

*GirlDiver: Mark V Hard Helmet*



GLOBAL EDITION  
September 2008  
Number 25

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COVER PHOTO  
*Sardin Run, South Africa* by Ralf Kiefner  
(CONTINUED ON PAGE 4)

Cowfish, Pulau Weh, Aceh, Indonesia. Photo by Asther Lau



# contents

**24**  
SOUTH AFRICAN  
TREASURES  
BY ANDREY BIZYUKIN, PhD

**32**  
PROFILE: RAINER SCHIMPF  
PORT ELIZABETH  
SOUTH AFRICA  
BY HARALD APELT

**37**  
SARDIN RUN  
SOUTH AFRICA  
BY HARALD APELT

**48**  
DIVING WITH WMDs  
BALTIC SEA  
BY COMMANDER  
CARL-GUSTAV VON KONOW

**52**  
PULAU WEH  
INDONESIA  
BY SIMON KONG

**plus...**  
EDITORIAL 4  
NEWS 6  
EQUIPMENT 40  
WHALE TALES 50  
BOOKS & MEDIA 71  
BUSINESS DIRECTORY 92

**64**  
ECOLOGY  
SUCCESS STORIES  
BY ARNOLD WEISZ

**67**  
TAMARIU  
SPAIN  
BY HARALD APELT

**73**  
REBREATHER  
BUYER'S GUIDE  
BY CEDRIC VERDIER

**93**  
MULNAR JANOS  
BUDAPEST, HUNGARY  
BY J P BRESSER

## columns...

**44**  
GIRLDIVER:  
MARK V HARD HELMET  
BY CINDY ROSS

**62**  
SHARK TALES:  
BITS & BITES  
EDITED BY PETER SYMES

**85**  
UW PHOTO & VIDEO:  
MAINTAINANCE & CARE  
BY KURT AMSLER

**98**  
PORTFOLIO:  
JO WOOLER  
BY GUNILD SYMES

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## Powered by Humans

A while back our good friend, Scott Jones from DiveNewsWire, was soliciting good news: "ENOUGH IS ENOUGH! Are you tired of hearing bad news? Seems like the mainstream media only wants to talk about negative news. It's something new every day—high gas prices, airline flight changes, natural disasters, etc," he wrote in his industry newsletter.

Hear, hear! Let's have a toast for the good things in life, such as diving adventure and the simple pleasures it gives us all. Coming out of the water after a great dive, or getting off my racing bike after a long fast

ride through the landscape, never fails to leave me in a much better mood and better shape than before. Come to think of it—they're also good for the planet, too. Finning and pedalling are carbon neutral ways of transportation, and the appreciation of nature makes us more inclined to protect our fragile Earth.

Let's also celebrate that this is our 25th issue! Like my bike and diving gear,

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— Peter Symes, Editor-In-Chief




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News edited by Peter Symes & Arnold Weisz

# NEWS

## Fishing ban around UK island brings seas back to life

**The eastern coast of Lundy is the UK's only "no-take" zone, where fishing is completely prohibited. Five years without fishing around Lundy Island off the coast of Devon have brought a significant revival in sea life, scientists report.**

Divers monitoring the sea bed near Lundy have found lobsters seven times more in number, compared to surrounding waters since 2003. Conservation groups say UK seas need more of them, but the government's recent Marine Bill promises much vaguer "marine conservation zones". Natural England is keen on the Marine Bill allowing the control of damaging activities

in areas where they might harm habitats and species. They are particularly eager to see the lessons learned in Lundy applied to a strategic network of Marine Conservation Zones. The Lundy zone was set up five years ago by Natural England and the Devon Sea Fisheries Committee, which administers fishing along the county's coasts, in partnership with local fishermen. Lundy Island is located 12 miles off the north coast of Devon in the Bristol Channel. It is England's only Marine Nature Reserve. The No-Take Zone covers 3.3 km<sup>2</sup> on the east side of the island. It was established in 2003 via a Devon Sea Fisheries Committee bylaw to enhance protection for the island's marine wildlife. ■



Abrólhos National Marine Park

# New Reef found in Brazil

Researchers from Conservation International (CI), Federal University of Espírito Santo and Federal University of Bahia announced their discovery in a paper presented on July 9, at the International Coral Reef Symposium in Fort Lauderdale. According to the scientist this will double the size of the reef system known as Abrolhos Bank.

### Abrolhos bank

This reef system is found off the southern coast of Brazil's Bahia state, and is the Southern Atlantic Ocean's largest and richest reef system. The importance of the Abrolhos Bank as one of the world's most important reefs rests on the fact that it harbours a high number of marine species found only in Brazil. In addition, some species of soft corals, molluscs and fish are only found on the Abrolhos Bank.

"Due to their relative inaccessibility and depth, the newly discovered reefs are teeming with life, in some places harbouring 30 times the density of marine life than the known, shallower reefs. That's the good news. The bad news is that only a small percentage of marine habitats in the Abrolhos are protected, despite mounting localized and global threats," said Guilherme Dutra, Conservation International's director of marine programs in Brazil.

The reefs are partially protected by the Abrolhos National Marine Park (Parque Nacional Marinho dos Abrolhos - 91300 hectares) established in 1983. The area of the Park comprises the 'Parcel dos Abrolhos' reefs (found in the clearest waters of the region), the five islands of the Abrolhos Archipelago, and the

Timbebas reefs, which are located nearer to the mainland. Researchers mapped the new reef structures in areas ranging from nine to 124 miles (15 to 200 km) off the coast and in depths ranging from 60 to 220 feet (20 to 73 meters) using a side scan sonar, which produces a three-dimensional map of the marine seabed. The reefs discovered were not completely unknown as local fishermen supplied the scientist with some clues where to look. The surprise was more to the extensive range of the reef system and the density of marine life they found. The studies are part of the Marine Management Area Science Program coordinated by Conservation International with the participation of research institutions around the world. ■



Red snapper



A study which was recently published by the University of Rhode Island's Graduate School of Oceanography shows that invertebrates and warm-water species increase, while bottom feeders decrease.

A detailed analysis of data from nearly 50 years of weekly fish-trawl surveys in Narragansett Bay and adjacent Rhode Island Sound on the US Atlantic coast, has revealed a long-term shift in species composition, which scientists attribute primarily to the effects of global warming. According to Jeremy Collie, professor of oceanography at the University of Rhode Island's Graduate School of Oceanography, the community has shifted progressively from vertebrate species (fish) to invertebrates (lobsters, crabs and squid) and from benthic or demersal species—those that feed on the bottom—to pelagic species that feed higher in the water column. In addition, smaller, warm-water species have increased while larger, cool-water species have declined.

#### Shift

"We think there has been a shift in the food web resulting in more of the productivity being consumed in the water column. Phytoplankton are increasingly being grazed by zooplankton, which are then eaten by planktivorous fish, rather than the phytoplankton sinking to the

bottom and being consumed by bottom fish. It's a rerouting of that production from the bottom to the top", Collie explained.

Collie noted that the increase in the numbers of lobsters and crabs is a result of their taking advantage of the benthic habitat abandoned by the bottom-feeding fish species. Overall, the survey analysis found huge changes in the abundance of some species. Butterfish and bluefish, for instance, have increased in abundance by a factor of about 100 times while cunner has decreased by

almost 1,000 times. There are multiple factors involved in the analysis, but rising sea temperatures seems to be the major contributor. Sea surface temperature in the area of the trawls has increased by 2°C since 1959, and the preferred temperature of the fish caught in the trawls has also increased by 2°C.

*Smaller, warm-water species have increased while larger, cool-water species have declined.*



#### Only explanation

"That seems to be direct evidence of global warming. It's hard to explain any other way," Collie said. The weekly trawl survey by URI scientists began in 1959 and continues to the present, making it one of the longest data sets of fish species composition available. The survey has recorded 130 species, though the analysis focused only on the top 25 species, which accounted for 96 percent of the total number of animals collected. ■



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# Climate change good for lobsters and crabs

## Discovery of sea trout in Seine River in Paris shows success of river clean-up

The French capital's authorities say the Seine is cleaner than it has ever been. For the first time since records began, a healthy-looking sea trout has been observed in the Seine. The Paris authorities, of course, claim that this environmental victory is proof that their bid to clean up the river after years of pollution and neglect is taking effect.

According to the SIAAP, the public body in charge of cleaning up the river, the observation of the migratory fish was "crucial evidence" that water quality has improved greatly over the last few years. This is the first time this species has been identified in the Parisian region," a spokesman for SIAAP said. ■



## Marine reserve established in New Zealand

A new marine reserve has been established on Wellington's south coast. The 854 hectare Taputeranga Marine Reserve takes in Owhiro and Island, Princess and Houghton Bays, and extends 2.3km out to sea and 3.3km along Wellington's south coast.

The reserve will be an attraction for divers and snorkellers wanting to view the naturally-restored ecosystems. Last year, more than 551 species—including at least four new ones—were discovered here, and the marine reserve will showcase this unique animal and plantlife. ■

## Northern Marianas to gain protection

US President Bush is considering conserving parts of the Northern Mariana islands in the western Pacific, as well as eight islands and coral reef atolls and their surrounding waters in the central Pacific that are part of the Line Islands and American Samoa. Conservation groups have been lobbying the White House to set aside 115,000 square miles of the Northern Mariana islands as a marine monument.

These vast Pacific areas are nearly three times the size of Texas. Countless seabirds, dolphins, fishes, corals and tiny things as yet undiscovered could survive as a result, free of the threats that are eliminating them elsewhere, said Elliott Norse, founder and President of Marine Conservation Biology Institute. ■



Filephoto of Deep Water Corals

## Oceana discovers deep-sea white coral in the Gulf of Biscay

The Oceana Ranger research vessel has discovered deep-sea white coral in the Aviles Canyon. The deep-sea coral was identified using an underwater robot, which can work down to 600 meters. The first colonies of white coral appeared at 200 meters depth, covering the walls of the canyon, and being especially numerous on the overhangs. Along with these colonies, the area also harbours gorgonians, black coral, glass sponges and a wide variety of fauna. The Aviles Canyon, located approximately 18 miles off the coast of Asturias on Spain's Atlantic coast, begins at 180 meters depth and drops to almost 2,000 meters.

WWF/Adena proposed that the canyon be considered an area of special interest due to the existence of the giant

squid. The recent discoveries made by Oceana highlights even further the importance of this area and its need for protection.

"One of the most fragile and important ecosystems in Europe is found here, in Asturias. Some coral reefs have already been damaged by fishing gear, but highly valuable colonies still exist. These areas are in need of urgent protection in order to ensure the survival of hundreds of species," declared Ricardo Aguilar, Director of Research for Oceana in Europe.

Recent studies estimate that almost half of the deep-sea coral reefs in Europe have disappeared, particularly due to destructive fishing methods such as bottom trawling. ■

## BBC film crews discover many new fish species

Expeditions for two BBC documentaries have uncovered up to 15 new species of fish.

Dives down into the rarely explored 'twilight zone' of the Pacific Ocean uncovered 13 new species during the filming of *Pacific Abyss*. Among the newly discovered species was a highly sought-after damselfish that team-member Dr Richard Pyle first sighted over ten years ago, with various sightings reported since.

However, this was the first time that specimens had been caught—and in honour of the series, Dr Pyle named the fish *Chromis abyssus*. Several more new *Chromis* species have also been described from the expedition, along with at least one new species of basslet (*Plectranthias* sp.), a hawkfish and a butterflyfish.

Another team of researchers and wildlife filmmakers spent six weeks searching the pristine Guyanan rain forest filming part of a BBC documentary called, *The Lost Land of the*

*Jaguar*. Dr McGavin, a zoologist and one of the four presenters of the documentary, told the BBC News Website: "The expedition captured on film the discovery of the strongest candidates for new species—two fishes." These are a small banded fish (*Hemiodus* sp.) netted near the expedition's base camp, and a parasitic catfish (*Vandellia* sp.) that fell out of the gills of a larger catfish. ■



DR. RICHARD PYLE



Edited by Peter Symes

# Loss of mangrove in Mexico threatens fisheries

Both on Mexico's Pacific and Caribbean coasts mangroves are being destroyed by high-end tourism resorts, marinas, and controversial industrial shrimp farms. A study by scientists at Scripps Institution of Oceanography at UC San Diego has measured the financial consequences of mangrove forest destruction.

Mangroves serve as homes to a variety of fish and crab species, and host nursery habitats for commercially valuable fishes such as snappers, snooks and mullets. The trees also protect the coastline from erosion and filter water between the continent and ocean. According to a study done by Mexican researchers, 2.5 acres (1 hectare) of coastal mangrove in the Gulf of California helps produce an average of US\$ 37,500 worth of harvestable fish and crab species annually. They found that 13 fishing regions in the Gulf of California produced

an average of 11,500 tons of mangrove-derived fish and blue crab per year between 2001 and 2005, generating nearly \$19 million for local fishermen.

## Tourism causing

The picture is even bleaker on Mexico's Caribbean coastal region, which has the highest mangrove deforestation rate in the country, approximately 12 percent. Mainly due to the construction of tourist resorts and to overall urban growth. The "Mangroves of Mexico" programme carried out by the National Commission for

the Knowledge and Use of Biodiversity (CONABIO) reports that the Yucatan Peninsula in the Caribbean has the greatest total area of mangroves, covering 349,252 hectares. A massive amount of tourist infrastructure is being built south of the resort city of Cancun, running to the southern border of the state of Quintana Roo. Innumerable new massive hotel chains, along with shopping malls, parking lots, and other people attractions are wrecking havoc on the ecosystems. Despite their value, the number of mangrove forests is dwindling at a regional rate of two percent per year in Mexico, as trees are cut to make way for new coastal developments, among other reasons. ■



Mangrove (*Rhizophora sp.*)



## Sea Urchins with Nightly Munchies Get Very Noisy

A new study by researchers from University of Auckland has found out that chewing sounds from ravenous sea urchins becomes a hundred times louder just before dawn and just after dusk. The urchins hide in crevices during the day, out of sight from predators, and emerge to feed at dusk.

The team recorded the sounds made by individual reef animals in the lab, and then compared them with the dominant sound in the natural reef din.

According to the researchers, this regular noise could even help the larvae of fish and crabs find their way to reefs, as previous studies have found that some larvae can orient towards sound. ■

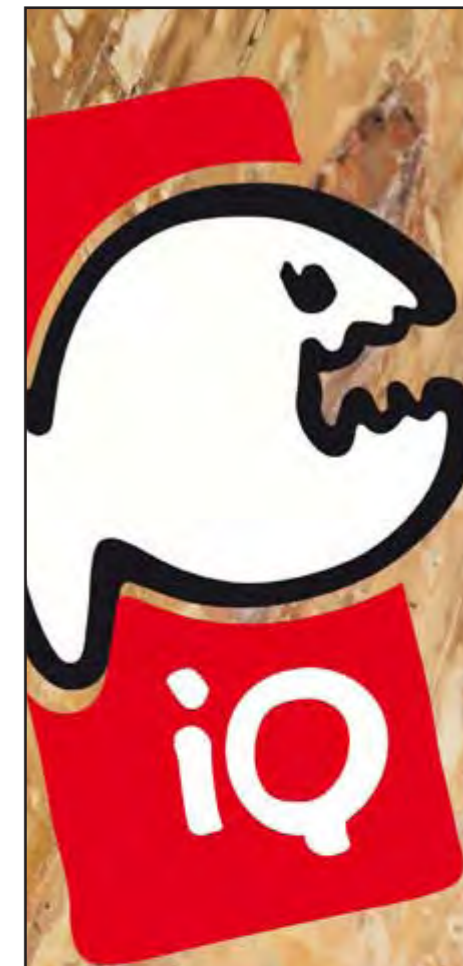
MUREL GOTROP

## Giant clams 'secure for another generation' after Philippine re-seeding

Re-seeding programs on over 50 reefs are securing the survival of the giant clam for at least another generation, according to WWF-Philippines.

The clams, the world's largest bivalve mollusks, can live for over a century. They have been known to exceed 1.4 meters in length and weigh over 260 kilograms. Once common throughout Philippine reefs, excessive hunting for the food, pet and curio trade all but depleted the wild giant clam population by the mid-1980s, prompting the IUCN to classify them as vulnerable. An attempt to restore natural clam populations is now being spearheaded by Dr Suzanne Mingoa-Licuanan of the University of the Philippines Marine Science Institute in partnership with WWF-Philippines.

"Several species of laboratory-raised giant clams have been re-seeded in over 50 reefs nationwide, significantly bolstering wild stocks and ensuring their survival for at least another generation," said WWF Project Manager Paolo Pagaduan. ■



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# Mystery of flatfish eyes unravelled

Some odd-looking fish fossils discovered in the bowels of several European museums may help solve a lingering question about evolutionary theory, and fill in the missing link of evolutionary biology of the flatfishes.



PETER SYMES

The 50-million-year-old fossils, which have been hidden in museums in England, France, Italy, and Austria for over 100 years could help explain how such flatfish as flounder, sole and halibut developed the strange but useful trait of having both eyes on one side. Because these fishes lay on their sides at the ocean bottom, this arrangement enhances their vision with both eyes constantly in play, peering up into the water. The fossils found have one eye near the top of their heads. Until now, this missing piece of information has posed a problem for evolutionary biologists because no one had found any so-called transitional fossils. The fossils show intermediate steps in the evolution of this trait.

## Evolution explained

"What we found was an intermediate stage between living flatfishes and the arrangement found in other fishes. These fossil fishes indicate that the evolution of the profound cranial asymmetry of extant flatfishes was gradual in nature. The important point is that many evolutionary biologists also could not imagine how the flatfish body plan could have arisen gradually, via a series of intermediates," said Matt Friedman of The Field Museum in Chicago.

## Eye migration

The orbital migration, the movement of one eye from one side of the skull to the other, happens during the youth of every flatfish, where the symmetrical larva undergoes a metamorphosis to produce an asymmetrical juvenile. One eye 'migrates' up and over the top of the head before coming to rest in the adult position on the opposite side of the skull. ■

This close up of the face of a plaice clearly shows the weird arrangement of the eyes. The fish rests on its left side

# Pacific shellfish about to invade the Atlantic

As the Arctic Ocean warms this century, shellfish, snails and other animals from the Pacific Ocean will resume an invasion of the northern Atlantic that was interrupted by cooling conditions three million years ago, predicts Geerat Vermeij, professor of geology at the University of California, Davis, and Peter Roopnarine at the California Academy of Sciences.

"Climate models predict a nearly ice-free Arctic Ocean by 2050. That will restore conditions that last existed during the mid-Pliocene era around three to 3.5 million years ago. Several north Pacific species have relatives in the north Atlantic, and the fossil record shows a lot of invasion from the Pacific to the Atlantic at that time," Vermeij said.

When cold conditions returned, the Arctic route was cut off, mostly by a lack of food. As the ice melts, productivity in the Arctic will rise and the northward march of the molluscs will resume where it left off three million years ago. The authors do not think that the invaders will wipe out native species. The fossil record shows that invasions rarely lead to species extinction in

marine environments. Instead, the invasion will add new species and hybrids and increase competition in the North Atlantic.

"The composition and dynamics of North Atlantic communities will change. But whether that will help or harm local fisheries is an open question. Humans may have to adapt as well," Roopnarine said. ■



The Astarte mussel lived only in the Arctic and North Atlantic oceans until prior to the opening of the Bering Strait after which it migrated southward into the Pacific approximately 3.6 million years ago

# Pacific oyster settles in Norway

Naturally, only the European oyster, *Ostrea edulis*, is found in Norwegian waters. This shellfish needs warmer water, so there has been limited populations along the south coast. During the '70s and '80s, there were some attempts to farm the pacific oyster *Crassostrea gigas* in Norway to replace some of local oyster populations, which were decimated by a disease starting in the



HUITRE DE MARENNES-OLÉRON

'60s. The pacific oyster proved to be very hardy and adaptable and is now spreading through European waters. In Norway, it is now forbidden to farm or release live specimens of this oyster in the sea, but it seems that they have come to stay here as well. Researchers from the Norwegian Institute for Research found a population of more than 500 specimens near the town of Sandefjord on the south coast. This population contained at least four different generations, which suggests that they have been reproducing for a while. Earlier, only single specimens of the pacific oyster had been found in Norwegian waters. It's still uncertain how this colony settled here. The researchers think it can either be wild specimens migrating from the south, or animals coming from a pacific oyster farm in nearby Denmark. The researchers from the Norwegian Institute don't welcome this species, as they pose a threat to the local marine fauna. ■



Seagrass meadows are essential to commercial species such as prawns

## Seagrass suffer in warmer waters

Impacts of global change threaten commercially valuable seagrass meadows, according to a report launched by IUCN, the International Union for Conservation of Nature. One hectare of seagrass meadows is worth around €12,000 per year, by providing benefits like food and shelter for highly valued prawn and fish populations.

"Overall, seagrasses are in a vulnerable state," says Mats Björk, one of the authors of the publication. "Seagrass habitats are already declining due to increasing water temperatures, algae growth and light reduction, which are all effects of global change."

### Let there be light

Seagrasses need high light intensities to survive. Storms, flooding and coastal erosion create sediment disturbances that smother the seagrass plants. Excessive nutrients (eutrophication) added to coastal waters may lead to algae invasions that also shade the seagrass leaves. Warmer sea water, changes in ocean acidity and higher CO<sub>2</sub> concentrations in

the atmosphere also affect seagrasses, but the exact consequences cannot be foreseen yet. When all these global changes come together, already stressed seagrass systems will be pushed over their limit of existence, resulting in further widespread seagrass losses. "We need to make seagrass more resilient to global change. For example, we know that genetically more diverse populations of seagrasses have a higher chance of success in a changing environment," says Lundin. "Protection of seagrass refugia and connecting them to adjacent habitats such as mangroves or coral reefs will increase their survival chances considerably." ■

## Seaweeds suffer from sunburn too

It's not just us humans who react sensitively to an increased dose of ultraviolet radiation. Many plants react, too. Yet, they are dependent on sunlight. With the help of pigments absorbing solar energy and light, plants produce their vitally important building blocks by means of photosynthesis. However, this has its limits: too much sun means an over-abundance of energy and thus the destruction of the sensitive pigments. The results are black spots, pale leaves and rotten parts. Since algae cannot apply sun lotion like we do, they develop their own strategies to protect themselves from the sun.

"A species of red algae, for instance, produces under increased ultraviolet radiation, less red light-harvesting proteins, thus decreasing the absorption of radiation. The typical red color of the algae fades and the plant gets white tips," explains Dr Christian Wiencke, marine biologist at the Alfred Wegener Institute for Polar and Marine Research in the Helmholtz Association. "The algae additionally produce substances which react similarly to melanin in human skins: mycosporin amino acids (MAA)." Melanin absorbs ultraviolet radiation and thus protects the human skin—at the same time, it gives a natural suntan. ■



Healthy red algae (*Devaleraea ramentacea*)

MAX SCHWANITZ, ALFRED WEGENER INSTITUTE



Red algae (*Devaleraea ramentacea*) under increased ultraviolet radiation. They produce less red light-harvesting proteins so the typical red color of the algae fades, and the plant gets white tips

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The guys from DivePhotoGuide.com, Matt Weiss (right) and Jed Bernstein



Simon Kong (center) with the friendly folks from East Marine, Jenny Cheah (left) and Danny Lim (right)

# MIDE 2008

Text and photos by Simon Kong

MIDE 2008 was a blast! Held for the third time at the Putra World Trade Centre, I met so many people, old friends and new ones as well, dive resorts and even a marine life expert. I expected the crowd to be a lot less on Friday, the opening day, compared to the weekend, but the crowd was not disappointing.

Fears of massive traffic jams due to a public demonstration on Sunday

to protest the recent local fuel price hike did not materialize. It also helped that there was a simultaneous kids exhibition one floor below. Many parents brought their kids to visit MIDE right after viewing it. And many exhibitors will attest to the rapidly diminishing sweets meant for their booth visitors disappearing faster than usual due to the sweet-toothed kids!

Overall, the expo was well organized and hardly a complaint was heard. But the major dive gear manufacturers, like last year, did not make their presence felt. The majority of the exhibitors were local dive operators and gear retailers with a few watercraft thrown into the mix.

The show was a great place to look for dive bargains and to meet up with old friends. Even a few local celebrities showed up to check out what was on offer. Everybody came away with smiles and some walked away with free gifts through lucky draws such as dive training and even a SeaDoo DPV! See you at the next MIDE! ■



Traditional Malay dance was part of the entertainment



How many species live in the sea?

# List of Known Ocean Species Surpasses 120,000

The new World Register of Marine Species ([www.marinespecies.org](http://www.marinespecies.org)) contains about 122,500 validated marine species names (experts having recognized and tidied up some 56,400 aliases—32 percent of all names reviewed). It also contains some 5,600 images, hyperlinks to taxonomic literature and other information. Once complete, it will provide the first definitive list of all known species in the world's oceans. The Register is freely acces-

sible online and includes descriptions of the species and photos. It will allow both the public and scientists to identify species they come across and easily recognize entirely new species.

Marking the World Register's official inauguration, some 55 researchers from 17 countries met in Belgium to plan its completion by 2010. Leading World Register experts independently estimate that about 230,000 marine species are known to science. They also believe there are three times as many unknown (unnamed) marine species as known, for a grand total on Earth that could surpass 1 million.

Some species, such as those reclassified in years past based on new information, were shown to have a handful of names or more. In such cases, the oldest name trumps later ones to become the valid name (though all aliases are noted to help researchers interpret centuries of scientific literature).

Popularly called Breadcrumb Sponge, *Halichondria panicea*, is the marine world's reigning champion of Latin aliases with 56 synonyms appearing in taxonomic literature since its first description in 1766. ■

Marbled swimming crab *Liocarcinus marmoreus*, a species of crab found in the northern Atlantic Ocean

# Shallow Water Corals Evolved From Deep Sea Ancestors

**The second most diverse group of hard corals first evolved in the deep sea, and not in shallow waters.**

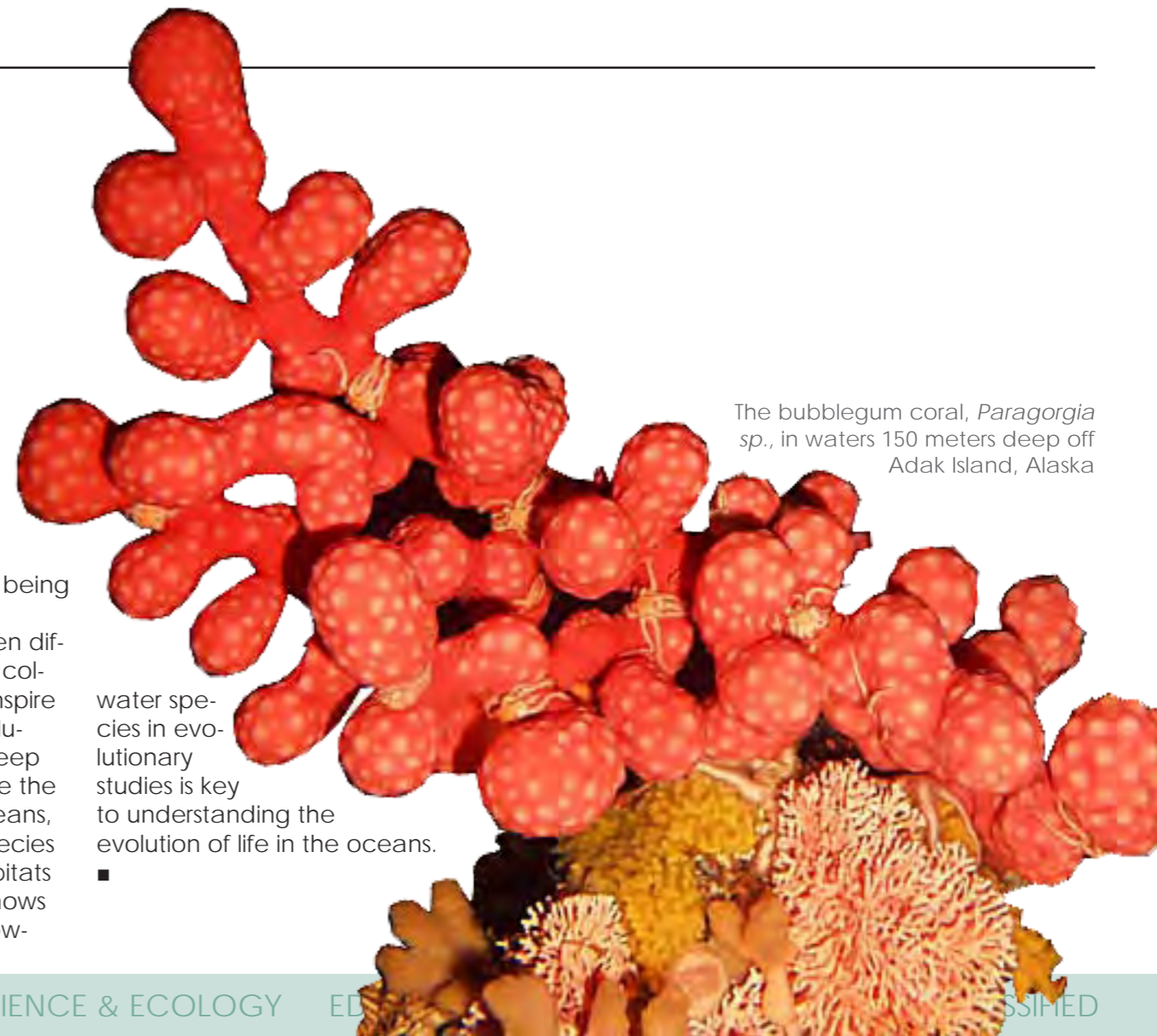
Alberto Lindner, a coral researcher at the University of São Paulo, Brazil, and colleagues have found that Stylasterids, or lace corals, diversified in deep waters before launching at least three successful invasions of shallow water tropical habitats in the past 40 million years.

This finding provides the first strong evidence that a group of deep-sea animals invaded and diversified in shallow waters.

"When we look at the DNA and fossils of these animals, we can trace how these transitions from deep water to shallow habitats have popped up in different parts of the family at different points in time," says Alberto Lindner. "We also see this story unfold in which the corals are building skeletal defenses, possibly in a long-running arms-race with their predators. Together, it shows us how wrong it is

to think of deep-sea ecosystems as being isolated and static."

Although deep-sea research is often difficult and expensive, Lindner and his colleagues hope their work will further inspire scientific exploration and broad evolutionary studies in the oceans. "The deep sea and the shallow-water tropics are the most diverse environments in the oceans, but how deep and shallow-water species have built these different marine habitats is still poorly understood. Our study shows that integrating deep-sea and shallow-



The bubblegum coral, *Paragorgia* sp., in waters 150 meters deep off Adak Island, Alaska

water species in evolutionary studies is key to understanding the evolution of life in the oceans. ■

# OWU Scholars Become IAHD Certified

**For over 35 years, thanks to generous funding from Rolex, the Our World-Underwater Scholarship Society (OWUSS) has offered a variety of internships and scholarships with the goal of fostering the development of future leaders of the marine environment. OWUSS is a nonprofit, educational organization whose mission is to promote educational activities associated with the underwater world.**

Text by Peter Symes

Currently, there are three Rolex Scholarships: North America, Europe, and Australasia. Each Rolex Scholarship provides a hands-on introduction to underwater and other aquatic-related endeavors for a young person considering a career in an underwater-related discipline. One scholar is selected from each of the three regions and each scholar spends approximately one year working side by side with current leaders in underwater fields. Each scholar travels primarily within his or her region, but may have opportunities throughout the underwater world. The range of experiences may include active participation in field studies, underwater research, scientific

Flemming Thyge conducts a pool demonstration. Flemming Thyge is IAHD's Director of Quality Management. Pro Trainer Examiner, and IAHD representative for Scandinavia & Russia, He is also a PADI Course Director and owner of 2DIVE Divecenter in Copenhagen, and sponsor of the event.

expeditions, laboratory assignments, equipment testing and design, photographic instruction, and other specialized assignments.

In August a whole group of the scholars, including two out of the three current scholars convened in Copenhagen to join a course set up by the Danish PADI and IAHD course director, Flemming Thyge, and Dutch colleague Daniel Zuidema from IAHD to qualify them as IAHD instructors or divemasters.

I sat down with scholars Igor Valente, Eline Feenstra and Jamie Brisbin and asked them why.

Igor Valente: I had a talk with Flemming and Daniel and came to realise that this was something very different. Hopefully, it would enable me to help more people. The challenges during this course were fun, and it was very rewarding to figure out how to make disabled enjoy themselves, too.

Eline Feenstra: I also wanted to help other people do something I like and share my experiences with them. It was very rewarding when you see this person smile wide underwater. Before I went into diving, or started studying, I was a home care provider for a disabled person, and that changed my views on these matters.

Not so easy?  
Igor Valente is about to find out how a blind diver has to cope with rigging up





Hey, pointing and gesturing doesn't work when you have to 'point out' the features of a dive site to a blind person. Daniel Zuidema from IAHD simulate being the blind in this training exercise with Jaime Brisbin

**The interviewed scholars:**



Jamie Brisbin, 22, of Setauket, NY, has been selected as Our World-Underwater Scholarship Society's 2008 North American Rolex Scholar. Jamie graduated from the University of Southern California in 2007 with a BS in Biological Sciences.

Jamie Brisbin: I, too, had some experiences with disabled people as I was a volunteer at the Special Olympics. And since scuba diving is a passion of mine, I combined the the two. It is about a combination of helping handicapped people and sharing experiences such as those you get when you dive. The techniques we learned at this course also made us better at dealing with 'normal' people. It makes you generally more perceptive to other people's needs and limitations.

**X-RAY MAG:** What would you say to people who ask you about this course?

Jamie: The more you invest in it, the more rewarding it gets. It is incredible to share these experiences with people who never thought they would be able to do things like this.

Igor: When you help a person with severe disabilities, with whom it is hard to communicate, it is priceless to see that big grin on their faces when we get them out of the water. The other interesting thing is that water is the big equaliser. On land, there is a big difference when the disabled person is tied to a wheelchair, but below the surface, it is not always easy to tell the able-bodied apart from those with disabilities. Perhaps you can see the disabled person has to use his/her arms, but aside from that, we are far more on equal terms down there.

Jamie: New divers who are not handicapped get that feeling, too. ■



Born and raised below sea level in the Netherlands, Eline Juliette Feenstra (22), has been selected as the European Rolex Scholar for 2008-09. At the moment Eline is majoring in Philosophy at the University of Amsterdam.



Igor Valente, 24, has been chosen as the European Rolex Scholar for 2007-08. A Portuguese citizen born and raised in Mozambique, Igor has witnessed first hand the realities of a developing country. Igor has a degree in Electronic Engineering.



The happy lot on the beach outside Copenhagen after graduation

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## PADI reinvents The Wheel

PADI just delivered its next generation of electronic dive planning—the Electronic Recreational Dive Planner, Multilevel version (eRDPM).

Developed by their dive science branch (DSAT), the new product aims at making planning single depth and multilevel dives easier. It is not a dive computer—as the first generation provided the same information as PADI's Recreational Dive Planner (RDP) Table version—the "eRDPM" provides the same information as PADI's multilevel dive planner, "The Wheel®".

The main features include:

- the ability to plan single depth and multilevel dives
- a flip cover with the General Guidelines displayed inside
- touch interface with large keys and a wide display window

- a compact user manual positioned under the device
- imperial or metric systems

Not to be confused with a dive computer, it can resist a mild rain or sea sprinkle, but it would go bust if you dip it. Its main usage is to plan the dives before you get wet, not after. "From a diving point of view, I love it because it gives you dive table dependability with calculator simplicity. For new divers, and even some experienced ones, mastering dive planning is now quick and easy. For PADI Instructors, this translates into more practical time in the water and less time reviewing tables in the classroom." said Karl Shreeves, DSAT Technical Development Executive. ■

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## Russian mini-sub on Lake Baikal



Lake Baikal is being surveyed by the two famous Russian submersibles, *Mir-1* and *Mir-2*

The project is set to run for two years, during which the scientists will conduct around 160 dives in various areas of the lake. Research will include tectonic information-gathering and a search for archeological artifacts. According to reports given, scientists onboard will take samples

of water and soil from the lake, which is home to more than 1,700 species of plants and animals. They also will plant a small pyramid bearing the Russian flag in the lake bed. Organizers then will compile a list of recommendations at how best to preserve Lake Baikal, a UNESCO World Heritage site.

Artur Chilingarov, leader of the submarine Arctic expedition that reached the North Pole in 2007, explained that the expedition's next

phase is to collect sample from the depths of the lake and establish what the effects produced by climate change are. The campaign will also be used as a means to draw more attention from the Kremlin to the matters of environmental protection. ■

## New German oceanography museum opens

The largest oceanographic museum ever built in Europe opened mid July 2008, in the port town of Stralsund, by the Baltic coast. It features the natural treasures of the Baltic and Arctic marine life.

"Ozeaneum" is, at first view, a very large public aquarium in the German city of Stralsund. But it's more than that, it's an architectural feat in itself. Belonging to the Deutsches Meeresmuseum, arguably one of the three largest European institutions of its kind, the

60 million euro project covers a total area of 8,700 square meters. It is an architecturally dramatic extension to the existing Oceanography Museum.

It's main highlight comprises life-size models of the Giants of the Seas. The exhibition, which was organized in conjunction with Greenpeace and its anti-whaling campaign, depicts giant models of whales hanging from 20 meter-high ceilings in rooms filled with whale song. Greenpeace donated 1.45

million euros to the whale exhibition. Unknown fish, coral and other marine life are exhibited in no less than 39 different aquariums at "Ozeaneum", which have a total capacity of six million liters. To ensure it is disease free, it will come from the city water system and have 200 tons of salt added to match the salinity of sea-water.

The museum is supposed to be self-supporting from now on, with at least 550,000 visitors annually needed to cover its running costs. ■



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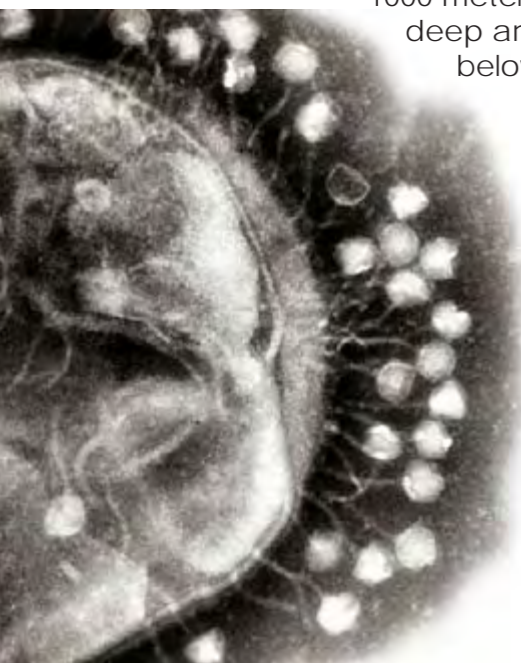


*"We need a whole new approach —and we need to act now. Our research shows that many of the world's existing no-take areas are in the wrong place."*

## Are Viruses Controlling Deep Sea Ecology?

**Viruses in the deepest ocean environments are unexpectedly strong regulators of the deep sea biosphere, according to a paper just published in *Nature*.**

Approximately 65 percent of the Earth is dominated by deep sea, or benthic, ecosystems. By infecting and killing bacteria and other prokaryotes (simple organisms without a cell nucleus) viruses are the main producers of the organic matter that sustains life at 1000 meters deep and below.



Is this the kind of interaction that governs deep sea ecology? Image is an electron micrograph of bacteriophages attached to a bacterial cell. A bacteriophage is any one of a number of viruses that infect bacteria

By generating this biomass, viruses also make major contributions to the carbon cycle and other geochemical processes. "This shows that a very large amount of the carbon that reaches the sea floor is going through pathways that were commonly thought to be relatively minor," said Jed Fuhrman, an ocean biologist at the University of Southern California not involved in the study. "The whole idea that viruses have any significance in marine systems is only 15 to 20 years old." The sea floor is one of the hardest environments for research because of the distances and logistical challenges involved in conducting experiments.

The researchers, led by Roberto Danovaro of the Polytechnic University of Marche, Italy, collected 232 samples of sediment from the deep sea. They found that viruses were surprisingly abundant in their samples, and that they were reproducing locally, rather than migrating down from surface waters. The deeper the water, the more virus-induced death they observed in the bacteria, with viral infection responsible for about 80 percent of bacterial death in the deep sea samples. ■

# Marine protection zones are in the wrong places

**Conservation zones are in the wrong place to protect vulnerable coral reefs from the effects of global warming, an international team of scientists warn.**

Current protection zones or 'No-take areas' were set up to protect fish in the late 1960s and early 1970s before climate change was a major issue. But many of these zones are not in the right place to help prevent the coral reefs from collapsing, a joint team from Newcastle University and the Wildlife Conservation Society has found.

