



GLOBAL EDITION
July 2011
Number 43

PACIFIC
Yap

British Columbia
Port Hardy

Sweden
**Tech Wreck
Park**

Caribbean
**Southern
Belize**

Ecology
Mangroves

China
Qian Dao Lake

Sharks
Broadnose Sevengill

DIRECTORY

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**PUBLISHER
& EDITOR-IN-CHIEF**
Peter Symes
Editor@xray-mag.com

SENIOR EDITOR
Michael Symes, PhD
science@xray-mag.com

**PUBLISHER / EDITOR
& CREATIVE DIRECTOR**
Gunild Symes
Gunild@xray-mag.com

SECTION EDITORS
Michael Arvedlund, PhD
- *Ecology*
Scott Bennett - *Photo & Travel*
Andrey Bizyukin, PhD - *Features*
Mathias Carvalho - *Wrecks*
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Cindy Ross - *GirlDiver*
Arnold Weisz - *News, Features*

**ASSOCIATE EDITORS
& REPRESENTATIVES**
Americas & Europe
Arnold Weisz
Arnold@xray-mag.com

CORRESPONDENTS
Robert Aston - CA, USA
Enrico Cappeletti - Italy
John Collins - Ireland
Marcelo Mammana - Argentina
Nonoy Tan - The Philippines

Russia
Andrey Bizyukin, PhD, Moscow
Andrey@xray-mag.com

Svetlana Murashkina, PhD, Moscow
Svetlana@xray-mag.com

CONTRIBUTORS THIS ISSUE

Scott Bennett
Daniel Brinckmann
Kate Clark
Aaron Gekoski
Julia Golosiy
Wayne Grant
Bob Halstead
Tyge Dahl Hermansen
Scott Johnson
Brian Keegan
Millis Keegan
Elaine Kwee
Kelly LaClaire
Rosemary E Lunn
Barb Roy
Don Silcock
Gunild Symes
Peter Symes
Arnold Weisz
Lawson Wood
Phillip "Gisborn" Yakimov

South East Asia
Catherine GS Lim, Singapore
Cat@xray-mag.com

**ASSISTANT EDITORS
& REPRESENTATIVES**
UNITED KINGDOM
Roz Lunn, London
Roz@xray-mag.com

USA East Coast
Millis Keegan, Fort Lauderdale
Millis@xray-mag.com
Wayne Fenior, Orlando
Wayne@xray-mag.com

USA Pacific Northwest/Canada
Barb Roy, Vancouver
Barb@xray-mag.com
Kelly LaClaire, Oregon
Kelly@xray-mag.com

USA West Coast
Matthew Meier, San Diego
Matt@xray-mag.com

Contacts page: Xray-Mag.com

ADVERTISING
UNITED KINGDOM
Rosemary E Lunn, London
Roz@xray-mag.com

International Sales Rep
Arnold Weisz
Sales@xray-mag.com

USA West Coast
Matthew Meier, San Diego
Matt@xray-mag.com

French speaking territories
Mathias Carvalho
Mathias@xray-mag.com

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COVER PHOTO: *King Crab on Kelp, Lucan Chute, Port Hardy, British Columbia, Canada*, by Barb Roy

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Hawksbill sea turtle, Southern Belize. Photo by Kate Clark



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Death Porn, no thanks

A middle-aged gentleman on his annual two-week vacation at a resort plays a game of tennis and drops dead on the court from a heart attack. Would that qualify as a 'tennis accident'? Would we see tennis magazines or websites make a mention of another 'tennis death'?

A lady in her 40's suffers a stroke and collapses during her Saturday shopping in the mall. Is that a *shopping fatality*?

It's ridiculous, right?

These people all died from common maladies resulting from modern unhealthy lives. Too many French Fries or cookies and a sedentary life style is what killed them.

Yet, if any of these persons had suffered their heart attack or strokes in the water during a dive or swimming back to the dive boat, it would immediately be labelled as a dive accident, and everybody would be up in arms, somber editorials would be written and admonitions given.

It's gotta stop.

Traffic accidents kill and injure a lot of people every year, but

could you imagine a car show, such as BBC's very popular *Top Gear*, make statements as to the weekly number of fatalities or injuries? Or how about travel magazines interspersing their articles about vineyards in France, cruises on the Nile and museums in New York with reports of tourists being abducted by terrorists or mugged in a dark alley?

That would come across as rather odd.

So, why is it that the diving press seems to have this morbid propensity for revelling in fatalities?

Diving is a wonderful past time giving many of us joy and adventure. Diving is also by any reasonable yardstick quite safe—even the insurance companies have to appreciate that.

Sure, there are some high-profile incidents, such as known personalities meeting their untimely demise, but many of these most unfortunate events are often associated with exploratory or deep dives with high levels of complexity. Yet, comparing cave divers pushing the envelope in pursuit of the unknown with the average

diver who mostly dives on holidays or perhaps on weekends is like making inferences from Formula One racing to commuting to work, or comparing the climbing of Mount Everest to hiking in the national forest. Technical divers are aware of the added risk; they're trained to handle it, and they accept it. And that is a completely different matter than going on a leisurely shallow dive to watch the clown fish and corals with friends or family on a vacation.

Like the general car industry benefits from research and developments in F1 and much of the outdoor wear we use today have mountaineering to thank for its existence, we can and indeed should learn from accidents and use the insights gained to make the sport even more safe. But that is a separate issue.

Nothing in life is totally risk free, and people die every day from a wide variety of causes including disease and starvation. Diving is all about living life and not about losing it.

Let's keep that in mind. ■





X-ray mag

News edited
by Peter Symes
& Scott Bennett

NEWS *out of the deep*

A two-week marine survey conducted by scientists with Conservation International (CI) in Indonesia, along with local partners, led to the discovery of eight potentially new species of fish and a potentially new species of coral in the waters surrounding the island of Bali.

Text by Arnold Weisz. Photos courtesy of Conservation International / Gerald Allen

A two-week marine survey conducted by scientists with Conservation International (CI) in Indonesia, along with local partners, led to the discovery of eight potentially new species of fish and a potentially new species of coral in the waters surrounding Bali island.

Among the potentially new species

documented were two types of cardinalfish, two varieties of dottybacks, a garden eel, a sand perch, a fang

blenny, a new species of goby and a previously unknown Euphyllia bubble coral. Further study will need to be done to confirm the taxonomy of each species.

Coral reefs recovering

This Rapid Assessment Program (RAP) survey, along with a previous survey conducted by CI and partners for the Bali government in November of 2008, documented 953 species of reef fish and 397 species of coral in the waters off the coast of Bali.

"We carried out this present survey in 33 sites around Bali, nearly completing a circle around it, and were impressed by much of what we saw," said Dr Mark Erdmann, senior advisor for the CI Indonesia marine program.

"There was a tremendous

variety of habitats, surprisingly high levels of diversity and the coral reefs appeared to be in an active stage of recovery from bleaching, destructive fishing and crown-of-thorns starfish outbreaks in the 1990's." Acting Executive Director for CI-Indonesia Ketut Sarjana Putra added, "Compared to 12 years ago, we observed an increase in healthy coral reef cover in the area surveyed, indicating a recovery phase. That is why it needs serious protection and management, to complete the revitalization."

Though the survey found the reefs to be recover-

ing well, with a seven-to-one ratio of live to dead coral, the RAP survey team observed that commercially important reef fish were severely depleted. In over 350 man-hours of diving, the team only observed a total of three reef sharks and three Napoleon wrasse—a stark contrast to a healthy reef system where a diver would readily encounter this number of large reef predators in a single dive.

The team also saw that plastic pollution was omnipresent and noted the encroachment of fishers on no-take areas in the West Bali National Park.



Improving sustainability

"This RAP survey highlights how important these Marine Protected Areas are to improving economic returns from marine tourism while

also providing food security and ensuring the sustainability of small-scale artisanal fisheries," Erdmann said.

Among the recommendations made by the CI team are a prioritization of which



© CONSERVATION INTERNATIONAL / GERALD ALLEN

New Marine Species Discovered on Bali Reefs

CLOCKWISE FROM RIGHT:
Parapercis new sand-
perch; Grallenia new
goby; Apogon new car-
dinalfish; Pseudochromis
new dottyback



areas need immediate protection, the need for spatial planning to reduce the clash between marine tourism and many unsustainable fishing practices, the need to commit to enforcement and public funding to manage the MPAs and the need for strict measures to be put in place to manage pollution from plastics, sewage and agricultural runoff. The survey, part of CI's 20-year long Rapid Assessment Program (RAP), was

undertaken by CI at the request of the Bali provincial government and the Department of Fisheries and Marine Affairs to assess reef health and provide management recommendations for 25 areas proposed to be developed into a network of Marine Protected Areas (MPA) in Bali, which will be designed to be ecologically-connected and resilient.

CI's partners in the Marine RAP survey include the Bali

Government's Office of

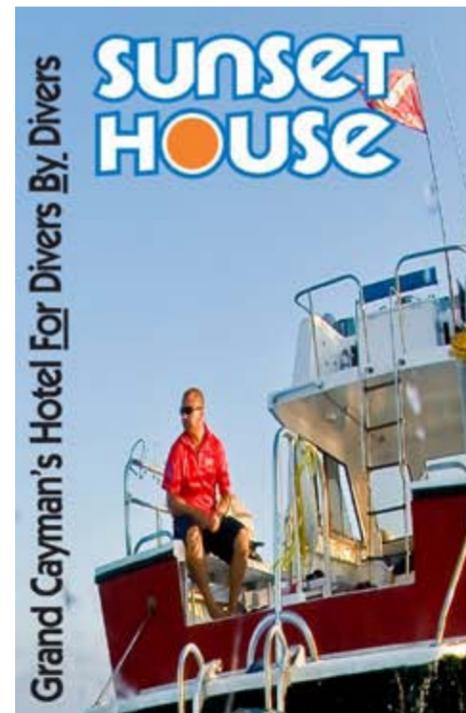


Marine Affairs and the Bali Department of Fisheries, as well as the Marine Research and Observation Office and Warmadewa University. Funding for the scientific survey was provided by USAID Indonesia as part of Coral Triangle Support Partnership (CTSP). The Coral Triangle Support Partnership-Indonesia (CTSP-I) is a collaborative five-year project to bring about the protection of marine systems and their myriad habitats for the benefit and sustainable livelihoods of communities across the Coral Triangle Region of Indonesia, which is the global center of marine biodiversity—with

the most diverse marine ecosystems in the world, and more than 500 species of coral, at least 3,000 species of fish and the greatest remaining mangrove forests on Earth. ■



Manonichthys new dotty-
back (left); Meiacanthus
new fangblenny (right)



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Supporting Publications



"This intriguing finding demonstrates that changes at the top of the food web can affect even the most fundamental ecosystem processes."

David Garrison, director of NSF's Biological Oceanography Program

Jellyfish Blooms Transfer Energy from Fish to Bacteria

A new study by researchers at the Virginia Institute of Marine Science shows that jellyfish have a more significant impact, drastically altering marine food webs by shunting food energy toward bacteria. An apparent increase in the size and frequency of jellyfish blooms in coastal and estuarine waters around the world during the last few decades means that jellies' impact on marine food webs is likely to increase in the future.

