



E-SLATE

American Academy of Underwater Sciences (AAUS)

EDITORIAL BOARD NOTE – April 2010

Welcome to the April E-Slate. We are now looking back on the March scientific symposium. One point of discussion was the need for additional content for the E-Slate. It is a newsletter from and for the scientific dive community. Please contribute news, business, new publications, images with captions of underwater work and other items of interest to the community. We encourage diving officers to forward each issue to their divers and administration. The impact will be greatest if items from or of direct relevance to your institution are included. Please mark your calendar to submit items by the 20th of every month. Send items to aaus@disl.org. Current and past issues of the E-Slate are available at www.aaus.org.

NEWS/ANNOUNCEMENTS

UAB in Antarctica Web Outreach Project

The University of Alabama at Birmingham in Antarctica website is active again this year from mid-February through May (<http://antarctica.uab.edu>). A team of five UAB benthic ecologists are posting thrice-weekly blogs about their research on the chemical ecology of benthic, macroalgal and invertebrate communities of the western Antarctic Peninsula, the diving techniques they use for their work and their daily activities at Palmer Station, Antarctica. New this year is an accompanying YouTube channel (<http://www.youtube.com/sublittoral>) where they are regularly adding videos.

Oceanographic Equipment for Bid

The Los Angeles County Sanitation Districts are preparing to sell a variety of used oceanographic equipment. Purchases of the equipment shall be 'as is, where is' with no warranty expressed or implied. Buyer is to assume all reasonable shipping and handling charges. Bidding closes April 30, 2010 at 1100. The following equipment is available (quantities in parenthesis):

- Sontek 500 kHz, 4 head ADP with battery canister (12)
- Benthos 867A shallow water acoustic release (17)
- Evans-Hamilton, trawl resistant bottom mounts (7)
- Aquatec 510 series thermistors (62)

Contact Alex Steele (astele@lacsdsd.org; 562-908-4288, # 2812) or Fred Stern (fstern@lacsdsd.org; 310-830-2400, # 5604) or visit:

http://www.lacsdsd.org/info/bid_information/bidrequest.asp?bidID=327

Review - 2010 AAUS Symposium

The 2010 AAUS meeting was hosted by the University of Hawaii in association with NOAA Papahānaumokuākea Marine National Monument and The Nature Conservancy of Hawaii. The meeting drew 124 registered participants representing 76 institutions and seven nations. The staff and volunteers of the host institutions did a superb job in organizing venues for DSO workshops, diving experiences and social events. Special thanks to our event sponsors: **Aqualung Pacific, Dive Oahu, Ocean Enterprises and University of Hawaii Sea Grant.**

AAUS meetings serve a multitude of disciplines supported by scientific diving or addressing the science of diving. Cross-training and networking opportunities are created for professionals with a range of specialties. The 38 symposium presentations covered ecology, risk management, archaeology, diving medicine, diving techniques conservation, diver protection and program development. Papers from each presentation will be included in the proceedings available later this year.

Eight presentations were provided by graduate students:

- Jonathan Dale (Hawaii Institute of Marine Biology, University of Hawaii at Manoa [HIMB, UH])
- Daniel Wagner (HIMB, UH)
- Kevin Turner (Friday Harbor Labs, University of Washington)
- Kasie Groom (HIMB, UH)
- Kelly Boyle (HIMB, UH)
- Tonatiuh Trejo-Cantwell (HIMB, UH)
- Matthew Iacchei (HIMB, UH)
- Derek Skillings (HIMB, UH)

Student presentation competition winners: **Kasie Groom** (first place; \$250); **Kelly Boyle** (honorable mention; \$100).