The team carried out the largest study of its kind covering 66 sites across seven countries and spanning over a decade in the Indian Ocean and found out that the small-scale zones were not working to protect coral reefs against the effects of climate change.

### Add some more

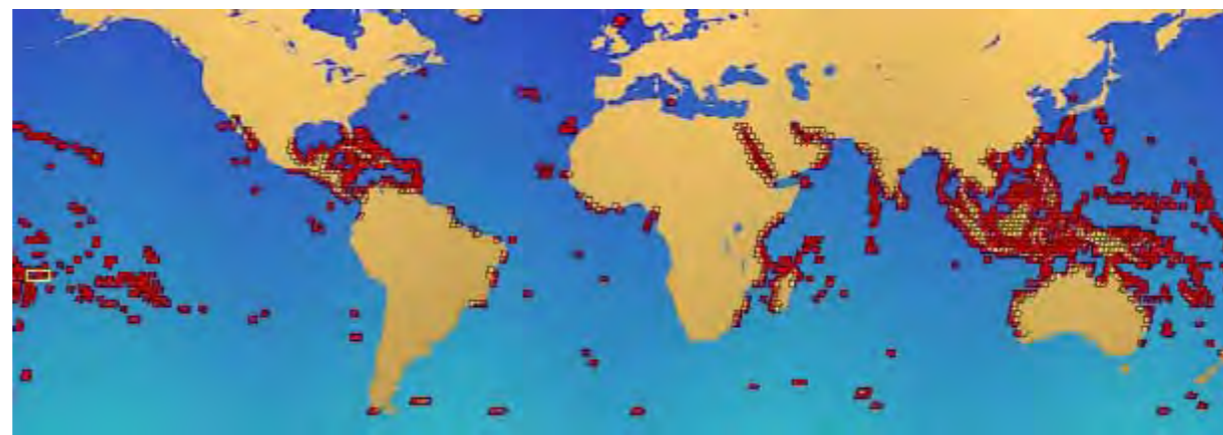
The researchers found that urgent action was needed to prevent the collapse of this important marine ecosystem. They also concluded that while the existing zones should not be removed, new areas are needed in the right places to protect corals against the effects of rising temperatures. Managing the system as a whole is crucial if coral reef communities are to have any hope of surviving the effects of global warming, lead

researcher Nick Graham, of Newcastle University's School of Marine Science and Technology, said.

"New protected zones are needed that focus on areas identified as escaping or recovering well from climate change impacts. But a major focus needs to be shifted towards increasing the resilience of the system as a whole—that means reducing as many other locally derived threats as possible," he added. Although many areas are showing signs of long-term degradation, Mr Graham said it was a positive sign to see that some locations either escaped the impact or have recovered.

### Removing stressors

"Coral dies when it is put under stress, so what we need to be doing is reducing the direct human impact—such as over-fishing, pollution and sedimentation—across the whole area. By removing all these other stresses, we are giving the coral the best chance of surviving and recovering from any changes in temperature that may occur as a result of global warming." ■



The position of the world's coral reef

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## Peter the Great's Ship Discovered in Baltic Sea

In July 2008, archeologists located the 54-gun *Portsmouth* battleship at a 12-meter depth in the waters off Kotlin Island. Designed by the Tzar, Peter the Great, it sunk on the way back to the port of Kronshtadt, along with another ship, the *London*. The battleship played a key role in the 1719 victory over Sweden, on the Baltic Sea.

The area surveyed contains a total of 11 wrecks, says Andrei Lukoshov, head of the research team. The cruiser *Oleg*, sunk by an English torpedo in 1919, was also found, as well as an aircraft resembling the Li-2 model from the First Long Range Aviation Division Guard, downed in 1944.

The team is part of a project named "Secrets of the Sunken Ships", which has already located 50 wrecks (such as those in the River Volkhov and in Lake Ladoga). Among these wrecks are the German boat, *Frida Horn*, a European mast ship from the second half of the 19th century, as well as the *Hanhoot* (1892), the *Jigit*, and the *Haezdnik* (built in 1856).

The team will also continue the study of a badly damaged 16th century 40-meter long mast-ship belonging to the same class of the famous Swedish battleship, *Vasa*. ■

Drawing of a sister vessel to the Portsmouth



## Ancient ship carried expensive Greek red wine

*Kyrenia ship* is the wreck of a 4th century BC Greek merchant ship restored and now on exhibit in Ancient Shipwreck Museum in Kyrenia Castle, Cyprus

At depth of 45m, some 2.5 km off the coast of Cyprus, an ancient cargo ship, estimated to be 2,350 years old, rests with its cargo of wine still intact. The vessel is a rare example of well-preserved late classical period (mid-4th century B.C.) commercial shipwrecks that sailed the Greek waters.

Marine archaeologists salvaged a few of the more than 500 terracotta amphora used to ferry liquids in ancient times. The recovered artefacts were identified as Chian amphorae, used to store red wine from the Aegean island of Chios. This wine is believed to be the most expensive type of wine in antiquity. Other examples of north Aegean amphorae were also identified. Many more are believed to lie buried in the sand under the hull of the wreck.

The ship might be similar to its more famous counterpart, the 15-meter "Kyrenia ship"—the oldest Greek shipwreck ever excavated—accidentally discovered on the northern coast of Cyprus more than 40 years ago.

The find will help scientists understand more about nautical history, trade and commerce in the Aegean and East Mediterranean area, during the Classical period. This is the first marine archeological research project conducted solely by Cypriot institutions, undertaken by the University of Cyprus' Archaeology Research Unit and funded by the Thetis Foundation. ■



## 2,500 year-old mariner's talisman discovered in Israel

An ancient white marble discus dating back to the 5th or 4th century B.C., has been found on Palmahim beach where the ancient port Yavne-Yam once stood. The site is currently a protected antiquities site. The 20 centimeter wide disc was discovered by a lifeguard, David Shalom, who was diving off the coast.

Only four similar artifacts have been found. The discs, representing the pupil of an eye, were talismans adorning the bows of ancient cargo or warships in order to ward off evil spirits. The painted eye and the engravings have eroded away after lying two and half millennium on the sea bed.

"It was used as a protective measure against the evil eye and envy, as well as a navigation aid and to act as a pair of eyes, which looked ahead and warned of danger. But we thought the eyes were only on fighting ships, not merchants ships," said Kobi Sharvit, the Director of the Marine Unit of the Israel Antiquities Authority (IAA). "This decoration is also prevalent today on modern boats in Portugal, Malta, Greece and in the Far East," he adds. ■



The disc-shaped talisman depicted on an antique ceramic serving bowl





Filephoto:  
Hercules



## Hercules C-130 becomes new attraction in Texan scuba park

## Sinking of the USS Vandenberg put on hold

Plans to sink the *USS Hoyt Vandenberg* off Key West to create an artificial reef and diving destination have stalled. The ship is now docked in Virginia where it will remain at least until hurricane season is over. What happens then is anyone's guess.

Escalating costs and evaporating finances have halted the Vandenberg project, and it's now uncertain whether the ship will ever be sunk. According to the most recent estimate, it will cost US\$8.45 million to scuttle the *Vandenberg*. A bank consortium consisting of BB&T, Orion and First State Bank offered an initial combined investment of \$4.6 million

*"...sounds like it's becoming an unreality"*

at the project's outset but scaled that back to \$3.2 million when progress came to a halt. Besides other smaller contributions, a funding gap of \$1.85 million remains to be raised either through private donations or more government earmarks.

District IV Commissioner Barry Gibson said the City Commission is "still interested" but that considering finances, the project "sounds like it's becoming an unreality." However, City Commissioner Bill Verge was upbeat. "This investment will make money for 100 years". He went on to project that free media coverage from the scuttling would be valued at \$40 million, citing media interest such as "Good Morning America," and "Mythbusters".

Jackie Harder, President of the Key Largo Chamber of Commerce and champion of the Spiegel Grove scuttling said that the success of the Spiegel Grove project is due in large part to continuing community support. ■

Retiring from 50 years of service with the US Air Force, a recently auctioned Hercules airplane is the newest diving attraction to local divers in Clute, Texas. The C-130 joins a fighter jet, train caboose, pieces of the Mayan Mindbender from Astroworld, giant sculptures of mammoths, turtles and old parts from NASA—all under the surface of the 55-acre "Mammoth" lake.

"The owners of the lake

acquire a lot of cool stuff for it," Hydrosports Scuba owner Michelle Cryer said. "As far as we know, this is going to be the only C-130 in the US available for scuba divers, so it's a big deal."

At a hundred feet long with a 149-foot wingspan, the plane had to be cut in half in order to be sunk to the bottom of the lake. "We had to cut it up in little

pieces to get it down here," the president of Vernor

Materials and Equipment, a partner in the venture, said. "Those wings are in four sections, and we had to scab them together, and we had to cut holes to make it safe inside." Divers helping to position the C-130 shared the boat with a Discovery Channel crew documenting dive sites all over the world. ■

## Diving Bermuda's newest 'shipwreck'

Wreck divers at the Bermuda's South Shore will find a recently scuttled 75-foot tugboat called *Forceful*, submerged at 60-feet beside a blossoming reef wall, placed near another 55-foot tugboat know as *King*, allowing for a great 50-minute dive on both sites.

The boat's watermarks and sign are still visible, while its inside has been cleared out. The wreck allows for a full penetration and swim up the metal staircase to the top deck, it is possible to get a view over the entire vessel.

The small pilothouse still has some of its machinery left, such as movable levers, creating a great opportunity for underwater photography. Being still a new wreck and lacking so far any reasonable amount of coral, local fishes are yet to adopt it as their local hangout.

Chris Haile, a local instructor, said that "The boat will eventually become like an artificial reef—it's just a process of time, so the coral will start to grow on the metal and within the boat. Without a doubt, this new tug will attract divers to come here. The first tug we sank was fun for around 15 minutes,

but with the new larger one here, it makes a perfect 40 to 55-minute dive with the short distance between the two boats," he added. ■

## Indian Navy sinks ship to create artificial reef

The decommissioned ship, *Sea-sward Defence Boat T-54*, was sunk off the Karnataka coast in the Arabian Sea. Since it was commissioned in September 1998, it served as a coast guard patrolling the maritime borders for 23 years.

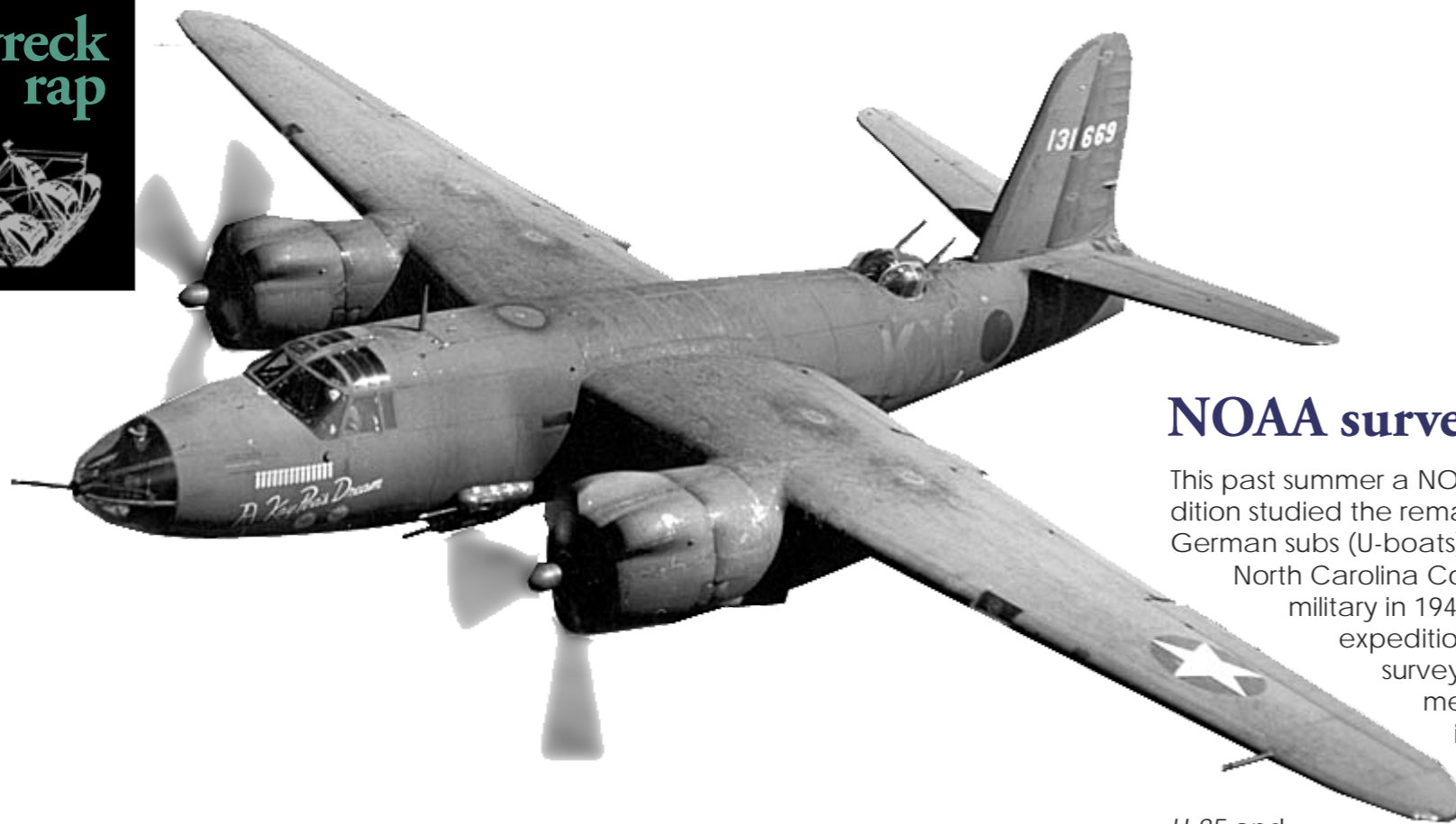
According to an Indian official, the ship's electrical wiring, communication and weapon systems, as well as most of the machinery were removed. Also, traces of oil were cleaned from the fuel tanks. "All potential contaminants that could adversely affect marine life were removed to make *T-54* as envi-

ronmentally safe as possible." the official added.

The ship was then towed out, mines were fitted on the vessel and detonated, causing it to sink, bow first. A survey conducted by a diver confirmed the vessel was settled correctly on the seabed. The area has initially been opened to professional divers as the underwater visibility has to improve to about six meters before it is possible to view the

ship from glass-bottomed boats. The ship will also promote scuba diving as a sport. ■





## WWII bomber wreck found by treasure hunters

The wreck of a B-26 Marauder WWII bomber, which crashed more than 60 years ago in the Mexico Gulf waters, was accidentally discovered in 1990 by charter boat captain Tim Wicburg, who believed he had found the elusive aircraft containing Fugencio Batista's loot—one of four B-26 the former Cuban dictator used to transport tons of gold raided from the Cuban National Treasury when fleeing from Fidel Castro's revolutionary forces in 1959.

Wicburg first stumbled upon the twin 50-caliber machine guns mounted in the top-turret. The remains, a section of an intact wing and two massive engines with badly bent propellers some 1,350 feet away, were located at a depth of 21m (70 ft). Certain that it was Batista's missing airplane, he convinced his partner Tom O'Brien to join him on a venture to locate the missing gold. Also in the seven-boat fleet crew was Pat Clyne, chief videographer for world-famous treasure hunter Mel Fisher, who recorded the team's efforts for a possible documentary.

They found no gold, and were disappointed when the true identity of the aircraft was established. However, the forensic analysis and documentation of the aircraft's condition shed new light on, and perhaps will suggest new causes for, the accident other than the official "pilot charged with accident" report. The B-26 was also known as the "widow maker" and the "flying prostitute" because of its notorious design flaws and difficulty in maneuvering. ■



## NOAA surveys WWII U-boats sunk off the Eastern US seaboard

This past summer a NOAA-led expedition studied the remains of three German subs (U-boats) sunk off the North Carolina Coast by the US military in 1942. During the expedition, researchers surveyed and documented all visible sections of each of the subs (*U-352*, *U-701*) using non-invasive techniques. The existing marine life found at the

sites will also be studied. "This expedition is the first part of a larger multi-year project," expedition leader David Alberg explained. "The information collected during this expedition will be crucial to efforts to preserve these historic sites."

The sunken vessels are located in the "Graveyard of the Atlantic" area, containing shipwrecks from both sides, some at recreational diving depths (less than 130 feet) and many located in deeper waters, untouched and in relatively good condition.

Since their discovery, over three decades ago two of the U-boats, the *U-352* and *U-85*, have been further damaged by salvagers and souvenir hunters. *U-701* is relatively intact but also shows signs of damage stemming from illegal salvage attempts. The sub was discovered by recreational divers in 1989 before being covered by sand and rediscovered in 2004.

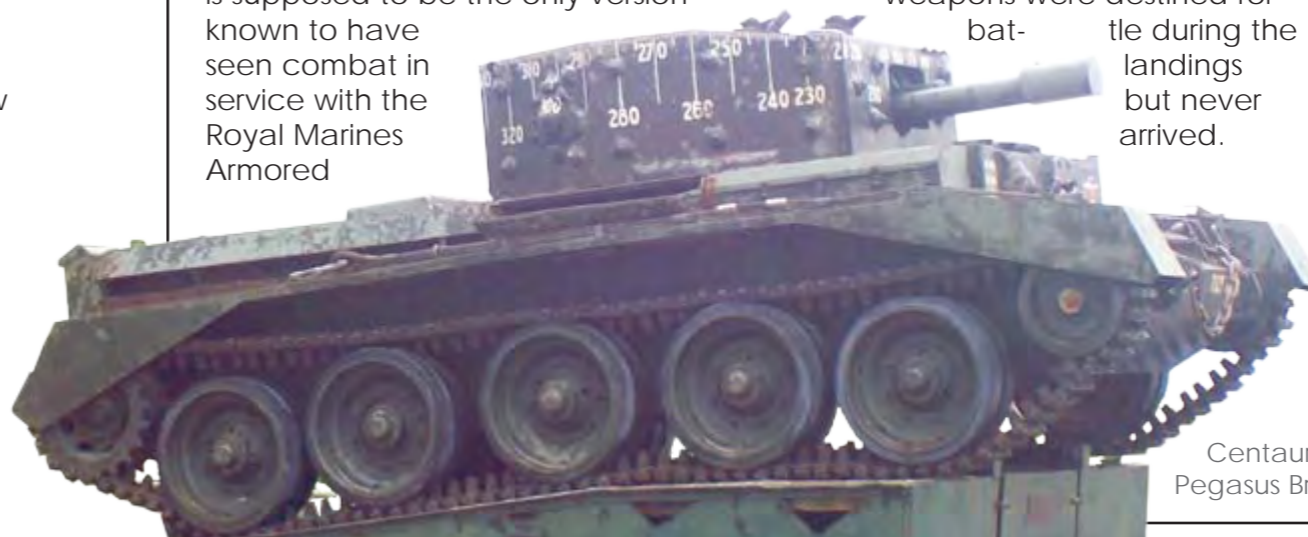
Phase two of the project, scheduled for summer 2009, will primarily investigate Allied wrecks in the area. ■

## Divers find rare WWII tanks on the bottom of the English Channel

Resting at the bottom of the English Channel, eight miles off the coast of West Sussex, two armoured WWII vehicles have now been identified as rare British Centaur CS IV tanks, part of a contingent of 80 heading to France for D-Day. The Centaur IV is supposed to be the only version known to have seen combat in service with the Royal Marines Armored

Support Group. BSAC divers, who accidentally stumbled on the wreckage, documented the find and were helped by historians to determine how they got there, as there was no shipwreck nearby. It was subsequently ascertained that the historic weapons were destined for battle during the landings but never arrived.

Apparently, the tanks fell overboard when a landing craft capsized on its way to the Normandy beaches on 6 June 1944. David Fletcher, historian at the Tank Museum, said, "They are very rare—there are only two in France that we know about." The tanks lie close to two bulldozers and a field gun. The bulldozers are believed to be armored Caterpillar bulldozers used by the British Army 79th Armored Division; there are no known surviving bulldozers of this type. ■



Centaur IV (A27L) on display at Pegasus Bridge, Normandy

Edited by  
Scott Bennett



## Wearing a simple patch may prevent stomach bugs picked up during foreign travel

The bane of all travellers, stomach upsets along with their ensuing symptoms of vomiting, diarrhoea and cramps can often leave people incapacitated or weak for days. Now, relief may have arrived in the form of a patch impregnated by toxins produced by the *E. coli* bacterium. Once worn, the toxins therein help to prime the immune system when confronted with the real thing.

US research published in the *Lancet* medical journal discovered the patch was 75 percent effective against diarrhoea attacks caused by *E. coli* in a study involving 178 people. The participants were given either a placebo 'dummy' patch, or one containing the toxin, then sent off to continue their journey through Mexico or Guatemala. Patch-wearers who did fall ill recovered far more quickly, it added.

The study's authors, who work a biotech company IOMAI in Maryland, estimated that up to 27 million travellers are affected each year. However, as *E. coli* is responsible for only 40 percent of all travellers' diarrhoea, it does not offer complete protection. The usual travel precautions still apply. ■

## The fate of *MV Odyssey 1*

After weeks of working with insurance and the salvagers, Odyssey Divers has announced that its liveaboard, the *MV Odyssey 1*, cannot be salvaged and has been declared a total loss. The vessel was severely damaged during a powerful storm on the evening 11 May 2008. As a result, all cruises chartered or booked for the remainder of the year were immediately cancelled. It was hoped repairs on the vessel would be feasible, but sadly, this has not been the case. There are currently

no immediate plans to obtain a new liveaboard. On a much brighter note, the company is now concentrating its resources on developing a new resort and dive operation in an unspoiled corner of southwest Lombok. All the necessary building permits have been obtained, with construction slated to begin in mid September 2008. The opening is planned for late 2009. In the meantime, the company's new Cocotinos resort, overlooking the Bunaken Marine Park in North Sulawesi, is in full operation. ■



## Hilton Hurghada Resort and Eurodivers Egypt

Eurodivers Egypt is proud to announce its new dive center in Egypt in an agreement with Hilton Hurghada Resort. Located on the south end of the newly renovated Hurghada hotel promenade, it is a short boat ride for all the top dive sites in the area.

The hotel is also well known within the Hurghada dive community as it is the location of the PADI - IE (Instructor Examination) for PADI Europe in Hurghada for many years. The Hotel was built in 1995 and has a total of 392 rooms split in two areas which were renovated in 2004. The dive center is located right on the beach; it has its own marina, with a handy guest equipment room, which makes the diving departures just a stroll from the room to the boat.

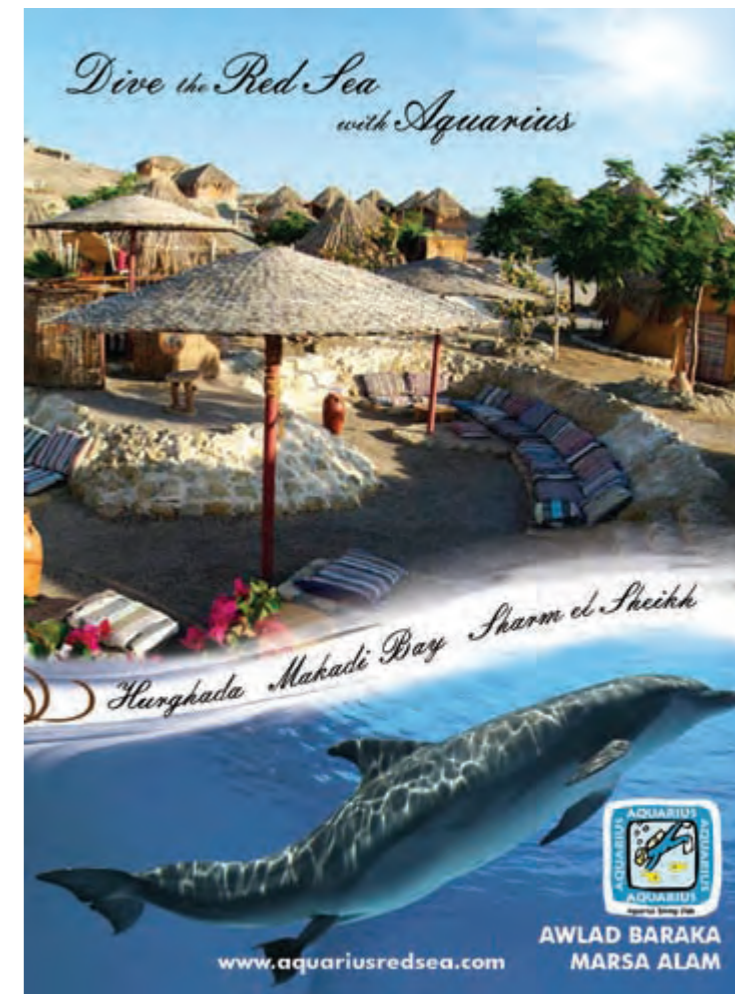
Eurodivers will be offering daily full and half day diving trips, special dive excursions, free "Try dives in the pool", all PADI courses from Bubble Maker to instructor, and of course, Nitrox is for free for all certified Nitrox divers. Hilton Hurghada Resort and Eurodivers Egypt will soon announce their new room and dive packages website deals for the upcoming winter season, so keep an eye on the news section of their website. ■

## Scuba Seraya gets online booking

Scuba Seraya Resort's efficient online reservation system with guaranteed instant confirmation makes online bookings a breeze. All that is required is to check the resort's website, where travellers can find a 14-day calendar displaying real-time room availability along with the corresponding rates.

Once the room type and date of stay has been chosen, guests must pay a minimal deposit of 10 percent, which will be deducted from the total room charge, as a reservation guarantee. This assures guests that their room of choice is ready and waiting upon their arrival at Scuba Seraya Resort. Guests will receive an automated e-mail confirming the transaction upon receipt of payment.

Situated on a stretch of prime beachfront property on Bali's north east coast, Scuba Seraya Resort offers exceptional diving and comfortable accommodation in a tranquil setting. A myriad of outstanding dive sites is close at hand including Seraya's very own house reef and the world-famous *Liberty* wreck. For additional information regarding the resort's facilities and location, see [www.scubaseraya.com](http://www.scubaseraya.com). ■



## Delta Airlines to Add Non-Stop Service from New York to Bonaire

Delta Air Lines will launch a weekly non-stop flight from New York to/from Bonaire beginning on 20 December 2008.

"We are delighted that traffic to Bonaire continues to grow, even at a time of international economic challenges," said Burney el Hage, Bonaire's Commissioner of Tourism.

To inaugurate the new service, Delta is offering one-way special fares of US\$239 from New York to Bonaire for travel between 10 January and 4 April 2009. ■



Edited by  
Scott Bennett

## Underwater Historical Trail Proposed in Saipan

In a move that could help boost local tourism, Saipan officials are considering a plan to establish an underwater historical trail in the lagoon on the island's west coast. A major battleground during the Second World War, the lagoon and its environs is an underwater graveyard for a multitude of relics including tanks, pontoon barges, a Japanese anti-submarine boat, and even an aircraft.

Earlier this year, underwater archaeologists Jason Burns and Michael Krivor catalogued a host of this war era wreckage in a survey utilizing specialized sonar and magnetic detection equipment. A draft report on those findings will arrive at the Commonwealth's Historic Preservation Office in the coming weeks, said director Roy Sablan.

Establishing an underwater trail for divers is "the next move" Sablan said, noting the report will help guide that effort. "It will be a good opportunity for tourists," he said. The trail could serve as a major draw for diving enthusiasts, who would follow local tour operators from wreck to wreck.

However, before the project can commence, additional surveys may be required to find out how many more artifacts there are to discover in Saipan's lagoon, according to preservation office staff archaeologist Ronnie Rogers. "When the west coast of the island was bombed, a lot of equipment got pushed into the lagoon and ended up on the bottom," Rogers said, adding a more thorough survey might occur in the coming months and completion of the trail may take up to a year. Saipan's underwater history "is a resource from which we can all benefit," he added. ■

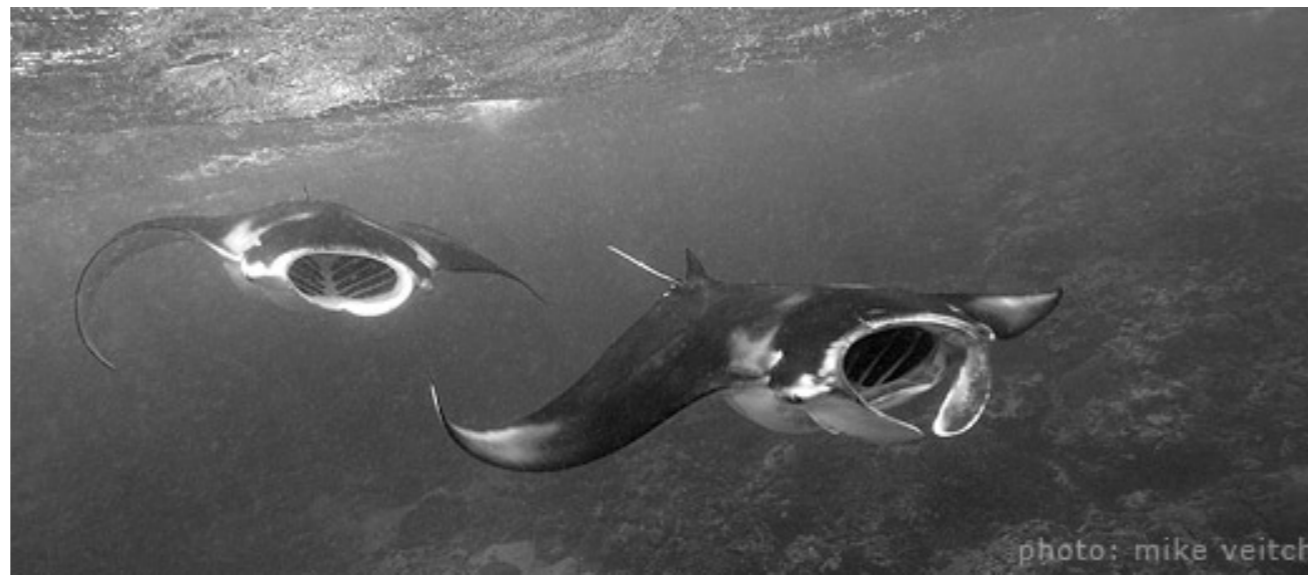


photo: mike veitch

## Yap Manta Fest 2008

Manta Ray Bay Hotel and Yap Divers have announced the second edition of their "Manta Fest" photo festival series. From September 3 to October 2, some of the world's top underwater shooters and videographers will be on hand to help guests hone their underwater photographic skills. Two sessions will be held; the first, from September 3-17 will feature Eric Cheng and Mike Veitch. From September 17 to October 2, Eric Hanauer and Marty Snyderman will be featured. Nightly presentations will be held outdoors as well as classroom seminars held in the afternoons. A slide show and video presentation comprising the guests' best efforts will be held on the last day of each session, with awards given to the participants. During the month-long event, guests will get to rub elbows with some of the world's top underwater shooters, experience superlative diving and most of all, have lots of fun. To book, visit the websites of one of the event's three corporate sponsors:

- Reef and Rainforest: [www.reefrainforest.com](http://www.reefrainforest.com)
- South Pacific Island Travel: [www.spislandtravel.com](http://www.spislandtravel.com)
- World of Diving: [www.worldofdiving.com](http://www.worldofdiving.com) ■

### Travel Tips - Skytrax

So, you've finally decided to go on that big overseas dive trip. The resort is booked but then comes the big question: which airline? The bewildering variety of choices is enough to overwhelm the most seasoned of travellers. Now, get the facts from fellow travellers with the simple touch of a mouse. With Skytrax, the world's largest selection of airline and airport reviews, access more than 335,000 independent traveller reviews and ratings for more than 600 airports worldwide. Reviews are even available on seating comfort from economy to first class.

Find out what to expect during your next transit stopover with extensive information on amenities such as restaurants, lounges, Internet access, transit hotel rooms, guided city tours or a quiet corner to have a snooze. A news page has all the latest information from new airlines to the latest routes and services. In addition, direct links are provided to websites of airlines worldwide based on regions. Not happy with a flight or airport? Write your own review and let others know of your experience! ■

## A Percent for the Ocean

Carlos Hiller is a painter of ocean light and life



© Carlos Hiller



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*Sardines, Dolphins, Sharks... Oh My!*

# South Africa



Text and photos by Andrey Bizyukin  
Edited by Gunild Symes

**Since times long forgotten, the promise of treasures such as diamonds, gold and platinum has attracted adventurers from all over the world to South Africa in the vain hope of finding new riches.**

Indeed, South Africa has long been a destination for adventurers world-wide since olden times. Hopes of finding new treasures, the excitement of the hunt and the pursuit of long held dreams heat up the mind of the explorer, painting fantasies in rainbow colors on the African plains. The desire to get away from the drudgery of everyday and familiar places inspires even the most inveterate home bodies and mamma's boys. Of course, divers have the adventurous spirit in the blood, too, from the time they are born. This is exactly why the unexplored treasures of this country are attractive and magical to everyone and are the basis of our journey to this exotic world.

In 1487, the explorer Bartolomeu Dias of Portugal became the first European to reach the most southern tip of Africa. King John II of Portugal named it the Cabo da Boa Esperança, or Cape of Good Hope, because it led to the riches of India cherished by Europeans and traders. Later, Jan van Riebeeck established a new midway station (now Cape Town) at the Cape of Good Hope on 6 April 1652 for the Dutch East India Company. Soon, colonists from the Netherlands, France and Germany started to arrive.

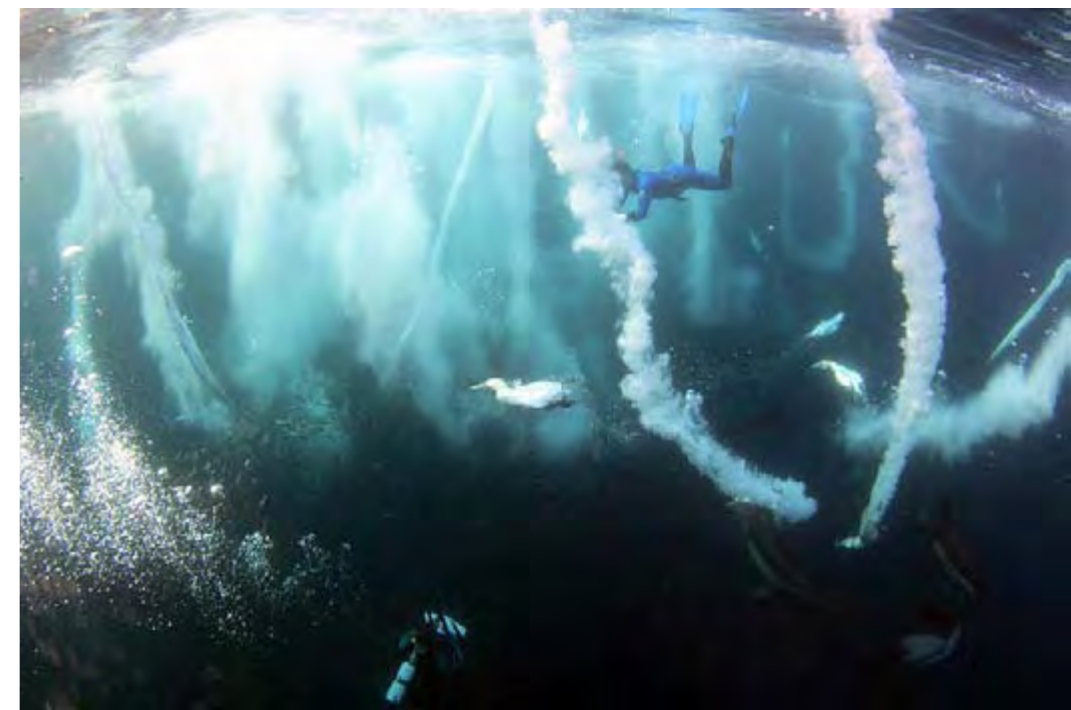
Modern South Africa is an incredible combination of people of different races, cultures, religions and languages. In this society of diverse social classes

South Africa is a paradise where wild animals can be seen not only at the ZOO! CLOCKWISE: Giraffes gaff at the camera; the South African landscape; Bateleur eagle; Elephant; Cheetah; Impala; Zebra



# South African Treasures





there are 11 different languages spoken including Sepedi, Sesotho, Setswana, siSwati, Tshivenda, Xitsonga, Afrikaans, English, isiNdebele, isiXhosa and isiZulu. Thus, it is very symbolic that the nation's motto is *!ke e: /xarra /ke*, or "Unity in Diversity"—literally, "Diverse People Unite".

The airlines of the Emirates offered us special weight terms as divers carrying extra heavy luggage with dive equipment. They rushed us over to this orange land of beauty, this mysterious country. What was waiting for us down there?

**Catch the sardine**

Each year, at the end of June and the beginning of July, the sardine migration travels along the south coast of the Republic of South

Africa. Millions of sardines collect into huge schools and follow each other somewhere for important sardine business.

Whales, dolphins, sharks, seals, sea birds, fishermen and divers cannot fail to attend this huge fish party. The place, where for a short time so many different sea animals collect together, is a big rarity on this Earth. It is an unique opportunity to watch the animals' behavior in natural conditions, get very closely acquainted them, and take good shots. It is exactly for this reason that we are going to the "Wild Coast", to Mbotyi River Lodge ([www.mbotyi.co.za](http://www.mbotyi.co.za))—a very convenient place to organize a dive expedition.

Each week, there are meetings of about 50 people, madcaps and adventurers from all over the

world. They are equipped up to the teeth with the most modern photo and video equipment and technology and are ready to dive even into the Devil's horns just to test themselves and to capture some good photographic fortune from the sea. Businesslike South Africans from companies such as Sea-Air-Land ([www.sea-air-land.com](http://www.sea-air-land.com)) and African Watersports ([www.africanwatersports.co.za](http://www.africanwatersports.co.za)) provide top-end marine speed boat charters with experienced captians. Two microlight vehicles go out every day starting at sunrise to search the ocean for marine creature activity.

**Action**

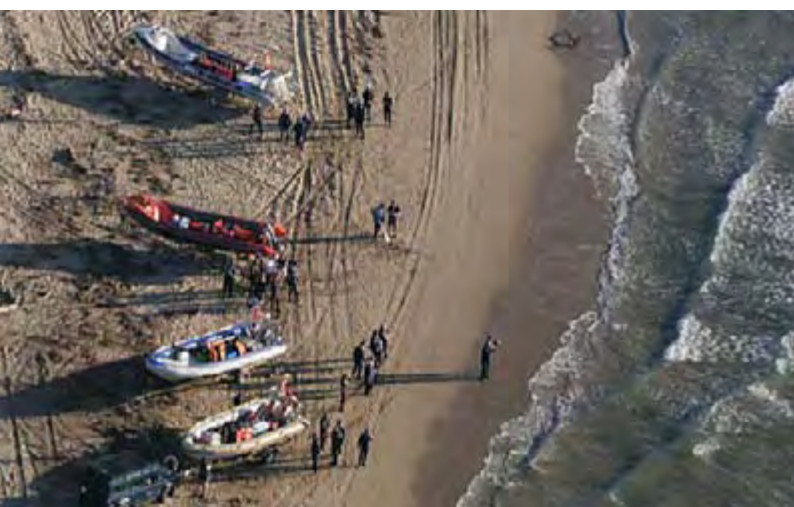
This is the place where dolphins, whales and sharks hunt, corral and pack sardines together into



This is a real adventure trip. Exciting danger is everywhere at sea—in the air, at the surface and underwater. THIS PAGE: Scenes from the put-in and excursion to witness the action of Sardin Run including the sea aboil (far left) with plunging sea birds diving for sardines

turned. But, we, not having experienced this everyday, left with the dawn and headed out to sea anyway. Struggling with

very important.” At last, our boat is flying over the tops of the waves, falling into water troughs, and speeding towards our adventures. Our purpose (as guests in this neck of the woods) is to capture the sardine dinner on film.



boat out as far away from the coast as possible as soon as it was possible.

All the crew members were dressed in life jackets—death clings to everything—but the only possible thing for us to cling to was the boat. Everything depended on the filigree skipper’s skill, who should, just like

the waves and rolling around in the surf, we drove on out to the sea in search of sardines.

