



E-SLATE

American Academy of Underwater Sciences (AAUS)

EDITOR'S NOTE – August 2009

Welcome to the August issue of the E-Slate. The Board of Directors Election results are in. Congratulations to the newly elected officers. Also in this issue, two new job opportunities and several new publications. Thank you for your submissions this month.

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.



Alma Wagner and Lora Pride in the Bahamas for the Dive Trip they won courtesy of Ocean Enterprises/Stuart Cove at the Bubble Breaker during the 2009 AAUS Symposium.

NEWS/ANNOUNCEMENTS

AAUS Diving for Science Symposium 2010

The 2010 AAUS Diving for Science Symposium will be held March 25-27 in Waikiki, HI. The Ala Moana Hotel has been secured for the symposium. When making a reservation mention AAUS for the reduced rate of \$119. This rate is available March 22-29. If hotel rates decrease before the symposium, the AAUS rate will also decrease. However, if the hotel rate increases, the AAUS fee is locked in at \$119. All symposium meetings including the DSO meeting and business meeting will be held at the hotel. The banquet will be at the Waikiki Aquarium (<http://www.waquarium.org>). Schedule of workshops will be posted ASAP. Call 1-808-955-4811 or visit <http://www.alamoanahotelhonolulu.com/> to make a reservation.

BOD Election Results

The polls for the 2009 AAUS Board of Directors election closed midnight June 30. Congratulations to newly elected President-Elect Michael Lang, Secretary George Peterson, and Elected Director Neal Pollock. The elected officers start their BOD service January 1, 2010. The President-Elect will serve two years as President Elect followed by two years as President of the Academy; the Secretary serves a two-year term; and an Elected Director serves a term of three years.

On behalf of the Academy I would like to thank all of the candidates participating in this year's election cycle. All were very qualified for BOD service and I suspect some of those who were not elected this time may find themselves approached for appointed BOD positions and/or as candidates for future elections.

Steve Sellers
2009 AAUS Nominations Committee Chair

AAUS Internship as part of OWUSS

AAUS has a new scientific diving internship as part of the Our World-Underwater Scholarship Society (OWUSS). This internship will provide undergraduates with the experience and opportunities necessary for a future in science, diving for research, or scientific diving-related fields. Intern applicants can be students from colleges and universities with an interest in science and diving. The program runs primarily from mid-May through August and will include training at one of several AAUS organizational member sites. This training will give the intern the necessary dive qualifications to allow participation on research projects requiring scientific diving and introduce the student to careers that utilize scientific diving as a tool. Once trained as an AAUS-recognized diver-in-training, interns will participate in underwater field-work at one or more locations and research facilities associated with AAUS. The internship will be supported by funding for travel to/from site, room, board, and other internship-related expenses. For information and applications, please refer to the Our World-Underwater Scholarship website at www.owuscholarship.org.

AAUS Fall BOD Meeting

The Fall Board of Directors meeting will be held in conjunction with the DEMA meeting in Orlando, FL. It will be on Thursday, November 5, 2009, from 1000-1800, at the Metropolitan Hotel in Orlando.

AAUS Bumper Stickers Available

Five inch diameter vinyl stickers with the AAUS logo are available for only \$4 each. To order, visit:

<https://web.memberclicks.com/mc/quickForm/viewForm.do?orgId=aaus&formId=46178>. Thank you for supporting AAUS.

UPCOMING EVENTS

DAN Instructor Trainer Workshops

Divers Alert Network (DAN) is offering a series of Instructor Trainer Workshops (ITW) and Trainer Updates throughout July in various cities across the US. DAN Trainers are able to offer both DAN Provider Courses and DAN Instructor Qualification Courses. The workshops are open to scuba diving instructor trainers who are also CPR Instructors. The ITW will cover Scuba Oxygen, Advanced Oxygen, Hazardous Marine Life Injuries, automated emergency defibrillators (AEDs), Neurological Assessment, Diving Emergency Management Provider (DEMP), both DAN Aquatics courses, and the new Dive Medicine for Divers Program (DMDP). DMDP covers topics such as fitness to dive, risk assessment and physical exam techniques. Combining it with DEMP and On-Site Neurological Assessment for Divers constitutes Dive Medicine for Divers Level 1. For more information, including a full list of dates and locations visit:

<http://www.dan.org/Events/Default.aspx>.

