



E-SLATE

American Academy of Underwater Sciences (AAUS)

EDITORIAL NOTE – October 2011

Welcome to the October issue of the *E-Slate*. The AAUS 2011 Symposium is this month. The symposium program schedule is provided below. We look forward to seeing you all there! There are new job openings and publications in this month's issue to check out. The 2011 scholarship winners are announced in this issue. Congratulations to the winners and best wishes to all the participants.

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

NEWS/ANNOUNCEMENTS

2011 AAUS Symposium

Although registration for the AAUS Symposium workshops and diving sessions is officially closed, there may be some opportunities if you act now. Please contact the AAUS office immediately if you would like to attend any of the events. If you are interested in sharing transportation from Portland to Darling Marine Center, please email the AAUS office (aaus@disl.org) with your arrival information and availability/needs. AAUS will try to coordinate drivers and riders. For information about local activities and places of interest in Maine, visit <http://umaine.edu/scientificdiving/aaus-symposium-2011>.

AAUS Board of Directors Meeting

The AAUS Board of Directors Meeting will be conducted in conjunction with the 2011 Diving for Science Symposium on Thursday, October 13th at the Portland Regency Hotel in Portland, ME. Further information is available from aaus@disl.org.

Call for Papers – Maritime Archaeology

Papers are invited for the 23rd Annual Symposium on Maritime Archaeology and History of Hawaii and the Pacific to be held February 17-20, 2012 in Honolulu, HI. The symposium theme is "Diving into History: Technical and Sport Exploration of Shipwrecks." Presentations are not limited to this theme, but special consideration will be given to abstracts that incorporate this message. Abstracts should be no more than 300 words (excluding title and author[s]/affiliation[s]). All presenters must register for the conference. Submission deadline is November 01. Visit: http://www.mahhi.org/Call_for_Papers.html for details.

AAUS Scholarship Awards – 2011

AAUS offers two competitive scholarship programs. The Kathy Johnston (KJ) award for doctoral-level students and the Kevin Gurr (KG) award for master-level students. First place awards are \$2500; second place awards are \$1500. Honorable mentions do not receive monetary awards but are recognized as high quality proposals. A total of 30 proposals were reviewed (16 KJ [8 female, 8 male] and 14 KG [8 female, 6 male]). Proposals ranged from tropical to temperate studies and spanned fields from ecology to archaeology. Best wishes to all who participated. Special thanks to the 12 anonymous reviewers.

Kathy Johnston Award

1st place – **Ryan Jenkinson** (San Diego State University)

Title: Biogeographical variation in trophic interactions on temperate reefs of the Southern California Bight.

2nd place – **Ashlee Lillis** (North Carolina State University)

Title: Can you hear me now? Habitat-associated sound as a larval settlement cue for estuarine benthic invertebrates.

Honorable mentions:

Laura Bhatti (Florida International University)

Title: The effect of no-take marine protected areas on the trophic niches of coral reef fish

Robert Ellis (Florida State University)

Title: Ecological effects of habitat manipulation by red grouper on the West Florida Shelf

Kevin Gurr Award

1st place – **Thomas TinHan** (Calif. State U., Long Beach)

Title: Long-term horizontal and vertical movement patterns of yellow snapper (*Lutjanus argentiventris*) and leopard grouper (*Mycteroperca rosacea*) at the Los Islotes reserve, Gulf of California.

