six focus areas listed in the AAUS Strategic Plan for 2008 through 2011 (administration, credibility, membership services, scholarship, standards & training, and statistics), provide comment on the items listed under each area, and describe a goal and strategy for meeting your top three ranked focus areas. Limit your response to a maximum of 600 words.

Asking for a ranking of importance implies that one of these areas is more important than the others. In reality, the goals in one focus area are attainable only with progress and support for those in the others. Standards, Statistics and Scholarship directly support Credibility, for example. Administration goals are in many places required to complete objectives laid out in the Member Services section.

AAUS Standards for Program Operation & Training are the core of our Academy identity, the main reason AAUS was founded and exists, the basis for our reciprocal agreements, and the reason other institutions look to us for guidance. No other entity has developed a model for occupational diving standards that is based on consensus peer review, and allows adaptation and modification of diving practice to implement new advances in diving technology in support of science. Variation between OMs in implementation of Standards presents a quality control problem, threatens the central concept of reciprocity and stems from many areas, including: (1) rapid growth in membership without thorough vetting; (2) reliance on external agencies with potentially conflicting agendas for training and vetting of AAUS trainers; and (3) increasing economic pressures upon member institutions to reduce staffing or outsource positions and services to providers that have no insight into the unique needs of scientific diving institutions and diving scientists. To combat these pressures, I support the following:

- Development and implementation of a required periodic OM re-accreditation process, including: (1) Completion of a five-year site visit inspection based upon objectively-defined criteria, conducted by regional teams of peer DSOs; (2) Attendance of the DSO Annual DSO and membership meeting and symposium at least once every third year; (3) Commitment of each OM to allow its DSO to participate in peer-review site visit teams at least once per biennium for a regional PM or re-qualifying OM; and (4) Designation of a probationary status and process for remediation and termination of OMs who do not fulfill requirements.

- Changes to the OM Applicant Approval Process. OM Applicant institutions should serve a two year "provisional member" (PM) period with an assigned regional mentor while completing specific requirements demonstrating applicability of scientific diving to the PM's activity and the ability of the PM to conduct its program in accordance with the AAUS Standards. To gain full OM accreditation, PMs would be required within the two-year provisional period to successfully complete current requirements for OM status, plus: (1) submit two subsequent years of AAUS scientific diving activity statistics, (2) ensure completion of the New DSO workshop by the PM's DSO and/or DCB chair, and (3) pass a peer site visit to evaluate correct implementation of the AAUS Standards by the PM.

- Implementation of the AAUS DSO Training and Accreditation Process. After two years of work, this program is ready, can serve as a primary Academy quality control mechanism and a means to provide professional credentialing to DSOs who complete it. It can be hosted at approved regional OMs independent of the symposium. As a condition of gaining or keeping OM accreditation, all DSOs of PMs and newly-hired DSOs of current OMs should be required to complete the accreditation within two years of application or hire respectively, with an evaluative component conducted by BOD-approved peer DSOs. All current sitting DSOs should be required to complete the accreditation course in a collegial manner within a three year period to ensure consistency in program operations and diver training and develop a larger pool of approved DSO mentors.

- Continued Scientific Diver Training Standards Development. Current Sections 4 and 5 are too vague on the required level of coordination, control and supervision of training by approved and qualified personnel and resolution is needed before further progress can be made. Clear, behaviorally based standards for evaluation of specific fundamental skills required of all SDs are in development and must be approved and adopted, but not every scientific diver is qualified to train and evaluate diver performance. Section 5 should be amended to specify that the 12 training dives specified in Section 5 are to be in addition to Section 4 training, and must be coordinated and supervised by a qualified trainer approved by the DCB. Training supervisory staffing ratios and level of supervision for various training activities also need to be defined for both Volume I training, as well as each Volume II specialty.

- Since the AAUS Standards specify that any scientific diver in good standing is eligible to serve as Lead Diver on a project within the scope of experience, Section 5 standards must be revised to include training all scientific

divers in operational risk assessment and management, control of diving operations conduct of briefings and debriefings, and supervision of less experienced divers.

Administration: The centralization of the AAUS office has proceeded well, with the establishment of the Office Manager and consolidation of activities there. The OM membership has increased on target. However, funding is a major impediment to further attainment of other listed goals. Efforts to increase the OM position to full time have slowed due to a decision to delay the scheduled increase in dues. Development of an Executive Officer position is inactive for similar reasons. Both of these are needed for the Academy to continue to fulfill its role, and will require additional funding. No one likes fees, but everyone wants services. There is no free lunch, and volunteerism is laudable but not sufficient. I expect several actions will be required:

- Membership dues, both on the individual and OM level must increase according to the previously approved schedule in the next year. OM fees generally should be increased further within in the next four years as costs for delivered services increase. Rather than an across-the-board increase in the base fee assessed all OMs, additional increases should employ a sliding scale based upon an index of program size to pro-rate the OM fee. Logical indices to be considered include the previous three-year average of total number of divers or dives reported by each OM in its statistics report.

- A revenue stream and source of new membership associated with the new Scientific diver certification card must be supported and maximized

- Securing extramural funding is key. AAUS serves not only its membership but the larger scientific diving community in the maintenance of a peer-based standard of practice employed by non-member institutions. AAUS must identify a qualified individual with a background in our or a similar community and expertise in grant procurement and program execution, and contract this person to spearhead proposal production to major funding agencies. Such proposals should include funding for the development of this individual's role into an AAUS Executive Officer.

Membership Services are developing well, with implementation of the statistics reporting software, development of AAUS/NOAA training materials, and an AAUS Scientific Diver card as member benefits. All provide excellent incentive for joining the Academy at either the individual or OM level. Constant re-development of training materials must occur, to keep up with changing technology and the science of diving.

Credibility: Representation of AAUS interests to other non-AAUS institutions and regulatory agencies is important now more than ever, so others recognize that the exemplary safety record enjoyed by Academy OMs is based on Academy efforts and Standards. As external interests such as NOAA and UNOLS move to lobby for re-evaluation and possible modification of the OSHA scientific diving exemption, AAUS must be involved to represent OM interests. This effort must be multi-pronged, with a defense of the current Scientific Diving exemption and promotion of the AAUS Standards as the only complete mechanism for compliance with a proven, defensible track record on the one hand, while cooperating with partner interests for constructive review and revision to better serve the constituency on the other.

