E-SLATE

American Academy of Underwater Sciences (AAUS)

EDITORIAL BOARD NOTE – August 2011

Welcome to the August issue of the *E-Slate*. The Board of Directors election results are in. AAUS congratulates the newly elected members and thanks all the candidates that participated in this year's election. The deadline for abstracts for the 2011 AAUS Symposium is August 10. Be sure to read OWU-AAUS intern Mykle Hoban's report on his experience as an intern at Scripps Institution of Oceanography.

Please continue to submit news, announcements, job postings, and images of underwater work to aaus@disl.org. Current and past issues are available at www.aaus.org.

NEWS/ANNOUNCEMENTS

2011 BOD Election Results

The votes for the 2011 AAUS Board of Directors election have been tallied. We are pleased to congratulate our newly elected President-Elect Amy Moran, Director-at-Large George Peterson and Secretary Lora Pride. The newly elected officers will start their board service January 01, 2012. The President-Elect will serve two years as President-Elect followed by two years as President. The Secretary will serve a two-year term and the Director-at-Large a three year term. On behalf of the Academy, we thank all candidates participating in this year's election; we are fortunate to have such a high caliber in the Academy.

Mykle Hoban (OWU-AAUS Intern 2010)

Excerpts from Mykle Hoban's report. View entire report at http://www.owuscholarship.org/Docs/internships/reports/2010_AAUS_Report_Final.pdf.

I have long had a passion for the sea and in recent years diving has become equally as important to me, both recreationally and as a potential research tool. When I discovered the Our World-Underwater Scholarship Society was offering an internship in conjunction with the AAUS, I knew that I had found what I was looking for. I was pleased to learn that I had been selected and excited that the site was Scripps Institution of Oceanography. Scripps was the first research institution to establish a scientific diving program and is the oldest continuous non-military diving program of any kind

The internship began with the Scripps scientific diving course. This course trains divers in skills and practices necessary to safely and successfully conduct research underwater. The first week following the scientific diving class was a dramatic shift of pace. In that period, I learned about and worked on dive equipment. As time went on, I was given the opportunity to assist various researchers in the field. Faculty and graduate students at Scripps have research sites all over the world, but many are local to San Diego. Some of the disciplines in which I was able to participate during my time there include kelp ecology and biological oceanography, physical oceanography, ocean chemistry and marine natural product research. The project I spent quite a bit of time on was a long term monitoring of kelp forest ecology run by the Dayton lab. My role consisted of conducting field urchin surveys and measuring kelp density and recruitment. It was good to make a contribution to a project that has been on-going since 1971. I was impressed with the breadth of the scientific diving program and the relative smoothness with which it appeared to be managed. I learned an extraordinary amount this summer. Scripps is a very diverse and dynamic research institution and I was able to involve myself in an interesting array of projects, and make some good personal connections within the research community. I believe that the first OWU/AAUS internship was a resounding success.

SIO's June 2010 scientific diving class on the Scripps Pier. Photo credit: Jill Harris.

2011 Symposium Abstracts

All first authors should have received notification of the disposition of abstracts submitted for the 30th AAUS symposium (October 14-15, 2011 at the Portland Regency Hotel in Portland, ME. Presenters must provide either an extended abstract (800-1200 words) or a full paper by August 10 (early submissions are appreciated) that will

be published in the proceedings in advance of the meeting. No presentation can be given if manuscripts are not received. The detailed schedule will be developed once conforming manuscripts are provided.
Proceedings publications can serve as a repository for details not otherwise captured in print. It is expected that some papers will be brief (hence the 'extended abstract' option) and may focus on the diving methods (including photos) of central interest to the Academy to avoid compromising the ability to publish original research data in peer-reviewed journals. Author guidelines are available on the AAUS website (www.aaus.org). Contact Neal Pollock neal.pollock@duke.edu) with questions.

DAN Training Program Update

DAN training programs are in the process of being updated with the 2010 International Liaison Council on Resuscitation Guidelines for CPR. DAN is also taking this opportunity to revise all programs. Some will be consolidated to make presentation flow more smoothly and to improve the students' abilities to handle emergencies. For example, Oxygen First Aid for Scuba Diving Injuries will now include skills from the original course along with the two resuscitation skills in the Advanced Oxygen First Aid course. If you are not yet certified to teach the Advanced Oxygen program, you will need to work with a DAN Instructor Trainer to learn use of the bag-valve mask and the manually triggered ventilator in order to continue teaching Oxygen First Aid for Divers. The updated On-Site Neurological Assessment for Divers will remain a stand-alone course but it will also be included in the Diving Emergency Management Provider and Diving First Aid for Professional Divers courses. Basic Life Support in the Diving First Aid for Professional Divers course will be taught at the Healthcare Provider level. Online knowledge development will be made available for all DAN provider classes during 2012. DAN Instructor Trainers are currently offering opportunities around the country for the necessary upgrades in training. More information is available at http://www.diversalertnetwork.org/training.

