E-SLATE

American Academy of Underwater Sciences (AAUS)

EDITORIAL NOTE – June 2012

Welcome to the June E-Slate. There are many important deadlines this month. Abstracts for 2012 AAUS symposium are due June 01, scholarship applications, BOD voting and statistics are due no later than June 30, 2012. Please check out the new website and begin to take advantage of the many features, including a new forum. We will begin to publish a forum question of the month in the E-Slate to highlight some of the topics being posted online. We encourage you to participate in the online conversations as well as submitting new publications to share with the membership. It is a great opportunity to highlight research from your home institution. In addition, we welcome news, announcements, job postings, and images of underwater work at aaus@disl.org. Please also note that our new website is live! As you submit information for the E-Slate, they will now also be posted on the new site. Current and past issues of the E-Slate are available at www.aaus.org.

NEWS/ANNOUNCEMENTS

Obituary - Kevin Flanagan

Kevin Christopher Flanagan, born March 20, 1970 in Lodi, California to Greg and Patricia Flanagan, passed away peacefully at his home in Greenville, NC on May 01, 2012. Kevin attended school in Lodi and graduated class of 1988 from Lodi High School. He was active in speech and debate and played water polo. After high school Kevin attended University of California, Santa Cruz where he majored in marine biology. Upon receiving his divemaster certification, Kevin went to work for the University of Southern California at the Philip K. Wrigley Marine Science Center on Catalina Island as Marine Lab Dive Safety Officer and USC hyperbaric crew member. In 2000 he was offered an Assistant Dive Safety Officer position in Honolulu at the University of Hawai'i, Manoa. Immediately after hire, Kevin participated in an extensive, multi-disciplinary scientific study of the North Western Hawaiian Islands and served aboard the Rapture as NOWRAMP Expedition Dive Officer. The Northwestern Hawaiian Islands are among the last large-scale coral reef wilderness remaining on the planet and support the highest degree of unique reef species for any large coral reef ecosystem. With little time to prepare for this trip, he gratefully stated at its conclusion the only accidents involved golf carts.

Anxious to further his career, Kevin was elated to accept the position of Dive Safety Officer at East Carolina University in July, 2011. His first major project was a trip to the Dominican Republic for a maritime archaeology field school to catalog the wreckage of Captain Kidd's Quedagh Merchant off the coast of Santa Catalina Island. Kevin longed to learn and found working with archeologists instead of biologists an open door to new learning opportunities. Kevin worked with an amazing group of people both at UH and during his short time at ECU. His family will be forever grateful for the love and support we received at his passing from the staff, administration and students at ECU.

Adding to his professional accomplishments, Kevin served on the board of the American Academy of Underwater Sciences from 2009-2011. His responsibilities included chairing the Diving Standards Committee.

Kevin greatly loved and married Sanja Du Plessis on February 15, 2004. They lived together for seven years and remained close even after he left Hawai'i.

Before his passing Kevin was able to fulfill his lifelong dream of swimming with great white sharks near Guadalupe Island. From childhood Kevin was fascinated by sharks of all species, but found the great whites to be the most awe inspiring. He approached them without fear, but with great respect.

But Kevin's true passion and gifting was his ability to teach. He had the opportunity to share his love of the ocean with many students and his enthusiasm was contagious. His diving standards and style have been imprinted on his many students, and Kevin's legacy will be his investment in those who were fortunate to learn from him.

His family would like those who knew and loved him to join us in a celebration of life which will be held on June 09, 2012 at Westside Assembly Church, 75 N. Crescent Ave., Lodi, CA, at 1100. A luncheon reception will follow at the home of Greg and Mary Flanagan, 13450 E. Dawson Rd., Lockford, CA.

In lieu of flowers, please send donations to the Kevin Flanagan Student Travel Award scholarship fund set up by the AAUS Foundation in Kevin's memory. AAUS will match all donations in Kevin's name. Please visit the website www.aaus.org for more information. The AAUS Foundation hopes to attract sufficient funds for this to become a permanently funded - an endowed - award.