2nd place – **Michael Fox** (Moss Landing Marine Lab)

Title: Effects of oceanographic climate on growth and resource physiology of giant kelp, *Macrocystis pyrifera*, in a central California kelp forest

Honorable mentions:

Brenna Bulach (San Diego State University)

Title: The synergistic effects of ocean acidification and elevated temperature on the physiology of coralline algae (*Rhodophyta*) and their ability to acclimate to predicted conditions

Gal Eyal (Tel-Aviv U. & Interu. Inst. of Mar. Sci., Eilat)

Title: Coral recruitment in the Mesophotic Coral Ecosystem of Eilat, Red-Sea

Obituary – Dr. Bill Hamilton

Dr. Hamilton died unexpectedly on Sept. 16, 2011 of cancer. He was born on June 6, 1930 in Midland, TX. Dr. Hamilton was a world leading physiologist with over five decades of specialization in diving, aerospace, and environmental physiology with particular interest in decompression, breathing gases, and the effects of pressure. Ten of these years (1964-1974) were as a scientist and director of the environmental physiology and diving research laboratory at the Union Carbide Research Center in Tarrytown, NY. He was a graduate of University of Texas, Texas A&M and University of Minnesota. Dr Hamilton contributed in significant ways to the scientific diving community over several decades. He led the charge to further validate enriched air nitrox for the scientific community's use by chairing the nitrox workshop at Harbor Branch Oceanographic Institution in 1988, co-chairing the AAUS Dive Computer Workshop at Catalina in 1988, consulting with NOAA, UNC Wilmington and a number of other AAUS OMs over the years as technical diving methodologies slowly made their way into scientific diving programs, and contributing a significant body of physiological and operational knowledge to the AAUS through his participation in a number of AAUS workshops on ascent rates, repetitive diving, and reverse dive profiles. Dr Hamilton is survived by his wife, Kathryn, daughters, Lucy and Sally, two sisters, five grandsons and an untold number of admirers.

Dive Gear Sale

Assorted dive and underwater research equipment for sale. Includes Viking drysuits, portable scuba compressor, EXO26 full face mask, S4 current meters, communications gear, CTD and more. Contact Phil Lobel for details (plobel@bu.edu).

UPCOMING EVENTS

AAUS Symposium 2011

The 2011 AAUS Symposium will be held in Portland, ME October 10-15. The Portland Regency will serve as the symposium hotel and the University of Maine Darling Marine Center will host the preconference workshops, annual DSO meeting and AAUS Business meeting. Contact Chris Rigaud at crigaud@maine.edu or the AAUS office at aaus@disl.org for more information.

DAN Diving and Hyperbaric Medicine Course

The 70th DAN Diving and Hyperbaric Medicine Course will be held October 22-29 at the Mayan Princess Beach Resort in Roatan, Honduras. This six-day course is designed primarily for physicians. Emergency medical personnel, paramedics, nurses and professionals with interest in diving medicine will also find the course

valuable. The program is jointly sponsored by DAN and Wilderness Medical Society for continuing education credit. A special dive package supplements the course. Contact DAN Education at 919-684-2948, ext. 555 or 800-446-2671, ext. 555 or cme@dan.org. Visit:

<http://www.diversalernetnetwork.org/Events/Event.aspx?EventID=880>.

DEMA 2011

The Diving Equipment and Marketing Association will hold its annual show in Orlando, FL November 2-5. For more information, visit: <http://www.demashow.com/>.

Tenerife Int'l Practical Anesthesiology Conference

The International Congress of Anesthesiology will meet November 7-10 at the Abama Golf & Spa Resort on Tenerife, Canary Islands. The topic of the conference is 'Hyperbaric medicine and its applications in daily practice.' The event is accredited by INAMI/RIZIV. Visit: www.tipactenerife.org for more information.

92nd Annual Meeting of the Western Society of Naturalists

The 92nd Annual Meeting of the Western Society of Naturalists (WSN) will be held November 10-13, at the Vancouver Hilton in Vancouver, WA. Visit: <http://www.wsn-online.org/meeting.shtml>.

41st Annual Benthic Ecology Meeting

The 41st Annual Benthic Ecology Meeting (BEM) will be held March 21-24, 2012 in Norfolk, Virginia at the Norfolk Marriott Waterside Hotel. The meeting will be hosted by Old Dominion University, an AAUS OM. Visit: <http://dl.dropbox.com/u/13470552/BEM%202012%20First%20Flyer.pdf>.