**The hunt**

“The key to success is harmonious command work,” said Nic de Gersigny, already on his sixth Sardine Run expedition. “The skilled pilot in the motorized hang-glider flying above the sea all day long observes the weather, finds places of congestion of sardines and whales, dolphins, sharks or diving birds, and by radio set, directs our boat to that location. From a boat, we can only see the congestion of the birds in dense flight circling above the specific spot in the sea. But the birds often arrive later, following the whales and dolphins who are leading the formation of the sardine bait balls. Therefore, support from the sky is

a heap, or a bait ball, to make a convenient arrangement for dinner. Sea birds swoop down from the sky into the water when they see that the sardines are accumulated into a dense ball. Dinner is ready.

Speed diving from altitudes of 20-30 meters above, the birds

dive into the water—rowing with their wings and rolling by twisting their heads—pursuing the sardines with great enthusiasm.

The “Wild Coast” is referred to in this manner because the currents, waves and wind vary unpredictably and change quickly. From time immemorial, this place has

had a bad reputation among seamen. Many brave seamen and good ships lie permanently on the bottom of the sea here.

Getting to the sea from the surf is a dangerous adventure in Mbotyi, even with a very skilled skipper. In the beginning, the whole team tried to push the

a surfer, slide the boat along the powerful ocean tidal waves—foam crested and roaring—rolling along the Wild Coast.

Those who were unlucky and had an unskilled captain got soaked with streams of salty water, their equipment washed overboard and their boat over-

Dolphins rushed in and zipped around the birds—their harmonious hunting groups jumping and leaping out of the water. As fast as it was possible, we were falling out of the boat with a loud command from our skipper. We grouped up and started the plunge.



All around us, the water was filled with continuous high-frequency squeaking—the voices of the dolphins. Somewhere below us, for a second, was the giant school of sardines shining and disappearing into the depths.

A few of the dolphins were a little curious with us. The chattering dolphins communicated

among themselves. They did a circle around our group. It was visible, that they discussed us with each other, examined us more closely, and then departed after

the sardines.

The sardines were gone again. They moved too quickly for us. All that was left in the water were the sparkling fish scales of the sardines—remnants from the dining table of the dolphins.

Then, the sharks came up from the depths to meet us; they were as curious as the other inhabitants of the sea. They turned directly under us, so we had to nestle our backs against each other more closely. We thought that if we presented ourselves as a large sea animal, we could frighten off the sharks. But some of the divers who were already approached by the sharks at close range, had to push them away aggressively with a long sharp stick. The sharks went back into the depths, and we got back onboard.

While we were in the water, all the activity had moved at least a kilometer away already. All the



events here happened so quickly that not only was it necessary to have surpassed skill, experience, and knowledge of the biological behavior of animals but great luck as well to appear in the right place at the right time. Furthermore, one needed to be able to manage to take pictures of all the events underwater.

We trained, over and over again. We jumped into the water at other locations where birds and dolphins were hunting. We pursued whales. By means of towing an empty plastic bottle, we beckoned a photo session with a new group of sharks. We gained experience and skill with the constant and instantly varying underwater conditions, and continued on this course six hours per day.

The next jump with the camera into the water resulted in an unsuccessful pursuit and, apparently, a group failure. All the divers, one by one, came back up into the boat, and I, the last one in line, looked back and around, being afraid of unexpected sharks.

The current carried me to the side of the boat. Everyone was onboard by now, and I was

heading there as well. But as not to be pushed, I swam more closely to the boat. I lifted my head upwards, and I saw a bird diving directly towards me.

Forgetting about everything, I pulled my head back down under the water and lifted the camera. It was happening! A small school of sardines gathered as the bird flew like a torpedo through the thickness of the water.

I took several shots by throwing up my arms camera in hand, like

## South Africa

the heroes of the old Westerns did with their pistols, not even lifting the camera to my eyes. Six shots fired off, and by some miracle, I got my first picture of a bird flying underwater.

All of a sudden and unexpectedly, the long-awaited action began. The water boiled around me. Dolphins started rushing in. The thickness of the water was ripped apart by the breakers from birds piercing the water. Unfortunately, my camera overheated and broke before finishing writing all the images I took onto the CF card.

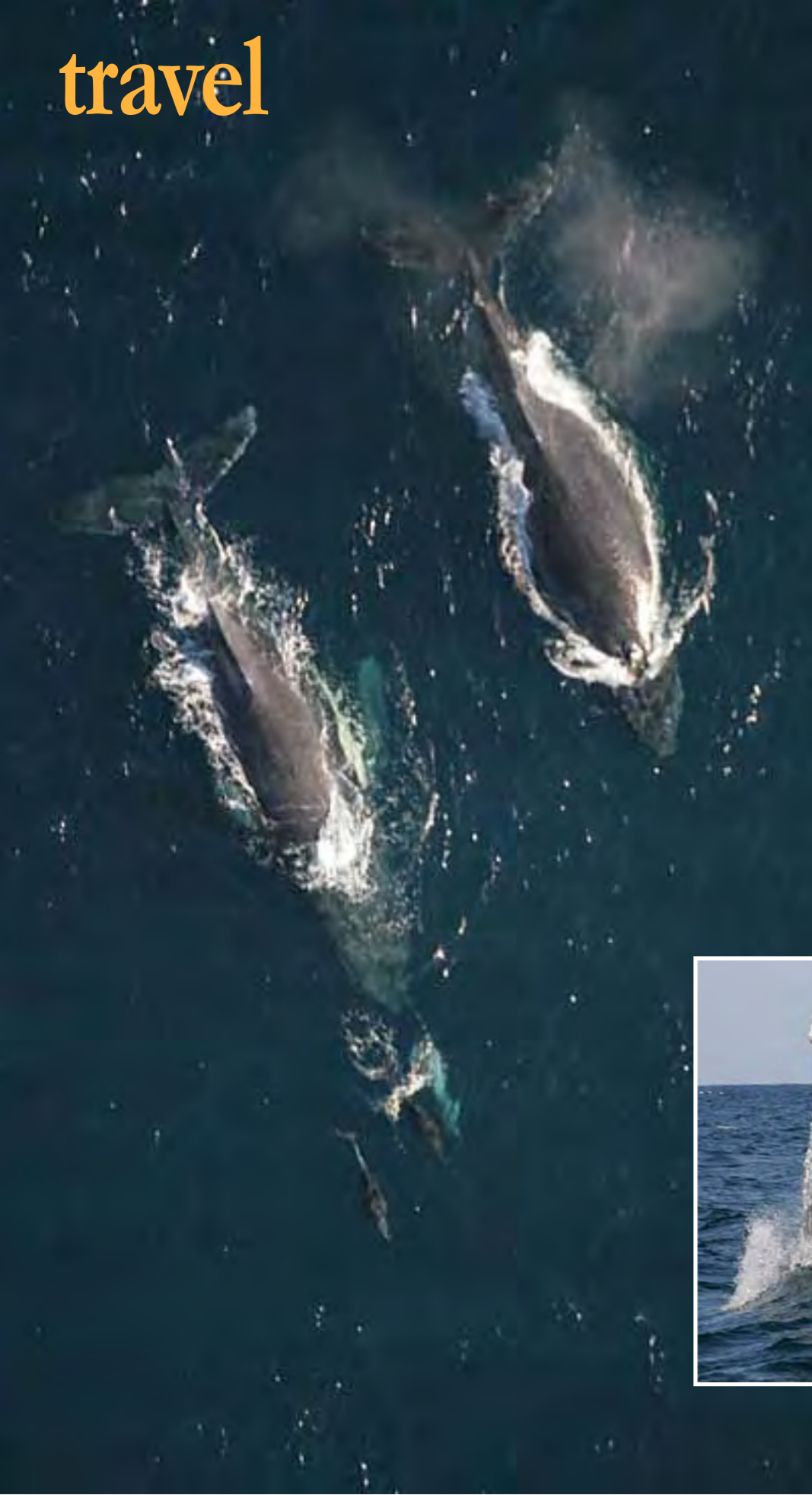
A few exciting minutes later, and I found myself once again in an absolutely empty ocean—all the recent events already seeming like a fantastic mirage. If not for the pictures remaining in the memory of my camera and the sardine fish-scales floating around of me, it all could have been a dream.

We knew in advance that our success with catching images of the diving sea birds was doomed, so our focus and confidence was transferred to dolphins, sardines



CLOCKWISE FROM ABOVE: Sardines circle around divers to avoid their bubbles; Dolphin pierces a baitball of sardines to snatch a meal; Seabird returns to the surface after diving for sardines; Shark encounter





The best whale-watching in the world

supreme sea inhabitants.

It seemed that the sardine hunt lasted only about ten minutes, but when we come back to the boat, overflowing with impressions, our skipper told us that we had been in the

water for one and a half hours! So quickly does time fly during the Sardine Run. One and a half hours of activity and my 4GB memory card was filled with pictures.

**Whales**

We devoted the whole next day to photographing whales. Our pilot searched for whales, informed us of their direction of travel, and then, we set off to pursue them. With a speed worthy of the Special Forces, we jumped into the water as we traveled at the same speed as the whales, and kicked our fins like crazy in hopes that they would swim up to us more closely.

Whales are like people, absolutely different. If one of them dived far away and more deeply in order not intersect with us underwater, others were absolutely indifferent to us. The third individual showed discontent and a lot of annoyance with the small men. The fourth showed surprising curiosity. We especially liked the humpbacked whales. They adored jumping out of the water, spraying enchanting fountains, waving chest fins and clapping their huge tail fins on the surface. The dull

and whales. They became photo models for us. Our day came when we dived all together twice.

The school of sardines, ever-changing in external form and outline, moved around a depth of no more than five to seven meters—slowly or quickly, the bait ball would swell. Bubbles exhaled by the divers gathered the sardines into a rotating circle dissipated by an attack by dolphins only to gather again in an almost perfect geometrical sphere.

We took more pictures.

discussed the situation with each other—what were these strange finned-feet entities doing near their sardines and why were these beings preventing them from having a snack?

Having stopped the discussion and made a decision, they swam up quickly onto different sides of us and the bait ball, and with well-trained hunting formation and loud shouts (underwater high-frequency squeaks), forced the whole sardine ball to move swiftly away, cutting it off from us. The dolphins swam at reckless speeds, dashing into the bait ball and snatching sardines from different angles.

I tried to catch up with the bait ball. I kicked my fins very hard. Then, I lifted my head and saw a dolphin with a brilliant sardine in its teeth take off away from the fish stew and swim directly towards me.

No, we had no time to collide, he was too skilled underwater and dodged a blow as easily as the passing of a thought, and he did not even forget to swallow the fish he had just caught.

Hunting directed by dolphins reaches the top of perfection and is, indeed, one of the most harmonious activities of these



Frightened by our air bubbles, the dolphins gathered in a group away from us. It was visible and audible how they

South Africa



THIS PAGE: Humpback whales are spotted swimming with their friends, the dolphins, and breaching the surface of the sea in spectacular fashion



round ends of their noses were so photogenic, too!

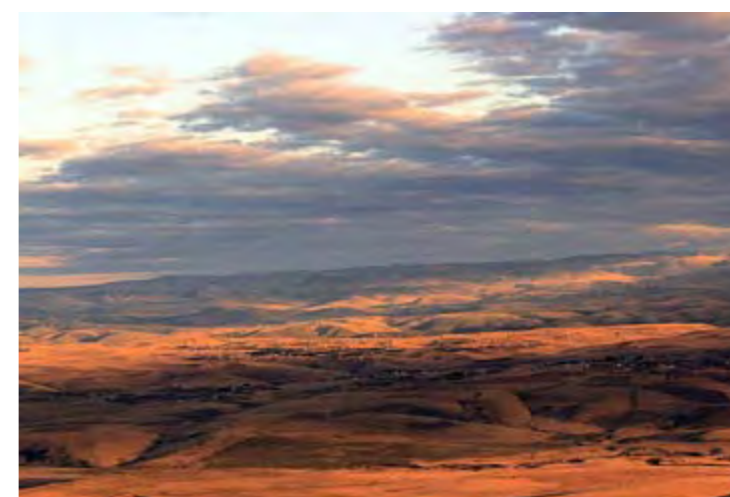
But the most amazing event happened when, tired and out of breath, we sat down for a minute to have a rest in our boat. On this occasion, we had already made five to seven unsuccessful attempts at pursuit, jumped into the water, tried to follow the whales, rowing with all the force we could muster, but made not one picture of our passionately favored sea giants. All the whales were completely immersed underwater or departed too quickly. And here, in that one moment when we relaxed, reflecting on the vanity of a diver's life and of the hunters of whales, was, literally within two to three meters from

our boat, a huge head silently rising out of the sea.

The whale stayed there and looked at us closely; it was obvi-

frighten away the huge entity. We were not pulled at all to our cameras, and simply enjoyed our silent dialogue with the whale.

Perhaps, the whale had bad eyesight and consequently swam up more closely to have a better look, or, maybe, he wished to smell us? We would never know. Some long moments later, he noisily inhaled, as though he was grumbling something to himself under his nose and dived, slapping his wide tail fin on the water. Yes, the slap was so strong that the entire



boat has covered with a down-pour of salty rain. We never saw the whale again, having not had a chance to ask him in time what it was that he was wanted.

ous that he wished to examine us further. We were so amazed at this show, that we were simply dumbfounded and had not stirred at all, being afraid to

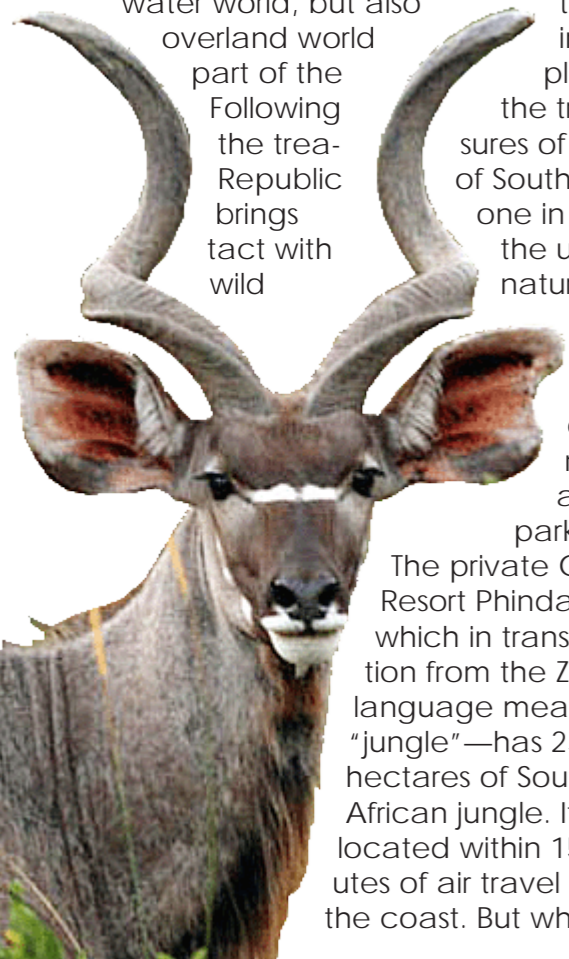
THIS PAGE: An amazing ride for skydivers. A microlight provides unique perspectives of the South African landscape



South Africa

The Big Five

To travel so far, to the edge of the Ojkumeny, and only dive for sardines and whales would be truly unfortunate. Even for keen divers, it is interesting to see and get acquainted with not only the underwater world, but also the overland world part of the planet. Following the trail to the treasures of the Republic of South Africa brings one in contact with the unique nature kept



today only in national parks.

The private Game Resort Phinda—which in translation from the Zulu language means "jungle"—has 23,000 hectares of South-African jungle. It is located within 15 minutes of air travel from the coast. But when

we landed here, we understood that we had entered an entirely different world.

We chose to go to Phinda because it was near one of the best natural parks of the Southern Hemisphere. It meant that we would find true professionals of the game business, we thought. Surely, they would show us the Big Five: a lion, a leopard, an elephant, a rhinoceros and a buffalo, living in a natural environment. And we were not mistaken!

With a hat that could have been Indiana Jones', some warm blankets, a little marula (a local sweet drink), binoculars, two cameras, a powerful four wheel drive open off-road vehicle, and an armed ranger on a bumper, we headed out to a meeting with new adventures in the real bush—this was a South African safari not to miss!

It was exclusive. We went through the jungle to track a lion, hiked through the high grasses of the savanna to track a cheetah, and cautiously, being afraid to approach too closely, photographed the elusive rhinoceros and a buffalo, participated in a night pursuit of a leopard and finally sensed and smelled an elephant running very close to us.

Afterthoughts

Two weeks of adventure seemed to fly by in a breath—so quickly, easily and with immense fascination. We had become active participants in an absolutely unique on the planet underwater event—the great migration of sardines and the big hunt for them by thousands of sea birds, sharks and dolphins. We lived and breathed South Africa, where it is still possible to see and photograph dozens of jumping whales. For a long time in our memories, will our minds' eyes remain in the great canyons, roaring falls, bright juicy colors of the wild woods, sensing the lions' hunt seizing

us down to our bones, hearing the night roar of the lion—the tsar of the animals—seeking the leopard—the king of the night jungle—and the fastest predator, the cheetah, eternally chewing and breaking into high speed chases all along the way. We saw elephants, rhinoceroses and self-assured, unshakable buffalos.

Now we can authoritatively state that Southern Africa is definitely one of the best places in the world for diving and for photo safaris with wild animals. The nature of South Africa and its wild inhabitants are the most priceless treasures, indeed, national treasures of this great country, and subjects of fascination for modern adventurers.

We left the South African Republic with a feeling of deep satisfaction—we opened ourselves to a new world and have the strong desire to return here once again to follow the migration of the sardines along the Wild Coast! ■

The editor wishes to express his most sincere gratitude to: Ship captain, Paul Warren Von Blerk, expert on whales and sharks of the Wild Coast; Microlight pilot, Larry Eschner, heavenly slow mover, who gave us a wonderful opportunity to see the Wild Coast in an absolutely new perspective; Emirates Airlines, (Emirates.com)

for allowing 10 kg extra weight for underwater equipment free-of-charge; The management of CCAfrica (CCAfrica.com) for granting us an opportunity to get acquainted with the wild nature of Phinda Privat Game Reserve.

Big 5 and more! CLOCKWISE: Tourists and guides head out to the bush; Yawning cheetah cub; Rhinos; Lion paw print; Galloping bison; Lounging cheetahs; Waterbuffalo; Baby elephant; Antelope

# Rainer Schimpf

& *His Adventure Playground for Experts*

Text by Harald Apelt  
Photos by Daniel Debes, Pascal Fazio,  
Ralf Kiefner, Wolfgang Pölzer, Robert  
Raderschatt and Rainer Schimpf

What has already been assumed for a long time now has been photographed, filmed and confirmed: Orcas have an acquired taste and go hunting especially for members of their own species—dolphins. Ashore, Port Elizabeth in South Africa is by far not the only attraction—seals, sharks, whales and a vast diversity of all kinds of species make Madiba Bay an adventure playground for divers and adventurers. For this reason, Rainer Schimpf has developed a unique advanced program for dive experts and filmmakers.

“There was absolute silence on board,” said Rainer Schimpf, owner of Expert-Tours in Port Elizabeth, South Africa. “A kind of ‘wow’ atmosphere.” When Schimpf started the two 90 PS engines of his semi-rigid boat, *Expert-Tours*, and went back to the harbor of Port Elizabeth, the dive pro was overwhelmed, and his clients on the boat were speechless. Only then did the divers realize that they had been witnesses to a most unusual happening.

The cameras went crazy, and Schimpf took footage with his HD-camera of orcas chasing a school of dolphins. This phenomenon had been observed before, but never had it been documented with such impressive footage.

The leader of the orcas attacked one dolphin from

underneath, caught it, and breached vertically out of the water, then let go of the wounded dolphin only to attack it again after a short moment. This hunting behaviour was known of the Great White sharks when they patrol in front of the kelp, or on the reefs hunting

for seals that leave the secure haven of the kelp.

“This was one of the most amazing moments I have experienced as an animal filmer and diving tours operator,” said Schimpf after this trip, which made such amazing pictures possible for his clients that their



ANIMAL PRESS / PASCAL FAZIO



DANIEL DEBES



DANIEL DEBES



DANIEL DEBES



DANIEL DEBES

Orca hunting dolphin—these first-of-a-kind shots prove that orcas prey on their cousins, the dolphins







RAINER SCHIMPF



RAINER SCHIMPF



RAINER SCHIMPF

CLOCKWISE FROM ABOVE: Extreme coastline of South Africa; A humpback whale breaches near the dive boat; You can dive cageless with Great White sharks; The Schimpf family, Rainer, Jonas and Petra, in Capetown

Schimpf. He only takes divers on his tours who have more than 100 logged dives, with experience and ease in rough conditions of current, swell and visibility. He doesn't do dive tours on a daily basis. "I only offer diving packages. In general, the duration of these packages is about ten days, and during that period, the diving spots will be picked individually and dived all depending on the weather circumstances," explained Schimpf. Only then, can he guarantee that the sometimes big expectations of his clients will be fulfilled by the end.

"For example, during the Sardine Run (see following article), we spent most of the time on the sea. We often deal with rough seas and current, and when we sight a baitball, everything has to happen

fast. The divers must be in the water within two to three minutes, otherwise the action will happen without them." This is why Schimpf insists on experienced guests, diving with their own equipment and perfectly controlling it.

"At the Sardine Run, we don't do buddy diving. This is impossible under a baitball," Schimpf explains. The visibility varies between three and 15 meters. Currents are not unusual, and if one gets into a baitball, the person has to react fast and right. For this reason, every Dive Expert-Tours' guest has to follow an explicit briefing to be able to react appropriately in the sometimes extreme situations. "If you come up with sand, you have lost," Schimpf said with a smile, because the Sardine Run takes place in the blue,

underneath the diver—nothing but blue water and up to 200 meters depth.

It's kind of a problem that the expectations of the clients have risen so high due to what they have seen on animal documentaries such as those of National Geographic. In reality, these documentaries are only 45 minutes cut out of several years of production during which the film teams stayed several weeks in a row in South Africa and dived many hundreds of times.

But the Sardine Run is not the only attraction for the passionate underwater filmer that South Africa has to offer. On the Madiba Bay Diving Tour, one may experience close encounters with humpback whales, brydes whales, minky



RAINER SCHIMPF

Common dolphins schooling off the coast of Port Elizabeth are spotted on the early morning dive



images were even printed on the cover pages of international daily newspapers.

Schimpf does diving tours within his company Dive Expert-Tours offering to his clients, as he says, "the non plus ultra" of their diving curriculum.

Schimpf is German and has lived since 1999 together with his wife, Petra, and their 9-year-old son, Jonas, in Port Elizabeth, their new home in South Africa.

It is here that he undertakes his company in showing film crews, professional photographers

and experienced divers the highlights of the ocean around Port Elizabeth. "Underwater scouting" or "marine logistics" is what this activity is called—an experience of a permanent adventure for paying customers.

And what Schimpf has to offer is so exclusive that it has its price. Nevertheless, these extraordinary tours get more and more supporters willing to pay the price and the strain, in order to witness spectacular encounters.

"What we do here is not for beginners," said

CLOCKWISE FROM TOP: Mug shot of humpback whale breaching; Filmcrews from Blue Planet prepare for a shoot; Sponges decorate the reef; Two nudibranchs; Diverse garden of soft and hard corals make up the reef off Port Elizabeth; Sea anemone

Views of a Tiger shark and Gray Nurse shark or Sand Tiger shark (bottom left)

## Rainer Schimpf

the visibility is not good and diving not a pleasure. Nevertheless, even during this unspectacular period there are travel destinations offering something really special.

During this period, Schimpf offers tours to Mozambique or Namibia. The Mozambique Channel in the North is known for its large encounters with whale sharks and mantas. And in Namibia, Dive Expert-Tours offers a special treat for diving groups: Lake Otjikoto.

The diameter of the little round Lake Otjikoto is only 150 meters, but it has something special to hide. It looks like it was created by a meteorite, but this is not the case. The lake evolved due to collapsing karst vacuums filling up with ground water.

At some places the lake is 95 meters deep. In addition, the lake keeps a special secret. On 9 July 1915, World War I took place in central Europe, the German Schutztruppe in the former German

RAINER SCHIMPF



RALF KIEFNER



WOLFGANG PÖLZER / WWW.UNDERWATER-PHOTOS.NET

RALF KIEFNER

at once be encountered.

"And one thing that surely no client will ever forget are the encounters with the dolphins. When we spot the huge schools of dolphins with sometimes up to 2,500 animals going through the water like a cavalry all at the same speed and all in the same direction, this is when we experience a special relationship with nature and the universe. This is an experience hard to explain in words," enthused Schimpf about his "adventure playground ocean".

The business with this particular type of tourism also has a hitch. Schimpf and his wife, Petra, came a long way and gained lots of experience before they got it right in terms of nature logistics. "It's not the way that we simply can plan the Sardine Run, and then sell it to the clients. The impressive schools of sardines don't come to order," Schimpf explained. "This is why it's

a game of patience before experiencing this diving highlight. We have planes flying up the coast, and we read satellite pictures in order to spot the big schools of sardines. (Flying with ultralights is not enough as we work offshore. Two-engine Barons are standard, as they can fly 40 miles offshore and are able to find the action.) As soon as we have a sighting, we direct our boat to the GPS position. In case of far away distances, we take the boat onto the trailer and drive up the coast, in order to reach the sardines. We offer this 'flexible' Sardine Run to give our clients the best possible chance to be part of this natural phenomenon," said Petra Schimpf.

It is not an easy task because often it is Petra who has to organise that the clients get there where the sardines are. And sometimes even the hotels have to be changed and rebooked, and the clients, including their luggage and equipment, transferred to the action. "This is quite big logistics to be managed in a short given time but also a

factor why nearly all our tours are successful for our clients" said Petra proudly.

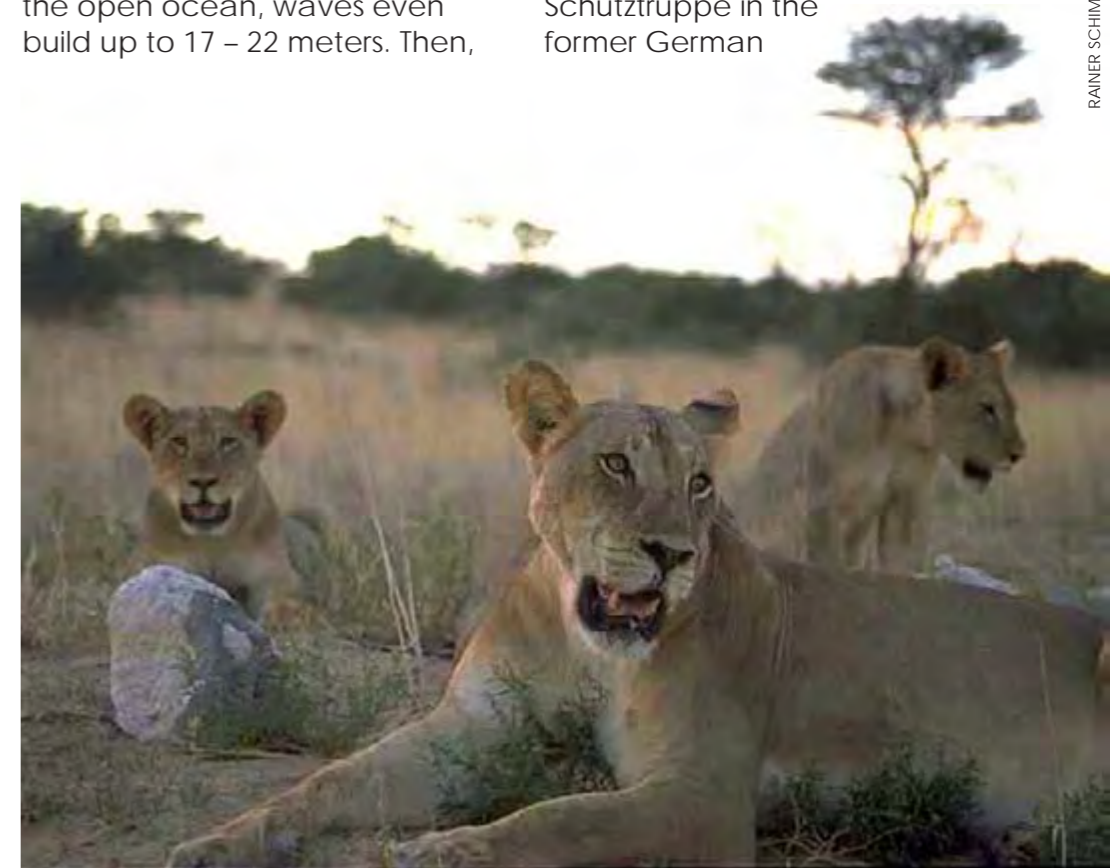
The best travel time for the Sardine Run is between February and July. After that period, the stormy season starts and the waves in front of South Africa might reach up three to four meters. In front of Cape Town in the open ocean, waves even build up to 17 - 22 meters. Then,

whales, Southern Right whales, Orcas, and common dolphins. Often the clients also have spectacular dives with seals.

In many ways, it is hard to believe that this part of the world still has such an apparently inexhaustible variety of species to offer. "This sounds so unreal, nobody wants to believe it," said Schimpf, because in the ocean around Port Elizabeth, there are not only whales but also 22 shark species, penguins

go fish hunting in their impressive ways, and even supporters of the macro photography will be highly satisfied. More than 140 species of nudibranchs have been counted here.

The variety of species in Madiba Bay, Port Elizabeth, is due to its extraordinary geographical situation. Because it is here, in the shore region of Port Elizabeth, where warm and cold water currents reunite, so that nearly all sea creatures of South Africa may



A pride of lions rest





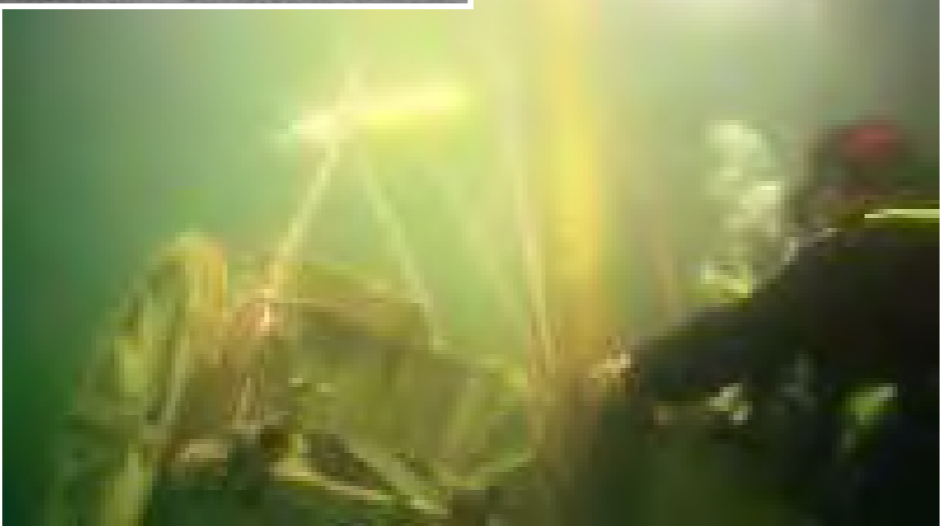
ROBERT RADERSCHATT

ABOVE: Lake Otjikoto. LEFT & BOTTOM: Germans sank their weapons, canons and ammunitions in the lake. CENTER INSET: Historic photo of the Krupp canons used by the Germans in WWI



is provided at the cosy and comfortable Bed & Breakfast, "Villa Chameleon", of Dive Expert-Tours. Villa Chameleon is situated in the calm but central suburb called Walmer on a property where Schimpf and his family live as well. A family atmosphere and integration of the guests is

therefore to be expected. Already in the morning, the diving guests start the planning of the diving day with Schimpf in the breakfast room of the house of the Schimpf family. With a Combi and the boat trailer, they drive seven minutes down to the harbor from where the diving excursions normally start. And it doesn't matter what has been foreseen for that very special day—in the evening the group comes back to the "Villa Chameleon" with sparkling eyes and stuffed with spectacular impressions, said Schimpf. ■



South-West had to surrender to the superior forces of the South African troops. But before that happened, the German troops sank their weapons, canons and ammunitions in the lake in order to avoid the enemy from getting a hold of them.

At a depth from 50 metres on, tech diving fans can still see old 7.5 cm Krupp canons. Ammunition boxes and nearly one hundred year old automatic machine guns can be discovered in their original condition. Some pieces of this old artillery have been retrieved and restored. They can now be seen in the regional museums.

What has never been found is the gold treasure. Rumours suggest that sealed boxes with gold from the

banks of the abandoned town have been sunk in the lake. Officially, they have never been recovered—a good story in a dangerous depth.

Besides the classic diving program, one should not forget to do the huge and spectacular land program in South Africa. A land safari to see the "Big Five" in the national parks offers breathtaking viewings of wildlife just like the diving tours do.

Accommodations in the two million strong metropolis of Port Elizabeth

## Port Elizabeth

In 1488, Bartholomeu Diaz came as the first European into the Algoa Bay, which has been used since then as an anchor place to resupply ships with food and drinking water. In the centuries to follow, many European sailing nations came into the Bay and many of them shipwrecked (400 estimated ship wrecks), some still can be dived on.

The British founded Port Elizabeth in 1799 and built Fort Frederick – the oldest stone building in the Eastern Cape and the oldest English building in Africa, South of the Sahara (see picture underneath). The fort was erected to protect the port against a possible attack by the French, but never once was shot fired out of the canons. A peaceful landing of the first 5,000 English settlers in 26 sailing ships occurred in Port Elizabeth in 1820.

Sir Rufane Donkin, who was the governor of the Cape at the time, gave the city its name by naming it after his wife Elizabeth who died two years earlier in India. A stone pyramid was built in the Donkin Reserve in memory of his wife. At the harbor, a clock tower "Campanile" erected in 1923 is a memorial to the first settlers arriving in 1820.

During Apartheid, Madiba Bay/Port Elizabeth became a center of resistance primarily due to the fact that many powerful leaders of the movement came for the Eastern Cape including Nelson Mandela, who grew up in the province (in the village Qunu), Govan Mbeki, Walter Sisulu and Steve Biko.

In the year 2000, Port Elizabeth became part of a new district "Nelson Mandela Bay Municipality" named after Nelson Mandela and includes the cities of Port Elizabeth, Uitenhage and Dispatch. ■



The first Europeans reached Algoa Bay in 1488

Today, Port Elizabeth (also called PE) has more than 2 million inhabitants and is the fourth biggest city in South Africa after Johannesburg, Durban and Cape Town. The harbor is the third biggest harbor in South Africa because Port Elizabeth became an important container docking port. PE's strongest industry is the automotive industry. Ford and VW (Uitenhage) have their production sites here. Another important industry is wool export.

PE has an airport that is fully integrated in the flight timetables of South African Airways. For the Soccer World Cup in 2010, there are plans of making the runway longer to enable international airlines to fly into Port Elizabeth directly.

Madiba Bay/Port Elizabeth has more than 40 km stretches of impeccable beach, most of them ideal for water sport activities. The city is an ideal starting point for anybody wanting to explore the beauties of the Eastern Cape. In this province, five different biome meet, and thus makes the region a must-see for every eco-tourist and anybody wanting to experience South Africa's extraordinary landscapes.

The region around today's Port Elizabeth was originally been settled by the San people. Later Xhosa settled here as well, especially along the Sundays River.



Fort Frederick built by the English in PE in 1799



# Sardine Run

**The Sardine Run is a rare phenomenon in the animal world, a mystery which hasn't been completely solved yet. The Sardine Run takes place every year during the end of February until July from Plettenberg Bay to Port Elizabeth up to Port St. Johns. Big schools of sardines follow plankton and swim from the South Atlantic to the west coast of South Africa. From here, they follow the nutritious Benguela current into the Cape region.**

Text by Harald Apelt  
Photos by Ralf Kiefner

In the best case scenario, the Algulhas current coming from the North East of South Africa and going to the South loses its strength during winter months and a counter current comes up along the east coast. This counter current also carries plankton and, consequently, sardines follow. For geographical reasons, this current and, therefore, the sardines settle every February between Plettenberg Bay and Port Elizabeth. Only when from June onwards the winter storms begin to blow, the sardines continue their journey in the current, pushing to the North.

In cases when the winter storms do not go through, as in the years 2006 and 2007, and the Algulhas current remains too strong, the Sardine Run

only takes place in the region around Port Elizabeth.

Why most of the sardines migrate and where they go after they come along such a long distance still has to be figured out. But one thing is for certain—where the schools of sardines are, big hunters of the ocean reunite for a common feast. Penguins, seals, all kinds of shark species, whales and huge numbers of dolphin schools feed on the sumptuous dinner table.

The most spectacular scenes are the feeding frenzies of sharks, gannets, whales and dolphins on sardines trapped under the surface of the water by the marine mammals giving chase in a teams. Like shepherd dogs, the dolphins surround the sardines, making their circles smaller and small-



THIS PAGE: Scenes from Sardin Run where sharks, dolphins and sea birds feed on sardines in a baitball





Topside view: Gannets diving for sardines

cake. The birds do not seem to be on the feeding list of the sharks. Why should one eat dry bread if the table is set with other glorious food?

The whole spectacle is dynamically loaded because the baitball constantly moves, changing depth and position. So some good advice for divers is to observe the action from a secure distance and from underneath the action. Water temperatures between 16 – 22°C

## Sardine Run

are moderate, but the visibility can vary strongly from 0 to 25 meters.

And the Sardine Run is a hard task. From 7:00 am in the morning, the boat leaves port and the whole day is spent at sea. With Dive Expert-Tours, the boat travels up to 120 km a day—even when the sea might be rough. Also, diving a baitball demands the highest concentration and perfect handling of equipment as well as the matrices of buoyancy because the person who becomes a game ball of the baitball can easily become a victim of a shark by mistake, bumping into the diver.

After approximately 15 – 20 minutes, the show is over. By then, the baitball becomes so small that the remaining sardines leave the security of the school and flee in all directions. Having had enough of the action, the hunters leave the place of the big feast after having succeeded in their day's task.

*Special thanks to Ralf Kiefner at [www.ocean-pix.de](http://www.ocean-pix.de) ■*



THIS PAGE: Glowing white bodies of gannets streaming through the water join the ghost images of feeding sharks and dolphins

er, blowing air bubbles surrounding the school of sardines like a virtual net and holding them together. The school of sardines condenses more and more until it appears on the water surface as a big, round, silver shiny and restless ball—the so-called baitball. Finally, the big feast can begin.

As the hosts, the dolphins open the feast and shortly afterwards, the dolphins and sharks breach through the baitball in order to catch the sardines without any effort. From the air, hundreds of gannets come into play. These birds are the Air Force of the Sardine Run. For a long period of

time, they observe the ocean and look out for signs of when the sardines are being chased by the dolphins and pushed onto the surface. Then, the surface gets transformed by millions of little sardine bodies into a boiling and silvery shining surface as they try hard, panic-stricken, to swim down again.

But it's too late; there's no more escape for the sardines. With routine and without getting in each other's way, sharks and dolphins complete their job, and from the air, gannets shoot fearlessly into the bustle to get their part of the prey. Anyone who thinks that the gannets' strategy only

consists of lucky hits is wrong. In a nearly vertical nose dive with open wings, they aim for the center of the baitball. Only in the last second do they put back their wings and their "landing gear" and shoot like an arrow into the ocean with a speed up to 100 km per hour. Underwater, they are able to use the remaining speed to skillfully catch a sardine. And if they miss by a few centimeters, they use two or three wing-strokes to complete their dive successfully.

The gannets dive into the ocean up to 15 meters deep in order to secure themselves their part of the

# fact file

## South Africa



SOURCES: US CIA WORLD FACT BOOK, SCUBADOC.COM

**History** In 1652, Dutch traders landed at the southern tip of modern day South Africa and founding the city of Cape Town, establishing a resupply station on the spice route between the Netherlands and the East. In 1806, many Dutch settlers (the Boers) travelled north to establish their own republics after the British seized the area of the Cape of Good Hope. In 1867 and 1886, the discovery of diamonds and gold encouraged wealth and immigration. This intensified the subjugation of the indigenous population. The years 1899-1902 saw the British defeat the Boers resistance during the Boer War; but, the British and the Afrikaners, as the Boers became known, governed together under the Union of South Africa. The National Party was voted into power in 1948 and

heid—the separate development of the races. In 1994, the first multi-racial elections saw the end of apartheid and brought in black majority rule.

Government: republic.  
Capital: Pretoria.