ISOSD 2009

The 2nd International Symposium on Occupational Scientific Diving (ISOSD) of ESPD, held at Tvärminne Zoological Station, University of Helsinki, Finland October 6-8, 2009, is organized by the Finnish Scientific Diving Steering Association. Symposium organizers welcome oral presentations and posters on all fields of scientific diving and training (science, maritime archaeology, scientific engineering etc.). Special emphasis is on methods, techniques, and instrumentation in actual underwater fieldwork. In addition to scientific presentations, presentations of scientific diving methods, interesting projects etc, are encouraged. Presentations are not required to follow strict scientific guidelines, and may be in the form of image slideshows, video etc. Optional dives at sites of scientific and/or archaeological interest in northern Baltic Sea archipelago, and in a clear water limestone quarry will be offered. Information:

<http://luoto.tvärminne.helsinki.fi/ISOSD2009.html>.

EQUIPMENT RECALL

Poseidon Diving Wings Recalled

The US Consumer Product Safety Commission (CPSC), in cooperation with Poseidon, announced a voluntary recall of Besea W50 Diving Wings with Poseidon inner bladders. Consumers should stop using recalled products immediately

unless otherwise instructed. The inner bladder located inside the diving wing can break, causing the wing to fail to operate as a floating/buoyancy device. This poses a drowning hazard to divers. Poseidon has received 15 reports of inner bladders breaking. No injuries have been reported. The recall involves the Poseidon inner bladders with batch number 5445 sold with the Poseidon Besea W50 wings. The inner bladder is located inside the outer cover of the wing. The batch number and 'Poseidon' are molded on a tab located between the 'legs' of the inner bladder. These units were sold at Poseidon dealers nationwide from September 2007 through June 2008 for about \$366.

Consumers who have wings that contain the recalled inner bladders should stop using the wing immediately and contact Poseidon for a free replacement. For additional information, contact Poseidon toll-free at 877-673-4366 (weekdays 0800-1700 central time) or email info@poseidoncentral.com. For additional information, visit:

<http://www.cpsc.gov/cpscpub/prerel/prhtml09/09251.html>.

JOB OPPORTUNITIES

Director – UNCW Aquarius in Key Largo, FL

Summary of Position: Permanent full-time position located at University of North Carolina's Aquarius Reef Base (ARB) in Key Largo, FL. ARB, <http://www.uncw.edu/aquarius>, is a NOAA-funded undersea research facility and shore base dedicated to coral reef science, ocean observations, technology development, training, and outreach and education. This position will lead the program into the next generation of ARB science and operations, including serving as Principal Investigator on the ARB Cooperative Agreement. Major responsibilities include:

- Science/Strategic Planning: provide visionary, innovative leadership and planning that ensures relevance of ARB efforts to NOAA and national ocean agenda in coordination with chief scientist.
- Administration and Operations: provide strong leadership for and overall management of all ARB assets (people, equipment, facilities) that ensures and improves safety, effectiveness, and efficiency of ARB program activities and innovation for the future.
- Outreach/Education: promote ARB to a variety of stakeholders (e.g., NOAA/OER [Office of Ocean Exploration and Research], UNCW, foundations, industry, Congress, educators, managers, public and media), build new and strengthen existing partnerships and help to develop creative products for stakeholders, including resource managers and educators.
- Business Development: sustain and grow the ARB program through sound business practices and partnerships, provide leadership in developing new sources of funding and partnerships.

Minimum Required Knowledge, Skills and Abilities:

- Master degree in a related field from an appropriately accredited institution or a Bachelor degree and greater than five years of comparable experience in ocean science and technology development program management.
- 300 or more dives, including dives to depths of more than 40 m. Must be able to obtain and maintain active diver status.
- Strong experience in budget and personnel management
- Proven leadership skills, excellent verbal and written communication abilities.
- Demonstrated experience and ability to work with a wide range of external stakeholders to describe and promote an ocean science and technology program.