Dennis Divins - 2012 Conrad Limbaugh Memorial Award for Scientific Diving Leadership

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 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 2012 American Academy of Underwater Sciences (AAUS) Recipient of the Conrad Limbaugh Memorial Award for Scientific Diving Leadership is Mr. Dennis Divins.

Dennis Divins, the University of California at Santa Barbara Diving Safety Officer from 1970 to 2004, has not only taught thousands of divers, but he has also inspired countless young biologists to pursue their careers in the marine world. His tireless dedication of the pursuit of safe diving practices while still taking the time to enjoy and respect the ocean is reflected in an impeccable safety record for the program he directed. Although retired, he continues to be a mentor, advocate and friend to many of the divers he has taught and remains active in the Santa Barbara diving community.

Kevin Flanagan Student Travel Award

The Kevin Flanagan Student Travel Award is a competitive award developed to support the professional development of students engaged in diving science or the study of diving science. The award was created in memory of Kevin Flanagan (1970-2012), an AAUS board member (2009-2011) and diving safety officer (1998-2012).

To qualify applicants must:

- Be a current member of AAUS (student or full member).
- Be enrolled as an undergraduate or graduate student.

Electronic submission of the following is required:

- Two page curriculum vitae (including academic history and connection to diving).
- Brief essay (600-1000 words) describing relevant personal history, aspirations and the professional benefits to be derived from attending an AAUS meeting.
- Budget page (numbers plus brief justification) for travel expenses requested from AAUS (maximum $800; smaller amounts may be requested).
- Letter of support from one faculty member (submitted with the package or directly to AAUS Foundation).

Submit application package to:

- aausfoundation@gmail.com - specify 'Kevin Flanagan Student Travel Award competition.'

The deadline for 2012 applications is July 01. Only complete applications will be considered. Award winners will be notified by August 01.

Donations to help fund this award can be given at www.aausfoundation.org. Please indicate "K Flanagan Fund" on the donation page. We hope to make

AAUS Foundation Logo Competition

The newly formed AAUS Foundation needs a logo! Any interested members can submit their proposed logos to aausfoundation@gmail.com by July 01. The Foundation would like to see some common elements between the existing AAUS logo and the new Foundation logo to link the two organizations together.

AAUS Website

Our new website (www.aaus.org) is up and running. **It is very important that individual and organizational members login and make sure that all information was transferred properly.** Organizational members need to confirm that their DCB members are listed properly and all contact information is current. Your username and password should be the same as on the old site. As with any new site, we expect a few glitches. Please detail any issues you find to aaus@disl.org. We value your feedback as we transition to the new format.

AAUS Forum Question of the Month

Please login at www.aaus.org to participate in the forum. Forum questions/topics can be submitted online or to aaus@disl.org.

At Penn State our science diving program has historically been funded and overseen by a college. This model has become less attractive to that college as our science diving activities have grown to include other colleges. We are in the process of (re)organizing, so I'm writing to ask for input from anyone who is willing to provide a short description of your program's organizational structure. Some of the information that would be helpful to understand is:

- To what entity/individual/office etc. does your program answer?
- How is your program funded? Research overhead? Dedicated general funds?

- Are recreational (diving or outing club if you have one) and recreational training activities overseen by the same entity as above?
- Is there a single DSO for all scuba related activities, or do you have separate DSOs for science diving and recreational diving activities?

Submitted by: Tim White, Penn State DSO

Call for Abstracts – AAUS 2012

Abstracts appropriate for the 2012 AAUS symposium can be submitted electronically to www.aaus.org until June 01. Please put "*AAUS symposium abstract* -" followed by your name in the message line to facilitate tracking. The minimum manuscript obligation is an extended abstracts (800-1200 words). (Note: longer manuscripts can be submitted if authors prefer - the 2011 proceedings were close to evenly split between extended abstracts and full papers). Notification on the disposition of submitted abstracts will be returned to the first author electronically by July 01. The deadline for final extended abstract or manuscript is August 01 so the published proceedings will be available at the fall meeting. Inclusion in the proceedings is a requirement of presentation. Contact Diana Steller (dsteller@mlml.calstate.edu) for more information.