"Jellyfish are voracious predators," said Rob Condon—a scientist at the Dauphin Island Sea Lab (DISL) in Alabama. "They affect food webs by capturing plankton

that would otherwise be eaten by fish, and converting that food energy into gelatinous biomass. This restricts the transfer of energy up the food chain, because jellyfish are not readily consumed by other predators." Jellyfish also shunt food energy away from fish and shellfish that humans like to eat through their effects on the bacterial community.

"Marine bacteria typically play a key role in recycling carbon, nitrogen, phosphorus and other by-products of organic decay back into the food web," said Condon. "But in our study, we found that when bacteria consumed dissolved organic

matter from jellyfish they shunted it toward respiration rather than growth."

The upshot of this "jelly carbon shunt" is that bacteria in jelly-laden waters end up converting carbon back to carbon dioxide, rather than using it to grow larger or reproduce. This means the carbon is lost as a direct source of organic energy for transfer up the food web.

The researchers think the shift toward bacterial respiration happens because jellyfish produce organic matter that is extra-rich in carbon. ■

SOURCE: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

Edited
by Matt Meier

First species of mushroom found to be growing *underwater*

The International Institute for Species Exploration has named its top new species discovered in 2010, and an Oregon mushroom, *Psathyrella aquatica*, is on the list. *Aquatica* is the first species of mushroom with gills that scientists have observed fruiting underwater.



The mushroom appears to be quite strong and can stand up to fast-moving river currents. It was found in 2005 in the Rogue River in the U.S. state of Oregon by Southern Oregon University professor Robert Coffan and described in the journal *Mycologia* in 2010. Gilled mushrooms usually reproduce using spores that travel through the air. He said that it raised the ques-

tion of whether other species of gilled mushroom could be found in streams. Biologists at Southern Oregon University studied the mushroom and decided last year that it was a genetically unique species that grew in river gravels and on submerged logs, and wasn't accidentally washed into the river.

Psathyrella aquatica is a new

species of Basidiomycota with true gills that has been observed fruiting underwater in the clear, cold, flowing waters of the upper Rogue River in Oregon. Fruiting bodies develop and mature in the main channel, constantly submerged, near aquatic vegetation, and where observed fruiting over 11 weeks. Its sequence data place this fungus in the genus *Psathyrella*. These appear to be truly underwater mushrooms and not mushrooms fruiting on wood recently washed into the river.

Substrates include water-logged wood, gravel, and silty river bed. Water constrains spore dispersal. Spores were observed as wedge-shaped rafts released into a gas pocket under the cap. Underwater gills and ballistospores indicate a recent adaptation to the stream environment.

This particular river habitat combines the characteristics of spring-fed flows, clear, cold, aerated water with woody debris in shallow depths on a fine volcanic substrate. The presence of nitrogen-fixing cyanobacteria near fruiting body attachment sites suggests a source of nitrogen in an otherwise clear stream. This observations adds to the biodiversity of stream fungi that degrade woody substrates. ■

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Lucrecia ERBERA, Anna LO PINTO, Alessia TERES, Andrea COSTA, Parthivaria, Italie



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Nudibranch
(*Coryphella verrucosa*) on hydrozoans
(*Eudendrium* sp.).
Fladen, Kattegat,
Denmark



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Oceana: Baltic Sea is heading towards collapse

Photos courtesy of Oceana

Oceana concluded one of its most comprehensive expeditions to date to document species and habitats in the region around the Baltic Sea. The international marine conservation organization completed over 100 dives with an underwater robot (ROV) and a team of divers in the coastal countries.

The Baltic covers an area of 415,266 square kilometres in Northern Europe, almost entirely surrounded by nine different countries. Baltic Sea is a very unique brackish water environment. But, at the same time, it's one of the most polluted

seas in the world. In addition, destructive fishing practices like bottom trawling, high levels of by-catch and illegal, unregulated and unreported fishing all lead to the degradation of its marine habitats.

The objective of the expedition, which

covered 7,000 nautical miles in two months, was to collect data on the state of conservation of the Baltic to prepare proposals to improve the network of Marine Protected Areas and their management.

"There is no precedent of any other international expedition that has covered all the Baltic countries and filmed depths ranging from three to 450 meters—the deepest area being Landsort Deep, Sweden," explained Xavier Pastor, executive director of Oceana Europe and the leader of the expedition. "Oceana's expedition is valuable because it proves that there are areas still rich in biodiversity in this devastated sea—areas that show how the Baltic Sea can look like if adequately protected. We've also seen areas that have been completely destroyed or are heavily polluted, proof of the lack of adequate conservation measures."

Seventy percent of the dives were

The Oceana *Hanse Explorer* in the Baltic Sea



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ABOVE: Chameleon prawn (*Hippolyte varians*). Hirsholmene Marine Reserve, Kattegat, Denmark; Oceana diver (top right) watching a fourhorn sculpin (*Triglopsis quadricornis*) on the seabed. Långron, Bothnian Sea, Sweden





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Nudibranch (*Dendronotus frondosus*). Fladen, Kattegat



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Dead man's fingers. Kattegat, Sweden



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Fourhorn sculpin (*Triglopsis quadricornis*) on the seabed. Älgön, Bothnian Sea, Sweden;
 Diver in the seabed. Kopparstenarna, Northern Baltic Proper, Sweden

completed with an ROV capable of filming marine life in high resolution. The divers took photographs and video footage of the shallow areas, in some cases at temperatures below zero. This graphic documentation was completed with samples of sediments and macroorganisms taken with a Van Veen dredge and a CTD—a device which measures hydrographical data such as salinity, temperature, oxygen, chlorophyll.

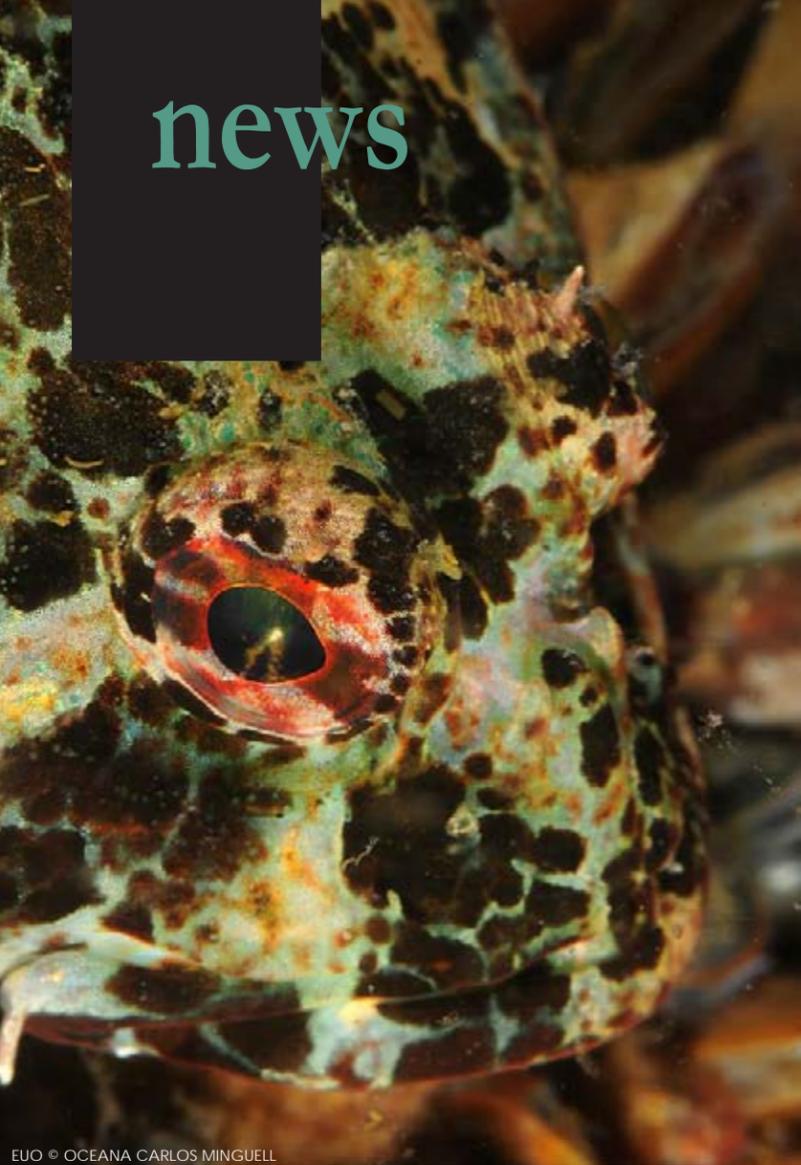
In the coming months, marine scientists from different countries will study this data, including experts specialized in visually identifying species filmed with the ROV. Oceana will publish proposals with specific conservation measures based on the results of this analysis.

Oceana's team on board the *Hanse Explorer* also documented fishing

activities in the Baltic, filming dozens of vessels from different countries using a variety of fishing gear. These observations will be combined with the data obtained from official sources and other analyses of the fishing sector in the Baltic Sea countries compiled by the organization.

"One of Oceana's characteristics is that our campaigns are not only based on analyzing scientific research, facts and figures, but on doing our own field work as well. This expedition will be a tool to promote the creation of an effective network of Marine Protected Areas that includes all types of habitats and species, while also promoting more responsible fisheries management in the Baltic," stated Anne





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ABOVE: Blue jellyfish (*Cyanea lamarckii*). Kattegat, Sweden; Shorthorn sculpin (*Myoxocephalus scorpius*). Kalmarsund, Western Gotland Basin, Sweden (left)

Schroerer, Oceana's Project Manager in the Baltic.

ICES, the International Council for the Exploration of the Seas, published their advice on recommended catch amounts for Baltic fish stocks in 2012. Based on this advice, the European Commission will propose a Total Allowable Catch (TAC) per fish stock.

While around 60 different fish species are caught in the Baltic Sea for consumption, ICES has only given advice for ten of them. The rest of species remain largely unmanaged despite the fact that many

are overfished, and some like the European Whitefish are threatened species according to the Helcom redlist.

However, after a decade during which countries ignored their obligations to report scientific data, this is the first time that ICES scientists applied the precautionary approach and advised a TAC for brill, dab and plaice that is not higher than catches in 2010 and a reduction of catches for flounder and turbot, all of which are currently unmanaged.

The species for which ICES gives advice, cod, herring, sprat, salmon and sea trout are overfished and most of the stocks are far from making sustainable fisheries possible. The situation is particularly bad for western Baltic cod, which is only very slowly recovering from an almost depleted state, and for the central Baltic herring, which is still severely overfished. In fact, ICES scientists recommended a 2012 catch limit for western Baltic cod that is

much too high given member states' requirement to reach Maximum Sustainable Yield by 2015. Meanwhile, after the 2011 ICES recommendations on herring stocks were ignored, scientists now advise a further reduction of catches as the current catch level is unsustainable.