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

I have been an AAUS Individual Member since 1990, and for the past 15 years have been primarily focused on operating one of the largest AAUS OMs. I hold instructor or instructor trainer-level ratings with several recreational training agencies, including NAUI, TDI and DAN. I have served previously on the AAUS BOD in several capacities, including chair of the Standards Committee, and currently co-chair of the Statistics Committee. In my capacity as DSO, I routinely interface with the diving control personnel for state and federal agencies. I have in the past provided advice to the NOAA Diving Program on implementation of advanced diving methods and rebreathers in support of science, and have served as an expert witness in legal proceedings.

Secretary Candidates:

PEMA KITAEFF
Diving Safety Officer/Marine Tech
Friday Harbor Labs
206-543-0876; pena@u.washington.edu

I became a certified diver at age 15 – I had saved my allowance for a while, and decided to spend it one summer on the NAUI certification course at the neighborhood dive shop where I grew up in Seattle. My first dozen or so dives were all spent in a 7mm farmer jane with matching beaver tail top, watching the flounder and ling cod and anemones of the Pacific Northwest. I became a divemaster 6 years after that, around the same time I graduated from college with a B.S. in Biology.
I used my degree and dive gear to do a variety of jobs on boats and in the water largely in Washington State, but also in Maine, the Red Sea, Seychelle Islands, and in Honduras, where I received my Instructor certification in 2003. A half a

year later, I started graduate school towards an M.S. in Marine Science from Western Washington University. So even now when I'm asked, "what did you get into first, the diving or the marine biology?" I'm not sure how to answer. Both paths came from the same fascination, and seemed to have been intertwined from the start.

I landed my current job as Dive Safety Officer at Friday Harbor Labs fresh from graduate school, and with the perspective of a student and researcher already engaged in scientific diving projects. But I've also been able to draw on some of the experience I gained in subtidal consulting work and recreational diving within Western Washington State, and – more importantly – on the connections I've been able to maintain from those sectors. I've found these relationships with other working divers in our local community to be good sources of information, and invaluable to the health of our University dive program. As a relatively new instructor, I feel particularly enthusiastic about teaching. My favorite course to conduct is Rescue, and I tend to encourage a good deal of role-playing scenarios and repetition of skills practice.

As the Dive Safety Officer for Friday Harbor Labs, I oversee daily dive operations and facilities, regular safety education, assistance with special projects, and administration of the small boating program. During my first year as DSO – which overlapped with my last year as a graduate student in the field of algae – I acted as primary organizer and host at Friday Harbor for the Northwest Algal Symposium in 2007. I'm always interested in expanding my own horizons with respect to new places, new equipment, or new methods so that I'm better able to help students and scientists at Friday Harbor Labs to get their data underwater efficiently and safely. I also get the privilege of assisting and learning from Sam Sublett, the University of Washington DSO.

As an AAUS board member, I am interested in being involved in education and outreach, and would especially like to help with the new DSO training. I'd like to see AAUS continue to grow towards independence from recreational certifications, and serve as a strong network.

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

In the coming decade, I hope to see ongoing efforts towards deepening the distinction between scientific and recreational diving and gaining a fuller recognition within the wider dive community. Ultimately, I expect this change to be accompanied by organizational training materials and certification cards (equivalent to a standard rescue or nitrox card).

It's been a pleasure – as well as an extremely useful tool – to interact at AAUS meetings with dive officers from other parts of the country or world and from other types of institutions. I would like to see this trend continue at AAUS by reaching out to new and more diverse members, and fostering more opportunities for site visits between DSOs for purposes of evaluation and sharing information. And as AAUS grows outward, more encouragement of meetings and networks at the regional level can help keep DSOs connected with one another and provide support close on-hand for those who may need it.

I also hope the near future brings an increased awareness about AAUS among scientists as a place to present research, and increased attendance at meetings among research divers who are not dive officers, but recognize AAUS as the best forum to share their results and ideas about underwater methods.

Rank in order of importance the six focus areas listed in the AAUS Strategic Plan for 2008 through 2011 (administration, credibility, membership services, scholarship, standards & training, and statistics), provide comment on the items listed under each area, and describe a goal and strategy for meeting your top three ranked focus areas.

The first priority in my mind is **membership services**. These are the goals that seem to me to be most closely associated with specific dive safety officers' and individual programs' basic needs. The provision of web-based dive logging tools and scientific diver instruction training materials can not only serve to improve growing dive programs or help newer DSOs, it can also be used as justification for increased OM dues and perhaps for some institutions this may be a major argument for becoming a member of AAUS.

My second priority from this list is **Standards and Training**, and I believe the component goals that fall under this heading are closely linked to those listed under membership services. The development of a DSO training and certification program seems like the first step towards a general and standardized body of training materials for scientific diver instruction. I am very interested in being involved with the development and production of such materials, and I'm sure some of the content that is already being organized for the DSO certification program can be adapted for lesson plans targeting the scientific diver.

I also think the formalization of a self-audit process, and perhaps even informal audit that could be conducted by a visiting DSO from outside, will act to help the program being audited by identifying areas that need work. But it could also be viewed as another useful service provided to help each member organization that participates in an audit, while improving consistency and communication between member organizations.

One of the rewards of self-auditing and improved consistency with respect to adherence to high standards among OMs could be increased **credibility** – my third priority on this list. This is a goal that can be reached by outreach in several directions at once – towards increased independence from recreational agencies with respect to the strength of our own standards, but also reaching out to other agencies to represent what we are and the important

niche AAUS fills in the diving world. I would be especially interested in working on collaborative projects with other organizations, like DAN, that could be mutually beneficial.

Although I'm listing **Administration** as a fourth priority, the establishment of a full-time administrative assistant to AAUS is, of course, very important as is the increase of OM dues. Reaching out to other potential new members in my own region is one way I can help achieve the goal of increasing the OM base.

Fifth, I think there are some exciting goals involved with AAUS **Scholarship** activities. Finding new ways to raise money for scholarships and increased publicity about scholarship opportunities can help expand this program.

Finally, **Statistics** is very important as a way to demonstrate our continued safety record as a group of divers and to show areas where we can improve. I would like to see a refinement of the incident submission and review criteria to make the process clearer, and to be sure we are learning as much as possible as a group from every incident that is experienced and reported.

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

I believe myself to be a good networker, mainly because I genuinely enjoy meeting other enthusiastic people and cooperating with them to accomplish big goals. I've worked for several non-profit and community-based organizations; the first was the Port Townsend Marine Science Center, a small interpretive aquarium in Washington State. While there, I collaborated in an effort to secure funds to renovate our facility, and research ways to spend the money we got by talking to other similarly-sized facilities. I also communicated about our project to the Center's membership through articles and public programs. Like any good productive meeting, bringing different factions together and working to agree and get things done seemed to produce more collective inspirational energy than each individual had contributed, and in the end we were able to accomplish even more than we expected.

