



E-SLATE

American Academy of Underwater Sciences (AAUS)

EDITORIAL BOARD NOTE – March 2011

Welcome to the March issue of the E-Slate. This month AAUS congratulates Dr. Michael Foster, the recipient of the 2010 Conrad Limbaugh Memorial Award and requests nominations for the 2011 Award. AAUS statistics are due June 30. Do not wait until the last minute to submit your statistics. Please continue to submit news, announcements, job postings, and images of underwater work to aaus@disl.org. Current and past issues of the E-Slate are available at www.aaus.org.

NEWS/ANNOUNCEMENTS

Call for Abstracts – AAUS 2011

Abstracts (150-250 words) for the upcoming AAUS symposium can be submitted until June 01. As discussed in the February 2011 *E-Slate*, the minimum manuscript obligation has changed from full papers to extended abstracts (800-1200 words). Note: longer manuscripts can be submitted if authors prefer. The deadline for final extended abstract or manuscript is August 01. The published proceedings will be available at the fall meeting. Complete details will be on the AAUS website (<http://www.aaus.org>) by March 15.

Maine Sea Grant Funding Support for AAUS 2011

Maine Sea Grant announced February 14 that AAUS will be awarded \$2000 to support our October 2011 research symposium. The majority of the funds will be dedicated to provide conference travel support for our 2011 student research award recipients. The grant program was competitive, with 10 submissions totaling approximately \$44,000 vying for \$19,500 in funds. Thanks to Chris Rigaud, AAUS appointed director/membership chair and diving safety officer at the University of Maine, for taking the lead on the application. For further information on Maine Sea Grant, visit <http://www.seagrant.umaine.edu>.

AAUS Conrad Limbaugh Memorial Award

The AAUS Conrad Limbaugh Memorial Award is presented annually to an individual who has made a significant contribution in diving safety and diving leadership on behalf of the scientific diving community.

Conrad Limbaugh was an underwater naturalist and Chief Diving Officer for of Scripps Institution of Oceanography, where he directed the diving program. He was killed in a

scuba diving accident in the Mediterranean on March 20, 1960. Limbaugh graduated from Whittier College in 1948 and did graduate work at the University of California at Los Angeles before going to Scripps Institution in 1950. He was largely responsible for developing the diver-training program at Scripps, as well as many research techniques used by marine scientists.

The 2010 AAUS Recipient of the Conrad Limbaugh Memorial Award for Scientific Diving Leadership is Michael S. Foster.

Michael S. Foster, Professor Emeritus, Moss Landing Marine Laboratories Mike Foster received his BS and MA from Stanford University, and his PhD from the University of California at Santa Barbara. His specific research interests are the population and community ecology of marine macroalgae. He was a professor of Marine Science at Moss Landing Marine Laboratories and San Jose State University from 1976-2002. His achievements include:

- Major advisor for 63 MS students at MLML, many of whom have gone on to fine careers in science, often including underwater research. Some of these carry on training future underwater scientists. Others have made a difference via good work in government agencies. Contributed to our understanding of kelp forests and rhodolith beds, with 80 papers plus a book and various chapters in books mostly on these topics. In particular, the "Ecology of Giant Kelp Forests in California" book has been widely cited and used. He is the lead author on the "Kelp Forests" and "Rhodolith Beds" chapters, and a contributor to a "Kelp Beds as Classrooms" chapter for the Smithsonian publication related to the Research and Discoveries: The Revolution of Science through scuba symposium.
- Contributed to the science of solving various environmental problems, including the effects of oil spills and thermal discharges. Recent work with the California Energy Commission and State Water Resources Control Board led to new and more environmentally sound state policy regulating power plants using once through, ocean water cooling systems in California.
- Designing and teaching the Subtidal Ecology class (including the Baja California version) beginning in 1977, introducing many (probably ~150) students to underwater habitats and doing underwater research.
- Developed some useful underwater research techniques, notably Random Point Contact for sampling seaweeds

(see the "Subtidal Techniques" chapter in the 1985 PSA Field Methods book for further samples).

