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Number 53

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COVER PHOTO: Clown triggerfish with anthias, Maldives,
by Scott Johnson

Giant moray eel, Maldives. Photo by Scott Johnson



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Support the resistance

As this issue goes to press, a U.S. court has declared the Sea Shepherd conservation group to be "pirates" and ordered it to cease aggressive actions against Japanese whalers.

The lawsuit, initiated by a group of Japanese researchers to halt Sea Shepherd, comes after years of clashes at sea. The group, collectively referred to in the judgment as "Cetacean", has long hunted whales in the Southern Ocean for scientific research.

"You don't need a peg leg or an eye patch. When you ram ships, hurl containers of acid, drag metal-reinforced ropes in the water to damage propellers and rudders, launch smoke bombs and flares with hooks, and point high-powered lasers at other ships, you are, without a doubt, a pirate, no matter how high-minded you believe your purpose to be," said Chief Judge Alex Kozinski.

Excuse me, but who are the real pirates here?
The whales do not belong

to the Japanese for them to take, but to us all, and I would very much like 'mine' left alive. They sail their whaling fleet half way round the planet to hunt them under the false pretences of conducting 'scientific research', and as we understand it, only to stockpile most of the meat in warehouses because the demand from consumers is simply not there anymore, and then they use some for pet fodder. It is such a far cry from the Inuit hunters who need meat to survive and only take what is needed to feed the family.

Yoshimasa Hayashi, Japan's fisheries minister, has reaffirmed the country's stance on whaling to the AFP, stating: "So why don't we at least agree to disagree? We have this culture, and you don't have that culture." Well, Bubba, you do come across like a kleptomaniac making excuses for not being able to help it. Get over it. It's pathetic, and it puts you



at odds with the rest of the world. Is your misplaced pride really worth all the animosity?

As for the ruling by the U.S. court, it is our position that while just societies rest on laws that are, at least in theory, carefully formulated to protect the common good and a legal system where disputes can be resolved peacefully, there are also times where the outcomes comes into conflict with our conscience or sense of what is right and what needs to be done.

In our case, while we do not agree with all the methods employed by Sea Shepherd or all the choices they made, we have elected to stand behind the organisation, make regular donations and consider ourselves supporters.

It was not a difficult choice.

—The X-RAY MAG Team



News edited by
Gunild & Peter Symes

from the deep NEWS

New Zealand: New deep sea discoveries

Scientists have reported new findings of deep-sea fish species after a two-week survey in the depths off the Kermadec Islands of New Zealand. Among the findings is a new species of eelpout, a large deep sea cusk eel, new records of a rattail fish in the southwest Pacific and the return of another type of rattail—the cosmopolitan rattail—in New Zealand waters, which hasn't been seen in over a century.



NIWA/UNIVERSITY OF ABERDEEN

Zealand Te Papa Tongarewa, during the seven days of sampling. In addition, a large number of amphipods or marine sand-hoppers were also taken to further previous research in the Kermadec Trench.

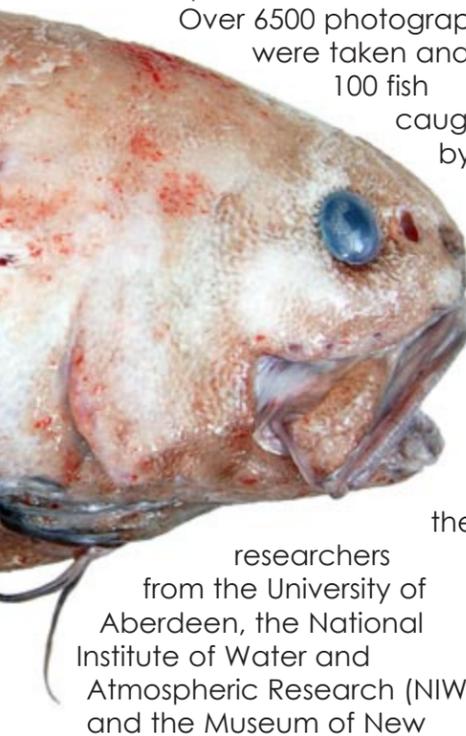
Landers lowered from the RV Kaharoa reached depths of one to six kilometers, well below the layer that light penetrates, on the edge of the Kermadec Trench, which is one of the deepest points on Earth, as it drops more than ten kilometers below sea level.

"The amount of data recovered during the survey was considerable. A lot can be learnt and achieved by using fairly basic equipment in the deep sea," said team leader Dr Alan Jamieson of the University of Aberdeen. "A voyage such as this is testament to how feasible scientific research in the deep sea has become. It is no longer the inaccessible, out of reach, part of the world it once was. The technological

challenges of the past no longer exist, and shouldn't limit our responsibility to learn about and understand the deep sea to help ensure the long term health of the deep oceans, one of the largest environments on earth."

NIWA Principal Scientist Dr Malcolm Clark said that the data collected will help scientists understand biodiversity in the deep sea near New Zealand. He added that researchers will be better able to make assessments on possible risks to the ecosystem posed by global warming and human activities such as mining on the seabed.

The major funding of the research voyage supported by NIWA's Deep-sea Communities project funded by the Ministry of Business, Innovation and Employment came from the Marine Alliance for Science and Technology for Scotland. ■ SOURCE: NIWA/ UNIVERSITY OF ABERDEEN



researchers from the University of Aberdeen, the National Institute of Water and Atmospheric Research (NIWA) and the Museum of New



NIWA/UNIVERSITY OF ABERDEEN

Healthy reefs need a mix of picky eaters

With the use of underwater video cameras, researchers studying fish feeding on South Pacific coral reefs in Fiji have discovered that there are only four species of herbivorous fish that remove the majority of common and potentially hazardous seaweeds off coral, but each of these fish will only eat one type of seaweed. This means that a specific mix of these species is necessary to keep a reef healthy, according to the new study published by the journal Ecology.

The study, which was supported by the National Science Foundation (NSF), the National Institutes of Health (NIH) and the Teasley Endowment to Georgia Tech, focused on macroalgae, or seaweeds, that threaten endangered coral reefs. The harmful seaweeds either produce chemicals toxic to corals or damage corals by smothering or scraping them.



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Adaptation

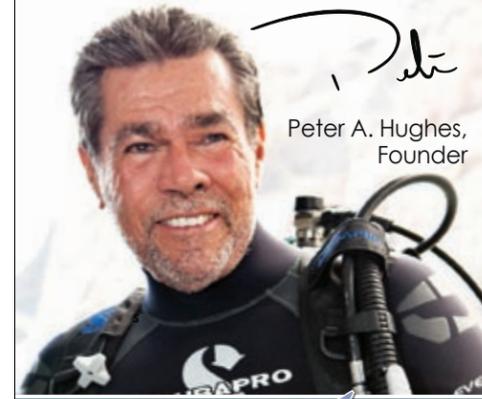
According to the researchers, specific fish have adapted to specific defense strategies of seaweed. They found that two species of unicornfish removed several types of brown algae, a species of parrotfish ate red seaweeds and a rabbitfish consumed a kind of green seaweed

that was very toxic to coral.

"Of the nearly 30 species of bigger herbivores on the reef, there were four that were doing almost all of the feeding on the seven species of seaweeds that we studied. We did not see much overlap in the types of seaweed that each herbivore ate. Therefore, if any one of these four species was removed, that would potentially allow some macroalgae to proliferate," said Mark Hay, a professor in the School of Biology at the Georgia Institute of Technology. "It's not enough to have herbivorous fish on the reef. We need to have the right mix of herbivores."

Rapid decline in coral reefs can follow if seaweed growth is not curbed

by herbivorous fish, said the scientists. Often, where there is overfishing, there is overgrowth of seaweed. No fishing zones or marine protected areas help threatened coral reef ecosystems recover, according to a related study. ■ SOURCE: GEORGIA INSTITUTE OF TECHNOLOGY



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Researchers found this eelpout (above), which is new to science; Cosmopolitan rattail, *Coryphaenoides armatus*, (top left) hasn't been seen in the waters of New Zealand since one was caught by the *HMS Challenger* on a scientific expedition in the 1870s; Mug shot of a deep-sea cusk eel new to New Zealand (left)

Spanish fossil reef reveals oldest spider crabs

Scientists have uncovered the remains of the oldest known spider crabs—dating over 100 million years ago—in a fossil reef in Spain. Discovered in an abandoned quarry in Koskobilo, eight crustacean species new to science were unearthed including the ancient spider crabs as well as some shrimp and lobster.

Two of the spider crab species, *Cretamaja granulata* and *Koskobilius postangustus*, surpass the previous record holder by a wide margin, according to Adiël Klompmaker, author of the study published in the journal *Cretaceous Research* and postdoctoral researcher at the U.S. University of Florida's Museum of Natural History. "The previous oldest one was from France and is some millions of years younger," said Klompmaker.