International Marine Forensics Symposium

The Marine Forensics Committee (MFC) of the Society of Naval Architects and Marine Engineers (SNAME) is holding the International Marine Forensics Symposium at the Gaylord National Hotel, Washington, DC, April 2-5, 2012. The symposium will honor the 100th anniversary of the sinking of RMS Titanic (April 12, 1912); the 150th anniversary of the sinking of USS Monitor (December 31, 1862); and approximately the 200th anniversary of the destruction of Commodore Joshua Barney's Flagship, the USS Scorpion during the War of 1812, as it tried to defend against the British march on Washington, DC. The event is co-sponsored by: Marine Technology Society (MTS), Royal Institute of Naval Architecture (RINA), American Society of Naval Engineers (ASNE), and Institute of Marine Engineers, Science and Technology (IMARest). Visit: <http://www.rina.org.uk/marineforensics> for details.

Rebreather Forum 3.0

Rebreather Forum 2.0 was held in Redondo Beach, CA in September 1996. Rebreather technology, ethos and training has changed substantially since then. Rebreather Forum 3.0 (www.RF30.org) will be convened May 18-20, 2012 at the Caribe Royale Hotel in Orlando, FL. The meeting is co-sponsored by AAUS, DAN and PADI. This program will be of particular interest to the scientific diving community as there are now evolving rebreather concepts and technologies that are simplified from the technical diving approach with more potential of becoming mainstream scientific diving methodology. An RF3.0 presentation will be given at the AAUS Diving Officer meeting on Wednesday, October 12 at the Darling Marine Center. Watch for further information on RF3.0, including programmatic and registration information.

JOB OPPORTUNITIES

UQ Boating and Diving Officer

The University of Queensland is seeking a Boating and Diving Officer to work primarily at Heron Island Research Station. Applicants should possess an ADAS Part 1 Scientific Scuba Diver Certificate or equivalent/Dive instructor Certificate and possess a Coxswain's Certificate or above. Applicants should also possess a broad technical competence in the maintenance of diving equipment and boats. This position is a Full time, Fixed Term appointment for 3 years at HEW level 5. The remuneration package will be in the range \$53,834 to \$60,293 p.a., plus 17% employer superannuation contribution (total package will be in the range \$62,985 - \$70,542). Application closing date is October 3, 2011 11:55pm E. Australia Standard Time. For more information visit:

<http://uqjobs.uq.edu.au/jobDetails.asp?sJobIDs=492503&IWorkTypeID=&ILocati>

Marshall Islands Coastal Environmental Advisor

The Marshall Islands Environmental Protection Authority is seeking a Coastal Environmental Advisor to serve with the RMI EPA for a minimum of two years. The successful candidate will be experienced in environmental management in coastal areas, be a certified scuba diver, have an MS or PhD, and a scientific understanding of tropical marine ecosystems. Contact Deborah Barker-Manase for more information at manase@gmail.com or 692-625-3035/5203.

DSO, Northeastern Univ. Marine Science Center

The Marine Science Center and the Three Seas Program of Northeastern University seek applicants for a program coordinator and Dive Safety Officer. Now entering its 28th year, the Three Seas Program offers in-depth training in marine biology at three field stations in three different marine ecosystems. Students spend a semester each at

Northeastern University's Marine Science Center in Nahant, MA; the Smithsonian Tropical Research Institute's field station in Bocas del Toro, Panama; and the University of Washington's Friday Harbor Laboratories on San Juan Island. Students finish the program with solid academic and practical experience in marine biological concepts, theory, and research. The successful applicant will assist the program director with all aspects of the program, including coordinating program operation with university offices; the hiring and supervision of faculty, staff, and teaching assistants; admissions; site logistics; recruitment of students; and management of the budget, curriculum, and program calendar. This person will serve as the Three Seas Program and Northeastern University Dive Safety Officer. A Bachelor of Science degree in marine biology, ecology, or the equivalent; experience with a field-oriented marine biology program; excellent verbal and written communication skills; and an internationally recognized scuba instructor certification are required. The successful applicant must be an active/current AAUS scientific diver. Knowledge of coastal U.S. and tropical marine ecosystems is preferred. Applications are available at:

<http://threes seasprogram.blogspot.com/2011/07/three-seas-marine-biology-program.html>.