Mike Foster is also a Fellow of the California Academy of Sciences, a Fulbright Scholar, became a NAUI certified scuba diver in 1964, a NAUI Instructor (Honolulu 1968; #0848), was the MLML Dive Officer from 1977 until 1982, and has received the Scientific Achievement Awards from the Monterey Bay National Marine Sanctuary and the International Temperate Reefs Symposium.

Obituary - Richard A. Cooper

North Stonington, CT - Richard A. Cooper, PhD, 74, beloved husband for 50 years of Patricia (Davis) Cooper, passed away suddenly at his home on Friday, January 28, 2011. Born in Ann Arbor, MI., he was a son of the late Gerald P. and Alma (Hosner) Cooper. Richard 'Dick' was an oceanographer and Professor Emeritus at the University of Connecticut. Early in his career Dick was a biologist at the National Marine Fisheries Service in Woods Hole, MA where he led the Manned Undersea Science & Technology group. During this time he was involved with many of our nation's first experiments in saturation diving and undersea habitation. In 1982, he received the prestigious NOGI Award for Diver of the Year in Science. Dick was also a former director of the National Undersea Research Center at the University of Connecticut where he implemented research programs using underwater vehicles across New England, the Great Lakes, and in places around the world. He founded the High School Aquanaut Program that created once-in-a-lifetime opportunities for hundreds of high school students and teachers in ocean sciences. Starting in the mid-1990s, Dick became director of the Marine Sciences & Technology Center at UConn where for 10 years he was instrumental in, among other things, the construction of two new state-of-the-art research and education buildings in addition to the university's flagship research vessel, the R/V *Connecticut*. He was also the founder and driving force behind Ocean Technology Foundation and the SeaBase1 Corporation. Most recently, Dick was nominated for Diver of the Year award from Beneath the Sea. On his behalf, the Cooper family is expected to accept the award during a ceremony in March. In addition to his wife, he is survived by two sons: Christopher G. Cooper (and his wife, Rozaliya) of East Lyme, and Jeffrey G. Cooper (and his wife, Tammy) of Brighton, MI; two daughters: Wendelyn D. Cooper of Groton, CT, and Catherine W. Cooper (and her husband, Michael Poulin) of North Stonington; two brothers, William



E. Cooper of Mason, MI and David K. Cooper of Washington, MI.; and three grandchildren, Jae HP, Abigail Rose, and Martin Richard.

DHM Approved for Medline Indexing

Diving and Hyperbaric Medicine (DHM), the academic journal of South Pacific Underwater Medicine Society (SPUMS; <http://www.spums.org.au>), was just approved for MedLine indexing, effective immediately. This is a laudable achievement, dramatically increasing the accessibility and, subsequently, the scientific value of the publication. Editorial board members include:

Mike Bennett, Australia
Alf Brubakk, Norway
Peter Germonpre, Belgium
Jacek Kot, Poland
Simon Mitchell, New Zealand
Neal Pollock, USA
David Smart, Australia

AAUS BOD Call for Nominations

AAUS is seeking individuals willing to run for the position of Director-at-Large for the 2012 Board of Directors. The Director-at-Large position is for a three year term starting January 01, 2012. Specific committee duties will be assigned by the president. To qualify, individuals must be voting members in good standing with the Academy for at least two consecutive years prior to nomination. The list of nominees along with candidate bios will be presented to the BOD on March 31, 2011. Candidates will be asked to submit responses to several questions to be provided to the AAUS membership as part of the election process. Balloting is open May 01 through June 30. Please submit nominations to one of the Nominating Committee members:

Jeff Godfrey (jeff.godfrey@uconn.edu)
William Dent (wdent@research.usf.edu)
Vallorie Hodges (val.hodges@aquarium.org)