Preferred Qualifications:

- Diver Medical Technician experience or other demonstrated knowledge of hyperbaric medicine.
- Experience in national and regional ocean research and technology issues and working with ocean agencies.
- Experience managing saturation diving operations.

Salary will be determined based on competencies, equity, budget, and market considerations. Position is contingent upon availability of funding from ARB sponsor agency. To apply, please complete the online application process available on the Web at <http://consensus.uncw.edu>. A letter of application, addressed to Tom Potts, Search Committee Chair, highlighting how your education and experience meet the above stated requirements and why you want to work at UNCW's Aquarius Reef Base, a comprehensive resume including work and educational experience and contact information for three professional references should be attached to the online application – not emailed, mailed or faxed. Microsoft Word or Adobe PDF attachments are required. For questions regarding the online application process, contact Ms. Sandie Ward, 910-962-3339. For questions about the position, please contact Tom Potts, pottst@uncw.edu. Priority consideration will be given to applications received by August 15, 2009. But, applications will be accepted until the position is filled.

UNCW actively fosters a diverse and inclusive working and learning environment and is an equal opportunity employer. Qualified men and women from all racial, ethnic, or other minority groups are strongly encouraged to apply.

Research Scientist – Coral Project in Miami

The University of Miami's Rosenstiel School of Marine and Atmospheric Science is seeking to hire a Research Scientist to lead a coral propagation and restoration project focused on the threatened coral *Acropora cervicornis* in South Florida. This research program will involve extensive field activities to be conducted using scuba. Primary duties include field sampling, data collection and management, statistical analyses, and report and manuscript preparation. The candidate is also expected to supervise both graduate and undergraduate

students. Funding for this position is presently available for a period of three years. This position is only open to US citizens or legal residents.

The qualifications for this position include:

- A graduate degree in Marine Science or related field
- Current AAUS scuba certification and demonstrated ability to safely operate small boats
- Background in Coral Reef Ecology
- Experience collecting, manipulating, analyzing, and interpreting scientific data
- Experience communicating clearly via written, spoken, and graphical means in English
- Willingness to travel frequently and work long hours in the field under variable weather conditions
- Hold or be able to obtain a valid driver's license and a safe driving record

Other desirable skills include:

- Strong GIS (geographic information systems), remote sensing, and statistics background
- Experience in Coral Restoration projects and coral identification

Send inquiries, letter of application, and curriculum vitae to:

Diego Lirman, Ph.D.
Marine Biology and Fisheries Division
Rosenstiel School of Marine and Atmospheric Science
University of Miami
4600 Rickenbacker Cswy.
Miami, FL 33149

NEW PUBLICATIONS

Boussuges A, Retali G, Bodéré-Melin M, Gardette B, Carturan D. Gender differences in circulating bubble production after scuba diving. Clin Physiol Funct Imaging. 2009 Jul 6. [Epub ahead of print]

Summary Objective: Differences in circulating bubble production have been described after exposures in altitude chambers between men and women. The present study was designed to examine gender differences in circulating bubble production after a dive. Methods: 52 men and 52 women performed the same dive profile (25 min to 35 m). Circulating bubbles were detected by continuous wave Doppler. Tests were conducted at sea in a boat, at 10-min intervals for 1 h after surfacing. Signals were graded according to the Spencer scale. The categorical data were then converted to a single number reflecting total bubble activity using the KISS index. Results: Considering each measurement period, bubble grade was higher in men than women 30, 40 and 50 min post-dive. On the contrary, bubble grade was comparable between men and women 10, 20 and 60 min after the dive. KISS index was significantly higher in men than women (6.77 [0.65-32.3] versus 0.91 [0-

22.9], $p < 0.02$). KISS index was significantly correlated with age, weight and body fat mass in the whole population and in the men and women separately. Postmenopausal women had a higher KISS index (42 [15-47]) when compared with premenopausal women and men older than 50 years. No difference in bubble production was found according to the use of oral contraceptive pills or the phase of the menstrual cycle. Conclusion: Overall, we observed fewer circulating bubbles in women than in men after an open sea scuba dive. This difference disappeared in the postmenopausal women.

