E-SLATE

American Academy of Underwater Sciences (AAUS)

EDITORIAL BOARD NOTE – December 2010

Welcome to the December issue of the E-Slate. This month's issue offers several new job opportunities and a special piece on submitted by former AAUS Scholarship winner Bonnie Rogers. Please continue to submit news, announcements, job postings, new publications and images of underwater work to aaus@disl.org. Current and past issues of the E-Slate are available at www.aaus.org.

AAUS SCHOLARSHIP RESEARCH

Can rockfish see after experiencing pop-eye?

Bonnie Rogers
M.S. Biology (CSU Long Beach)
Coadvisors: Dr. Christopher Lowe and Dr. Esteban Fernandez-Juricic

Fishers, divers, and other ocean-lovers are long familiar with the troubling appearance of a rockfish when it is brought to the surface. Common external signs of barotrauma resulting from rapid ascent to the surface from depth include a bloated abdomen, stomach sticking out of the mouth, and eyes protruding seemingly beyond comfort. There is no doubt why a recreational fisher might question whether a fish in this condition is still alive, and contemplate whether it would survive after release. Luckily, growing evidence suggests that rockfish are much more resilient than expected. Recent research in southern California demonstrated that rockfish exhibit high survival rates (~80%) when quickly returned to depth after capture (Jarvis and Lowe, 2008). So, although rockfish have a rough ascent to the surface, many have the ability to recover if forced back down to depth with the use of special release techniques. While it was discovered that recompression techniques may be used to reduce overall release mortality of rockfish, there was uncertainty whether released rockfish could survive in the long-term.

Like other fish, long-term survival requires finding food, habitat, and mates. For rockfish, these necessary elements are best found using vision. Rockfish have very large eyes and are strong visual predators. Scuba divers are well aware of a rockfish as it 'follows' you with its eyes as you swim past. It is no wonder that protruding eyes or 'pop-eye' as it is commonly referred, might have you question whether a rockfish suffering from barotrauma would have long-term visual impairment. Using magnetic resonance imaging (MRI), we discovered early on in our research that pop-eye is caused by a buildup of trapped gas behind the eyes during rapid fishing ascent (Rogers et al., 2008). This is apparently due to expanding gas from a ruptured swim bladder that travels up into the eye region (Hannah et al., 2008). Predictably, when rockfish are forced down to depth, these gases are recompressed to a smaller volume, allowing the eyes to return to normal position. But the relentless question remained, can they still see?

To answer this question, we tested the affect of pop-eye on the visual performance of rockfish using a behavioral eye exam. First, scuba-divers captured rockfishes in the kelp forest using hand-lines and bait. These fishes were caught in shallow water less than 33 ft (10 m) to prevent barotrauma injury, and baseline behavioral eye exams were conducted in the lab to determine their general range of vision. Much like how a rockfish visually tracks a scuba-diver with its eyes, a rockfish also tracks other moving objects in their visual space. Taking advantage of this natural eye-tracking response, we built a behavioral eye exam test, consisting of a series of black-and-white vertical bars that were rotated around the stationary fish. Very wide black and white bars, 5 cm wide, are easy for the fish to track, while very narrow bars, 0.19 cm, are more difficult. A fish that cannot visually resolve the bars will not be able to track the rotating bars. However, when a fish's eyes are able to track the bars, they demonstrate the ability to recognize moving objects. We used these baseline tracking-movements to establish the widths of bars we would present to fish that had experienced barotrauma.

Twelve rosy rockfish (*Sebastes rosaceous*) were captured on hook-and-line from depths of about 150-175 ft (45-53 m, or 60-70 psi), and all exhibited pop-eye. All fish were recompressed to depth within 10 minutes after capture; however, instead of using release techniques in the ocean to recompress fish to depth, we simulated pressure at depth using hyperbaric pressure chambers on-board the vessel. Fish were placed in the chambers and as expected, their eyes visibly resumed to normal position when recompressed. We could not test the vision of the fish in their chambers, so to avoid a second barotrauma event, the pressure in the chambers was slowly reduced over four days until reaching surface pressure. At that point, the fish could be safely removed. Each fish was presented with a series of eye exams, and the number of eye-tracking movements was recorded for each trial. After 30 days, we assessed their vision a second time to look for any changes in performance over time.