"So this discovery in Spain is quite impressive and pushes back the origin of spider crabs as known from fossils."

The team of researchers from Spain, the United States and the Netherlands visited the quarry several times between 2008 and 2010 to collect fossils. At this location, they found a large diversity in the decapod population, identifying at least 36 different species dating between 145 million to 66 million years ago. "One of the main results of this research is that decapod crustaceans are really abundant in reefs in the Cretaceous," said Klompmaker. "The presence of corals seemed to promote decapod biodiversity as early as 100 million years ago and may have served as nurseries for speciation." ■ SOURCE: LIVESCIENCE



Today's European spider crab shown swimming in a reserve in the Balearic Islands

NOAA plan addresses coral loss on Maui reef

The U.S. National Oceanic and Atmospheric Association (NOAA) announced a new plan to help reverse the loss of coral cover at the Ka'anapali reef off West Maui, Hawaii. Almost a quarter of the living coral has been lost over 13 years due to damage by pollution, according to NOAA.

Focusing on the Honokowai and Wahikuli watersheds, the plan comprehensively addresses the effects of

coordinator, Tova Callender, told Maui Now that everyone can help revive the Maui reefs: "Simple actions like conserving water, not pouring chemicals down the drain, and keeping debris and soil out of storm drains, can reduce the pollutants flowing into the sea and help our coral reefs."

With a goal of implementing important projects within five years, NOAA stated that several activities are



Satellite image of the island of Maui in Hawaii

runoff pollution on reef health—a first for Hawaii. "A big part of the problem is what is flowing off the land into the sea," said project manager Kathy Chaston of NOAA's Coral Reef Conservation Program. "Our team looked 'mauka'—inland—to identify major pollutant types and their sources, and then developed actions to reduce them."

Proposed actions for government, community members and the private sector are included in the voluntary management plan. West Maui Watershed and Coastal Management

planned to start this year including a workshop to create a rain garden at a local park as well as improvements to agricultural roads, post-fire rehabilitation planning and gulch stabilization, measures supported also in part by other state agencies.

Aside from being beautiful, coral reefs are also vital. They protect coastlines, provide habitats for a myriad of marine species, are nurseries and spawning grounds for fish, provide jobs and income for locals, are a source of food and new medicines, and provide jobs and income for the local economy, according to NOAA. Indeed, Hawaii's coral reefs contribute as much as US\$364 million yearly to the state's economy, according to a 2004 study by Pacific Science journal cited by NOAA officials. ■

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Australia's Great Barrier Reef on list of shame?

A scorecard rating the performance of the Queensland and Australian governments' management of the Great Barrier Reef has been released by a joint assessment team from the Australian Marine Conservation Society (AMCS), WWF-Australia and the Fight for the Reef campaign. The assessment does not look good and could risk the UNESCO World Heritage Status the Great Barrier Reef currently enjoys.

The Australian government was given a deadline last year for devising a plan to make substantial improvements to the management of the Great Barrier Reef by

UNESCO, which stated that failure to do so would put the reef's world heritage status in jeopardy. Well, that deadline has passed, and the Australian government has been put on alert.

"These dismal scores highlight our grave concerns that UNESCO is going to have no option but to recommend the Reef be put on its unenviable 'List of World Heritage in Danger' -- the list of shame," said Richard Leck, WWF's campaign director. "There's a very real risk the Great Barrier Reef could lose its World Heritage status. The impact of that would be felt right throughout Queensland's economy, especially its \$6 billion reef tourism industry. Australia's reputation is on the line."

Contributors to the poor report card include the Queensland government's recent efforts to expedite port development, while weakening coastal protection laws.

"The sheer size and speed of port and associated development along the Reef coast is unprecedented. There's more dredging, more ships and more turtles and coral dying. We also have significant concerns that instead of strengthening legislation to protect the Reef, the Queensland Government has moved to weaken legislation, which flies in the face of the World Heritage Committee's recommendations," said Leck.

An immediate moratorium on further development is being called for by WWF and AMCS until the governments of Queensland and Australia come up with a well-funded, sustainable plan for the future of the Great Barrier Reef. The organisations also want the Australian government to put AU\$500 million into reducing pollution of the reef. ■ SOURCE: WILDLIFEEXTRA.COM



Shark on Tubbataha Reef in the Philippines

Brouhaha over Tubbataha

In January, the U.S. Navy vessel *USS Guardian* plowed into Tubbataha Reef in the Philippines—a treasured UNESCO World Heritage Site and a mecca for divers. Since the accident, there's been a flurry of responses and reactions. U.S. officials have repeatedly expressed regrets and offered apologies for the incident while swiftly transporting the crew of the vessel out of the region; salvage operations have been initiated by the U.S. Navy; UNESCO has offered to send a team to do an independent assessment of the damage; and newly appointed U.S. Secretary of State John Kerry has made an offer of compensation for reef damages, which opponents in the Philippines say is a way to evade fines under local and international law.

While Kerry promised U.S. cooperation and it's own probe into the incident, the Philippine Department of Transportation and Communication (DOTC) and the Philippine Coast Guard (PCG) are conducting their own comprehensive investigations of the incident.

According to marine park's monitors, 4,000 square meters of the reef have been damaged, surpassing the Coast Guard's earlier estimate of 1,000 square meters.

In addition to compensation for reef damages, the U.S. government is plan-

ning activities to support the reef's recovery including a US\$100,000 grant to a Philippine university for coral restoration research at Tubbataha Reef, according to the U.S. Embassy in Manila. Other activities include cooperation and discussion with local experts on rehabilitation of the reef, surveys to make improvements to the park ranger station and better mapping of the reef.

Explanations?

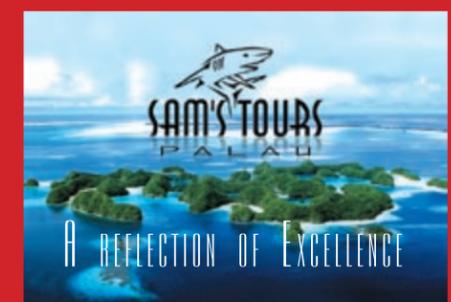
Questions have been raised as to why the minesweeper was there—in a marine protected area—in the first place. "Faulty navigation chart data" was blamed for the incident by U.S. Navy officials, even though the ship was given warnings from park rangers. According to transportation officials, crewmembers of the *USS Guardian* cannot be held criminally liable, as they have immunity under international law.

Meanwhile, the Philippines DOTC said they want to set up more solar radars and surveillance equipment in Tubbataha Reef in order to prevent another catastrophe like the grounding of the *USS Guardian*. ■

SOURCES: PHILSTAR.COM, MANILA BULLETIN, PHILIPPINE DAILY INQUIRER, MANILASTANDARDTODAY.COM, ABS-CBNNEWS.COM, GMANETWORK.COM



Great Barrier Reef



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Russian researchers reach bottom of 'Russian Loch Ness' in first-ever dive in one of the planet's 'Poles of Cold'

Researchers in Russia have dived to the bottom of Lake Labyntyr, one of the coldest lakes on the planet. The dive was recorded by Guinness World Records. Taking place in Oymyakon, a Siberian village in Yakutia called a 'Pole of Cold' because it is one of three places in the world with the coldest air tem-



HANS EGEDE'S SEA SERPENT, 1734

peratures, the ten-man crew from the Russian Geographical Society (RGS) took the plunge in relatively *mild* -45°C (-49°F)—mild for a place that can reach -71°C (-96°F).

The leader of the group, Dmitry Shiller, explained the reason for the dive: "By now almost all the land on Earth has been studied, but terra firma is only 30 percent of the planet. I'm sure there are a lot of secrets under

water, so that's where all of the science will go in the near future."

Indeed, as legend has it, Lake Labyntyr, which is popularly known as the Russian Loch Ness, is thought by some to be inhabited by a cryptid, a lake monster nicknamed "the Labyntyr devil"—a myth furthered by a 1953 sighting by Viktor Tverdokhlebov, the leader of an expedition by the Soviet Academy of Sciences geological unit in Siberia who said he saw "some kind of animal" with a large, dark gray, oval body and possibly a fin, in the water.

While the lake attracts attention for its anomalies, such as freezing more slowly than other local lakes and its large crack which reaches depths of 75-80 meters, Shiller was after more immediate data, taking first-ever footage at the lake bottom as well as samples of water, flora and fauna at depth. Prior to the RGS team's dive, the lake had only been explored by robot and echo sound. While the dive team found no lake monster, they did manage a dive that according to the expedition supervisor, Tatiana Nefyodova, was groundbreaking as "the first ever winter aqualung dive in a cold pole natural body of water". ■ SOURCE: RT.COM



Women scuba divers in Saudi Arabia demand own section of sea

More and more women scuba divers in Saudi Arabia want designated scuba diving areas in the Red Sea in order to get around the obstacles facing them when attempting to get a permit for a dive trip. The Coast Guard will not allow women to dive without a male guardian, or mahram.