Oceana Baltic Sea project manager

Schroerer commented, "This is the first time that scientists have followed the legal obligation to apply the precautionary approach and propose catch limits for stocks that are currently unmanaged as Oceana requested. That is a big step forward." ■



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European flounder (*Platichthys flesus*). Kopparstenarna, Northern Baltic Proper, Sweden



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Painted goby (*Pomatoschistus pictus*), Örskar, Bothnian Sea, Sweden

EUO © OCEANA CARLOS MINGUELL

Edited
by Arnold Weisz

Asteroid Research Begins Under the Sea

A NASA team is going underwater in the U.S. Florida Keys to lay the groundwork for the space agency's first simulated journey to an asteroid.

To determine how best to explore asteroids in the future, U.S. National Aeronautics and Space Administration (NASA) scientists and engineers are taking their experiments underwater in the 15th expedition of NASA Extreme Environment Mission Operations, or NEEMO. This year's NEEMO expedition, which will include the usual compliment of astronauts and engineers, is slated for October. Since this is the first

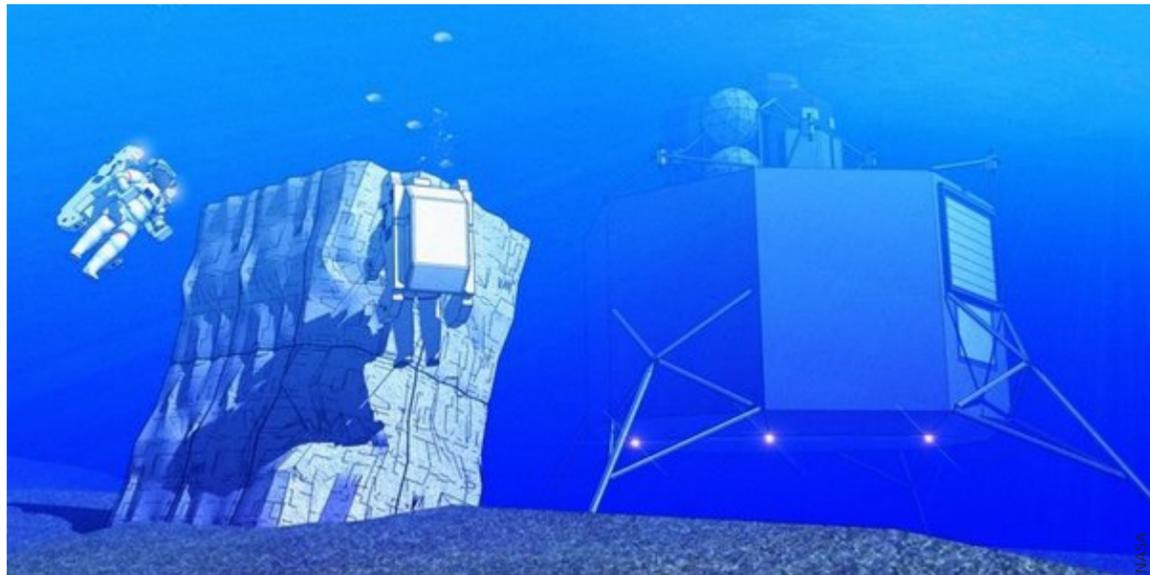
mission to simulate a trip to an asteroid, there's a lot of work to do before the mission can start. To prepare, engineers have journeyed to the National Oceanic and Atmospheric Administration's Aquarius Underwater Laboratory near Key Largo, Florida, to work through some of the concepts that will be tested in the fall.

"Even experts don't know what the surface of an asteroid is going to be like," said NEEMO project

manager, Bill Todd. "There may be asteroids that we don't even know about yet that we'll be visiting. So, we're figuring out the best way to do that."

The aim is to determine which tools and techniques work best for asteroid exploration. NASA has gotten quite familiar with micro-gravity operations on the International Space Station, and traveling around the moon or Mars doesn't pose all that much of a chal-

lenge, gravity-wise. In a sense, making your way around an asteroid combines the worst of both worlds: Most asteroids are so small, it's virtually like working in zero-G. But unlike the space station, there are no built-in handholds or railings. "We have no control over what this asteroid looks like," NASA astronaut Mike Gerhardt said. ■



An artist's conception shows astronauts practicing for asteroid exploration on an underwater rock wall



NEEMO engineering crew diver simulates anchoring to an asteroid surface



Ocean warming detrimental to inshore fish species



To assess the impacts of this temperature increase on a marine species, the research team analysed long-term changes in the growth rates of the banded morwong (*Cheilodactylus spectabilis*)

WIKIPEDIA

Australian scientists have reported the first known detrimental impact of southern hemisphere ocean warming on a fish species.

Surface water temperatures in the Tasman Sea have risen by nearly 2°C over the past 60 years. This warming, one of the most rapid in the southern hemisphere oceans, is due to globally increasing sea-surface temperatures and local effects caused by southward extension of the East Australian Current.

“Generally, cold-blooded animals respond to warming conditions by increasing growth rates as temperatures rise,” CSIRO marine ecologist Dr Ron Thresher said. “But theory and laboratory studies show that this has a limit. As temperatures get too high, we begin to see increased signs of stress, possibly eventually leading to death. We are looking at whether climate change is beginning to push fish past their physiological limits.

“By examining growth across a range that species inhabit, we found evi-

dence of both slowing growth and increased physiological stress as higher temperatures impose a higher metabolic cost on fish at the warm edge of the range. In this case, off northern New Zealand, ocean warming has pushed the banded morwong—which inhabits temperate reefs in waters 10-50m deep—past the point where increasing temperatures are beneficial to growth.”

Influence on body function

Climate change can affect species directly by influencing how their bodies function, their growth and behaviour and indirectly through environmental effects on ecosystems. To assess the impacts of this temperature increase on a marine species, the research team analysed long-term changes in the

growth rates of the banded morwong (*Cheilodactylus spectabilis*). These fish can live for almost 100 years and, as adults, they stay in essentially the same area even if the water temperature shifts.

The bony structures fish use for orientation and detection of movement—called otoliths—have annual growth rings which were measured for changes. Similar to growth rings in trees, they can be counted to indicate a fish’s age and annual growth rate, estimated by measuring distances between each new ring.

Dr Jeremy Lyle from the University of Tasmania said the study showed that growth performance in banded morwong began to suffer above average annual water temperatures of about 17°C. ■

Seagrasses are disappearing

Across the globe, seagrass species are disappearing at an alarming rate, with some species now threatened with extinction. The first global survey of individual seagrass species has discovered that 14 percent are at risk of becoming extinct. Common species are also in decline, indicating a loss of habitat.

Heading up the survey was Professor Frederick Short of the University of Hampshire in Durham, North Carolina, USA, and director of SeagrassNet, an international seagrass monitoring program with 114 sites around the world.

Along with an international team of experts, Short convened three workshops to gather all the knowledge about individual seagrasses, utilizing the findings to evaluate how each species is at risk. The workshops were hosted by Conservation International, the Global Marine Species Assessment programme and SeagrassNet.

Forming vast meadows that flower and seed underwater, seagrasses form important marine habitats, providing food and habitat for a plethora of ocean species. As well as being nurseries for young fish, they are also the primary food for large marine mammals such as

manatees and dugongs. They also contribute to the health of a variety of marine habitats ranging from coral reefs to mangroves, salt marshes and oyster reefs. Seagrasses have vanished from the most developed coastlines due to a mixture of sedimentation and runoff

have both an overall loss of habitat and a loss of bio-diversity,” stated Short. “Seagrasses are both direct food for important species, and as they break down within the coastal ecosystem, they are part of a vast food web that provides food to many organisms within

the coastal ocean, including many commercially and recreationally important species.”

The team discovered that 15 of the 72 seagrass species should be considered Endangered, Vulnerable or Near Threatened, under criteria laid

down by the International Union for Conservation of Nature (IUCN) Red List. Of those, ten face a significant extinction risk. Results of the study have been published in the journal *Biological Conservation*. ■



See grass bed. If you look closely you will see a school of razor fish

from impacted watersheds and deforestation.

“Many widespread, common seagrass species, which are not presently threatened, are nonetheless in decline, so we



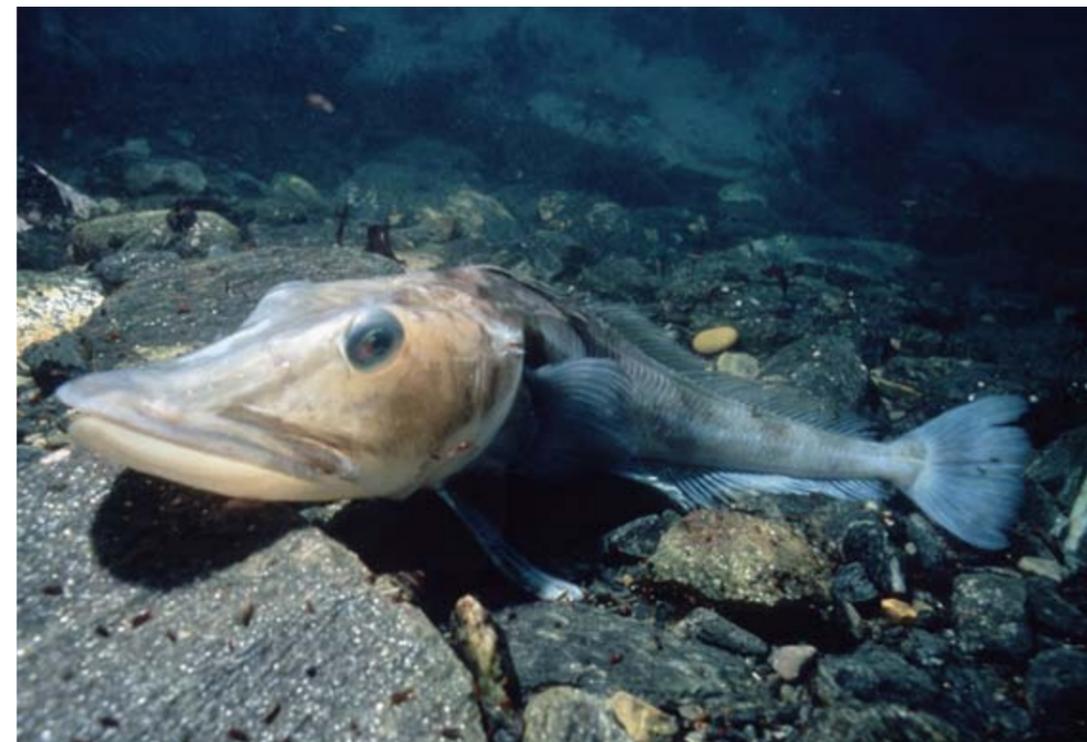
South Georgia is the most biodiverse island in Southern Ocean



island is home to the densest mass of marine mammals on Earth, making it the the richest area for marine life in the Southern Ocean. Highly diverse, poorly studied and uniquely threatened by climate change: an assessment of marine biodiversity on South Georgia's continental shelf by Oliver T Hogg, David K. A Barnes and Huw J. Griffiths is published online in *PLoS ONE*.

entific cruises, fisheries vessels and by scuba divers from the seas encircling the islands resulting in approximately 1,500 species being recorded from 17,000 specimens. Species identified include sea urchins, free-swimming worms, fish, sea spiders and crustaceans, with many rare and occurring nowhere else on Earth. "This is the first time anybody has mapped out the biodiversity of a small polar archipelago in

Specimens were obtained via sci-



South Georgia is richer in biodiversity than even many tropical sites, such as the Galapagos Islands.

