



GLOBAL EDITION
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Sea of Cortez

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Sidemount

Diving
Hardhat

Portugal
**Artificial
Reef**

Wide-Macro
**Fisheye
for Critters**

Portfolio
Sharon Brill



Profile
Mike Fletcher

Sport Rebreathers
**Opening Up
Closed Circuit**

INDONESIA'S
Lembeh & Buyat Bay

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COVER PHOTO: Juvenile dusky batfish, Lembeh Strait, Indonesia
Photo by Andrea & Antonella Ferrari

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Clark's anemonefish in anemone, Lembeh Strait, Indonesia. Photo by Andrea & Antonella Ferrari



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Checklists rule!

Airline pilots and surgeons are some of the most highly trained and skilled professionals – as they should be since we entrust them with our lives. They are very smart people, have a lot of routine and undergo constant training. Yet, as most of us are aware in the case of pilots, they also stick to rigorous procedures aided by checklists.

The value of implementing and nurturing a safety-minded culture in preventing accidents and saving lives cannot be underestimated. In the airline industry, for example, it led to a year (2012) with no fatal accidents at all in commercial aviation.

The issue at hand is, of course, that regardless of how skilled and experienced we may become, we will always be prone to making mistakes, or forgetting something. It is human nature, it is as simple as that.

In the diving community, checklists are used mostly by technical divers, and it is an integral part of the training and procedures when diving rebreathers, where the level of technical complexity more

easily leads to human errors. But even during our basic open water courses, we are taught some acronym or jingle to help us memorize pre-dive routines and checks. On a more menial level, we use shopping lists to help us remember to get all the groceries the first time around in order to avoid having to go back to the store to pick up what we forgot. Lists and aides make us more efficient and less prone to making mistakes.

That goes for our ventures underwater, too.

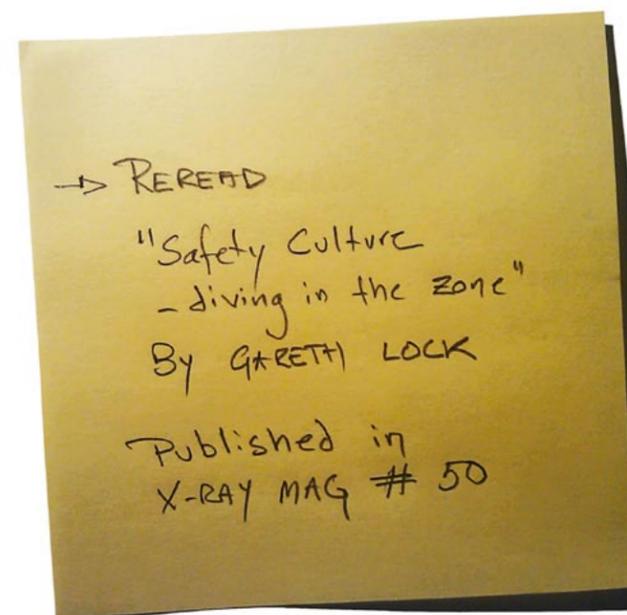
There has been much talk recently about how using checklists can make the difference between life and death, but the principles also apply on a smaller scale and can save each of us a lot of small mishaps and annoyances – it only takes a broken or missing o-ring to potentially flood your camera, short your dive computer or cause some other equipment

malfunction. The devil is often in the detail, and all the details can be hard to remember, which is where the checklists come in.

They not only make things safer but also easier and less stressful. Yes, I may take my sweet time rigging up both my camera gear and my rebreather, but what is the hurry?

In any case, these rituals also serve to get me grounded, focused and into the right mindset after which I feel ready and assured – but never complacent – everything is in order, making me enjoy my dive much more.

— Peter Symes





from the deep
NEWS

Despite the continued increase in atmospheric greenhouse gas concentrations, the annual-mean global temperature has not risen in the twenty-first century.

Is the Pacific Ocean pausing Global Warming?



PETER SYMES

A series of naturally occurring La Nina weather events in the Pacific in recent years seem to be responsible for the slowdown in the pace of global warming so far this century, a new study suggests.

In an article entitled, *Recent global-warming hiatus tied to equatorial Pacific surface cooling*, just published in the science journal *Nature*, a group of scientists affiliated with Scripps Institution of Oceanography in San Diego, California, has looked into why average surface temperatures seem to have plateaued since the 1990s even though the

decade also qualifies as the hottest on record. Rising concentrations of greenhouse gases in the atmosphere have not accelerated warming to new heights as rapidly as happened at the end of the 20th century.

Climate scientists have disagreed over the cause of the pause in fairly regular increases in temperatures seen before 1998. The slowdown

has raised hopes among some governments that it will be easier and cheaper to achieve long-term goals for limiting temperature rises to avert more heatwaves, droughts, floods and rising sea levels.

Natural variability

The current study finds that the current hiatus is part of natural climate variability, tied specifically to a La-Niña-like decadal cooling. Although similar decadal hiatus events may occur in the future, the multi-decadal warming trend is very likely to continue with

greenhouse gas increase.

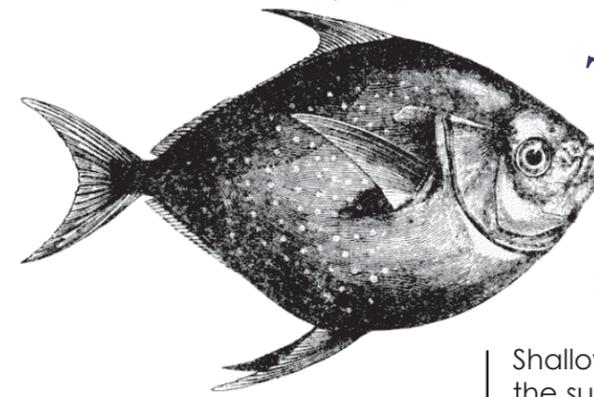
But it is clear that the cool Pacific pattern cannot persist forever to cancel out the extra heat trapped by rising CO₂ concentrations, climate scientist Shang-Ping Xie and senior author on the *Nature* journal study notes.

"Our results strongly confirm the role that (man-made) emissions are having on the climate. At one point over the long term, the effect we are seeing in the Pacific will stop. I'm confident the bigger increases in warming will resume." ■ SOURCE: NATURE

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The deeper the fish, the more mercury they accumulate

Shallower fish are safer to eat as, at the surface, photochemical reactions break down mercury, researchers have found. A new study by the University of Michigan and the University of Hawai'i at Manoa School of Ocean and Earth Science and Technology (SOEST) has combined direct observations of marine ecology and biogeochemistry to show a global picture of how mercury is acquired by ocean fish at different depths of the sea.

A common industrial toxin, mercury is transported through the atmosphere before it enters the ocean and the marine food web, accumulating in the flesh of ocean fish we eat. Scientists have found that this takes place at deeper depths, since organic mercury is broken down by photochemical reactions in well-lit waters at the surface.

Researchers used a highly sophisticated mass spectrometer to measure mercury levels in nine species of marine fish feeding at different depths. Study findings show that sunlight destroys up to 80 percent of mercury at shallow depths and that a significant amount of mercury is forming and entering the food web in deeper, oxygen-poor waters.

"The implication is that predictions for increased mercury in deeper water will result in higher levels in fish," said Joel Blum, professor of earth and environmental sciences at the University of Michigan and lead author of the study published in the journal *Nature Geoscience*. "If we're going to effectively reduce the mercury concentrations in open-ocean fish, we're going to have to reduce global emissions of mercury, including emissions from places like China and India." ■

SOURCE: EUREKALERT.ORG

Ailing California seagrass boosted by return of sea otters

A new study published in the journal *PNAS* finds that the return of sea otters to a U.S. central California coast estuary has improved the health of seagrass in the area. Seagrass in this region was thought to be headed for extinction. But researchers found that the sea otters triggered a chain reaction of activity which boosted the health of the seagrass in the area, which has been threatened by a massive increase in nutrient pollution from fertilizer run-off.

"This estuary is part of one of the most polluted systems in the entire world, but you can still get this healthy thriving habitat, and it's all because of the sea otters," said lead author of the study, Brent Hughes of the University of California. "It's almost like these sea otters are fighting the effects of poor water quality."

