American Academy of Underwater Sciences (AAUS)

EDITORIAL BOARD NOTE – February 2009

Welcome to the February issue of the E-Slate. The AAUS Symposium is approaching quickly. Be sure to reserve a room at the Crown Plaza Atlanta before rooms at the AAUS rate are gone. We look forward to seeing you in March.

The E-Slate is disseminated as a Word document to make it easier for recipients to access website addresses and reuse text. We strive to include as many useful and interesting items as possible while controlling the file size. If file size is a problem for your inbox, we can offer an alternative. All E-Slate issues are maintained on the AAUS website (www.aaus.org; select 'Publications'). Recipients can be moved from the direct delivery distribution list to a list receiving notification of a new issue without the attachment. Contact us at aaus@disl.org if this is your choice. You can also help us keep the scientific dive community informed. Please submit relevant news, announcements, research reviews, underwater research images and new publications.

NEWS/ANNOUNCEMENTS

Diving for Science 2009 - Abstract Review

A total of 40 abstracts were submitted for the March AAUS meeting. Each was reviewed by a panel of six individuals. The first author should receive review results by February 02. Please contact AAUS (www.aaus.org) if you do not receive confirmation of the status of your submission.

Diving for Science 2009 - AAUS Symposium

The 28th scientific AAUS symposium will be hosted by the Georgia Aquarium March 10-14 in Atlanta, GA. Events include presentations on an array of scientific diving and underwater science topics and several workshops. Hotel accommodations are reserved at the Crown Plaza Airport Atlanta (866-750-3365). The AAUS rate is $129 plus applicable tax and fees (available as space allows until February 16, 2009). To register for the symposium: https://web.memberclicks.com/mc/quickForm/viewForm.do?orgId=aaus&formId=50293 to go directly to the registration form or visit www.aaus.org for more information.

Whale Shark Diving at the Georgia Aquarium

Come swim with the Gentle Giants in the one of the world's largest fish tanks. Dive into Georgia Aquarium's 6.2 million gallon Ocean Voyager Exhibit which is the home of Whale Sharks, a Manta Ray, Sand Tiger Sharks and over 80 other species. All diving gear is supplied, all you need is a swim suit and a certification card. The Georgia Aquarium is allowing diving exclusively for AAUS members ($110 fee) during the 2009 AAUS Symposium, so come and join us.

Top: Diver experiencing the Ocean Voyager Exhibit at the Georgia Aquarium. Left: Alma Wagner and Kathy Johnston diving with the Whale Sharks at the Georgia Aquarium. Photographer: Jeremy Smiedendorf. Photos courtesy of the Georgia Aquarium.

The Georgia Aquarium is allowing 10 nightly dive immersions (Mon-Fri) exclusively for AAUS members ($110). Register for this incredible diving experience on our website at www.aaus.org.

Web Based Dive Logging for AAUS OMs

Over the past year AAUS and Ego Factory have been working together to produce a web based logging system for divers at AAUS Organizational Members (OMs). Ego Factory has been modifying software developed for divers at the Aquarium of the Pacific (AOP) by Alex Zonin of Ego Factory, a volunteer diver at AOP, and the former DSO at AOP, Derek Smith. Our challenge has been to adapt the AOP software so that it will

meet the needs of the largest number of OMs in AAUS. Use of this software is voluntary; if you have a system in place that works for you, you are free to continue to use it. AAUS pursued this option because many of the smaller to medium OMs lack access to information technology resources and the DSOs are overwhelmed trying to track dives and divers manually. We want to make it a little easier for you to comply with the requirement to turn in annual stats. Each OM that would like to use the software will have their own password protected website and a limited ability to customize the look of their data collection. The OM's site may be logged into at any time by the OM divers once they are registered and activated by the DSO. The intent is that divers log their dives immediately following each dive, project or trip. The software will keep running totals of the end of the year stats required by AAUS for the OM's group of divers. Once the DSO has determined that all the dives have been logged and reviewed them for accuracy, the annual AAUS statistics report numbers can be entered at a separate site. It is important to realize that no one at AAUS or at any other OM can see any data on your website. Only the DSO at each OM can see all of their OM's divers and the summary data of their collective dives. All data must be reviewed by the DSO annually and then submitted to AAUS through a separate website.
http://aauscf.egofactory.com/omservices1.cfm

Another utility of the software is that if the certification data in the diver profiles (CPR, first aid, oxygen therapy, etc.) is kept up to date by the DSO, the report function will indicate which divers are not current on any given date. In addition, fully editable letters of reciprocity can be printed using data in the diver's profile.