More recently, as a graduate student in the field of phycology, I was the organizer and host for the 2007 Northwest Algal Society meeting held at Friday Harbor Labs. I had a lot of fun! but I also found it to be a priceless experience orchestrating details and fielding the problems that arose both in the planning and execution stages of the meeting.

Currently, as DSO at Friday Harbor Labs, I am constantly striving towards better relationships with our community and within our institution to help our dive program function better. My biggest success has been the connection formed between FHL and the dive shop on the small island where we're located; where historically there had been mistrust, the dive shop owner and I have now established a solid line of communication that has resulted in knowledge about new sites, help with gear, and perhaps most importantly – a positive representation of our institution to the public.

GEORGE PETERSON
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I grew up in Iowa, graduating from the University of Iowa in 1995. I immediately moved west to Colorado and became a professional diver. During the next few summers I lived in the Bay Islands of Honduras while managing a dive resort and took a lead role in introducing technical diving to the area. Eventually I landed full time in Washington State to manage a busy Tech Diving facility and dive the deep walls of British Columbia. After two years in the PacNW I returned to Honduras to open my own resort and to work with the Bay Islands Conservation Association (BICA). BICA is a non-profit, non-governmental organization founded in 1991 by the people living in Bay Islands in order to initiate and coordinate efforts in protecting the Islands' fragile natural resources. BICA's operation and projects are funded through the support from local individuals, businesses and at times through national and international agencies. BICA has been instrumental in initiating many conservation projects: management of the Turtle Harbor Wildlife Refuge and Marine Reserve, protection of sea turtles, protection of coral reefs through installation of buoys, beach cleaning actions, environmental education in local schools, developing of codes of conduct for divers, monitoring of whale sharks.

In April of 2003 I was hired as an ADSO at the Monterey Bay Aquarium and received my initial Scientific Diver Training at Monterey Peninsula College. In 2004 I was promoted to Dive Safety Officer/Volunteer Coordinator and attended my first AAUS National DSO meeting at Wrigley. In 2006 I was promoted to my current position as Dive Officer/Supervisor of Dive Operations. Here at MBA I supervise all aspects of our dive program: scientific, recreational and commercial. We currently have 100 volunteer divers and 55 staff divers performing over 4200+ scientific dives 364 days per year utilizing most modes of diving. 1200+ of these dives occur in the field doing research and/or collections. Some of these projects include Otter captures using rebreathers, scooters and Wilson traps to support the federal recovery plan for the Southern Sea Otter: YOY White Shark research in net pens off the coast of Southern California, baseline assessments with RCCA and SIMoN for MPAs in California as well as remote operations in Canada, Mexico and Hawaii. We frequently collaborate on projects with USGS, NOAA, Cal F&G, MBNMS, CINMS, UCSC, MLML, UCB, Hopkins, RCCA and Humboldt State. I personally have logged 160+ scientific

dives per year for the past six years. I served on the AAUS standards committee in 2008 and continue to do so in 2009. I am currently the elected Treasurer for the Association of Dive Program Administrators (ADPA), a group of approx 70 DSOs from Zoos and Aquariums in the US, Canada and Europe. In addition I am adjunct faculty at Monterey Peninsula College where I serve as Instructor for a Research Diving class.
Instructor Ratings/Professional Affiliations:

PADI Kiss Rebreather certified
NAUI DMT (expired)
ANDI Trimix certified
DSAT Repair Tech for numerous lines
DAN PSI
ASHI Reef Check
EFR
MFA

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

I believe that the Academy would benefit by focusing on the continued strengthening of the already defined goals outlined in the most recent business plan. In the area of administration I would like to see AAUS develop a funding model to employ an administrative assistant on a full time basis. The move to raise OM dues coupled with authoring a grant proposal(s) to help defray the costs would allow us to free up the time of the volunteer board to focus on more appropriate tasks. With regards to standards AAUS has grown rapidly in the last few years and will most likely continue to do so. I think the ongoing development of a mechanism to certify our own divers and DSOs in line with the needs of the scientific diving community would help to move away from relying on recreational agencies. This would allow us a measure of quality control with existing OMs as well as with the new OMs and DSOs joining in the coming years. The new training materials recently promulgated by the Academy are a great example of a member service that can serve a dual purpose. By "taking back" our standards and providing the existing and new OMs a vehicle to do this not only is a benefit to the OM/DSO but serves as the first measure of quality control. In conjunction with regional DSO certification workshops this would allow us to train and certify DSOs with the same core standards. By furthering the development of the web based dive log our statistics should be more accurate with a higher number of OMs complying. The growth of AAUS will continue to happen. If we focus on these particular areas I believe we can help to promote this growth in a sustainable manner while continuing to guide the Scientific Diving community.

Rank in order of importance the six focus areas listed in the AAUS Strategic Plan for 2008 through 2011 (administration, credibility, membership services, scholarship, standards & training, and statistics), provide comment on the items listed under each area, and describe a goal and strategy for meeting your top three ranked focus areas.

Standards and Training – I believe that AAUS needs to fully control our standards and not rely on recreational agencies to train and certify our divers and DSOs. Goal: To develop regionally based DSO certification summits employing the use of AAUS qualified mentors to help guide the OM and DSO throughout the process. Strategy: Create the position of Training Director, either BOD level or paid, with a committee to help implement the summits.
Membership Services – The most recent round of services (training materials, web-based dive log, certification summits) for the membership is quite impressive. Not all OMs are fully aware of the new benefits. Goal: For the Academy to continue to disseminate this information to the membership. Strategy: Tap into the collective knowledge of the past and present AAUS DSOs to help the new DSO/OM to implement these tools. This will serve to raise the bar throughout our community.
Credibility – This topic is tied to the first two areas of focus. In the coming years AAUS will experience much growth, not only in the number but also the diversity of our OMs. Goal: When the full implementation of the Academy's 2008-2011 plan is realized I believe it would benefit AAUS, the OMs and ultimately DSOs to explore an accreditation program. Strategy: Research and develop an accreditation model. In the aquarium industry the entire institution including the dive program is subject to independent peer review approximately every five years. These types of programs can serve as valuable tools for DSOs to educate Administrators on what we do and advocate for any number of benefits including more fiscal, operational or personnel resources.
Statistics – As stated earlier by furthering the development of the web-based dive log our statistics should be more accurate due to a higher number of OMs complying. By continuing to share these with the diving community at large we will reinforce our historically safe record and ultimately our exemption.
Scholarship – The continued diversification of funding streams are good examples to support further expansion of AAUS's scholarship opportunities. The Academy's plan to establish a 501c3 will strengthen this cause.
Administration – By developing a funding model to employ an administrative assistant on a full time basis and improving some functions of our online office we will be better equipped to meet the challenges of sustainable growth by diversifying the efforts of our BOD, committees and members.