In the study, researchers analysed seagrass levels in the past five dec-

ades in the Elkhorn Slough area of Monterey Bay, mapping periods of growth and decline of the seagrass. Various changes were studied that could have affected the seagrass, and the only common factor that influenced seagrass was the number of sea otters in the area. The research suggests that the hunting of sea otters to near-extinction in the late 1800s early 1900s most likely made the situation worse, while the reintroduction of sea otters in this century is aiding the revival of seagrass populations, despite pollution from agricultural run-off.

The theory is that sea otters eat crabs, which eat small invertebrates, which eat a type of algae, which blooms with nutrient rich soil and grows on seagrass leaves, blocking sunlight and thus causing die-off of seagrass. To test this theory, scientists compared similar estuaries that had sea otters with

Seagrass signals

According to researchers, seagrass is important to the health of the oceans and fisheries, as it acts as a nursery for many species of fish and is an important CO₂ sink combatting the effects of climate change. Hughes said seagrass is "the canary in the coalmine" in regards to prediction of the levels of nutrient pollution in estuary waters.

"It's what we call a foundation species, like kelp forest, salt marsh or coral reef," said Hughes. "The major problem from a global perspective is that seagrass is declining worldwide. And one of the major drivers of this decline has been nutrient inputs from anthropogenic sources, via agriculture or urban runoff."

Sea otters have until recently been banned from moving along the coast to southern California because it was feared that the sea otters would have a negative impact on fisheries in the area. The research findings are particularly interesting in light of this lifting of the ban.

"That's important because there's a lot of these kind of degraded estuaries in southern California because of all the urban runoff from places like Los Angeles and San Diego," said Hughes. "Coastal managers will now have a better sense of what's going to happen when sea otters move into their systems. There's a huge potential benefit to sea otters returning to these estuaries, and into these seagrass beds that might be threatened." ■

SOURCE: BBC NEWS

those that didn't, running experiments in the lab and in the field. The experiments confirmed their hypothesis.

Female sea otter with her pup at Morro Rock, California



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Jennifer O'Neil



Tubbataha Reef

—The Crown Jewel of Philippines Diving

Text by Duane Silverstein and Ferdie Marcelo. Photos by Randy Wright and David Reubush

The word *tubbataha* is a combination of two Samal words, *tubba* and *taha*, which together mean “a long reef exposed at low tide.” But today the name Tubbataha is synonymous with a different definition—the best dive location in the Philippines. About 180 kilometers (110 miles) south of Palawan Island, Tubbataha is a coral reef in the Sulu Sea, Philippines, consisting of three distinct parts: the huge North and South Atolls and the smaller Jessie Beazley Reef. In 1981, it became the first national marine park in the Philippines under the leadership of then President Corazon Aquino, and in 1993, Tubbataha was declared a UNESCO World Heritage Site. Just last year, CNNgo.com named this 130,000 hectare site one of the world’s top ten dive spots.

I recently visited Tubbataha through my work as director of Seacology, a non-governmental organization (NGO) whose sole purpose is preserving the marine and terrestrial ecosystems of islands throughout the world. Seacology has 240 projects in 51 countries throughout the globe where deals are made to provide an island village something tangible it needs such as a school or fresh water delivery system in return for establishing a marine or forest reserve.

One such project is on the small island of Manamoc in the Philippines where we provided the requested solar energy system in return for support of a 267 acre marine protected area. This past April, I led a group of Seacology donors to the Philippines to see our project on



RANDY WRIGHT



USS *Guardian* aground on Tubbataha Reef in the Philippines

Manamoc and spend a week diving the reefs of Tubbataha.

I have visited the Philippines on many occasions and dived some of her magnificent reefs. But every time I mentioned where I had been I would get the same response: “The diving there is quite good but if you want

One of the reasons Tubbataha diving was supposed to be so good is its remoteness from human activity. There are no villages within 150 kilometers of Tubbataha, which means little pollution and little pressure from divers. The only way to dive Tubbataha is on a liveboard dive boat, and due to potential rough seas caused by seasonal climate changes, Tubbataha can only be dived between early March and early June of each year.

Hippocampus denise seahorse

to see world-class diving you should go to Tubbataha.”

Ship groundings

As the time of our trip rapidly approached I could hardly contain my excitement about diving this isolated reef. However, just two months before our trip I received terrible news. The U.S. minesweeper USS *Guardian* ran aground on Tubbataha’s south atoll—2,345 square meters of the reef were damaged by this grounding, which the U.S. Navy’s own report attributed to a “lack of leadership”.

Everyone breathed a huge sigh of relief when on March 30 shortly before our trip to Tubbataha the last section of the USS *Guardian* was lifted off the South Reef by a crane. There was great sadness over the damage done to the reef, but this was ameliorated to a small extent

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Diver with large cuttlefish on reef



RANDY WRIGHT

by knowing that finally the boat was gone and could not do any more harm. Now we can once again think of our impending trip and perhaps even see for ourselves the extent of the damage done by this horrible accident.

Then the near impossible happened. Just one day before our flight from Manila to Puerto Princesa (the departure point for most liveaboards), another ship went aground on Tubbataha. How could this happen twice in such a short period of time particularly at a UNESCO World Heritage Site that is nowhere near a major shipping lane?

My first reaction upon reading this news was the same as that attributed to Philippine President Benino Aquino III: "This must be some mistake. This can't be happening again!" Or in the oft-quoted words of famed U.S. baseball player Yogi Berra, "It's déjà vu all over again!"

This time the culprit was a Chinese fishing vessel, the F/V *Min Long Yu* (whose cargo, as I'll explain, was anything but fish). And this time, the damage was a lot worse. Nearly 4,000 square meters were destroyed, including some massive corals over 500 years old. As one official stated, "It bulldozed through vibrant coral reefs

leaving a highway of destruction in its wake."

Our trip, however, was still a go so later that same day we boarded the scuba liveaboard, the *Atlantis Azores*, which is a former Aggressor fleet ship that was recently renovated. The boat was in excellent shape, the hard-working crew was spectacular and the food was very good. The rooms below deck were on the small side and did not have windows or portholes, but the friendliness of the crew more than made up for these minor shortcomings.

During the course of the week a tank was accidentally dropped on my gear, and consequently, my regulator and flashlight were damaged. Though I was not pleased with this, I have dived enough to know that accidents will happen. The captain

and crew were extremely apologetic and took immediate responsibility. They lent me replacement gear at no cost and told me to take my damaged equipment to my favorite dive shop back in the States, and they paid the bill by credit card, no questions asked. I was impressed with the way they handled this mishap.

Diving Tubbataha

But how was the diving in Tubbataha? In a word, excellent. During the course of the week, I saw more sharks than I have in years, particularly in Jessie Beazley Reef. I also have not dived with this many turtles in a long while, and for the first time ever, saw a pair of mating turtles. The occasional napoleon wrasse, large tuna and large schools of jacks added to the enjoyment of the dives.

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MABUL ISLAND, SABAH





Reef shark resting in its hiding place on the reef

there are more in the Galapagos. Tubbataha has a lot of pygmy seahorses, but there are more in Raja Ampat. Tubbataha has good visibility, but you can find better viz in the Solomon Islands. Tubbataha has a lot of nudibranchs, but you can see more in other parts of the Philippines. However, when you add things up, Tubbataha is one of the best rounded dive sites in the world.

To me, the key to Tubbataha's beauty is its remoteness from human activity. Other reefs are

RANDY WRIGHT

Except where there was old damage from blast fishing and, of course, the two recent groundings, the reef itself is in excellent shape. And Tubbataha has plenty of small creatures as well. I saw many pygmy seahorses, nudibranchs and various fingernail size crabs. There were many opportunities for night dives which ranged in interest from so-so to one dive where an octopus spent 30 minutes putting on so many poses for us that we nicknamed it "Zoolander".

I cannot give a personal assessment of the damage caused by either boat, as we were not allowed to dive the sites closest to where the USS *Guardian* went aground. This was allegedly so that the area could begin to recuperate, but I suspect the real motivation was to prevent divers from taking photos of the damaged reefs. Nor could we dive the area near the F/V *Min Long Yu*, as it was still aground when we were there. It has since been removed.

We did however pay a visit to the ranger station that sits less than two kilometers from the point where the *Min Long Yu* went aground. The rangers

told us that the ship was carrying 2,870 dead pangolins, an endangered scaly anteater found on Palawan Island. These were probably destined for the shelves of Chinese drugstores alongside rhino horns and remnants of other threatened species.