We have tried to make the process as intuitive as possible; a brief orientation is enough to get you started. DSOs wishing to try the software should contact Mike Dardeau at mdardeau@disl.org. Please include a 170 x 170 pixel or higher resolution jpeg or gif image of your OM logo if possible. You will be assigned a website and encouraged to log in and begin developing it. It will be necessary for you to go to the new website, enter with the username and password provided, then respond to the prompt to change your username and password.

DSOs, before making the website available to your divers, open it up, enter your information and try out a few functions so that you will be able to help your divers with the basic registration and data entry. They will see far fewer options than you have as DSO, basically the ability to register, log dives and export dives to Excel. You, as a DSO, will have the ability to customize the look of the dive log data entry screen through the 'Location/Projects' and 'Purposes Administration' menus. Statistical reporting options required by AAUS are hard coded in and cannot be changed. DSOs will be able to see a list of their divers, edit their profiles and their dive logs and generate an LOR for each diver.

We hope the web-based dive logging software is useful to you. As with any new product designed for 100+ users on different browsers, operating systems and so on, problems may arise. Please contact Mike Dardeau (mdardeau@disl.org) to help resolve any difficulties.

AAUS is grateful to the DSOs who tested the software and offered suggestions. We could not do what we do without your input and assistance.

AAUS Lifetime Achievement Award

Associated with Scripps since the 1950s, James Stewart helped pioneer research scuba diving
Scripps Institution of Oceanography/University of California, San Diego

James Stewart, chief diving officer emeritus at Scripps Institution of Oceanography at UC San Diego, has been awarded the 2008 AAUS Scientific Diving Lifetime Achievement Award.

From 1960 until his retirement in 1991, Stewart managed Scripps' diving operations, the oldest and largest nongovernmental research diving program in the United States. Under his guidance, the program became a model for safety and effectiveness for international research diving. Today he continues to be involved with the Scripps scientific diving program as an advisor to the Scripps Diving Control Board and lecturer for Scripps scientific diving courses.

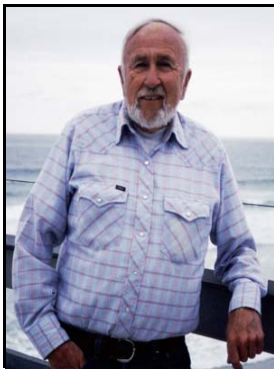
The AAUS Scientific Diving Lifetime Achievement Award is bestowed annually to a member of the scientific diving community who has made significant contributions in advancing underwater science and technology.

"Jim's legacy is apparent in all aspects of what we do," said Christian McDonald, current Scripps DSO and President-elect of the AAUS. "The rational approach to scientific diver training and diving safety developed and promoted by Jim and his colleagues in the early years remain the cornerstone for AAUS standards for diving safety."

A native of San Diego, Stewart first put on a diving mask in 1941, paving the way to an invitation to the San Diego Bottom Scratchers, the nation's oldest and most exclusive skin diving club. Joining Scripps as a volunteer in 1952, Stewart, with Conrad Limbaugh and Andy Rechnitzer (both previous recipients of the AAUS Scientific Diving Lifetime Achievement Award), worked to innovate scuba training procedures and underwater data collecting techniques, allowing scientists to safely and efficiently use scuba as a means of conducting underwater research.

As DSO in the 1960s, Stewart developed the original "University Guide for Diving Safety", a diving safety manual promulgating the framework for the conduct and management of scientific diving programs, initially within the University of California system and later for the national scientific community and various state and federal agencies.

While conducting research diving off Wake Island (North Pacific Ocean) in 1961, Stewart was attacked by a gray reef shark. Hit twice on the right elbow, the bites cut the joint capsule and two arteries. With his diving experience and the aid of friend Ron Church, he was able to escape and avoid further injuries. He was flown to a Hawaiian hospital and eventually recovered fully.



Stewart adds the AAUS Scientific Diving Lifetime Achievement Award to a long list of honors that includes the inaugural Conrad Limbaugh Memorial Award for Scientific Diving Leadership from the AAUS (2001); the Roger Revelle Trophy from the San Diego Oceans Foundation (2001); induction as one of the first members of the National Association of Underwater Instructors Hall of Honor (2000); the National Conservation Award from the secretary of the U.S. Department of the Interior (1992); and election to the Diving Hall of Fame, concurrent with being honored with the first Pioneer Award, from the Diving Equipment Manufacturers Association (1991).

In 2003, in honor of his years as diving officer for the National Science Foundation's Office of Polar Programs, in which he oversaw science diving activities in the U.S. Antarctic Program, the U.S. Board of Geographic Names conferred the name "Stewart Peak" on a 1,097-meter mountain in Antarctica in his honor.