Even though diving courses for women only are expensive, it hasn't stopped more Saudi women from participating in the sport. Indeed, it costs SAR 1,500-2,000 (US\$400-533) per diving course over six days, which includes two study days, two diving days in the pool and two diving days in the sea. Courses are only open to individuals 18 and older. These issues keep women from getting into the sport.

Dive instructor Fuad Azmerli said that Saudi women divers have shown commitment to the sport over the last ten years by getting certified abroad. Another instructor, Tamader Baitallmal, said it was hard for women to practice their scuba skills because they don't have their own diving area—a place where they can dive in private, freely and without a male guardian. In addition, most dive

boats require large groups of participants, so Saudi women wanting to go in a private group often have their dive trips cancelled due to not meeting required numbers.

More women dive instructors wanted

Women dive instructors are few, and demand is high, so fees are expensive. "Nonetheless, an increasing number of women

have started taking an interest in the sport," said certified dive instructor Riham Al-Qhadi.

While statistics in Saudi Arabia is not yet available, women divers are on the rise and on the move. "Nothing is impossible. All I have to do is to keep training," said Samar Al-Fatih, a Saudi dive instructor who obtained her certification abroad. She said she was willing to travel to another country in



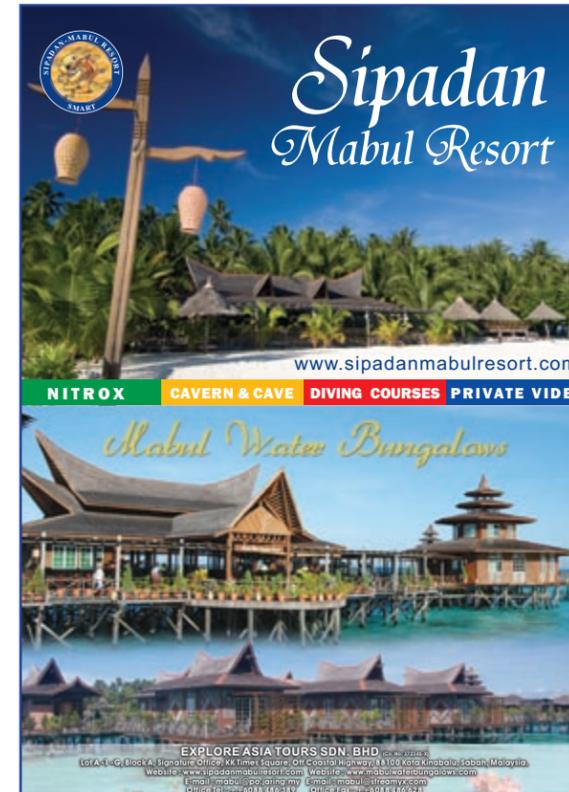
FILE PHOTO: PETER SYMES

order to dive without limitations, to such countries as Bahrain or the United Arab Emirates where she said there are marine clubs who arrange dive trips for which members pay a fee, adding that for any avid scuba diver, private pools are just not on par with the real thing—namely, diving in the open ocean.

Getting there can be a problem for women divers, though, as most dive centers are located in remote areas, said Al-Qhadi. However, these remote dive centers that welcome women are the only ones that can offer privacy.

The women dive instructors said it is imperative that clubs and centers dedicated specifically for women divers are developed in Saudi Arabia to provide women divers with the environment they need, especially since there are now many Saudi women divers, who have surpassed the diving skills of men, wanting to work in the sport internationally. ■

SOURCE: ALBAWABA.COM



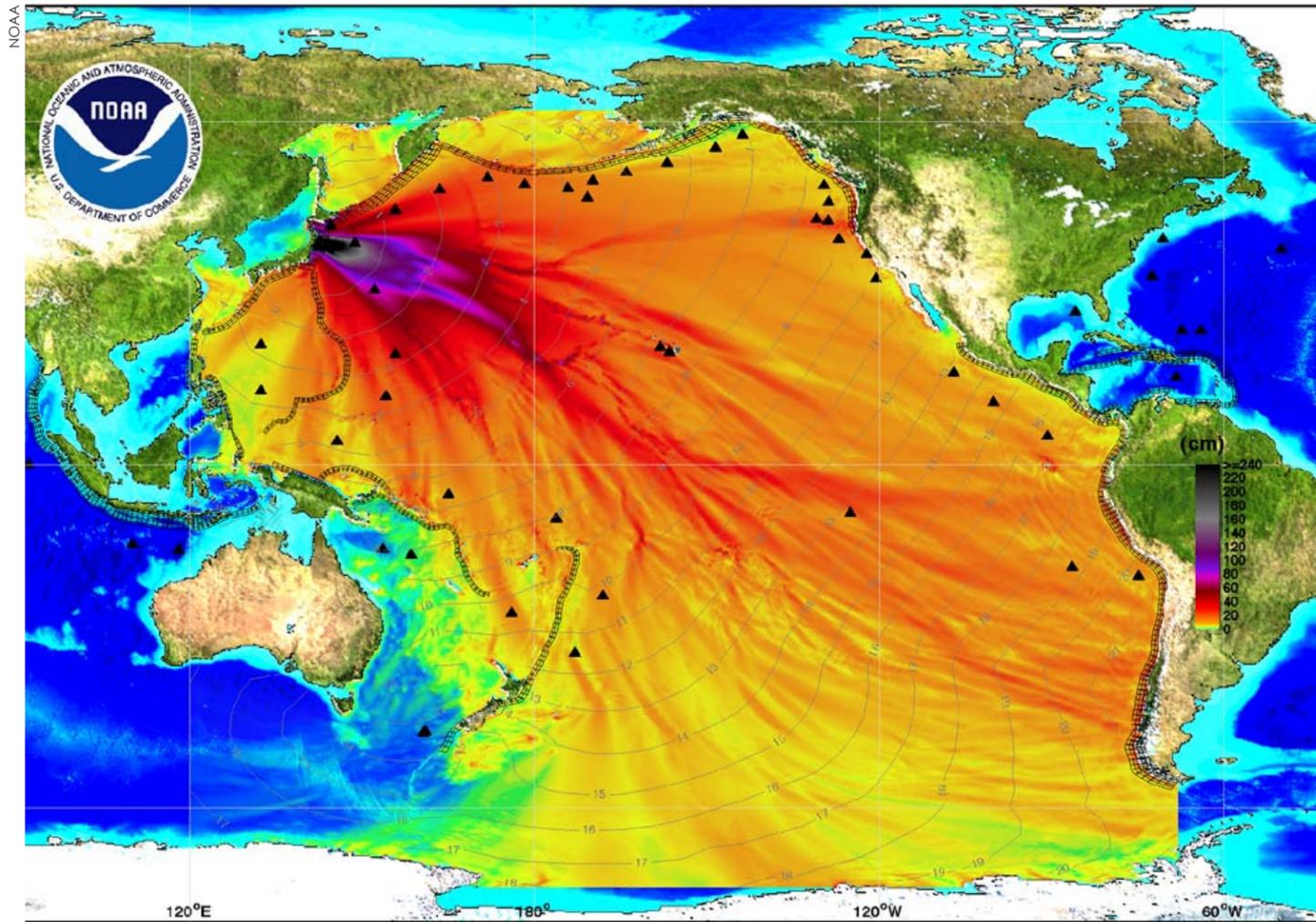
New kind of underwater volcano found

Scientists from New Zealand and Great Britain have discovered a new type of underwater volcano. It ejects lava resembling a mass of foam. This foamy lava then ascends slowly to the surface of the ocean.

It was previously thought that undersea volcanoes were either effusive or explosive, depending on the level of their eruptive force. However, the new discovery describes a new class of volcanic eruption, in which lava is so full of gas bubbles that it becomes buoyant, floating to the surface as an airy foam. The air bubbles are released as the foam rises and the lava then falls to the sea bed, leaving some pumice at the surface.

Named after the Maori god of the sea, the new class of eruption will be called Tangaroa. Led by a team of scientists from Victoria University in New Zealand, the research was done at the Macauley volcano in the Kermadec Islands. It is unrelated to the raft of floating pumice, which was found floating in the Pacific Ocean a bit further north of the site, scientists said. ■

SOURCE: RADIO NEW ZEALAND



On 11 March 2011, an undersea megathrust earthquake took place off the coast of Tōhoku, Japan. It had a magnitude of 9.0 (Mw), reaching underwater depths of about 20 miles (32km). As a result, tsunami waves reaching heights of up to 133 ft (40.5m) were triggered off Tōhoku, which then raced across the Pacific Ocean. It was the most powerful known earthquake to hit Japan—in the top five most powerful earthquakes in the world since written records began in 1900. It moved Honshu 8ft (2.4m) east and shifted the planet on its axis approximately 4-10 inches (10-25cm). The earthquake and tsunami caused the death of 15,853 people, injured 6,013, and left 3,283 missing.