The rangers told us that the 'fishermen' on board the *Min Long Yu* offered them a bribe of US\$2,400 for their quick release. This proffer was refused, and the culprits are now in jail.

I have a theory as to why Tubbataha is not better known than it is amongst international dive circles. Tubbataha is an all around excellent dive site but it does not rate as the world's best in any one criterion. Tubbataha has a lot of sharks, but

too close to human settlements and are thus extremely vulnerable to over-extraction and degradation from pollution. That is unless the island community nearest the reef actively protects and conserves it. And this is precisely what is happening in Manamoc Island in the Philippines with the help of Seacology.



RANDY WRIGHT

Pair of sea turtles mating

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DIVE & DISCOVER



Children welcome the delegation visiting the Seacology solar energy system in the village of Manamoc in the Philippines; Diver hovers over lush soft corals on reef (far right)



DAVID REUBUSH

Community action

One of the major problems besetting island communities like Manamoc is the lack of reliable electricity. Its generators depend on fossil fuel, which has to be imported to the island and is very susceptible to price increases. The very high cost of power makes it difficult for villages to provide efficient and effective services to the community. Moreover, the community's generators are usually turned on only at dusk and turned off at midnight. In the local high school, for instance, students and teachers had to shell out personal money to purchase gasoline for the sole generator within the school to power at least two of the six working computer units in their classroom.

In 2008, Seacology funded several solar power supply systems for the community health center, village hall, community training cum multi-purpose center, public high school, public elementary school and the pre-school center—all in exchange for their commitment to protect a nearby 108-hectare marine protected area (MPA). Our local partner, the Andres Soriano Foundation (ASF), has been reporting that the solar power systems are serving the community well, and that the MPA is being strictly enforced

as a no-take zone. Shortly after our visit to Tubbataha, a Seacology delegation visited

Manamoc to see for ourselves what is actually happening on the ground.

On our arrival we were met by dancing children, ASF staff and village officials who briefed us on the status of the MPA. Fish counts have tripled between 2008 and 2012. In 2008, there was only 25 percent hard coral cover, whereas now hard coral covers 50 percent of the reserve.

The villagers have organized their own fish warden group, which continuously patrols the MPA. Poachers, invariably other fisher folk originating from neighboring islands, are apprehended and fined. Through the fines collected, the villagers were eventually able to purchase a patrol boat exclusively for this purpose.

After the brief presentation at the beach, we were taken around the village where we saw the solar power systems at work, most notably at the health center where temperature sensitive medicine such as vaccines are now refrigerated, and the high school where students can now learn

and practice computer skills regardless of their families' ability to pay for fuel. This project is a good example of what can happen when a highly motivated village such as Manamoc works with a terrific local NGO such as ASF with the support of Seacology.

Our Seacology expedition to Tubbataha and Manamoc Island offers critical lessons in the management of the Earth's remaining wildlife resources. No spot on this planet is sufficiently isolated from potential damage done by humankind. A single ship grounding can instantly obliterate wide areas of coral for decades if not centuries to come. Wanton poaching for whatever purpose can drive a species to extinction. And a small island community taking responsibility for the protection of its marine resources can cause these areas to flourish, translating to increased bounty within nearby designated fishing areas. ■

Duane Silverstein is the executive director and Ferdie Marcelo is the Philippines Field Representative for Seacology an NGO whose sole purpose is preserving the marine and terrestrial ecosystems of islands throughout the world. For more information about Seacology, which has protected almost two million acres of island marine and terrestrial habitat, or to find out more about and Seacology's expeditions, visit Seacology.org

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RANDY WRIGHT



Text and photos by Barb Roy

If anyone was to notice me I probably looked pretty funny underwater, sticking half way out of a hole in the side of a fair-sized shipwreck. My fins kicking away to control my balance might make one think I was stuck or something. But I was by no means—only totally absorbed in what I was looking at. From the outside, this natural shipwreck appeared to be just another ordinary wooden cargo barge, mostly deteriorated and dull-looking after years of weathered exposure to the Atlantic Ocean. You might say nature's camouflage had done a great job blending it into its surroundings.



Portugal: Another Ship Down
Hermenegildo Capelo
— Adds to Unique Diving



Hermenegildo Capelo heading for new life as a reef

The sinking of the *Hermenegildo Capelo* on 15 June 2013

I too would have not given the *Batelao do Burgau* a second thought except for the fact I was searching for some form of color or marine creature to photograph when I came across a few tiny red anemones in the tattered opening of where a porthole once was. Previous experience hinted there might be more of these colorful critters within the covered section of the hull, so I peered into

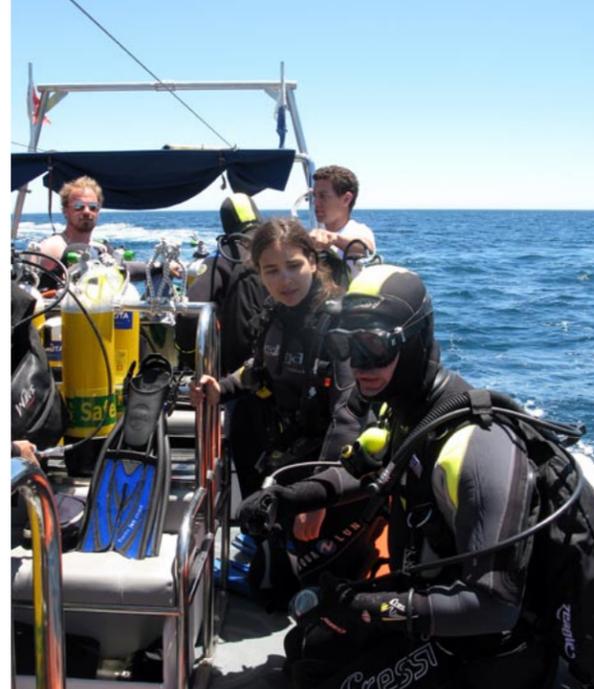
a larger opening to investigate.

Whoa! To my delight, life was everywhere. The sun's shimmering rays of light trickled in through dozens of small holes in the top deck allowing vivid colors of orange, purple, yellow and red to emerge. A variety of jeweled anemones, gorgonians, sponges, and other invertebrate life seem to occupy every part of the remaining interior skeletal structure

wreck rap



Exterior (right) and interior (below) of the *Batelao do Burgau* wreck



Divers prepare to dive on the new wreck

in the Algarve region of southern Portugal when the first explosive charges rumbled through the 102-meter (335-foot) Ex-NRP *Hermenegildo Capelo*. Not long after, fiery pyrotechnics boomed from the bow, mid-ship and stern, sending giant fireballs into the air. Boat horns sounded from surrounding boats while equally loud cheers roared over the radio from on-lookers at a nearby resort on land. Silently the decommissioned Portuguese Naval frigate slipped beneath the surface in just over two minutes to begin its final mission of providing new habitat for future marine residents on a barren sandy ocean floor.

The *Hermenegildo Capelo* is the third and largest ship to be scuttled in the new marine park as part of the Ocean

Revival Project, a venture started and headed by local business owner, Luis Sa Couto, over five years ago. "My intention for the project is to help transform the Algarve region into a world-class destination for diving, attracting divers from all over the world. The project is also meant to help increase the marine bio-diversity of life and preserve the memory and history of the ships in the park," said Sa Couto,

a diver since 1969. In 2007, Sa Couto opened Subnauta, a PADI Five Star dive facility designed to offer local and visiting divers professional dive excursions off the coast of Portimao. This quaint, laidback community is already treasured by Europeans for its golden beaches and mild climate, so the addition of four ships will only add to Portimao's attraction.

along with small schools of hovering fish in mid water. It was like I was transported to another dive site. Needless to say, it didn't take me long to maneuver my camera and strobes inside, but as tight as it was, I was extremely careful not to damage the structure or critters around the opening. Once finished collecting my shots, I paused to admire the beauty, wondering if this is what the inside of the steel ships they just put down in the new underwater park off Portimao, would one-day look like.

Ocean Revival Project
June 15, 2013 – It was a warm, clear afternoon along the peaceful coastline of Portimao



One of the first dive groups to dive the *Hermenegildo Capelo*; Subnauta dive boat (left)

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The *Hermenegildo Capelo* is prepared for divers (left); Chris Straub (right) of British Columbia, Canada, volunteers his time to set 17 Go Pro cameras on the ship before sinking to record the event

in a single day anywhere in the world. With three ships underwater in less than a year, Sa Couto is well on his way to meeting his goals.