**Geography** Southern Africa, is located at the southern tip of the continent of Africa. The country of Lesotho is completely surrounded by South Africa, which also almost completely surrounds Swaziland. Coastline: 2,798 km. Terrain: vast interior plateau surrounded by rugged hills and a thin coastal plain. Lowest point: Atlantic Ocean 0 m. Highest point: Njesuthi 3,408 m. Natural hazards: extended droughts. Environmental issues: extensive water conservation and control measures are required due to the lack of important arterial rivers or lakes; water usage increases out-

pace supply; agricultural runoff and urban discharge cause pollution of rivers; acid rain due to air pollution; soil erosion; desertification. South Africa is party to: Antarctic-Environmental Protocol, Antarctic-Marine Living Resources, Antarctic Seals, Antarctic Treaty, Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling.

**Economy** A middle-income, emerging market with a large supply of natural resources, South Africa has well-developed financial, legal, communications, energy, and transport sectors. Its stock exchange is the 17th largest in the world. Its modern infrastructure supports an efficient distribution of goods to major cities throughout the region. Since 2004, growth has been strong, as South Africa reaps the benefits of macroeconomic stability and a boom in global commodities. However, there is still high unemployment and an outdated infrastructure limits growth. The country began to experience an electricity crisis at the end of 2007, due to supply problems of the state power supplier Eskom plagued with aged plants. It necessitated “load-shedding” cuts to businesses and

residents in the major urban areas. Remnants of the apartheid period include daunting economic problems, especially poverty, no economic empowerment among disadvantaged groups, and public transportation shortages. The economic policy of the country is fiscally conservative but pragmatic. It focuses on controlling inflation, sustaining a budget surplus, and—as a means in increasing job growth and household income—employing state-owned enterprises to provide basic services to low-income areas. Natural resources: gold, chromium, antimony, coal, iron ore, manganese, nickel, phosphates, tin, uranium, gem diamonds, platinum, copper, vanadium, salt, natural gas. Agriculture: corn, wheat, sugarcane, fruits, vegetables; beef, poultry, mutton, wool, dairy products. Industries: mining (South Africa is the world’s largest producer of gold, platinum, chromium), automobile assembly, metalworking, machinery, textiles, iron and steel, chemicals, fertilizer, foodstuffs, commercial ship repair.

**Climate** South Africa is mostly semiarid with with sunny days and

cool nights. There are subtropical areas along the east coast.

**Population** 43,786,115 (July 2008 est.) This figure factors in the effects and mortality rate of AIDS which is ravaging the country’s population. Ethnic groups: black African 79%, white 9.6%, mixed 8.9%, Indian/Asian 2.5% (2001 census). Religions Zion Christian 11.1%, Pentecostal/Charismatic 8.2%, Catholic 7.1%, Methodist 6.8%, Dutch Reformed 6.7%, Anglican 3.8%, Muslim 1.5%, other Christian 36% (2001 census), Internet users: 5.1 million (2005).

**Currency** rand (ZAR). Exchange rates: 1EUR=11.39ZAR, 1USD=7.60ZAR, 1GBP=14.27ZAR, 1AUD=6.67ZAR, SGD=5.44ZAR

**Language** IsiZulu 23.8%, IsiXhosa 17.6%, Afrikaans 13.3%, Sepedi 9.4%, English 8.2%, Setswana 8.2%, Sesotho 7.9%, Xitsonga 4.4%, other languages: 7.2% (2001 census).

**Health** There is an intermediate degree of risk for food or water-

borne diseases such as bacterial diarrhea, hepatitis A, and typhoid fever. Vectorborne diseases include Crimean Congo hemorrhagic fever and malaria. Water contact diseases include schistosomiasis (2008).

### Decompression Chambers

CAPE TOWN: National Hyperbarics Klienmont Hospital, Cape Town 24-Hour Hotline: Tel. 021-671-8655

DURBAN: St. Augustine’s Hyperbaric Medicine Centre Hyperbaric and Woundcare Unit St. Augustine’s Hospital 24-Hour Hotline: Tel. 031-268-5000 www.sahmc.co.za

JOHANNESBURG: The Hyperbaric Treatment Centre cc, East rand of Johannesburg, Tel. 011-914-2675 www.hyperbaric.co.za

### Web sites

Expert-Tours  
[www.expert-tours.de](http://www.expert-tours.de)  
South Africa Tourism  
[www.southafrica.net](http://www.southafrica.net) ■

RIGHT: Global map with location of South Africa

FAR RIGHT: Detail map of South Africa



RAINER SCHIMPF



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POINT & CLICK  
ON BOLD LINKS



# Nifty Equipment



Edited by  
Arnold Weisz



## NiteRider HID II Series

The new HID II 14w lamp and digital ballast are now available! Twice as bright and twice as strong as the previous 10w HID and with a low beam / high beam feature. The output of the 14w HID lamp is 1000 lumens on high beam and has 2.3 hours burn time. The new dual beam HID II has a low beam feature with a 4 hour burn time at 500 lumens (same brightness as previous 10w HID). The high beam mode is 2 X 14w and 2000 lumens. Owners of the NiteRider 10w HID can upgrade their older 10w HID to the new 14w HID lamp and digital ballast. [www.niteriderdive.com](http://www.niteriderdive.com)

## Surface Marker WDS™ Deluxe with Signal Mirror

This diver signal tube is a larger version of the Surface Marker WDS buoy and also includes the Webbing Deployment System (WDS™). With a height of 175cm the Deluxe model is ideal for divers who want maximum visibility combined with the ease of use of the WDS™. The SOLAS reflective tape at the top tip of the buoy is an additional safety feature which significantly increases visibility. The Signal Mirror included in this product is stowed in a kangaroo pouch on the outside of the carry sack or can easily be attached to the divers BCD. With a tested visibility over 32 km this simple device can be a life-saver.



## Signal Mirror

A light weight and practically indestructible polycarbonate Lexan® Signal Mirror that can easily be carried on every dive is a good survival tool for all divers. Features on this mirror is that the reflection can be aimed at a specific target with the aid of the retroreflective mil-spec aimer in the centre of the mirror. Weight 20g, Size: 7cm x 5cm. [Surfacemarker.com](http://Surfacemarker.com)



## YourBagTag

YourBagTag.com has produced a new line of personalized name tags made from polypropylene webbing and embroidered in many high-visibility neon colors to make identification a snap. Both the BC NameTag and the YourTankTag™ easily attach to a diver's gear. The tags simply wrap around the BC shoulder strap or SCUBA air tank and attach to themselves using Velcro® tabs. [www.yourbagtag.com](http://www.yourbagtag.com)



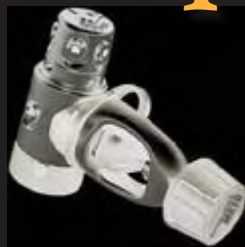
## DUI Polartec PowerStretch 300

This jumpsuit is both stretchy and form fitting, which allows you to wear the less weight and is easy to launder. Main features include: made of Polartec PowerStretch 560gm/m2, all-way stretch polyester/lycra blend, two zippered hand-warmer pockets, thumb and ankle stirrups and sizing from Small to XX-large, male and female. If you don't fit in standard sizes, DUI offers its customers made-to-order so-called special production drysuits, so you can get the size you need and customize the colors. [Dui-online.com](http://Dui-online.com)





# equipment



## HEWEE GO urination system

Need to go when you are diving, maybe Custom Divers urinal system can be an idea. This is a rubber flange containing the chosen diaphragm is then fitted through the reinforced ring on the front of the support belt. The sheath is then rolled over the penis to provide a good fit with any excess left rolled. This rolled section of the sheath can then be stretched over the front part of the flange where it sits securely in position. Further features: no adhesive or tape for fixing, three sizes of sheaths, two sizes of diaphragm, adjustable support belt system, washable sheaths and diaphragms.  
[www.customdivers.com](http://www.customdivers.com)



## Tryton multimedia subaquatic system

This is an interactive subaquatic TV system that can be installed in any swimming pool. Among the interactive contents available in the Tryton, there is the underwater "edutaining" video game Nautilus Quest produced by VIRTUALDIVE. This exploration game gives children the possibility to learn more about sea life (thanks to an underwater photographic safari), to seek treasures and to discover fantastic sea beds. The scuba diving simulator version will allow divers to wander virtually on 3D reconstitutions of real sites, to locate points of interest and to discover the local underwater fauna and flora. They will be able to prepare themselves to real dives in their future by choosing among a catalogue of virtual spots. The simulator will integrate various diving parameters (navigation, decompression time, etc). It will also be possible to calculate the covered distance and the swimming speed.

[www.virtualdive.com](http://www.virtualdive.com)



## Seac Sub Syren

This Italian manufacturer has a new jacket especially designed for women. Features include: 840 D PU coated nylon outer material, 420 D PU coated nylon inner material, three dump valves with traction command, two stainless steel and two plastic d-rings, sternal locking adjustable on two positions. There are also available optional trim pockets, which can take up to 2kg load per pocket.  
[www.seacsub.it](http://www.seacsub.it)



## Recall



Products affected: Crimped Low Pressure Hoses supplied by Ambient Pressure Diving. It has come to the manufacturer's attention that some LP hoses have been released from the factory without being crimped and while these hoses work properly for a time, there is potential and a very real risk of the hose fittings coming away from the hose. As a precaution, they are asking all owners to visually inspect their hoses if purchased since January 2007. Do not dive with defect hoses and contact the factory to obtain replacements. Email: [Nicky@apdiving.com](mailto:Nicky@apdiving.com) or telephone: (+44) (0)1326 563834. In the USA, contact: [ed.price@silentdiving.com](mailto:ed.price@silentdiving.com) or telephone: 603-447-2600



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ISSUE #3  
MEGAMERICAN

ALEX KIRKBRIDE: AMERICAN WATERS | CONTESTS: DEEP INDONESIA & OUR WORLD-UNDERWATER | CONSERVATION: CALIFORNIA'S GREENS

## WETPIXEL QUARTERLY

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**Lucasdivestore.com**  
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Text by Cindy Ross  
**GirlDiver.com**  
Photos by Bill Battan  
and Chris Padilla

# The Girl In the Bubble

**Time travel becomes reality, as I descend beneath the waterline in a 1944 Mark V Hard Helmet, the standard U.S. Navy dive equipment used for undersea salvage operations in World War II.**

"So, what's under the water?" I asked Maurice, the aged Greek instructor from a local training facility for commercial divers. I was 19 years old, and my only experience with the underwater realm was a five-minute dive in a college swimming pool. He told of the brilliant sea life inhabiting the chilly waters of the Puget Sound in the northwestern corner of the U.S. He explained what the guys were doing underwater, welding and cutting, and how they would eventually use it to work in the offshore oil fields.

"I want to learn how to dive!" I exclaimed. Maurice just shook his head and in a thick accent said, "Girls like you... you no dive. Girls like that, (pointing to a tall, stocky girl on the dock) they dive. Girls like you... you date the divers. Come, I'll introduce you to my boys." And with that, it was done.

I was 19, in college, and so the introduction to the boys on the dock sufficed. In the four months following, I helped the guys get in and out of their dive gear, learned about the dockside diving bell, rinsed and stored the commercial dive equipment. But I knew I could never dive, for I wasn't big enough, or strong enough. It took a full decade for my entry into the

scuba world—recreationally, not commercially.

I sought out dive gear made for small women, found easier methods to don the heavy equipment and slowly developed the "dive specific" muscular structure by hauling countless tanks to and from dive sites. I honed my instructional skills to ease the entry of other women into the sport.

Now, I'm taking the plunge as a hard helmet diver. Using "modern equipment" from another century. Descending to the depths in an authentic Mark V helmet.

This level of helmet was produced by the Diving Equipment and Salvage Company (now known as DESCO) for the U.S. Navy from 1927 until the Mark XII surface supplied system in the late 1970's.

## Donning the Gear

The dive was coordinated by Tim and Steve King of Smokey Point Diving. As members of the Historical Diving Society, they

are collectors of diving helmets and equipment from our past. The suit I dived in was a "Men's Large" size—the smallest available suit size.

With enough lacing and strapping, pull-



RIGHT INSET: Mark V Girl Cindy Ross dons the hard helmet breast plate  
FAR RIGHT: Underwater – Feeling what it was like to do work underwater. Robotic and difficult to move. Definitely a respect builder!



BILL BATTAN

CHRIS PADILLA



BILL BATTAN

The smallest suit available was a men's large. How does a five foot tall girl fit?

ing and tugging, they fitted me into the rubber coated canvas suit, promising no leaks in a suit manufactured the year after Jacques Cousteau took his first experimental dive in his Aqua-Lung.

The diving helmet was bolted to the

suit brales, with a weight of 56 pounds (25 kilos) alone. Underwater, the top heavy helmet configuration, even with air added, would turn divers on their heads. So, to counteract the tipsiness, boots weighing 17 pounds (8 kilos) each, and a weight belt of 85 pounds (38.5 kilos) was added to the standard diving dress. Total weight of the equipment is 190 pounds (86 kilos)—almost two times my weight!

As the donning of equipment commenced, the suit engulfed my frame, and my two dive attendants began the task of strapping the leather laces and belts.

My canvas clad feet were slipped into the brass tipped boots with flat wooden insoles. The legs were laced in the back to avoid over inflation once below the surface. Ergonomics and comfort were definitely not in the design phase on this equipment.

They stood me upright (definitely not moving anywhere with the metal slippers on my feet) and finished tightening the lower part of the suit to fit my small frame. I'm sure

the Desco Company never expected a five foot nothing (152 cm) girl to don this outfit.

The rubber seals at the end of each arm were pushed up my forearm to find a thick enough place to seal. (Dainty wrists



BILL BATTAN

were not in the plans either, apparently.) Next, the breastplate was attached to the suit with wing nuts. I can feel the weight on my shoulders, but it's not as bad as I thought it would be. Movement is definitely getting difficult, no yoga today.

Now for the final touches. First, the leather harness was suspended from my shoulders holding 85 pounds (38.5 kilos) of lead weight around my waist. This would counteract the internal lift from the air, as well as help my center of balance underwater.

They released the weight onto my shoulders... "I'm standing! Ok, I can do this," I thought to myself. "This is not that tough."

At this point, my tenders had me sit on the dress platform. It was time for the helmet. As I was sitting on the platform, the belt started to take its toll. I had been

able to maintain correct posture, but as the weight beared down, my spine began to bend. In my mind, I was secretly wondering if the two inches of compression my spine was undergoing would be able to be undone.

## The helmet

"Ok, here we go," said Steve, as he lowered the "brass helmet" onto my head. The helmet of an authentic Mark V is not actually brass, but rather spun copper with tin plating, and all of the original helmets were spun by a single individual who had mastered the craft. The helmet, complete with brales and wing

nuts, had a weight of 56 pounds (25 kilos), and this became the final piece.

As the faceplate on the bonnet closed and sealed, my world changed to a sepia toned view of what early salvage divers were faced with using the "modern equipment" of their time.

Final instruction included operation of the chin button (purge valve) to release the air as it flowed into the suit. My surface air supply was connected to a turn valve mounted on the front of the suit, to which I could increase or

The breast plate is attached to the suit with wing nuts

## Hard Helmet

decrease flow by turning the knob with my left hand.

Overhead, a communication unit, made of telephone wiring, allowed me to speak with my "dive guide" on the surface. His voice would be guiding me on my journey, and my responses would assure him that I was both safe and composed underwater.

## Taking the plunge

Hoisted up, and six heavy steps later, I was on the edge of the dock ready for a giant stride into the water. While the Mark V had four "lights" (windows) in the hel-



BILL BATTAN



Giant Stride entry - Unable to see the water but trusting the voice in the hood saying, "Just one step with your right foot."



Just Waiting – With the heavy shoulder harness and helmet, waiting for entry is challenging on the spine

met, the suit only allowed a diver to see directly ahead, to the sides or above, not down. The giant stride was made without any visual reference to the water below, trusting, for the first time, the voice coming through the speaker overhead.

As I splashed in, I took a quick look about the helmet.... no leaking. Sigh of relief.

The voice overhead told me to turn and find the blue rope. Using my hands for mobility, as I have no fins, I turned and held the blue nylon rope.

Giving the ok, I lowered down the rope to the bottom. Theoretically, you are supposed to clear your ears by pressing your nose against the side of the helmet and blowing through it. I tried, but to no avail.

As I lowered down, the pressure built up. However, I landed on the bottom with the pain diminished.

Now, it's time to "work". Walking in the Mark V suit is a challenge. We all believe the water makes us weightless, however, not so in a suit designed for walking on the bottom. Each step entrenches the boots into the soft mud, and the suction must be overcome with each lift of the leg.

My safety divers directed me, along with the voice in the helmet, to turn and walk in the suit.

## Hard Helmet



Definitely the shortest hard hat diver they've put in the water —190 pounds, and I'm walking!

## Hard Helmet



Climbing the ladder

I imagined doing work in the suit, holding a welding torch, or rescuing men trapped in a downed submarine, while moving quite like an oversized robot in the clumsy dive outfit.

Spotting a pink mask on the bottom, I motioned for the safety divers to retrieve it. The safety divers

were dressed in recreational scuba outfits, with full face communication masks on. They could easily retrieve the mask. But what if I, in my robotic attire, wanted to reach down and get the mask?

"Go ahead and sit down," the voice in the helmet directed. Against my better judgement, I fell slowly back into a seated position on the sticky bottom.

"Now stand up," the voice offered. Right. Stand Up. I'm stuck in the mud, and he says stand up?

I rolled to my front and push deeper with my hands into the bottom silt. "This isn't working," I informed my

dive safety officer.

"Try adding some air," he suggested. I found the valve on the front of the suit, turned for higher air output into the suit and sprang to my feet.

Chin on the exhaust control valve on the side of the bonnet, I released the excess air, turned the

air demand knob back down, and I was once again on my feet.

As the voice overhead melded with the bubbles, each inhale and exhale, I walked the floor of the sea. I experienced, for a moment, what the pioneers of underwater work went through. I imagined going 240 feet down a line, as the rescuers in May of 1939 reached the sunken U.S. submarine, *Squalus*, and saved 33 crewmen from the bottom of the Atlantic. The slow, deliberate movement, each reach and step carefully thought out, as the suit was difficult to travel or maneuver in.

I am thankful to those who pioneered the modern day self contained breathing gear we used. Men like Hans Hass and Jacques Cousteau, who enabled common people to be able to experience the underwater realm without donning 190 pounds (86 kilos) of gear. Allowing us to use adaptive equipment in a foreign environment, rather than shield ourselves in a rubberized canvas balloon.

I thought of the female commercial divers worldwide who, even with lighter helmets and gear, are still operating in a world where a "Mens' Size Large" is the smallest dive suit available, and who walk the floor of the sea, the tanks of nuclear power plants or inspect hazardous sites in full suits.

Still very much a man's realm, I applaud the women who are reaching into the world of commercial diving, not succumbing to the belief that they are too little or not able to build the strength.

As I climbed the ladder, and again felt the full weight of the gear with each step up the rung, I returned to our modern times.

Having made my first surface supplied dive, I knew I had experienced the past in a vivid way. ■

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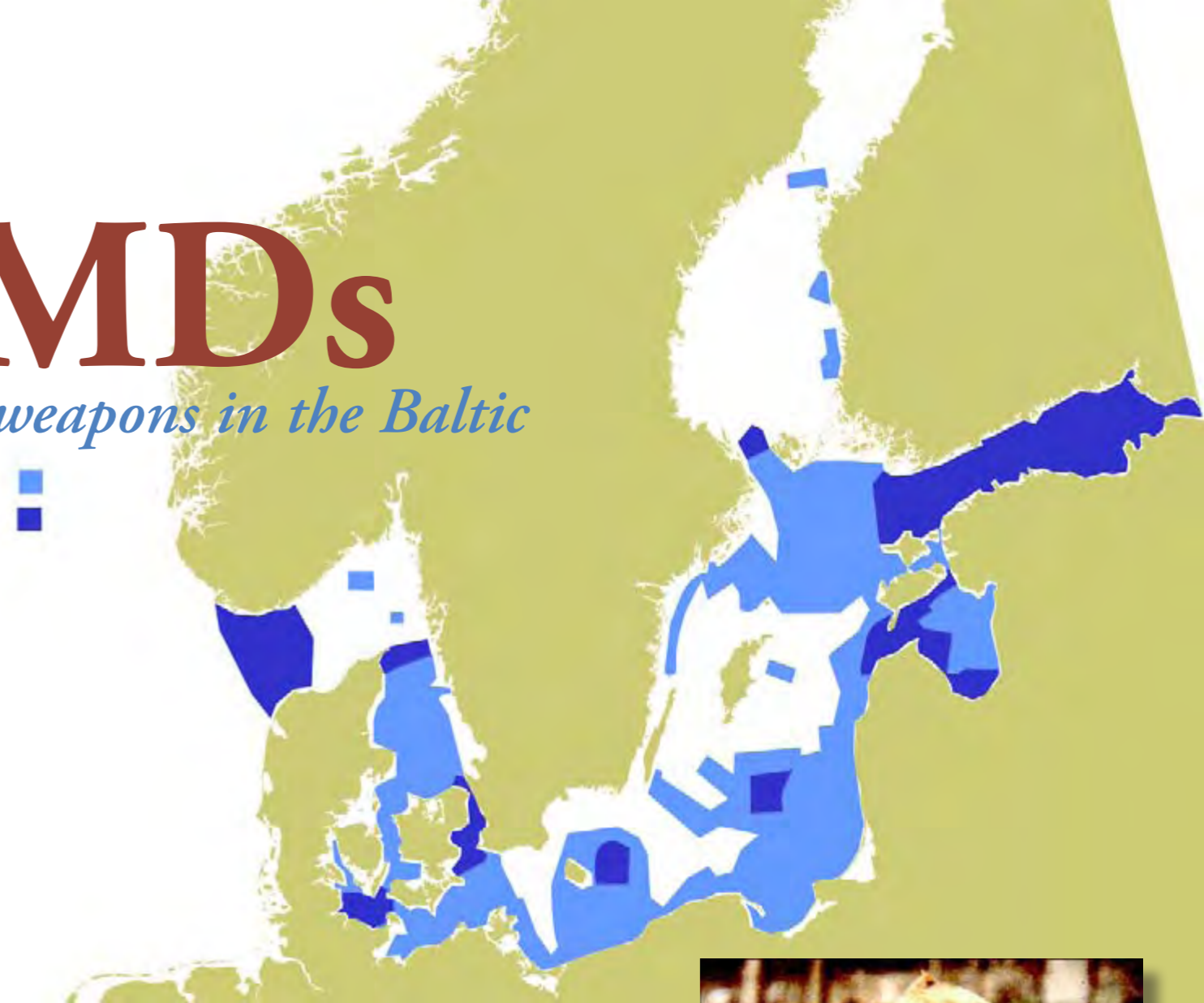
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# Diving with WMDs

*Divers & dumped chemical weapons in the Baltic*

Text by Commander Carl-Gustav von Konow  
Photos courtesy of the Swedish Coast Guard



The Swedish Coast Guard is responsible for surveillance of and response to oil and other harmful substances at sea. Why do we have these problems today? While a complete history is beyond the scope of this article, I will discuss dumping at sea from German stores. Before and during the Second World War, the Germans produced a lot of different chemical weapon agents, and in December 1944, they had about 65,000 tons

in storage. When the war was over, none of the chemical weapons had been used on the German side, so everything was still in stored. The large number of chemical weapons was a problem for the allied countries. According to the Potsdam agreement "all munitions shall be destroyed". The most functional way to get rid of them, was to dump them at sea.



In Skagerrack (see map on next page) off the Swedish west coast, fully loaded ships were dumped and sunk in rather deep water, 200-700m. Today, the ammunition is still on the ships, or underneath in the clay on the sea bottom. The

LEFT TO RIGHT: Hulls of boats take a beating in the Baltic; Map of areas in the Baltic Sea at risk for chemical weapons agents and other dangerous objects; INSET: On the seabed in dumping zones, one can find artillery shells, a complete bomb, or a lump of mustard gas with a hard surface, but 'fresh' mustard gas inside



# focus

*The total amount of dumped ammunition with and without chemical weapons agents was approximately 300,000 tons.*



most problematic areas are in the Baltic where the dumping was in more shallow waters at an approximate depth of 30-90m. In the Baltic, chemical weapons were dumped as well as artillery shells, air-mines or bombs—either one by one, or in containers. Even containers with pure agent were dumped. They were even dumped by hand, mostly by war prisoners (Germans). The total amount of dumped ammunition with and without chemical weapons agents was approximately 300,000 tons.

ABOVE: The Swedish Coast Guard patrols the Baltic Sea. LEFT INSET: Rotting fish tainted with chemical weapons agents. TOP RIGHT: Map of dumping zones where there is a risk of finding chemical weapons agents

Please have a look at the map on the previous page.

Today the risks are:

- in the dark blue areas, where there is a high risk of finding dangerous objects like mines, oxa and chemical weapons agents;
- in the light blue areas, where there is a moderate risk of finding chemical weapons agents;
- in the white areas, where it is possible that one can find dangerous objects when exploring the seabed for laying cables, pipelines, drilling, building wind power stations or doing scientific research.

The explorer must be prepared to meet these threats.

Fishermen never know when they may catch war gas or a bomb. Today, the dumped ammunition is spread all over the southern Baltic.

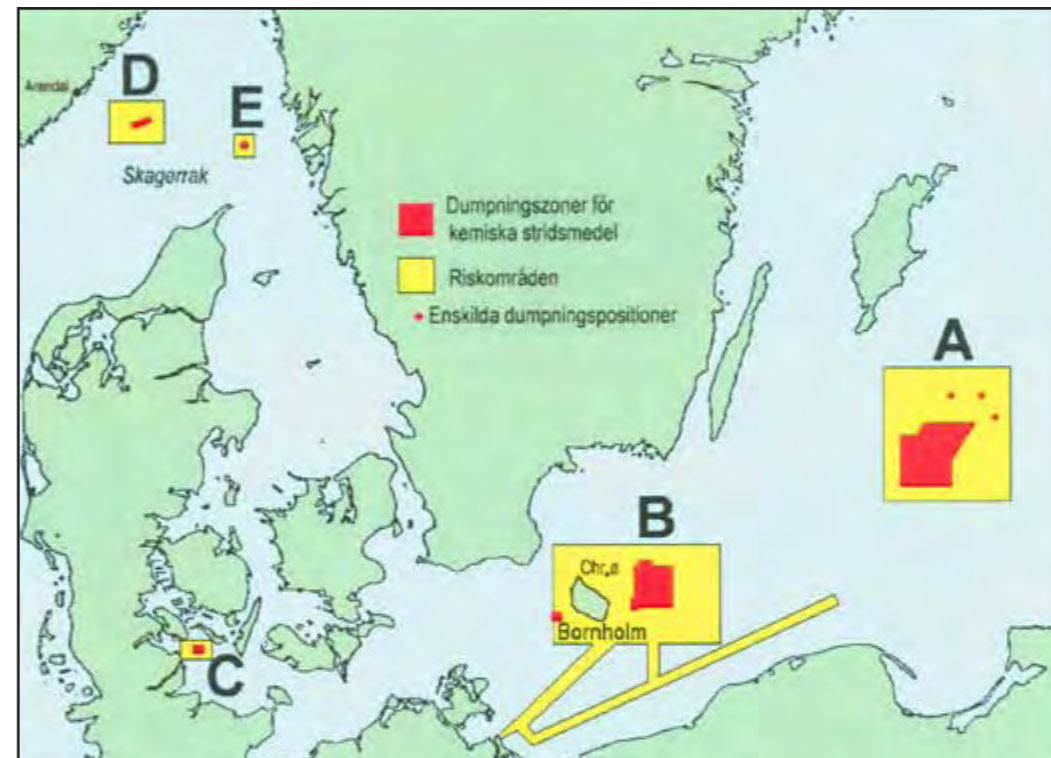
The diver doesn't know if he or she will meet dangerous objects, especially when digging into the bottom sediment. Perhaps the diver does not see the object.

Divers taking samples risk contamination. Seabed ploughs, ROV, SONARS and their umbilical cables can be contaminated.

What can you find on the seabed?

- Artillery shells, a complete bomb. The bomb shells are made of thin material and are often completely corroded by now. The mustard gas has solidified (slow oxidation) but we don't know what it looks like on the inside. The dumped ammunition was normally not armed—it could have detonators— but the main charge is always there.
- A lump of thickened mustard gas. The surface is hard but can break, and then there is "fresh" mustard gas inside. Mustard gas does not react with water, so even after a rather long time in water, it will not be destroyed. It will only wash away slowly and oxidize. The same goes for findings of sneezing and tear gas. Approximately 90 percent of the findings in the southern Baltic is mustard gas.

Divers can't rely on help from the SCG or other rescue units for some hours. So, one has to take care of oneself. The surface crew and other personnel or divers must also be protected against the threat.



They have to build a decontamination station before diving. They must check that everything works beforehand, because in case of an accident, they will have a very short time for minimizing the injury—within 20 minutes, if it's mustard gas. The surface organisation must be protected. Don't think that water will minimize the threat from mustard gas.

The diver must have help with decontamination and must be 100 percent clean before he takes off his breathing device (helmet or diving mask). Other personnel have to wear protective clothing. Even very small amounts of mustard gas can give symptoms after 24 hours or more. If a diver is contaminated, check the diver with the use of indication equipment! It must be 100 percent clean before the diver can leave the decontamination line. Remember, if a contaminated diver goes indoors, there is a risk of contaminating other persons, too. Don't forget that when it's cold outdoors, some war gases will become more dangerous when reaching higher temperatures. Mustard gas starts gassing at approximately +14°C. The influence of temperature is important to know. Don't forget the diver could have contaminated the lift or ladder.

Indication equipment is simple and reliable. AP2C is a very good field instrument for this purpose. Common indicating paper is easy and cheap.

Commander Carl-Gustav von Konow is head of responders, Swedish Coast Guard: [carl-gustaf.von.konow@coastguard.se](mailto:carl-gustaf.von.konow@coastguard.se) ■



Edited by Peter Symes

# Blue whale calls have mysteriously grown deeper

PETER SYMES



## Hungry seals navigate by the stars

It has been discovered that seals can identify a single star in the night sky.

Navigating in the open ocean is essential for seals to move between foraging grounds that may be hundreds of kilometres apart and this is the first evidence that marine mammals, like humans, use stars to navigate in open water.

The European team of researchers, headed by Dr Guido Dehnhardt of the University of Rostock in Germany, simulated a night sky above two captive male seals and monitored the movements of the animals through six hidden infrared cameras. Initially, the seals were guided to one of the brighter stars by a laser pointer, and encouraged to swim towards it.

Once the seals got the hang of navigating by the one star, the night sky above them was swivelled around and the seals were watched to see if they could still orientate themselves. With a little practice the seals swam in the right direction 100 percent of the time.

In the wild, the foraging trips of seals can take several days and

so they often find themselves in open water with no visible landmarks for nights on end. How these seals learn the relationship between a star and their feeding ground is still unknown. It is suggested that seals might learn the position of the stars relative to foraging grounds during dawn and dusk when they can see both the stars and landmarks on the coast.

The researchers think that marine mammals might use star paths, or *kaveingas*, as Polynesian seafarers call them. These people navigate by heading towards a star on the horizon until it moves too high, and then swap over to follow another star, and so on, guiding their way until dawn.

Seals, sea lions and whales are often seen elevating themselves out of the water as they swim in the open ocean. This act of coming out of the water vertically and staying above the surface momentarily, in the same way a human treads water, could allow marine mammals to set their course, the researchers speculate. ■



T. BJORNSTAD

**Calls and songs have been steadily dropping in frequency for seven populations of blue whales around the world over the past 40 years.**

Scientists at the Scripps Institution of Oceanography, among others, have analysed data collected with hydrophones and other tools, and found that the songs, which they believe are by males advertising for mates, had lowered in frequency by as much as 30 per cent in certain populations. Much of the songs are at frequencies too low to be detected by the human ear.

The study, as yet unpublished, has been reviewed by several experts in the field who called the global decline both significant and unequivocal. Scientists cannot explain why blue whales from places as disparate as the northern Pacific and the

Southern Ocean, which surrounds Antarctica, would drop the pitch of their songs. Each blue whale population has a distinct tempo and tone-set to its vocals.

### A male thing

It is believed that only male blue whales sing, with female blue whales choosing their mates based on size. This selection process has therefore led to the species' great size. And deeper songs might signal bigger.

John Hildebrand, professor of oceanography at Scripps and an author of the study, said the drop might signal a rebound in the population of blue whales since commercial whaling bans began to take effect in the 1970s. When populations were smaller, whales may have had to be louder to make their calls heard. Now, the males might be competing to make their calls deeper.

### A matter of evolution?

It is thought that we can expect the mating display to change

because, as density increases, there are more individuals competing to find mates. It seems that with the blue whales, the songs are getting both lower and a little less loud. Although it is easier to make a powerful sound at high frequencies, lower-frequency sounds tend to travel farther. However, in the blue whale vocal range, which is 10 hertz to 100 hertz, there is no practical difference in the sound transmission properties in the deep ocean.

### Population rebound

It is estimated that there are now up to 25,000 blue whales, compared with perhaps 300,000 before whaling. The number may have risen from a low of about 10,000 animals with blue whale populations growing by up to 5 percent each year.

The population-rebound explanation, while speculative, is compelling to David Mellinger, a professor at the Hatfield Marine Science Center at Oregon State University. He said that it is hard

to see anything that would have impacted all of those populations and made them all decrease frequency other than the increase in the population.

The global blue whale population was thought to have been around 200,000 animals, but numbers fell to just a few hundred by the 1960s when a hunting ban was introduced. The population has since recovered to around 4,500 animals.

### Dialects

Professor Hildebrand has also discovered that blue whales in different parts of the world use different "dialects" in their songs.

Only the males sing, and it is thought that they are attempting to attract mates or to communicate to other males during the mating season.

But other researchers believe whale song is a more complicated form of communication than simply trying to attract a female. ■





# First Humpback Whale in the Baltic in 30 years

In the past century and a half there have been exactly three documented sightings of living humpback whales in German waters. A recent sighting of a humpback whale off the German island of Rügen in the Baltic Sea can therefore be considered a sensation.

The last time a living humpback whale was spotted in German waters was nearly 30 years ago, in August 1978, also off the coast of Rügen. But to find a prior documented sighting, you have to go back another 127 years to 1851.

The sighting was clearly a humpback whale; it had the typical long white pectoral fin, which can make up a third of the animals' bodies. The whale was estimated to be around 12 meters long.

It is believed that the animal might have got lost, swimming first into the North Sea and then into the Baltic Sea by following a swarm of fish during its usual trip to

spend the summer in the Arctic. Although the animal will probably remain in the Baltic Sea for a few more weeks, it is likely it will look for other hunting grounds, as it will struggle to find enough food in those waters.

The whale is only the latest unusual sighting in the Baltic Sea in recent years. A giant swordfish stranded itself on the Darss Peninsula in the German state of Mecklenburg-Western Pomerania earlier this month. In September 2007, several dolphins were spotted between Darss and the island of Hiddensee. And seals began appearing on Baltic Sea beaches in August 2007.

According to Greenpeace, humpback whales live in all the world's oceans. In the summer, they tend to flock to the polar regions and, in winter, to subtropical waters. The animals, which can grow to 18 meters and weigh up to 40 tons, live off small fish and krill. Their world population is estimated to number between 35,000 and 40,000.

Humpback whales are also known as "singing whales" because they compose intricate compositions that can last longer than ten minutes. ■



## An arrest warrant has been made for the Japanese whaling fleet

In four months time, the Sea Shepherd ship, *Steve Irwin*, will depart from Australia for Sea Shepherd's fifth major mission to confront the illegal activities of the Japanese whaling fleet.

The Sea Shepherd Conservation Society intends to intervene against the continued illegal whaling activities of the Japanese fleet in the Antarctic Whale Sanctuary. They intend to stop the killing of endangered species of whales in the sanctuary—whales that are being killed in violation of the global moratorium on whaling. It is intended to enforce the orders of the Australian Federal Court that has banned Japanese whalers from killing whales in the waters of the Australian Antarctic Territory. The objective is to arrest the *Nisshin Maru* and its fleet of hunter killer boats.

### Campaign matter

In 2005-6, the whalers were 84 whales short of their quota because of the Society's interventions. In 2006-7, they only took half their quota and in 2007-8, they took zero Humpbacks, zero Fin whales and only half their Piked whale quota. They have lost tens of millions of dollars, and the Institute for Cetacean Research is over 50 million dollars in debt on loans from the Japanese government.

### Whaling fleet deep in debt

The Japanese whaling industry is

**Sea Shepherd Conservation Society**  
 Warrant for Arrest for International Poaching  
 Issued August 5th, 2008

The Sea Shepherd Conservation Society  
 hereby  
 issues an arrest warrant  
 authorizing the crew of the *Steve Irwin*  
 to intervene and  
 shut down the illegal whaling activities  
 of the Japanese whaling fleet inside  
 the waters of the Southern Ocean Whale Sanctuary.

The Sea Shepherd Conservation Society is operating in accordance to the principles established in the United Nations World Charter for Nature (1982)

The violations of the Japanese Whaling fleet are:

1. Killing and targeting of endangered whales in violation of the Convention of Trade in Endangered Species (CITES)
2. Killing whales in a Whale Sanctuary in violation of International Whaling Commission regulations
3. Killing whales in violation of the global moratorium on whaling in violation of the IWC regulations
4. Re-fueling in Antarctic waters in violation of the Antarctic Treaty
5. Using firearms in Antarctic waters in violation of the Antarctic Treaty
6. Operation of a factory vessel to kill Piked Whales in violation of IWC regulations
7. Intentionally ramming other vessels in violation of the International Maritime Organization (IMO)
8. Conducting commercial exploitation in Antarctic Treaty waters
9. Operating unsafe vessels with the potential to pollute Antarctic waters

Authorized by: Captain Paul Watson  
 President of the Sea Shepherd Conservation Society  
 August 5th, 2008.

becoming increasingly more frustrated because of the annual interference with their operations and the rising debt they are incurring. The society suspects that they will be more violently defensive of their illegal activities this next season than they were last season.

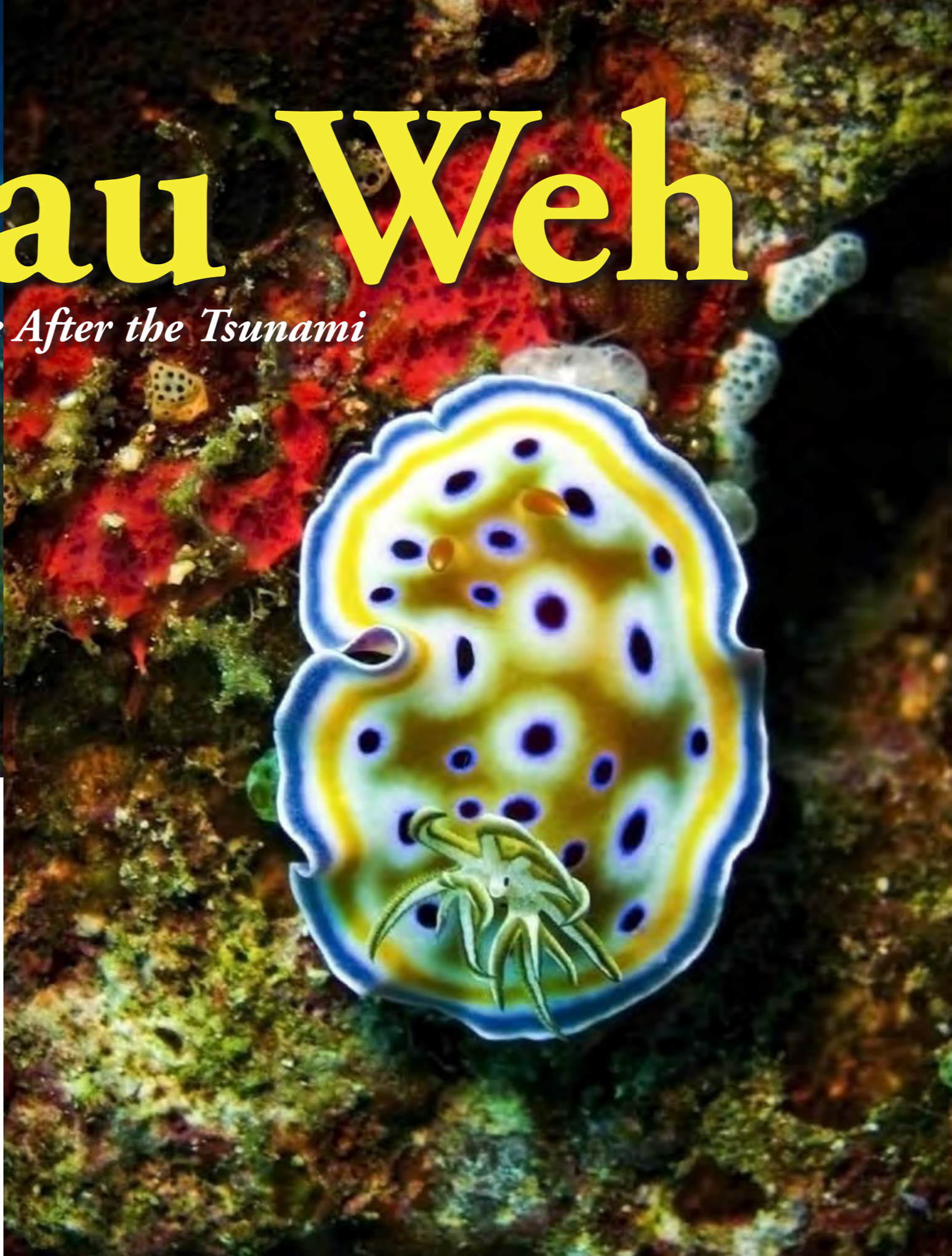
There is talk of sending a Japanese warship to the Southern Ocean, and if that happens, it will be a violation of the Antarctic Treaty. There is talk about physically assaulting the *Steve Irwin* and capturing the crew and taking them back to Japan

as prisoners. If that happens, it will certainly be an international incident involving numerous nations, because the crews of Sea Shepherd ships are usually citizens of a dozen different countries.