Photos courtesy of the British Antarctic Survey

The first comprehensive study of sea creatures around the sub-Antarctic island of South Georgia has revealed a region richer in biodiversity than even the fabled Galapagos Islands. Made famous by great polar explorer Sir Ernest Shackleton's expedition, the sub-Antarctic island of South Georgia is one of the remotest outposts of Great Britain's

overseas territories.

Reporting recently in the online journal *PLoS ONE*, a team from British Antarctic Survey (BAS), funded by the British Government's Darwin Initiative and the South Georgia Heritage Trust analyzed over 130 years of polar records, discovering a biodiversity that exceeds that of Galapagos and Equador in terms of the number of species inhabiting its shores. According to lead author Oliver Hogg from BAS, the





the Southern Ocean. If we are to understand how these animals will respond to future change, a starting point like this is really important," added Hogg.

The near-surface waters around South Georgia are some of the fastest warming on Earth, so this study provides a framework to identify ecologically sensitive areas and species, identify conservation priorities and monitor future changes. Over an 81-year period from 1925-2006, researchers observed significant warming, with a mean increase of 0.9°C in January and 2.3°C in August in the top 100m of the water column.

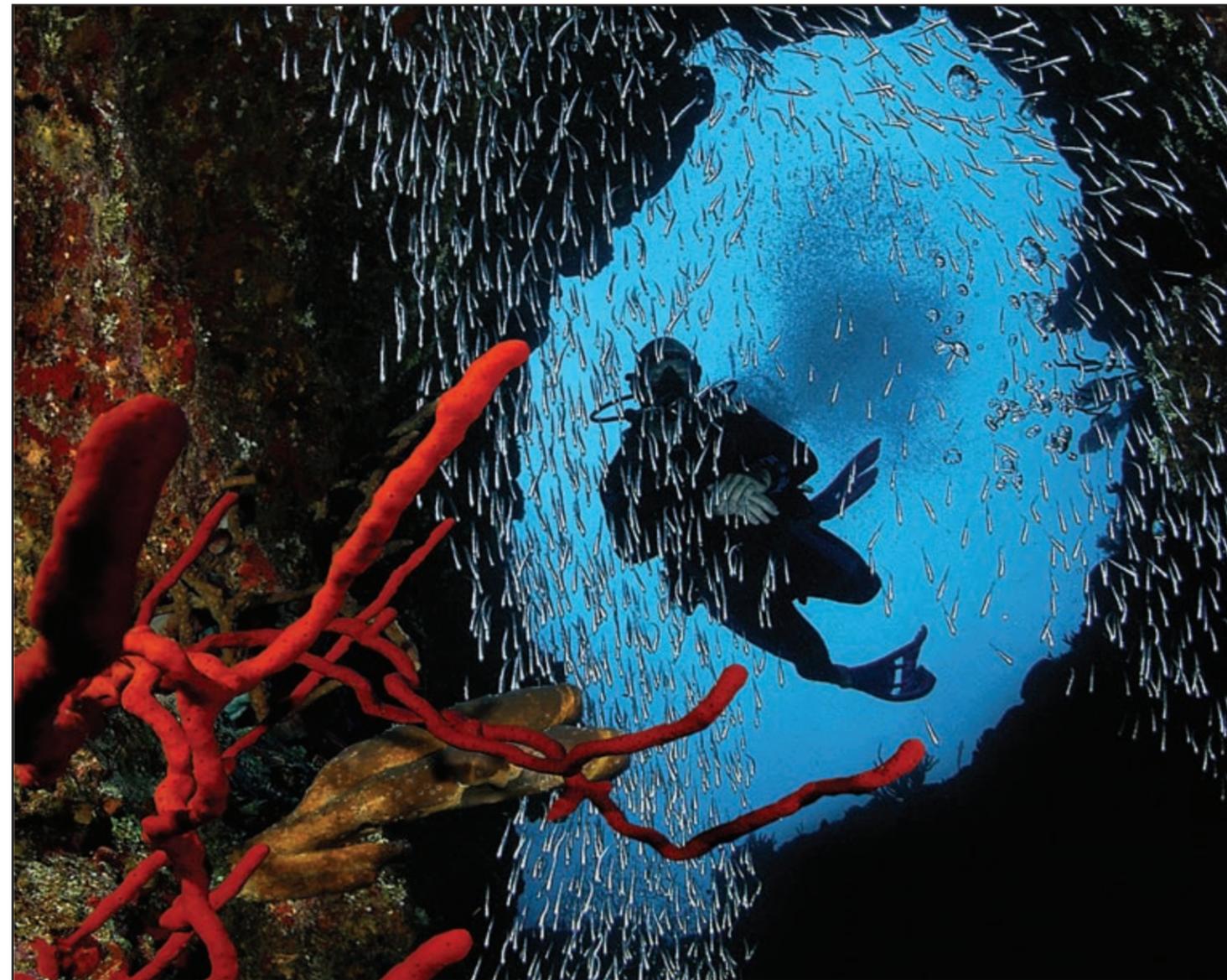
A significant decrease in warming was observed at depths of 200m. However, these warm-



ing levels are much greater than reported elsewhere in the Southern Hemisphere.

The temperature of the ocean around Antarctica has increased by an average of 1°C in the

last 50 years. The atmospheric temperature on the Antarctica Peninsula has increased by 2.5°C over the same period and is one of the most rapidly warming areas on the planet. ■



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In Bahama Deep

Successful expedition places humans at lower limits of Mesophotic Zone.

Text and photos by Michael Lombardi



Ocean Opportunity announced that it has successfully conducted an expedition to explore and document the natural history of the mesophotic, or 'middle light', zone from 200 (61m) to 500 (152m) feet in the Exumas, Bahamas.

The not-for-profit organization, based in Rhode Island, USA, conducted the expedition from April 28 to May 8 and was hosted in the Bahamas by the John H. Perry, Jr. Caribbean Research Center—a facility with a long history of advancements in marine technology and innovations in ocean exploration.

The mesophotic zone expedition built upon the Ocean Opportunity team's previous success in November 2010 with a project at Andros in the Bahamas when they worked down to 430 feet—more than three times the depth of conventional scuba diving.

The expeditions are being led by explorer, Michael Lombardi, who has been funded by the National Geographic Society to carry out the work. Collaborators on this latest expedition included individuals from the American Museum of Natural History, the City University of New York, the University of Connecticut, and the University of Kansas.

The deep diving team conducted several mixed-gas closed circuit re-

breather dives in excess of 300 feet, with one to 400 feet, and another reaching 446 feet. These explorations allowed the team to observe, first hand, below the presumed sea level at the end of the Pleistocene ice age, some 370 to 420 feet below today's sea level. Numerous images, samples, and specimens were gathered, which are being evaluated by project collaborators.

Lombardi commented, "Working to the lower limits of this newly accessible realm is wrought with challenges from a technical and psychological perspective. We are working with the best and brightest in the industry to improve human accessibility to this alien environment, and bring back data and knowledge from each dive that will advance the necessary life support technologies to improve in-water efficiency, and catalyze scien-

tific discoveries."

When asked, "Why work to the frontier limits of manned exploration?" Lombardi stated, "The reaction time, real-time decision making, and personal interaction offered by wet diving at these depths, as opposed to robotics use, brings the raw and intimate experience of human exploration back into the game. Nearly 70 years of marine science has been fuelled by the ability to routinely access the shallow coral reef ecosystems—that excitement, and creativity made possible by a researcher actually being there catalyzed the marine science field that we know today. We are on the verge of creating an opportunity for the next 70 years. This is a very exciting time for benthic marine scientists." ■





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Dive Caching

Everyone loves a great treasure hunt, and the Diving Equipment Marketing Association (DEMA) has officially launched their new real life, in-water game called DiveCaching. DiveCaching—an underwater variation of “Geocaching”—is all about adventure and fun.

The basic idea behind DiveCaching is to locate containers called, *caches*, which have been hidden underwater by divers using a GPS-enabled device and a compass. When the cache is found, the finder logs their visit to the cache online, and puts the cache back where they found it. The cache, itself, is usually composed of a container holding a log book or log sheet, something with which to

GEOCACHING

Grown-up men and women are searching planet Earth, on land and in lakes and seas, all looking to swap worthless objects. They are Geocaching, a fun, international game that spread like a bush fire more than a decade ago, thanks to the Internet. Anyone with access to a computer, the Internet, a handheld GPS and, of course, a bit of that childhood sense of adventure can play can partake of the game. GPS positions along with a few clues to the caches can be found on the Internet. Small trinkets, sometimes not even that, are found in durable containers, well-hidden but not buried. So, it's really not the treasure they are looking for, it's the hunt itself that makes the game interesting. www.Geocaching.com.

write, and various items that might be of interest to the dive cacher, such as collectible coins, lapel pins, key chains, beads, money, stones, or other treasures. These items, known as, SWAG (Stuff We All Get), can include handmade items, stuff from the dollar store and anything else the DiveCacher can imagine. Items don't need to be expensive but should be a reflection of the cacher's personality.

There are many rewards for DiveCaching, and everyone has their own favorite reason for participating. Some will thrive on the fun and adventure of discovery. Others enjoy exploring a new dive site or returning to one that they have not visited in a while. Still others enjoy practicing their diving skills or using new skills in navigation or search and recovery, or just simply being with friends and family. Some, especially the younger DiveCachers will love the treasure!

The cache container is hidden underwater and out of sight of non-caching divers or swimmers. The surface coordinates of the item are recorded using a Global Position System (GPS) and are posted online so that other divers can find the cache. DiveCaching is a form of “Geocaching”, a decade-old land-based activity with more than five million participants worldwide who are looking for (mostly land-based) caches hidden by others and posted on the internet. To view the introduction video of DiveCaching visit: www.DiveCaching.org ■

Swimmers, a fun experience for sea lovers

A new original and fun idea has been born, so that water sport enthusiasts enjoy the sea by treasure hunting. Any swimmer, snorkel or scuba diver can hide underwater ceramic figures called, Swims, in a ceramic amphora, then fill in information online about the road map with photos, videos, coordinates and all the clues you want to indicate so that another swimmer, snorkel- or scuba diver can find the treasure, hide another figure in the amphora and take one in exchange to be hidden in another corner of the world. With Swimmers, you will discover beautiful underwater places you have never been, and you will live an

underwater adventure. The swims are a great way to attract other swimmers to great free- or scuba diving enthusiasts, by placing the hidden treasures in the sea you consider attractive because of the marine species, any pleasant sea experience you have

had, or simply because of its originality, it could be the perfect location for a swim. And remember the environment. Therefore, the amphoras and swims used should only be made of clay, without lacquer finish. The use of non-self-degradable materials are not allowed. Swimmers is a new activity that needs your support to be successful! Diving centers, activity centers and individuals interested in participating are encouraged

to help us to hide more amphorae and swims. There are already hidden swims in Spain, Italy and Egypt. Are there any swims in your country? Swimmers is organizing contests and competitions for you in order to make this game fun and enjoyable, so check out www.swimmersexperience.com/en become a pirate and start to live the Swimmers experience. ■



Human Factors in Sport Diving Incidents



For the last two years, Gareth Lock has been working on a paper which takes the Human Factors Analysis and Classification System (HFACS) devised to investigate the root cause of incidents and accidents in aviation and applies it to sport diving, covering both recreational and technical diving. The application of the HFACS to U.S. Navy and U.S. Marine Corps accident analysis reduced accidents whose root cause was violations of rules or regulations from approximately 44 percent to approximately 12 percent over a nine-year period ending in 2000.