In addition to the placing of these reefs of steel, a brand new hyperbaric chamber was provided to the hospital in Portimao by Sa Couto as part of the project. Medical professionals in the area have already begun utilizing the chamber's many useful applications as well as being prepared for any possible dive emergencies. Currently, an inland exhibit for the public is also underway, which will depict the history of these retired warships.

CARC

To assist in making this vision



a reality, Sa Couto and those behind the project enlisted the services of the Canadian Artificial Reef Consulting (CARC) group who has successfully scuttled over 23 ships in similar reef projects around the world.

"A project like this wouldn't be possible without the efforts of a lot of people," said Wes Roots, consultant and coordinator for CARC. "It usually takes about seven months to prepare one of these ships before sinking it. After the Navy turns over a decommissioned ship, it goes to Batista's Shipyard in Lisbon where it is thoroughly cleaned and prepared according to OSPAR Convention Rules. Sa Couto works with them on what to leave on the ships so each ship will be different, like leaving on the Gun Director or a radar unit.

"Scrap metal and any dangerous items are removed while still in Lisbon. Then it is brought down to Portimao where diver access holes are cut into the decks and hull, making it safe for divers to exit or enter the ship during a dive. After the holes are cut, the ship is brought to the Naval dock where Roy Gabriel, our explosives expert, and his son work with members of the PRT Navy EOD

"We supply all diving gear for our boat charters," said Sa Couto, "because we understand about the airlines and traveling with heavy dive bags. We want divers to have a good experience when they come here."

Subnauta offers four dive boats of varying size which service not only the new park, but any of the natural historic wreck sites as well. In addition to shipwrecks, there are also several dozen nearby reefs to choose from.

On 30 October 2012, the first two vessels donated by the Portuguese Navy were placed in the park. The 85-meter (279-foot) Ex-NRP *Oliveira e Carmo*, a Corvette class ship, and the 44-meter (144-foot) Patrol Vessel Ex-NRP *Zambeze* offer two very different sites to explore. From what I could find, this was a record set for sinking two ships (prepared for diving) of this size



Portuguese Navy Clearance divers and the Canadian team

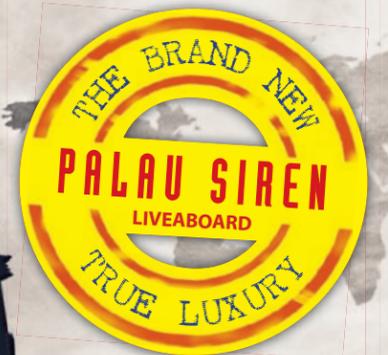


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Engine room of the *Hermenegildo Capelo*; Roy Gabriel Jr adjusts banner on the *Hermenegildo Capelo* (far right)



Divers to set the charges. ORICA Marine Services supplied the electronic detonation system and Alberto Braz acted as our liaison to coordinate everyone."

The last of the vessels to be scuttled will be the 64-meter (210-foot) Hydrographic ship Ex-NRP *Almeida de Carvalho*, scheduled to be scuttled in September of 2013. Not only has the project provided jobs for local residents in Lisbon and Portimao, the three ships underwater have already established a resident population of marine life and attracted curious divers

throughout Europe.

"After seeing how many different fish that now inhabit the corvette (*Oliveira e Carmo*) after only ten months," said Roy Gabriel Jr., part of CARC's demolition crew and an avid scuba diver, "I would expect that these ships will quickly become an amazing location for people who want to swim amongst large schools of fish. I expect that the frigate and eventually the hydrographic ship will populate as quickly. Once the word gets out, people will want to visit the park.

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I mean, what more could you ask for? Four decommissioned Portuguese Navy ships placed in one location and within ten minutes from the wharf, all under 35 meters of water."

Diving

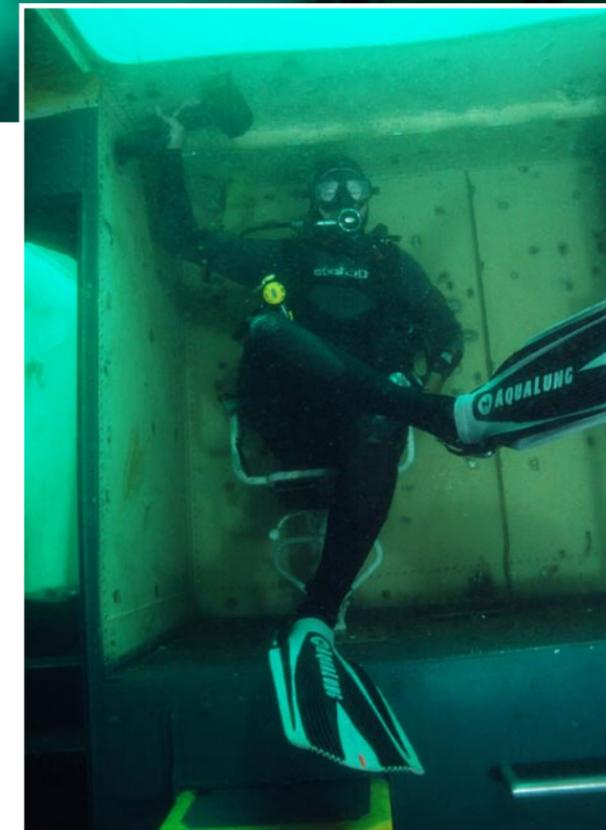
My dive buddy, Roy Gabriel Jr., and I were able to dive on the *Hermenegildo Capelo* the day after it went down in June along with Wes Roots and his son Greg. Since Greg assisted in the prep work for this ship and the previous two, he was excited to check out the new wreck. Rebeca Sa Couto, daughter of Luis, and several other eager divers also joined the group.

Needless to say, it was another calm, sunny day when we rolled over the side of the rib. While descending I remember reading that the *Hermenegildo Capelo* had a crew compliment of 164 and was

the first ship in the Portuguese Navy to take on female crewmembers. It was retired in 2004 after 37 years of service.

Visibility was around 45 feet as we approached the ship, which was sitting upright with little to no noticeable damage. One of the first things Roy and I did was to straighten out the banners on the ship for a photo. Then it was off to the bridge for a photo in the captain's chair! A photo on the table in the Med-Bay and one on a bench on the side of the ship followed.

Being good on air has its advantages when exploring a ship of this size! Roy was like a kid wanting to visit all of his favorite places. However, as we darted about the ship engaging in various photo opts, I thought it all to be quite surreal; the idea of walking around on the ship the day before, and now seeing it underwater was indeed very cool.



Roy Gabriel Jr in captain's chair on the *Hermenegildo Capelo*



Anemones adorn part of the *Conhoneira Faro* wreck; Rebeca Sa Couto on bridge of *Oliveira e Carmo*; (far right)



The huge anchors tied to the deck on the bow looked even bigger underwater, and the gun barrel on the back-deck Director, too high for me to reach yesterday, was now at my fingertips. Similar memories were expressed back on the dive boat as everyone prepared for the next dive.

Oliveira e Carmo

The *Oliveira e Carmo* was our next adventure, but this time I went with Wes and Greg since Roy was flying home

soon. This was the first ship to be scuttled in the park and during a bad storm this past winter, was torn into two sections.

Lt Jaqueline Barroso, the Commander of the Portuguese EOD team helping the Canadians with the explosives, told me: "Yes it's true; the EX-NRP *Oliveira e Carmo* Corvette is now broken in two sections because of a winter storm. The smaller section, approximately 50ft, is the stern and is still in the original position. The biggest section—middle ship and bow—was dragged to the southeast approxi-

mately 900ft from the original position. When I was on it in June, I dove on the section that was moved. The power of the ocean is amazing. The ship was torn into two parts like a sheet of paper!"

Talking with Barroso after the ship went down, he also explained how excited he was to have a park like this in Portugal.

"As a sailor and as a Navy Diving Officer, I'm really happy with this fantastic project," said Barroso. "After more than 40 years of duty in the Portuguese Navy, this is a wonderful and useful way to maintain these ships and keep them alive. Although they are on the bottom of the Atlantic Ocean they are still on a mission, not only as a Portuguese Naval Underwater Museum for all the divers to see but also for the environment to attract marine life to what would normally be a naked sandy underwater terrain."