No amount of intimidation will deter Sea Shepherd from returning to the Southern Ocean this year. Every single crew member onboard the ship understands the risks. Far better to risk one's life for the protection of the whales and the oceans than to die for some oil well somewhere, or over some asinine conflict over real estate. ■

# Pulau Weh

*Rebirth of Paradise After the Tsunami*



**On a beautiful day just like any other, divers in the water were enjoying the underwater scenery and rich marine life around Pulau Weh in Aceh, Indonesia. All of a sudden, they heard a loud and painful noise forcing all of them to cover their ears. Many thought it was a tanker passing overhead, but the sight of all the moray eels swimming out of their holes must have been something totally unimaginable and bewildering.**

Text by Simon Kong  
Photos by Asther Lau

The divers then surfaced and headed back to the dive shop, not knowing what to make of the strange phenomenon until they started seeing brand new bungalows floating on the sea.

Back at Gapang Beach, almost all the wooden houses and restaurants had disappeared, and Lumba Lumba Diving Centre had its front façade smashed away. The divers had to wait two hours until the surge was safe enough to land the boat. It was the day of the 2004 Tsunami.

Fortunately and miraculously, the tsunami that hit Aceh on December 26, claimed very few lives on Pulau Weh located only

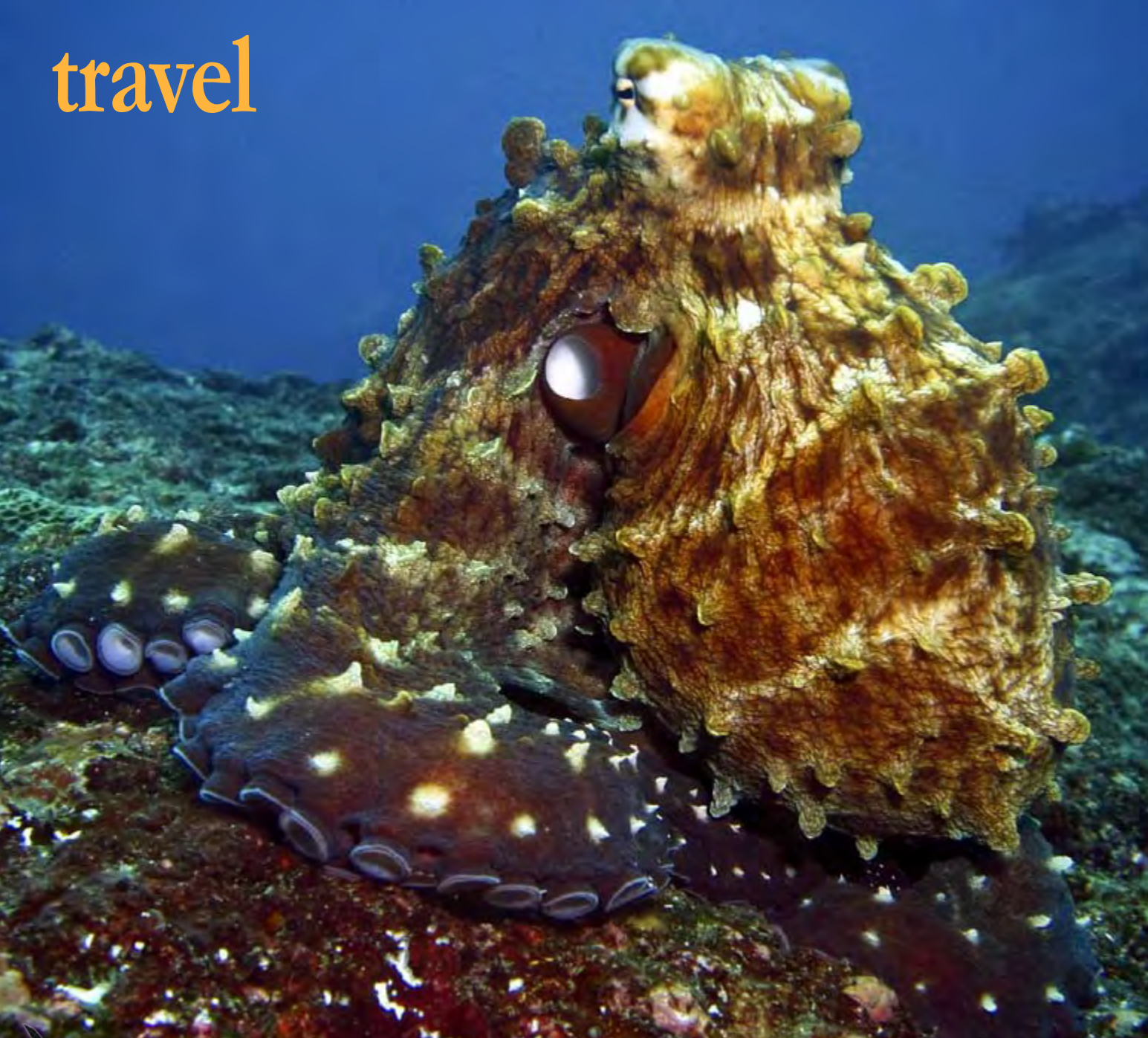
one hour north of Banda Aceh. The owners of the dive center, Ton and Marjan Egbers, survived by standing atop the dive gear rinsing shed and a tree located just beside the shop.

Most of the destructive power of the tsunami was the strong pulling power of the receding wave, where everything was swept out to sea including fins and masks prompting the owners to later joke that they were the dive shop with the mismatched fins.

Today, there are hardly any signs that this terrible tragedy

TOP: Freckled hawkfish are a common sight. RIGHT: Nudibranchs are rare in Pulau Weh





Octopus; Flat worm crawling along bottom; Red spotted coral crab

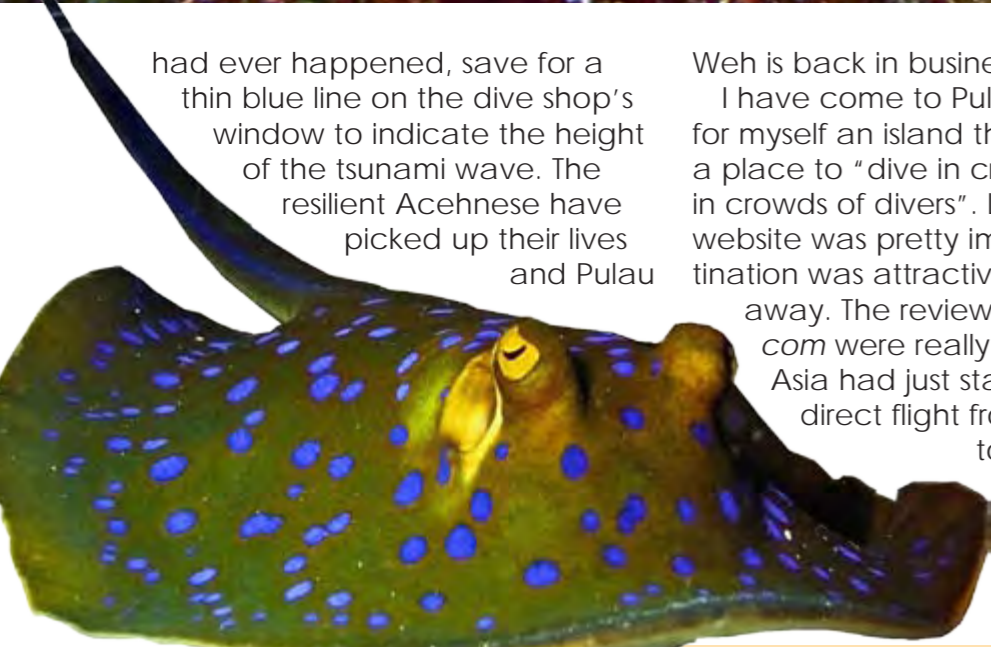
of meeting mantas, whale sharks and mola molas plus the ultra slim chance of seeing a megamouth shark. This island was the site of one adult sighting and one discovery of a dead juvenile mega-mouth shark right on the beach in front of Lumba Lumba Diving Centre! With any luck, I could very well be the next guy to brag about a sighting.

At the Ulee Lheue ferry terminal, it is easy to see why the tsunami had such a devastating effect; the terrain is flat making it very easy for the tsunami to flow right through. You can also see the black domes of the Grand Mosque in Banda Aceh where in pre-tsunami times, the view was totally blocked by tall

After a pleasant and hassle free flight, a pass through a very primitive immigration line, and a hunt for my bags in a pile of luggage just dumped on the floor, my traveling partner, underwater photographer Asther Lau, and I were on our way to the Ulee Lheue ferry terminal. On the way, we stopped by a solemn remnant of the tsunami—a mass grave. There were no grave stones there, just an empty grassy field where all the unidentified victims were buried. The place is peaceful, and a few Acehenese can be seen praying and weeping.

buildings that are now gone.

**Pulau Weh**  
Pulau Weh is an active volcanic island that rises hundreds of meters from the sea floor.



Blue spotted stingray

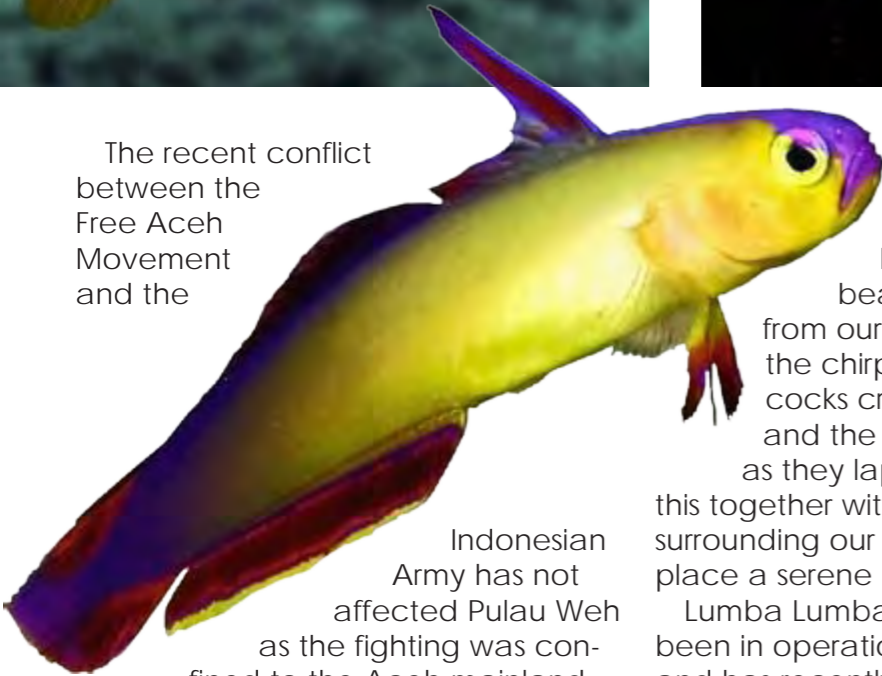


Honeycomb moray of Rubiah Sea Garden

had ever happened, save for a thin blue line on the dive shop's window to indicate the height of the tsunami wave. The resilient Acehnese have picked up their lives and Pulau

Weh is back in business. I have come to Pulau Weh to discover for myself an island that is touted as a place to "dive in crowds of fish, not in crowds of divers". Lumba Lumba's website was pretty impressive, the destination was attractive and not too far away. The reviews on *Scubaboard.com* were really good, and Air Asia had just started a convenient direct flight from Kuala Lumpur to Banda Aceh. So, I asked myself, why not? There was the chance





## Gapang

The recent conflict between the Free Aceh Movement and the

Indonesian Army has not affected Pulau Weh as the fighting was confined to the Aceh mainland.

Under martial law, a blue book system was implemented. Foreign visitors had to get a 14-day visa in Medan before proceeding to Banda Aceh, and from there, were escorted by police all the way to Pulau Weh.

Since the 2005 peace agreement, all fighting has stopped, and divers have started to return. The new Air Asia flight now makes it really easy to get here. Whereas in the past, the only flights to Pulau Weh were from Medan or Jakarta.

From the ferry terminal in Balohan, it's an hour ride on a bumpy and twisty mountainous road to Gapang. We occasionally got glimpses of the sea and some very interesting wildlife such as monkeys, wild boars, monitor lizards, goats, cows and buffaloes.

We stayed at a brand new bungalow overlooking the beach. In the mornings from our balcony, I could hear the chirping of birds, insects, cocks crowing in the distance and the sound of the waves as they lapped the beach. All this together with tall coconut trees surrounding our bungalow gave the place a serene atmosphere.

Lumba Lumba Diving Centre has been in operation for ten years now and has recently completed the last of seven new bungalows. They also have very ambitious plans to upgrade all the bungalows with air conditioning, hot water, wireless internet and even a new swimming pool.

It's an easy hop to the dive shop where the Acehnese dive masters love to hang out between dives. Out in front of the shop is a nice area where you can sit around to fill up your log book.

We went to Dangdangna Restaurant for breakfast, located just next door, where the resident top dog 'Cheeky' came over and sat under our table on the sand. I buried my feet in his nice fur and gave him a massage with my feet. He really loved it. Here, the food came in big portions and was very tasty, too.

CLOCKWISE FROM FAR LEFT: Elegant dartfish; Clownfish; Leaf scorpionfish; Longnose hawkfish; Fire dartfish; Acehnese children playing on the beach; Bungalows at Lumbalumba Diving Centre





The friendly donut lady

The owner of Dangdangna, Syukur, was the man who found the Megamouth shark lying on the beach. He actually wanted to sell the shark in the market and called Ton and Marjan to have a look. "We were surprised to find a shark with a big mouth and contacted scientists to help identify it," said Marjan. That shark later became the 21<sup>st</sup> confirmed sighting of the rare megamouth shark. In the end, Shukur was paid a finder's fee, and the shark is now



Loyal little customer

I was told that she managed to put her children through university just by selling her delicious donuts. She is somewhat of a celebrity here; it seems everyone survives on her donuts!

Gapang Beach is a very nice and quiet place. It's easy to relax here without being pestered by souvenir sellers. The only time it is noisy is during the weekends when locals and NGOs come for a break.

A pack of friendly dogs roam the beach everyday. The Muslim Acehnese are surprisingly very tolerant of the dogs and don't mind them one bit. Occasionally, the dogs will get into fights and disturb the peace, so we had to play policeman.

Mouthwatering donuts make a great snack after diving

in a museum near Jakarta.

Back at the resort, the donut lady comes over with her basket of freshly made donuts everyday.

As I ate my breakfast and admired the view of Sabang harbour in the distance, I could not but also admire a very ingenious invention made by our boatman. It was a simple but very effective boat landing system. Ropes were tied to the



Cheeky, the top dog

Lumbalumba's diveboats moored at the line

base of a large tree on the beach leading out 100m into the bay where they were anchored to a buoy. Whenever a dive boat needed to land, all the boatman had to do was tie the boat to metal rings at the bow and stern, ride along these ropes, and just back up onto the beach. This way, the boatman was able to land the boat in rough weather, at night and at different tides without damaging the corals. Brilliant!

### The house reef

The house reef was beautiful and had a lot of diversity in flora and fauna. It was a place with a varied landscape. Wading out from the beach along the line, it was recommended to wear booties, as stepping on the rocks was quite uncomfortable.

Heading straight out, we came across the resident Hawksbill turtle resting in the corals. Over at a sandy area, were garden eels. I swam over to some staghorn corals. From a distance, it looked like I had come across some swaying grass, but it was actually schools of razor fish dancing above the staghorns.

At a spot with an artificial reef ball and beer bottles, lived the resident ornate



Razorfish dancing in the staghorns



CLOCKWISE FROM TOP LEFT: Scorpion fish; Ornate ghost pipefish; Cockatoo waspfish; Portrait of a Scorpion fish; Peacock mantis shrimp; Batfish



Whip goby

ghost pipe fish. Scorpion and lion fishes loved to hang out here, too. Past a field of mushroom corals was a small coral outcrop teeming with fishes. It was pleasant just lying there looking at all the schools of juvenile snapper, cardinal fish, anthias, goat fish, trumpet fish and grouper.

Nearby, was a lone 3m long whip coral, the home of some whip gobies. Everywhere scorpion fishes and moray eels were quite common, and I spotted my first octopus. Since I started diving, the only octopus I had ever seen was the one connected to my regulator!

The day was coming to an end when we spotted an unusually large longhorn cowfish that was about to go to sleep. Ending the dive, we looked up at the darkening sky and saw huge bats flying as high as eagles. Very nice for a first dive...

On the second dive, we spot-



ted cockatoo waspfish doing their usual thing swaying in a make-believe surge. I also just managed to catch a glimpse of a comet longfin's tail just before it disappeared in some coral. Going back to the tunicate infested line, we saw some big sized needle fishes, sergeant majors and a juvenile spiny lobster.

Coming back for a night dive,

one can find the razor fishes sleeping among the staghorns and the very hairy red reef lobster that only comes out at night. Other than that, the house reef is also good for frog fish, sea moth and the elusive mimic octopus.

### Batee Tokong

This was a huge place; we only managed to explore one side of it. Batee Tokong was a round plateau with rocky slopes and walls.

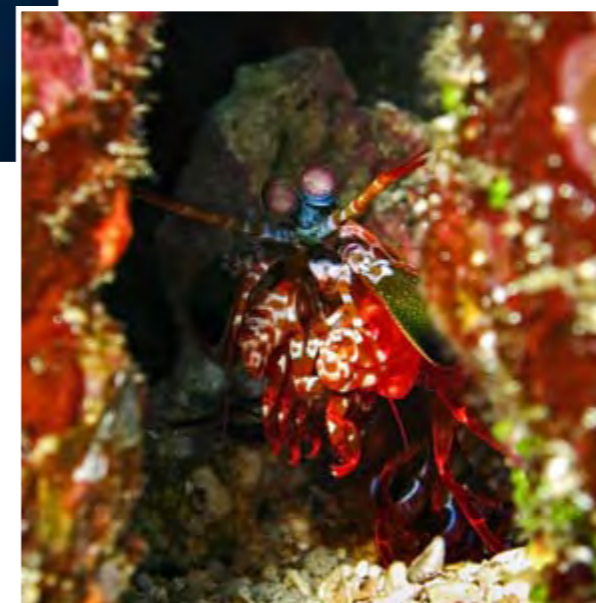
There were tons of fish here. It was like diving in bouillabaisse! Mostly anthias, red tooth trigger fish and fishes that love current, because this place tumbled like a washing machine. The current was very fierce, unpredictable and came from all directions making where you went all depend on the current's strength and direction.

There was even a place called Arus Paleh meaning 'bastard current' in the local dialect. A dive here, or at its close neigh-

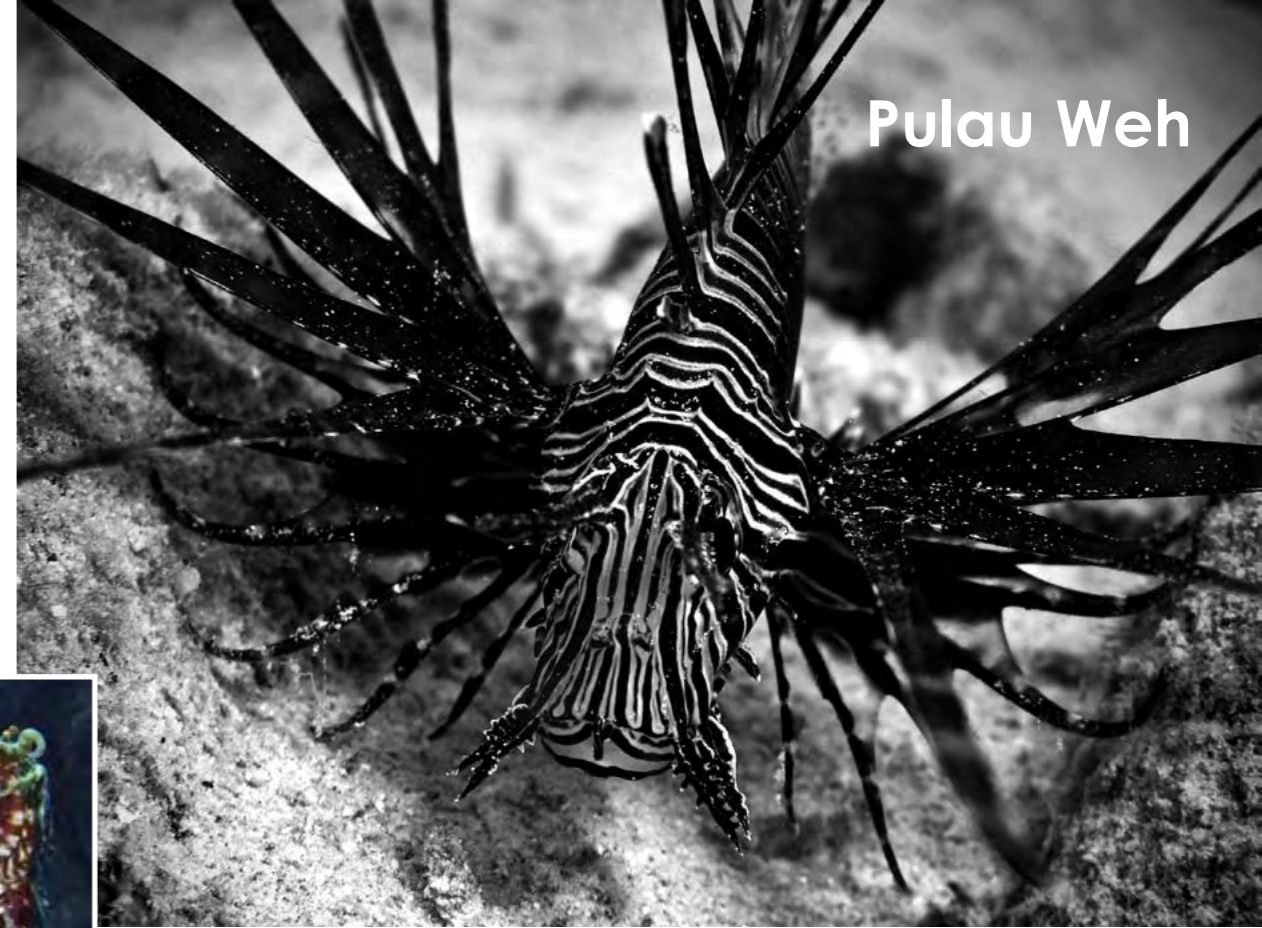


bor's, Rubiah North, will indeed make you come up swearing at the current. You will either love it or hate it. For me, it was the latter, because I usually dive only in mild currents.

And I couldn't help thinking that this would be a great place in which to lose your evil step mother. The surge was wild, and the fishes loved it. It was a trade off to see such variety and numbers, yet many a time, we would







Pulau Weh



have to fight the current to seek shelter and hold on for dear life. It was during this time that we discovered more fishes under the rocks: Squirrel fish, grouper, sweetlip and the occasional sting ray.



There were lots of freckled hawkfish sitting on green tree corals and fire gobies darting around on the bottom. Neon fusiliers and rainbow runners swarmed by like locust, while red tail butterfly fish

schooled in large numbers. It was also said to be the number one place to see morays, and it was absolutely true. You could find all sorts of species here, such as white eye, giant, spot face, honeycomb, snowflake, whitemouth, zebra and yellow margined. Every other nook and cranny had at least one moray. Under rocks and ledges one may even find two or three of them. And they were all manned by big-sized, well-fed cleaner shrimp.

And if there were lots of morays, one would find lots of their favorite prey as well—octopus. This place should have been renamed 'Octopus Garden' after that Beatles' song.

### The Canyon

Another great site was the Canyon. It had a unique topography that, not surprisingly, looked like a canyon! Divers usually started at the southern end of big black boulders. The



CLOCKWISE FROM FAR LEFT: Anthias schooling above giant clam; Red reef lobster; Cuttlefish; Lionfish; Hawksbill turtle; Yellow featherstar



CLOCKWISE FROM BOTTOM LEFT: Artificial reef ball at Gapang house reef; The funnel of the tugboat wreck; Underwater hotspring; Serene Gapang Beach; Ubiquitous scorpionfish; Sleeping parrotfish

terrain sloped down to a lot of small rocks and finally to a sandy bottom beyond 30m. Here, the anthias started to school. This time there wasn't much current, but the water clarity was very good.

Heading west, then turning north at the corner, we found a wall that

went down to 50m. At 30m, there was a small cave, and if one shined one's light into it, one could see soft corals and big snappers hiding there. At the bottom was an excellent dense sea fan garden, and divers could spot the special blue variety.

Back to the wall, the fishes started to thicken in numbers until one got that diving in bouillabaisse feeling again. Here, that slogan, "Dive in crowds of fish, not in crowds of divers" really came true.

The colors started to come alive as the fishes danced in the unpredictable current along a wall that was festooned with sponges, tunicates and feather stars.

Scorpion fishes sit on the ledges here, so be careful.

One façade was even blanketed with blue and white little soft corals that made it look like it had just snowed.

On the top, we found schools of yellow goat fish, all sorts of trigger fish, barracuda and star fishes.

The 25-minute boat ride back to the dive shop gave us the opportunity to talk about one big Napoleon wrasse that came only an arm's length from our masks.

Suddenly, it started to rain heavily, and my buddies who had stripped down to their bikinis were shivering from the freezing wind.



As we approached the beach at Lumba Lumba, we saw a scene that could only be described as mystical. We could see the trees at the water's edge, but beyond

it, everything was foggy, obscured by the rain and clouds, and the water had changed to an emerald green. The whole scene looked like a dream, like the misty banks of a lake in winter, and this was the tropics!

As the boat backed up along the line, it was a magical moment. It was truly beautiful, and at the same time, mystical. As suddenly as this scene appeared before our eyes, it disappeared when the rain





Pulau Weh

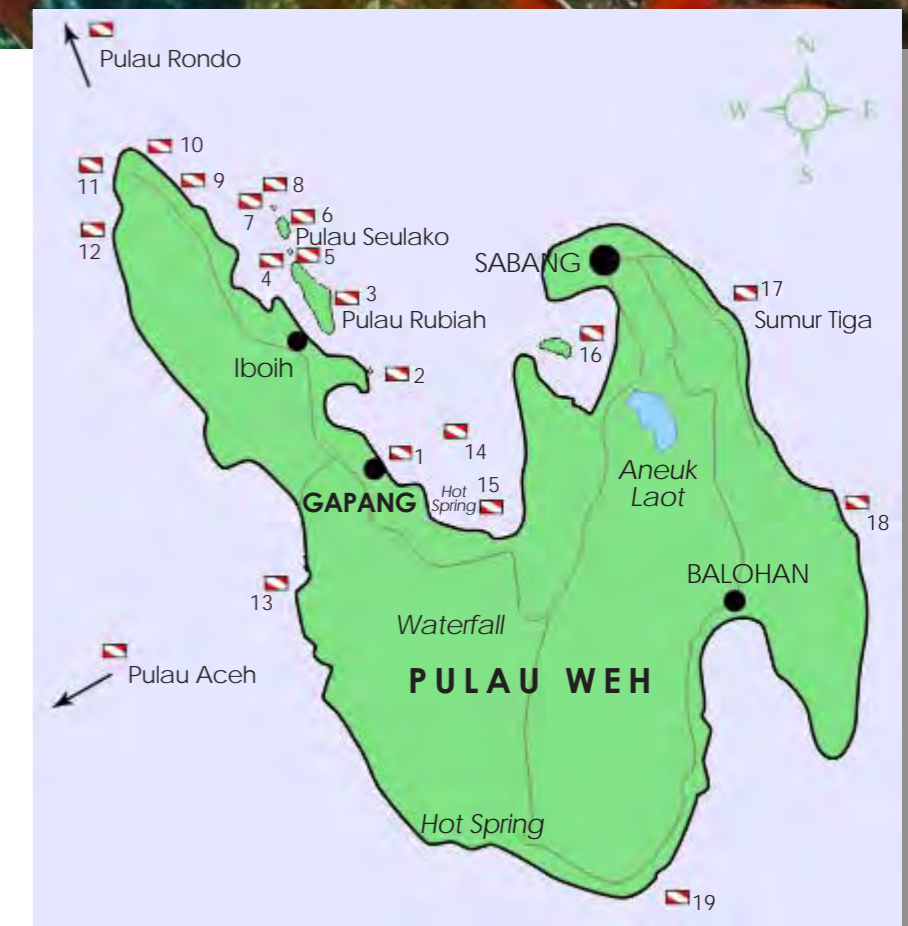
abruptly stopped and the fog lifted. It left a lasting impression in our minds. We saw something really beautiful, and we felt fortunate.

aft deck was the hunting ground of numerous pipe fishes and groupers hid in the open holds. On the top, trumpet fishes swam along the line that led to the buoy. Around the keel, one could find scorpion fish, and on the muddy bottom, lizard fish waited for prey.

### Tugboat wreck & underwater hot spring

In Sabang bay, lying perfectly upright in 14m of water was the wreck of a tugboat. It was surprisingly in very good condition with little coral growth. The 17m long wreck made a very relaxing and easy wreck dive in very clear water with no current at all. Believed to have sunk in the 1970s, this wreck was teeming with fish.

Congregations of striped large-eye bream, anthias and damsel fishes could be seen inside and around the wheelhouse. The



PULAU WEH SITES: 1) BATEE DUA GAPANG; 2) BATEE MEURORON; 3) RUBIAH SEAGARDEN; 4) RUBIAH UTARA; 5) ARUS BALEE; 6) SEULAKO'S DRIFT; 7) BATEE TOKONG; 8) SHARK PLATEAU; 9) PANTEE IDEU; 10) BATEE GLA; 11) PANTEE ANEUK SEUKE—THE CANYON; 12) PANTEE PEUNATEUNG; 13) LHONG ANGEN & PANTEE GUA; 14) LIMBO GAPANG; 15) WW II WRECK SOPHIE RICKMERS; 16) WRECK TUGBOAT & UW HOTSPRING; 17) SUMUR TIGA; 18) ANOI HITAM; 19) BATEE MEUDURO



CLOCKWISE FROM ABOVE: Banded cleaner shrimp; School of juvenile snappers; Barrel sponge and Anthias; Squirrel fish; Dive map of Pulau Weh; Giant moray eels and cleaner shrimp



Pulau Weh

LEFT TO RIGHT: Diver and Sea fan; Nudibranch; School of barracudas



A dive to this wreck is usually followed with a dive to one of Pulau Weh's most unique sites. In Pria Laot Bay, there is an underwater hot spring. One cannot escape the unmistakable smell of sulphur as the gas bubbles break the surface of the water.

Underwater, the terrain was

a featureless shallow slope of black sand no deeper than 10m. Bubbles came out from the sandy bottom in steady fast streams to the surface.

Some divers said it looked like a jacuzzi, but I likened it to a boiling kettle. In large holes, the bubbles emerged violently, and

it was possible to feel the heat with one's hands. It was also very surprising to find Moorish idols and goat fish happily swimming around the bubbles. A truly unique diving experience.

**Pantee Peunateung & other sites**

Located on the western side of the island and just next door to the Canyon, Pantee Peunateung or Rice Paddies, was another favorite of divers. The terrain here was interesting, but the Canyon was much better. Nevertheless, this place was special as it was famous for its big pelagics.

Another group of divers reported dropping down into a school of barracudas and swimming through a massive school of a few hundred big eye trevallies. Then a friendly turtle got really close to the divers, while a giant Napoleon

wrasse swam by. If that wasn't good enough, they were then greeted by some ten mantas!

On the way back, they spotted an odd-looking fin on the surface. It turned out to be a Mola Mola! Talk about luck.

If you want a more relaxing dive with less current, then Rubiah Sea Garden is a good bet. The main attractions here are the very big-sized honeycomb morays and beautiful red bubble anemones. We even saw a honeycomb moray with a twisted jaw. There was also a very friendly Hawksbill turtle, which had apparently been hand fed, because it was always going after someone's fingers.

For experienced deep divers and wreck buffs, there is the impressive German WWII cargo ship *Sophie Rickmers*, which is also located in Pria Laot Bay. It

was scuttled by her own crew to avoid Dutch capture.

The story goes that while her captain was entertaining the Dutch with drinks onboard, his crew was busy making holes in the hull, and that's why it sits upright on the bottom in more than 55 metres of water. This 134m long wreck is the home of large schools of bat fish and a gigantic grouper. A megamouth shark was also spotted here, so keep your eyes sharp.

**Conclusion**

It's very refreshing to visit a great dive site that is in the opposite direction from the current diving hot spots of Indonesia such as Raja Ampat, Manado, Ambon

and Bali—all of which are located in the east while Pulau Weh is located in the west.

Coming to dive in Aceh helps its economy and reconstruction from the devastating effects of the tsunami.

Overall, the diversity and density of life in Pulau Weh is stunning; the reefs are very pristine and the colors are richer than Sipadan Island's. I'll definitely be back. ■



Crab on the beach

# fact file



## Indonesia



SOURCES: ANDY FERRARI, US CIA WORLD FACT BOOK, STARFISH.COM



LEFT: Location of Pulau Weh on regional map of Aceh, Indonesia  
BELOW: Global map with location of Aceh in Indonesia



**History** In the early 17th century, the Dutch began to colonize Indonesia. From 1942 to 1945, the islands were occupied by Japan. After Japan's surrender in World War II, Indonesia declared its independence, but four more years passed mired by recurring hostilities and intermittent negotiations before the Dutch relinquished its colony. Indonesia is the largest archipelagic state in the world. It is home to the world's largest Muslim population. Current issues include: poverty, terrorism, strengthening democracy after 40 years of authoritarian rule, financial reforms, corruption, human rights violations by military and police personnel, and avian influenza. Indonesia reached a historic peace agreement in 2005 with armed separatists in Aceh. It led to democratic elections in December 2006. Indonesia must continue to confront a low intensity separatist guerilla movement in Papua. Government: republic. Capital: Jakarta

**Geography** Indonesia is located in Southeastern Asia. It is an archipelago between the Indian Ocean and the Pacific Ocean, which consists of 17,508 islands, of which 6,000 are inhabited. Indonesia straddles the equator. It has a strategic location along major sea lanes from the Indian Ocean to the Pacific Ocean. Terrain is mostly coastal lowlands with interior mountains on the larger islands. Lowest point: Indian Ocean, 0 m. Highest point: Puncak Jaya ,5,030 m. Coastline: 54,716 km. Natural hazards: floods occasionally, severe droughts, forest fires, tsunamis, earthquakes, volcanoes. Environmental issues: deforestation; water pollution from sewage and industrial wastes, urban air pollution in, smog from forest fires. Indonesia is party to the following international environmental agreements: Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands

**Economy** Indonesia is a vast polyglot nation and has struggled to overcome the Asian financial crisis. It still struggles with persistent unemployment and poverty. It has inadequate infrastructure, corruption, a weak financial sector,

poor investment, and unbalanced resource distribution among regions. The country continues to gradually recover and rebuild after the devastating December 2004 tsunami as well as from an earthquake in central Java in May 2006 that caused damages and losses over \$3 billion. The current administration faces declining oil production, lack of new exploration investment, subsidized domestic fuel straining the budget in 2005, weak monetary policy, a run on the currency, a 126% average fuel price hike, lack-luster growth through mid-2006, heavy increases in rice prices, increase in people under the poverty line. Economic reforms aim to improve the investment climate, infrastructure, and strengthen the financial sector. There has been progress in rebuilding Aceh after the 2004 tsunami. Aceh now shows more economic activity than before the disaster. Unfortunately, Indonesia suffered another tsunami in South Java and major flooding in Jakarta in 2006-7 causing billions of additional dollars in damages.

**Climate** tropical; hot, humid; highlands are more moderate in climate

**Population** 245,452,739 (July 2006 est.) Internet users: 16 million (2005). Ethnic groups: Javanese 45%, Sundanese 14%, Madurese 7.5%, coastal Malays 7.5%, other ethnic groups 26%. Religions: Muslim 88%, Protestant 5%, Roman Catholic 3%, Hindu 2%, Buddhist 1%, other religions 1% (1998)

**Currency** Indonesian rupiah (IDR). Exchange rates: 1EUR=13,645 IDR, 1USD=9,235 IDR, 1GBP=17,120 IDR, 1AUD=8,022 IDR, 1SGD=6,536 IDR

**Language** Bahasa Indonesia is the official language and is a modified form of Malay. Other languages spoken: English, Dutch, local dialects (Javanese is most common)

**Health** Be prepared. Get your shots before you go to Indonesia. There is a high degree of risk for food or waterborne diseases including bacterial and protozoal diarrhea, hepatitis A and E, and typhoid fever. There is also a risk for vectorborne diseases in some locations. These diseases include dengue fever, malaria and chikungunya. Bird flu, or highly pathogenic H5N1 avian influenza, has been identified among birds in Indonesia. It poses a very low risk, but check with your doctor before you go.

**Decompression Chambers** JAVA, Jakarta: Rumah Sakit Angkatan Laut (Navy Hospital) in Jl. Bendungan Hilir No.17, Central Jakarta

MALAYSIA, Lumut (near Pangkor Island): Department of Diving and Hyperbaric Medicine of the Armed Forces Hospital Lumut Naval Base. Phone: 05 - 683 7090 ext 4071

SINGAPORE: The Singapore Naval Medicine & Hyperbaric Center Phone +65-750 5546

### Web sites

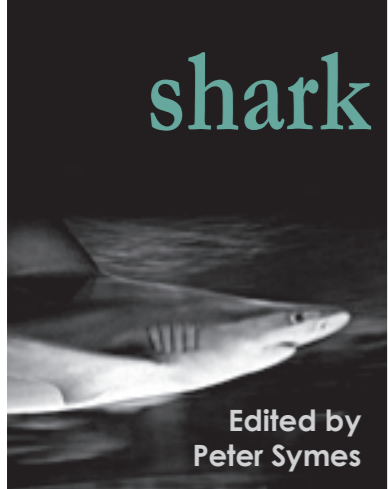
- Lumba Lumba Diving Centre [www.lumbalumba.com](http://www.lumbalumba.com)
- Indonesia Tourism [www.indonesia-tourism.com](http://www.indonesia-tourism.com)
- Indonesia Tourism [my-indonesia.info/indexpromo.php](http://my-indonesia.info/indexpromo.php)
- Tourism Indonesia [www.tourismindonesia.com](http://www.tourismindonesia.com) ■



Cool and comfy bungalow at Lumbalumba Diving Centre



Local kids lead a carefree life



Edited by Peter Symes

# New Species of Manta Ray Discovered

Until recently, it was thought that there was only one manta ray species, but now a second, and possibly a third, species of manta ray has been discovered in the world's oceans. After five years of study, a marine biologist has confirmed that a larger and more elusive manta is in fact a distinct species.



The newly-discovered larger, migratory manta ray

ANDREA MARSHALL

This is the biggest news to date to come out of ray research, and its importance is the marine equivalent of discovering an unknown species of elephant. The discovery however, has implications that go far beyond the breaking news of scientific journals, as it will deeply affect real world conservation ideas and policies.