Introducing the AAUS Foundation

We are excited to introduce the newly formed AAUS Foundation. This 501(c)(3) entity will help advance the mission of AAUS, in part by allowing tax deductible donations to support our scholarship initiatives. The Foundation will support the AAUS Scholarship program and other AAUS outreach programs. The new website (www.aausfoundation.org) streamlines processes for donation, scholarship application, product raffles and Kathy Johnston print purchases. Visit the site and enter drawing for a new VRX dive computer, signed copies of Brett Gillam's book *Diving Pioneers and Innovators* and the 2011 AAUS Kathy Johnston print.

Lodging for the 2011 Symposium

Please note that pre-symposium meetings and workshops (October 10-12) will be held at Darling Marine Center (DMC). Driving time from Portland to the DMC is about 90 minutes. Most attendees will likely prefer housing for DMC-based events at DMC or surrounding Inns. Portland-based events begin October 13. The AAUS group rate at the Portland Regency is only available Wednesday-Sunday (October 12-16) (www.theregency.com).

EQUIPMENT RECALLS/ADVISORIES

Sea Elite BCD Recall

The US Consumer Product Safety Commission and Health Canada, in cooperation with Sea Elite Systems, have announced a voluntary recall of Sea Elite Scout and Profile model buoyancy control devices. The Scout is black with blue accents on the lower sides. 'Scout' is printed in white letters on the right front and 'Sea Elite' on a flap over the corrugated hose. The following serial number ranges are affected: 001229 to 001244 and 001246 to 001489. The serial number is printed on a tag in the front pocket. The Profile is a jacket-style BCD, black with blue on the lower sides. 'Profile' is printed in white letters on the right front and 'Sea Elite' on a flap over the corrugated hose. Affected serial numbers can be found at:
http://www.cpsc.gov/cpscpub/prerel/prhtml11/11209.html.
Consumers should immediately stop using the BCDs and return them to an authorized Sea Elite Systems dealer for spring replacement at no charge. Contact Chris Richardson at 1-888-370-3483 weekdays from 0900-1700 EST for more information.

UPCOMING EVENTS

Sci. of Wound Care, Diving, & Hyperbaric Med

The conference will be held at the Ritz Carlton in Palm Beach, FL, August 04-07, 2011. Visit: www.orf2011.com or contact Sharon Phillips at sphillips@orf2011.com.

EUBS Annual Scientific Meeting 2011

The 37th annual scientific meeting of the European Underwater and Baromedical Society (EUBS) will be held August 24-27 at the Medical University of Gdansk, in Gdansk, Poland. Main conference topics will include: diving physiology and medicine; non-dysbaric disorders; research in deep diving and dysbaric diving disorders; basic research and clinical hyperbaric medicine; and hyperbaric safety, technology and organization. Satellite meetings will also be conducted: ECHM workshop 'HBO in Emergency Medicine,' EBAss and EDTCmed meetings and DAN Divers Day. Visit: www.eubs.org.

AAUS Symposium 2011

The 2011 AAUS Symposium will be held in Portland, ME October 10-15. The Portland Regency will serve as the symposium hotel and the University of Maine Darling Marine Center will host the preconference workshops, annual DSO meeting and AAUS Business meeting. Workshops include:

- PSI - VCI certification and recertification courses
- PSI - Eddy Current Testing
- DAN Instructor Certification
- Diver-based suction sampling: a monitoring tool for newly settled lobsters
- Quantitative observation of the adult American lobster (*Homarus americanus*)
- New DSO Orientation
- DUI Demo Day

Make travel and lodging arrangements early to avoid missing out. Look for additional information and registration materials in an email invitation that will go out to all members or on our website (www.aaus.org). You can register directly at http://guest.cvent.com/d/ydqgkt/4W. Contact Chris Rigaud at crigaud@maine.edu or the AAUS office at aaus@disl.org for more information.