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

I currently serve as the elected Treasurer of the Association of Dive Program Administrators (ADPA) www.adso.org. This is a group of approximately 70 DSOs (17-19 are also AAUS OMs) from zoos and aquariums throughout the United States, Canada and England. The mission of the ADPA is to serve as a professional forum for the exchange of safe diving practices. If elected to the AAUS BOD I would continue to work to inform appropriate ADPA members to explore AAUS membership for their respective institutions as well as to represent the mutual interests of both groups. I am also an active participant in DOCAL (Dive Officers of California), a group of university and aquarium DSOs from California, Oregon and Washington, of which most are AAUS members. This group is a valuable resource of experienced DSOs that often work together on collaborative projects and serve as mentors for new DSOs in our area. Additionally I have a professional working relationship with the Monterey Bay National Marine Sanctuary's SIMoN (Sanctuary Monitoring Network) dive team and previously served as co-DSO for the program. I also collaborate with Reef Check of California (RCCA) www.reefcheck.org and am currently working on formalizing an MOU in order to eventually allow us to set up a permanent monitoring station in the MBNMS.

Director Candidates:

KEVIN BUCH
Diving Safety Officer
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Howdy Folks! Many thanks to the Board for the opportunity to run again-I am honored to have received a nomination, and look forward to the opportunity to serve AAUS and its membership as a BOD participant.
My position statements and priorities have rearranged a little bit over the last 12 months or so. The few recent high-profile diving incidents that have been in the public eye prompted me to realize how important credibility and public perception is to our overall mission. In addition, we have moved forward with some of the programs I commented on last year, and my updated suggestions reflect some of these advances.
As far as a biography goes, I currently serve as the DSO for Texas A&M University at Galveston, a position I have held for over three years. My experience with diving, dive programs and scientific diving is varied, is both practical and managerial, and includes years spent in both the scientific and recreational diving professions.

My scientific diving career began a decade ago with NOAA as a Research Specialist for the Flower Garden Banks National Marine Sanctuary (FGBNMS) where I was involved in the planning and execution of research projects in the Sanctuary, as well as spending lots of time under the water actually doing the work. From the FGBNMS I moved to the Perry Institute for Marine Science (an AAUS OM) stationed at the Institute's marine lab, the Caribbean Marine Research Center (CMRC) at Lee Stocking Island, Exuma, Bahamas (also a NOAA Undersea Research Program Center). I spent almost four years coordinating and conducting research for visiting scientists and in-house projects and worked closely with the CMRC DSOs, often serving as the on-island DSO during transition periods. I also spent many years managing a recreational diving business, and as a NAUI Instructor Trainer still actively teach entry, intermediate and leadership level courses through our academic diving program here at TAMUG, and I feel that AAUS can benefit by keeping abreast of the changing standards and trends within the recreational diving community. In addition to my status as a NAUI IT, I am also an Instructor with DAN, Technical Diving International (TDI), and hold TDI ratings in Decompression Procedures, Advanced Nitrox, and Nitrox Gas Blender.
At this point in my career I am fortunate to have made many great contacts and gained insight and perspective from many different scientific diving programs, both inside and outside of AAUS. I currently serve on the DCBs or Advisory Boards for several varied institutions. I currently face, or have faced, many of the common issues affecting the scientific diver today, both at the programmatic level and as the guy in the field, underwater, collecting the data. As I have advanced myself as a scientific diving professional I have been supported many times directly and indirectly by the membership of AAUS, and would welcome the chance to pay back some of that support. Thanks!

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

I feel that The AAUS Strategic Plan for 2008 through 2011 points a pretty clear heading that AAUS should take over the coming years, and is a credit to all of those who worked, refined and commented on it.
As we work to build in these key areas, I would also like to see AAUS work to increase general academic and public awareness of who we are, what we do, and the services/benefits we provide. For example, I know that even given my current efforts I have administrators and researchers within my own institution who have only a vague idea of what AAUS is all about, and I have heard similar comments from other members as well. I'll bet that most of us have experienced difficulties with support or funding at some point that could have been lessened with a better understanding of our benefits and services by those outside our immediate membership.

Some ways to build awareness might include putting together an informational/educational program that OM reps/DSOs could implement at their home institutions, expanding/improving our education and outreach materials (including building our internet presence), and possibly increasing our representation as an organization at more of the major scientific conferences/meetings.

I believe that our mission and the product we deliver is solid, and as we move through our strategic plan over the coming years, I would like to see us also work to pass our message along to those outside the AAUS family. Increased outside awareness could be an important factor in supporting our continued growth.

Rank in order of importance the six focus areas listed in the AAUS Strategic Plan for 2008 through 2011 (administration, credibility, membership services, scholarship, standards & training, and statistics), provide comment on the items listed under each area, and describe a goal and strategy for meeting your top three ranked focus areas.

These are all important areas to our continued growth and improvement, but here are my thoughts on priorities:

Standards and Training- through my experience as a diving researcher and as a diving educator, I have seen the direct result of our standards and training policies in the water, and feel that this is at the core of what we do. **Goals:** I would like to see us bring to completion the development of the DSO qualification program, and the revisions of the rescue and first aid training sections. I also like the idea of our basic scientific diving training manual and standardized core exam, and feel that we need to implement a formal feedback program to get input from OMs who have incorporated these materials and are actively teaching with them. Individual OM flexibility will always be a necessity, but in general I feel that, with regards to standards and training, standardization leads to more consistency and that consistency enhances safety. **Strategy:** The constant revisions of standards and implementation of our certification programs is obviously a big job. One way to make it easier might be to identify individuals within AAUS with experience/expertise relevant to a particular topic needing development or revision and ask them to contribute material for that small section. This would spread the work out and would also enhance the overall quality of the final product.