All 12 rosy rockfish originally had severe pop-eye causing their eyes to protrude an average of 60% beyond their normal position. However, the results of the eye exams indicated that all 12 fish were able to see the moving bars. In addition, their ability to track the moving bars increased over time, providing support that not only could they see after having experienced pop-eye and recompression, but that over time, there was also improvement in their performance.

The results of this study add support to the growing evidence that many rockfish are able to survive if released to depth. While the cause of these capture-injuries cannot be prevented during fishing ascent, there are tools that can be used to increase the survival of a released rockfish. Here are some great techniques for releasing rockfish: 1) permanently attach a barbless hook to a fishing weight, then hook the fish's lip; the fish will stay on the hook as you release it to depth on your line; when you reel up fast on your line, the fish will swim free at depth and stay at depth; 2) purchase a Shelton Fish Descender to attach to your line and use it to release fish to depth; 3) secure four weights on the bottom corners of an upside-down milk crate attached to a rope; place the fish in the upside-down crate and allow it to fall to depth; when you pull up on the rope, the fish will swim free at depth and stay at depth. For more information on rockfish barotrauma and releasing a buoyant rockfish that is unwanted bycatch or a no-take species, see: www.dfg.ca.gov/marine/pdfs/release.pdf.

So next time you catch a rockfish exhibiting pop-eye or other signs of barotrauma, give it a chance, and 'send it on down!' You never know, it may even look you back in the eye one day on a scuba dive!

NEWS/ANNOUNCEMENTS

AAUS/OWUSS Research Host Site Opportunity

AAUS has collaborated with Our World-Underwater Scholarship Society (OWUSS) to create a scientific diving internship program. This initiative will provide undergraduates with the experience and opportunities appropriate for a future in science, diving for research, or scientific diving-related fields. Applicants must be students from colleges and universities with an interest in science and diving. Interns will be trained to participate in research conducted at host facilities. AAUS/OWUSS will provide funding for travel to/from host facility, basic living expenses and other internship-related expenses. AAUS organizational members interested in the possibility of hosting a AAUS/OWUSS scientific diving intern should contact AAUS head office at aaus@disl.org. Students can apply for the internship at: www.owuscholarship.org. The submission deadline for the 2011 competition is January 31st.

FUNDING OPPORTUNITIES

NOAA/NFWF Grant - Coral Reef Conservation

The National Oceanic and Atmospheric Administration's Coral Reef Conservation Program, in cooperation with the National Fish and Wildlife Foundation (NFWF), has announced a new grant competition for coral reef conservation projects (domestic and international applicants). The request for proposals (RFP) can be seen at: http://www.nfwf.org/AM/Template.cfm?Section=Charter_Programs_List&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=60&ContentID=17700. Approximately $500K will be made available for this competition, which will leverage an equal amount of matching funds provided by applicant organizations for a total investment of approximately $1,000,000. See the RFP announcement for a description of the funding categories for this competition as well as other important application information. Brief pre-proposals are due on December 15, 2010 and must be submitted via the NFWF Easy Grants system. NFWF will also host a webinar on December 1st to discuss the priorities identified in the RFP and describe how to write a competitive application.

EQUIPMENT RECALLS

OTS Guardian Full Face Mask Recall

Ocean Technology Systems (OTS) Management has issued an urgent safety notice for the Guardian Full Face Mask (GFFM). Under certain conditions and/or usages, 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. Call 877-270-1984 or email recall@otscomm.com for more information. Note: OTS operating hours Monday-Friday 0730-1600 (PST).

EDGE BCD Recall

In cooperation with the US Consumer Product Safety Commission, EDGE Gear is issuing a voluntary recall on all EDGE FREEDOM buoyancy compensator devices (BCDs), some EDGE STEALTH 2 BCDs (units with red weight release handles for weight pockets are not involved), HOG 32 lb single tank wings identified as 'Made in China' and all EDGE 32, 38 and 58 lb wings. An EDGE Freedom BCD was returned to a dealer with a complaint of a broken spring in the over-pressurization valve (OPV). This is the first report of this issue brought to the attention of EDGE Dive gear and no injuries have been reported. Upon inspection of the unit involved and other used EDGE and HOG products utilizing the same OPV design it has been determined that

the springs in the OPV exhibit an unacceptable amount of corrosion. Immediately cease use of the identified products and return the product to an authorized Edge dealer or Edge for spring OPV replacement. Contact recall@edge-gear.com or 404-579-7631 for more information.