The three of us dropped onto the stern section of the *Oliveira* where we could check out the torn away hull first. It actually looked like a pretty clean separation. The hull had a few rough edges on the sides but appeared okay for entry into the different levels.

I followed the guys down the port side near the sand and watched as they examined several openings and looked into the engine room. The sand was built up like craters around most of the bottom openings, probably from surge action during the winter storms. With visibility around 60 feet, I could see a great deal of the openings, all of which looked clear.

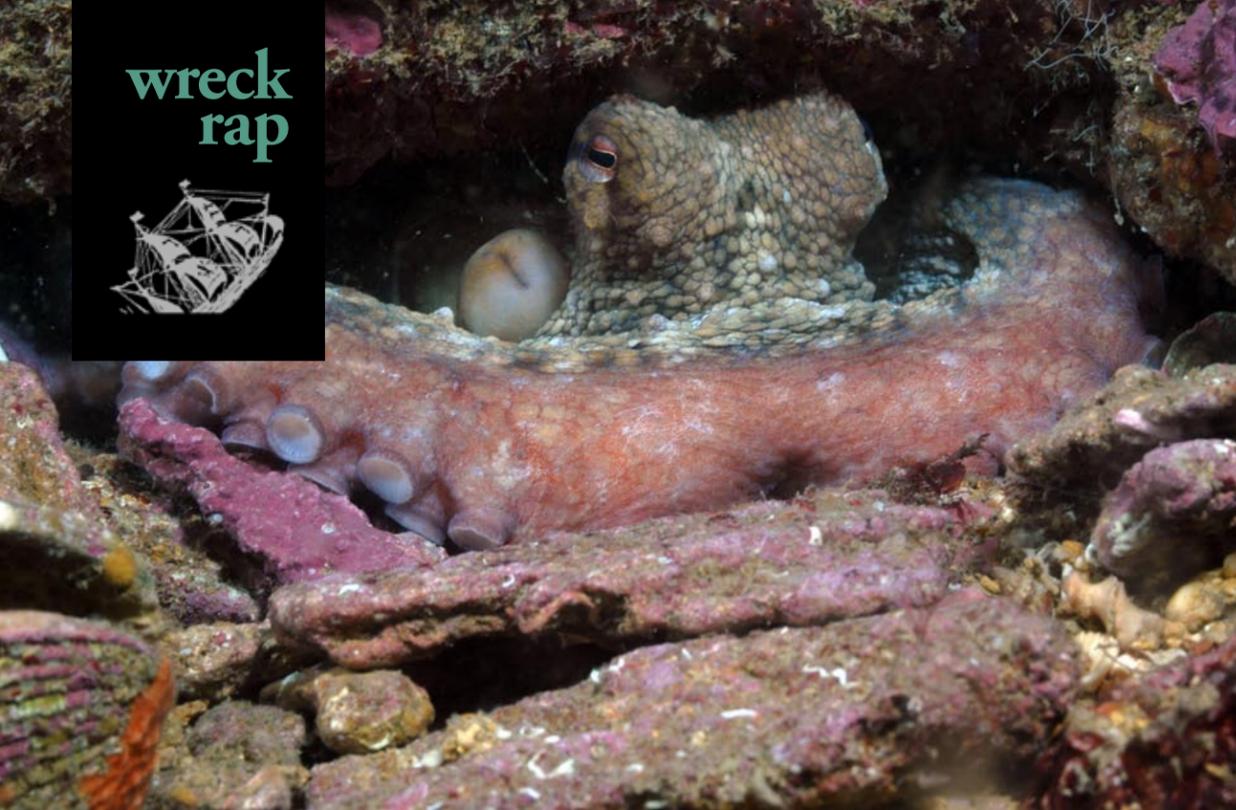
Since the guys were occupied below, I peered into one of the top-deck access holes and found a small room filled with ambient light. Remembering what the

wooden cargo barge had looked like inside, covered in an array of life and color, I tried to imagine what the inside of this room might look like in five or ten years. Maybe there would be tiny red and purple anemones hiding within and small gorgonian sea fans growing on the hatch openings or on ridges where a wall was removed.

The ship's bridge was our next stop. With three divers inside visibility swiftly diminished. Once finished photographing both Wes and Greg at the wheel, I remained inside and waited for visibility to clear. This is when Rebeca entered with the grace of a lady and in much better control of her buoyancy. She swam over to the wheel where I proceeded to photograph her as well. I could tell by her wide eyes that she was as enchanted with the dive as I was.



Greg Roots at bow of *Oliveira e Carmo*



CLOCKWISE FROM LEFT: Little octopus hiding on wreck of *Conhoneira Faro*; Jeweled anemones found on a dive at Jardim dos Nudibranquios; Meerkats taking it easy at the Lagos Zoo; Portimao boardwalk along the beach



Overall, the local diving offered a variety of different sites. The invertebrate life was colorful and the fish were plentiful on both the wrecks

Again, back on the boat we all had fun stories to tell. I'm sure the other divers felt as I did, wishing there was more time and air to visit all the wrecks right then! Alas, there is always tomorrow...

Historic wrecks

In addition to diving on three historic natural wrecks and on two of the three Naval ships in the park, I was able to explore a reef in the area. Perhaps my favorite site however, was on the *Canhoneira Faro* which translates to "Faro Gunboat," a steam-powered Portuguese Navy warship made of iron.

I would have to say, as a photographer I was delighted by the amount of marine life living on and hiding in what remained of the iron debris. Beautiful anemones seemed to be glowing blue color from their center while pink, lavender and red encrusting algae spotted protruding pieces of the ship. Orange and white gorgonians, tubeworms, small blennies, sculpins and sponges were everywhere.

One of the most interesting creatures was a small octopus, trying its best to build a wall of rocks and empty shells. When it saw me, or maybe it saw its reflection in my camera's dome port, it cautiously moved closer. I am used to



the giant octopus we have back home in British Columbia, the kind that will grab onto your camera and challenge you to a tug of war to get it back! No, this one was small, cute, and according to one of the dive masters, doesn't get much bigger. After a few minutes it went back to its construction, ignoring me altogether.

in the park and at the natural dive sites. I found the dive staff at Subnauta to be knowledgeable, friendly and all spoke English well.

Topside excursions

When not diving, I was able to easily walk around Portimao. The town

supported a nice variety of reasonably priced restaurants, all with exceptional wines. A boardwalk stretches along the beach from one end of town to the other, which I found nice for evening walks. Land-based and water tours are available, with most companies able to arrange transportation from your hotel or bed and breakfast.

A good place to spend a half day with the family or alone is at the Lagos Zoo. Here, I enjoyed seeing a wide selection of animals, birds, reptiles and flowers from around the world.



Afterthoughts

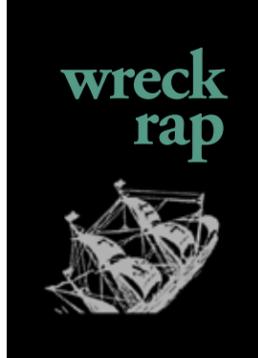
For a unique view of one of these ships sinking, check out the video, *17 Points of View*, at Oceanrevival.org. Greg Roots helped Canadian volunteer diver, Chris Straub, put up 17 Go-Pro cameras around the *Hermenegildo Capelo* before sinking. Viewers can see from different angles and locations on the ship, the water rushing in as the vessel sinks!

As with most ships of this size prepared and placed on the ocean floor for divers to enjoy and marine life to inhabit, it is wise to seek specialized training for overhead environments if you want to explore inside the ships. Because of their sheer size, it might also be more prudent to take a couple of dives to see it all.