Tsunami created giant underwater dunes off Japan

In March 2011, a giant tsunami hit the northeastern coast of Japan. Today, scientists say that the tsunami may have dramatically changed the topography under the waves in addition to laying waste to everything above ground. They have found evidence of changes on the ocean floor that may affect the marine ecology of Japan.

In an emergency field survey 20 days after the tsunami hit, scientists attempted to find out how much change had occurred to the seafloor and whether or not

it was safe for large ships to enter Kesennuma Bay. This bay, which is located northeast of Sendai, is for the most part, calm, and usually used as a refuge for vessels during storms.

At first, the survey was not done for research purposes. It was done to help rescue and recovery efforts in areas affected by the giant tsunami. However, the findings have given the study a new goal of finding out whether tsunamis can affect the deep in ways previously unknown—by creating underwater dunes,

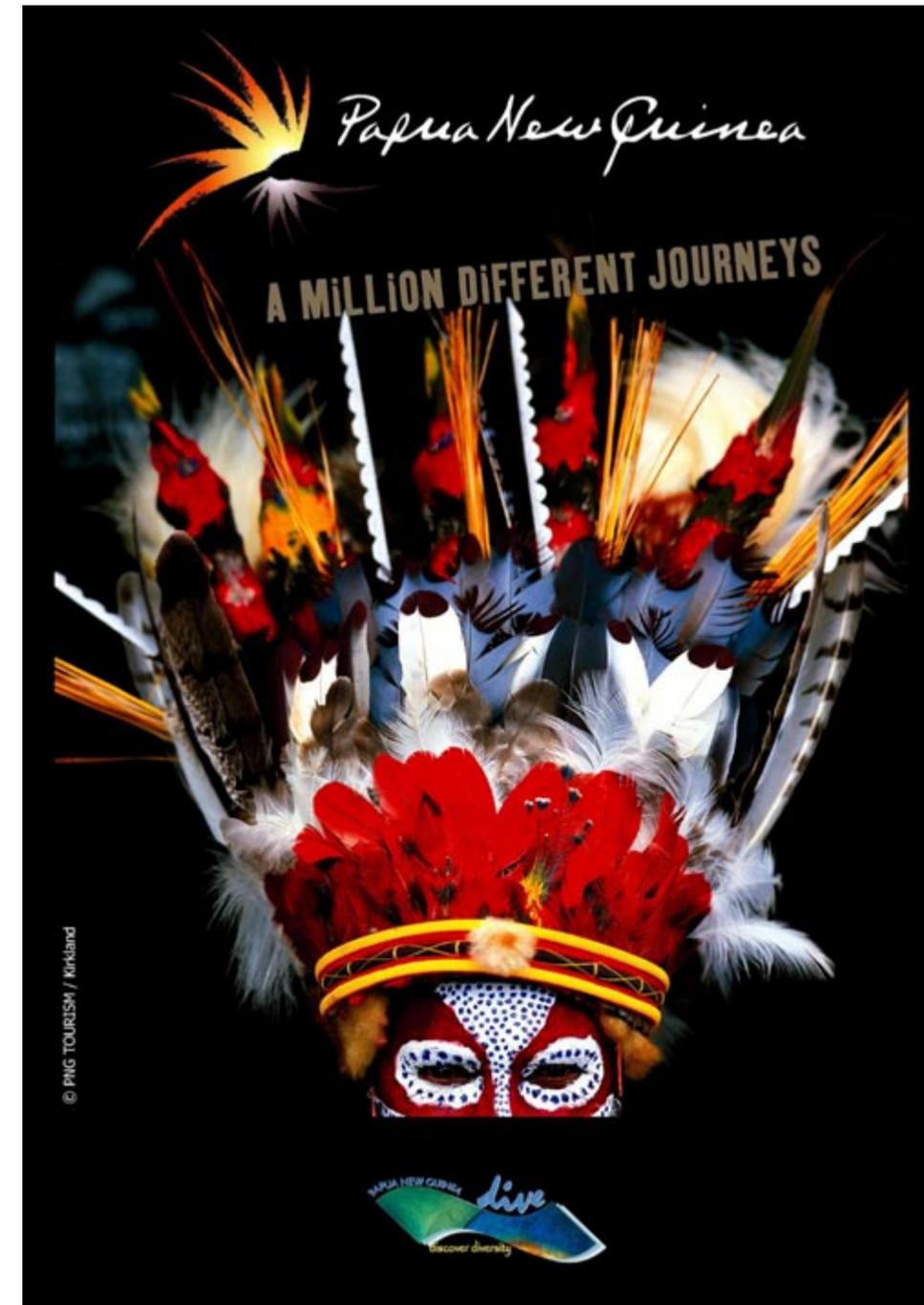
for example.

Indeed, scientists did find huge dunes underwater, which were made by the 2011 tsunami. The findings published in the *Marine Geology* journal in January show that these dunes were a direct result of a large tsunami at work on the topography of the ocean floor. This means that past tsunamis can be studied by examining the seabed.

It also means that the marine ecosystem of Japan has been affected by the dramatic alteration of the underwater

landscape and requires further monitoring.

It is yet unknown precisely how many dunes were created by the 2011 tsunami. However, now scientists can learn more about the strength and frequency of tsunamis by studying their effects on the sea floor. This is especially handy when traces of a tsunami in urban areas are destroyed by people themselves, as they rebuild and reshape the land during the recovery process. ■ SOURCE: JAPAN DAILY PRESS



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Noise makes crabs crabby

Ship noise is the most common source of noise in the aquatic environment.

A team from the Universities of Bristol and Exeter exposed crabs to recordings of ship noise and found it affected their metabolism—indicating elevated stress—and found little evidence that

crabs acclimatise to noise over time.

Repeated exposure to ambient-noise playback led to increased oxygen consumption (probably due to handling stress), whereas repeated exposure to ship-noise playback produced no change in physiological response. ■



Two new species of the gorgonian inhabiting barnacles—*Conopea saotomensis* and *Conopea fidelis* (inset)—have been collected from the area surrounding the historically isolated volcanic islands of São Tomé and Príncipe

Symbiosis between barnacles and gorgonian

Two newly discovered species of gorgonian inhabiting barnacles occur exclusively in a symbiotic relationship with a black coral host.

The newly discovered barnacles are both gorgonian inhabiting.

Observations by the authors suggest that they also demonstrate preference to a particular gorgonian hosts. This peculiar behavior is reflected in

the name of one of the newly described species, *Conopea*

fideli referring to the 'fidelity' of the barnacle towards its host of preference.

Observations suggest that the barnacles might have a unique ability to recognize and choose a specific host of their preference.

The host gorgonians are a particular type of beautiful octocoral, also known as sea fans. Once locating the host, the barnacle then lives in complete symbiosis with the gorgonian, almost fully covered by host tissue.

To date, not all the details

of barnacle larvae settlement and interaction with the gorgonian host are known, but it seems that barnacle larvae are able to choose between the different gorgonians in their search for a host. It is believed to be mediated by pheromones. It has been shown that barnacle larvae can determine where to settle by recognizing pheromone cues from their host. It has also been shown that gorgonians produce barnacle settlement inducers as well as inhibitors. ■

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Anemonefish oxygenate their anemone hosts

As clownfish move around at night, they boost water flow over the anemone and increase its oxygen consumption.

U.S. researchers measured and compared the net dark oxygen uptake of fish-anemone pairs when partners were separate from each other, together as a unit, and together as a unit but separated by a mesh screen that prevented physical contact.

They found that both the fish and anemones consumed 1.4 times more oxygen when they were together than when apart.

Three behaviours

Based on observations, they defined three particular behaviours: fanning, wedging and switching, which Dr Joseph T. Szczebak compared to tossing and turning in bed.

"During fanning, clownfish were motionless among the tentacles, aside from rhythmically flapping their pectoral fins," he said.

"During wedging, the clownfish forcefully wiggle deeper into the anemone's bed of tentacles, causing a flutter of tentacular activity.

"Lastly, during switching, clownfish rapidly changed their orientation within the anemone.

"Anemone oxygen consumption increases with water flow, suggesting that any flow-related side effects of clownfish behaviour will indeed increase anemone breathing rates," Szczebak said. ■

SOURCE: JOURNAL OF EXPERIMENTAL BIOLOGY

Anemonefish behaviour at night appears to oxygenate sea anemone hosts and to augment the metabolism of both partners. At night there is less oxygen available on the reef because photosynthesis ceases once the sun goes down

When clownfish rest in the tentacles of their anemone host, they engage in certain behaviours more often than when they are alone. These behaviours appear to enhance water motion through anemone tentacles.