DAN Diving and Hyperbaric Medicine Course

The 70th DAN Diving and Hyperbaric Medicine Course will be held October 22-29 at the Mayan Princess Beach Resort in Roatan, Honduras. This six-day course is designed primarily for physicians. Emergency medical personnel, paramedics, nurses and professionals with interest in diving medicine will also find the course valuable. The program is jointly sponsored by DAN and Wilderness Medical Society for continuing education credit. A special dive package supplements the course. Contact DAN Education at 919-684-2948, ext. 555 or 800-446-2671, ext. 555 or cme@dan.org. Visit: http://www.diversalertnetwork.org/Events/Event.aspx?EventID=880.

Tenerife Int'l Practical Anesthesiology Conference

The International Congress of Anesthesiology will meet November 07-10 at the Abama Golf & Spa Resort on Tenerife, Canary Islands. The topic of the conference is 'Hyperbaric medicine and its applications in daily practice.' The event is accredited by INAMI/RIZIV. Visit: www.tipactenerife.org for more information.

International Marine Forensics Symposium

The Marine Forensics Committee (MFC) of the Society of Naval Architects and Marine Engineers (SNAME) is holding the International Marine Forensics Symposium at the Gaylord National Hotel, Washington, DC, April 02-05, 2012. The symposium will honor the 100th anniversary of the sinking of RMS Titanic (April 12, 1912); the 150th anniversary of the sinking of USS Monitor (December 31, 1862); and approximately the 200th anniversary of the destruction of Commodore Joshua Barneys Flagship, the USS Scorpion during the War of 1812, as it tried to defend against the British march on Washington, DC. The event is co-sponsored by: Marine Technology Society (MTS), Royal Institute of Naval Architecture (RINA), American Society of Naval Engineers (ASNE), and Institute of Marine Engineers, Science and Technology (IMARest). Visit: http://www.rina.org.uk/marineforensics for details.

JOB OPPORTUNITIES

DSO, Northeastern Univ. Marine Science Center

The Marine Science Center and the Three Seas Program of Northeastern University seek applicants for a program coordinator and Dive Safety Officer. Now entering its 28th year, the Three Seas Program offers in-depth training in marine biology at three field stations in three different marine ecosystems. Students spend a semester each at Northeastern University's Marine Science Center in Nahant, MA; the Smithsonian Tropical Research Institute's field station in Bocas del Toro, Panama; and the University of Washington's Friday Harbor Laboratories on San Juan Island. Students finish the program with solid academic and practical experience in marine biological concepts, theory, and research. The successful applicant will assist the program director with all aspects of the program, including coordinating program operation with university offices; the hiring and supervision of faculty, staff, and teaching assistants; admissions; site logistics; recruitment of students; and management of the budget, curriculum, and program calendar. This person will serve as the Three Seas Program and Northeastern University Dive Safety Officer. A Bachelor of Science degree in marine biology, ecology, or the equivalent; experience with a field-oriented marine biology program; excellent verbal and written communication skills; and an internationally recognized scuba instructor certification are required. The successful applicant must be an active/current AAUS scientific diver. Knowledge of coastal U.S. and tropical marine ecosystems is preferred. Applications are available at: http://threeseasprogram.blogspot.com/2011/07/three-seas-marine-biology-program.html. This position is requisition number 114020. Please contact Dr. Salvatore Genovese (s.genovese@neu.edu), Three Seas Program Director, for more information. This search will continue until the position is filled.

Assistant DSO Aquarium of the Pacific

Part-time, 24 hours per week. The Assistant Diving Safety Officer of Exhibit Diving Operations (ADSOED) works closely with the DSO to oversee safe diving operations at the Aquarium of the Pacific. The ADSOED is largely responsible for oversight of routine daily dive operations and training inside the Aquarium. For details: http://www.aquariumofpacific.org/employment/information/assistant_diving_safety_officer/.

Ocean Observatory Technician MBARI

This position is responsible for the operation, integration, maintenance, and calibration of oceanographic equipment and instruments deployed on MBARI's moorings. Duties include, but are not limited to: perform maintenance of oceanographic instrumentation and ensure reliable operation prior to deployment, assist with the integration and testing of scientific sensors, assist with the development, deployment, and maintenance of MBARI's moorings. Scheduled sea duty may be required.
Minimum qualifications: associate degree or equivalent and five years related experience; experience with maintenance, operation, integration of standard oceanographic instrumentation, and basic electronic test equipment; working knowledge of PC-based computer applications and UNIX/Linux. Must be willing and able to go to sea, have excellent communication skills and be able to work with diverse groups of people. Desired qualifications: experience with deployment and recovery of oceanographic moorings; familiarity with C; scuba diving experience and scientific diver certification. Visit: www.mbari.org/oed/jobs/OOT.html.