This position is requisition number 114020. Please contact Dr. Salvatore Genovese (s.genovese@neu.edu), Three Seas Program Director, for more information. This search will continue until the position is filled.

Ocean Observatory Technician MBARI

This position is responsible for the operation, integration, maintenance, and calibration of oceanographic equipment and instruments deployed on MBARI's moorings. Duties include, but are not limited to: perform maintenance of oceanographic instrumentation and ensure reliable operation prior to deployment, assist with the integration and testing of scientific sensors, assist with the development, deployment, and maintenance of MBARI's moorings. Scheduled sea duty may be required.

Minimum qualifications: associate degree or equivalent and five years related experience; experience with maintenance, operation, integration of standard oceanographic instrumentation, and basic electronic test equipment; working knowledge of PC-based computer applications and UNIX/Linux. Must be willing and able to go to sea, have excellent communication skills and be able to work with diverse groups of people. Desired qualifications: experience with deployment and recovery of oceanographic moorings; familiarity with C; scuba diving experience and scientific diver certification. Visit: www.mbari.org/oed/jobs/OOT.html.

2011 AAUS SYMPOSIUM PROGRAM

October 14th

0830 – 0840 - Opening Comments

0840 – 0910 - **Habitat structure influences survival and predator-prey interactions of early juvenile Red King Crab, *Paralithodes camtschaticus***

Jodi Pirtle^{1,2}, Ginny Eckert²

¹University of New Hampshire, Center for Coastal and Ocean Mapping, Durham, NH; ²School of Fisheries and Ocean Sciences, Juneau Center, University of Alaska Fairbanks, Juneau, AK

0910 – 0940 - **Effects of the red sea urchin on benthic invertebrate communities: a link to spatial subsidies**

Ross Whippo¹, Alex Lowe², Kevin Britton-Simmons²

¹University of British Columbia, Department of Zoology, Vancouver, BC; ²Friday Harbor Laboratories, University of Washington, WA

0940 – 0955 - **A visual profile of the vertical mesophotic coral ecosystem of the tongue of the ocean (TOTO), Andros, Bahamas to 100 meters**

Michael Lombardi^{1,2,3}

¹ American Museum of Natural History, Dept. of Environmental Health & Safety, New York, NY, ² University of Rhode Island, Office of Research Compliance, Kingston, RI ³ Ocean Opportunity Inc, New York, NY

0955 – 1010 - **In-water strategies for scientific diver based examinations of the vertical mesophotic coral ecosystem (vMCE) from 50 to 150 meters**

Michael Lombardi^{1,2,3}, Jeff Godfrey⁴

¹ American Museum of Natural History, New York, NY, ² University of Rhode Island, ORC, Kingston, RI ³ Ocean Opportunity Inc., New York, NY

⁴ University of Connecticut, Groton CT

1010 – 1040 - Break

1040 – 1110 - **Survey of previously outplanted Pinto (Northern) Abalone (*Haliotis kamtschatkana*) in the San Juan Island Archipelago, Washington State**

Jeffrey B. Hester, Jenna M. Walker, Paul A.