Maldivian coral islands atolls as seen from a NASA satellite

Maldives pledges entire country to become bioserve by 2017

In response to the call for champions in support of the Aichi Biodiversity Targets, the Republic of Maldives has pledged to become the first nation where the entire country and its Exclusive Economic Zone will be a Biosphere Reserve.

In order to become a UNESCO designated reserve, the nation must adhere to strict guidelines that combine strat-

egies of resource management, conservation, and sustainability.

The Biosphere Reserve's strategy must integrate management of natural resources with conservation and sustainable use. The plan also must seek to ensure equitable distribution of natural resource wealth. Currently, there are 610 biosphere reserves in 117 countries. ■



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Diver swimming between the WWI SMS *Cormoran* and the WWII *Tokai Maru*

The Tale of Two Wrecks of Guam

Text and underwater photos by Brandi Mueller

Guam's Apra Harbor is home to a unique set of sunken warships. It is the only place in the world where a World War I and a World War II wreck sit touching each other underwater, and they can both be dived on one tank. The calm, warm waters of Guam make for easy diving, and both wrecks can be mostly explored above 100ft. The story of how these ships sank is almost as interesting as the dive itself.



German merchant raider, SMS *Cormoran*

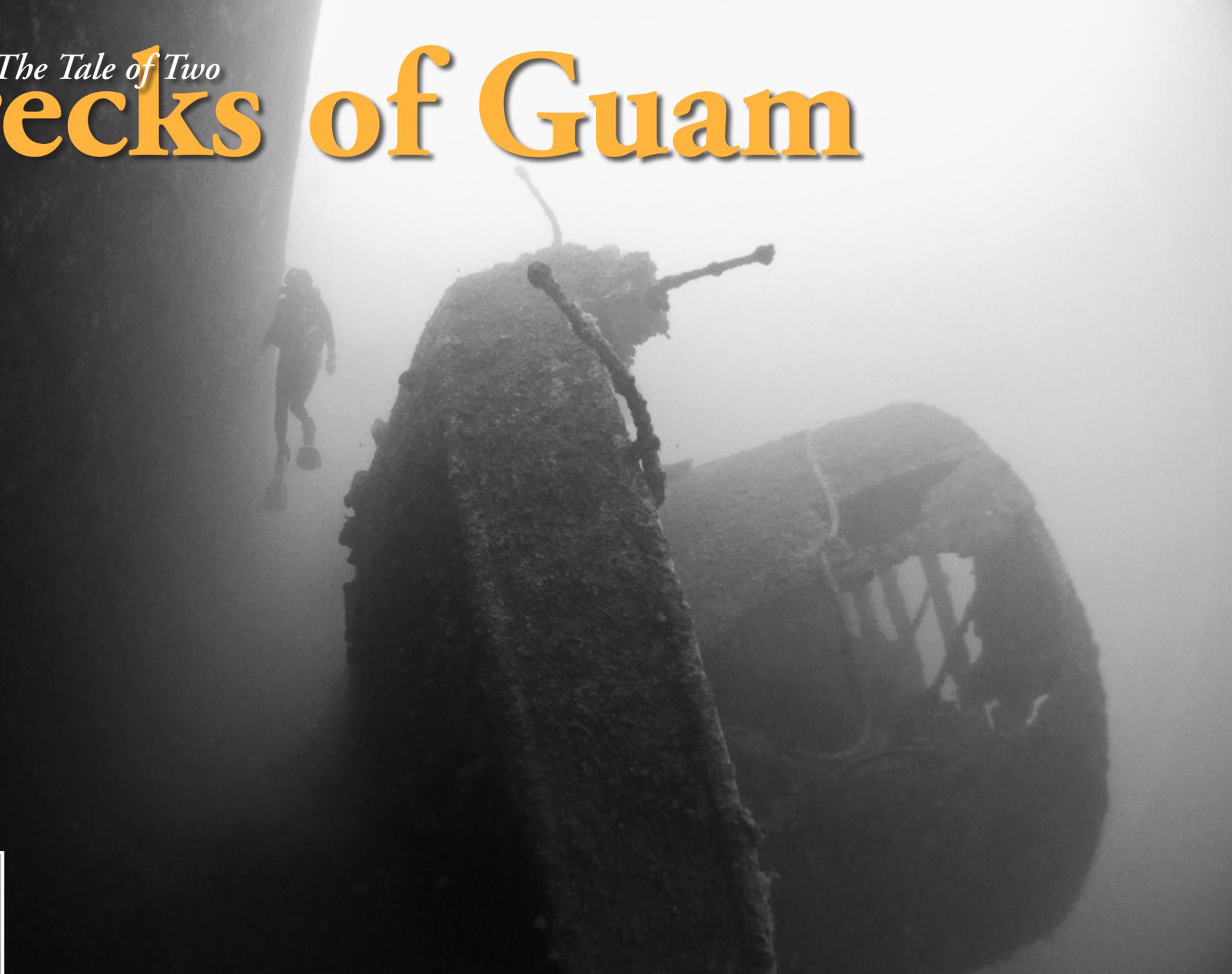
German Captain Adalbert Zuckschwerdt steered his ship, the *SMS Cormoran*, into Guam's Apra Harbor on 14 December 1914. With only 50 tons of coal left in the hold and not much food, he hoped the Americans of this U.S. territory would provide them with much needed supplies to continue their voyage. Although still a neutral party of WWI,

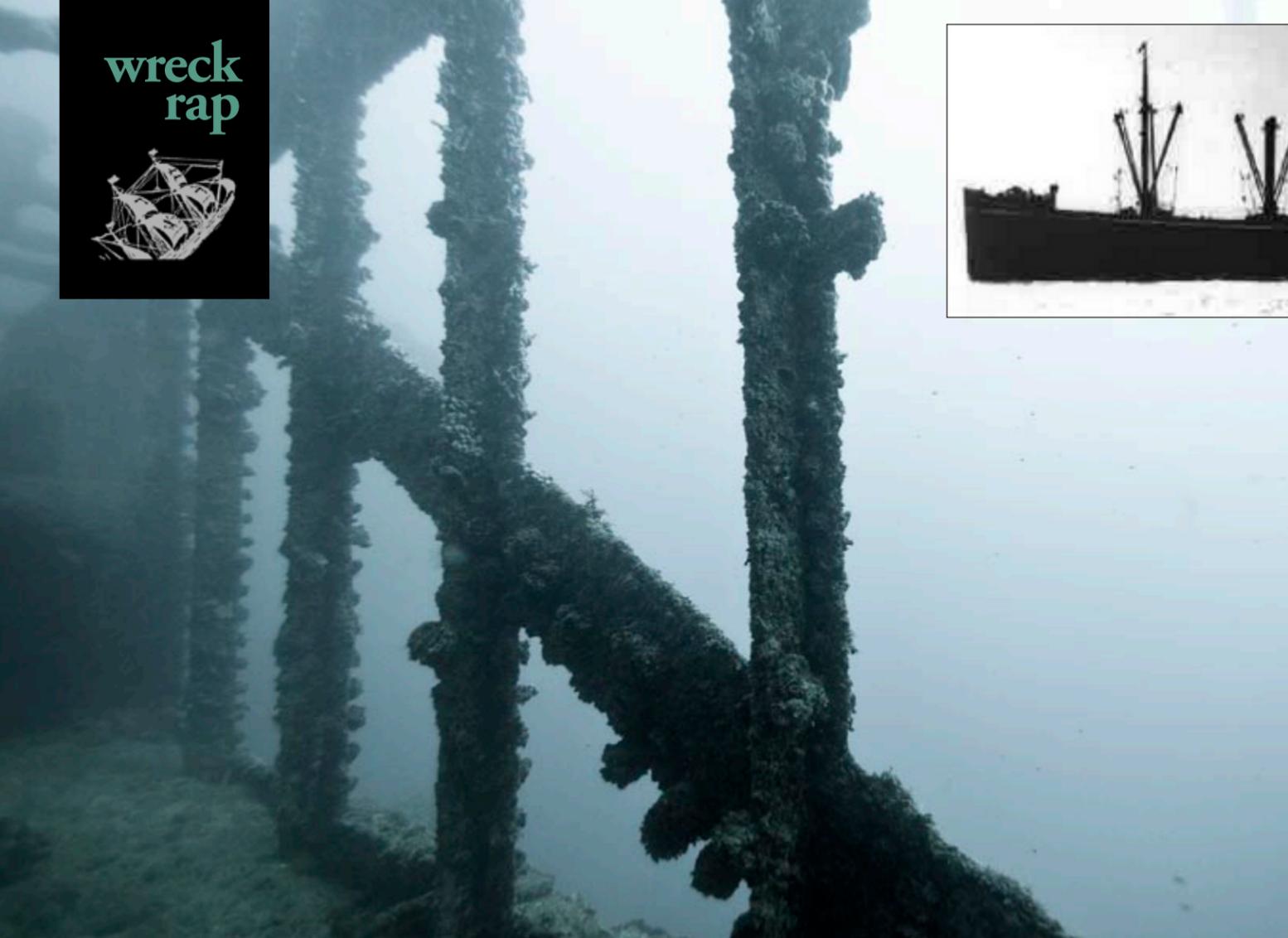
the Americans refused to give an adequate amount of coal to continue their voyage, in part because of their own short supply, thus preventing the vessel from leaving Guam. The ship and her crew stayed in Guam peacefully for over two years, many moving onto land and living as neighbors among the indigenous Chamorros and Americans.