The paper looks at how incidents develop, and whilst it includes the individual's actions to 'create' the event, it also looks at the influence of the supervisor or organisation on how the incident develops. By identifying those influences,

future incidents may be prevented. This work has been the baseline for his presentations on Human Factors and Diving Incidents, which he has presented at DiverSE '10, Eurotek 2010, LIDS and TEK 2011. (More presentations are planned for this year, too, including the Global Diving Conference in Germany in November 2011).

Some reviewers have commented that such a system will not be adopted within a recreational sport because it costs money, and therefore drawing comparisons with an activity (aviation or medicine) which is well funded, is not a valid comparison. He leaves that to the readers to decide, but the drivers must come from the top down, rather than the bottom up.

*The full paper can be found on the **Cognitas** website. ■*

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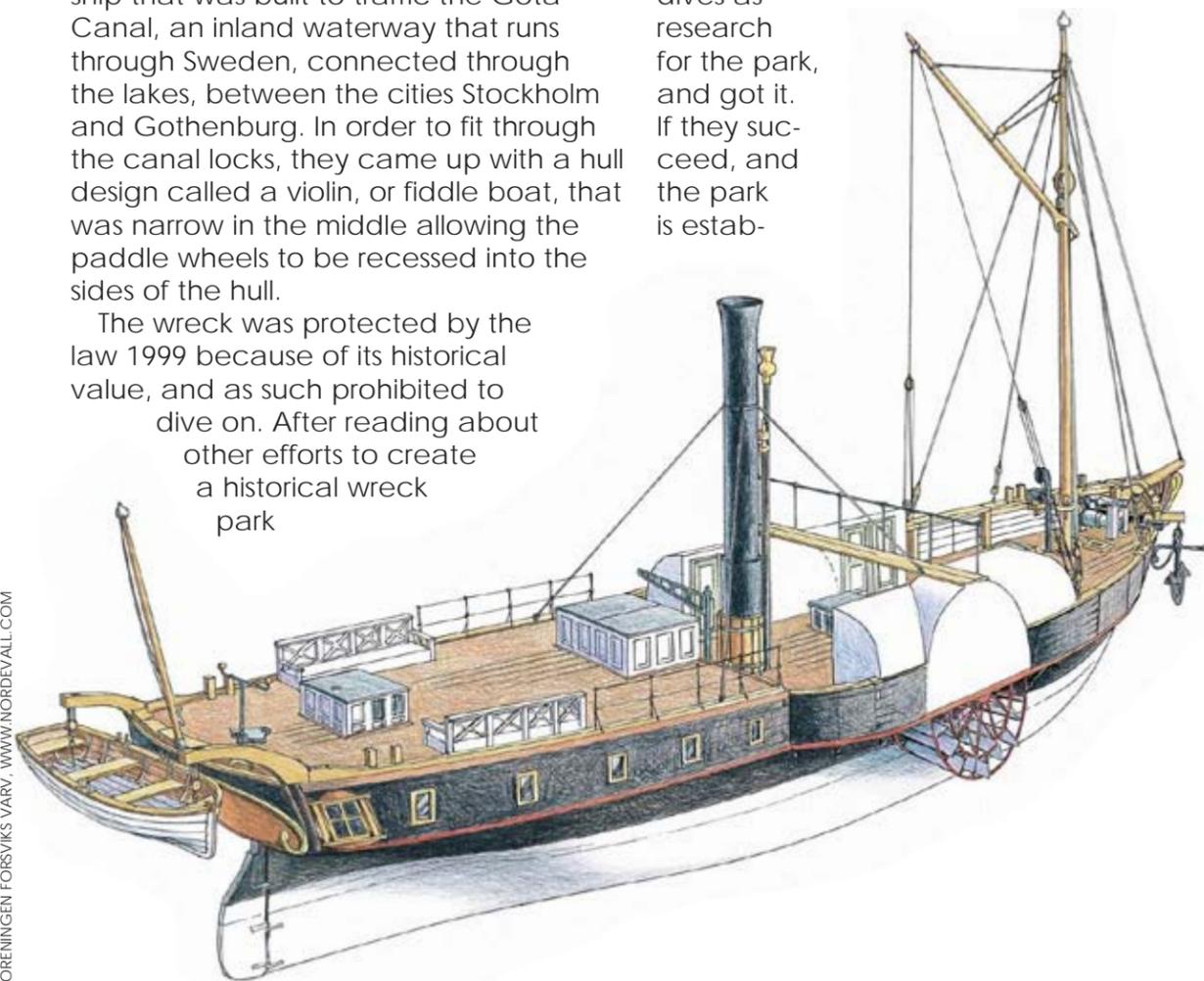
A group of Swedish divers is working on creating a wreck park in Lake Vättern. Vättern is Sweden's second largest lake and is located in the center of the country.

Text by Brian Keegan

The centerpiece of the park will be the wreck of the *Eric Nordevall*. She was built in 1837 and is a rare type of side wheeler steam powered paddle wheel ship that was built to traffic the Göta Canal, an inland waterway that runs through Sweden, connected through the lakes, between the cities Stockholm and Gothenburg. In order to fit through the canal locks, they came up with a hull design called a violin, or fiddle boat, that was narrow in the middle allowing the paddle wheels to be recessed into the sides of the hull.

The wreck was protected by the law 1999 because of its historical value, and as such prohibited to dive on. After reading about other efforts to create a historical wreck park

for divers in Sweden, the group became interested in doing the same. The process of applying for the wreck park includes carefully documenting the condition of the wreck. They worked for one and a half years to get the permit to do the dives as research for the park, and got it. If they succeed, and the park is estab-



lished, another survey of the condition of the wreck will have to be done in one year, regarding how diving has affected the wreck.

The extraordinarily well-preserved wreck of the *Eric Nordevall* sits upright on the bottom of the lake at a depth of 45 meters. That means it's out of sport divers reach, so the park itself will be aimed at tech divers. A number of other well-preserved wrecks in the lake will also be included in the park; some wrecks will be within sport diving depth, but it will be advanced diving.

I had a talk with Erik Rådström, who started the project. I was interested in what inspired him to try to create a park

like this. It is not exactly an easy task! Erik told me that he'd wanted to dive *Eric Nordevall* ever since his uncles dove her in 2001. They showed him some fantastic videos of her, and after seeing the amazing footage, he set a personal goal of diving her some day.

In the beginning of 2009, he read about how the Swedish maritime museum planned to develop a dive wreck park at Dalarö in Sweden.

Fulfilling the dream

Eric then realized that this could be the solution—to create a wreck park with a possibility to dive historical wrecks but under supervision to protect them from

damage. "I could dive *Eric Nordevall*, and I would have the chance to make her available for others, to fulfill their dream dives."

This is not a one-man job. I asked: "Who else is involved in creating this dive park? Between your day jobs and your other regular activities, how do you and the others manage to find the time and resources you need for the work on establishing the park?"

He started the project alone with some advice from one of his uncles, who is now a part of the project as one of two project leaders. "We are at the moment between seven to ten guys that are involved in the documentation of the



FORENINGEN FORSVIKS VARV - WWW.NORDEVALL.COM

Tech Wreck Park in Sweden



FORENINGEN FORSVIKS VARY, WWW.NORDEVALL.COM

wreck and all the work around the dives. Everyone helps as much as they can, and some do much more work now, and others will do their part later.”

Erik is dedicated. He has a vision, a dream. But all the hard work is getting to him, especially since the paperwork for the park is taking time from the dives and the documentation of the wreck. “I just realized that I need to slow down a bit, I don’t want to get burned out. We just had a very time consuming period getting the permits, sponsors, website updates and PR. I hope it will calm in a couple of weeks and we can focus more on the diving and documentation.”

It turned out that much of the work that needed to be done he needed to do on his own, resulting in late hours and few hours of sleep.

As soon as he came home from his day job, he started working with the dive park project.

He feels it is all worth it, though. Sure, it is hard work, but in the end, something good will come out of it. The work he and his team are doing will open the area up for other divers and give them a great experience by visiting a one of a kind, a truly unique wreck site!

It’s great that one person’s dream may result in a dive park that gives everyone a chance to dive on such an interesting wreck while preserving it for future divers. We wish Erik and his project the best of luck and will finish off with just a few more questions:

BK: Given the 45-meter depth of the main attraction, how will tech diving figure into the operation? Will

you allow sport divers to dive on depth-appropriate wrecks, or will the park’s management only cater to tech divers?

ER: *Eric Nordevall* will never be available for sport divers. You can’t do safe dives at that depth when you are at that level. There will be other suitable wrecks at shallow depths, so there will be a wreck for everyone at any level.

BK: What do you think is the most important aspect of establishing a tech wreck park like the one you are working on?

ER: The hardest thing with the entire project is the work we have ahead of us when we are going to discuss who is suited to guide and arrange trips to the *Eric Nordevall*. One

Resting cannons

person’s right is another person’s wrong, so it will be a difficult discussion.

I don’t put down all this time, so a shipper can go and do as he wants, and it results in damages to the wreck. We have examples of shippers anchoring in wrecks from the 19th century and dragging it until it hits the wrecks. We need a way to keep them away from the start.

BK: Any clever names in mind?

The name is Dykpark Vättern. It’s a brand that will include several companies in the future, just like Dalarö Dykpark.

BK: Are there any dive centers involved to run the logistics and if so which one(s)?

ER: No centers at the moment, it is too early in the process to start talking to dive centers about these things.

BK: I read a little on the system you came up with to anchor the boat at the wreck site. Can you tell us a little about that? Are there any other major tasks you are currently working with to make this work?

ER: The anchor system is a combination of several different systems I read about on the Internet. We think it will be a good solution at the wreck site. The bottom at the wreck site is sand, and we decided to use used brake drums from a large truck; they weigh 50kg each and look like a piece of pipe. They sink themselves into the bottom, and by putting a chain in one side of the drum, it will dig down in the bottom if you pull on one end.

We chose to put a buoy at 6m, because if the buoy at the surface gets cut, we won’t need to go down 45m to pick up the line. It’s

also a good thing to keep as a reference on deco.