Lynch JH, Bove AA. Diving medicine: a review of current evidence. J Am Board Fam Med. 2009; 22(4): 399-407.

Recreational scuba diving is a growing sport worldwide, with an estimated 4 million sport divers in the United States alone. Because divers may seek medical care for a disorder acquired in a remote location, physicians everywhere should be familiar with the physiology, injury patterns, and treatment of injuries and illnesses unique to the underwater environment. Failure to properly recognize, diagnose, and appropriately treat some diving injuries can have catastrophic results. In addition, recreational dive certification organizations require physical examinations for medical clearance to dive. This article will review both common and potentially life-threatening conditions associated with diving and will review current evidence behind fitness to dive considerations for elderly divers and those with common medical conditions.

Nicolas G, Bideau B. A kinematic and dynamic comparison of surface and underwater displacement in high level monofin swimming. Hum Mov Sci. 2009 Apr 21. [Epub ahead of print]

Fin swimming performance can be divided into underwater and surface water races. World records are about 10% faster for underwater swimming vs. surface swimming, but little is known about the advantage of underwater swimming for monofin swimming. Some authors reported that the air-water interface influences the kinematics and leads to a narrow vertical amplitude of the fin. On the one hand, surface swimming is expected to affect drag parameters (cross-sectional area (S) and active drag (AD)) when compared to underwater swimming. On the other hand, the surface swimming technique may also affect efficiency (η^F). The aim of this study is therefore to evaluate and compare drag parameters and efficiency during underwater and surface swimming. To this end, 12 international level monofin swimmers were measured during both underwater and surface swimming. Kinematic parameters (both dimensional and non-dimensional), η^F (calculated according to the Elongated-Body Theory), and AD (computed with Velocity Perturbation Method) were calculated for an underwater and a surface fin swimming trial, performed at maximal speed. As expected, results showed significantly lower velocities during surface swimming vs. underwater $V(1, \text{under}) = 2.5 \text{ m}\cdot\text{s}^{-1}$ vs.

$V(1, \text{surf}) = 2.36 \text{ m}\cdot\text{s}^{-1}$, $p < 0.01$). Velocities during underwater and surface swimming were strongly correlated ($r = 0.97$, $p < 0.01$). Underwater swimming was also associated with higher vertical amplitudes of the fin compared to surface swimming ($V(\text{under}) = 0.55 \text{ m}$ vs. $V(\text{surf}) = 0.46 \text{ m}$, $p < 0.01$). Length-specific amplitudes ($A(\text{under})/L(b)$) were in the order of 20% during underwater swimming as for undulating fish, and significantly higher than during surface swimming ($A(\text{surf})/L(b) = 17\%$, $p < 0.01$). Efficiency for surface swimming was about 6% lower than for underwater swimming ($\eta^F_{\text{under}} = 0.79$ vs. $\eta^F_{\text{surf}} = 0.74$, $p < 0.01$). This decrease could be associated with an increase in swimming frequency for surface swimming ($f(\text{surf}) = 2.15 \text{ Hz}$ vs. $f(\text{under}) = 2.08 \text{ Hz}$, $p < 0.01$). Active drag during surface swimming was about 7% higher than for underwater swimming ($AD(\text{under}) = 78.9 \text{ N}$ vs. $AD(\text{surf}) = 84.7 \text{ N}$, $p < 0.01$). A significantly smaller cross-sectional area for surface swimming ($S(\text{under}) = 0.053 \text{ m}^2$ vs. $S(\text{surf}) = 0.044 \text{ m}^2$, $p < 0.01$) and higher drag coefficient for surface swimming ($C(d, \text{under}) = 0.47$ vs. $C(d, \text{surf}) = 0.69$, $p < 0.01$) were measured. Finally, correlation between cross-sectional area and vertical amplitude of the fin was reported for both underwater and surface swimming. These results suggest that the performance improvement during underwater swimming is not only linked to a wave drag reduction effect but also to a specific swimming technique due to the free surface.