For the past five years, the Save Our Seas Foundation (SOSF) has sponsored Andrea Marshall, a PhD marine biologist in a quest to make advances in the scientific knowledge of these winged beauties of the sea, whose large triangular pectoral fins can span almost 8m in width and whose weight can reach over 2000kg. Manta rays, which are totally harmless and do not possess a stinging barb, are the largest of over 500 different species of rays and skates, and although divers have noted variations in physical appearance, they were previously believed to be the same kind. ■

The discovery of two distinct species of mantas has huge implications for the conservation management and protection of these mysterious gentle giants. The larger, ocean wanderer knows no borders, making collaboration between countries on its protection essential, whereas protective measure within countries must be enforced to avoid resident manta ray populations crashing. Habitat degradation, harassment by boat traffic and even divers who interact with them at critical habitats such as cleaning stations and breeding areas are other threats that these graceful animals face. They also fall victim to ghost nets and are killed alongside many other marine creatures as by-catch. ■

## A magnet a day...

In what is claimed to be a world-first, scientists from the Department of Primary Industries and Fisheries at James Cook University have shown magnets can repel sharks. It is hoped the magnets will keep sharks out of fishing nets. The researchers do not believe the magnetic repulsion will prevent shark attacks on people. ■

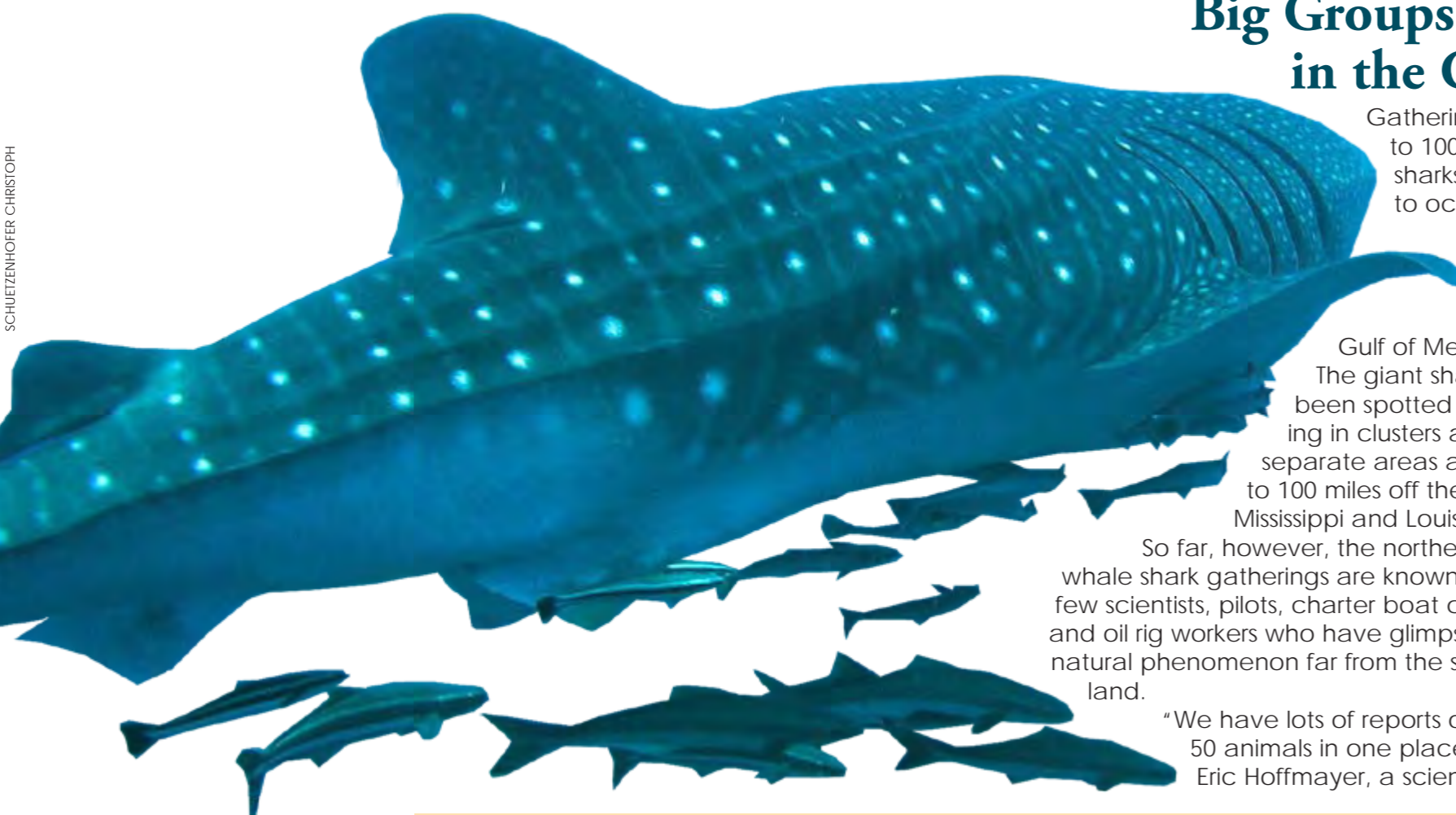
## Google finally bans advertising for shark products

Google AdWords has implemented a new policy regarding endangered or threatened species, including sharks. Advertising is not permitted for products obtained from endangered or threatened species. This includes, but is not limited to, the sale of products derived from elephants, sharks, tigers, whales, rhinoceroses, or dolphins. ■

## Megalodon bite

The Carcharodon megalodon super-shark swam in the oceans more than a million-and-a-half years ago. It grew up to 16m (52ft) in length and weighed in at 100 tonnes—30 times heavier than the largest Great White shark—and must have been one of the most formidable carnivores to have existed. It is estimated to bite down with a force of between 10.8 to 18.2 tonnes. ■

# Big Groups of Whale Sharks Congregate in the Gulf of Mexico



Gatherings of up to 100 whale sharks seem to occur with clockwork regularity in the northern

Gulf of Mexico. The giant sharks have been spotted feeding in clusters at three separate areas about 40 to 100 miles off the coasts of Mississippi and Louisiana.

So far, however, the northern Gulf whale shark gatherings are known only to a few scientists, pilots, charter boat captains and oil rig workers who have glimpsed the natural phenomenon far from the sight of land.

"We have lots of reports of 30 or 50 animals in one place," said Eric Hoffmayer, a scientist with

the University of Southern Mississippi's Gulf Coast Research Laboratory in Ocean Springs. "They are obviously gathering for a reason. But right now, we are not sure what that is, or how they know to show up at these spots."

He theorizes the big sharks get together in the northern Gulf to dine on massive concentrations of fish eggs; bonita, skipjack and tuna spawn in the area. Occasionally, the sharks feed vertically, which means they stop in one spot and angle their bodies at 45-degrees, sucking in water near the surface and hoovering in their tiny prey. The gatherings could somehow be connected to whale shark aggregations near Holbox, which occur at roughly the same time of year.

The Holbox whale sharks have spawned a booming ecotourism business for the small island, where fisherman have a business of bringing tourists offshore to snorkel with the gentle giants. Whale shark aggregations also have created ecotourism businesses in Australia, the Philippines, Belize and a few other locales. ■

# New found hope for porbeagle sharks

Scientists have discovered a new breeding ground for porbeagle sharks off Canada's East Coast, giving hope to a species whose numbers have been steadily declining all over the world. The find of the new mating area on Georges Bank makes it only the second known breeding ground in the Northwest Atlantic.

A research team located the mating area earlier this month after hearing reports from fishermen that they were hauling up the large, blue-grey sharks in their nets.

Researchers set two lines near the northern edge of Georges Bank, a rich scallop and groundfish fishing ground almost 500 kilometres from the Nova Scotia coast. Within an hour they pulled in 21 sharks—19 of which were large, mature female porbeagles that weighed 200 kilograms each and were about two meters long.

"This is really good news," said Steve Campana, a marine biologist who specializes in the species and heads the Canadian Shark Research Laboratory at the Bedford Institute of Oceanography in Halifax. The Committee on the Status of Endangered Wildlife in Canada recommended the porbeagle be designated as endangered in

2004, but the federal government didn't act on the recommendation.

"To have a second mating ground where they actually seem to be more abundant is great news. It is key toward conservation efforts."

Campana suspects there might be hundreds, if not thousands of sharks in the area. Canadian Fisheries managers are now reviewing the latest find to determine whether the area should be closed to shark fishing to stave off another collapse in the population.

"The discovery of the second mating area which is totally unregulated is of concern. Nobody wants to fool around with this one. We want them to recover, and everything we've seen so

*To have a second mating ground where they actually seem to be more abundant is great news. It is key toward conservation efforts.*

Porbeagles are fast sharks that can reach almost four meters in length

far indicates they are, but it's going to take a long time."

The porbeagle fishery is worth an estimated US\$2 million annually on the East Coast, with 90 percent of it going to markets in Boston. The porbeagle population reached dangerously low levels in the mid-1990s, when

quotas soared to 1,500 tonnes in the Atlantic region versus today's catch allowance of 185 tonnes. It's estimated that there are about 190,000 porbeagles in Canadian waters—putting the stock at about one quarter of its level in 1961 when the fishery first started. ■

## Blue sharks are off the hook because they taste yucky

A recent study on western North Atlantic blue sharks has found out that they escape being hunted because their taste is not liked by consumers in North America. While most other species of sharks are experiencing dramatic population declines of up to 90 percent, new reports estimate that populations of blue sharks have dropped by only 30 percent since the mid 1950s, when large scale fishing practices began in that part of the Atlantic.

A study conducted by Alexandre Aires-da-Silva, John Hoey and Vincent Gallucci from the School of Aquatic and Fishery Sciences at the University of Washington,

Seattle, concluded that blue sharks appear to be most vulnerable to swordfish fishing gear, which have hundreds to thousands of baited hooks hanging from a single line. The lines are deployed at shallower depths at night after dusk, when the sharks feed.

Blue sharks sometime become by-catch, but since blue shark meat has historically been regarded as unpalatable due to its soft texture and strong odor of ammonia, targeted fisheries did not develop," explained Aires-da-Silva.

Two other factors also seem to have helped the shark. The first is that they are

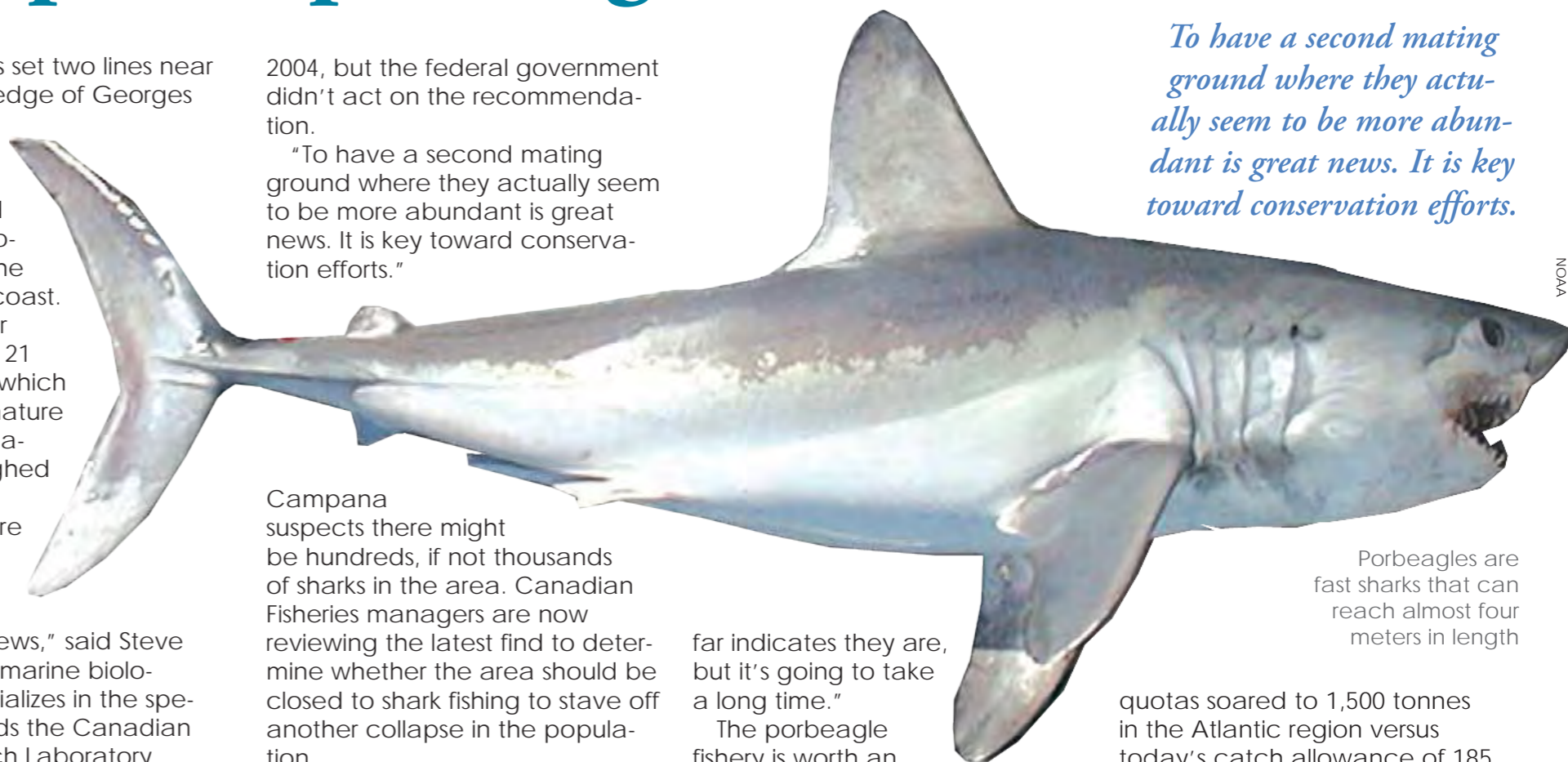
rather hearty fishes and often survive after being caught on a long line. The second is that blue sharks are among the most productive shark species in the world, with females producing an average of 37 pups per litter, with some litters numbering 80 pups or more.

"These pups can nearly double their size over their first year of life to increase their chances of survival," said Aires-da-Silva, adding that it "is not a coincidence that the blue shark has often been described in the scientific literature as the most widespread and abundant of the pelagic sharks in the world's oceans." ■

## Volunteers asked to count basking sharks off Cornwall coast

The Seaquest Basking Shark project is being run by the Cornwall Wildlife Trust (CWT) and SeaWatch, who will set up shark spotting points at two locations off the Cornwall coast. Basking sharks are the second largest fish in the world, and the collected information can help establish details about their behavior and raise public awareness of the giant fishes and the threats they face.

Tom Hardy, marine conservation officer for CWT, said a number of marine life surveys have been carried out before, but this is the first specifically for basking sharks. "The project is important because basking sharks are a protected species and we know very little about them. [www.cornwallwildlifetrust.org.uk](http://www.cornwallwildlifetrust.org.uk) ■



NOAA

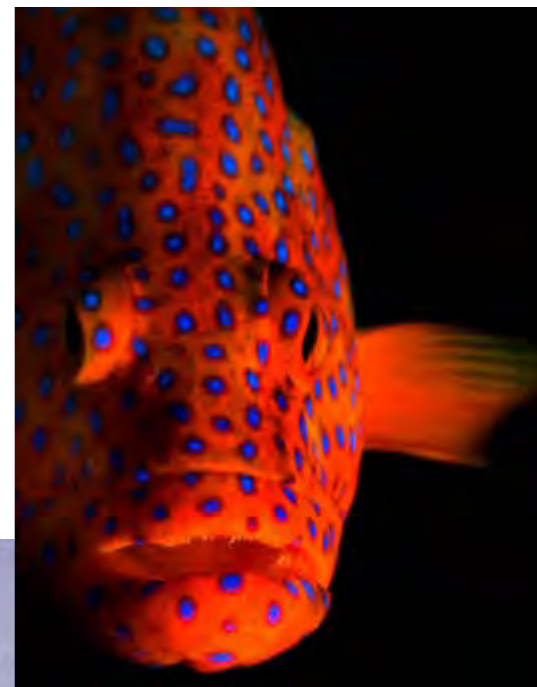
NOAA





# Success Stories in Troubled Waters

Text by Arnold Weisz



Coral trout (*Plectropomus leopardus*) on the Great Barrier Reef, Australia. Photo: Michael T. Gallager

**The race to save animal species from extinction is as important as ever before. There are still many threats to a growing number of animals, but there are also some success stories. Animals on the brink of extinction have rebounded.**

Marine protected areas have proven to allow threatened fish stocks to recover and to increase the fishing yield in adjacent areas. In the Egyptian Red Sea, five years after the establishment of marine reserves, fishing has increased by 66 per cent in neighbouring areas. Conservation is not an empty word, it actually helps. Even though the list of threatened marine species continue to grow, there are some remarkable success stories of the recovery of animal populations once threatened by extinction.

## Coral trout comeback

Dramatic evidence that protected fish populations can bounce back rapidly from the impact of years of heavy fishing has been obtained by a team of marine scientists

Goliath groupers can reach a maximum length of approximately eight feet, weigh up to approximately 880-pounds and can live for more than 35-years. Photo: NOAA

working on Australia's Great Barrier Reef (GBR). Researchers report a spectacular recovery in coral trout (*Plectropomus leopardus*)—also called common coral trout or Leopard trout—numbers on unfished reefs. A team led by Professor Garry Russ of the ARC Centre of Excellence for Coral Reef Studies and James Cook University, Dr Hugh Sweatman of the Australian Institute of Marine Science and supported by the Australian Government's Marine and Tropical Sciences Research Facility (MTRSF), has

found coral trout numbers rebounded by 31 to 75 per cent on a majority of reefs, which had been closed to fishing for as little as one and a half to two years. This come back of the coral trout came as a result of an imposition of a strict no-fishing policy across 33 percent of the total GBR area in 2004. Coral

trout species are the main target species for reef line fishers along the Queensland coast from the Eastern Torres Strait in the north to the Capricorn Bunkers area in the

south. Coral trout are the favourite target fish for all sectors of the fishery because they are a good eating fish and collect good market prices.







Northern elephant seal (*Mirounga angustirostris*)  
Photo: Joe Martin / U.S. Fish and Wildlife Service

LEFT INSET: A female lounging in cool damp sand in the Monterey Bay National Marine Sanctuary.  
Photo: Robert Schwemmer, CINMS, NOAA

sale in the 1800s for the oil that could be rendered from their blubber. In the late 1890s, it was estimated that only 50 to 100 individuals were left. The only remaining colony was on the Guadalupe Island off the coast of Baja California. The Mexican government was slow to react, but was the first to give protected status to elephant seals in 1922. The US government followed suit a few years later when the seals began

to appear in Southern California waters. Since that time, elephant seals have continued to multiply exponentially, and they have extended their breeding range as far north as Point Reyes. Today, there are approximately 160,000 northern elephant seals.



Northern elephant seal- Battle-scarred male veteran of many a harem war.  
Photo: Robert Schwemmer, CINMS, NOAA. Photo: Joe Martin / U.S. Fish and Wildlife Service. TOP Photo: Robert Schwemmer, CINMS, NOAA

### 100 individuals left

Another dramatic success story is the survival of the northern elephant seals (*Mirounga angustirostris*). Hundreds of thousands of northern elephant seals once inhabited the Pacific Ocean from Baja California, Mexico to the Gulf of Alaska and Aleutian Islands. They were slaughtered whole-



## Success Stories

### Recovering, but still endangered

Another example which yet can't be called a success story, but shows that protection can help to save a species from extinction. The Goliath Grouper (*Epinephelus itajara*) populations in the eastern Gulf of Mexico are still on the IUNC Red list as Critically Endangered, but showing good signs of recovery. Intense fishing pressure by recreational and commercial fishing contributed to the population declines of goliath grouper. Goliath grouper is the largest of the western north Atlantic groupers. It can reach about 455 kg / 800 lbs and over 2m total length. Their slow growth, longevity, and large size at sexual maturation make them especially susceptible to overfishing.

All harvesting of the Goliath Grouper in federal waters of the south-eastern United States (including the Gulf of Mexico) has been prohibited since 1990 by the South Atlantic Fisheries Management Council and the Gulf of Mexico Fisheries Management Council, and in the Caribbean since 1993 by Caribbean Fishery Management Council.



LEFT: Grouper distribution map. FAR LEFT: Live large groupers such as *Epinephelus corallicola* and *Plectropomus leopardus* were common in this Hong Kong fish market. Photo: Julie McGowan, Timana Photography, 2006 / Marine Photobank

According to IUCN, it has been indicated that the ban on spear-fishing in the upper Florida Keys has significantly and beneficially influenced the average size of groupers, although their populations in this region have not reached stable levels.

A study by Southeast Fisheries Science Center from 2003, indicates that the U.S. goliath grouper population has a about 50 percent chance that the population will have recovered to by 2006 and about a 95 percent chance that it will recover by 2012.

### Not too late

The International Union for the Conservation of Nature (IUCN) has identified more than 16,000 species threatened with extinction. The risk of extinction for many species may have been seriously underestimated, according to new research published in the journal Nature. Well known studies also show that all species matter.

Because too many species in a region become extinct or are too low in numbers, the ecosystem itself unravels. According to researchers there is still time to reverse the trend, the but only if quick action protects depleted species more effectively and saves ocean habitats by creating new marine reserves. ■

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Tailgating the lone dugong, KAT, on Cocos (Keeling) Islands. Photographed by Karen Willshaw ~ underwater.com.au member

pearls of the  
mediterranean



**I made up my mind quite a long time ago about whether or not I should entrust you with one of my favourite holiday destinations. Tamariu is not like any other small port town in which one can swim, dive and eat well. No! Tamariu is my little secret, and I share it already with quite a lot of other insiders. But if you like, I will initiate you now.**

I cannot describe in just a few words why Tamariu counts as one of the loveliest places I have ever visited in my life. It is not just the smell of the pine woods and cypresses, the mild climate and the wild, cleft coast that hides probably the best dive sites of the Mediterranean Sea under the surface of the water, Tamariu is a small pearl that has

preserved its original face in the midst of the big tourist centres of Spain's Costa Brava for over six decades. Tamariu still looks like a small fishermen's village. There are no big tourist resorts or hotels, and it still combines the advantages of a uniquely beautiful diving area with the original charm of the "wild coast". The German diver, Günter Stollberg, founded his dive centre in Tamariu 37 years ago. Since then, he has offered dive trips to nine dive sites that belong to some of the best of what the Mediterranean Sea has to offer.

"Stolli" (Stollberg's nickname) gives his divers a high degree of personalized service, up-to-date dive technology, and well cared for state-of-the-art equipment. His dive base provides a fresh water rinse shower as well as an easy on-site storage of gear. *Gabriela*, the 75-year-old diesel engine-powered dive boat, is a 30-foot former Spanish fishing boat that can

Over and under water Tamariu offers awesome perspectives—the picturesque bay is one of the loveliest on Costa Brava, and the reefs are lusciously carpeted with gorgones

Text by Harald Apelt. Photos by Maria Pichlmaier and Günter Stollberg



# Tamariu • *A Hidden Secret*

# pearls of the mediterranean

## Tamariu

COUNTER-CLOCKWISE FROM LEFT:  
The sandy beach of Tamariu is not very crowded outside the main tourist season. Big swarms of Anthias are patrolling the reefs, Mediterranean moreys and Seahorses are not so easy to find



also be operated under sail while taking a maximum of 15 divers per dive tour. She is dedicated to exploring nine different dive sites close by which present the usual varied population of marine life found in the Mediterranean.

It's only 30 metres away from the dive center to the little pier where divers can start their dive expeditions at the house reef with a very comfortable

entrance and submerged depths between 5-15 metres of depth. The highlight—the sea horses—are difficult to find, but Stolli's partner, Ade, has eyes like an eagle and is one of the best guides for discovering sea horses.

Scorpion fishes, Octopuses, Sepias, Groupers, Conger and Morays can be seen while diving at Tamariu.

There are two dive sites that are the favorites of Stolli and his team. The Tamariu reef with its Spanish name "Cala Nova", is probably one of the most exciting dive spots on Costa Brava. The reef has five parallel running gulches; they are various in width and covered excessively with Gorgones and Zoanthids. Groupers of all dimensions, crawfish, swarms of breams and Barracuda can often be seen here, and for observers of "small" things and macro photographers, nudibranchs in all kinds of colors and forms can be seen. The reef begins with 12 metres of depth and goes down to 40 metres.

The second highlight Stolli offers is the "Furio Fito de Begur". The reef looks like a big plateau and begins on approximately 14 metres of depth. On the north side is a drop-off wall, which is covered with Gorgones. The wall drops 42 metres vertically down. To the east of the drop off is the second reef, formed like a sugar loaf. This one begins at 25 metres. Between both reefs are big lobsters, which hide in the depths. On the plateau there are numerous Morays and a lot of Octopuses. Under overhangs and in fissures, one can regularly see Congers, Fork beards and splendid Scorpion fishes.

In April and May, the rare John Dory (*Zeus Faber*) can be observed, and in May-June, sunfishes can be seen quite often sleeping on the surface in the sun.

And after diving activities, divers can enjoy the fine, clean stretch of the sandy beach dotted with little shops and a handful of restaurants and tapas bars where the typical Catalan cuisine of the region is celebrated. The crew of Stolli's dive center will offer you a distinct and fulfilling atmosphere—both below and above the waterline.

### Travel information

Tamariu is situated in the northeast region of Spain, just 80 kilometres south of the French frontier. It lies in the centre of the Costa Brava. The capital of this region is Girona, an old city whose old mediaeval centre is worth a visit. Costa Brava starts in the north at the French border at Port Bou and runs down to Barcelona, the capital of Catalonia.

Costa Brava is not an all-year destination. Although it has the mild Mediterranean climate most of the year, the really cosy times start in the beginning of May. The tourist season finishes at the end of October. Sometimes



# pearls of the mediterranean



## Tamariu

“Come and see us!” Stolli, Mary and Tom and Ade are proud to offer individual service and a very friendly atmosphere

the “Tramuntana” brings windy or even stormy days. That’s why you should bring along a pullover and a windbreaker, especially early in the season. April and May normally are good months for diving. During the main season in July and August, the diving centres are empty, but the beaches are overcrowded. Another reason not to go there in these months is that all the bays look like parking lots in front of a football stadium because they are occupied by hundreds of sport boats that bob up and down on their buoys in the water. No space for swimming.

Stolli’s dive centre is open from Easter to the end of October. Stolli’s team can give you a hand in finding an apartment, house or hotel room.

The best time for diving is April until mid-June and September through October. Water temperatures start at 13°C in April, but soon get warmer. In April until mid-June, a dry suit is comfortable, a semi dry suit is okay, and wet suits are only for the really rugged types. During the main

season and late-summer, the water temperature reaches 23°C to 24°C. The security system of the dive centre works perfectly. Decompression chambers are located in Palamos—only a few kilometres from Tamariu and Barcelona.

By car on the highway, take the “Autopista del Mediterrani” leaving Girona-Nord, follow the C66 to La Bisbal and Palafrugell. In Palafrugell-Montras, turn left into Avinguda de Espanya. After 2km, turn right into Carrer de Bruguero (GIV-6542) heading to Tamariu. After 2.5km, follow GIV-6542 on the left side into Carrer de la Perica until you reach Tamariu centre.

Two airports are close to this region. Girona airport is only served by some carriers such as Ryanair. From Girona airport, a bus shuttle drives to the coast. Barcelona International Airport is about 100 kilometres away from Calella de Palafrugell. The bus ride from Barcelona (Estació del Nord) to Palafrugell takes two hours and cost 15 Euro. More information and

timetables can be found at [www.sarfa.com](http://www.sarfa.com).

The best way to reach the destinations and have mobility during the visit is to rent a car. Cars can be rented directly from Barcelona’s airport with really good terms, for example, one week in May starts at 119 Euro.

A mid-class car (Peugeot 107) rents for 159,50 Euro including insurance and unlimited kilometres for seven days at [www.carbookers.com](http://www.carbookers.com).

for 159,50 Euro including insurance and unlimited kilometres for seven days at [www.carbookers.com](http://www.carbookers.com).

### What you must see

Of course the medieval cities of Pals and Peratallada are a must-see. If you are interested in the arts you should do the trip to Cadaqués. It’s another lovely pearl close to the French border. The famous painter, Salvador Dalí, lived there. You can visit his house in the little bay of Port Lligat and see a set of fishing huts that Dalí renovated. It is here where he based his summer home and workshop. The estate has a maze-like structure with different areas on different levels where Dalí’s furniture and personal objects are preserved. (book reservations beforehand). If you stay for a night and are still interested in good diving in Cadaqués, you’ll find the dive centre of Ulla and Paul Bräutigam right next to the Dalí house. The diving centre offers dive trips to the fantastic dive spots of the national park of Cape de

Creus ([www.ullaundpaul.de](http://www.ullaundpaul.de)). On the way back to Tamariu, you should visit the Dalí museum in Figueres, Dalí’s hometown. The museum is located in an old theatre, and it is here where the first works of the famous painter were shown to public. Dalí himself restored the building in 1960. It had been bombed and destroyed during the Spanish civil war. It re-opened its doors to the public in 1974. After his death on January 23, 1989 in Girona, Dalí was buried in his hometown of Figueres in the crypt of his museum.

Check out La Bisbal. It’s a city you will pass on your way to Tamariu anyway, and you will immediately be caught by its unique presentation of the fine art widely produced here. From the moment you reach the first

house on the main road of the town, you will recognize that La Bisbal is one of the biggest pottery centres in Catalonia. Thousands of pottery products and ceramic artworks are displayed directly on the main road—an invitation to stop and take a closer look at the ceramic shops in town.

Well, if you are a diver, your heart might be bleeding by now, but a look into the market hall of Palafrugell (early in the morning from 6 am) is very interesting and certainly shows a bigger offer of fish than you will ever see on your dives. This visit should be combined with market day in Palafrugell on Monday. It’s a typical Spanish market with a wide range of products and many impressions and views into the Catalan soul. ■



# fact file



## Tamariu, Spain



SOURCE: HARALD APELT, CIA WORLD FACT BOOK

**History** The powerful world empire of Spain in the 16th and 17th centuries saw the nation take command of the seas to England. However, Spain failed to embrace the industrial and mercantile revolutions, which caused the it to fall behind Britain, Germany and France in political and economic power. During the two world wars, Spain remained neutral, but suffered devastating during its own civil war from 1936 to 1939. After the death of dictator Francisco Franco in 1975, there was a peaceful transition to democracy. In 1986, Spain joined the EU. Rapid economic modernization has given Spain one of the most dynamic economies in Europe. It has become a global champion of freedom. However, challenges including Basque Fatherland and Liberty (ETA) terrorism, illegal immigration, and slowing economic growth continue to hamper the government. Government: parliamentary monarchy. Capital: Madrid

**Geography** Spain is located in southwestern Europe. It borders the North Atlantic Ocean, the Mediterranean Sea, Bay of Biscay, and the Pyrenees Mountains in the southwest of France. Coastline: 4,964 km. Terrain: large, flat to divided plateau surrounded by rugged hills and the Pyrenees to the north. Lowest point: Atlantic

Ocean 0 m. Highest point: Pico de Teide (Tenerife) on Canary Islands 3,718 m. Spain holds a strategic location along approaches to the Strait of Gibraltar. Calella de Palafrugell is situated in the north-east of Spain, just 80 kilometres south of the French frontier and lies in the centre of Costa Brava. The capital of this region is Girona, an old city whose old medieval center is worth visiting. Costa Brava starts in the north end at the French border at Port Bou and ends down at Barcelona in the south, the capital of Catalonia.

### Environmental issues

Deforestation and desertification; air pollution; water quantity and quality nationwide; pollution of the Mediterranean Sea from effluents from the offshore production of oil and gas and raw sewage.

**Climate** temperate; clear, hot summers in interior, more moderate and cloudy along coast; cloudy, cold winters in interior, partly cloudy and cool along coast.

**Currency** Euro. Exchange rates: 1 EUR = 1.48 USD, .74 GBP, 158.13 JPY, 1.47 CAD, 1.66 AUD, 2.09 SGD

**Population** 40,448,191 (July 2007 est.) Ethnic groups: composed of Mediterranean and Nordic types. Religions: Roman Catholic 94%,

other religions 6%. Internet users: 18.578 million (2006)

**Language** The official language is Castilian Spanish, 74%. Catalan 17%, Galician 7%, Basque 2%, are official on a regional basis.

**Visas & Permits** All members of Schengen countries of the European community need only a valid identity card. Visitors from all other countries need a passport and a classic visa.

**Medical** For diving, one always needs a valid medical certificate of diving capability (up to the age of 40, valid for two years; from the age of 40, valid for only one year). Underage divers need to have a written permission from their parents.

**Divers Insurance:** For diving at the Costa Brava, one needs to have valid accident and liability-insurance for divers (covering the costs of treatment in a decompression chamber).

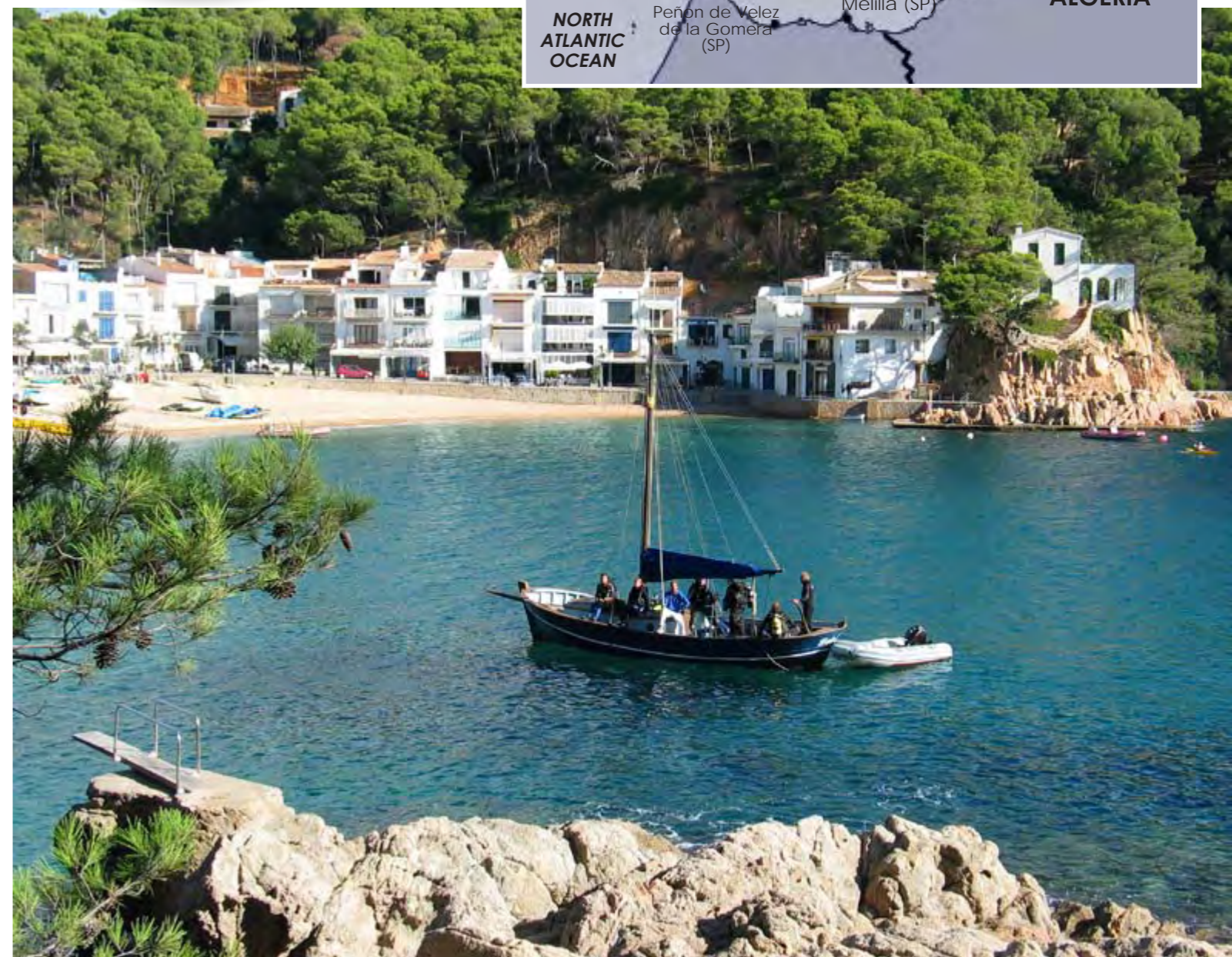
### Websites

Stollis' Dive Base  
[www.stollis-divebase.de](http://www.stollis-divebase.de) ■

The dive boat *Gabriela* is more than 75 years old but still in great condition. It can carry 15 divers to the spots outside Tamariu

Glonsl msp highlights location of Span (right)

Map of Spain highlights location of Tamariou on Costa Brava (far right)

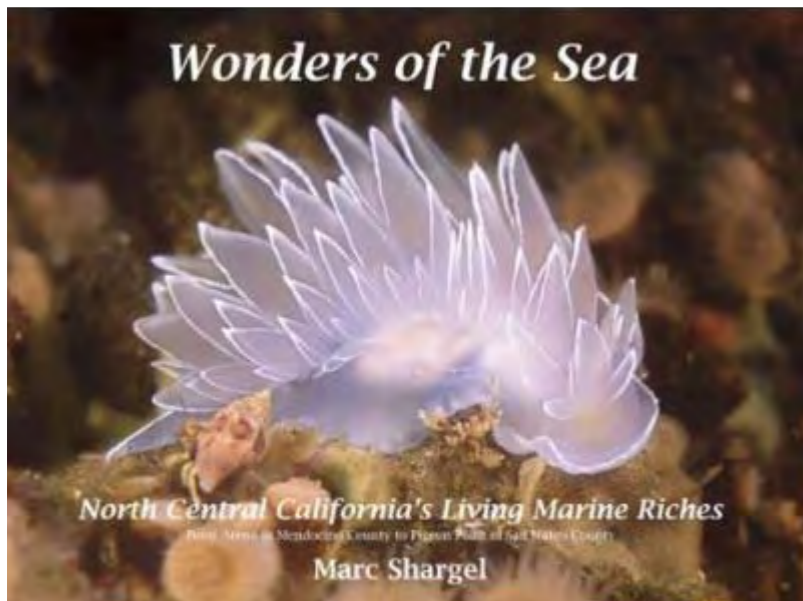




## Books Film DVDs CDs

Edited by  
Peter Symes

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ON BOLD LINKS

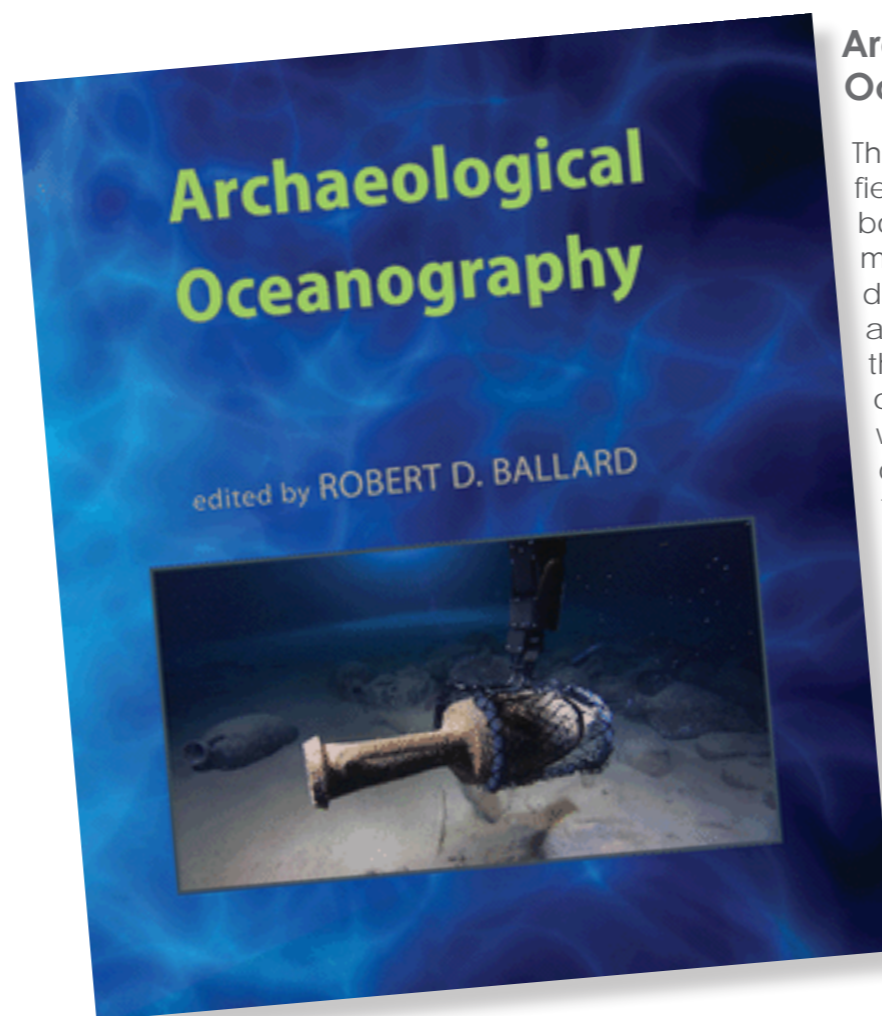
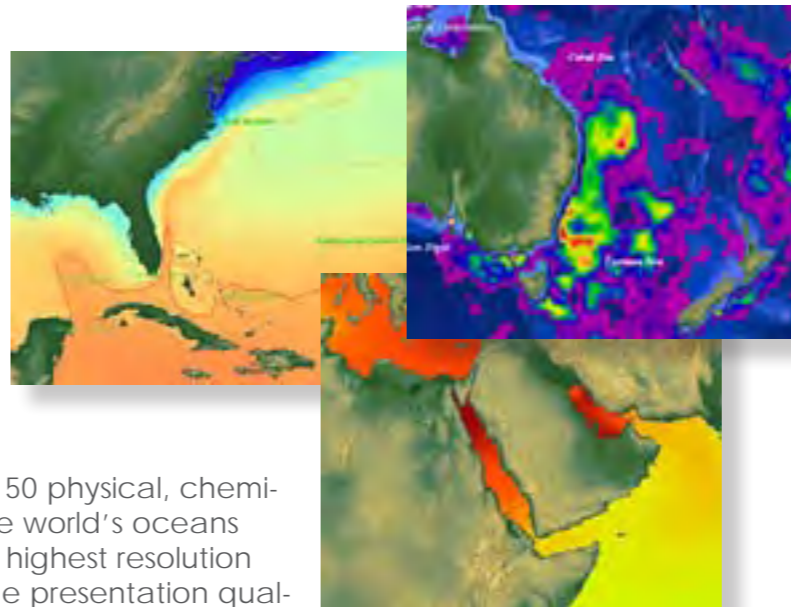


### Wonders of the Sea: North Central California's Living Marine Riches

Created by award-winning marine life photographer Marc Shargel, this book is a visual journey beneath California's near-shore Pacific Ocean. Offering a window onto some of the diverse marine life of California's North Central Coast, Shargel's images allow one to go on an adventure of imagination past the waves that crash on the craggy shores and long sprawling beaches and into the underwater world of sea. Here you will find a diversity of forms and a rainbow of color, which meets the majesty and splendor of some of the most amazing biospheres on Earth. *Wonders of the Sea* takes you on a submarine voyage of discovery from Point Arena in Mendocino County to Pescadero in San Mateo County and out to the Farallon Islands beyond the Golden Gate Bridge. While topside and in between dives, you can enjoy, remember and relish the underwater world off the California coast with this book. Ten areas are described within its pages, each of which have been eligible to become a marine protected area through the Marine Life Protection Act of the state. The author hopes to increase public awareness of what lies beneath the waves just beyond the Californian shores and highlight the ongoing efforts in conservation in the region. 80 pages, 77 full-color images. [www.lumigenic.com](http://www.lumigenic.com)

### Sea Breeze for World Wind

An extensive collection of high resolution maps depicting a broad variety of oceanic properties and characteristics, this program includes data categories such as Oceanography, Bathymetry, Seafloor Features, Geology, Geophysics and Meteorology. With over 600 maps covering about 50 physical, chemical and biological parameters of the world's oceans and seas, the program provides the highest resolution publicly available. In order to provide presentation quality maps of many important marine variables, data is compiled from the leading, most up-to-date sources. Sea Breeze helps users be able to visualize the complex processes underlying the behavior of Earth's largest biological and climatic engine. Designed to be a scientific reference source of oceanographic data, it is also an intuitive interface for the educational exploration of marine systems. [www.panglostech.com](http://www.panglostech.com)



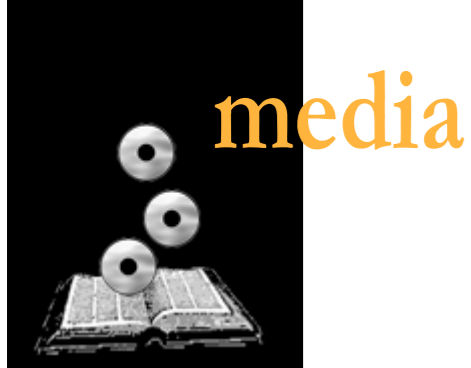
### Archaeological Oceanography

The definitive book on the new field of deep-sea archaeology, this book edited by Robert Ballard—the man who discovered the Titanic—describes the latest advances that allow researchers to investigate the secrets of the deep ocean. It covers the critical contributions which these advances have offered to archaeology and maritime history. Shipwrecks have been found and excavated by marine archeologists since at least the early 1950s. It is only recently that restriction have been placed on their explorations to what is now considered shallow depths by oceanographic standards. In this book, Ballard has brought together a cross-disciplinary group of archaeologists, oceanographers, ocean engineers, and anthropologists—pioneers of archaeological oceanography who have made ambitious expeditions into the deep sea. [press.princeton.edu](http://press.princeton.edu)



### A Diver's Guide to Southern California's Best Beach Dives

The new fourth edition by Dale and Kim Sheckler is available late June 2008. With fabulous color photographs, the guide covers 70 different dive sites, with maps of the several locations. It also includes informative and inspirational sidebars about dive techniques, photography, marine life and hunting. There are beach diving tips and information on areas such as Santa Barbara, Ventura, Los Angeles, Orange and San Diego Counties. Size: 6 x 11 inches, 152 pages. [www.saintbrendan.com](http://www.saintbrendan.com)



## Dives Brasil DVD series

By Arnold Weisz

When it comes to researching your upcoming underwater experiences before you go, or re-living them after you've come home, a DVD can be handy. This is exactly how the DVD's from Dives Brasil can be useful. The three titles out so far are a mix of a documentary and tourist commercials. These DVDs do not only give you an impression about the diving, but they start with some general footage and information about the area. Ranging from the local food, culture and architecture to tourist sights. Some of the places are also shown with aerial images. Even though not all of the underwater filming is of cinematic quality, it's made by local divers and a producers who know the sites well. Ranging from 35 to 90 minutes, the films are probably more fun to show to your friends, than the good old photo album, screen or paper. No great secrets revealed but informative films. The major obstacle for non-Portuguese speakers, is that none of the three titles available at the moment come in English. Although that is to change. The Project Dives Brazil is planning to produce a further 14 titles covering the Brazilian coast from north to south. And future titles are planned to include seven different languages, either by narration or subtitles.