On our next dive, we are going to dig them down a bit in the bottom so they stay in place. We are also going to place a line between the wreck and the anchor line. Nothing can be attached to the wreck, so we will be putting a weight near the side of the wreck and attaching the line to that and a small float to hold it up at the same level as the upper deck.

BK: What do you envision as the end result?

ER: I picture a wreck diving park with wrecks at all depths for all types of divers and the *Eric Nordevall* as a main attraction for tech divers. Many of the wrecks are dived regularly by the local diving clubs. They are great wrecks that are worth visiting even for divers from other parts. We just need to advertise them for the public.

BK: Anything else you would like to share with us that you feel is of importance?

ER: I would like to encourage all of you out there with an idea to go for it. If it is a good idea, you will succeed, but it will take more time than you ever could plan for! It will never be fun all the time, but the good moments will carry you through the rough parts if you set your mind to it. If everyone does one thing for the diving community, we will have fantastic options in the future!

LINKS

The wreck park’s web site is:

www.dykparkvattem.se

The Facebook page is:

www.facebook.com

At the time of this writing, there are plans to translate them to English. ■



WWW.DDIVERS.ORG



PHOTO: DAVID FLOSOFF



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The Lion Wreck Lejonvraket



A couple of years ago, Johan Rönby, professor at the Marine Archeology Institute of Södertörn University in Sweden, got a call from two divers saying they wanted to show him something, and they wanted to do it right that minute. He didn't know what to think, but said, "Sure." He did not regret that decision.

The divers had images of a pretty well intact ship with details telling him it had to be around 400 years old. He identified it as most likely a Dutch Flute, one of the more popular trading sail ship models during the 17th century, because it could be manned by fewer sailors than other sail ships of that size.

You never know...

As Markus Hårde and Jonas Rydin's group and a few other dive teams were looking for four steamships that went down in the outer archipelago of Stockholm when they made another intriguing find.

Underwater cliffs at all depths makes the area a challenging place to search even with modern technology, but all four steamers were eventually located. They were in excellent condition, basically untouched, and the team would like to keep it that way so the positions have not been disclosed. One steamship in particular caught the team's interest. They knew the name of the ship and an approximate location. What they did not know, was the extraordinary shape she was in. Five years have now gone by, and only ten dives have been conducted on her.

A diver sheds light on a wood carving on the Lion Wreck

The Flute looked astonishing, as if it had gone down within the past year or so, the masts still standing tall.

Amazing woodwork

The images showed some amazing woodwork. A carving of a lion on the rudder naturally led to naming the ship the "Lion wreck". Rönby found the whole thing hard to believe. Just a few years earlier a ship was found from the very same era, so eerily well-preserved, it was named the Ghost ship. That wreck was a remarkable find for the entire world of marine archeology, a one of a kind, one thought. The research gave a lot of insight into the past. Now, he was looking at yet another well-preserved wreck from the 17th century found near Stockholm. The Lion wreck appears to be untouched, so there are some hopes to find a cargo in the cargo hold.

Luck

The find was by pure luck. The divers—Markus Hårde, Anders Backström and Jonas Rydin—were looking to dive a steel wreck from the 20th century, outside the island of Värmdö. When the sonar picture of the site showed up on the screen, the divers went down. Rather surprised, they found a wooden wreck instead, richly decorated with wooden sculptures and canon ports. The bottom depth read close to 50 meters (150 feet).

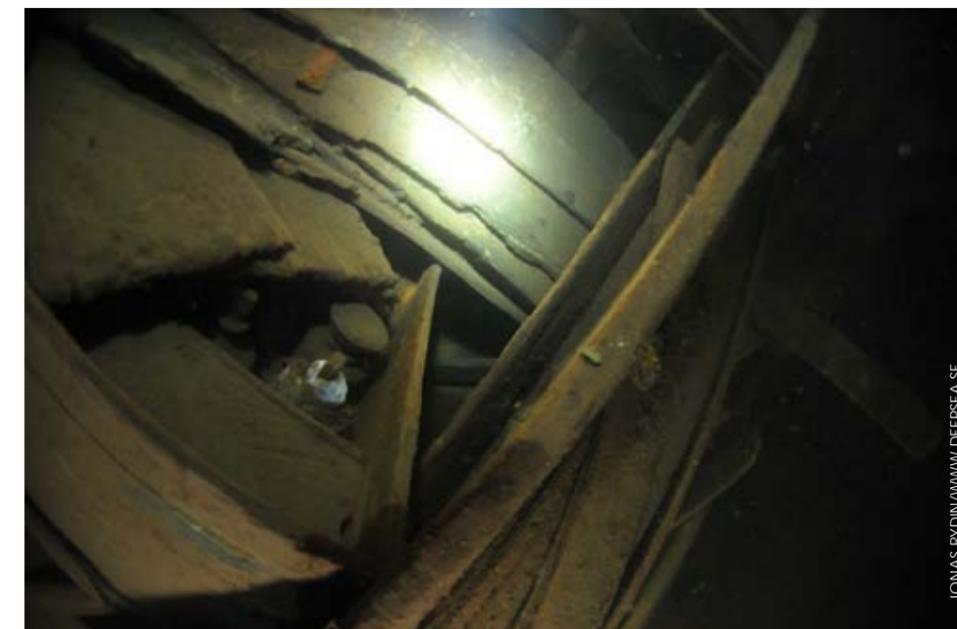
The future for the Lion wreck is an international research project together with the Netherlands, England and the USA. There have been talks about salvaging the Lion wreck, the know-how exists. The Maritime Museums of Sweden have already salvaged an historical wreck—the well-known Vasa ship. Still, it is a huge undertaking and is nowhere in the near future. ■ [▶ Watch video](#)

She might not be as historically important as their other finds, but every dive on her has revealed something new. On the latest dive, the team penetrated the wreck and found a small room with a complete set of 20 pharmaceutical bottles. They were all in great condition; many of them are still sealed and with liquid inside.

Morphine

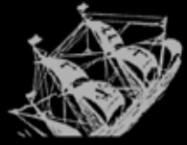
"I lifted a bottle out of the set," Jonas said, "and to my amazement, the label was still on the bottle. It read Morphine, and a date and a year. I can't quite remember the year, but it was sometime around World

War I." That information is a time stamp. He put the bottle back in the set and left it as they found it. "Many groups are still looking for the wrecks, and we want it to be as pristine for them as it was for us. We just hope they have the same code of honor as we do and the other few [folk] that know its location." ■

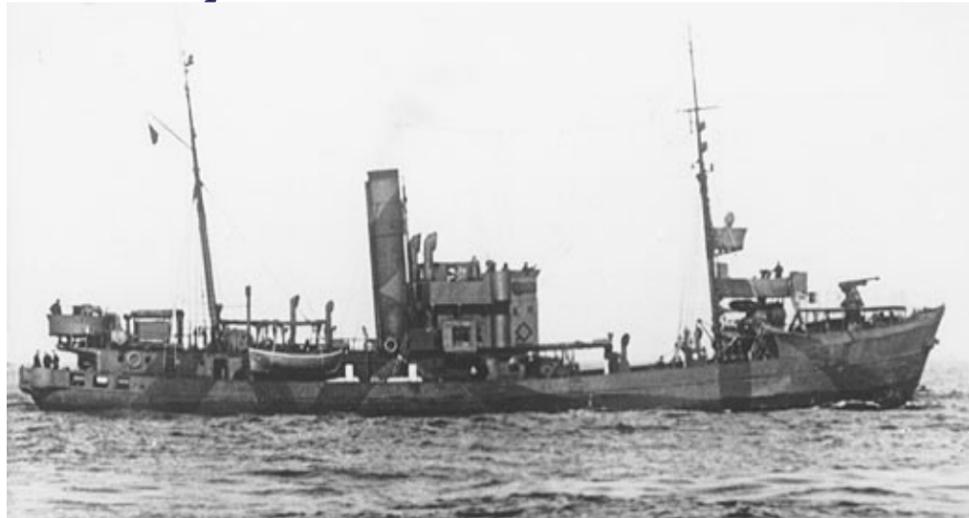


JONAS RYDIN/WWW.DEEPSEA.SE





Armored WWII trawler found in Norway



The *Jan Hubert*

The 50-meter-long M-1104, *Jan Hubert*, was a German armed trawler and minesweeper that collided with another vessel on 8 July 1941 and sank not far from the city of Kristiansand in Southern Norway. The wreck was located by side scan sonar last fall at a depth of 50m by divers Arne Wathne and Steinar Monsen, who first visited the wreck on January 3.

"It was a fantastic sight that greeted us as we came down the bottom line. In the incredibly good viz, we could see most of the vessel, which stood there as if it was neatly parked along the side of the cliff. Objects were still in place as well as cannons in both ends," Arne Wathne told *Dykking*, the Norwegian dive magazine.

M-1104 *Jan Hubert* is very similar to the *Mosel*, which was found near the town of Lillesand in 2001 and has become a very popular wreck. The excellent state of preservation of the two wrecks are also reported to be similar. ■

► Watch video

Steamship *Dix*: Puget Sound's worst maritime disaster discovered after 104 years

The steamboat *Dix* operated from 1904 to 1906 as part of the Puget Sound Mosquito Fleet. She was sunk in a collision, which remains one of the most serious transportation accidents in the U.S. state of Washington to this day.

Using a five passenger submarine and a remotely operated vehicle (ROV), Scott Boyd—wreck diver and co-author of *Northwest Wreck Dives*—and underwater videographer, Laura James, discovered an historic Mosquito Fleet Steamer in Elliott Bay near Alki Point (the westernmost point in Seattle) that they believe is the *SS Dix*, which sank in 1906 and has

not been seen since. OceanGate then provided an ROV with an experienced crew on *Dive Bum*, and on 19 March 2011, the first video images of the wreck were recorded along with high-definition sonar. "The deep wreck is clearly a wood-hulled passenger steamer from the Mosquito Fleet era and is in a location consistent with the last sighting of the *Dix*," said James.

Dix was purpose-built for one route only—the run across Elliot Bay from Seattle to Alki Point, then the main recreation area for Seattle.

On 18 November 1906, *Dix* was not on her customary Alki route, but was acting as a relief boat for the *Monticello* on the Seattle-Port Blakeley run. She left Seattle with about 77 passengers. Her captain, Percy Ler-

mond, tasked with collecting fares, was absent from the pilot house, leaving the mate Charles Dennison in charge.

Disaster

Off Duwamish Head, *Dix* approached near the Alaska Coast Company steamer *Jeanie*, and then mate Dennison (who, it turns out, was unlicensed) inexplicably turned the vessel directly into *Jeanie's* path. *Jeanie* was ten times the size of *Dix* and loaded with iron ore. Even though *Jeanie* had already reversed her engines, and was barely under steerage way, the impact was sufficient, given the much greater weight of the *Jeanie*, to cause *Dix* to heel sharply over on her port side. She quickly filled with water, rolled over, and sank in 103 fathoms (188m). ■



On 18 November 1906, the *Dix* was underway from Seattle to Port Blakeley on Bainbridge Island with 77 passengers and crew when she struck the three-masted schooner *Jeanie* one mile west of Duwamish Head. The *Dix* sank within minutes with a loss of 39 lives

Pieces of Eight



Silver Treasure Coins of the 1622 Shipwrecks
Nuestra Señera de Atocchia
Santa Margarita
& the Portuguese Carrack *São José*

by Carol Tedesco

Fully illustrated with hundreds of finely detailed photographs, *Pieces of Eight* is more than just a reference book. Carol Tedesco not only explains the subtle nuances of the coins themselves, but places them in the context of their moment in history, explaining where they were coming from, where they were going and why.