Call for Nominations - Conrad Limbaugh Award

The Conrad Limbaugh Memorial Award is presented annually to an individual who has made a significant contribution in diving safety and diving leadership on behalf of the scientific diving community. Conrad Limbaugh was an underwater naturalist and Chief Diving Officer of Scripps Institution of Oceanography, where he directed the diving program. He was killed in a scuba diving accident in the Mediterranean on March 20, 1960. Limbaugh graduated from Whittier College in 1948 and did graduate work at the University of California at Los Angeles before going to Scripps Institution in 1950. He was largely responsible for developing the diver-training program at Scripps, as well as many research techniques used by marine scientists. Please send all nominations with a justifying paragraph by the nominating member, along with the nominee's biosketch and contact information, to the AAUS Awards Committee, c/o John Heine, via e mail to: jheine@ucsd.edu.

EQUIPMENT RECALLS

OTS Guardian Full Face Mask Recall

Ocean Technology Systems (OTS) has issued an urgent safety notice for the Guardian Full Face Mask (GFFM). Under certain conditions and/or usage, the GFFM exhaust assembly may come loose. If this assembly separates from the housing, you will not be able to breathe from the second stage regulator. This is a result of a defective part with bad threads. It is extremely important that you conduct a simple test to ensure your second stage regulator is securely fastened. If you find any problem whatsoever with the second stage, do not dive with the mask. See <http://www.oceantechnologysystems.com/GFFM-NOTICE-E.html> for instruction on how to test the exhaust system. Contact 877-270-1984 or recall@otscomm.com for details. Note: OTS operating hours Monday-Friday 0730-1600 (PST).

UPCOMING EVENTS

ICHM 2011 - Cape Town, South Africa

The International Congress of Hyperbaric Medicine will be held March 16-19 in Cape Town, South Africa. Details are available at: www.acitravel.co.za/ichm2011.

DAN Diving and Hyperbaric Medicine Course

The 69th DAN Diving and Hyperbaric Medicine Course will be held April 09-16 at the Little Cayman Beach Resort. 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 800-496-446-2671, ext. 555 or cme@dan.org. Visit: <http://www.diversalertnetwork.org/Events/Event.aspx?EventID=829>.

SPUMS Annual Scientific Meeting 2011

The 40th annual scientific meeting of the South Pacific Underwater Medicine Society (SPUMS) will be held May 22-27 at the Hilton Resort and Spa, Tumon Bay, Guam. Meeting themes include: medical aspects of military, occupational and recreational technical diving; head injury and diving workshop – review of clinical cases and guidelines; and management of acute diving injuries. Keynote speakers include: David Doolette, PhD, US Navy Experimental Diving Unit, Panama City, FL, USA; Simon Mitchell, MD/PhD, University of Auckland, New Zealand; and Andrew Fock, MD, Alfred Hospital, Melbourne, Australia. The deadline for abstracts is March 31. Contact: SPUMS ASM 2011 Convenor Dr Sarah Lockley (spumssecretary@gmail.com or secretary@spums.org.au). Register via the SPUMS website (www.spums.org.au).

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 topics of the conference 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. Abstract submission deadline is May 01. Several satellite meetings will also be conducted: ECHM workshop 'HBO in Emergency Medicine,' EBAss meeting, EDTCmed meeting and DAN Divers Day. Visit: www.EUBS2011.org.

Science 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.

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 (DMC) will serve as host for preconference workshops as well as the annual Diving Safety Officers Meeting and AAUS Business Meeting. Workshops to be offered are:

- PSI – VCI certification course
- 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

There will be boat and shore diving opportunities as well as our annual Bubble Breaker sponsored by Ocean Enterprises. October is a beautiful time of year in Maine but also a busy tourist season. Plan to make travel and lodging arrangements early to avoid missing out on a great meeting. Look for additional information and registration materials in an email invitation that will go out to all members, on our website www.aaus.org or register directly at <http://guest.event.com/d/ydggkt/4W>. Contact Chris Rigaud at crigaud@maine.edu or the AAUS office at aaus@disl.org for more information.