Credibility-an important aspect of our future growth will be how we are perceived by the OMs that support us, by the governmental and non-governmental agencies/ institutions we collaborate with, and by the scientific community at large. **Goals:** I feel that the standardized "accreditation and compliance" program mentioned in the strategic plan is a very good idea, as it would result in an impressive final product clearly showing the benefits of AAUS to those key OM persons outside the scientific diving program. We should keep working to determine what final shape this program would take and how best to acknowledge and leverage those OMs who are "accredited". Under the "Membership Services" section I also mention some thoughts on improvements in our outreach and education areas. **Strategy:** possibly creating "regions" where OMs are geographically clustered and asking a local DSO/OM rep to serve as the "coordinator" with the other reps in the region for purposes of helping each other with the compliance process and with identifying/participating in local and regional opportunities for outreach/awareness

Membership Services-the way standards, training and policies are implemented can be positively influenced by the level of support AAUS provides to the individual OMs. **Goals:** develop tools and materials to help OMs better educate those they interact with about AAUS; improve our web presence. **Strategy:** short-term might be to work to broaden distribution of The *Slate* and expand the "About Us" section of the website to include a more complete description of what we do, possibly incorporating an audio/video message and a rotating "highlighted" OM scientific diving program. Create support materials that OM reps/DSOs could use for presentations to those within their institutions that they would like to be better informed.

Administration- because of the financial component I almost listed this one first, but it's pretty obvious that for us to have success in the first 3 areas I prioritized (especially **2** and **3**), we are going to need to expand our funding sources. We should also continually assess our needs in terms of how we are staffed and managed.

Statistics- core reporting to me seems solid, but as the strategic plan mentions, we should work to improve the efficiency of the process. Also, for reporting purposes, are we standardized across all OMs as to what defines our various categories of dives?

Scholarship- growth in this area would also constitute an improvement in the Membership Services and Credibility focus areas

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

I am fortunate to have worked (and to continue to work) with a lot of great people, and I have built many great relationships over the years as a diver and as a diving scientist. Some of these relationships relevant to AAUS include my work with NOAA's National Marine Sanctuary Program, my service on several Diving Control Boards (DCBs), and collaborative programs with several universities and NGOs (Reef Environmental Education Foundation, Gulf of Mexico Foundation). As an active recreational diving educator in our academic diving program, I also work closely with representatives from some of the major training agencies.

I work frequently with NOAA's National Marine Sanctuary Program (NSMP), both locally with the Flower Garden Banks NMS, and with staff at NOAA headquarters. As the NSMP grows in scope and budget, so does its need for qualified scientific manpower underwater. AAUS OMs are well placed to help satisfy this need, a situation that I feel is mutually beneficial to both AAUS and NOAA, as AAUS gains opportunities for OM divers and scientists as well as increased public awareness, and the NMSP gets support in fulfilling their core missions. Some of these ideas were expanded on during my talk at the 2009 Symposium.

I currently serve on DCBs for both non-profit (Perry Institute for Marine Science, Ocean Opportunity) and academic (Texas A&M University at Galveston, University of Texas-Brownsville) institutions. I am also currently working to help other Texas universities as they develop their own scientific diving programs. These relationships give me an opportunity to observe the practical aspects of implementing or maintaining an AAUS program, and these insights would be useful in helping AAUS refine standards and policies in the future.

PHILLIP LOBEL
Professor of Biology/Scientific Diving Officer
Boston University
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Phil Lobel is a Professor of Biology (Ichthyology) in the Boston University Marine Program and Department of Biology. He teaches courses in ichthyology, marine science and scientific diving. He learned to dive from his father in Lake Erie in the mid 1960s and also dove for two summers in the Florida Keys before finishing High School in Ohio. Phil was an undergraduate at the University of Hawaii at Manoa, (1971-1975) during which time he also worked some summers and breaks as the assistant lab manager at UH's Enewetak Atoll Marine Lab. His job was mostly being a dive buddy for famous scientists and "riding shotgun" with a McNair powerhead. Phil attended graduate school at Harvard University, (1975-1979) during which time his dissertation research was at sites in St Croix, Panama and in the tropical Pacific at Fanning Atoll. The next position was as a Post-Doctoral Fellow in Oceanography, Center for Earth & Planetary Physics, Harvard U., (1980-83) when he returned to Hawaii to study ocean currents and fish spawning patterns. The research involved many hundreds of hours underwater and often alone in very remote locations. Phil was an Aquanaut twice (1980 & 82) in the old Hydrolab at St. Croix. He was a Scientist at the Woods Hole Oceanographic Inst. (1984-94) prior to joining the BUMP program. Phil was chief scientist for the Department of Defense marine ecological program at Johnston Atoll, Pacific from 1983 to 2003. This atoll was a major DoD facility for weapons testing, storage, and destruction, and had been historically impacted by aborted nuclear detonations, Herbicide Orange, and PCBs among other things. His professional expertise beyond ichthyology includes the practical sea-going aspects of conducting underwater science and physical oceanography. Phil has published about 134 scientific publications including peer-reviewed journals, a book and a variety of popular publications and technical reports. He has been a scientific diver since 1971, is a NAUI Scuba instructor, a DAN Instructor and currently serves as the Boston University Diving Safety Officer. He has previously been authorized as a NOAA Working Diver, Navy and Coast Guard diver. The current subject of Phil's scholarly research is the behavioral ecology of fish bioacoustics; topics include examination of the morphology and evolution of fish sonic mechanisms, defining and comparing fish sounds and associated behaviors, and passive acoustic monitoring of fish sound signals to define mating cycles.

For additional information see
http://www.bu.edu/biology/Faculty_Staff/plobel.html

DoD Coral Reef Protection Implementation Plan
https://www.denix.osd.mil/denix/Public/ES-Programs/Conservation/Legacy/Coral-Reef/Plan/coralreef.html

SCRUMP - the music video with Phil and Fish
http://www.youtube.com/watch?v=4ebjtxqbil0

Discovery Channel - the science side of Phil's Fish sounds
http://www.exn.ca/inc/demo.asp?Video=exn20011126-fishnoise.asx

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

The path that I see AAUS on now is a good one. This centers on how AAUS can provide services to OMs and advancing the accreditation process. The training materials are a great example. AAUS should continue and strengthen its role as the organization that establishes credibility of professional scientific diving.

All this being said, one of the main next goals is to further developed AAUS following the UNOLS model. This means we need to prepare and submit proposals for funding from NSF, ONR, & NOAA. The initial main costs are for fulltime professional staff and basic office operations. As the Academy has grown, so has the huge amount of administrative responsibility that is exceeding what a purely voluntary organization can do. This is all linked to the next phase for AAUS in being the recognized agency for accreditation of scientific diver training and experience.