The three titles available now:

### Parcel Manoel Luis (Maranhão)

This is a coral reef in open ocean which has an unimaginable abundance of wrecks. The DVD shows a great reef with a rich marine life and some fantastic wrecks. It also gives you an impression of how difficult it is to get there. The pay off is, you're alone on the reef.

### Ceará

This DVD takes you diving out of Fortaleza. The grand prize here is diving the wreck on a 120-meter cargoship, which was sunk by a German submarine during WWII.

### Archipelago of Fernando de Noronha

The DVD gives you a nice aerial overview before you roam the island. The longest of the DVDs has spared a lot of time to enjoy the underwater experience of the island. One of Brazil's top dive sites can never get enough justice on a DVD. So, consider this as small taste of what's to come or a way to refresh memories.

Project Dives Brazil is distributed and marketed (national and international) by MEDIA RIGHTS ([www.mediarights.com.br](http://www.mediarights.com.br)). ■



## Antartica with Amos Nachoum

February and March are the prime time to sail to Antarctica, see thousands of penguins and dive with leopard seals on icebergs. Space is designed for seven guests only onboard the uniquely designed and equipped-for-diving '74 *Pelagic Australis*.



The greatest explorers of all time helped discover Antarctica, the last continent, and the most daring adventures took place onboard sailboats in reaching the South Pole. To this day, very few people have gone scuba diving here by large cruise ships, and only a handful will ever reach the remote reefs and unexplored bays and waters that we will reach with the specially designed sailboat, the 74' *Pelagic Australis* and her dedicated crew.

We have

budgeted 12-14 days of diving, two dives per day, including land exploration of noisy and colorful penguins colonies, research stations, past explorer huts and remote extraordinary vistas of glaciers and bays, which no other vessel can or will visit.

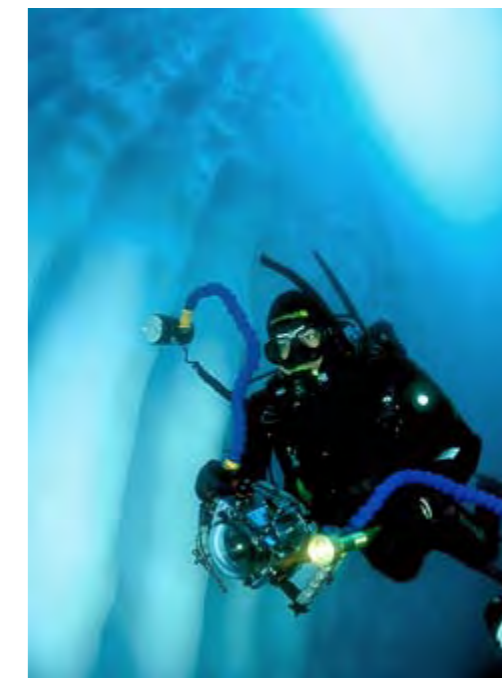
The diving experience will coincide with the prime time to see Leopard seals ambush and prey on adult penguins. We will search for stranding blue icebergs and dive safely around them. We will dive on reefs that are free of ice and discover the wonder of the flora and fauna that thrive in 28°F of water—absolutely mind-bending forms and colors.

This departure is also dedicated to two more specialties for rebreather divers. Onboard is O<sub>2</sub> and scrubber. Underwater photographers will benefit from Amos Nachoum's (Master of BigAnimals Photography) first hand coaching.

A Life Changing Experience  
February 25 - March 20, 2009.  
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— Amos Nachoum ■



ALL PHOTOS AMOS NACHOUM





Column by Cedric Verdier

AS PART OF MAKING THIS ARTICLE ALL THE REBREATHING MANUFACTURERS KNOWN TO US WERE CONTACTED WITH A REQUEST TO PROVIDE US WITH THE LATEST TECHNICAL INFORMATION AND PRODUCT IMAGES. WE ALSO INVITED THEM TO OFFER ADVICE OR TIPS TO THE PROSPECTIVE BUYER. PRODUCT IMAGES IN THIS ARTICLE ARE TO A LARGE EXTENT PROVIDED BY THE MANUFACTURERS

IMAGE COURTESY OF POSEIDON



What to think about before

# Buying a Rebreather

Text by Cedric Verdier  
Supplemented by Peter Symes



One morning, sooner or later, you will wake up with a strange sensation—as if some minor and weird changes happened in your body overnight. You are not turning into another Dr Jekyll and Mr Hyde, but in the recent weeks you have come to find your dives to be very noisy with all the bubbles escaping from your regulator starting to get on your nerves. All your dive gear has also started to feel very heavy, with all these tanks and regulators to carry everywhere. And then you have this fancy and expensive dive computer full of features you cannot use because they are designed for divers with little in common with you, using state-of-the-art and highly complex equipment on their back and breathing esoteric

mixes coming from remote planets. So, after reading magazines, walking your way along many booths in the dive shows, surfing the net looking for rebreather-related websites, you have finally arrived at an important threshold in your life. You are ready to buy a rebreather. You have made up your mind, checked that the mortgage for your nuclear bunker is in place and you won't have to replace your two-year-old pink Jacuzzi anytime soon. What do you do then? Asking yourself the following questions is a good place to start:

## Do I really need a rebreather?

It might sound like a strange ques-

tion, but it is an important one nonetheless. Take a peek at the internet forums and mailing lists and you'll discover a lot of people selling their expensive and brand new rebreathers. Why? The reason stated most of the time is that the present owner just doesn't use it! Yes, you read it correctly. After months of research and comparisons of products, prices and offers, and after making a financial investment equal to the one needed for buying a small car, a lot of divers discover that they don't really need it, or it's

too much of a hassle—they don't have time, or they don't like it. So, it is better to think twice beforehand, weighing cost against benefits, taking into consideration what types and frequency of the dives you usually do or plan to do. Points to consider should include:

**The type of diving you do.** Using a rebreather can make a lot of sense for a diver who spends a lot of time doing deep wreck dives or long video dives. But does it also make sense for short and shallow reef dives in a tropi-



cal environment? Only you can answer that question. But consider the hassle of travelling with a rebreather (even a small one!), filling nitrox or oxygen tanks, buying scrubber, preparing the unit before the dive, cleaning it afterwards and what not. All that work for something that can possibly be done just as easily with a single tank you can rent anywhere!

**The number of dives you do.** Consider the initial investment for a rebreather, plus the maintenance (batteries, O<sub>2</sub> sensors, yearly regulator maintenance). Then divide this number by the number of dives you do in the span of three years, which is the average time people own a specific rebreather. Then add the additional expenses for each rebreather dive (scrubber, tank fills, etc). If you end up with a cost per dive very close to your monthly salary, it might be wise to consider sticking with your current open diving open circuit.

*There is no way around it: Rebreathers need proper care*

**Your complacency level!** There is no way around it—rebreathers need proper care. And they can be temperamental pieces of equipment. After some dives on open circuit, don't expect to come back to your rebreather and find it working flawlessly. Chances are that something will not be working properly as it was before. It is necessary to dedicate some time to your rebreather—for maintenance, pre-dive and post-dive checks and routine skills underwater. So, if you spend more time brushing your teeth in the morning than preparing, checking and properly packing your diving equipment, you'll

have to change your habits if you want to dive with a rebreather. If post-diving maintenance means having a nap after the dive to you, then rebreather diving is not for you.

The Dräger Dolphin is possibly the best known and most widely produced semi closed rebreather. Introduced in the mid 1990s, the design is now beginning to show its age in comparison with more contemporary models



"Lt. Lund II" A military oxygen-rebreather from 1954

PETER SYMES

### What type of rebreather do I need?

There are about as many rebreather models on the market now as three-syllable words in a Rambo movie. These rebreathers are either semi-closed rebreathers (SCR) or fully closed circuit (CCR) rebreathers. In the recent years, the favor of the public has gravitated towards the fully closed-circuit rebreathers. Firstly, the once significant price gap between the SCRs and CCRs full bred units have narrowed over the years. Secondly, the performance and accessibility of the CCRs have kept improving.

Purely mechanical SCRs constantly loose gas by every exhalation, and they work by providing a constant percentage of oxy-

gen—something that is not as ideal as CCR from a decompression standpoint. Therefore, the current trend is still that fewer SCRs are being built, with CCRs clearly being the preferred choice overall.

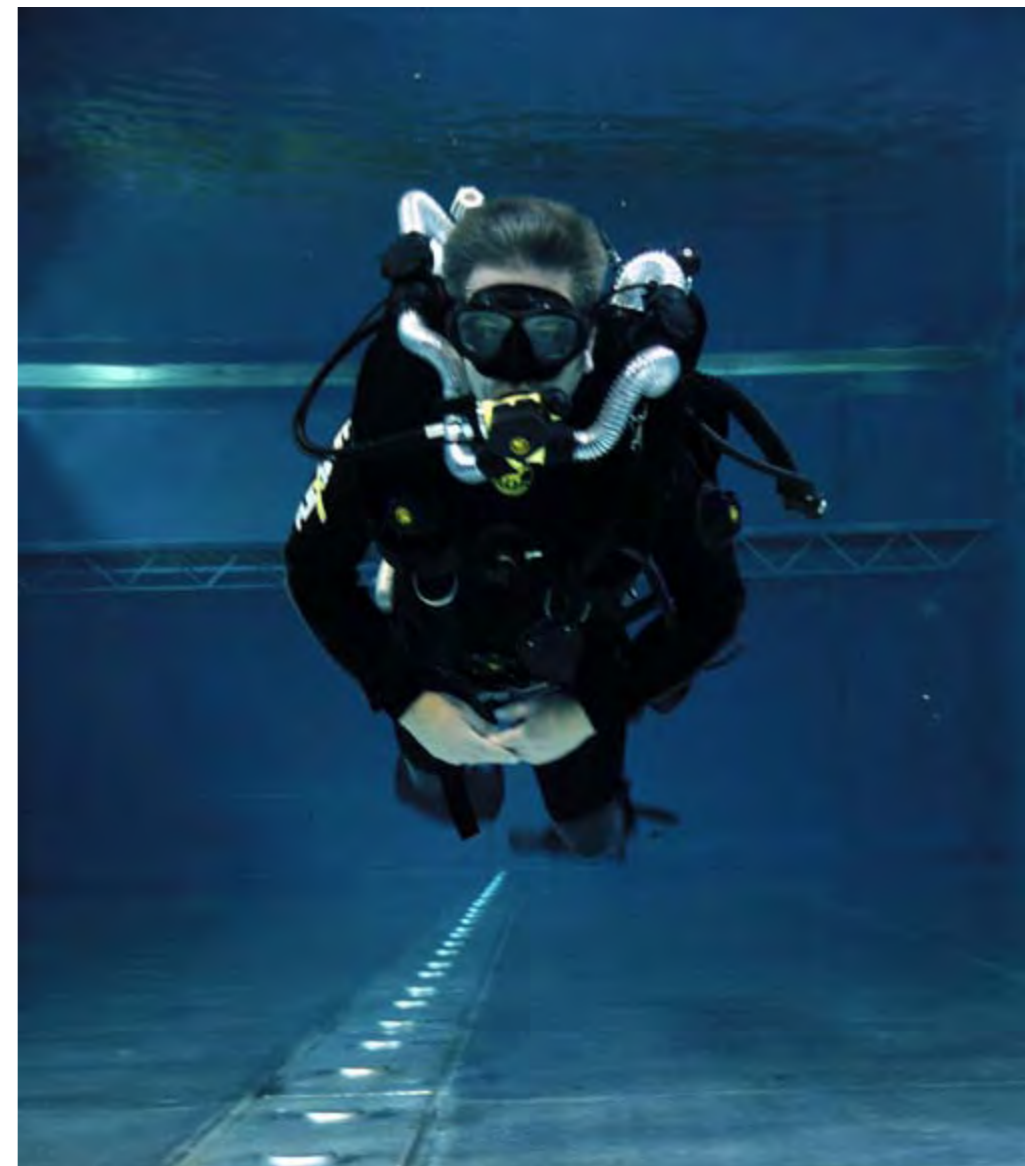
Aside from some very specific applications, pure oxygen CCRs are not used in sport diving because their use is limited to a maximum depth of only six meters. (Any deeper than that, the partial pressure of the pure O<sub>2</sub> reaches toxic levels). That leaves two main types of CCRs to share the scene: mCCR (manually operated CCR) and eCCR (electronically controlled CCR). The main difference lies in the manner by which oxygen is injected in the breathing loop:

#### mCCR

Most of mCCRs rely on a tiny constant feed of O<sub>2</sub> into the loop making the content safe to breathe. The user has to frequently check the loop content on a display showing the pO<sub>2</sub> readings from a set of (most often three) oxygen sensors and manually inject more oxygen if necessary to keep oxygen content at the correct levels. These rebreathers are simple and reliable but require the diver to constantly keep a close eye on the oxygen monitors.

#### eCCR

eCCRs are more complex units using a computer (sometimes several) to constantly monitor the oxygen level in the breathing loop and electronically maintain a pre-determined constant pO<sub>2</sub>. This level is known as a "setpoint". What type you choose may in part depend on the contents of your piggy bank, as eCCRs are more expensive than mCCRs. Also, the type of dives you do means something, as eCCRs are usually less depth-limited than mCCRs. It may also be a matter of which degree you are comfortable with relying on electronics under water.



POSEIDON

# education



Granular absorbent you pour into your scrubber yourself (left). Cheaper, but care must be taken to pack the scrubber correctly. Prepacked cartridges (right) are more expensive but more convenient and always correctly packed



Radial has a longer duration and is generally considered to offer a lower breathing resistance. Scrubbers, too, come in different sizes. A bigger scrubber gives you more time underwater, or more reserve for the same duration.

## Duration?

Probably one of your least concerns. Chances are you will be starving long before your scrubber expires. Unless you are a technical diver planning very long dives, most scrubbers will outlast any dive you can endure before you crave the next meal or need to go to the bathroom. It is mostly a matter of convenience and how often you need to change. A typical scrubber will last you 4-6 hours depending on the size of the canister and the temperature of the water.



Golem Gear's radial scrubber unit for the Megalodon CCR is almost a piece of art. The breathing gas comes down the center axis and then traverses radially through the absorbent and through the grid

## Granular absorbent or prepacked cartridges?

To some extent, this is a matter of choice of economy versus convenience. Pouring granules and packing the scrubber is not outright messy but a bit of manual work. It can also be contended that prepacked cartridges are packed uniformly and correctly by a manufacturer ensuring that channelling won't happen. (see box next page). But there is not always an option. There aren't cartridges available for each and any size of canister or rebreather, while some rebreathers, i.e. the Poseidon CCR, only accepts proprietary cartridges.

## Which features should I look for in a CCR?

This is where we get technical. So, to spare you long nights of ploughing through heaps of technical brochures, graphics, curves and test results, let's get right to point.

### Counterlungs

These are the 'bags' on the breathing loop where your exhalation goes. The shape and position of these determine some of the breathing characteristics and how easily you breathe in different positions underwater. Some rebreathers have the counterlungs back-mounted, giving a nice chest-free configuration. This configuration aids exhalation but makes inhalation harder. The opposite is true for chest-mounted counter-lungs.

Others have them configured "over-the-shoulders" for a better work of breathing, but a more encumbered chest. In any case, the counterlungs should be positioned as close to your real lungs as possible to minimize work of breathing (See info box). Some manufacturers

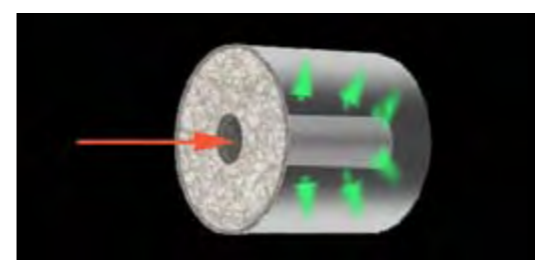
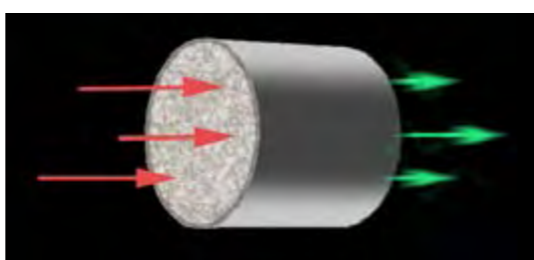
also provide the option of different sizes of counterlungs. Size is another another trade-off, which has to be balanced. Too small and you may find yourself in a struggle to get enough gas, too large and they create a lot of unnecessary drag.

### Scrubber

One of the most important components of the unit, the scrubber canister holds the absorbent (i.e. Sodalime) which absorbs the exhaled CO<sub>2</sub> cleaning up the gas you'll breathe. You can choose between granular absorbent that you pour into the canister yourself or solid state cartridges, which you just slide in as a whole package.

There are also different scrubber architectures—axial or radial. An axial scrubber is essentially a wide cylindrical pipe through which gas flows from one to the other in a 'vertical direction'. In a radial scrubber, gas flows in a radial direction from a central pipe at the hub and towards the side of the canister.

Illustration of the two main scrubber architecture: Axial or radial. Red is exhaled air with CO<sub>2</sub>. Green is 'scrubbed' gas



Counterlungs

## Work of breathing and counterlung position

A new method of counterlung evaluation presented by Dr Dan Warkander, US Navy, breaks down the common concept of breathing effort into three constituent breathing factors that must be evaluated for closed circuit systems.

- **Resistive effort** describes the burden of pushing or pulling gas through the breathing loop—think of the difference between breathing through a soda straw and a snorkel.
- **Hydrostatic Loading** describes the relative difference between the pressure center of the diver's lungs and the maximum and minimum pressure differentials when the counter lung is fully inflated and fully emptied.
- **Elastance refers** to the change in shape of the counter lung as its volume changes during a breath.

Each of these three elements causes the diver to do work when breathing. Lower work of breathing is a design objective to avoid fatigue from just breathing.



In a normal swimming position, the hydrostatic load of back mounted counter lungs produces negative lung loading—it is hard to inhale but easy to exhale. Chest mounted counter lungs produce positive lung loading where the inhalation is easy but exhaling requires more of an effort. Over the shoulder counter lungs provide the best compromise reducing lung net loading to zero.

As regards to resistive effort, small diameter air passages have higher resistance to flow. So does elbows, long tubes, flow direction mushroom valves and thick scrubber beds. Using a sufficiently large diameter tubes throughout the breathing loop, avoiding too many bends and elbows and a radial scrubber all reduce resistive effort. Since a large flat counter lung has a lower elastance than a long narrow tube standing vertical in the water column, once again the shoulder counter lung configuration seems to offer the best trade-off. ■

## Gas supply

All CCRs have a small tank of oxygen and a small tank for air or other diluent. Some units are able to use different tank sizes, depending on what you find locally. Other manufacturers make their units with a "hard-case", which leaves just enough room for a specific size and shape of cylinder. Once again, size matters—even for rebreather tanks, as these tanks are also being used for inflating BCD and possibly a drysuit, too. And even if the rebreather diver carries an off-board bailout tank for emergencies, the on-board tank might also be used as a backup in a bailout emergency. In any case, the more gas, the better!

## Electronics

This is the area in which the changes and advances have been the most impressive in the last few years. SCRs and mCCRs usually display simple pO<sub>2</sub> readings. eCCRs, on the other hand, tend to have more advanced displays with redundant pO<sub>2</sub> and set-point reading, built-in decompression softwares with Open Circuit bailout capabilities, battery level indication, O<sub>2</sub> sensors voltage and even scrubber monitoring. Just make sure you can easily read the most important information!

### Upgrades

Can your electronics be upgraded? Rebreathers constitute a substantial investment, so it is nice to know whether it can be upgraded or updated and at what cost. Fortunately, much of the software can now be upgraded by the user at home by downloading files from the manufacturer's website and installing them via some interface.

Vision electronics for the Inspiration and Evolution CCRs are upgradable over the internet



This photo is meant to illustrate the differences in length between the Evolution and Evolution+ scrubbers but also clearly shows the typical tank configuration. The oxygen tank is on the right. The diluent—in this case, air—is on the left. Tanks shown are 2-liter

*Make sure you can easily read the most important information!*

Too small for bailout

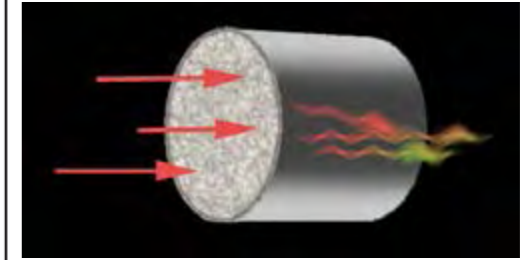


### Diluent bottle for bailout?

When diving a rebreather, at anything but very shallow depths, a separate bailout bottle should always be carried. The diluent bottle, even when using a larger than standard diluent cylinder, does not provide an adequate bailout gas supply for emergencies. The emergency bailout cylinder should be an open circuit gas in a separate cylinder i.e. in the form of a sling tank.

## What is channelling?

Channelling happens when the scrubber material packs unevenly leading to the creation of a path—or 'channel'—of least resistance through which the breathing gas may move as a focused flow without being properly filtered. This can lead to a CO<sub>2</sub> breakthrough much sooner than the nominal duration time for the scrubber. The mere action of pouring



Improper packaging of absorbent can create a channel

the granular scrubber into the canister can lead to some sorting of particles according to size, not unlike how stone, sand and gravel are sorted out in zones on a beach. For this reason, it is very important to go about filling the canister as instructed including tapping the canister to make the material settle uniformly. Tapping it after transportation is usually also a good idea.

## Measuring CO<sub>2</sub>

One of the main functions of a rebreather is to filter out your exhaled CO<sub>2</sub>—the other is, obviously, to provide you with the correct concentrations of oxygen. If CO<sub>2</sub> builds up in the breathing loop, you'll soon end up in a very uncomfortable and dangerous scenario. So, why not have a sensor monitoring CO<sub>2</sub> in the same manner that we have O<sub>2</sub> sensors, may you ask? Because the necessary technology doesn't yet exist.

Instead CO<sub>2</sub>, or rather the risk of scrubber expenditure, is monitored in a roundabout way. As CO<sub>2</sub> is being absorbed by the scrubber, a chemical reaction takes place that produces heat, which can be felt as warm band across the canister. The position of this warm band moves down the canister as the scrubber gets spent giving an indication of remaining scrubber duration. The position of this zone of active CO<sub>2</sub> absorption can then be traced by temperature sensors giving some kind of readout to the diver. When the warm zone gets closer to the bottom, the scrubber is about to be spent and needs to be replaced. This technique, it should be stressed, says nothing about the actual CO<sub>2</sub> content in the loop. ■



Quite unique: Steam Machines use an analogue pO<sub>2</sub> meter as its secondary system on its Prism CCR



Electronic display from a Pelagian rebreather





Head up display (HUD) on a Megalodon rebreather serves as an alert to any issues with the unit the user should be made aware of or react to



A bailout valve (BOV) allows you to change from breathing from the closed circuit to an independent open circuit. The BOV has a regulator second stage to be attached upon the rebreather mouthpiece (not shown here). Changing from closed to open circuit is then done by a flip of the switch with no need to remove the mouthpiece.

A BOV can either come as an accessory that you can retrofit on the unit such as the Golem Germ BOV mount shown on the right. Or they come as a standard and integrated feature as seen on the Poseidon / CIS-Lunar Discovery (left)



## Are there any other additional features I may want?

### HUD

Most of the rebreathers on the market come with some forms of safety devices like visual and audible alarms. However, not all come with a Head-Up Display (HUD), which is a very nice way to monitor your loop content without using your hands, something very handy when you take pictures, hold on a shotline in a strong current, or play cards during a long decompression stop.

### BOV

A Bail-Out Valve is a rebreather mouthpiece combined with an open circuit regulator second stage. Even if you carry a bailout tank and regulator, this regulator might not be immediately available when you need it—you could be dangling from something, entangled or the bailout is already being used by your buddy. The BOV gives you the ability to immediately switch to Open Circuit by flipping a switch if something goes wrong with your rebreather and you find your breathing loop filled with an unbreathable gas mix or even water. It is a highly desirable extra feature, as some divers have reported that some symptoms of intoxication showed up as the inability to think properly and to quickly locate their alternate air source.

### Off-board plug-in

When it comes to gas supply and avoiding depletion, the more options you have, the better. Some rebreathers allow you to plug in the loop any gas tank you might find, as long as it has a standard LP hose fitted. This gives you some flexibility when dealing with what shouldn't become an emergency with a rebreather.

### 4th sensor

Semi-closed Circuit rebreathers used to have no form of electronics whatsoever. Then divers discovered that an oxygen sensor might help them to better monitor their loop content. Some mCCRs have two cells but problems arise when one of the cells doesn't agree with the other one. Most eCCRs come with three oxygen sensors fitted, using what is called the "Voting Logic" to double check their reading between each other (a faulty cell is voted out by the two others). Now, the idea might be to have four cells fitted to eliminate any potential situations where two cells display wrong information but are considered to be right by the computer.



This is an adaptor that enables a fourth and independent sensor i.e. one that is connected to a dive computer—to be mounted in a CCR. This adaptor is for the Inspiration and Evolution CCRs



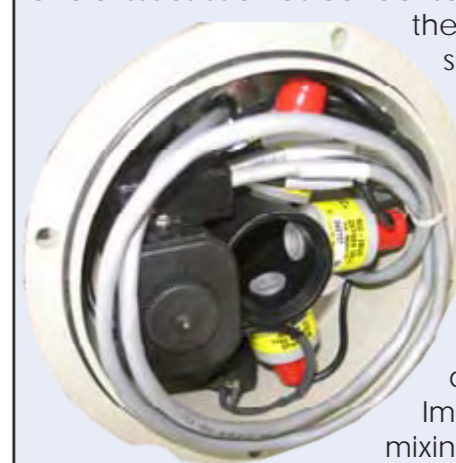
*It is important for the prospective buyer to be aware of any third party testing that has been done on the product; it is of course life support equipment, so independent testing and approvals are very important. It is also a good idea to think of the company behind the product; you need to know you will be able to get spares and support in the future and be sure the product is reliable and manufactured to a standard.*

—AP Valves

## Design Issues

Manufacturers tend to place the oxygen cell(s) close to the diver's inhalation in order to get the most accurate information about what the diver will actually be breathing. The loop is a dynamic environment, and its content is not the same everywhere within.

How these sensors are physically placed in the unit to ensure accurate readings of the O<sub>2</sub>-content and avoid issues such as condensation on



the sensor surface is a matter of many considerations and much dispute. Improper mixing of

gases after O<sub>2</sub> injection may lead to incorrect readings, so does gas by pass. Also, it is a known issue that oxygen sensors read lower than normal when they get damp. Many controllers (handsets) will provide readouts from each cell so the user can somewhat diagnose their individual performances and take appropriate action in case of a malfunction. The Poseidon / CIS-Lunar is significantly different in this regard by only using one main sensor. This sensor is then repeatedly calibrated and checked against a flow of 100 percent oxygen. However, different manufacturers have different opinions regarding the design of their units.

Which way is the gas flowing inside the loop? Where is the oxygen injection located (preferably not too close to the cells to avoid oxygen spikes when an injection occurs)? Where is the diluent injection located (preferably not too far from the diver's inhalation bag to provide him/her with a quick way to get fresh and safe to breather gas)? ■

### pO<sub>2</sub>-integrated computers

When it comes to constant pO<sub>2</sub> dive computers, most of divers immediately think about the VR3 made by Delta-P in the UK or the American-made HS Explorer made from Hydrospace Engineering, or Cochran's EMC-20H. Most of discussions on the Internet focus on these models, with sometimes strong arguments about the necessary features and advantages of one or the other.

Decompression model, Graphic User Interface, reliability, customer service—it's like toppings on a pizza, everybody has an opinion about what is good or bad.



Cochran EMC-20H

### Recommended reading

DIRrebreather published a book written by Cedric Verdier and designed for Semi-Closed and Closed-Circuit rebreather divers. The Rebreather I book is dedicated to nitrox rebreather diving and the basic principles and skills that every rebreather diver should know and master. It covers some topics like balance and trim with a rebreather, risk management, and proper nitrox dive planning.

This book, along with other rebreather-specific books and manuals, is available on a digital format at the DIRrebreather bookshop: [www.dirrebreather.com](http://www.dirrebreather.com)

DIRrebreather is a not-for-profit organization, and its goal is to promote safe rebreather diving. The DIRrebreather Team focuses its work on designing standard practice, equipment, techniques and procedures both for the novice and the seasoned rebreather divers. DIRrebreather divers worldwide participate in rebreather-specific workshops and DIRrebreather-sponsored expeditions on wrecks and caves. For more information, contact [DIRrebreather@yahoo.com](mailto:DIRrebreather@yahoo.com) ■



VR3

## What else do I need to spend on?

Air, oxygen and absorbent (soda lime) are the basic consumables. Absorbent comes in different brands, sizes and flavours. Air and oxygen doesn't.

**Oxygen sensors** have a limited life span and need to be changed at least every every 18 months. Batteries also need to be changed at intervals as solar cells don't perform well underwater.

### Tanks

You'll also need to consider a bailout tank with a regulator fitted. It doesn't need to be a very big tank, unless you dive deep. One of the most popular bailout tanks for recreational rebreather divers is the aluminium 40cuft (5.5L), but it all depends on your open circuit gas consumption. You need to carry enough gas to safely ascend from your maximum depth and complete all your decompression, and still have some extra gas left in the tank (at least one third).

### Masks and straps

Also consider some additional accessories like a neck strap or a full-face mask that help to prevent you from drowning should you fall unconscious underwater. It may sound quite unlikely, and it is, but like safety belts in a car, it save lives when accidents do occur. You don't think twice about buckling up when drive in a car, do you?

### Computers

A rebreather-friendly dive computer can also help you make the most of your unit and take full advantage of the optimal mix in your breathing loop. Several dive computers on the market have a constant pO<sub>2</sub> capability. Some even have the option to plug in an additional oxygen sensor for real-time pO<sub>2</sub> calculation. But probably the most important ingredient or purchase with your rebreather is a proper training course. It is not possible to dive rebreathers safely without imple-

menting good habits first. Rebreather diving is like horseback riding. It can be a lot of fun if you do it properly, but performed wrongly, it can also be dangerous. A rebreather is, in fact, a bit like a horse—it seems to have a life on its own. You have to stay in charge at all times in order to avoid being put at risk, which you need to be aware of.

But that's another topic...



Full-face mask

GOLEM GEAR

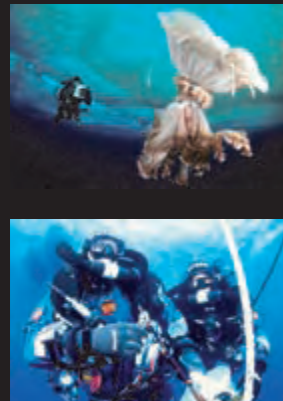


So, which one is it going to be? With so many great brands and products to choose from, it can be a tough choice

PETER SYMES



### Advanced Computers for Advanced Divers



VR computers are designed to meet the exacting demands of the most experienced divers in the world and as such they are the perfect choice for advanced divers like you who want sophisticated technology with a simple user interface which will continue to meet your needs as you progress.



You may not be diving the Britannic, doing extended penetrations in Italian caves or following photographer Norbert Wu under the Antarctic ice just yet, but you might find it reassuring to know that your VR computer has already been there and performed perfectly.



See [www.vr3.co.uk](http://www.vr3.co.uk) for further information and to find a VR dealer near you.

### Travelling with units

With the never-ending tightening of luggage allowances on flights, weight and size becomes more of a concern if you plan to bring your rebreather on a dive trip. Tanks, even the small rebreather ones, are the first items you should leave at home. Not only are they bulky and weighty, but new airline regulations stipulate that all scuba tanks should have their valves completely removed, and what that does for your oxygen cylinder is ruin the cleaning for oxygen service it has been through. Carrying a sufficient supply of scrubber also adds to bulk and weight, which might send the scales at the check-in counter in the airport well into the red

zone. So, even though these consumables may cost

O2ptima CCR neatly packed and ready to go

**Tip:** As tighter weight limitations on airplanes come into effect in some instances, it is sometimes a cheaper option to ship your gear ahead of you by land or surface—and less hassle, too

twice the going price you are used to paying at home, at your end destination, it is worth renting tanks and buying scrubber on location. It doesn't make much of a difference on the bottom line considering the price of the whole trip. Look for 'rebreather-friendly' operators. There are usually a bunch of these at each major dive destination, and upscale live-aboards usually cater for rebreather divers, too. Some even specialised in this field. ■

### Other good-to-know websites

- [www.rebreatherworld.com](http://www.rebreatherworld.com)
- [www.therebreathersite.nl](http://www.therebreathersite.nl)
- [www.diveraid.com](http://www.diveraid.com)
- [www.DIRrebreather.com](http://www.DIRrebreather.com)

Look for "rebreather friendly" operators when travelling with your units. It may enable you to leave lots of the heavy stuff back home and only bring the essentials



Look for 'rebreather-friendly' operators

This is a pre-packed scrubber from Poseidon / CIS-Lunar's Discovery unit. The way airfares are heading, in the future, it will probably be far more commonplace to purchase such consumables on location rather than carrying the extra weight from home



## Inspiration & Evolution

Ambient Pressure Diving, United Kingdom  
www.ambientpressurediving.com

Following Dräger's massive but aborted effort in the 1990s to make rebreathers commonplace on the market, Ambient Pressure Diving is the brand that saw it through. Their rebreathers with their characteristic yellow shell can now regularly be seen at many dive centers, resorts and liveboards around the world. The various makes of Inspiration and its more compact younger sibling, Evolution, is without question the most mass-manufactured units on the market. The first make of Inspiration was marketed back in 1997, but it has undergone a steady improvement ever since. The year 2005 saw the introduction of the smaller Evolution at about two-thirds of the size of the Inspiration. This unit also introduced the advanced 'Vision' control electronics, which integrated the two handsets the classic Inspiration had into one compact unit, which also had a built-in dive computer with nitrox and trimix capabilities. Another new feature of the Vision electronics was a Head Up Display and temperature gauge on the scrubber unit. A short while later, Vision electronics were also offered for the Inspiration, so the main difference between the two was the size.