The general meeting was closed with an awards banquet held at the Waikiki Aquarium. Dr. Richard Pyle of the Bishop Museum provided fascinating insights into advanced diving activities. The following awards were announced:

- Service Recognition - **Jeff Godfrey** (Past-President), **Brenda Konar** (BOD member), **Nathan Schwarck** (BOD member), **Derek Smith** (dive log database development), **Alma Wagner** (AAUS office manager), **Alex Zonin** (dive log database development).
- Sci. Diving Lifetime Achievement - **William M. Hamner**
- Conrad Limbaugh Memorial - **Douglas E. Kesling**

The AAUS board of directors meeting was held on March 28th. Ten members participated (regrets: Jenn Caselle).

Winner of Kathy Johnston Painting

Congratulations, Becky Gladych. Becky Gladych, from University of Connecticut, won the Kathy Johnston painting that was raffled off at this year's symposium. Thank you, Becky, and everyone else who supported the AAUS scholarship fund by purchasing raffle tickets.

AAUS Seeks Candidates for BOD

AAUS is seeking candidates for a three year term on the Board of Directors (BOD). For information or nomination contact Jeff Godfrey at jeff.godfrey@uconn.edu.

FUNDING/SCHOLARSHIPS

AAUS 2010 Student Scholarships

AAUS will award two \$2,500 scholarships in 2010 to graduate students conducting research who are using scientific diving as their principal research tool or studying diving science. Contingent on funding and quality of proposals, two additional \$1,500 scholarships may be awarded. The application deadline is June 30. Recipients will be announced Oct. 1. For more information, contact the Scholarship Committee Chair at aaus@disl.org or visit: <http://www.aaus.org/mc/page.do?sitePageId=64326&orgId=aaus>.

EQUIPMENT RECALLS

Recall of Mares Nemo Air Computers

Mares is recalling all Nemo Air Computers. Mares issued a recall last summer for the slow-leaking O-rings on the Nemo Air computer's Quick Connector hose, but the replacement O-ring issued did not solve the problem. On February 1, Mares announced another recall for the entire hose. Mares designed a new quick disconnect system to replace the faulty hose. All Nemo Air dive computers need this replacement. Contact a Mares dealer to get the hose replacement, free of charge. If you want Mares to do the replacement, call Customer Service at 800-874-3326 with your computer's serial number.

TUSA Regulator Recall

TUSA has announced a recall of RS-670 regulators sold between May and September 2009 because loosening of the BLC plug on the first stage may cause a high-pressure leak. Affected units have first stage serial numbers between 22 and 29, 31 and 103, 637 and 676, 708 and 716, and 737 and 776. Take your regulator back to the dealer or contact TUSA at info@tusa.com or 800-482-2282 for repair under warranty.

UPCOMING EVENTS

DAN Diving Fatalities Workshop

Divers Alert Network will host a 2.5 day workshop, April 8-10, in Durham, NC focusing on strategies to reduce compressed gas diving fatalities. Presentations and panel discussions will be led by or include an array of experts and industry stake-holders in this globally-focused workshop. The goal is to develop consensus for effective strategies. Those who would benefit from participating include persons having responsibilities for training divers, supervising diving operations, conducting medical examinations of divers and diver candidates, and/or investigation of diving accidents. Registration is \$395 per person (\$435 for physicians who can earn 20 hours of continuing medical education credit). For more information, contact Jeanette Moore (jmoore@dan.org; 919-684-2948) or visit: <https://www.diversalertnetwork.org/Events/Event.aspx?EventID=758>.

JOB OPPORTUNITIES

DSO – Oregon State University

Oregon State University (OSU) Office of the Vice President for Research is seeking an experienced Professional Faculty position as Diving Safety Officer (DSO). This is a part-time, 12 month fixed term position (approximately 20 hours per week). Salary is commensurate with education and experience. The DSO is responsible for, but not limited to, the oversight and conduct of OSU academic and research diving operations and will provide diving instruction to faculty, staff, and graduate students. For complete announcement visit: <http://oregonstate.edu/jobs>, posting 0005374. Competition closes April 9, 2010.