JOB OPPORTUNITIES

Dive Tech. - University of Alaska

Researchers at the University of Alaska Fairbanks are seeking an AAUS certified diver to assist with a field experiment in Juneau, AK. The job will involve assisting a PhD student in Dr. Ginny Eckert's lab who is conducting predation experiments using juvenile red king crabs. The field experiment is part of a king crab stock enhancement feasibility study.

<https://www.uakjobs.com/applicants/jsp/shared/frameset/frameset.jsp?time=1298299888679>.

Assistant DSO Adventure Aquarium

The position requires a dedicated individual who will take direction from the Dive Safety Officer (DSO), Curator of Fish and Invertebrates and the Husbandry Director in carrying out the duties of the position. The Assistant DSO assists the DSO with the planning, development and administration of all scuba diving and snorkel/dive adventure programs which include all water related activities requiring water entry, both in-house and open water. The position also functions in assisting husbandry department activities as required. Dive Safety, communications, animal health, equipment repair, record keeping and visitor experience are the driving priorities in accomplishing the goals of this position. For more information visit:

<http://www.adventureaquarium.com/>

Georgia Aquarium Assistant DSO

The Assistant Dive Safety Officer (DSO)/Volunteer Coordinator will work with a diverse team of divers in the implementation of dive safety procedures and guidelines to ensure the safety of all employees at the facility and offshore. The Assistant DSO will possess a broad knowledge base in all aspects of diving and diving technology. S/he should also possess a broad technical and scientific expertise in research and research related diving. In short, the Assistant DSO's level of knowledge and diving skills should span the reach of the Georgia Aquarium's dive program, with particular attention to the volunteer diving program. Contact Jeff Reid, DSO/Manager, Georgia Aquarium at 404-581-4310 or jreid@georgiaaquarium.org for a full job description and application.

Research Support – HIMB

The Hawaii Institute of Marine Biology, Coconut Island, Kaneohe is looking for a professional to join the research and support staff. The staff member will implement and direct a program to serve HIMB's boating and scientific diving needs, train and/or evaluate boat drivers, design a maintenance protocol for the research boat fleet and interface with the maintenance staff in implementing a maintenance schedule, schedule and manage boat use, ensure that all safety equipment is serviceable and meets

Coast Guard requirements, provide boat-driving support as necessary, perform dive checkouts and swim tests, coordinate with UH Dive Safety Program to promote the training of scientific personnel and effective use of compressed air diving at HIMB, facilitate continued training and timely submission of dive logs to UH Dive Safety Program, support and oversee other in-water activities by HIMB visitors and other duties as assigned. Visit <http://www.pers.hawaii.edu/wuh/nadvert.aspx?m=11315&si=740105&pn=1&sn=postdate&so=desc> for complete job listing.

Director, Office of Diving and Water Safety

East Carolina University (ECU) is seeking a director for its diving and water safety program. Candidates must have broad and intimate knowledge of scientific diving techniques, water-related research techniques, fleet management and operations, and boating safety. Managerial skills include personnel supervision, budget management, and interfacing with research faculty and staff. The successful candidate will report to the director of the Institute for Coastal Science and Policy (ICSP). Applications must include a letter of interest, resume, and contact information for three references. Nominations and inquires should be made to Dr. Hans Vogel song (vogel songh@ecu.edu or 252-328-9373). Screening of applicants will start January 1, 2011. The position will remain open until filled. For additional details visit:

<https://ecu.peopleadmin.com/applicants/jsp/shared/frameset/frameset.jsp?time=1291654699059>.

NEW PUBLICATIONS

Dupont JE, Hallock P, Jaap WC. Ecological impacts of the 2005 red tide on artificial reef epibenthic macro invertebrate and fish communities in the eastern Gulf of Mexico. *Mar Ecol Progress Ser.* 2010; 415: 189-200.

A harmful algal bloom (red tide) and associated anoxic/hypoxic event in 2005 resulted in massive fish kills and comparable mortality of epibenthic communities in depths <25 m along the central west Florida shelf.