Lodging for the 2012 AAUS Symposium

Do not delay in booking lodging for the 2012 Symposium. There are several concurrent meetings scheduled for Monterey and lodging will be limited. The AAUS group rate at the Hyatt Monterey is only available Sunday-Tuesday (September 23 - October 02). Bookings at Hyatt Monterey outside of these dates will be at the regular price. It is also important to note that the Monterey Jazz Festival is September 21-22 and rates are significantly higher during this time.

2011 AAUS Statistics

2011 statistics are due now. If statistics are not submitted by June 30, OMs will be turned over to the Standards Committee as delinquent. Statistics may be submitted at http://stats.diveaaus.com. Please review 'AAUS Statistics Collection Criteria and Definitions' (Statistics Collection page) or contact Cheryl Thacker (cthacker@ehs.ufl.edu) or Mike Dardeau (mdardeau@disl.org) with questions.

2012 AAUS BOD Election

The 2012 AAUS election opened May 01 and closes June 30. This year the academy will elect a Director-at-Large. The term will start on the January 01, 2013. The Director-at-Large will serve a three year term. The election is open to Full Voting Members (individual and OM Reps) in good standing (dues paid, etc.). Ballots and candidate profiles are accessed via the AAUS website, www.aaus.org, by logging into your individual account and selecting 'Voting and Polling.' To write in a candidate for any office send an email with the name of the candidate and position for which you are voting to cmcdonald@ucsd.edu. The Academy thanks the candidates for their willingness to serve the scientific diving community.

FUNDING/SCHOLARSHIPS

AAUS Student Scholarships 2012

The AAUS Foundation awards scholarships to graduate students engaged in, or planning to begin, research projects in which diving is used as an important research tool or studying diving science. The Kevin Gurr Scholarship awards $3000 to a Master program student. The Kathy Johnston Scholarship awards $3000 to a Doctoral student. AAUS may also award additional $1500 scholarships to the next top-ranked proposals. If the additional scholarships are awarded, they may be split between Master and Doctoral programs or awarded within a single program. Applicants must fulfill the following requirements: be a current member of AAUS (student or full member); be accepted and enrolled in a Master or Doctoral program; agree to write an article for the E-Slate describing the proposed research; and present the results of their research at an AAUS symposium or other scientific meeting within one year of the project's completion. Applications are submitted electronically; including a 3-5 pages describing the research methods, significance of the research, and a budget (if part of a larger budget, specify how AAUS funds will be spent). A letter of support from a faculty advisor must be submitted electronically. **Proposal deadline is June 30**. Scholarship winners will be announced October 01 For more information and application, visit www.aausfoundation.org, or send questions to the Scholarship Committee Chair at aaus@disl.org.

JOB OPPORTUNITIES

Diving and Water Safety Officer

Diving and Water Safety is a specialized service unit of East Carolina University. It provides training, research support, equipment, maintenance and safety over-site to University Programs and individuals involved in scientific diving, water-related research, and scuba instruction. The units currently involved in these activities are the Maritime Studies Program, Geology, Biology, Health and Human Performance and Coastal Resource Management. The primary missions of the unit are to promote, facilitate, coordinate, and conduct fundamental and applied underwater and water-related research performed under the auspices of the University. The DWSO will oversee the training, certification, equipment, and safety of compressed gas diving; and will oversee the safety of the University research fleet, including maintenance and operation of

vessels and operator training and certification; to supervise and support scientific and recreational diving activities and research activities involving boats. Candidates should submit (online) a cover letter, resume/curriculum vitae (including diving certifications), and a list of three references including contact information. Visit https://ecu.peopleadmin.com/applicants/jsp/shared/position/JobDetails_css.jsp?postingId=260642 for more information.