Director - Diving & Underwater Technology FKCC

Florida Keys Community College (FKCC) seeks a director for the School of Diving and Underwater Technology. The Director is responsible for the development, supervision, leadership and management of the academic programs and certificates offered through the James E. Lockwood, Jr. School of Diving and Underwater Technology. Work is performed under the general supervision of the Dean, Marine Science and Technology. For complete announcement visit:

<http://www.fkcc.edu/faculty-admin/hr-employment-key-west.da>.

The closing date for this position is April 9, 2010.

DSO – WHOI

Woods Hole Oceanographic Institute (WHOI) is seeking a Diving Safety Officer. The DSO is responsible for initiating and supervising the diving program and training divers. Major duties include: operational authority for the diving program, implementing policy as established by the Diving Control Board, reviewing the latest diving technology and

procedures, and recommending budgets for the Diving Program and compiling an annual report of diving activities for the DCB. Applicants should have a degree in Marine Science or a related field and must possess a current Instructor's Certificate issued by a nationally recognized agency, have at least four years of varied diving experience plus 100 hours underwater using scuba and surface-supplied equipment. Applicants must exhibit a thorough knowledge of diving theory, safety practices, operational procedures and diver training. Some sea duty may be required. For more information visit:

http://www.who.edu/services/HR/jobdescp/administrative/dive_off.htm.

Diving Technician Position

The Academic Diving Program of the Florida State University Coastal and Marine Laboratory invites applications for the position of Diving Technician. The DT will provide operational support for all diving-related academic and training courses, and will be responsible for the maintenance and repair of diving equipment. Visit: <http://www.marinelab.fsu.edu/news/openings.aspx#diving> or contact Alison Ma, Marine Technical Operations Coordinator and DSO (ama@fsu.edu; 850-697-2078).

NEW PUBLICATIONS

Aronson RB, Macintyre IG, Moesinger AM, Precht WF, Dardeau MR. History of reef-coral assemblages on the Rhomboid shoals of Belize. *Smithson Contrib Mar Sci.* 2009; 38: 313-22.

Coral assemblages of the rhomboid shoals of the Belizean barrier reef have undergone dramatic, historically unprecedented changes over the last several decades. Prior to the late 1980s, the flanks of the shoals exhibited distinct biological zonation, with branching *Porites* spp. dominant in a shallow zone (0-3 m water depth); the staghorn coral *Acropora cervicornis* dominant in an intermediate zone (3-15 m depth); and large, plating agariciids and the lettuce coral *Agaricia tenuifolia* dominant in a deep zone (15-30 m depth). *Acropora cervicornis* died off catastrophically from white-band disease after 1986 and was replaced by *Agaricia tenuifolia* in the intermediate zone. Push-cores extracted from intermediate depths in previous studies showed that *Acropora cervicornis*, was the dominant space occupant and primary framework builder for millennia prior to the phase shift to *Agaricia tenuifolia*. Cores extracted from the shallow zone in previous studies showed that *Acropora cervicornis* dominated until several centuries ago, when the tops of the reefs reached ~2 m water depth and branching *Porites* spp. replaced it. In contrast, cores extracted from deep water (14.5-16.2 m) in the present study showed that for millennia the subsurface coral assemblage, like the assemblage on the reef surface, was dominated by large, plating agariciids and *Agaricia*

tenuifolia. Because WBD only affects acroporid corals, the recent disease outbreak and the unprecedented phase shift that followed were confined to the intermediate zone. High sea temperatures in the summer of 1998 caused coral bleaching and mortality, especially of agariciids in the intermediate and deep zones, but to date this event has not left a geological signature in the Holocene record of the rhomboid shoals.

Goffredo S, Pensa F, Neri P, Orlandi A, Scola Gagliardi M, Velardi A, Piccinetti C, Zaccanti F. Unite research with what citizens do for fun: 'Recreational monitoring' of marine biodiversity. *Ecolog Applic.* 2010;10:1890-09.