Mares Nemo Air Quick Connector Recall

Mares has discovered a quality issue involving the O-ring assembly of the Nemo Air Quick Connector. Under certain circumstances, the O-ring can fail and cause a slow leak of breathing gas through the Quick Connector, which could require a diver to surface quickly and face possible risk of injury or running out of air. The O-rings in some units may have been replaced in an earlier service campaign, but this recall requires replacing the entire metal quick connector female fitting at the end of the high pressure air hose that holds the O-ring (new Mares part no. 44200829). Replacement connector assemblies have a groove machined around the middle of the fitting which recalled units do not. All consumers should stop using any Nemo Air Dive Computer and all retailers should remove these units from distribution until they have been inspected by an authorized Mares Dealer/Service Center.

Affected product codes are:

414158 Dive Computer Nemo Air
414159 Dive Computer Nemo Air w/Compass
44200771 HP hose w/ Nemo Air Quick Connector
44200770 Quick Connector Assy. Female Nemo Air

Please contact an Authorized Mares Dealer/Service Center to schedule the removal and substitution of your Nemo Air computer Quick Connector Assembly Female with the new Nemo Air computer Quick Connector Assembly Female. If you want Mares to perform the above service procedures, please contact the customer service department (800-874-3236) for a return authorization number. For more information visit: www.mares.com.

SITECH Inflation Hose Recall

SITECH low-pressure hoses contain a flow-restricting insert that may malfunction, potentially causing an obstruction of air flow. Anyone with a hose subject to this recall (or other equipment that has been connected to such a hose) should stop use until the insert has been exchanged by knowledgeable service personnel. Recalled inflator hoses should be sent back to the Mares Dealer or Mares US Service Center so the insert can be removed at no charge.

The SITECH recall affects the following Mares products:

412012 Drysuit Polarfit TLM
412014 Drysuit Dryfit 3.5 LX UNI
412015 Drysuit Dryfit 3.5 NP UNI
412016 Drysuit Icefit 4.0 Latex Men
412017 Drysuit Icefit 4.0 Latex Women
412018 Drysuit Icefit 4.0 Neoprene Men
412019 Drysuit Icefit 4.0 Neoprene Women
412010 Drysuit Dryfit 3.5
412011 Drysuit Icefit 4.0
480094 Drysuit 3.5 LX Man W/Radial Boots
480095 Drysuit 3.5 LX Lady W/Radial Boots
480096 Icefit 4.0 LX Man
480097 Icefit 4.0 LX Lady
480098 Polarfit TLM LX Man
42150060 Hose W/Wing Puller

Visit: http://www.sitech.se/pages/default_uk.asp?SectionID=3562.

Halcyon Buoyancy Compensator Recall

Halcyon Manufacturing Inc., in cooperation with the US Consumer Product Safety Commission, has initiated a voluntary recall of select Eclipse, Evolve, Explorer, Pioneer and CCR35 buoyancy compensators (BCDs) manufactured between January 2006 and September 2008. In addition, select Halcyon inflatable devices (Lift Bags, SMBs, DAMs, Surf Shuttles and Diver Lift rafts) may also be affected. These BCDs or inflatable devices could develop excessive corrosion or rust of the stainless steel over-pressure valve (OPV) spring, causing failure. It is unlikely that most of these units will experience problems since the potential defect is limited to a small portion of the total number of OPV springs used during this time period. However, given the potentially serious implications, all OPV springs should be checked. Visit: www.halcyon.net/opv-recall.