Dinnel, Nathan T. Schwarck

Shannon Point Marine Center, Western

Washington University, Anacortes WA

1110 – 1140 - **Reproduction of red tree corals in the southeastern Alaskan fjords: implications for conservation and population turnover**

Rhian G. Waller¹, Robert P. Stone², Jennifer Mondragon³, Christian E. Clark¹

¹ Darling Marine Center, University of Maine, Walpole, ME ² NOAA-NMFS, Alaska Fisheries Science Center, Juneau, AK, ³ NOAA-NMFS, Alaska Regional Office, Juneau, AK

1140 – 1210 - **Toxic caviar: using fish embryos to monitor contaminant impacts**

Lisa Kerr Lobel

Biology Department, Boston University, Boston, MA

1210 – 1340 - Lunch

1340 – 1410 - **2011 American Academy of Underwater Sciences/Our World Underwater Scholarship Society internship report: Shannon Point Marine Center**

Jenna M. Walker, Nathan T. Schwarck

Shannon Point Marine Center, Western Washington University, Anacortes WA

1410 – 1440 - **Use of tethered scuba for scientific diving**

Sean Sheldrake¹, Rob Pedersen¹, Chad Schulze¹, Steven Donohue², Alan Humphrey³

¹USEPA, Region 10, Seattle, WA ²USEPA, Region 3, Environmental Assessment and Innovation Division, Philadelphia, PA ³USEPA, Environmental Response Team, Edison, NJ

1440 – 1510 - **Use of surface-supplied gas for scientific diving**

Alan Humphrey¹, Scott Grossman², Jonathan

McBurney², Sean Sheldrake³

¹USEPA, Environmental Response Team, Edison, NJ

²Lockheed Martin SERAS, Edison, NJ ³USEPA, Region 10, Seattle, WA

1510 – 1540 - Break

1540 – 1610 - **Atmospheric diving suits – new technology may provide ADS systems that are practical and cost-effective tools for conducting safe scientific diving, exploration and undersea research**

Douglas E. Kesling

J. F. White Contracting Company, Framingham, MA

1610 – 1640 - **Belize barrier reef transect: how far do coral reef fish larvae travel in marine currents?**

Oscar Puebla, Edgardo Ochoa, Owen McMillan,

Eldredge Bermingham

Smithsonian Tropical Research Institute, Panamá,

República de Panamá

1640–1710 - **Spectral reflectance as a method to identify the invasive tunicate *Didemnum vexillum***

Thomas Leeuw, Emmanuel Boss, Wayne Slade

University of Maine, Orono, ME

October 15th

0830 – 0840 - Opening Comments

0840 – 0910 - Milestones in underwater ichthyology: a historical perspective

Phillip S. Lobel
Boston University, Boston, MA

0910 – 0940 - Discoveries of new marine species of the Aleutian Islands

Stephen C. Jewett^{1,2}, Roger N. Clark³
¹Institute of Marine Science, ²University of Alaska Fairbanks, Fairbanks, AK ³Insignis Biological Consulting, Eagle Mountain, UT

0940 – 1010 - Population density and choice of den and food made by *Octopus rubescens* collected from Admiralty Bay, Washington, in July 2011

Elizabeth R. Chase
Corning School of Ocean Studies, Maine Maritime Academy, Castine ME

1010 – 1040 - Break

1040 – 1110 - Scuba diving surveys used to estimate Pacific herring egg deposition in Southeastern Alaska

Kyle P. Hebert
Alaska Department of Fish and Game, Juneau, AK

1110 – 1140 - An assessment of growout strategies for the green sea urchin (*Strongylocentrotus droebachiensis*)

Pamela E. Fraungruber, Nick P. Brown
Center for Cooperative Aquaculture Research, Franklin, ME

1140 – 1210 - A 'BLAGRRA' assessment of coral bleaching and disease in Bonaire

Phoebe Jekielek
University of Maine School of Marine Sciences, Aubert Hall, Orono, ME

1210 – 1340 - Lunch

1340 – 1410 - Freediving for science: the study of coral overgrowth by an encrusting red alga (*Ramicrosta* sp.) in a shallow reef environment