Weaver LK, Churchill SK, Hegewald MJ, Jensen RL, Crapo RO. Prevalence of airway obstruction in recreational scuba divers. Wilderness Environ Med. 2009; 20(2): 125-8.

OBJECTIVE: The prevalence of airflow obstruction in recreational self-contained underwater breathing apparatus (scuba) divers is unknown. Since airflow obstruction is a relative contraindication for diving, we conducted a study to determine its prevalence and magnitude in a cohort of recreational divers in Saba, Netherlands Antilles. **METHODS:** Prior to diving, divers were asked to complete a diving/health questionnaire and then to perform spirometry administered by trained dive store personnel. Spirometry instrumentation provided immediate feedback regarding test quality. **RESULTS:** Of 8365 eligible divers during the study period (November 1997-March 1999), 668 enrolled and completed questionnaires. Of those completing questionnaires, 46% reported a history of smoking, 13% were current smokers, 15% wheezed, 6% had asthma, 4% used bronchodilators, and 3% took oral steroids. Of 654 completing spirometry, 231 had acceptable spirometry quality and complete questionnaires. By forced expiratory volume in 1 second/forced vital capacity, 10% had mild, 1.7% had moderate, and 0.4% had severe airflow obstruction. **CONCLUSIONS:** The prevalence of airflow obstruction was 6% to 15% by report and 12% by spirometry, approximating the combined prevalence of asthma and chronic obstructive pulmonary disease in the

general population. Study limitations include possible self-selection and low enrollment rate. Prospective lung function testing can be conducted at remote sites using nonmedical personnel as "testers." This study could guide future investigations to determine if asthma is a risk factor for decompression illness.

Luna B, Valle Pérez C, Sánchez-Lizaso J. Benthic impacts of recreational divers in a Mediterranean Marine Protected Area. ICES J Mar Sci. 2009. 66: 517–23.

The features of many Marine Protected Areas (MPAs) have increased scuba diving tourism in these areas. Impacts caused by recreational scuba activity vary widely among different divers with differing underwater behaviour. We studied diver underwater behaviour, the effects on the natural environment, and the characteristics that may influence diver behaviour. In all, 181 recreational divers were followed, and contacts and the effects produced were recorded. Information on diver profile and dive features was recorded. Field sampling revealed that 175 of the divers observed (96.7%) made at least one contact with the seabed, with a mean contact of 41.20 ± 3.55 (mean \pm SE) per diver per 10 min. Flapping was the most frequent type of contact, and the main damage by this action was to raise sediment. Contact with the seabed was greater for males than for females, inexperienced divers than for experienced divers, camera or lantern (dive light) users than for non-users, and divers unaccompanied by a dive leader or who had not been briefed about avoiding seabed contact before undertaking a dive than for accompanied or briefed divers. A greater understanding of the causes of harmful behaviour may be useful for stricter management, reducing diving damage and assuring the sustainability of this activity in MPAs.

Yap HT. Local changes in community diversity after coral transplantation. MEPS. 2009; 374: 33-41.

Over several decades, coral transplantation has been developed as a tool to rehabilitate damaged coral reef habitats. This investigation aimed to determine whether this form of intervention would result in a significant improvement in diversity and abundance of associated reef species. The experiment consisted of four treatments: undisturbed sites (which also served as sources of the transplants), degraded plots to which corals were transplanted, empty plots that received no transplants, and control plots that were empty and situated at least 100 m away from the transplant and empty plots. The latter three treatments were replicated at four different sites. The establishment or movement of fish and invertebrates, as well as the abundance of algae, were recorded on a quarterly basis. Both non-metric multidimensional scaling and repeated measures ANOVA detected significant differences among treatments, with transplant plots having higher numbers and abundances of taxa than the empty plots and the empty controls. The two latter treatments did not differ significantly from each other. The source sites had higher

abundances of coral recruits (Poritidae) than all the other treatments and of sea urchins (Diadematidae) than the empty plots and empty controls. The transplant plots harbored greater numbers of damselfish (Pomacentridae) and sea urchins than the empty plots and empty controls. Thus, coral transplantation resulted in higher diversity and greater abundance of fish and invertebrates and has the potential to help re-establish degraded reef communities.

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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