UPCOMING EVENTS

50th Anniversary: Pennekamp State Park

The Coral Restoration Foundation (CRF) is hosting a celebration of the John Pennekamp Coral Reef State Park's 50th Anniversary in Key Largo, FL. It includes a one-day volunteer program on December 6th hosted by the Amoray Dive Resort. This program features a morning lecture and two afternoon dives (one to the CRF nursery and one to a reef restoration site). CRF will also participate in the Educational Fair and Environmental Expo on December 11 at Pennekamp Park. For more information, visit: http://www.fla-keys.com/pennekamp50/.

JOB OPPORTUNITIES

NSF Ocean Acidification and Coral Reef Tech. Applications are invited for a two-year (with potential for a two-year renewal), NSF-funded technician position at California State University, Northridge (CSUN), to support research in the area of ocean acidification (OA) and its effects on coral reefs. The successful candidate will work under the supervision of principal investigators RC Carpenter and PJ Edmunds (robert.carpenter@csun.edu and peter.edmunds@csun.edu), as well as a postdoctoral scholar, to elucidate the effects of OA on corals, algae, and coral reefs in Moorea. The research focuses on the ecophysiology of corals and algae, and spans investigative

scales from organisms to assemblages of species and natural communities; experiments will involve microcosms and in situ analyses. Candidates are expected to have an MS in a field-based marine biology topic, experience in the biology/ecology of marine organisms, a history of working in tropical environments, and a strong background in the maintenance of marine aquaria, biological laboratory skills, seawater chemistry, and marine field operations (driving of small boats, scuba diving, etc.). AAUS training (or equivalent) is required. The research involves significant periods (up to six months/year) of work overseas in Moorea, French Polynesia, and Hawaii. This position provides unique opportunities to work with a small team studying the biology of coral reefs in the Caribbean and Pacific, and work with colleagues in the Moorea Coral Reef LTER, and Hawaii. The salary includes benefits, with additional funds to support travel and research in Moorea and Hawaii. Applicants should submit a cover letter in which they describe their research training and interests, CV, and arrange to have two letters of reference submitted. All applications must be submitted through the CSUN website (http://www-admn.csun.edu/ohrs/employment/).

Academic Diving Program Coordinator - FSU

The Florida State University Coastal and Marine Laboratory (FSUCML) invites applications for the position of Coordinator of the Academic Diving Program (ADP), a non-tenure track faculty line. The FSUCML is committed to building a research program focused on coastal and marine issues of ecological importance. They seek a highly motivated individual with strong leadership skills who can build the underwater research capabilities of the ADP while serving as the University Diving Officer. They are particularly interested in someone who can strengthen the technical support for underwater research conducted by the faculty. The successful candidate will be responsible for the conduct, training, and operational aspects of all diving-related research, for supervising the technical and instructional staff of the ADP; for coordinating teaching of diving-related courses ranging from Introductory Compressed Diving to Science Diver Training, based on national certification standards, and provide support to faculty teaching other underwater courses. This person will also ensure compliance with dive safety regulations and dive planning guidelines following AAUS standards and applicable state and federal statutes, review standard operating procedures; develop recommendations for new activities for review and consideration by the Diving Control Board; and prepare reports and budgets. Visit: http://www.marinelab.fsu.edu/news/openings.html. To apply visit: https://jobs.fsu.edu. Review of applicants will continue until a successful candidate is identified.

Full Time Research Associate with SCCF

The Marine Laboratory of the Sanibel-Captiva Conservation Foundation in Sanibel, FL has an immediate opening for a full time research associate to conduct fieldwork relating to intertidal oyster habitats and water quality. Candidates must have a background in marine or estuary ecology and experience working with both invertebrates and vertebrates. A MS in environmental, marine or ecological sciences and scientific diving experience is preferred. Visit: http://www.sccf.org/content/120/Employment-Opportunities.aspx

Maritime Archaeology Assistants

Academic and fieldwork assistant position open for current or potential East Carolina University students. Candidates will be responsible for compiling maps and literature, planning lessons, conducting public education programs and preparing fieldwork experiments for ongoing projects in Africa and South Carolina. Interested students must qualify for Federal Work Study positions. Visit: https://ecu.peopleadmin.com/applicants/jsp/shared/frameset/Frameset.jsp?time=1279291470872.