Caren E. Eckrich¹, M. Sabine Engel²
¹CIEE Research Station Bonaire, Bonaire, Dutch Caribbean ²STINAPA, Bonaire, Dutch Caribbean

1410 – 1440 - Phylogenetic order differentiates fatty acid composition of 40 Northeast Pacific macrophytes

Aaron W. E. Galloway¹, Kevin H. Britton-Simmons¹, Michael T. Brett²
¹Friday Harbor Laboratories, University of Washington (UW), Friday Harbor, WA, ²UW Civil and Environmental Engineering, Seattle, WA

1440 – 1510 - Variability in antibacterial activity in Hawaiian corals

Deborah J. Gochfeld^{1,2}, Katerina E. Pappas¹, Sylvester Lee², Greta S. Aeby³
¹National Center for Natural Products Research
²Environmental Toxicology Research Program, University of Mississippi, Oxford, MS ³Hawaii Institute of Marine Biology, Kaneohe, HI

1510 – 1540 - Break

1540 – 1610 - Fertilization success of the circumpolar Antarctic seastar *Odontaster validus* (Koehler, 1906): a diver-collected study

Laura J. Grange¹, Paul A. Tyler¹, Lloyd S. Peck²
¹School of Ocean and Earth Sciences, University of Southampton, National Oceanography Centre, Southampton, UK ²British Antarctic Survey, Natural Environment Research Council, High Cross, Cambridge, UK

1610 – 1640 - CCR validation protocol and associate training

Gregg R. Stanton, Joerg Hess
Wakulla Diving Center, Inc., Crawfordville, FL

1640 – 1650 - Closing Comments

NEW PUBLICATIONS

Bove AA. The cardiovascular system and diving risk. Undersea Hyperb Med. 2011 Jul-Aug; 38(4): 261-9.

Recreational scuba diving is a sport that requires a certain physical capacity, in addition to consideration of the environmental stresses produced by increased pressure, low temperature and inert gas kinetics in tissues of the body. Factors that may influence ability to dive safely include age, physical conditioning, tolerance of cold, ability to compensate for central fluid shifts induced by water immersion, and ability to manage exercise demands when heart disease might compromise exercise capacity. Patients with coronary heart disease, valvular heart disease, congenital heart disease and cardiac arrhythmias are capable of diving, but consideration must be given to the environmental factors that might interact with the cardiac disorder. Understanding of the interaction of the diving environment with various cardiac disorders is essential to providing a safe diving environment to individual divers with known heart disease.

Farmery S, Sykes O. Neurological oxygen toxicity. Emerg Med J. 2011 Sep 6. [Epub ahead of print]

Scuba diving has several risks associated with it from breathing air under pressure-nitrogen narcosis, barotrauma and decompression sickness (the bends). Trimix scuba diving involves regulating mixtures of nitrogen, oxygen and helium in an attempt to overcome the risks of narcosis and decompression sickness during deep dives, but introduces other potential hazards such as hypoxia and oxygen toxicity convulsions. This study reports on a seizure during the ascent phase, its potential causes and management and discusses the hazards posed to the diver and his rescuer by an emergency ascent to the surface.

Mitchell SJ, Bove AA. Medical screening of recreational divers for cardiovascular disease: consensus discussion at the Divers Alert Network Fatality Workshop. Undersea Hyperb Med. 2011 Jul-Aug; 38(4): 289-96.

Cardiac events are responsible for a significant proportion of recreational diving fatalities. It seems inescapable that our current systems for selecting suitable recreational diver candidates and for longitudinal monitoring of diver health are failing to exclude some divers at high risk of cardiac events. Based on review of practice in parallel sporting disciplines and of the relevant literature, a series of recommendations for screening questions, identification of disqualifying conditions and risk factors, and investigation of candidates with risk factors was drafted. Recommendations for ongoing health monitoring in established divers were also generated. These

recommendations were promulgated and debated among experts at a dedicated session of the Divers Alert Network Fatality Workshop. As a result, we propose a modified list of screening questions for cardiovascular disease that can be incorporated into health questionnaires administered prior to diver training. This list is confluent with the American Heart Association (AHA) pre-participation screen for athletes. The exercise stress test unmasks inducible cardiac ischemia and quantifies exercise capacity, and remains the tool of choice for evaluating diver candidates or divers with risk factors for coronary disease. An exercise capacity that allows for sustained exercise at a 6-MET intensity (possibly representing a peak capacity of 11-12 MET) is an appropriate goal for recreational divers.