Rank in order of importance the six focus areas listed in the AAUS Strategic Plan for 2008 through 2011

(administration, credibility, membership services, scholarship, standards & training, and statistics), provide comment on the items listed under each area, and describe a goal and strategy for meeting your top three ranked focus areas.

I have served as an appointed Board Member for the past year, and have heard many discussions about the multiple facets of the organization. I think the Strategic plan is right on target as a path forward and agree in the ranking as presented.

My main goal is to help with the funding proposal(s) to the NSF, ONR & NOAA to support the formal institutionalization of AAUS. My background as a diving marine scientist for the past 38 years and having written many successful research proposals with funding from ONR, NSF, NOAA and other federal agencies will be very helpful as we draft the AAUS proposal and represent our goals to the agencies. I also would enjoy continuing as chair of the Statistics committee.

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

As mentioned above, I have 38 years as a diving scientist. I have extensive experience worldwide with scientific diving, military diving, Coast Guard diving and recreational dive operations. My field studies have been supported by grants from several US Federal agencies as well as NGOs and private foundations. All of my research has been based on diving using the latest advances in oceanographic instrumentation and diving technologies. My experience in grantsmanship should help as we draft AAUS proposals. My experience as a Professor is good training for being a BOD member. I bring to the table not only the perspective of a working dive officer but also as one who has been through the drills of being a scientific diver (at all levels) while maintaining an underwater research program at a major institution.

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Initially certified in 1979, I became a scientific diver in 1981 while studying zoology/marine science. I attended my first AAUS meeting in 1986. I served as diving officer for the University of British Columbia from 1986-1991. I held executive office, including the presidency, in the Canadian Association for Underwater Science from 1987-1993. Stateside, I served on the diving control board of East Carolina University from 1997-1998. I currently serve as an elected board member (meetings and publications chair) of AAUS (2007-2009).

My academic training includes degrees in zoology, exercise physiology, and exercise and environmental physiology. My academic interest focuses on human safety and physiological response to extreme environments. I am currently a Research Director at Divers Alert Network and a member of the applied physiology research group at the Center for Hyperbaric Medicine and Environmental Physiology at Duke University Medical Center. We receive research funding from the U.S. Navy, NASA, and other organizations to study a variety of problems that share a theme of altered ambient pressure. Current or recent projects have addressed decompression safety for flying after diving, the response to diving in insulin-requiring diabetics, the efficacy of exercise-augmented oxygen prebreathe to reduce the risk of decompression sickness for astronauts conducting spacewalks, the performance of oxygen breathing systems, breath-hold diving safety, and the interaction between elevated oxygen concentrations and elevated carbon dioxide in cognitive impairment.

I currently serve on the editorial boards of *Diving and Hyperbaric Medicine*, *Wilderness and Environmental Medicine*, and *Alert Diver*. I also provide frequent lectures on diving health and safety in a variety of local, regional, national and international venues.

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

I believe that the AAUS has provided a great service in formalizing valid and practical standards for the scientific diving community. I also believe that increased efforts are required to ensure that the academy maintains a leadership role in the diving and scientific diving communities. This requires enhanced data collection. The need for evidence-based decisions is influencing all areas of professional conduct. Expanding initiatives to document the safety and efficacy of community practices and to respond to incidents that uncover shortcomings will help to both protect and strengthen the organization and the field of scientific diving. Equally important for the academy is the need to strengthen communications within and outside the scientific diving community. This includes increasing the rigor and breadth of the annual diving for science symposium, ensuring rapid and wider release of AAUS materials and promoting collaborations with other organizations. To realize these goals, AAUS must ensure the strongest professional and leadership skills in board members, expand the capabilities of the central office, and create additional opportunities to capitalize on the energy and abilities of the membership.

Rank in order of importance the six focus areas listed in the AAUS Strategic Plan for 2008 through 2011

(administration, credibility, membership services, scholarship, standards & training, and statistics), provide comment on the items listed under each area, and describe a goal and strategy for meeting your top three ranked focus areas.

Rank Order: credibility, administration, statistics, standards and training, scholarship, and membership services.

Credibility: I view any rank ordering as arbitrary since the focal areas are all intertwined. Organizational credibility leads, however, since it is critical to the health of the academy. On the core scale, it requires appropriate administrative support, statistical documentation and standards and training initiatives. On the larger scale, it is enhanced through collaborations with outside organizations, providing high quality educational opportunities and scholarship support. Such outreach can dramatically raise both the profile and the productivity of the organization.

Administration: The administrative capability of the academy – supporting board activities, coordinating statistics collection, providing membership services, and securing extramural funds – are best served by the efforts of an executive director and support staff to coordinate what will be an increasing number of elements and volume of data and demands. Expanding the central office staffing to a full-time position is an early step in developing this central office capability. The incremental evolution allows the administration to develop in tandem with our growing needs and financial resources.

Statistics: The collection of accurate, detailed and meaningful statistics is essential to ensure and to support the efforts of the academy.

Standards and Training: Professional standards require constant monitoring and timely revision for them to remain relevant and appropriate. DSO training is important to ensure both a minimal capability of diving officers and also to provide a venue to identify emerging and evolving issues of concern. Accreditation efforts are essential to demonstrate professional competencies. Professional development opportunities are necessary to meet accreditation goals in both traditional and specialty and/or emerging areas. Ongoing training and conferencing opportunities can reduce the risk of complacency across all levels of involvement.

Scholarship: Providing scholarship funding for developing professionals is important to promote interest in the field and to capitalize on energy and enthusiasm to expand our knowledge base. To become self-sustaining in the future, the AAUS research award program must be developed as a fully endowed program; this will require continued effort. Fund-raising must be expanded to grow the balance to meet future needs, initially to cover student travel to present at AAUS meetings and ultimately to support targeted research initiatives.

Membership Services: I rank membership services last not because they are least important, but because addressing the first five areas will augment membership services far beyond the limited list included in the strategic plan under this category.

My Goals: My primary interest is to expand the scientific rigor, volume and utility of AAUS meetings and publications and thus raise the profile of the academy. I would use our platforms to continue to encourage individuals and groups to participate in and rely upon academy efforts. I would promote expanded collaborations in the form of jointly sponsored workshops and symposia of interest to the scientific and broader diving communities; specifically those with the potential to draw extramural funding. I would encourage refinement of our data collection to support publication of results in peer-reviewed journals to enhance the permanence and credibility of AAUS contributions.