MS/PhD Students: Caribbean Coral Reef Ecology

The Pawlik lab will be recruiting one or two new MS/PhD students for Spring or Fall 2011 to study the ecology of Caribbean coral reefs at University of North Carolina Wilmington (UNCW). The research program, funded by NSF and NOAA, includes research components in the Bahamas, southern Caribbean, and the Florida Keys, and has included missions in NOAA's Aquarius habitat. Visit: http://people.uncw.edu/pawlikj/index.html. Applicants should be highly motivated and independent, with an excellent academic record, references, and past field research experiences using scuba. Visit: http://people.uncw.edu/pawlikj/prosStudent.html.

NEW PUBLICATIONS

Angeletti L, Ceregato A, Ghirelli M, Gualandi B, Lipparini E, Malatesta D, Sperotti A, Taviani M. ROV-scuba integrated survey of the Montecristo Island Nature Reserve (Tuscan Archipelago National Park, Mediterranean Sea). Underwater Technol. 2010; 29: 151-4.

A remotely operated vehicle (ROV) survey aimed at exploring the waters around Montecristo Island, a nature reserve in the Tuscan Archipelago (Tyrrhenian Sea), was carried out in summer 2008 down to a maximum depth of ca. 160 m. The main target of this exploration was checking the potential occurrence of deepwater scleractinian corals. Whilst the ROV transects did not document any deepwater corals, they did reveal that the coarse detrital bottom of the Montecristo granitic edifice between 110–160 m was dominated by a crinoid facies made of *Leptometra phalangium* (Müller, 1841) with a density of up to 15 individuals per m^2.

Clark RN, Jewett SC. A new genus and 13 new species of sea stars (Asteroidea: Echinasteridae) from the Aleutian Island Archipelago. Zootaxa. 2010; 2571: 1-36.

A new genus and thirteen new species of echinasterid sea stars are described from nearshore waters of the Aleutian Islands. The new genus *Aleutihenricia* is distinguished from *Henricia* by the morphology and arrangement of the skeletal ossicles. *Henricia beringiana* D'yakonov, 1950 is designated as the type species. The new species described include *Aleutihenricia federi, Henricia lineata, H. uluudax, H. iodinea, H. rhytisma, H. gemma, H. echinata, H. vermilion, H. elachys, H. insignis, Odontohenricia aurantia, O. ahearnae,* and *O. violacea.* In addition to the descriptions, associations between echinasterids and sponges are briefly discussed. A key to the shallow water (<20 m) Echinasteridae of the Aleutian Islands is provided.

Collins KJ, Suonpää AM, Mallinson JJ. The impacts of anchoring and mooring in seagrass, Studland Bay, Dorset, UK. Underwater Technol. 2010; 29: 117-23.

Studland Bay, Dorset, on the central south coast of England is shallow and well protected from the prevailing south-west winds, making it an ideal habitat for a dense seagrass bed of *Zostera marina*. The shelter and proximity to the port of Poole make it a popular anchorage. Bare patches in the seagrass habitat associated with boat anchoring and mooring are described. Shear vane stress of the seabed was measured *in situ* by scuba divers. When comparing the undisturbed seagrass sediment with the bare, impacted areas, the latter sediments are less cohesive, contain less organic material and have a lower silt fraction, infaunal organism number and taxa. A mechanism for the progression of an anchor scar is suggested, involving storm wave induced mobilisation and dispersion of the impacted sediments exposing the underlying rhizome mat, which is further undermined by crabs. Results from this work and studies on other seagrass species suggest that the recovery is far from straightforward. It may take many years, leading to the decline of the Studland Bay seagrass habitat and associated species.

Conte AM, Caramanna G. Preliminary characterisation of a shallow water hydrothermal sulphide deposit recovered by scientific divers (Aeolian Islands, southern Tyrrhenian Sea). Underwater Technol. 2010; 29: 109-15.