STUDENT OPPORTUNITIES

Maritime Archaeology Field School in Bermuda

Saint Mary's College of California and the University of Rhode Island will be offering a joint Field School in Maritime Archaeology in Bermuda July 16 to August 08, 2012. Training leading to AAUS qualification as a Scientific Diver-in-Training will be provided in advance of departure for Bermuda. Direct questions to jallan@stmarys-ca.edu or rodmather@mail.uri.edu.

UPCOMING EVENTS

Diving Emergency Symposium

Training Beyond Borders Diving Emergency Symposium will take place July 25-31, 2012 in Cancun, Cozumel & Riviera Maya Mexico. This training extravaganza unites divers from across the globe with one common mission – to reach beyond borders to promote dive safety through education. The goal of this symposium is to help increase worldwide understanding and improve management of a dive emergency. A community outreach program is built into this event. Additional information and an itinerary can be found at www.trainingbeyondborders.info.

AAUS Symposium 2012

The 2012 AAUS Symposium will be held in Monterey, CA September 24-29, hosted by the Monterey Bay Aquarium, University of California Santa Cruz and Moss Landing Marine Laboratories. The Hyatt Regency will serve as the symposium hotel. Events include pre-conference workshops, the Diving Safety Officer meeting, AAUS business meeting and two days of science talks. Planned workshops:

- PSI – VCI certification and refresher courses
- Desert Star Navigation
- Organismal Collection Techniques
- DAN FA Pro Instructor Certification
- Pacific Coast Species ID/Reef Check CA Methodology
- Oceanic Equipment Repair
- Photo Techniques for Scientific Divers
- New DSO Orientation
- Organizational Member Poster Night

There will be boat and shore diving opportunities as well as our annual Bubble Breaker welcome sponsored by Ocean Enterprises and a second social hosted by Backscatter. September is a beautiful time of year in Monterey but also a very busy time for other conferences. **Early travel booking is recommended.** You can visit our website to register directly at http://www.cvent.com/d/kcqlds. Contact the AAUS office at aaus@disl.org for more information.

Workshop on Analysis of Multivariate Data PRIMER v6

This five day workshop will cover the statistical analysis of assemblage data (species by samples matrices of abundance, area cover, etc.) and/or multi-variable environmental data which arise in a wide range of applications in environmental science and ecology, from environmental impact assessments, through basic studies in community ecology and biodiversity monitoring, to analysis of biomarkers, water quality indices, physico-chemical variables, etc. The workshop will be held October 08-12, 2012 in the Weedon Island Preserve Visitor's Center, 1800 Weedon Island Drive NE, Saint Petersburg, FL 33702 (www.weedonislandpreserve.org). Contact local organizer, Walt Jaap (wjaap@tampabay.rr.com; 727-896-0521) for a detailed schedule, registration forms, or lodging questions.

NEW PUBLICATIONS

Allan SE, Smith BW, and Anderson KA. Impact of the Deepwater Horizon Oil Spill on Bioavailable Polycyclic Aromatic Hydrocarbons in Gulf of Mexico Coastal Waters. Env Sci and Tech. 2012 Vol. 46, 2033-2039. doi:/10.1021/es202942q

An estimated 4.1 million barrels of oil and 2.1 million gallons of dispersants were released into the Gulf of Mexico during the Deepwater Horizon oil spill. There is a continued need for information about the impacts and long-term effects of the disaster on the Gulf of Mexico. The objectives of this study were to assess bioavailable polycyclic aromatic hydrocarbons (PAHs) in the coastal waters of four Gulf Coast states that were impacted by the spill. For over a year, beginning in May 2010, passive sampling devices were used to monitor the bioavailable concentration of PAHs. Prior to shoreline oiling, baseline data were obtained at all the study sites, allowing for direct before and after comparisons of PAH contamination. Significant increases in bioavailable PAHs were seen following the oil spill, however, preoiling levels were observed at all sites by March 2011. A return to elevated PAH concentrations, accompanied by a chemical fingerprint similar to that observed while the site was being impacted by the spill, was observed in Alabama in summer 2011. Chemical forensic modeling demonstrated that elevated PAH concentrations are associated with distinctive chemical profiles.