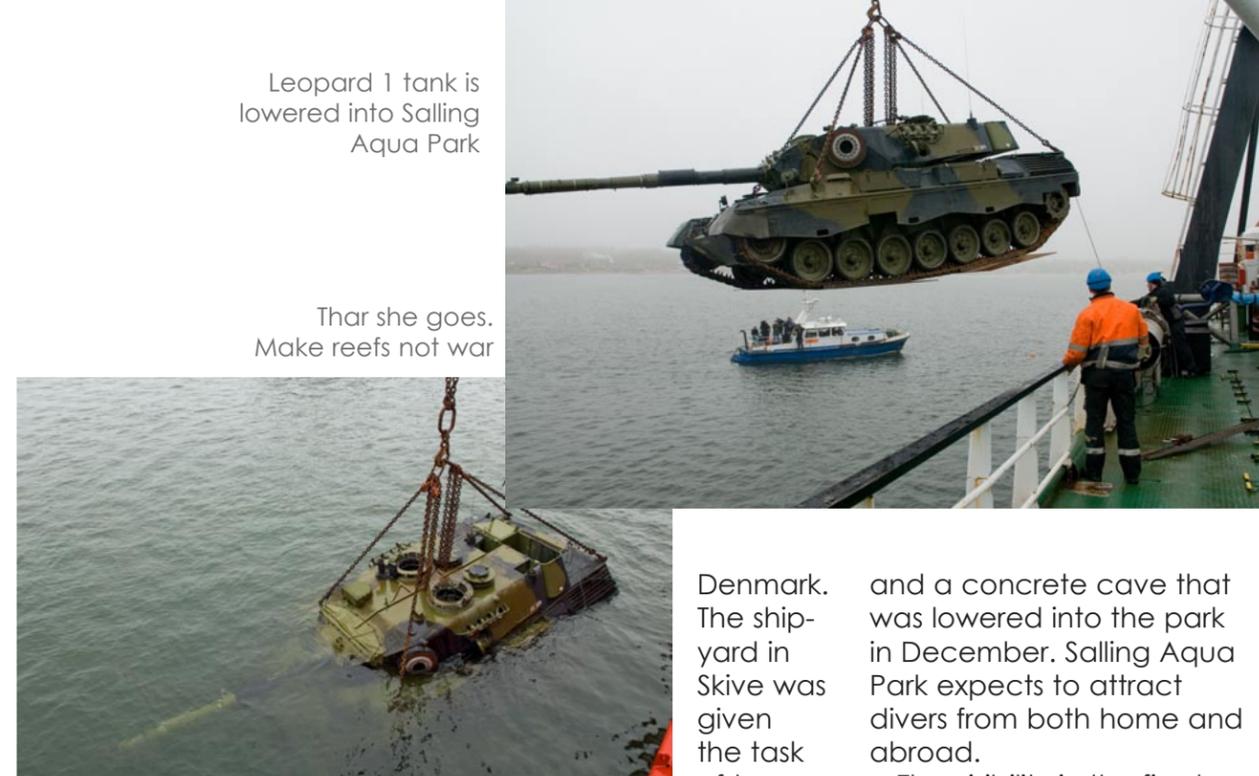
Perhaps seeing the success of this project, as well as others before it, will be an encouragement for more countries around the world to brave projects such as this and sink their own reef of steel. ■

For more information, visit Ocean Revival Project at Oceanrevival.org; Subnauta at Subnauta.pt; Canadian Artificial Reef Consulting at Artificialreefs.net.





Swedish minesweeper M25 on its last journey to its final resting place in a Danish fjord



Leopard 1 tank is lowered into Salling Aqua Park

Thar she goes. Make reefs not war

Minesweeper and tank see new life as artificial reef in Denmark

Photos by Kim Meineche

This past March, the Swedish minesweeper M25 found its last resting place at a depth of 18 meters on the bottom of Limfjorden, in the Northwestern part of Denmark. According to observers, the old vessel sank and sat nicely on the bottom a few hundred meters off the coast of the

town of Glyngøre.

"She stands the way she is supposed to, upright and resting on the keel, without a lean. We have, afterwards, also appointed ourselves the world champions in wreck lowering," said Jan H. Opstrup cheerily, as project leader for the Salling Aqua Park in



The former Swedish minesweeper M25 now rests at a depth of 18 meters and can be reached by swimming out from the beach.

A crab has now taken the Leopard tanks periscope into possession

Glyngøre.

Sport divers from the local area volunteered to help with the sinking of the minesweeper in the soon-to-be completed Salling Aqua Park next to Glyngøre. Many interested spectators from the surrounding communities came to see the sinking of the vessel despite the cold winter weather, which is typical this time of year in

72-year-old ship from the port of Skive to its final resting place near Glyngøre Harbour, where it was anchored to the bottom with four concrete blocks, which were sunk on the site in advance.

The minesweeper will be one of the main attractions in Salling Aqua Park, along with the Leopard 1 tank

Denmark. The shipyard in Skive was given the task of towing the

and a concrete cave that was lowered into the park in December. Salling Aqua Park expects to attract divers from both home and abroad.

The visibility in the fjord often leaves a lot to be desired but the proximity to the coast makes these new artificial reefs diveable straight off the beach which is definitively a bonus and the location within a fjord is not subject to wave action from the open seas. But do bring a torch local divers we have been recommended by local divers familiar with the site. ■ SOURCE: SKIVE FOLKEBLAD



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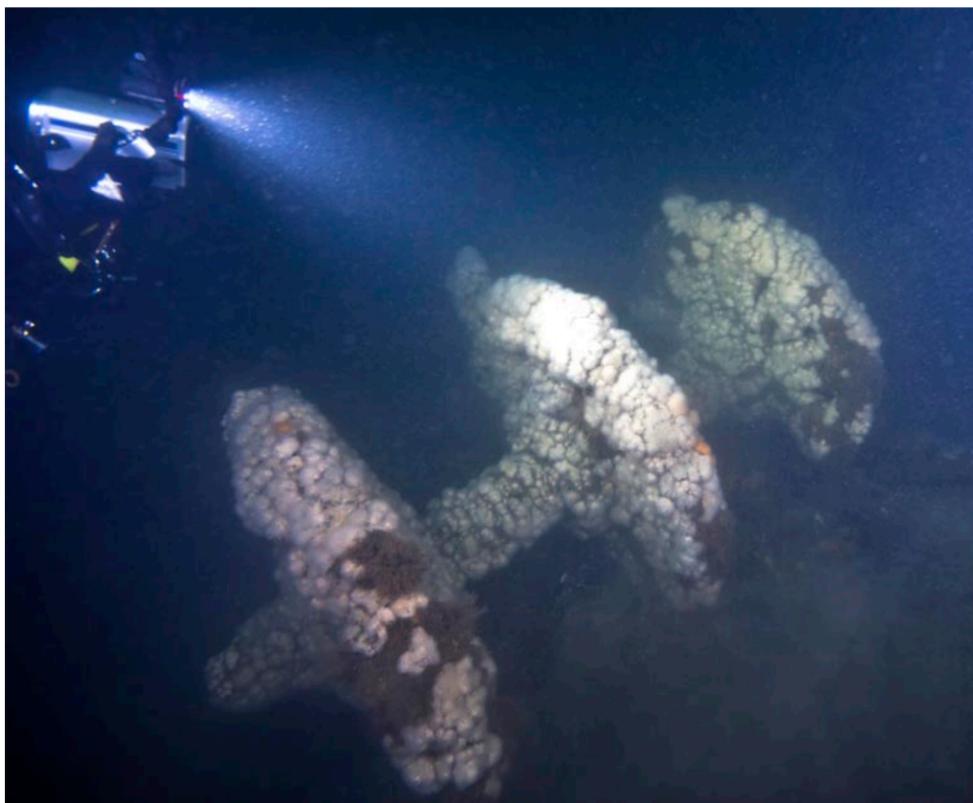
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Confirmed: Lost 19th century wreck is U.S. Coast Survey steamer, NOAA says



USCS *Robert J. Walker's* unique paddlewheel flanges

The U.S. National Oceanic and Atmospheric Agency (NOAA) has identified a 153-year-old mystery wreck as the USCS *Robert J. Walker*, which was coming back home from a hydrographic survey mission in the decade before the Civil War when it met its demise in a collision at sea.

Twenty souls were lost on 21 June 1860 when the steamer that served the U.S. Coast Survey, which was a predecessor agency of the NOAA, was hit by a commercial schooner off the coast of New Jersey, sinking within just 30 minutes and marking the largest single loss of life in the Coast Survey history.

An important survey ship carrying 66 crew members, the USCS *Robert J. Walker* was responsible for charting the Gulf Coast and plotting the movement of the Gulf Stream along the U.S. eastern seaboard.

"Before this identification was made, the wreck was just an anonymous symbol on navigation charts," said the director of NOAA's Office of Coast Survey, Rear Admiral Gerd Glang. "Now, we can truly honor the 20 mem-

bers of the crew and their final resting place. It will mark a profound sacrifice by the men who served during a remarkable time in our history."