The *Cormoran* started off as the *Rjasan*, built in a German shipyard in 1909. It was a 88-meter (290ft) passenger-cargo freighter built for Russia.

World War I

During World War I, in August 1914, the Russian *Rjasan* was captured by the Germans



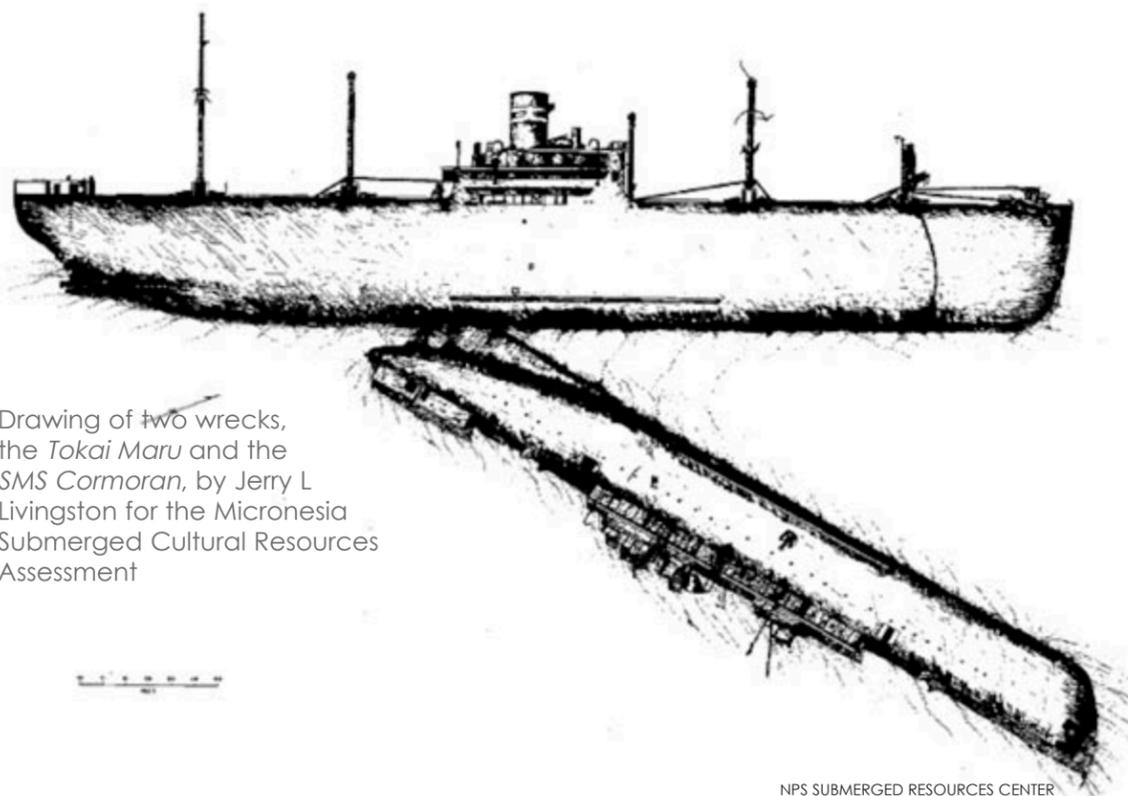


SMS Comoran (left); Tokai Maru (above); Impact point of the SMS Cormoran and the Tokai Maru (right)

off Korea by the SMS Emden. Converted to an auxiliary cruiser in the port of Tsingtao, Northern China, she was outfitted with guns salvaged from a disabled warship called the *Cormoran*, which had serious engine failures; she was renamed after that ship.

Once refitted for war, the SMS *Cormoran* took to

ing, the captain sent his ship and 13 crew to the bottom of the sea. These crewmembers are buried with full military honors in the Naval cemetery in Agana, Guam, and the rest of the crew were sent to Fort Douglas, Utah, for the duration of the war. This was the only hostile encounter between United States and German forces during the Pacific Ocean campaign of the war.



Drawing of two wrecks, the *Tokai Maru* and the SMS *Cormoran*, by Jerry L Livingston for the Micronesia Submerged Cultural Resources Assessment

the Pacific where she spent all her time avoiding allied warships and Japanese battleships. Prior to reaching Guam she had not sunk any enemy ships.

Scuttling the ship

News reached Guam of America's declaration of war on Germany on 7 April 1917, and in an attempt to prevent hostilities between the Germans living on Guam and keep the Guamanians from harm, the Americans asked Captain Zuckschwerdt to surrender. He agreed to surrender and asked if he could go to his ship to let his men know the news.

Upon returning to his ship, he ordered the crew to scuttle the vessel. As the Americans saw this happening, they fired a warning shot across the bow of the *Cormoran*, the first shot fired by Americans in WWI. Ignoring this warn-

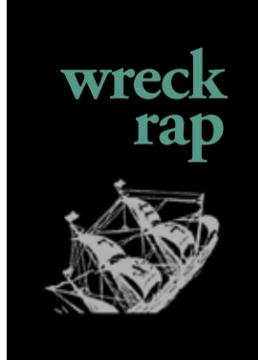
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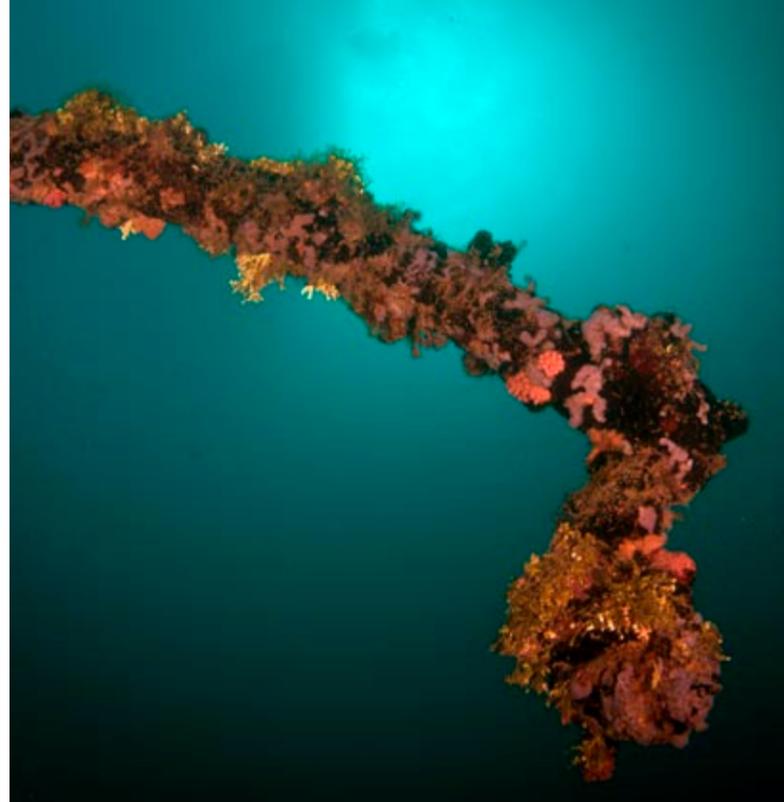
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SMS Cormoran;
Coral growth on davit on Tokai Maru (far right)