Diving Internships at Channel Islands National Park

Channel Islands National Park's Kelp Forest Monitoring Program (KFMP) has two Student Conservation Association (SCA) internships available from April/May through September/October 2009. The program is seeking scuba divers with a moderate amount of experience (preferably with an AAUS recognized scientific diving certification, minimum of 50 cold water dives, some vessel experience and excellent recommendations) to help collect long-term subtidal data on the kelp forest communities around the Channel Islands.

The interns' primary duty will be to assist with all aspects of the Park's long-term KFMP to determine the status of living marine resources. The KFMP has conducted annual monitoring around the five Park Islands since 1982. Interns will collect data on population dynamics of fish, invertebrates and algae. Most data are collected underwater using scuba and surface-supplied air diving techniques. Interns will participate in all aspects of data acquisition and data management and help to prepare equipment, vessel, and food for multi-day remote offshore monitoring cruises and other trips. Interns will also likely have opportunities to help out with other monitoring programs at the Park such as vegetation, Island fox, intertidal and sea bird monitoring.

The work involves multi-day (but typically five-day) research cruises on 30-65 ft vessels with up to 10 people, and may include up to 17 cruises during this period. Other monitoring trips may also be multi-day on the Islands. Divers typically make up to five dives per day in water temperatures ranging from 50-73°F. Most dives are conducted at depths less than 65 ft and are often in dense kelp forests. Travel and dive conditions are often rough as some of the monitoring sites are in exposed areas or up to one mile offshore.

A non-taxable stipend will be available to interns of up to $640/month in addition to $650/month for housing, accident and medical insurance. Interns will also have up to $2,000 to purchase scuba equipment. In addition, a $1,250-$4,725 Americorps Education award may be available.

For more information or to apply, please send a resume with cover letter to David Kushner at David_kushner@nps.gov, or call 805-658-5773. Your resume and/or cover letter should describe in detail your scuba diving and biological experience. The program hopes to select interns by be the end of February, so applications should be completed immediately.

UPCOMING EVENTS

DAN Diving Medical Technician Course

A Diving Medical Technician (DMT) course will be held in Durham, NC April 19-24. The program includes a lecture series and hands on experience at local recompression facilities. Participants who complete the certification course

receive DMT certification through the National Board of Diving and Hyperbaric Medic al Technology (NBDHMT). For registration or more information visit: http://www.diversalertnetwork.org/training/courses/dmt.

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

JOB POSTING

OSU Seasonal Research Assistant

Physical Oceanography/Marine Ecology Seasonal Research Assistant at Oregon State University (OSU). OSU is looking for an enthusiastic individual to assist in scientific research in the nearshore oceanographic environment for the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO). The primary responsibilities are to assist in conducting oceanographic research on and offshore of the Oregon coast. At sea work includes: participating in research cruises on the R/V Elakha and R/V Kalipi; deployment, maintenance, and retrieval of oceanographic instruments; and occasional scuba to observe and recover moorings. Shore and lab work includes: constructing moorings and other sampling devices; assisting with downloading and maintaining oceanographic data and data logs; mussel growth measurements; assisting with instrument calibrations; assisting with water sampling collection and processing; and assisting professors, postdoctoral fellows and graduate students in their research. This position requires working weekends and early mornings, and long hours in the field. It may also require staying at housing on the coast for short periods.
Required Qualifications:

- Scuba diving certification and significant diving experience
- Boating experience and resistance to motion sickness
- Ability to work as part of an ecological research team
- Interest in physical and biological oceanography

Desirable Qualifications:

- Strong attention to detail
- First Aid and CPR certification
- AAUS scientific diving certification
- Cold water/drysuit diving experience
- Physically fit, hardworking, willing to work required hours
- Marine biology/oceanography coursework and/or fieldwork

Salary: $11/h.
Dates: Mid-March 2009 through September 2009.
Location: Oregon State University in Corvallis, Oregon
For more information visit: http://lucile.science.oregonstate.edu/?q=node/view/245.

NEW PUBLICATIONS

Bennett PB, Weinke B, Mitchell S, eds. Decompression and the Deep Stop Workshop. Proceedings of the Undersea and Hyperbaric Medicine 2008 pre-course meeting. Durham, NC: UHMS, 2008; 329 pp.

Brueggeman P, Pollock NW, eds. Diving for Science 2008. Proceedings of the 27th American Academy of Underwater Sciences Symposium. Dauphin Island, AL: AAUS; 2008; 200 pp.