Institutes often lack funds and manpower to perform large scale biodiversity monitoring. Citizens can be involved, contributing to the collection of data, thus decreasing costs. Underwater research requires specialist skills and scuba certification and it can be difficult to involve volunteers. The aim of this study was to involve large numbers of recreational divers in marine biodiversity monitoring for increasing the environmental education of the public, and collecting data on the status of marine biodiversity. Here we show that thousands of recreational divers can be enrolled in a short time. Using specially formulated questionnaires, non-specialist volunteers reported the presence of 61 marine taxa encountered during recreational dives, performed as regular sport dives. Validation trials were carried out to assess the accuracy and consistency of volunteer-recorded data, and these were compared to reference data collected by an experienced researcher. In the majority of trials (76%) volunteers performed with an accuracy and consistency of 50-80%, which are comparable to the performance of conservation volunteer divers on precise transects in other projects. The recruitment of recreational divers involved the main diving and tour operators in Italy, a popular scientific magazine, and mass media. During the four-year study, 3825 divers completed 18,757 questionnaires, corresponding to 13,539 diving hours. The volunteer sightings-based index showed that in the monitored area the biodiversity status did not change significantly within the project time scale, but there was a significant negative correlation with latitude, suggesting improved quality in the southernmost areas. This trend could be related to the presence of stressors in the northern areas, and has been supported by investigations performed by the Italian Ministry of the Environment. The greatest limitation with using volunteers to collect data was the uneven spatial distribution of samples. The benefits were the considerable amounts of data collected over short time periods and at low costs. The successful development of citizen-based monitoring programs requires open-mindedness in the academic community; advantages of citizen involvement in research are not only adding large datasets to the ecological knowledge base but also in the environmental education of the public.

Littler MM, Littler DS, Brooks BL. Assessment of coral reefs using assays for herbivory and nutrients and indicator groups of benthic primary producers: a review. *Smithson Contrib Mar Sci.* 2009; 38: 401-14.

Threshold levels (= tipping points where the probability of community phase-shifts is increased) for critical bottom-up interactions of productivity (*e.g.*, nutrients) and those for top-down disturbances (*e.g.*, herbivory) must be known in order to manage the competitive interactions determining the health of coral dominated matrices. In highly diverse and productive reef ecosystems, much of the overall diversity at the benthic primary producer level is afforded by the interaction of opposing nutrient limiting/enhancing and herbivory controls with the local physical/spatial variability, such that a mosaic of environmental conditions typically occur in close proximity. Although the Relative Dominance Model (RDM) appears straightforwardly simple, because of the nature of direct/indirect and stimulating/limiting interacting factors it is extremely complex. For example, insufficient nutrients may act directly to limit fleshy-algal domination (via physiological stress); conversely, abundant nutrients enhance fleshy-algal growth, with the opposite effect on reef-building corals (via toxic inhibition or increased diseases). Furthermore, the effects of controls can be indirect by influencing competition. Even this seemingly indirect control can have further levels of complexity because competition between algae and corals can be direct (*e.g.*, overgrowth) or indirect (*e.g.*, pre-emption of substrate). High herbivory (via physical removal) also acts indirectly on fleshy algae through reduced competitive abilities; whereas, lowered herbivory and elevated nutrients also indirectly inhibit/control corals and coralline algae by fleshy-algal competition. Other ecologically important bottom-up factors, such as reduced light, abrasion, allelopathy, disease vectoring, and sediment smothering, also can be indirect side effects of fleshy algal competition. These tend to selectively eliminate the longer-lived organisms in favor of fast-growing species, thereby reducing desirable complexity and biodiversity. The most conspicuous indicators of coral-reef health, degradation, and mortality, from a management perspective, are functional groups of dominant benthic primary producers (*i.e.*, corals, coralline algae, dense algal turfs, frondose macroalgae) and their herbivore associates.