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Carol Tedesco

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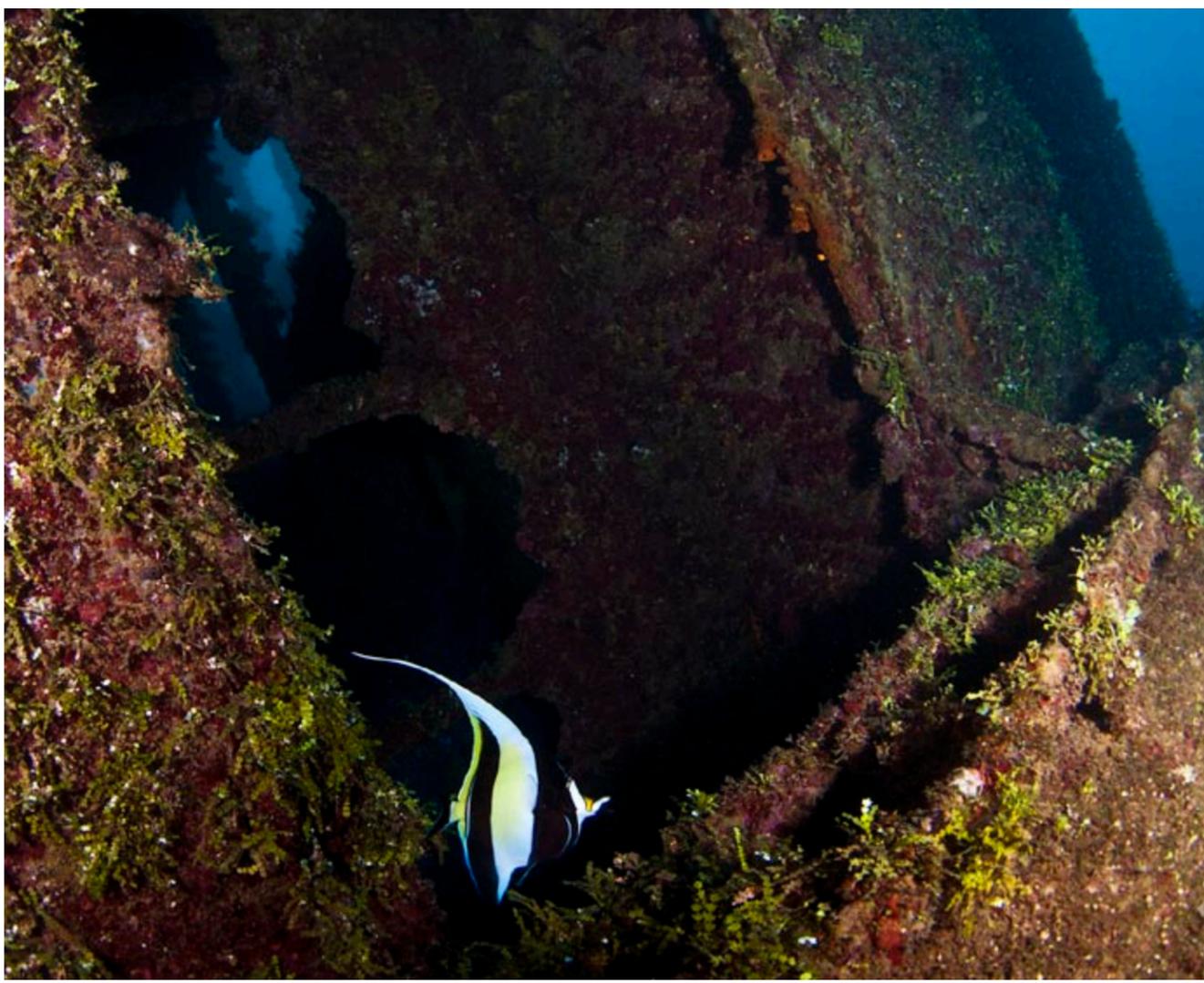


Location
of Guam on
global map

World War II

Almost 25 years and another war later, Guam was invaded by Japan. In 1941, Japan occupied Guam—the only United States territory occupied by Japanese forces during WWII. The *Tokai Maru* was a ship built by the Osaka Shosen Company as a Japanese luxury liner in 1930. It travelled from Tokyo to New York and was 134 meters (440ft) long and 18 meters (60ft) wide. In 1940, it was recommissioned as a freighter to transport personnel and war materials for the Japanese Imperial Navy.

On 24 January 1943, the U.S. submarine *Flying Fish* spotted the Japanese Imperial Navy freighter *Tokai Maru* in Apra Harbor. The submarine waited just outside the harbor for three days for it to leave. Giving up on the waiting, the *USS Flying Fish* fired two torpedoes, one missing com-



Moorish idol hides in the *Tokai Maru*



Apra Harbor

Map of Guam



THIS PAGE: Scenes from the wreck of the *Tokai Maru*

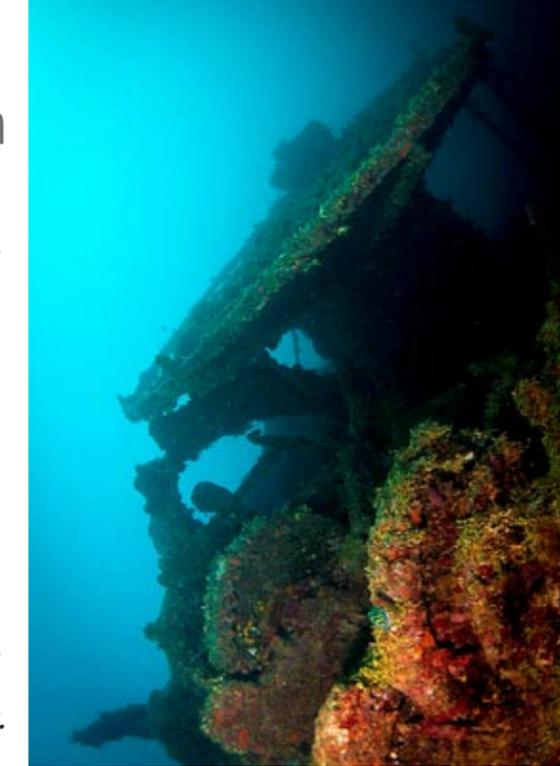
Guam

tinue across the ship to where it touches the *Cormoran* around 30 meters (100ft). Then divers explore the *Cormoran* first, the majority of that ship being deeper, during dive one. Often the second dive is used to explore the slightly shallower *Tokai Maru*. MDA does not lead dives, but for an extra cost will provide a guide. Unfortunately the location of these wrecks inside the harbor leads to varied visibility, usually 10-11 meters (35-40ft), depending on tide change and ship traffic in the harbor.

Guam also offers plenty

of other diving including a Japanese Val bomber, a 90-meter concrete barge called the *American Tanker* to provide a breakwater at the mouth of Apra Harbor, and spectacular reef diving with a lot of healthy hard corals, schools of fish and more anemone fish than one can count. ■

Brandi Mueller is an underwater photographer, PADI IDC Staff Instructor and 100ton USCG Captain based in Honolulu, Hawaii. See: smugmug.sirenphotography.com



pletely, running aground on a reef, and the other striking the *Tokai*, but not sinking her.

Seven months later, on 27 August 1943, another U.S. submarine, the *USS Snapper*, was given another chance to finish the job the *Flying Fish* started. They fired four torpedoes, three hitting and sinking the *Tokai Maru*, the fourth hitting another injured Japanese vessel, the *Nichiyo Maru*.

The *Tokai Maru* sank next to the *Cormoran* in Apra Harbor, with one small section touching each other. The *Tokai* rests in 36 meters (120ft) of water with an 85 degree list to her port. The upper forward bridge is the shallowest area start-

ing around 12 meters (40ft). Most of the superstructure is still intact, and the engine room still has two engines with intact catwalks. Depth charges can still be seen in the stern, and the holds contain bed and truck frames. The *Cormoran* sits in 36 meters on her port side.

Diving the wrecks

Only a 10-minute boat ride from shore, both wrecks can be seen on one dive, but most dive shops, including Micronesian Diver Association (MDA) offers weekly two-tank boat trips allowing for two dives on these wrecks. With the mooring attached to the *Tokai*, most divers descend to the *Tokai* and con-



Diver peers through interior of *Tokai Maru*



Pay-as-you-go carsharing goes global, appeals to tourists, not just locals

Pay as you go instead of paying by the day, that's the new way cars can be rented not only in the United States but also in several countries around the world. One of the largest of these services, Zipcar, with some 767,000 members, was just bought by Avis, the global car rental corporation, at a cool \$500 million, catapulting the concept into the media and highlighting the globalization of car sharing.

Originally geared to locals, travellers and tourists are finding the pay-as-you-go services increasingly appealing and convenient, as they find these type of rental cars available in more and more cities. While you can't yet join while abroad, several service providers let you book a car in another country by using your electronically coded membership card.

The main appeal for travellers is the ability to find cars parked all around town available on the spot at any hour of any day or night, adding spontaneity and flexibility to one's trip. For example, if in London, you could take a jaunt to Stonehenge in a car. No need to figure out how to get there by bus or train.

Because you can reserve cars online or with an iPhone or Android app, anytime, you can get around the limited office hours, limited locations and closed Sundays of traditional car rental companies. Often as



MARIO ROBERTO DURAN ORTIZ / WIKIMEDIA COMMONS

cheap as US\$8 an hour, which covers fuel, insurance and roadside assistance, the premiums don't go up if you are driving in a foreign country, but read the rules carefully. And if you happen to run out of fuel, you can just top it up with the company credit card supplied with the vehicle. How smart is that?