Active hydrothermal vents, mainly occurring along the mid-ocean ridges, are also found in shallow-water environments in volcanic areas. This paper presents data for a shallow-water vent and associated sulphide hydrothermal deposits located east of the volcanic island of Panarea (Aeolian Archipelago, southern Tyrrhenian Sea). The vent lies at a depth of 25 m on the seafloor in an exhalative area characterised by the presence of several vents (Caramanna et al., 2003, 2005; Anzidei et al., 2005; Esposito et al., 2006). Samples of the hydrothermal deposits were collected by scientific divers in January 2007. The ore mineralogy components of the deposits, mostly Pb–As sulfosalt, Zn–Pb sulphide and barium sulphates, reveal a genetic analogy with late-stage, low-temperature products of Kuroko-type mineralisations in subduction-related tectonic settings.

Eash-Loucks WE, Jewett SC, Fautin DG, Hoberg MK, Chenelot H. *Ptychodactis aleutiensis*, a new species of ptychodactiarian sea anemone (Cnidaria: Anthozoa: Actiniaria) from the Aleutian Islands, Alaska. Mar Biol Res. 2010; 6: 570-8.

We describe a new species of ptychodactiarian sea anemone, *Ptychodactis aleutiensis*, and redefine the family Ptychodactiidae and the previously monotypic genus *Ptychodactis* to accommodate *P. aleutiensis* sp. nov. Individuals of the new species were photographed and collected at depths of less than 20 m off the Aleutian Islands, Alaska. Many were found detached, adrift in the water. The species differs from the only other member in its genus, *Ptychodactis patula*, in having more tentacles, tentacles only at the margin, frilled structures associated with only two siphonoglyphs, infertile primary mesenteries, oral stomata, holotrichous nematocysts of two size classes in the tentacles, actinopharynx, and mesenterial filaments, and by the morphology of the holotrichs and spirocysts. It is the fourth species of ptychodactiarian described; *Ptychodactis* is the only genus of suborder Ptychodacteae with more than one species.

Gempp E, Sbardella F, Stephant E, Constantin P, De Maistre S, Louge P, Blatteau JE. Brain MRI signal abnormalities and right-to-left shunting in asymptomatic military divers. Aviat Space Environ Med. 2010; 81(11):1008-12.

INTRODUCTION: We conducted a controlled study to assess the prevalence of brain MRI hyperintense signals and their correlation with right-to-left shunting (RLS) in military divers. METHODS: We prospectively enrolled 32 asymptomatic military divers under 41 yr of age and 32 non-diving healthy subjects matched with respect to age and vascular disease risk factors. We examined both groups with a 3-Tesla brain MRI; RLS was detected using transcranial pulsed Doppler in divers only. RESULTS: Hyperintense spots were observed in 43.7% of the divers and 21.8% of the control subjects. In particular, divers with significant shunting exhibited a higher prevalence of hyperintensities compared to those with slight or no RLS (75% vs. 25%, respectively). Linear trend analysis also revealed a positive correlation between focal white matter changes, determined using a validated visual rating scale and the RLS grade. CONCLUSION: Healthy military divers with a hemodynamically relevant RLS have an increased likelihood of cerebral hyperintense spots

compared to age-matched normal subjects. The clinical relevance of these MRI signal abnormalities and their causal relationship with diving remain unclear.

Jewett SC, Bodkin JL, Chenelot H, Esslinger GG, Hoberg MK. The nearshore benthic community of Kasatochi Island, one year after the 2008 volcanic eruption. Arct Antarct Alp Res. 2010; 42(3): 315-24.

A description is presented of the nearshore benthic community of Kasatochi Island 10–12 months after a catastrophic volcanic eruption in 2008. The eruption extended the coastline of the island approximately 400 m offshore, mainly along the south, southeast, and southwest shores, to roughly the 20 m isobath. Existing canopy kelp of *Eualaria* (*Alaria*) *fistulosa*, as well as limited understory algal species and associated fauna (e.g., urchin barrens) on the hard substratum were apparently buried following the eruption. Samples and observations revealed the substrate around the island in 2009 was comprised almost entirely of medium and coarse sands with a depauperate benthic community, dominated by opportunistic pontogeneiid amphipods. Comparisons of habitat and biological communities with other nearby Aleutian Islands, as well as with the Icelandic volcanic island of Surtsey, confirm dramatic reductions in flora and fauna consistent with an early stage of recovery from a large-scale disturbance event.