NEW PUBLICATIONS

Curry TB, Lundgren CE. Nitrogen washout during a fatty meal while breathing nitrogen-free gas at sea level. Aviat Space Environ Med. 2011 Jul; 82(7):725-8.

The reasons for wide variability in the incidence of decompression sickness (DCS) are not well known, but diet may play a role. The hypothesis of the present study was that raising plasma triglycerides via a high-fat meal would increase the rate of nitrogen washout and, therefore, might be a useful adjunct when denitrogenation is used to reduce the likelihood of DCS in diving and exposure to altitude. Nitrogen elimination was measured for 125 min in 10 subjects by gas chromatography while they breathed a normoxic argon-oxygen mixture at sea level. Measurements were performed on separate days after high-fat and control, low-fat meals. The high-fat meal increased blood triglycerides by 236±86% while there was no significant change after the control meal. Despite causing a significant increase in cardiac output (21.6±13.8%), there was no difference in nitrogen elimination after high-fat (817.4±233.1 ml) vs. control (828.3±180.5 ml). These data suggest that raising blood triglycerides via a high-fat meal does not affect the rate of whole-body nitrogen elimination. The lack of effect of the increase in cardiac output may be due to an increased blood flow to the gastrointestinal tract being negated by decreased blood flow in other vascular beds.

Flook V. Predictions from a mathematical model of decompression compared to Doppler scores. Undersea Hyperb Med. 2011 May-Jun; 38(3):187-96.

This paper describes an attempt to calibrate a mathematical model that predicts the extent of bubble formation in both the tissue and blood of subjects experiencing decompression from a hyperbaric exposure. The model combines an inert gas dynamics model for uptake and elimination of inert anesthetic gases with a simple model of bubble dynamics in perfused tissues. The calibration has been carried out using the model prediction for volume of free gas (bubbles) as microl/ml in central venous blood and relating this to Doppler scores recorded at the end of hyperbaric exposures. More than 1,000 Doppler scores have been compared with the model predictions. Discriminant analysis has been used to determine the cut-points between scores below a certain level and all scores at or above that level. This allows each prediction from the model to be equated to a particular pattern of bubble scores. The predictions from the model are thus given a context against the more familiar Doppler scores as a means of evaluating decompression stress. It is thus possible to use the mathematical model to evaluate decompression stress of a hyperbaric exposure in terms of the predicted volume of gas that will form into bubbles and to convert that to a prediction of the most likely pattern of Doppler grades which would be recorded from a group of subjects experiencing that exposure. This model has been used in assisting regulators to set limits to the level decompression risk that should be considered acceptable and in assisting those working with decompression procedures to design effective modifications.

Hannak JS, Kompatscher S, Stachowitsch M, Herler J. Snorkelling and trampling in shallow-water fringing reefs: Risk assessment and proposed management strategy. J Environ Manage. 2011 Jun 25. [Epub ahead of print].

Shallow reefs (reef flats <1.5 m) in the northern Red Sea are impacted by growing tourism that includes swimmers, snorkellers and reef walkers but have largely been neglected in past studies. We selected a fringing reef along the lagoon of Dahab (Sinai, Egypt) as a model for a management strategy. Point-intercept line transects were used to determine substrate composition, coral community and condition, and the coral damage index (CDI) was applied. Approximately 84% of the coral colonies showed signs of damage such as breakage, partial mortality or algal overgrowth, especially affecting the most frequent coral genus *Acropora*. Questionnaires were used to determine the visitors' socio-economic background and personal attitudes regarding snorkelling, scuba-diving and interest in visiting a prospective snorkelling trail. Experiencing nature (97%) was by far the strongest motivation, and interest in further education

about reef ecology and skill training was high. Less experienced snorkellers and divers - the target group for further education and skill training - were those most prepared to financially support such a trail. We therefore recommend a guided underwater snorkelling trail and restricting recreational use to a less sensitive 'ecotourism zone' while protecting the shallow reef flat. Artificial structures can complete the trail and offer the opportunity to snorkel over deeper areas at unfavourable tide or wind conditions. This approach provides a strategy for the management and conservation of shallow-water reefs, which are facing increasing human impact here and elsewhere.

Henckes A, Arvieux J, Cochard G, Jézéquel P, Arvieux CC. Hemoptysis and pneumomediastinum after breath-hold diving in shallow water: a case report. Undersea Hyperb Med. 2011 May-Jun;38(3):213-6.