First discovered in the 70's Resting at 85ft, the *Walker* wreck site was first discovered by a commercial fisherman in the 1970s. Despite being regularly visited by divers, the wreck's identity has until now been a mystery.

Identification of the wreck was a collaborative process between public and private groups. Research in identifying the wreck was provided by New Jersey wreck divers; maritime archaeology student, Joyce Steinmetz, of East Carolina University; and Capt. Albert Theberge, a retired NOAA Corp captain and chief of reference for the NOAA Central

Library.

On-site clues were gathered by the NOAA Maritime Heritage diving team visiting the site on the NOAA Ship *Thomas Jefferson*, using multibeam and sidescan sonar systems. Identifying keys of the iron-hulled wreck included its layout and size as well as unique features such as its engines and rectangular portholes.

"The identification of *Walker* is a result of excellent collaboration with the local community," said director of maritime heritage for NOAA's Office of National Marine Sanctuaries, James P. Delgado. "We look forward to working with our local partners to share *Walker's* story with the public in a manner that both promotes educational dive tourism and protects this nationally significant wreck and gravesite." ■ SOURCE: NOAA

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NOAA OCEANOS EXPLORER

The two-masted ship may be 200 years old. Archaeologists have been able to recover some items like ceramics and bottles, including liquor bottles and an octant. Other items spotted among the wreckage are muskets, swords, cannons and clothing

Find three wrecks for the price of one

As marine archaeologists were examining a well-preserved shipwreck deep in the Gulf of Mexico, they also found two other sunken vessels that likely went down with it during an early 19th century storm.

The shipwreck appears to be an untouched, early 19th century, wooden-hulled, copper-clad vessel containing artillery and firearms.

The vessel's length is 84 feet and the most prominent feature of the site is the remains of the ship's hull covered with copper sheathing, which indicates a relative date of late 18th to early 19th century. The rake of the vessel at the stem and the stern suggest that it is potentially a clipper or shares attributes with this vessel type. While the hull might be the most prominent feature, the assemblage of material culture found on the shipwreck is extremely impressive and lends to the need for sampling and further study.

Little is known about the other ships, including the flag or flags they sailed under and the year they sank about 170 miles southeast of Galveston.

Although they weren't allowed to retrieve artifacts from the two new sites

under the terms of their agreement to examine the initial one, the researchers took thousands of photos and closely examined the wreckage of all three ships, which came to rest within five miles of one another.

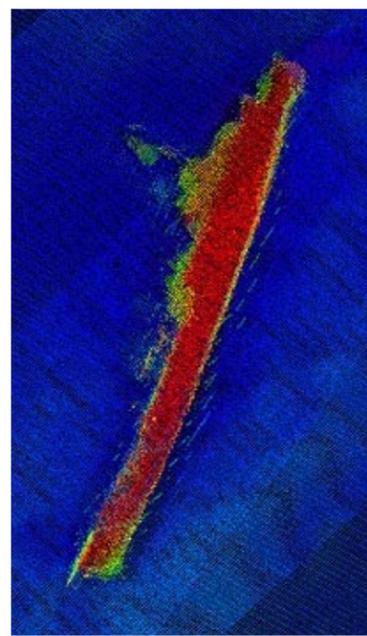
Two of the ships were carrying similar items, and researchers believe they may have been privateers, or armed ships that governments would hire, said Fritz Hanselmann from Texas State University in San Marcos' Meadows Center for Water and the Environment. The third vessel was loaded with hides and large bricks of tallow, suggesting that it may have been a prize seized by the privateers. ■ SOURCES: NOAA, TEXAS STATE UNIVERSITY

Royal Navy survey finds wrecks off Libyan Coast



(File photo) HMS Echo

HMS Echo used state-of-the-art sonar equipment to map the unseen wrecks, reefs and rocks of the Libyan coast and make navigation less hazardous. Significant discoveries included a number of uncharted wrecks in shipping lanes, which could have posed a danger to vessels.



In total, the ship's crew surveyed 46.8 square nautical miles, an area equal to that of just under 20,000 football pitches. All of the survey data will be shared with the Libyan Hydrographic Office in order for the area's charts to be updated.

In addition, specialists from the ship passed their expertise on to members of the Libyan Navy who spent several days on board. The sailors learned the

modern surveying methods including side-scan sonar, satellite positioning and electronic data collection to allow the Libyan Navy to take responsibility for mapping their waters in the future.

The operation was the ship's second visit to Libya following a successful trip in 2012.

Echo was launched at Appledore in Devon in 2002, and was designed to carry out a wide range of survey work, including support to submarine and amphibious operations, through the collection of oceanographic and bathymetric (analysis of the ocean, its salinity and sound profile) data.

Echo left Devonport in the first week of 2011 on a two-year deployment to the Red Sea, the Gulf, the Indian Ocean, the Middle and Far East and returned to home waters at Devonport in August 2012. After spending two months in Falmouth for a revamp, the specialist survey ship spent the final weeks of last year putting would-be navigators through their paces in the waters off the southwest of England. ■ SOURCE: ROYAL NAVY

Turkish shipwreck survey in ancient Troy

An international team of archeologists sponsored by the Institute of Nautical Archaeology (INA) and the Honor Frost Foundation have been granted a permit to survey the waters around the ancient city of Troy (located in northwest Anatolia in Turkey), as well as the entrance to the Dardanelles (the

narrow strait in northwestern Turkey, which connects the Aegean Sea to the Sea of Marmara). The team will collaborate with Harun Özdaş, INA research associate from Dokuz Eylül University Marine Science and Technology Institute.

The researchers will focus on the trade routes that lead to the

entrance of the Dardanelles, formerly known as Hellespont. The team will conduct a systematic shipwreck survey of Gokceada and map WWI remains of the famous naval battles known as Gallipoli, or Dardanelles Campaign. ■

SOURCE: NAUTICALARCH.ORG



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Edited by Larry Cohen

Divers from the United States can now explore Cuba

The United States partially imposed an economic embargo on Cuba in the fall of 1960. After Cuba nationalized the properties of U.S. citizens and corporations, the embargo was strengthened in 1962. From that time forward, U.S. citizens could not visit Cuba for tourism. They also could not do business or spend money there.

Many U.S. citizens do travel to

Cuba by entering illegally from other countries. The U.S. Treasury Department's Office of Foreign Assets Control does issue licenses for U.S. citizens to visit Cuba for humanitarian, cultural, religious and a few other special reasons. Journalists and professional researchers can get a license for work that will be published.

It is also possible for educational

organizations to get a people-to-people license. The purpose of this is for U.S. citizens to have meaningful interactions with the Cuban people and communities. Now a people-to-people license has been issued that involves scuba diving.

Diving in Cuba

Ocean Doctor, a nonprofit organization founded in 2004 by Dr David E. Guggenheim, who has conducted research programs in Cuba for nearly 13 years, has been granted a people-to-people license to run educational programs in Cuba for U.S. citizens. Transportation from the United States will be handled by Marazul Charters, which works with a number of charter airlines that fly between the United States and Havana.

Avalon Cuban Diving Centers will be in charge of dive operations and all logistics in Cuba. Avalon is the only dive operation with a permit to operate in the national marine park, Los Jardines de la Reina (Gardens of the Queen).

Cuban reefs are rich with soft corals sponges (left); Southern stingray (right) and Atlantic goliath grouper (far right) can be seen on most dives



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National marine park

The tours are designed to educate U.S. citizens about conservation and ecotourism and how it affects the Cuban people and their communities. Participants will visit historic sites in and around Havana and will interact with Cuban scientists.

After leaving Havana, the group will travel south to visit and dive the national marine park. Christopher Columbus named the archipelago, which is located



in the park, in honor of Queen Isabel of Spain. The Cousteau crew visited the area in 1985 on the famous research vessel *Calypso*. It is also rumored that both Castro and Che fished and might have even dived these islands.

In 1996, the 837-square-mile area became a no-take reserve—the largest in the Caribbean—

and in 2010, was designated a national park. For several years, researchers from Ocean Doctor have been studying this area with the Cuban Center for the Study of Coastal Ecosystems and the University of Havana's Center for Marine Research.