Kerckhof F, Rumes B, Jacques T, Degraer S, Norro A. Early development of the subtidal marine biofouling on a concrete offshore windmill foundation on the Thornton Bank (southern North Sea): first monitoring results. Underwater Technol. 2010; 29: 137-49.

In 2008 the building of a first windmill park some 30km off the Belgian North Sea coast began. Such offshore constructions represent a novel, artificial, hard substratum habitat on the Belgian continental shelf, where the sea-bottom consists mainly of sandy and muddy sediment. It is anticipated that in the coming years, several hundreds of offshore windmills will be constructed in a dedicated zone off the Belgian coast. scuba-based *in situ* techniques were used to document and sample the fouling assemblage on the hard substratum represented by the concrete foundations of the first windmills constructed in Belgian waters. Here this paper presents and discusses the results of the monitoring undertaken from February 2009 to February 2010. Despite the further offshore location and differences in substratum type, the preliminary results indicated that the overall structure of the marine biofouling assemblage at the Thornton Bank site is similar to that on the foundations of other offshore wind farms in Germany, Denmark and the Netherlands, as well as on other hard structures in the North Sea.

Ljubkovic M, Dujic Z, Møllerløkken A, Bakovic D, Obad A, Breskovic T, Brubakk AO. Venous and Arterial Bubbles at Rest after No-Decompression Air Dives. Med Sci Sports Exerc. 2010 Nov 11. [Epub ahead of print].

PURPOSE: During scuba diving, breathing at increased pressure leads to a greater tissue gas uptake. During ascent, tissues may become supersaturated and the gas is released in the form of bubbles that typically occur on the venous side of circulation. These venous gas emboli (VGE) are usually eliminated as they pass thorough the lungs, although their occasional presence in systemic circulation (arterialization) has been reported and it was assumed to be the main cause of the decompression sickness. The aim of the present study was to assess the appearance of VGE following air dives where no stops in coming to the surface are required and to assess their potential occurrence and frequency in the systemic circulation. METHODS: Twelve male divers performed six dives with three days rest between them following standard no-decompression dive procedures: 18/60, 18/70, 24/30, 24/40, 33/15 and 33/20 (the first value indicates depth in meters of sea water and second bottom time in minutes). VGE monitoring was performed ultrasonographically every 20 minutes for 120 minutes after surfacing. RESULTS: Diving profiles used in this study produced unexpectedly high amount of gas bubbles with most dives resulting in grade 4 (55 out of 69 dives), on the bubble scale of 0-5 (no to maximal bubbles). Arterializations of gas bubbles were found in 5/12 divers (41.7%) and following 11/69 (16%) dives. These VGE crossovers were only observed when a large amount of bubbles was concomitantly present in the right heart. CONCLUSION: Our findings indicate high amounts of gas bubbles produced following no-decompression air dives based on standardized diving protocols. High bubble loads were frequently associated with the crossover of VGE to the systemic circulation. Despite these findings, no acute decompression-related pathology was detected.

Palozzi R, Caramanna G, Albertano P, Congestri R, Bruno L, Romano R, Giganti MG, Zenobi R, Costanzo C, Valente G, Polani D, Vecchio M, Vinci M, Sbordoni V. The underwater exploration of the Merro sinkhole and the associated diving physiological and psychological effects. Underwater Technol. 2010; 29: 125-34.

The Pozzo del Merro (Merro sinkhole), a few kilometres away from Rome, Italy, is the deepest flooded karstic cavity known in the world. Over the last two years, a multi-disciplinary scientific research project studied the almost unknown aquatic ecosystem of the sinkhole while also studying the psychological and physiological reactions of scientific divers operating in the very hostile underwater environment. This paper presents a

preliminary overview of the seven studies carried out in parallel and attempts to highlight the fundamental role of scientific diving in contributing to increased knowledge about this extreme environment. The discovery of two exotic species in the sinkhole represents a paradigmatic case of the problem of invasive species introduction in such a unique environment. The project also included research on human diving physiology, pathology and psychology through monitoring of all the divers (plus one freediver) working in the Merro sinkhole.

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

AAUS BOARD OF DIRECTORS