Ljubkovic M, Gaustad SE, Marinovic J, Obad A, Ivancev V, Bilopavlovic N, Breskovic T, Wisloff U, Brubakk A, Dujic Z. Ultrasonic evidence of acute interstitial lung edema after scuba diving is resolved within 2-3h. *Respir Physiol Neurobiol.* 2010 Feb 24. [Epub ahead of print]

Recently, an increase in extravascular lung water (EVLW) accumulation with diminished left ventricular contractility within 60 min after scuba diving was reported. We have

observed previously that diving was associated with reduced diffusing lung capacity for carbon monoxide (DLCO) and arterial oxygen pressure for up to 60-80 min postdive. Here we investigated whether increased EVLW persists 2-3 h after successive deep dives in a group of seven male divers. The echocardiographic indices of pulmonary water accumulation (ultrasound lung comets (ULC)) and left ventricular function, respiratory functional measurements and arterial oxygen saturation (S_aO_2) were assessed 2-3 h post-diving, while venous gas bubbles (VGB) and the blood levels of NT-proBNP and proANP were analyzed 40 min after surfacing. Spirometry values, flow-volume, DLCO, S_aO_2 and ULC were unchanged after each dive, except for significant increase in ULC after the second dive. Left ventricular function was reduced, while NT-proBNP and proANP levels were significantly elevated after majority of dives, suggesting a cardiac strain.

Pacheco AS, Laudien J, Thiel M, Heilmayer O, Oliva M. Hard-bottom succession of subtidal epibenthic communities colonizing hidden and exposed surfaces off northern Chile. *Scientia Marina* 2010;74:147-54.

The biodiversity of hard-bottom substrata comprises species growing on exposed rock and in hidden microhabitats, such as cracks and crevices. This study examines the succession of epibenthic organisms colonizing an artificial substratum with one surface exposed and one surface hidden on a vertical wall off northern Chile. On each sampling date species coverage of three replicate panels on both surfaces was assessed. The hidden surface was dominated in terms of coverage by the bryozoans *Membranipora isabelleana* and *Lagenicella variabilis*, while algae were absent. In contrast, the exposed surface was dominated by encrusting red corallines and the red alga *Rhodymenia corallina*. At the end of the experimental period both surfaces were dominated by colonial suspension feeders, but showed a different community structure and successional pattern. On the exposed surface, competitive exclusion was identified as an important aspect of succession, whereas on the hidden surface this pattern was not observed. These findings have implications for overall biodiversity, because pioneer species that are not able to survive long periods on exposed surfaces become restricted to hidden surfaces, from where they spread laterally. Thus, hidden microhabitats provide refuges for certain species, and may play an important role in the overall succession on rock faces. We conclude that examination of hidden microhabitats is necessary in order to fully understand succession in hard-bottom habitats.

Trevett A, Peck D, Forbes R. The psychological impact of accidents on recreational divers: a prospective study. J Psychosom Res. 2010;68(3):263-8.

OBJECTIVE: The present study aimed to examine the medium and long term psychological impact of diving accidents on the victims (n=52), compared with the impact on two control groups: the victim's diving "buddy" (n=40) who simply witnessed the accident, and a second control from the same boat who did not dive with the victim (n=38). **METHODS:** This was a prospective cohort study of the impact of an accident on the victims who attended the Hyperbaric Unit, in comparison with the two control groups. Pre-accident psychological morbidity was assessed using the General Health Questionnaire. Trauma symptoms were assessed using the Revised Impact of Events Scale at 3, 6 and 12 months post accident. **RESULTS:** The accident victims endorsed more trauma symptoms and experienced them more intensely and for longer, compared with the two control groups. **CONCLUSION:** A significant minority of diving accident victims (between 25% and 50%) continued to suffer from the psychological impact of the accident, some for over a year. This has important implications for their future health care, for their safety on subsequent dives, and for dive training.

Tuya F, Wernberg T Thomsen MS. Colonization of gastropods on subtidal reefs depends on density in adjacent habitats, not on disturbance regime. J Molluscan Studies 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 m²) and intensity (50% vs 100%), and retrieved after three 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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