Boussuges A, Pontier JM, Schmid B, Dussault C. Paradoxical gas embolism after scuba diving: Hemodynamic changes studied by echocardiography. Scand J Med Sci Sports. 2012 May 22. doi: 10.1111/j.1600-0838.2012.01474.x. [Epub ahead of print].

Hemodynamic changes induced by self-contained underwater breathing apparatus diving were investigated using Doppler echocardiography. We detected circulating bubbles in both right and left cavities of the heart and in the cerebral circulation in two divers with a large patent foramen ovale. A reduction in the left ventricular preload was suggested by echocardiographic measurements. The decreased cardiac preload was paralleled to a lower stroke volume and cardiac output. These findings were also observed in divers with no evidence of circulating bubbles. In these subjects, pulmonary vascular resistances remained unchanged while an increase was observed in the two divers with arterial bubbles. This increase could promote right-to-left shunting.

Cabañes FJ, Bragulat MR, Castellá G. *Hortaea werneckii* isolated from silicone scuba diving equipment in Spain. Med Mycol. 2012 May 2. [Epub ahead of print]

During a survey of black yeasts of marine origin, some isolates of *Hortaea werneckii* were recovered from scuba diving equipment, such as silicone masks and snorkel mouthpieces, which had been kept under poor storage conditions. These yeasts were unambiguously identified by phenotypic and genotypic methods. Phylogenetic analysis of both the D1/D2 regions of 26S rRNA gene and ITS-5.8S rRNA gene sequences showed three distinct genetic types. This species is the agent of tinea nigra which is a rarely diagnosed superficial mycosis in Europe. In fact this mycosis is considered an imported fungal infection being much more prevalent in warm, humid parts of the world such as the Central and South Americas, Africa, and Asia. Although *H. werneckii* has been found in hypersaline environments in Europe, this is the first instance of the isolation of this halotolerant species from scuba diving equipment made with silicone rubber which is used in close contact with human skin and mucous membranes. The occurrence of this fungus in Spain is also an unexpected finding because cases of tinea nigra in this country are practically not seen.

Dujic Z, Breskovic T. Impact of breath-holding on cardiovascular respiratory and cerebrovascular health. Sports Med. 2012 Jun 1;42(6):459-72. doi: 10.2165/11599260-000000000-00000.

Human underwater breath-hold diving is a fascinating example of applied environmental physiology. In combination with swimming, it is one of the most popular forms of summer outdoor physical activities. It is performed by a variety of individuals ranging from elite breath-hold divers, underwater hockey and rugby players, synchronized and sprint swimmers, spear fishermen, sponge harvesters and up to recreational swimmers. Very few data currently exist concerning the influence of regular breath holding on possible health risks such as cerebrovascular, cardiovascular and respiratory diseases. A literature search of the PubMed electronic search engine using keywords 'breath-hold diving' and 'apnoea diving' was performed. This review focuses on recent advances in knowledge regarding possibly harmful physiological changes and/or potential health risks associated with breath-hold diving. Available evidence indicates that deep breath-hold dives can be very dangerous and can cause serious acute health problems such a collapse of the lungs, barotrauma at descent and ascent, pulmonary oedema and alveolar haemorrhage, cardiac arrest, blackouts, nitrogen narcosis, decompression sickness and death. Moreover, even shallow apnoea dives, which are far more frequent, can present a significant health risk. The state of affairs is disturbing as athletes, as well as recreational individuals, practice voluntary apnoea on a regular basis. Long-term health risks of frequent maximal breath holds are at present unknown, but should be addressed in future research. Clearly, further studies are needed to better understand the mechanisms related to the possible development or worsening of different clinical disorders in recreational or competitive breath holding and to determine the potential changes in training/competition regimens in order to prevent these adverse events

Eriksson H, de la Torre-Castro M, Olsson P. Mobility, expansion and management of a multi-species scuba diving fishery in East Africa. PLoS One. 2012;7(4):e35504. Epub 2012 Apr 17.