There are a few drawbacks to pay-as-you-go car rentals including the fact that you can't join yet while overseas and there is little availability at airports, with a few exceptions in New York City, Baltimore, Vienna and Hamburg. In addition, it's designed for short-term use and not cost-effective on long journeys. After about 24 hours, you might as well go with traditional day rental, because the cost of pay-as-you-go will exceed the flat daily rate. ■ SOURCE: BBC



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EC debates regulation of carry-on luggage fees

European Parliament lawmakers (MEPs) stated they wanted to end “the excessive restrictions and arbitrary charges that some airlines impose on carry-on luggage”. In addition, MEPs pressed the European Commission, “to include a reasonable hand luggage allowance rule in the coming revision of air passenger rights legislation”—a revision to be postponed for consideration before summer.

“We must protect consumers from the abusive commercial practices that airlines use to generate extra income,” said MEP Georges Bach. In order to allow for carry-on purchases in the airport, MEP Said El Khadraoui said that hand luggage should be checked at the check-in counter rather than at the gate.

However, Commissioner De Gucht was not in favor of more regulatory action even though he conceded that current restrictions varied a lot reflecting what he called a “diversity in a very competitive market”. To that, MEP Wolf Klinz rebutted: “Citizens have lost a lot of confidence in the EU—here's a chance to do something to restore it.” ■

SOURCE: ATWONLINE.COM

World's biggest airport to be built in Istanbul

Turkey has announced plans to build the world's largest airport. With six runways and a cost US\$5.6 billion, the hub will be able to service 150 million passengers per year. That's 60 million more than Hartsfield-Jackson Atlanta International Airport, which is currently the busiest airport in the planet. Slated to be completed in 2017, the airport will be built in four stages on a 77 million square meter area near Istanbul. According to Turkey's transport minister, Binali Yildirim, the new airport will have an annual capacity of 90 million once operational. He said that the plans for the airport would help improve Turkey's bid for the 2020 Olympics. There are other large construction projects planned for Istanbul, which include a high-speed train to Ankara, a make-over for Taksim Square and a third bridge over the Bosphorus. ■

SOURCE: TELEGRAPH.CO.UK



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Planes powered by plants look promising

New fuels made from plants are making waves in the airline industry, as flight tests such as the one made by a twin-engine bio-fueled Falcon 20 from Ottawa International airport in Canada in October 2012 make aviation history.

Upon landing the National Research Council of Canada (NRC) craft, pilot Tim Leslie said, "Today, I flew the world's first 100% biofuel flight. It is truly inspiring to take this step towards an eco-friendly future."

Bio-fuel benefits reported by the Canadian Falcon 20 test flight showed a 50 percent decrease in aerosol emissions as well as increased engine efficiency.

The plane ran on a fuel made from rapeseed oil, but there are other fuels it could have used made from flax, algae, coconut husks or even used cooking oil. Considered eco-friendly because they are carbon neutral, these kinds of "green" fuels are derived from plants that absorb CO2 from the atmosphere while they grow and release the gas when they burn without adding any net greenhouse gases. So many believe that these bio-fuels are the way to go for the aviation industry to decrease its carbon footprint -- an important point considering that aviation contributes 2 percent of all greenhouse gases, according to the IPCC (Intergovernmental Panel on Climate Change).

Some argue the percentage

is closer to 5 to 10 percent due to altitude. Steven Barrett, assistant professor of astronautics and aeronautics at the Massachusetts Institute of Technology (MIT), and the director of the Laboratory for Aviation and the Environment, told the BBC, "Emissions from planes have a different impact than they would on the ground."

While the number of passengers and flights is likely to double by 2030, according to the U.N. International Civil Aviation Organization, airline manufacturers and carriers are scrambling to find effective alternatives. Dr John Tracy, chief technology officer (CTO) at Boeing, told the BBC, "Probably 75% of the research and development

dollars we invest in the commercial airplane side goes towards improving our environmental footprint."

Flying in the future

Long into the future, we may see new aircraft shapes running on electricity, hydrogen or solar energy, but for now, biofuels are seen as a potential savior, as most commercial passenger jets need no modifications to use them. There are those who fear that mass use of bio-fuels will lead to deforestation or the taking of land away from the growing of food, and scientists are calling for further research and assessment of the entire life-cycle of a fuel before it is called 'green' and sustainable. ■



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While not outfitted with special codes or microchips, **Magellan's Retriever Tags** encapsulates instructions written in eight languages (English, Italian, Spanish, Portuguese, Japanese, Chinese, French and German) alerting baggage agents to check the itinerary inside your bag and send your luggage to your next destination. Cost is US\$10.50.

Airlines must compensate passengers for delays

Stuck in an airport for hours or even days because your flight is delayed? Well, now you may be able to get compensation from the airline for your trouble. In a landmark ruling in the United Kingdom, airlines could be required to pay compensation to any passenger whose flight is delayed more than three hours.

European Court of Justice decision, which was made in October 2012. In the European Court case, a Staffordshire couple Jeff and Joyce Halsall claimed that their return flight from Tenerife on Thomas Cook Airlines was delayed by 22 hours.

In the Halsall's claim, which was initially rejected by a local judge, the airline is said to have blamed the delay on an 'exceptional circumstance', which was beyond its control. It was discovered, however, that the flight was actually delayed due to a mechanical problem. So, the Halsalls filed an appeal to the European Court.

Currently, European legislation permits passengers to claim GB£200-£480 if their flights are delayed by more than three hours. These claims can still be rejected by airlines when delays are outside their control, such as strikes or bad weather. It is hoped

by consumer groups that airlines will now not be able to so easily reject most claims, as they have been allowed to do for far too long.

Statistics show that nearly 2 million passengers out of 200 million in U.K. airports each year, endure flight delays of three hours or more. ■ SOURCE: WANDERLUST.CO.UK



TED & DANI PERCIVAL / CREATIVE COMMONS

In a court in Staffordshire, a key ruling has paved the way for passengers to get compensation if their flights are delayed three or more hours. Theoretically, travelers can now even place claims for delays that date back several years—back to 2005, in fact.

The Stoke-on-Trent County Court judge was in fact implementing a

Wikivoyage presents destination guides

Have you checked out the new Wikivoyage? Re-launched under Wikimedia in January 2013, Wikivoyage offers travel guides to destinations all around the world. With user-generated content, the popular online encyclopedia, Wikipedia, collaborates with Wikivoyagers—globe-trotting Internet users—to compile useful travel information on a wide range of countries and places, all on one website. The website states that travel information is currently available in nine languages including English, French, German, Italian, Spanish, Portuguese, Russian,

Swedish and Dutch.

Billed on the site as "the free, worldwide travel guide that anyone can edit", Wikivoyage states that it currently has 27,045 articles in English, and that contributors are not averse to calling a spade a spade: "Being 'fair' does not necessarily mean being 'nice'. We have a mission to make (among other things) a reliable and complete travel guide, and a travel guide that doesn't give qualitative information about the things it describes isn't reliable or complete." For example, an entry about a particular restaurant might state that "serv-

ice can be slow and quality suffers during rush hour".

While it claims not to be a travel magazine, users of Wikivoyage will find a wealth of travel information on each destination entry including details about terrain, weather, a bit of history, and the most popular places to visit. In addition, there's information about how to get into the country and how to get around. One has only to surf the pages to learn more. ■

SOURCE: JYLLANDS-POSTEN.DK



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Sharks show plane makers how to fly more efficiently

Airbus and the German airline Lufthansa are testing a shark-skin coating for their airplanes.

Sharks skin is composed of jagged scales covered with tiny longitudinal ridges, which play a big role in why sharks can so easily slice through the water. Experiments suggest that the ridges cut down on the friction between the shark and the water, channelling the water and even speeding it along, as it moves over the skin and preventing eddies, which contribute to drag. This observation has made the aviation industry believe sharks could hold the key to cutting energy consumption.

The aviation industry believes sharks could hold the key to cutting energy consumption

To this effect, a new state-of-the-art varnish, which attempts to mimic the skins of fast-swimming sharks, has been developed by the Fraunhofer Institute for Manufacturing Technology and Advanced Materials (FAM) in Bremen, Germany.

In the past, said Volkmar Stenzel, the project's head at the Fraunhofer Institute, sheets of plastic imitation shark skin were glued to the aircraft's exterior. "But the foil had major disadvantages: it was rather heavy and the added weight cancelled out the amount of fuel that could be saved," Stenzel said.

Instead Fraunhofer Institute have developed a new technique to emboss the structures of shark skin into aircraft paints.

The idea is to make surfaces more aerodynamic and reduce fuel consumption by about one percent and lower operating costs. ■

SOURCE: BLOOMBERG BUSINESSWEEK



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