Puebla O, Bermingham E, Guichard F. Pairing dynamics and the origin of species. Proc R Soc Lond B 2011 doi:10.1098/rspb.2011.1549

Whether sexual selection alone can drive the evolution of assortative mating in the presence of gene flow is a long-standing question in evolutionary biology. Here, we report a role for pairing dynamics of individuals when mate choice is mutual, which is sufficient for the evolution of assortative mating by sexual selection alone in the presence of gene flow. Through behavioural observation, individual-based simulation and population genetic analysis, we evaluate the pairing dynamics of coral reef fish in the genus *Hypoplectrus* (Serranidae), and the role these dynamics can play for the evolution of assortative mating. When mate choice is mutual and the stability of mating pairs is critical for reproductive success, the evolution of assortative mating in the presence of gene flow is not only possible, but is also a robust evolutionary outcome.

Thompson PD. The cardiovascular risks of diving. Undersea Hyperb Med. 2011 Jul-Aug;38(4):271-7.

Cardiovascular disease may be responsible for a quarter of diving fatalities, but there are few studies on the cardiovascular complications of this activity. In contrast, there is a rich literature on land-based, exercise-related cardiac events. These studies document that exercise can increase the risk of acute cardiac events, but that absolute risk is small for healthy individuals. There are no proven strategies to reduce exercise-related cardiac events and consequently no proven strategies that could be confidently applied to diving. Nevertheless, requiring a pre-diving medical evaluation and clearance for those with known cardiac disease, training dive personnel to elicit possible cardiac prodromal symptoms, and frequent emergency training for diving supervisors are prudent approaches to this problem.

Vann R, Lang M. Recreational diving fatalities. Undersea Hyperb Med. 2011 Jul-Aug;38(4):257-60.

The risks of dying during recreational diving are small. The Divers Alert Network (DAN) held a workshop to consider whether the risks could be reduced further. Topics included investigation, surveillance, operational safety and cardiovascular disease. Investigation is essential to determine causes and involves on-scene inquiry, forensic examination of the deceased, and testing of life support equipment, but thorough investigations are unusual. Independent annual fatality rates were presented and reviewed for diving, jogging, and motor vehicle accidents and for divers in training. Common factors associated with diving fatalities included running out of gas, entrapment or entanglement, buoyancy control, equipment misuse, rough waters and emergency ascent. Asphyxia by drowning, air embolism and cardiac events were the principal injuries or causes of death. About one-quarter of the deaths were associated with cardiac events, mostly in older divers. Revised procedures were recommended for identifying occult cardiovascular disease in candidate divers who warrant further investigation, but older, previously certified divers may be at greatest risk.

Zapol WM et al. Future Science Opportunities in Antarctica and the Southern Ocean. National Research Council of the National Academies 2011. Washington DC; National Academies Press. 174 pp. (open access at www.nas.edu).

Future Science Opportunities in Antarctica and the Southern Ocean suggests actions for the United States to achieve success for the next generation of Antarctic and Southern Ocean science. The report highlights important areas of research by encapsulating each into a single, overarching question. The questions fall into two broad themes: (1) those related to global change, and (2) those related to fundamental discoveries. In addition, the report identified key science questions that will drive research in Antarctica and the Southern Ocean in coming decades, and highlighted opportunities to be leveraged to sustain and improve the U.S. research efforts in the region.

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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