Scuba diving fishing, predominantly targeting sea cucumbers, has been documented to occur in an uncontrolled manner in the Western Indian Ocean and in other tropical regions. Although this type of fishing generally indicates a destructive activity, little attention has been directed towards this category of fishery, a major knowledge gap and barrier to management. METHODOLOGY AND PRINCIPAL FINDINGS: With the aim to capture geographic scales, fishing processes and social aspects the scuba diving fishery that operate out of Zanzibar was studied using interviews, discussions, participant observations and catch monitoring. The diving fishery was resilient to resource declines and had expanded to new species, new depths and new fishing grounds, sometimes operating approximately 250 km away from Zanzibar at depths down to 50 m, as a result of depleted easy-access stock. The diving operations were embedded in a regional and global trade network, and its actors operated in a roving manner on multiple spatial levels, taking advantage of unfair patron-client relationships and of the insufficient management in Zanzibar. CONCLUSIONS AND SIGNIFICANCE: This study illustrates that roving dynamics in fisheries, which have been predominantly addressed on a global scale, also take

place at a considerably smaller spatial scale. Importantly, while proposed management of the sea cucumber fishery is often generic to a simplified fishery situation, this study illustrates a multifaceted fishery with diverse management requirements. The documented spatial scales and processes in the scuba diving fishery emphasize the need for increased regional governance partnerships to implement management that fit the spatial scales and processes of the operation.

Holt J, Weaver LK. Carbon monoxide poisoning mimicking arterial gas embolism in a commercial diver. Undersea Hyperb Med. 2012 Mar-Apr;39(2):687-90.

A 32-year-old male commercial diver was working at 7,000 feet of altitude in a municipal water tank, at a depth of 27 feet for two hours. While surfacing from a compressed-air surface-supplied dive, he exhibited loss of consciousness and neurological symptoms. He was presumptively diagnosed with arterial gas embolism, flown by pressurized aircraft to a regional medical center and treated with hyperbaric oxygen. During the U.S. Navy Treatment Table 6, new information suggested the patient's air supply had been contaminated by a continuously running engine and compressor. His admission blood was then assayed for carboxyhemoglobin (COHb), which measured 8.8% six hours after surfacing, including four hours of normobaric oxygen inhalation. His estimated COHb based on rough reported half-life calculations at the conclusion of the dive was approximately 45%. The patient's diagnosis was changed to carbon monoxide poisoning from contaminated breathing gas. Upon hospital discharge, he exhibited problems with balance and gait, nystagmus, word-finding limitations and slurred speech. Also, he had cardiac injury treated with carvedilol. When evaluating diving-related casualties, including in commercial divers, clinicians should consider carbon monoxide poisoning as a differential diagnosis.

O'Leary JK, Potts DC, Braga JC and McClanahan TR. Indirect consequences of fishing: reduction of coralline algae suppresses juvenile coral abundance. Coral Reefs. 2012, Vol 31, Num 2, 547-559, DOI: 10.1007/s00338-012-0872-5.