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What sank the Soviet destroyer *Moscow*?



Text by Julia Golosiy
and Philip 'Gisborn' Yakimov

Moskva (Moscow) was commissioned in 1938 and twice made port visits in Turkey before Operation Barbarossa began on 22 June 1941. Both ships bombarded the Romania port of Constanța with a total of 350 rounds on June 26, but *Moskva* either struck a mine or was torpedoed

Nearly 70 years ago, on the night of 22 June 1941, German troops crossed the Soviet border, and opened up the East Front. It is a common belief that the Soviets were taken by surprise and the command was passive and slow to respond during the first days of fighting. This may be the case in other places but not in the Black Sea. Already the same morning the city of Sebastopol was blacked out, and the Black Sea Fleet put on the highest alert. And by 3:15 the same morning anti-aircraft batteries shot down the first German aircraft.

About 13 hours later, at 4:40 pm, three submarines—Щ-205, Щ-206 and Щ-209 (Щ is short for Щыка or *shuka*, which means pike in Russian)—received approval from the Kremlin to move towards the eastern shores of the Black Sea, while the *M-33* and *M-34* left for long-range patrol near the main base. It was the first day of the war in the Black Sea.

On the night of June 26, Soviet warships attacked the Romanian port of Constanta. The artillery fire from the Soviet vessels, which were led by the Kiev and Moscow, completely destroyed the port's oil reserves and also took out several trains with arms and ammunition destined for Romanian troops and the invasion of Ukraine.

These events were reported to the Soviet government, but it was through the Soviet Information Bureau that the whole world learned about the successful raid. But, as often happens, the full story was not told. It was

left out that the otherwise successful operation had cost the Soviet Navy one of its finest ships—the destroyer, *Moscow*.

Even after so many years, it is quite difficult to determine the course of events and what actually caused the loss of the ship. According to the testimonies on both sides, the explosion was so monstrous that a column of white flame and smoke shot more than 30 meters into the air. The ship broke midships, and the bow almost immediately sank while the stern, with the still rotating propellers now sticking up in the air, remained afloat for several minutes. Until it too slipped under the waves, the aft bridge was continuously strafing enemy aircraft with anti-aircraft fire.

Surprisingly, during all these years the story of the ship and its sailors has been shrouded in an information vacuum. Perhaps in the depths of the (Russian - ed.) Central Naval Archives answers to all these questions can be

found, but researchers have never been able to reconcile any of the official versions with where the wreck was actually located.

The prevailing official theories as to what sank the *Moscow* come in four varieties: she was hit by a large-caliber grenade from coastal artillery; fire from enemy ships hit her; she hit a mine; or she was attacked by a submarine. As regards to the location of the sinking, scans were made of the sea floor at the alleged position, which was marked on sea charts but no remains of the ship were detected.

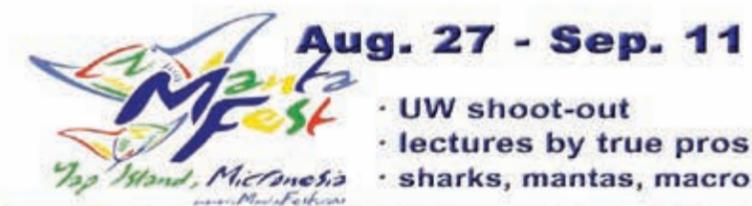
Dive team

On 1 May 2011, a Romanian-Russian-Ukrainian team of divers arrived in the city of

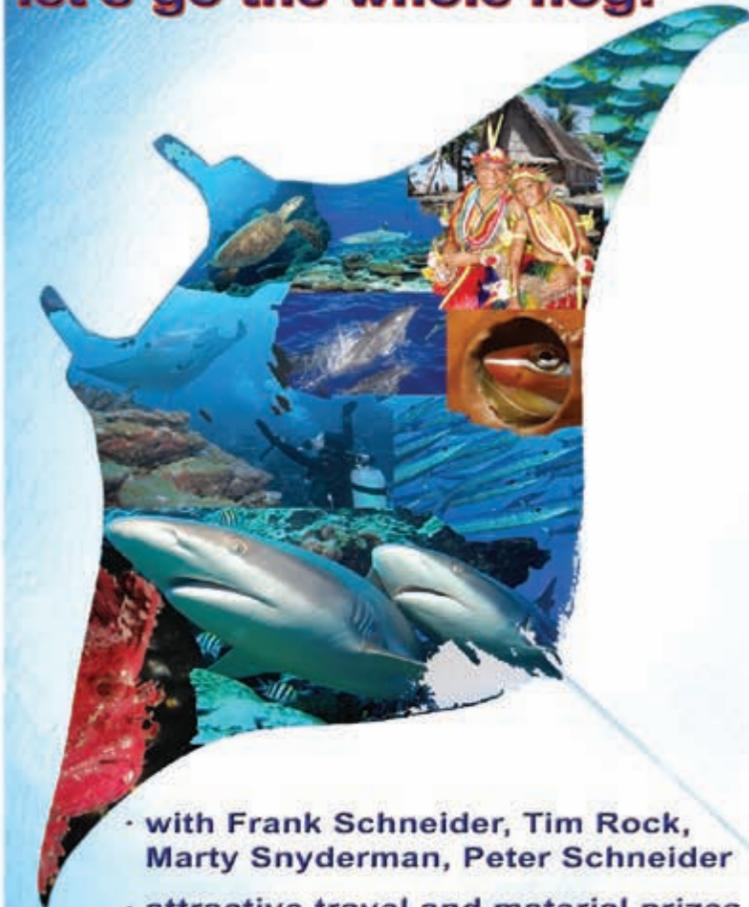
Constanta, following an invitation by the leader of the Respiro Diving Society, Mircea Popa, who has been searching the *Moscow* for more than two years.

The first day, the team scanned the seabed in a sector that archival Romanian sketches showed was the battlefield, but it produced no results. During the debriefing the same evening, the team once more went over the various information discarding the scenarios that they considered improbable.

First, the team discarded the theory that artillery from enemy ships sunk the *Moscow*. The armament of the Romanian Royal Navy's destroyers, *Regina Maria* and *Marasti*, were probably too light for such a devastating hit, and combined with the fact that the Soviet vessels were taking evasive manoeuvres and were hidden under a smoke screen and already at the maximum range of their 120mm Bofors cannons, this



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Diving the Mosvka.

events of 26 June 1941. The meeting took place in the offices of the Marea Noastra magazine and was attended by Rear Admiral Petre I. Zamfir, who served on the destroyer, *Regina Maria*, remembered the battle. This meeting opened with an interesting piece of information, which was not mentioned in any of the Soviet sources.

According to this information, the Soviet vessels which were beyond the range of the German heavy (280mm) Tirpiz coastal batteries attracted the fire from the Romanian (105mm) battery, Elisabeth, which, unlike the German batteries, opened fire three minutes after the Soviet vessels entered the battle at 5:05. At that time the Soviet ships were moving at 26-28 knots, heading 221°, which took them, directly towards the Elisabeth battery. The light calibre of the battery was insufficient to defeat the ships at the beginning of the operation, but it's probable that the fire from the Elisabeth battery made the Soviet ships change their course and withdraw along a bearing of 123°.

Diving the site

While part of the team was at the meeting, the other part of the team was busy searching the area that was selected the previous evening. The first part of the day was devoted to the com-



Satellite image of Constanta and its port

plete search of the area north of the S-10 mine field in order to exclude this region from further search. During the second part, after about ten hours of searching with sonar at a depth of 45 meters, they first located an indefinable object with the dimensions of eight by six meters, later affectionately nicknamed the "box", and a few seconds later, the sonar pictured the hull of a vessel about 90 feet long.

On May 5, divers went down to examine the wreck, and they were able to confirm beyond a doubt that the *Moscow* was finally found! The ship had rolled onto its left side and was resting at a degree of 35° rising about ten meters above the seabed. The divers inspected the intact rudder and propeller. The whole aft part appeared to be in a good state of preservation up to the first

boiler compartment—aft gun turrets, anti-aircraft cannons, stern fire post and filled torpedo tubes. But further ahead, it was just a tangle of collapsed metal, and it is impossible to comprehend the magnitude of the destruction. The team did two dives with a bottom time of 40 minutes, which allowed for a preliminary inspection of the ship, but obviously was not enough for detailed study.

From the condition of the "box"—which in size was very similar to the main superstructure, which was located at the edge of the S-10 minefield—the team concluded that the ship exploded as a result of striking a mine. But it is difficult to understand how a 200-kilo mine could cause such severe destruction of the bow by itself. This could be explained by accounts that during the beginning of the war, spare torpedoes were kept directly on the deck near the explosion. Perhaps then, it was a detonation of the torpedoes on the port side that caused the terrible explosion.

Indirectly, this theory is substantiated by the fact that after the operation in Constanta, such torpedoes were removed across the entire fleet. Furthermore, upon examining of the wreck, the divers did not find any spare torpedoes except one detached from the main part of the crew compartment, which was on the right side of the ship.

scenario struck the team as quite unlikely.

Also the team considered it unlikely that the *Moscow* were hit by heavy artillery from the Tirpiz coastal artillery battery. According to German sources, as well as the report of the flotilla's flagship, *Kharkov*, the battery's first salvo only came quite late in the battle. It landed dangerously close to the *Kharkov*, but only after the *Moscow* had already exploded. The team was then left with the options of hitting a mine or being struck by a torpedo.