Getting to the marine park is an adventure. The journey from Havana starts at 5:30AM with a five-hour charter bus ride to the small fishing village of Jucaro. At the marina, participants board one of Avalon's four liveaboard vessels or the water taxi for a

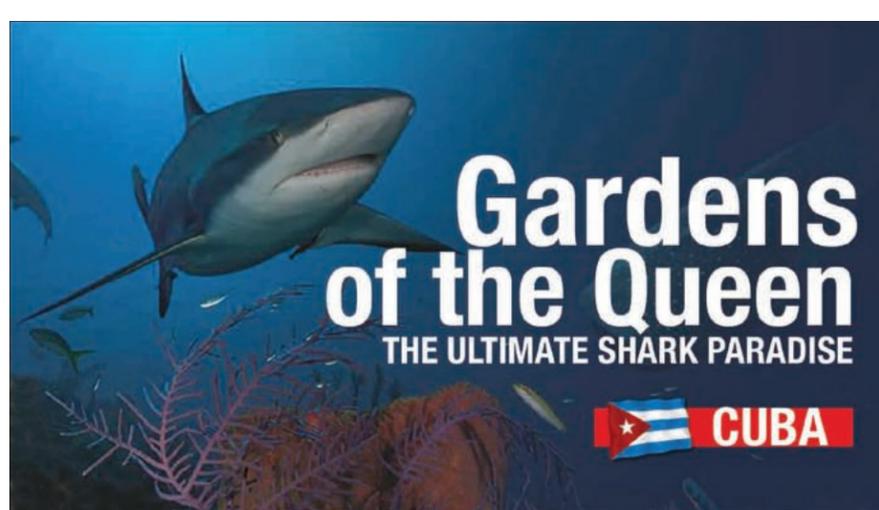




Caribbean reef sharks call Cuban reefs home

researchers studying how ecotourism is improving the environment and the lives of local people and their communities. Proceeds from this program will be used to fund additional research and conservation efforts in Cuba.

The program is scheduled to start in late September 2013. For more information, visit: OceanDoctor.org/Gardens.



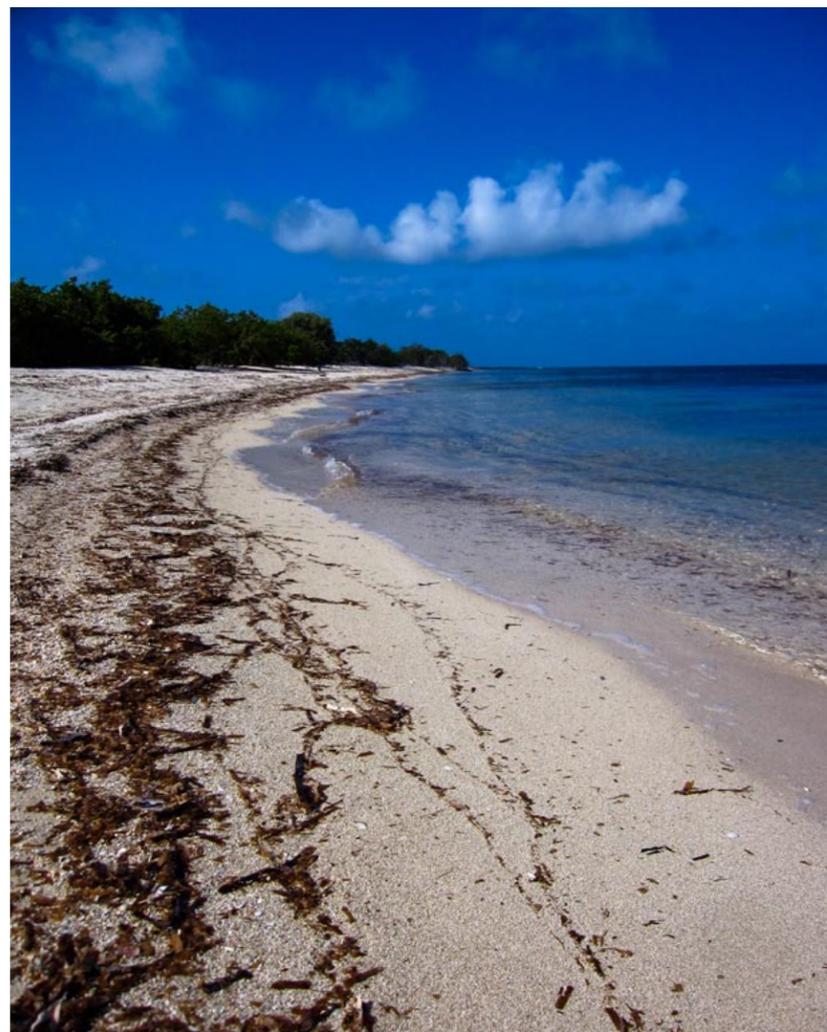
A unique educational program focused on conservation, ecotourism & diving in the heart of Cuba's spectacular Gardens of the Queen National Park



three-hour boat ride to Tortuga, a floating hotel.

The marine park has an exceptionally healthy marine ecosystem. Coral and fish populations are abundant. Fish populations include black grouper, tarpon, Cubera snapper and mahi-mahi. The critically endangered Nassau and Goliath grouper are found in large numbers. The area also harbors an abundant population of Caribbean reef and silky sharks. In the fall, whale sharks migrate through the area.

Travellers will visit coral reefs, mangroves and secluded beaches, but this is by no means a vacation. Divers will interact with local



Beautiful secluded beaches will be visited during the educational programs in Cuba; Christmas tree worms on reef (center left)

www.OceanDoctor.org/Gardens



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The diving community gains three deco chambers and loses one

The good news is that the Hyperbaric Unit at Gozo General Hospital (GGH) has reopened, and the deco chamber on the Mediterranean island is now oper-

ational and able to treat diving emergencies. The Maltese Ministry for Health is also planning to train two further doctors in hyperbaric medicine at the GGH.

High speed internet in planes next year

Would you like to be able to view streaming video such as Netflix while on board a plane, but the connection is too slow? Well, this could soon change, as the communications regulator Ofcom has proposed licensing a new satellite system called Earth Stations on Mobile Platforms (ESOMPs) which can deliver internet connections up to ten times faster than what is currently available to travellers on planes, trains and ships. ■

Mosquito repellent

A new wearable anti-mosquito patch has been developed, which will protect you from mosquitos for 48 hours. Called the Kite Patch, the stick-on can emit compounds that make it so mosquitos cannot detect carbon dioxide, and hence, cannot detect you. The patch developed by ieCrowd and Olfactor Laboratories is a major breakthrough in the fight against malaria, dengue fever and west Nile virus. ■



Meanwhile, quite some way from the Med, the Pacific Grove Hyperbaric chamber on the Monterey Peninsula, California, USA, has also reopened. The National Oceanic and Atmospheric Administration (NOAA) funded technical repairs; chamber volunteers, dive-community donors, city officials, the Monterey Bay Sanctuary Foundation and other marine research institutions also pitched in. The City of Pacific Grove, on the Monterey Peninsula, has provided medical treatment to injured divers with its hyperbaric chamber since 1966. The City of Pacific Grove provides for many of the chamber's operation needs, yet the facility needs continued fiscal support to offer

these important medical treatments.

We have also learned that St. Francis Hospital and Medical Center in Connecticut, USA, has purchased two hyperbaric chambers. While these are intended primarily for wound care, a press release states that treatments are also offered for decompression illness.

In the not-so-great news department, we have also learned that Bartlett Hospital in Juneau, in Southeast Alaska, has dismantled its compression chamber used for diving emergencies. Divers in Southeast Alaska requiring emergency treatment in a hyperbaric chamber will now have to go all the way to Anchorage or Seattle. ■

Helpful travel websites

Check out Knowdelay.com and Expertflyer.com.

Knowdelay helps travellers avoid flights in the United States with the greatest chance of delays due to weather. Although they do not claim to predict the weather, Knowdelay has created a formula using different weather models in order to gauge the impact of weather events, up to 100 miles away, on airport performance. With a red, yellow and green warning scheme, you can

see which flights have the most chance of experiencing delays.

ExpertFlyer was created to help travellers wade through all the airline flight information available when considering their next trip. While the site does not sell tickets, it can give travellers the best information on which flights they should take, what the fares are, where the best place to sit on the plane is and how to best utilize elite upgrades and frequent flyer miles—so travellers are thoroughly briefed on the options before they purchase tickets online or off. ■

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