Duplessis C, Fothergill D, Gertner J, Hughes L, Schwaller D. A pilot study evaluating surfactant on eustachian tube function in divers. Mil Med. 2008; 173(12): 1225-32.

BACKGROUND: Middle ear barotrauma (MEBT) is the most common medical complication in diving, aviation, and hyperbaric medicine. Eustachian tube dysfunction (ETD) quantifies the inability to open the eustachian tube (ET), risking MEBT. Surfactant administration improved ET function and efficaciously treated otitis media in a host of animal models. We performed a pilot study evaluating the efficacy of intranasal surfactant administration in reducing MEBT in repetitive diving. METHODS: Eight divers participated in a subject-blinded, placebo-controlled, random order, multiarm (air and O_2)-repeated measures trial investigating the relative efficacy of intranasally administered surfactant, acetylcysteine and oxymetazoline, and orally administered pseudoephedrine versus saline-placebo in middle ear equilibration during repetitive, multiday diving. Subjects were tested with the Nine-Step Inflation/Deflation Tympanometry Test (NSI/DT) and sonotubometry (testing eustachian tube opening pressure [ETOP]) before and immediately after each dive. RESULTS: Significant interaction effects were found for drug-by-test ($F_{8,668}=4.05$; $p<0.001$) and the three-way interaction of drug-by-dive-by-test ($F_{16,668}=2.47$; $p=0.001$) in sonotubometry testing. The ETOP revealed trends toward lowered (improved) values post-versus predive in all treatment arms, which was significant for oxymetazoline ($p=0.04$). Only four of the eight subjects

experienced any holds during diving. Statistical analysis of the NSI/DT data showed that none of the drug interventions resulted in improvements in ET function over that expected by chance. CONCLUSIONS: There is large intra- and intersubject variability in daily functioning of the ET as measured using the NSI/DT and sonotubomtery (ETOP). Sonotubometry engendered trends toward lowered (improved) values post-versus predive in all treatment arms. The repetitive dives did not result in a significant decrease in ET function as evidenced in the saline-placebo trials, circumventing an ability to detect superiority among the various treatment arms in our subject population. Additionally, since our study was underpowered to detect significant effects, we can only assert that various inhalational agents may improve middle ear ventilation in repetitive diving warranting further study. A larger subject population including subjects diagnosed with ET dysfunction may provide more statistical power to discern the benefit of inhaled agents as a useful prophylactic for preventing or reducing ET dysfunction during diving and/or hyperbaric/hypobaric pressure changes.

Fitz-Clarke JR. Lung compression effects on gas exchange in human breath-hold diving. Respir Physiol Neurobiol. 2008 Dec 24. [Epub ahead of print]

Lung compression during breath-hold diving reduces gas exchanging surface area. Beyond a critical depth, collapse of all alveoli should result in total pulmonary shunt and a drop in arterial oxygen partial pressure toward the mixed-venous level. The effect of lung collapse on human breath-hold diving capability is analyzed using a computational model of the lungs and circulation that simulates oxygen, carbon dioxide, and nitrogen exchange between alveoli, blood, and tissues. Gas uptake during descent becomes limited by lung compression when the ratio of diffusing capacity to the product of perfusion and gas solubility in blood drops below one. An equation is derived for estimating collapse depth due to direct alveolar compression and time-dependent absorption atelectasis. Oxygen dissolved in blood during descent builds a limited capacitive store for supporting metabolism during the period of lung collapse. Hypoxemia with loss of consciousness prior to alveolar re-opening on ascent is predicted to occur on dives beyond 300 m, depending on initial lung volume.

Levett DZ, Millar IL. Bubble trouble: a review of diving physiology and disease. Postgrad Med J. 2008; 84(997): 571-8.

Exposure to the underwater environment for recreational or occupational purposes is increasing. Approximately 7 million divers are active worldwide and 500,000 more are training every year. Diving related illnesses are consequently an increasingly common clinical problem with over 1000 cases of decompression illness reported annually in the USA alone. Divers are exposed to a number of physiological risks as a result of the hyperbaric underwater environment including: the toxic effects of hyperbaric gases, the respiratory effects of increased gas density, drowning, hypothermia and bubble related pathophysiology. Understanding the nature of this pathophysiology provides insight into physiological systems under stress and as such may inform translational research relevant to clinical medicine. We will review current diving practice, the physics and physiology of the hyperbaric environment, and the pathophysiology and treatment of diving related diseases. We will discuss current developments in diving research and some potential translational research areas.

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 251-861-7504 Fax 251-861-7540
aaus@disl.org www.aaus.org

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