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

I have strong ties in diving research and medicine fields that I believe will provide good avenues for communication and mutual benefit. In addition to my appointments at Duke University and Divers Alert Network, I am an active member of the Undersea and Hyperbaric Medical Society, the South Pacific Underwater Medicine Society, the Aerospace Medical Society and the Wilderness Medical Society. I conduct research in diving safety and regularly serve on the faculty of numerous diving, diving safety and diving medicine education programs. My experience as a university diving officer, diving control board member, and executive member of the Canadian Association for Underwater Science, a sister group of the AAUS, and a board member of AAUS gives me familiarity with many of the issues facing scientific diving. I also have extensive experience in organizing conferences and educational programs and publishing technical documents.

UPCOMING EVENTS

Bimini Bay Lionfish Smash

South Florida Freedivers has organized a spearfish tournament to help protect the Florida reefs from invasion of Lionfish. The event will take place May 2, 2009, with a 0800 start and 1630 weigh in, followed by a ceremony at Bimini, Bahamas. For information contact Mike Schmidt (President - 305-491-7244), Joe Fernandez (Treasurer - 305-562-1944), Edwin Gonzalez (VP and Marketing - 305-215-5702) or Ivon Rodriguez

(Public Relations and Sponsorships - 305-781-6941).

UAF Cold Water Diving Course

The University of Alaska Fairbanks is offering a cold water diving course May 11-15, 2009 at the Kasitsna Bay Laboratory in Alaska. Introduction to Cold Water Diving will train certified scuba divers in drysuit use and maintenance. The course will stress drysuit safety and buoyancy skills and will include practical experience in a cold-water rescue. Students will be beach and small boat scuba diving. Students will graduate with a PADI Drysuit certification.

Professor: Dr. Brenda Konar
Prerequisites: AAUS scuba certification (www.sfos.uaf.edu/dive/index.html)
Costs: $598 + tuition (in-state tuition for all students)
To register visit: http://www.uaf.edu/summer/.
Prospective students are encouraged to contact bkonar@guru.uaf.edu

Shoals Marine Lab Underwater Archaeology Course

Shoals Marine Laboratory (SML) is offering an Underwater Archaeology course (ARKEO 3002) August 10-17, 2009. This course will be held on Appledore Island, located six miles off the coast of Portsmouth, NH. The course will cover the development of maritime archaeology and the discipline of underwater archaeology. Students will participate in active fieldwork, including underwater exploration. Tuition includes room and board, activity fees, and round trip boat transportation between Portsmouth, NH and Appledore Island. This two-credit course is open to all college undergraduates. If space is available, non-matriculating students may audit with permission of the instructor. Those who wish to scuba dive must be active AAUS scientific divers. Training to become an AAUS scientific diver is also available at SML by participating in our four credit Underwater Research course (BIOSM 3650/ZOOL 730). For those without AAUS diving qualifications, snorkeling is a suitable way to participate. Financial aid is available and students are encouraged to apply. For more information visit: http://www.sml.cornell.edu.

NEW PUBLICATIONS

Duplessis C, Fothergill D. Exploiting otoacoustic emission testing to identify clinical and subclinical inner ear barotrauma in divers: potential risk factor for sensorineural hearing loss. J Otolaryngol Head Neck Surg. 2009; 38(1): 67-76.

INTRODUCTION: Divers may sustain subclinical inner ear barotrauma (IEBT) that is not identified on pure-tone audiometry (PTA) but is potentially an important contributor to chronic sensorineural hearing loss (SNHL). Otoacoustic emission (OAE) testing, which identifies transient emission shifts (TESs) stemming from noise-induced inner ear injury, may be a more sensitive measure than PTA. Recognizing the salubrious health implications in mitigating the incidence and severity of SNHL in divers with earlier detection, we performed a pilot study investigating the potential of OAEs to identify clinical and subclinical IEBT (defined as a TES without an accompanying transient threshold shift) in divers subject to a provocative repetitive diving protocol. METHODS: Eight US Navy-trained male divers participated in a repetitive diving protocol encompassing up to a maximum of 10 weeks of diving. All subjects received an otoscopic examination, tympanometry, and OAE testing on both ears prior to and immediately after each dive. Audiometry was evaluated prior to and after each week of repetitive diving. RESULTS: There were 212 data pairs for comparison in the OAE testing. The average group wideband transient-evoked OAE shift was -1.24 dB. Only 25 significant threshold shifts were identified in over 1000 comparisons via audiometry. CONCLUSIONS: OAE testing identified significant TES in a provocative repetitive diving protocol, supporting the assertion that both clinical and subclinical IEBT may contribute to chronic SNHL in divers. Exploiting this technology as an integral component of diving medical surveillance may identify those at risk for subsequent IEBT and hearing loss, facilitating opportunities for interventions to mitigate its severity or circumvent its development.

Egi SM. Design of an acoustic telemetry system for rebreathers. Undersea Hyperb Med. 2009; 36(1): 65-71.

Despite the abundance of telemetric applications for ecology, behavior and physiology of marine life, few efforts were reported about the use of acoustic telemetry for scuba divers. The objective of this study is to design and test an acoustic telemetry system for monitoring breathing gases of a Dräger Dolphin semi-closed-circuit rebreather as well as the depth of the diver. The system is designed around a PC based surface unit and a microcontroller based diver carried module that digitizes the output of CO_2 and O_2 sensors located in the inhalation side of the canister. One pair of acoustic modems establishes the data link between the microcontroller and the topside PC. The graphical user interface is written in C# and enables the recording of the diving session as well. The system is calibrated in a hyperbaric chamber and tested successfully with four dives in three different environments using 100% O_2 and nitrox (47.9% O_2 - 52.1% N_2) up to 15 m depth and a distance of 40 m between acoustic modems. The telemetry data cannot be used only for recording physiological data but also provides an important operational safety tool to monitor the rebreather user. The future designs will include actuators for controlling the diluent and oxygen flow to closed-circuit mix gas rebreathers.

Jagger RG, Shah CA, Weerapperuma ID, Jagger DC. The prevalence of orofacial pain and tooth fracture (odontocrexis) associated with scuba diving. Prim Dent Care. 2009; 16(2): 75-8.

AIM: To assess the prevalence of orofacial complications associated with scuba (self-contained underwater breathing apparatus) diving. Main outcome measures were prevalence of orofacial pain and odontocrexis. METHOD: Two hundred divers at four dive centres on the north-east coast of Australia were asked to complete a questionnaire that requested information regarding diving experience and facial pain and dental symptoms experienced during diving. RESULTS: One hundred and twenty-five completed questionnaires were returned (63% response rate). The prevalence of reported orofacial pain was 44%. Twenty-one per cent reported toothache, 27% sinus pain, 16% jaw pain, and 12% other pain. The prevalence of odontocrexis was less than 1%. Less than 1% had lost a filling when diving. No divers reported a crown or bridge being dislodged during diving. CONCLUSION: Among those who returned questionnaires, orofacial pain in divers was common and odontocrexis was rare.