The team did not really believe in the latter option either. According to available archival documents the only Romanian submarine, the *Delfinul*, was much further north at that time. The only submarine in any meaningful proximity was the Soviet *U-206* under command of Lieutenant-SA Karakaya. However, this vessel was not involved in the raid, and in fact, he most likely knew nothing about it. It should be noted, however, that the northern position of the boat was only seven to eight miles from the alleged

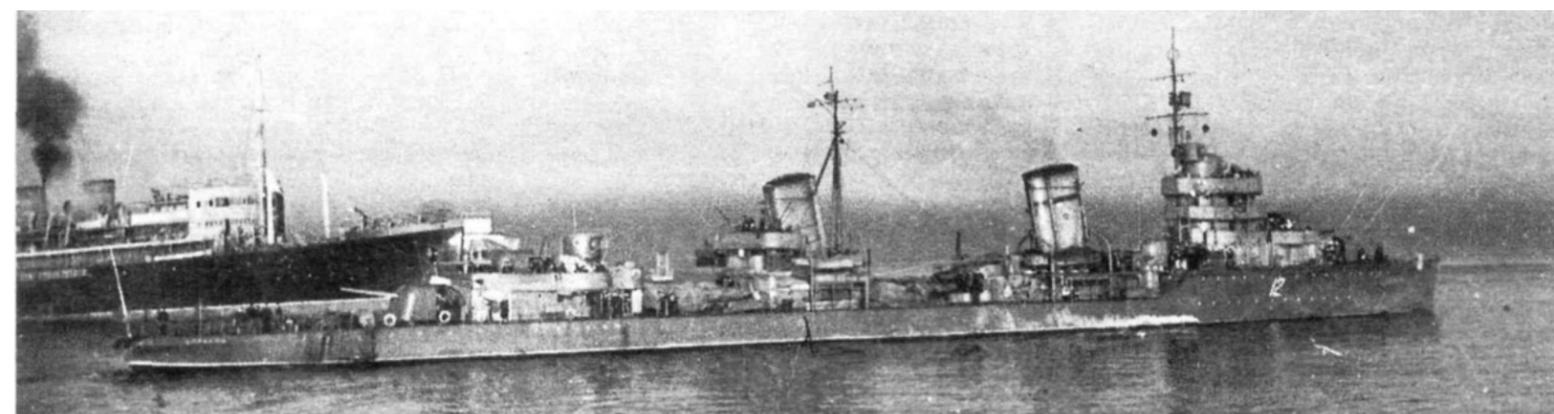
location of these events, and only a small error in navigation could have put this submarine within the battlefield. However, the *Kharkov* made an observation of wakes from two torpedoes just a few seconds before the explosion. Nonetheless, the team felt that this scenario was the least likely of the two and turned their attention to the minefield theory.

After analyzing all available information, the team pinpointed what was the most likely position for the sinking—the first quadrant (south-western part) of the S-10 mine barrier. Unfortunately, all sources differ in regards to the accounting of the movement of the Soviet vessels before the explosion, but by comparing the information, the team estimated the most logical course of the ship, taking all circumstances into account.

The next day produced some interesting moments. Firstly, the team managed to meet with the historian, Prof. John Damaschin, who has spent more than a decade trying to understand the



Constanta today



The *Kharkov*

Unfortunately, neither the weather nor the time allowed the team to dive to the cherished "box", and it will await exploration by future researchers.

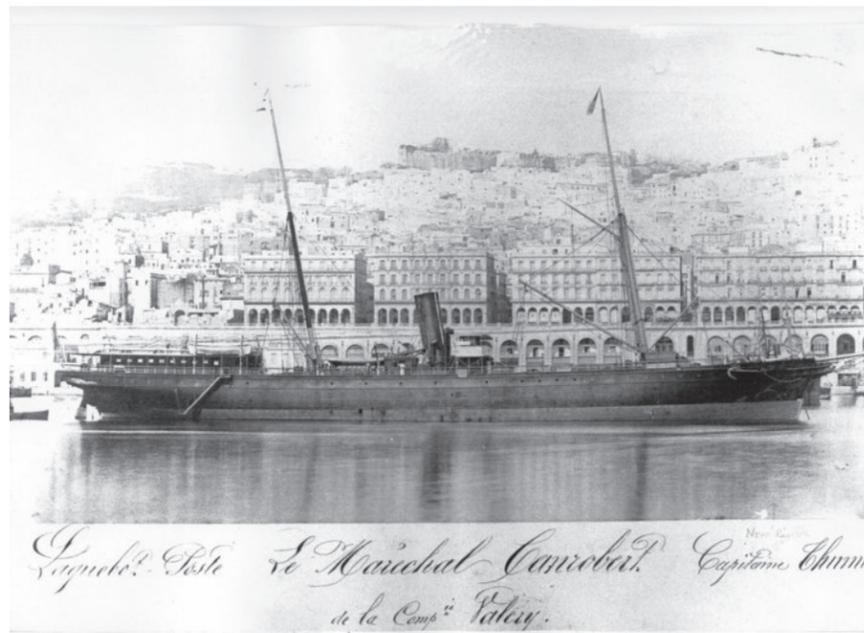
On 26 June 2011, on the 70th anniversary of the loss of the *Moscow*, the Respiro Diving Society is planning to drop a memorial plate on the deck of the *Moscow* and a wreath in memory of the dead sailors and the first Soviet warship, which perished during the Great Patriotic War.

As a result of the expedition, all the data and project materials, as well as information about the location of the wreck will be sent to the archives of Romania and Russia, and various web-resources. Everyone in any way interested in further information on the project, should contact pgscuba@gmail.com

Thanks

The members of the expedition would like to thank Colonel Banskatsu Boris Shoylovichu and Lubyaynovu Kolmogorov for the great job they have done compiling a large number of documents and versions in the book, *The leader of the destroyers—Moscow*. Thanks goes also to Professor John Damascene who assisted and provided valuable information not previously studied. The team is also grateful to all those who directly or indirectly helped in the search and believed in the success of the expedition.

Note: Submarine *U-206* did not return to base and is considered "missing in action". It is difficult to say how credible the reports are about the torpedo track at the Battle of Konstanz before the sinking of the *Moscow*, and several hours later, the sinking of the *Kharkov*. There are documents about the successful attack of the destroyer, *Soobrazitelnyi* (the quick-witted)—the vessel, that protected *Kharkov*—directed towards an unknown submarine in the square 3953. On the other hand, there is no confirmation of the sinking of a U-boat from *Kharkov*, which, in fact, hailed the *Soobrazitelnyi* to protect and attack submarines. This is another dark page in history to be investigated further. ■



In 1892, off Marseilles, the steamer *Maréchal Canrobert* collided with the Ironclad *Hoche* and sank with the loss of 107 lives.

French divers locate steamer sunk in 1892

After a two-year-long search, French divers—Florent M. Locatelli, Lerome Espla and Romain Lhost—reach and identify the wreck of the steamer *Maréchal Canrobert* resting at a depth of 108m.

In 1892, off Marseilles, the steamer *Maréchal Canrobert* collided with the Ironclad *Hoche* and sank with the loss of 107 lives.

On 7 July 1892, at the end of a crossing between Bône and Marseilles in the Gulf of Lyons, the ship sank in eight minutes, close to the Island of Planier, following a collision with the armoured battleship *Hoche* during manoeuvres with its squadron off Marseilles.

According to an article in *New York Times* dated 8 July 1892, 107 lives were lost. It is supposed that

some of the people were killed by being struck by the ram of the *Hoche* when she crashed into the side of the steamer. There were 85 passengers on the deck of the *Maréchal Canrobert* watching the manoeuvres when the collision happened.

The *Maréchal Canrobert* was literally cut in two by the ram of the man-of-war, and eight minutes later the two portions sank, all lives, with the exception of two soldiers and three children, being saved by the *Hoche's* boats.

The disaster occurred 18 miles outside Marseilles, and was due to an error of judgment on the part of the steamer's captain.

Well-preserved

According to the divers, the 75-meter-long vessel, which was launched in 1881, is still in an astonishing state of conservation. The dive, which took four hours and 20 minutes, was conducted with trimix and CCR rebreathers, which permitted a bottom time of 30 minutes at 110m of depth. ■

Former British flagship, HMS Ark Royal, could become the largest artificial reef in Europe

A group of divers in the United Kingdom is bidding to turn the decommissioned aircraft carrier into a dive wreck.

Michael Byfield and James Doddrell, from Torbay, believe turning the former Portsmouth-based ship into a reef could bring GB£40m into the Devon economy, creating the largest artificial shipwreck reef in Europe. It would mean towing the vessel to a port to be stripped and made clean enough to be sunk.

The idea could repeat the success of *HMS Scylla*, which, since being sunk, has attracted thousands of divers to Plymouth, generating millions of pounds for the local economy.

The divers have formed a team called Ark Royal Reef, which was one of a number of interested buyers to tour the vessel last week.

"We would love to get it ready in time for the closing ceremony of the 2012 Olympics when we could sink it, with a fireworks display, to coincide with that and get worldwide coverage.

"It should bring us worldwide attention because *Ark Royal* is the flagship of the Royal Navy, and it would be the third largest artificial shipwreck reef in the world and the largest in Europe." ■

We would love to get it ready in time for the closing ceremony of the 2012 Olympics when we could sink it, with a fireworks display, to coincide with that and get worldwide coverage. It should bring us worldwide attention because Ark Royal is the flagship of the Royal Navy.



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Edited by
Scott Bennett



One price for one flight

Budget airline add-on charges set for EU-wide ban

Most air passengers are all too familiar with this scenario: after discovering a so-called 'bargain' fare online, the final cost is much higher due to fees and taxes. A growing trend among budget airlines to advertise a low price for fares before hitting the customer with a series of charges could be a thing of the past if a proposed ruling comes into effect.

European Commission transport chief Siim Kallas is considering a European-wide ban on hidden add-ons to ensure airlines must offer the final price for flights on their websites. The ruling would combat levies made by airlines, such as Ryanair's £1.75 charge on all flights which is set to earn it £150m extra a year. The justification for the levy is to pay compensation for delays and cancellations.

However, British Labour MEP Brian Simpson, chairman of the European Parliament Transport Committee isn't buying it. "Flyers are being ripped off by an endless list of charges that airlines add to the prices they advertise. I am calling for the European Commission to look at how passengers are being misled and how it can force airlines to be more transparent in showing holidaymakers exactly what they're buying."

To all those divers returning to the Red Sea with an excess of luggage, take note:

In a bid to woo tourists back to Egypt, Egyptair has doubled its baggage allowance for both international and domestic passengers. With this latest development, the airline has become one of the few airlines in the world allowing two free checked bags. The announcement was made by Mr Medhat Nabil, General Manager Egyptair and Mr Adel EL Masry, Director Egyptian Tourism Office in India. "Because of the recent political movement, the airline had lost its business considerably. This move will help Egyptair attract

more and more tourists from all over the world, as people, when they travel abroad, like to travel in their comfort zone with all their personal articles on them. This will be one incentive to travel to Egypt as not many airlines allow such baggage allowance", said Mr. Nabil.

The effects of the democratic movement in January, 2011 has dealt a severe blow to Egyptian tourism. More than twelve percent of the country's GDP is derived from tourism.



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Evidence mounts that electronic interference impacts airplane safety

We've all heard the those pre-flight announcements about turning off personal electronic devices (PED's) such as cell phones, blackberries and iPods.

They are flat-out ignored by many passengers, who seriously doubt such devices pose any threat to airplane safety. However, a confidential indus-

try study indicates that the reality may prove to be quite the opposite.

According to a report by the International Air Transport

Association(IATA), 75 separate incidents have been documented that may link mobile phones and other electronic devices to electronic interfer-

ence hampering aircraft operation. Spanning the years 2003 to 2009, the report is based on survey responses from 125 airlines accounting for a quarter of the world's air traffic. Reported incidents affected a range of airline operations, from affected flight controls including the autopilot, autothrust and landing gear, to navigation and communication systems. The culprit most often suspected in the incidents was cell phones, linked to four out of ten. The report, which stresses that it is not verifying that the incidents were caused by PEDs, includes a sampling of the narratives provided by pilots and crewmembers who believed they were experiencing electronic interference.



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