Removing predatory fishes has effects that cascade through ecosystems via interactions between species and functional groups. In Kenyan reef lagoons, fishing-induced trophic cascades produce sea urchin-dominated grazing communities that greatly reduce the overall cover of crustose coralline algae (CCA). Certain species of CCA enhance coral recruitment by chemically inducing coral settlement. If sea urchin grazing reduces cover of settlement-inducing CCA, coral recruitment and hence juvenile coral abundance may also decline on fished reefs. To determine whether fishing-induced changes in CCA influence coral recruitment and abundance, we compared (1) CCA taxonomic compositions and (2) taxon-specific associations between CCA and juvenile corals under three fisheries management systems: closed, gear-restricted, and open-access. On fished reefs (gear-restricted and open-access), abundances of two species of settlement-inducing CCA, *Hydrolithon reinboldii* and *H. onkodes*, were half those on closed reefs. On both closed and fished reefs, juveniles of four common coral families (Poritidae, Pocilloporidae, Agariciidae, and Faviidae) were more abundant on *Hydrolithon* than on any other settlement substrate. Coral densities were positively correlated with *Hydrolithon* spp. cover and were significantly lower on fished than on closed reefs, suggesting that fishing indirectly reduces coral recruitment or juvenile success over large spatial scales via reduction in settlement-inducing CCA. Therefore, managing reefs for higher cover of settlement-inducing CCA may enhance coral recruitment or juvenile survival and help to maintain the ecological and structural stability of reefs.

Sureda A, Batle JM, Ferrer MD, Mestre-Alfaro A, Tur JA, Pons A. Scuba diving activates vascular antioxidant system. Int J Sports Med. 2012 May 4. [Epub ahead of print]

The aim was to study the effects of scuba diving immersion on plasma antioxidant defenses, nitric oxide production, endothelin-1 and vascular endothelial growth factor levels. Nine male divers performed an immersion at 50 m depth for a total time of 35 min. Blood samples were obtained before diving at rest, immediately after diving, and 3 h after the diving session. Leukocyte counts, plasma 8oxoHG, malondialdehyde and nitrite levels significantly increased after recovery. Activities of lactate dehydrogenase, creatine kinase, catalase and superoxide significantly increased immediately after diving and these activities remained high after recovery. Plasma myeloperoxidase activity and protein levels and extracellular superoxide dismutase protein levels increased after 3 h. Endothelin-1 concentration significantly decreased after diving and after recovery. Vascular endothelial growth factor concentration significantly increased after diving when compared to pre-diving values, returning to initial values after recovery. Scuba diving at great depth activated the plasma antioxidant system against the oxidative stress induced by elevated PO_2 associated with hyperbaria. The decrease in endothelin-1 levels and the increase in nitric oxide synthesis could be factors that contribute to post-diving vasodilation. Diving increases vascular endothelial growth factor plasma levels which can contribute to the stimulation of tissue resistance to diving-derived oxidative damage.

Van Meter K. Hyperbaric Oxygen Therapy as an Adjunct to Pre-hospital Advanced Trauma Life Support. Surg Technol Int. 2012 Dec 1;XXI:61-73. [Epub ahead of print].

Most commercial diving operations and naval operations have 24/7, on-site availability of hyperbaric oxygen therapy to perform routine surface decompression or immediate treatment of arterial gas embolism or decompression sickness. Availability and prompt use of hyperbaric oxygen therapy in the field for treatment of divers with dysbaric conditions has demonstrated its efficacy in acute, co-morbid conditions such as acute exsanguination, blast injury, crush injury, and cardiopulmonary arrest affecting those same divers. Hyperbaric oxygen therapy applied in these cases has demonstrated its utility to augment the efficacy of conventional, pre-hospital advanced cardiac life support and advanced trauma life support. Case studies gleaned from actual experience with the diving industry illustrate the use of hyperbaric oxygen therapy in these conditions. The unexpectedly favorable results have been replicated by controlled laboratory animal studies. The deck decompression or saturation multiplace chambers used by offshore diving operations can easily and quickly be converted for use as medical field resuscitative units. Lightweight and mobile hyperbaric chambers can be outfitted for use in ambulances or helicopters to address civilian street injury or military "far-forward" injury. These transport chambers are compact in design to be efficient transport stretchers designed to hold both the patient and the medical support clinician. It is hoped that hyperbaric oxygen therapy will gain an increasing role as an adjunct to pre-hospital advanced cardiac life support and advanced trauma life support resuscitative efforts as a low-cost, high-yield intervention. In this regard HBO as applied to ATLS/ACLS in civilian and military medical systems may be a productive, disruptive new application of technology.

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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