Johnson GA, Gutti VR, Loyalka SK, O'Beirne KA 2nd, Cochran SK, Dale HM, Kracke GR. Albuterol metered dose inhaler performance under hyperbaric pressures. Undersea Hyperb Med. 2009; 36(1): 55-63.

The weight change per actuation and aerosol particle size and number delivered by albuterol metered dose inhalers (MDIs) were measured in a multiplace hyperbaric chamber at pressures ranging from one atmosphere absolute (1 ATA, 0 feet of seawater, fsw, 101 kPa) to three ATA (66 fsw, 304 kPa). Weight change per actuation by CFC (chlorofluorocarbon) and long canister HFA (hydrofluoroalkane) powered MDIs was 13±1% and 12±1% less, respectively, at 3 ATA compared to 1 ATA. However, weight change per actuation by short canister HFA MDIs was not significantly changed with pressure. The geometric mean diameters of nano particles from the CFC and short canister HFA MDIs decreased from 50 nm at 0 fsw to 32 nm at 66 fsw whereas the long canister HFA aerosol diameters were not affected. The numbers of nanometer size particles delivered at 66 fsw were only 4-7% of those delivered at 0 fsw for the CFC and long canister HFA MDIs whereas for the short canister MDIs it was 26%. We conclude that the weight change per actuation of albuterol and the sizes and numbers of aerosol particles emitted from albuterol MDIs actuated in a hyperbaric environment vary by canister type.

Konar B, Iken K, Edwards M. Depth-stratified community zonation patterns on Gulf of Alaska rocky shores. Mar Ecol. 2009; 30(1): 63-73.

Vertical zonation patterns have been considered ubiquitous in intertidal ecosystems but questions remain about their generality for individual taxonomic groups and over broad spatial scales, and whether they continue into adjacent shallow subtidal habitats. Taxon richness, invertebrate abundance, and macroalgal biomass were examined in the summer of 2003 along a vertical gradient in the rocky intertidal and shallow subtidal habitats around Kodiak Island, Kachemak Bay, and Prince William Sound, all within the Gulf of Alaska. Replicate samples of benthic organisms were taken in the high (7 m), mid (4 m) and low (0 m) intertidal (relative to MLLW), and at 1, 5, 10 and 15 m water depths at three sites in each region, and identified to the lowest possible taxonomic level. Our primary goals were to assess (1) how estimates of taxon richness, invertebrate abundance, and macroalgal biomass vary among intertidal heights and subtidal depths and (2) how general these patterns are when considered across the Gulf of Alaska. Our results show that when all invertebrates were considered together, most of the variation in taxon richness was accounted for by differences among depths (i.e. intertidal heights and subtidal depths) (51%), and among replicate samples within each depth (26%). Little to none of the variation was accounted for by differences among sites within each region (1%) or among regions themselves (0%). When considered across the Gulf of Alaska, total taxon richness and organism abundance were greatest in the low intertidal/shallow subtidal and decreased with increasing height/depth. When separated by phylum and examined together with macroalgae, variation in abundance and/or biomass among depths was significant and accounted for most of the variability. Differences among regions and sites within each region were not significant and accounted for little to none of the variance. Because the pattern of zonation varied among sites within each region, it reduced the generality of a single zonation pattern for the Gulf of Alaska. Likewise, when community composition was compared among depths, geographic regions and sites within each region using multivariate analyses, vertical zonation patterns were evident at a regional scale, but high variability in these patterns among sites within each region reduced the generality of these patterns.

Skogstad M, Eriksen T, Skare Ø. A twelve-year longitudinal study of hearing thresholds among professional divers. Undersea Hyperb Med. 2009; 36(1): 25-31.

In this prospective study over 12 years, we have studied 30 young professional divers. The aim of the study was to see if changes in hearing thresholds were related to cumulative diving exposure. The study started at the beginning of the divers' education to become professional divers. Over the follow-up period the divers performed air-dives to shallow sea levels with a median number of 477 dives (range: 40-4458). The examination was performed by measuring air conduction thresholds in a sound treated booth. During follow-up, a significant reduction in auditory function was found at 0.25, 0.5, 2, 3 and 6 kHz for the right ear and 3, 4

and 6 kHz for the left ear. A reduction in hearing function associated with diving was found at 4 and 8 kHz ($p<0.01$) both ears combined. Hearing impairment among this group of professional divers, with possible noise exposure, shows that hearing impairment is associated with their profession.

Tuya F, Wernberg T, Thomsen MS. Colonization of gastropods on subtidal reefs depends on density in adjacent habitats, not on disturbance regime. J Mollus Stud. 2009; 75(1): 27-33.

Habitats dominated by algal canopies are often altered by physical disturbances of varying severity, changing environmental conditions and biological processes. We used Artificial Seaweed Units (ASUs) to test whether severity of physical disturbances on algal canopies affects the post-disturbance colonization of gastropods on subtidal reefs. Specifically, we examined patterns of assemblage structure of gastropods to test the hypothesis that the extent and intensity of canopy removal affects the post-disturbance colonization of ASUs, testing the consistency of these effects among four regions encompassing a ~6° latitudinal gradient in southwestern Australia. Because adjacent habitats can act as a source of new colonists (either as drifting migrants or as a source of propagules) from the perimeter surrounding perturbed areas, we also predicted that patterns of colonization (types and total abundances of colonizers) were influenced by the available pool of individuals at the scale of reefs. Three reefs were selected within each region. On each reef, ASUs were placed in the centre of circular canopy clearings of different size (0, 3, 13 and 50 m^2) and intensity (50% *vs* 100%), and retrieved after 3 months. Resulting assemblages occupying the ASUs were quantitatively representative of the adjacent (undisturbed), algal-associated, assemblages at the scale of reef. Within reefs, recruited assemblages largely mimicked those associated with erect red algae. However, neither disturbance size nor intensity affected the colonization patterns across reefs and regions. These results suggest that algal-associated gastropods, regardless of the prevalent mode of dispersion, are resilient to physical disturbances to canopies across broad geographical regions as long as the pool of potential colonists is maintained. A high dispersal ability of gastropods likely ensures a quick colonization of recovering algal habitats.

The mission of the American Academy of Underwater Sciences 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, & operations.

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