We report the case of a healthy 21-year-old woman who performed iterative breath-hold dives in relatively cold water, not exceeding depths of 5 meters but with '"empty lungs." At the end of a dive, after experiencing an intense involuntary diaphragmatic contraction underwater, she presented hemoptysis followed by chest pain and cough. Chest radiography and computed tomography were performed 24 hours later, confirming the diagnosis of pneumomediastinum. The clinical course was benign: However, chest pain and effort dyspnea lasted for a few weeks. The pathophysiology of this accident may be explained by a combination of mechanisms involved in several clinical entities, namely pulmonary edema of immersion, pulmonary barotrauma and spontaneous pneumomediastinum.

Kowalski JT, Varn A, Röttger S, Seidack S, Kähler' W, Gerber WD, Andrasik F, Koch A. Neuropsychological deficits in scuba divers: an exploratory investigation. Undersea Hyperb Med. 2011 May-Jun;38(3):197-204.

To investigate whether divers with varying levels of experience and without a history of reported decompression sickness (DCS) show neuropsychometric alterations possibly as a result of so-called repetitive "silent" paradoxical gas embolisms. Using reaction time as a psychometric measure, 17 experienced military divers (ED, logging between 150 and 1,200 diving hours) and eight very experienced military divers (VED, logging between 2,800 and 9,800 diving hours) with no decompression sickness (DCS) in their medical histories were compared to 23 healthy controls without any diving history, matched as closely as possible with respect to age for the two diving groups. Motor reaction time, decision reaction time and error rates were measured during completion of both simple and complex reaction time tasks. Compared to their control group, VED showed significantly higher motor reaction times on both tasks and significantly higher decision reaction times in the complex task. ED were not found to be different from their respective controls. No changes in performance quality in terms of increased errors were observed in any of the tasks for either diving group. The findings support the proposed possibility that minimal cerebral lesions occur after diving even without DCS. Further studies with this highly selective population of very experienced divers using more elaborate neurocognitive and neuromotor tasks seem warranted.

van Ooij PJ, van Hulst RA, Houtkooper A, Sterk PJ. Differences in spirometry and diffusing capacity after a 3-h wet or dry oxygen dive with a PO_2 of 150 kPa. Clin Physiol Funct Imaging. 2011 Sep;31(5):405-10. doi: 10.1111/j.1475-097X.2011.01034.x. Epub 2011 Jun 21.

Rationale: Breathing oxygen with a partial pressure of >50 kPa causes pulmonary oxygen toxicity (POT), resulting in a decrease in vital capacity (VC) and in diffusing capacity for carbon monoxide (DL_{CO}). As submersion is thought to potentiate POT, we hypothesized that submerged oxygen divers are at increased risk for POT. Objective: To compare changes in lung function after submerged (wet) and non-submerged (dry) oxygen dives. Method: Thirteen healthy male divers (mean±SD: 25±2 years, 184±7 cm, 85±10 kg) made a dry and a wet dive to 150 kPa for 3 h, during which they breathed 100% oxygen. At baseline, within 1 and 4 h after their dives, spirometry and diffusing capacity were measured. Data were analysed with ANOVA using Bonferroni correction and paired t-tests. Results: Compared with baseline, there was a significant reduction in DLco (-1·6 $mmol \cdot kPa^{-1} \cdot min^{-1}$) after a wet oxygen dive but not after a dry dive. In addition, relative to baseline, there was a significant difference in ΔDL_{CO} and ΔVC when comparing wet and dry oxygen dives. Conclusion: Diffusing capacity is more impaired after a wet oxygen dive than after a dry one. This suggests that wet oxygen divers are at increased risk for POT. Monitoring studies during daily practice of professional divers are mandatory to determine the exact operational relevance of the present findings.

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.

American Academy of Underwater Sciences
101 Bienville Boulevard, Dauphin Island, AL 36528
Tel 251 591 3775 Fax 251-861-7540
aaus@disl.org www.aaus.org

Editor: Roxanne Robertson - aaus@disl.org
Editorial Board: Neal Pollock, Michael Dardeau, Heather Fletcher

AAUS BOARD OF DIRECTORS

Christian McDonald	President
Michael Lang	President-Elect
George Peterson	Secretary
Mike Dardeau	Treasurer
Kevin Flanagan	Director-at-Large, Standards Chair
Pema Kitaeff	Director-at-Large (DAL)
Neal Pollock	DAL, Meetings & Publications Chair
Marc Slattery	Appointed Director (AD), Standards
Jenn Caselle	AD, Scholarship Chair
Amy Moran	AD, Statistics Chair
Chris Rigaud	AD, Membership Chair