There is a robust body of information on the etiology of red tide and human health issues; however, there is virtually no quantitative information on the effects of red tide on epibenthic macro invertebrate and demersal fish communities. Ongoing monitoring of recruitment and succession on artificial reef structures provided a focused time series (2005 to 2007) before and after the red-tide disturbance. Radical changes in community structures of artificial reefs were observed after the red tide.

Scleractinian corals, poriferans, and echinoderms were among the epibenthos most affected. Fish species richness declined by >50%, with significant reductions in the abundances of most species. Successional stages were monitored over the next 2 yr; stages tended to follow a predictable progression and revert to a pre-red tide state, corroborating previous predictions that the frequency of

disturbance events in the shallow eastern Gulf of Mexico may limit the effective species pool of colonists. Substantial recovery of the benthos occurred in 2 yr, which was more rapid than predicted in previous studies.

Vann RD, Butler FK, Mitchell SJ, Moon RE.

Decompression illness. Lancet. 2011; 377(9760): 153-64.

Decompression illness is caused by intravascular or extravascular bubbles that are formed as a result of reduction in environmental pressure (decompression). The term covers both arterial gas embolism, in which alveolar gas or venous gas emboli (via cardiac shunts or via pulmonary vessels) are introduced into the arterial circulation, and decompression sickness, which is caused by in-situ bubble formation from dissolved inert gas. Both syndromes can occur in divers, compressed air workers, aviators, and astronauts, but arterial gas embolism also arises from iatrogenic causes unrelated to decompression. Risk of decompression illness is affected by immersion, exercise, and heat or cold. Manifestations range from itching and minor pain to neurological symptoms, cardiac collapse, and death. First-aid treatment is 100% oxygen and definitive treatment is recompression to increased pressure, breathing 100% oxygen. Adjunctive treatment, including fluid administration and prophylaxis against venous thromboembolism in paralysed patients, is also recommended. Treatment is, in most cases, effective although residual deficits can remain in serious cases, even after several recompressions.

Walterspacher S, Scholz T, Tetzlaff K, Sorichter S.

Breath-Hold Diving: Respiratory Function on the Longer Term. Med Sci Sports Exerc. 2010 Dec 21. [Epub ahead of print]

PURPOSE: Extensive breath-hold (BH) diving imposes high pulmonary stress by performing voluntary lung hyperinflation maneuvers (glossopharyngeal insufflation, GI), hyperinflating the lung up to 50% of total lung capacity. Breath-hold durations of up to 10 minutes without oxygen support may also presume cerebral alterations of respiratory drive. Little is known about long-term effects of GI onto the pulmonary parenchyma and respiratory adaptation processes in this popular extreme sport. **METHODS:** Lung function assessments and subsequent measures of pulmonary static compliance were obtained for 5 min following GI in 12 elite competitive breath-hold divers (BHD) with a mean apnea diving performance of 6.6 years. 3-year follow up measurements were performed in 4 BH divers. Respiratory drive was assessed in steady-state measurements for 6% and 9% CO₂ in ambient air. **RESULTS:** Acute pulmonary stress effects for static compliance during GI (13.75 L/kPa) could be confirmed in these 12 divers without exhibiting permanent changes to the lungs distensibility (7.41 L/kPa) or lung function parameters as confirmed by the follow up measurements

and for 4 BHD after 3 years ($p > 0.05$). Respiratory drive was significantly reduced in these breath-hold divers revealing a characteristic breathing pattern with a significant increase in V_E and mouth-occlusion pressure (P0.1) between free breathing and 6% CO₂, as well as between 6% CO₂ and 9% CO₂ (all $p < 0.001$). **CONCLUSION:** BH diving with performance of GI does not permanently alter pulmonary distensibility or impair ventilatory flows and volumes. A blunted response to elevated CO₂ concentrations could be demonstrated which was supportive of the hypothesis that CO₂ tolerance is a training effect due to BH diving rather than being an inherited phenomenon.

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

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