Evolution uses 2-liter cylinders and a shorter scrubber unit, whereas Inspiration uses 3-liter cylinders. After the Inspiration offered advantages in scrubber duration, and the Evolution offered advantages in size and weight, a hybrid size—the Evolution+—was offered. The Evolution+ combines the 2-litre cylinders from the Evolution and the larger scrubber as used on the Inspiration—all housed in a new specially-designed case. Prices start at £ 4695 (incl VAT) ■



### Isolation Valve

This little thingy goes in between your LP regulator hose and the second stage regulator/ADV. This enables you to shut off the connection in case of a free flow or other problem



## Megalodon

Innerspace Systems, United States  
www.customrebreathers.com

The 'Meg' is another unit that has gained quite some popularity. It is a modular design constructed around a sturdy aluminum tube, which supports the scrubber, head and cylinders. This allows for a wide range of cylinders to be used, although the standard cylinders are Luxfer aluminum 19s as well as different harnesses or backplates and wings. The single-tank adapter (STA) allows standard backplates and BCDs to be used. This makes the unit very easy to travel with, as it enables the user to bring only the essential part on trips where restrictive luggage allowances are a concern. To cater for the travelers, the manufacturer—InnerSpace Systems—has also produced a compact version nicknamed the mini-Meg. The entire system, not including cylinders, can be packed into a hard case that will fit in an airline overhead luggage compartment. The standard scrubber is an axial design, but a radial scrubber canister is now also offered. The control unit, the electronics, consists of the head that sits in the core—which contains the O<sub>2</sub> sensors, electronics, batteries and solenoid—and two handsets and a head-up display mounted on the mouthpiece. Price not listed. ■



## Submatrix

Submatrix, Germany  
www.submatix.com

Submatrix is a German manufacturer who places emphasis on ease of use, safety, easy maintenance and being uncomplicated to dive. They are also convertible and can be configured as an easy SCR system for the ambitious scuba diver as well as a demanding emCCR system for the technical divers. New units are being marketed in September as this magazine goes to press, so check back with the manufacturer's website. The new units have a new pO<sub>2</sub>-monitor, 'oxyscan', and come with a newly designed case that encloses the whole unit. A new pO<sub>2</sub>-monitor with integrated dive computer SPX 42 is expected to ship in the beginning of 2009. Prices for complete units: mCCR = € 4,800; emCCR100 SPX 42 system = from €5,000 ■







## Kiss & Sport

Jetsam Technologies,  
Canada

www.kissrebreathers.com  
'Safety in Simplicity' is the motto that greets the visitor to the manufacturer's website. The name of their rebreather stems from the well known acronym, 'Keep it Simple Stupid' (KISS). The KISS units, which come as the Classic KISS and KISS Sport, both are mCCRs that constantly feed oxygen into the loop through an orifice but also require the diver to also manually add oxygen. The monitor-

ing displays have three independent, backlit PPO<sub>2</sub> displays. Each display has its own housing, battery and sensor, making the system completely redundant. The batteries are user changeable. Each display can be replaced independently, and spares are easily affordable.

Both KISS units use two individual back-mounted counterlungs, which are attached to the scrubber head from the inside of the counterlung case. The units have different canister designs. The Classic scrubber canister has an axial flow design, which holds approximately six pounds of absorbent. The gas flows down the center of the scrubber tube, and then comes up through the scrubber material where the carbon dioxide is scrubbed out.

The Sport canister has a bi-axial design, which holds approximately five pounds (2.3 kg) of absorbent. The gas flows from the exhaust hose into the canister and lung below, and then passes through to the next canister and lung, and back out the inhalation hose. A variety of cylinder sizes can be used. Kiss Classic CAD 5700  
Kiss Sport CAD 4600 ■



## rEVO

rEvo rebreathers, Belgium  
www.revo-rebreathers.com

The main feature that sets this Belgian-made rebreather apart from the lot is the double scrubber units and independent programmable PO<sub>2</sub> monitors with head-up displays. The two scrubbers, being placed in sequence, are said to offer more protection against channelling as well as a better scrubber economy.



The oxygen is injected via a fixed orifice with constant flow. The diver has to monitor the pO<sub>2</sub> and manually inject additional oxygen as needed. This unit has back-mounted counterlungs. In order to keep breathing effort to a minimum, the unit comes with a specially designed backplate, which brings the counterlung as close to the diver's body as possible. In March 2008, a new hybrid electronic rebreather was introduced. As the manufacturer states: "The Hybrid mode combines the advantages of the stable mCCR constant mass flow, with a PPO<sub>2</sub> controller that tracks the PPO<sub>2</sub> towards the desired setpoint." The hybrid unit is equipped with both a gas flow orifice fed by an absolute pressure regulator and a solenoid valve controlled electronically. This enables the unit to be used in any desired mode from pure mCCR up to fully electronic eCCR without the depth limitation linked to the absolute pressure used in mCCR systems.

Since the rEvo is a manually operated closed circuit rebreather, it cannot be CE certified. For this reason, the rEvo is not yet commercialised within the CE zone, but only produced for export. However, the manufacturers have informed us that they are now working towards having the electronic control version CE certified. This is estimated to happen by the end of 2009. ■



## Watch out for eBay Scams

Rebreathers on eBay seem to attract a high number of scam artists. The classic tactics used by the scammers are fairly easy to spot if you look for some telltale signs:

- Hiding the identity of bidders, which prevents other eBayers from warning victims
- Requirement for buyers to be pre-qualified. Once contacted, the scammer will offer you a special deal. If they offer you an off-line deal, report them.
- A short auction time of 1-5 days,

which makes it harder for eBay to spot

- Zero or low feedback
- Re-used photos and text. Have you seen it before? Is it a stock photo?
- Suspicious methods of payment that are untracable
- Wrong category. Check the seller's other listings. Does the seller have a lot of high-end stuff with similar characteristics?
- Is it an exceptionally good deal? Even on eBay: If it seems too good to be true... ■

SOURCE: eBay

## Hammerhead

Juegensen Marine, United States  
www.rebreather.us

You may say that this is a controller that has the rest of a rebreather attached to it. Juergensen Marine specializes in developing and supplying controller electronics to other rebreathers—and to the US Military—the Optima from Dive Rite to mention one. Juergensen has also produced upgrades and kits to a number of other makes. Their own rebreather has some resemblance to the Megalodon but is highly configurable. There is, for example, a choice between over-the-shoulder counterlungs and backmounted counterlungs. The scrubber is radial. The controller, which is also a full trimix computer, uses the usual three sensors for primary control, but a fourth can be added for independent monitoring by a separate computer. ■



## Prism 2

Hollis Gear, United States

[www.hollisgear.com](http://www.hollisgear.com)

The Hollis Prism 2 is based on the ground-breaking design from Steam Machines with the ongoing development aimed at improving and maturing the design for mass production. Hollis chose the Prism because it is the only commercially available unit meeting (US) military standards. The Steam machines are also unique in the way that they offer two completely different and independent systems of monitoring O<sub>2</sub>. One system is electronic with LED displays; the other is an analogue meter that reads directly of the sensors. This allows the user to still operate the unit even in the unlikely case of a total electronic failure. The analogue meter is calibrated with a rotary switch using a simple potentiometer measuring the small currents generated by the sensors. Features include sealed electronics, radial scrubber design for lower resistive breathing effort and more efficient scrubber use and over the shoulder counterlungs for decreased work of breathing. The primary HDD (Heads-Down Display) is a battery driven sequential LED for continuous hands-free monitoring. ■

## Discovery

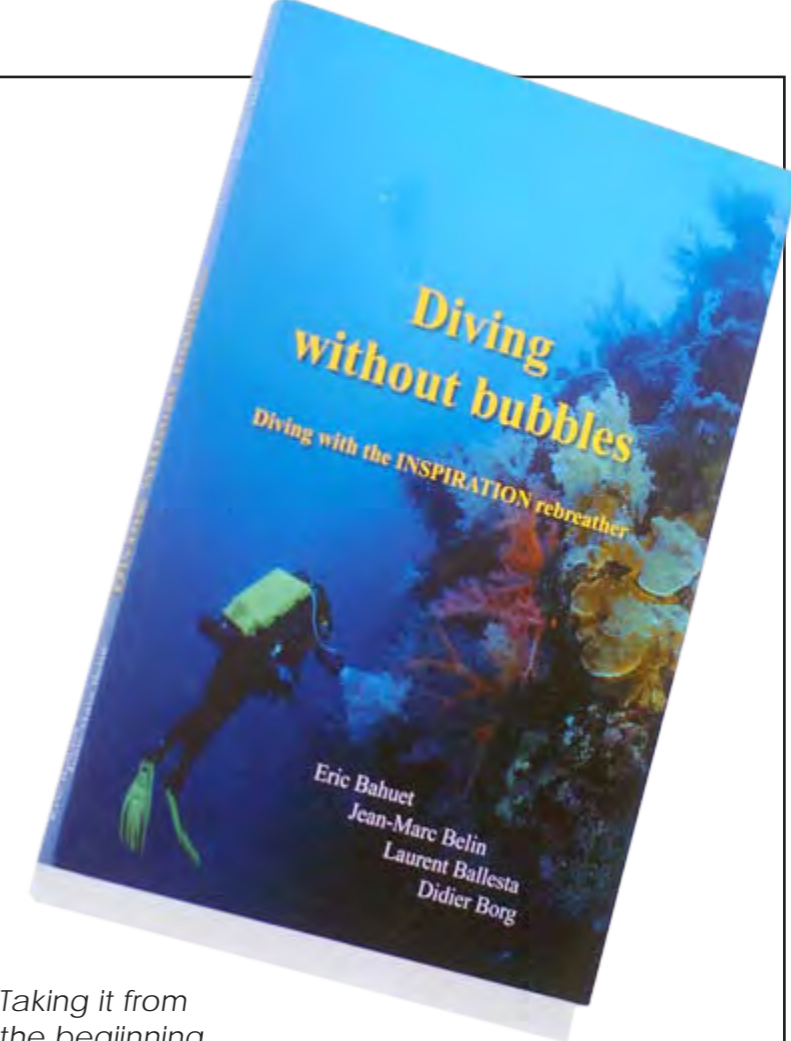
Poseidon Diving Systems. Sweden

[www.poseidon.se](http://www.poseidon.se)

When Poseidon entered the closed circuit market, they did it with a splash introducing a ground-breaking first eCCR aimed specifically at sport divers rather than technical divers and packed with novel design features. The unit is very compact and priced significantly lower than mainstream CCRs closing much of the price gap to a set of open circuit equipment. Above all the manufacturer has gone to great lengths to make the unit as foolproof, user friendly and failsafe as possible. The intention is to make it as much of a don-and-dive unit for sportdivers without technical training as possible. It has also been designed with entry level training in mind. Poseidon took over the renowned CIS-Lunar brand some years ago and tied in the expertise from Bill Stone and Richard Pyle as consultants during the development, which went on for several years. The Discovery introduces many new design features and ideas. The compact control unit is completely sealed and oilfilled and cannot be accessed, or messed around with, by the user. The battery is rechargeable like a cellphone and visible from the outside where a diode shows that the battery is charged. The unit uses special scrubber canisters, so no messing around with granules or risking packing the scrubber the wrong way. The oxygen cylinder can only be filled to 100bar. This is to ensure that the scrubber always outlasts the gas. The idea is that you always change scrubber and refill oxygen in tandem, at the same time.

But what is probably to most significant deviation or development from mainstream thinking is the use of only one main sensor. The other sensor the unit carries is for the detection of internal leaks. The manufacturer explains that they have chosen going with one sensor only because the logic behind the conventional three sensor and voting logic configuration has been demonstrated to be somewhat flawed. Why focus on getting correct readings when you can rule out sensor errors? This is the philosophy. This is achieved by constantly validating the sensor against pure oxygen.

The first production units are expected to be shipped in September. ■



Taking it from the beginning

## Diving without Bubbles

This book takes a very different approach in two ways. It starts at the beginning assuming that the reader knows nothing or very little about rebreathers but is interested in the subject. This makes the book a good supplement to training manuals—there are plenty of illustrations and down-to-earth explanations. The other thing that sets this book apart is that it focuses on one product model—the Inspiration. Whilst these units are probably the best selling CCRs on the market, this will probably put off fans and manufacturers of other units from buying this book, which would be a shame, really. It does get around an amazing amount of issues and is packed with good tips and things worthwhile considering without ever getting heavy. The design does come across a little homemade in places, but so what? It's the content that matters, and the combined knowledge of the four authors—who are all leading technical divers drawing on a range of other experts—poured into this book is rock solid. ■

[www.divingwithoutbubbles.com](http://www.divingwithoutbubbles.com)





## O2ptima

DiveRite, United States  
www.diverite.com

The O2ptima FX is an electronic CCR with built-in decompression ability, which has primarily been designed with diving in overhead environments in mind, such as cave diving or any technical dive where an immediate ascent to the surface is not possible. The design seeks to minimize the risk of a caustic cocktail. Two water traps in the loop along with horizontal, behind-the-head positioning of the scrubber canister, create a difficult path for water to travel, hence making it difficult for water to penetrate the canister chamber. A high impact frame and polyester cover protects the O2ptima from tight cave squeezes and rolling boats. Hoses, regulators and tanks are kept neatly streamlined and away from potential snags inside a wreck or cave. The controller is fitted with Hammerhead electronics from Juergensen Marine. The unit has over-the-shoulder counterlungs. Other standard features include Heads-up-display (HUD), Display Integrated Vibrating Alarm (DIVA), Dive Surface Valve (DSV) and Automatic Diluent Valve (ADV). The US MSRP is \$7000 (cylinders are not included). ■



### The significance of the CE marking

In the European Union, any equipment that falls within the scope of the EU Directive on Personal Protection Equipment (PPE) must be tested and certified according to the current CE standard.

In this case, the EN14143:2003 covers all rebreathers and also all PPO<sub>2</sub> monitors for use with a rebreather that are imported, manufactured, sold or used in work in Europe.

Any person or company that is importing, manufacturing, selling or using equipment without the CE mark can be prosecuted. Sale can be banned and goods seized, and in case of an accident involving the use of the equipment, criminal charges can be brought to the directors of the involved company.

Clearly, obtaining the approval and CE marking is a serious matter. ■

## Pelagian

Rebreather Labs, Thailand  
www.rebreatherlab.com

The Pelagian is deemed a DCCCR. This impressive acronym stands for Diver Controlled Closed Circuit Rebreather, which essentially means that this unit is not controlled by an automatic electronic circuit for maintaining the right oxygen-levels. In other words, it's an advanced mCCR. The oxygen is injected into the breathing loop through a valve, which the diver can vary.

Quoting the their website: "This means that oxygen is added mechanically through a fine metering needle valve at a constant flow set slightly lower than the diver's metabolic rate. As the PO<sub>2</sub> slowly drops the diver manually adds oxygen with a push button." It is an approach somewhat related to what is seen in many semi-closed rebreathers. But while these have a fixed orifice with a constant gas flow, in this case, the diver can fine tune the flow by adjusting the needle valve while monitoring the PO<sub>2</sub> on the O<sub>2</sub> displays.

The Pelagian Head has space for three cells sitting next to each other, which are all subject to instant cell validation. The Pelagian display shows two cells. The third cell is usually connected to a decompression computer, type Pursuit, VR3, etc. The idea is to keep the third cell completely isolated from the Pelagian display circuits so that, no matter what may happen with either the Pelagian display or the computer, none will compromise the other.

Another feature that is unique to this unit is the position of the counterlungs. They are front-mounted but also partly tucked away under the diver's arms keeping the chest area free of clutter and minimizing the work of breathing. There is no manual diluent valve but a ADV on top of the scrubber unit. Also worthwhile noting are the small dimensions and low weight of the unit, which weighs only 10.5 kg—a package small enough to fit in an overhead compartment in an airplane. It can accommodate tank sizes from 1.8 - 11 liters.

The manufacturer, Rebreather Labs, which is based in Thailand, informed us that they do not plan on getting the unit CE tested in the near future. Listed at USD 5800. ■



The needle





## Halcyon RB80

Halcyon, United States  
www.halcyon.net

The Halcyon RB80 is something quite unique and not a rebreather in the usual sense. It blends features and advantages from open circuit with the rebreather's capabilities of preserving gas. The name RB80 refers to the standard 80 cu ft tanks utilized by the system and its designer Rainhard Buchaly. The RB80 has been designed with reliability in mind. Adhering to the DIR principles, it is not reliant on electronics. The Halcyon rebreather supplies breathing gas as required by the diver's respiratory rate and gas replenishment is mechanically triggered by the diver's breathing cycle. The Halcyon "on demand" gas delivery system is designed to provide less oxygen variation, better predictability and overall significant performance advantages over other SCR platforms. On their website, Halcyon states that their patented technology significantly reduces oxygen content variations over a wide range of diver activity levels. Moreover, this on-demand feature is coupled with a naturally intuitive "alarm" feature, which provides the diver with an immediate and obvious indication that supply gasses are depleted or that rebreather function is somehow compromised. There is no diluent either, so in a sense, what this unit essentially does is extend the gas of an open circuit by recirculating it a number of times before exhalation. This system increases gas efficiency an average of eight times more than conventional open circuit consumption. The RB80 is offered with a dual inlet gas manifold that allows divers the ability to plug various gasses into the system, and change them during the dive as conditions and/or depth vary. or allow for the use of various bottle sizes. Divers may use any mix that would be appropriate for open circuit diving, gaining the benefit of the rebreather by greatly extending the mileage a diver would get out of the supply. ■



## Ouroboros & Sentinel

Closed Circuit Research, United Kingdom  
www.ccrb.co.uk

The Ouroboros is a high-end and high-performance CCR designed for the most demanding dives and divers with a long list of stringent requirements to be met. For example, it is argued that the choice of back-mounted counterlungs also allows all the soft—in the sense of being vulnerable—parts of a rebreather to be tucked away under a protective shell, which makes the unit safer on wrecks full of sharp bits. Materials are resistant to corrosive agents, all cable systems being floodproof and double armoured, and so forth.

The current model is the fourth generation, since it was introduced in 2004. The unit can be used with a range of diluents from air through Trimix to Heliox. All



Ouroboros

electronic features can be overridden by using the manual functions of the unit. The unit comprises a central computer with a head-up display (HUD), a primary display for control and monitoring, and a rear facing display for buddy or instructor use. There is also an independent passive display not connected to the main electronics, which has its own power source and displays each

of the three oxygen cell readings. Loss of any or all electronic displays will not stop the unit maintaining a 'life support' PO2 level.

The Ouroboros is a modular design. The primary layout is a back mounted system in a hard carbon shell. Lightweight cordura covers are available with differing canister sizes as well as a chest mounted counterlung configuration.

In 2007, the smaller and more affordable Sentinel was presented, and it has just made the market. It is also fully electronic

Sentinel



state of the art closed circuit rebreather with fully integrated decompression software, integrated bailout valve, digital HP monitor system, heads up display and a host of user selectable upgrades.

The Sentinel is competitively priced with three levels to choose from: Airdiluent(40m), Normoxic Trimix(60m) and full Trimix(100m) enabled. The counterlungs are back mounted, and where its bigger sibling has a radial scrubber, the Sentinel's is axial. ■

Ouroboros is listed at £8250 (incl. VAT)  
Sentinel listings start at £4,500 (incl. VAT)

# Maintenance & Care

Check the o-rings with a magnifying glass for tears and scratches. When cleaning the camera equipment, make sure you have a clean and well organized working space



Ports/domes made of acrylic glass are easy to polish, but only on the outside. Never touch the inside, not even to polish



**Dependable and well functioning camera equipment is the foundation of good pictures. This article gives you some hints and tips on how to maintain your equipment in flawless condition.**

Some of the most important parts of your camera equipment are the o-rings. Without watertight o-rings there won't be any underwater photography. It

doesn't matter if they are made of neoprene, silicon or viton, they need to be in perfect shape.

### Keep it clean

On every dive, the o-rings are strained by extreme forces as they are pressed against the grooving on the underwater housing, including water and the particles it contains. It is therefore just a matter of time before so many particles are left around the seals, that the camera housing starts to leak. To

Text by Kurt Amsler  
Translated by Arnold Weisz  
Photos by Kurt Amsler



Checking the TTL- function is vital. Just flash the camera. If the strobe flashes immediately and then recharges without delay, it's ok

In addition to the large o-rings on i.e. the lids, there are smaller but no less important o-rings on all bushings. These I recommend to be serviced about every 100 hours (underwater). This is usually only possible on more advanced camera housings. On simpler camera housings of synthetic material (except Sea & Sea) this is not possible.

### Strobes/ashes

Your strobe/flash devices also need to have their o-rings serviced and cleaned. The pilot lamp is ideal for testing the apparatus. Test all flash settings. The recharge time should of course be longest by the strongest setting. All other settings should allow for quicker recharging. The TTL is best tested when you point the strobe directly into the lens and fire it. If the strobe flashes, but the pilot lamp doesn't come on, you have a circuit contact problem. The reason for such problems are often lack of maintenance. If the contact has

## Maintenance

grease, moisture, or is oxidized, you will get a short, which will affect the controlling mechanism of the TTL. Always clean the contacts with alcohol, and keep a spare cable with you. Nothing is worse than finding the 'perfect shot' and then the strobe fails. To avoid such mishaps you should always test the batteries before entering the water. Battery testers are cheap and easy to buy. Some camera manufacturers inform you about the batteries' charge rates, but often just one flash can separate a red from the green light.

### After diving

After every dive, you should always rinse the housings in fresh water. When you come home from a dive trip, you should always soak the housing/strobes 30 minutes in water containing white vinegar (about a teaspoon per litre). This is to dissolve all salt crystals. Then, repeat this twice without the vinegar for 30 minutes. After you have rinsed it off for the last



prevent this, you need to clean all the o-rings after every film-, memory card or battery change. Additionally, you have to grease the o-rings. Don't use any sharp objects to remove the o-rings. Use your fingernails. Have a close look at the o-ring, clean it with a paper towel. Never use cotton Q-tips, as they leave behind an 'anti-grease' surface, which eventually can lead to leaks.

on the silicone o-ring you risk that they are not flexible enough, which may lead to leakages. o-rings made from neoprene or viton can be greased with all kinds of grease, but silicone o-rings should only be greased with the grease that is recommended by the manufacturer. Otherwise, you may deteriorate the quality.

### Greasing O-rings

Again, and again the questions arises about how much grease should be applied to the o-rings. The whole point of greasing the o-rings is to make it easier for them to slide into place as an increase in water pressure starts to work on the camera housing. Using neoprene and viton o-rings, only apply silicone sparsely. The o-ring may shine slightly, but there shouldn't be any visible grease on them. The silicone o-rings need three times as much grease, as they seem to absorb the grease. If you don't apply enough grease



Working batteries are essential. Cleaning tools: WD-40 spray and cleaning tissues



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photo & video

time and dried it, you should apply all parts (metal, screws, shafts and bushings) with the anticorrosion formula WD-40. Remove all o-rings made of neoprene or viton and store separately. This prevents them from losing their shapes. Then, remove all batteries. Non-removable batteries should be charged. It is best if your charger has a trickle charge setting. Even though some divers feel that this kind of maintenance is time and labor intensive, it will be worth your while—and your camera will not give up when you have the 'perfect shot' in your frame.

Practical tips for maintenance and care:

- On a regular basis, clean all the o-rings after every film, memory card or battery change.
- The anti-corrosion formula WD-40 is perfect for protection of your equipment. Spray it on all metal parts to avoid salt depositing.
- Rinse your housing after every saltwater dive with freshwater. If you are not going to use the housing within the near future, soak the housing in freshwater to dissolve all salt crystals.



## Maintenance

*If you get at leak, nothing helps. Return to the surface and save the equipment*

- Especially the humid and salty air near the ocean quickly affects the contact points and batteries on your equipment. Clean the contacts with either sandpaper or cleaning spray. You can also use an eraser.
- To keep a good working connection between the camera and strobe, regularly clean the contact points with alcohol. Often grease from the o-ring will get into the cables or contact points breaking the electric flow.
- To avoid surprises during a dive, always test the strobe, the zoom rings, and the shutter to assure faultless operation.
- Small scratches on acrylic ports can easily be polished off. On glass ports on the other hand, this is not possible. To avoid such scratches, always protect your domes/ports with a neoprene protector.
- To avoid a "memory effect" and to maintain long-life for your batteries, you should only recharge them when they are almost empty. Modern battery charges often come with a discharge function.
- To ensure that your batteries have sufficient power before you enter the water, you should always test them.
- Keep all your maintenance tools like silicone grease, o-rings, battery charger, battery tester, etc, in a small waterproof case when you travel.

Clean the contacts with a tissue and some alcohol

For workshop information, please visit Amsler's website at: [Photosub.com](http://Photosub.com) ■

# 35<sup>e</sup> FESTIVAL MONDIAL

# DE L'IMAGE SOUS-MARINE



Eugenie MICHÉVA, 13 ans, Suédois, Russie

**PALAIS DES CONGRÈS**  
ANTIBES - JUAN-LES-PINS  
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29 octobre - 2 novembre 2008



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JEAN LEONETTI, DÉPUTÉ-MAIRE D'ANTIBES  
ET DE CHRISTIAN ESTROSI,  
PRÉSIDENT DU CONSEIL GÉNÉRAL DES ALPES-MARITIMES

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info@underwater-festival.com - http://www.underwater-festival.com





### FSD-1100

Fantasea has released the FSD-1100 Housing for Canon's PowerShot SD1100 IS / IXUS 80 IS camera. Composed of durable injection molded polycarbonate, the compact, lightweight design offers full function controls along with double o-ring seals on all command control buttons. Other features include a radial o-ring main seal, new flash diffuser design, LCD screen glare protection, stainless steel buckles and a 46mm threaded port ring, suitable for a wide variety of filters and accessory lenses. The robust design allows for use in depths of up to 60m. A one-year free D.E.P.P flood insurance policy is also included. [www.fantasea.com](http://www.fantasea.com) ■



### Nikon unveils the 12.1 megapixel D700 digital SLR

Utilizing the same FX format CMOS sensor as the flagship D3, this 12-megapixel camera boasts features such as a built-in flash, Nikon's first self-cleaning system for the FX-format sensor, and a top ISO of 25,600. Especially notable for the underwater photographer is the large viewfinder. The five frames per second shooting speed can be boosted to eight with the addition of an external battery pack. Nikon's 51-point auto focus system coupled with two Live View shooting modes enables photographers to frame shots using the three-inch high-resolution LCD monitor. In addition, employment of Nikon's Picture Control System enables image adjustment to a series of preset parameters including Standard, Neutral, Vivid and Monochrome. These presets also allow easy image sharpening, tone compensation, brightness, overall tone and saturation. There is already a lot of speculation as to whether the D700 will fit into D300 housings. The D700 retails for US\$2,999. ■

### Gates EX1

Constructed with "Bulletproof" machined aluminum and a black type III 'hard' anodize finish, the Gates EX1 housing for the Sony PMW-EX1 is engineered for discriminating professionals. From marine research and military to TV and movie productions, Gates housings are tasked with critical projects the world over. In addition to providing a perfect grip, the adjustable handles enable fingertip access to more than 20 different functions. Flexible trim weights can be added or removed for ideal buoyancy and control. Precision ports, along with the optional EM43 high-resolution monitor, afford the sharpest HD images. Each housing comes with a 2-year renewable warranty. [www.gateshousings.com](http://www.gateshousings.com) ■



### Ikelite substrobe

A new and improved version of the popular D-125 strobe introduced in 2001, the Substrobe DS-160 is compatible with all Ikelite TTL systems and cameras ranging from Nikonos systems to the latest digital models. When utilized in either manual or TTL mode, recycle times are virtually instantaneous when fired at fractional power and a speedy 1.5 sec from full discharge. In manual mode, ten powers in half-stop increments allow for precise control over exposure. With minimal drain on the strobe's battery, the powerful 5-watt LED modeling light is ideal for focusing assistance or night diving. The concentrated beam automatically turns off and on when the strobe fires. Also included is a rechargeable NiMH battery pack, flash diffuser, and standard mount with through-bolt. The Smart Charger is available separately. An optional mount with 2.5cm diameter ball allows the attachment of the strobe to a TLC or Ultralight arm system. List price is \$840.00. [www.ikelite.com](http://www.ikelite.com) ■

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# photo & video



## New Aperture

With dozens of image editing and export plug-ins, automations and scripts, and third-party book and web themes available, Aperture's capabilities can be easily extended to access an entire industry's worth of imaging expertise without ever leaving Aperture. The page breaks down the add-ons into four categories. Image Editing Plug-ins adds a variety of specialized tools for noise reduction, selective adjustments, lens correction and much more. With Export Plug-ins, send photos to Facebook and photo sharing websites directly from Aperture. Automations & Scripts turn complex multi-step tasks into one-click operations that extend existing Aperture features and allow straightforward integration into a workflow that includes other applications such as Keynote, Mail or InDesign. Finally, Extras features third-party web and book themes offering a variety of creative design options that allow greater flexibility when presenting your photos in print and on the web. ■



## Ikelite WP-80 Wide Angle Port

WP-80 Wide Angle Port is an interesting option for select Ikelite video housings. This represents the premium end of Ikelite wide-angle options and delivers the ultimate in resolving power, particularly important in high-definition applications. [www.ikelite.com](http://www.ikelite.com) ■



## Zillion housing

Japanese manufacturer Zillion has released a housing for Canon's EOS 450D. Named the ZAP-KissX2 (the 450D is named the Kiss X2 in Japan) is available in a wide assortment of colors and is brimming with features including AF frame select and Zoom, exposure compensation, metering select, easy direct/white balance select, AF mode select, playback and manual focus dial. The ABS resin/Acrylic resin/stainless steel construction is rated to depths up to 60m. Optical fiber cable connectors for strobes are built in. [www11.ocn.ne.jp/~zillion](http://www11.ocn.ne.jp/~zillion) ■

DoF Calculator	
Values for Calculation	
Film Format	Canon DSLR
Focal Length	50 mm
Aperture	f/5
Distance	5 m
Depth Of Field	
Focus Distance	5.00 m
Near Limit	4.20 m
Far Limit	6.17 m
Total DoF	1.97 m
Hyperfocal Distance	26.16 m

## New Depth-of-Field Calculator for iPhone

A new native application for the iPhone promises to help photographers take control of DoF (Depth of Field). The application is a DoF (Depth-of-Field) calculator, which allows you to calculate the depth of field of your pictures in advance of the next photo shoot. After you have set all required settings (camera, focal length, aperture, subject distance), the DoF Calculator calculates all the required information (near limit, far limit, depth of field, hyperfocal distance, depth of field in front of the subject as well as behind the subject, circle of confusion), which you can use for your perfect picture.

The DoF Calculator is available now through iTunes for US\$7.99 ■

## Seatool

The new Seatool housing for the Canon Rebel XTi packs a lot of features into its compact size. The smallest and lightest underwater digital SLR system on the market, the XTi underwater housing fits the ultra compact Canon Rebel XTi camera like a glove. Loaded with full SLR features such as TTL, fast focusing, no shutter delay and a large LCD monitor, the camera delivers beautiful crisp images with minimal noise. For the traveller seeking a high-end yet lightweight carry-on system, the Canon Rebel Xti fits the bill. Price US\$2,299.00 [www.backscatter.com](http://www.backscatter.com) ■



## ULTRAcompact

The Ikelite ULTRAcompact digital housing for the Coolpix L18 is indeed compact and cool; it slips into your pocket to carry along on any adventure. Housing measures only 15.2 x 11 x 8.6 cm (6" x 4.4" x 3.4") including controls and port. Camera and housing together weigh under 0.66kg (1.5 lbs) above water and are nearly neutral underwater. All camera controls are fully functional through the housing and depth rated to 60m (200ft). Includes USB Cable, Audio and Video Cable, Strap, two AA Alkaline Batteries, and the Nikon Software Suite for Coolpix. [www.ikelite.com](http://www.ikelite.com) ■

# Underwater Australasia Photo Competition 2007-08 Winners

The annual *Underwater.com.au* photo competition is over, the judges have spoken, and we are ready to announce the winners of the fourth annual underwater australasia photo competition. As in every year, we have selected two winners each month until June 2008—one in the Open Category and one in the Novice Category.

Text by Tim Hochgrebe

3rd prize,  
Novice category:  
Larry Medenilla  
with a incredibly  
lit *Chromodoris* at  
Anilao, Philippines

1st Prize,  
Open category:  
Matt Tworkowski  
with a great  
atmospheric  
shot of stingless  
jellyfish at the jellyfish lake, Palau, Micronesia

Thanks to all of you who contributed to this amazing competition. The quality of entries was even better this year, and we are looking forward to a great 2008-09 competition. If you didn't win this year, don't despair—continue to dive, take photos and submit them to us.

The prizes for our fourth annual competition were absolutely AMAZING! Thanks to all the sponsors of this competition.

We have seen over a thousand fantastic entries over the last year, and the winners of the 12 monthly competitions were in the finals to compete for very exciting prizes including a week dive trip for two at Lotus Hotels

and Resorts with the choice of Villa Almarik, Gili Trawangan, Lombok or Bali; a custom made dry suit from Apollo; a Taka live-aboard trip from Cairns; and a dive trip for two to the Tutukaka coast, New Zealand, with Poor Knights Divers in New Zealand.

A VERY big thanks to the judges, who included legendary underwater photographer Michael Aw and contemporary underwater artist Richard Vevers from Underwater Australia, as well as of course us, the underwater team.

Okay, now to the winners of the 2007-08 competition—drum roll please... ■



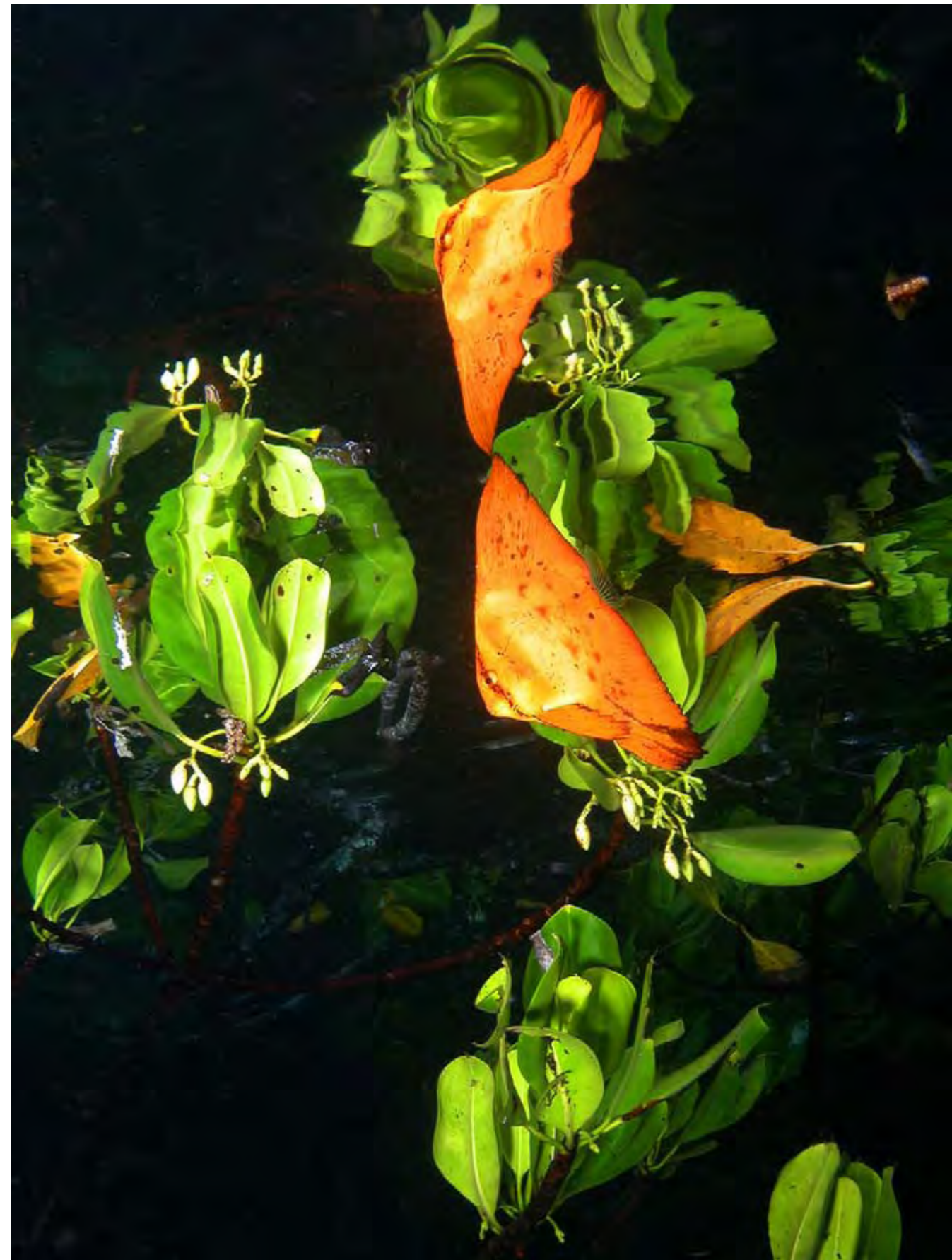


1st Prize, Novice category:  
Larry Medenilla, with his super-close-up of  
a Pygmy seahorse from Anilao, Philippines



2nd Prize, Novice category:  
Caelum Mero, with *Take me to your  
leader*, Point Franklin, Victoria, Australia

# Photo Competition Winners



3rd Prize,  
Open category:  
Linda Johnston,  
with a magically  
mirrored juvenile  
Orbicular Batfish  
at Raja Ampat,  
Indonesia



2nd Prize, Open  
category: Peter  
Hitchins from South  
West Rocks, with  
the ultimate shot of  
Grey Nurse Sharks  
in Fish Rock Cave





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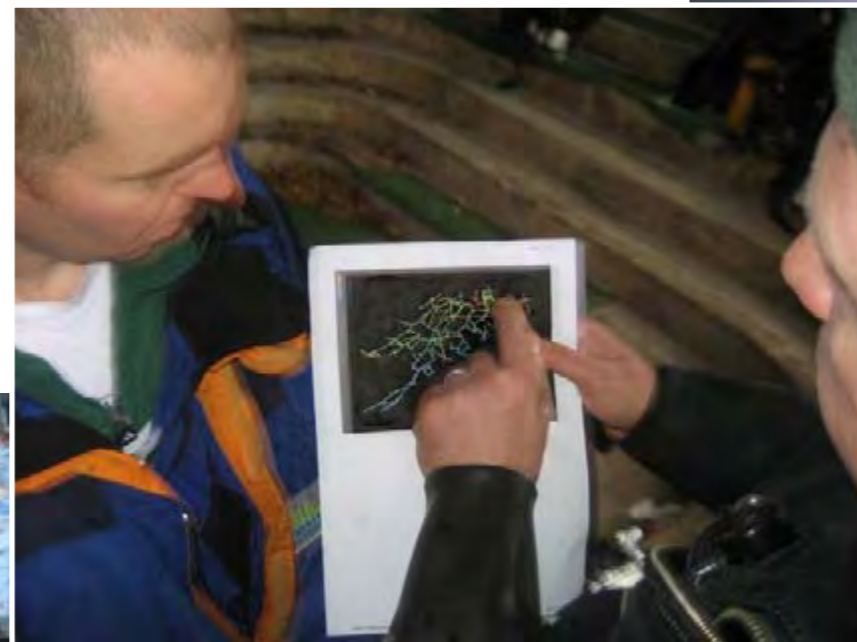
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# Budapest

*Beneath the streets*

# Caving in the City



Text and photos by JP Bresser

I was actually heading somewhere completely different—a small island in the Seychelles. But since this trip got cancelled just prior to departure, I decided to go to a tech divers conference in Budapest instead. That in itself was an interesting event with presentations on all aspects of technical diving. The cherry on the cake was a forum discussion on rebreather diving with some of the most “famous and well known” rebreather divers on the planet. And to make it even more interesting, the more “controversial” camps of the rebreather world were also represented. A tech dive conference with familiar faces, new ideas and knowledge, and equal minds. But why on Earth head for Budapest?



*Unique Dive Site*

Members of the dive team meet in the spa room the ruins of an old hospital in Budapest before the dive

Budapest was once known as the “Paris of the East”. Today, it is a gateway for a group of countries that hope to join the West. I found that it was also a gateway for enthusiastic technical divers striving for more knowledge and experience. This may sound like a long way to go just for a two-day conference on diving, but there was much more to it than just a conference.

Underneath the city lies a huge cave system with warm thermal water, and we got a permit to dive into it. Isn't life beautiful?

## The dive

On a drizzling Monday morning

after the conference, we gathered in the middle of Budapest in front of an old iron gate with a big lock on it. We were joined by three teams including a group of Dutch cave-trained cave divers and some American friends who also wanted to dive the cave.

Curiosity got the better of us, so we climbed onto the surrounding wall to see what was hiding behind it. What we could see was an old building built in a traditional style and a small pond covered with duck weed. Through the few open areas of the pond, we could see the crystal clear water beneath, and our heart beats sped up as our

*I look at a glass wall between other buildings that is showing a hint of a construction well hidden behind it. I climb on the wall and discover a dark pond and something that looks like an ancient bath house. Is this really the entrance?*

—Anton van Rosmalen  
(Team 2)

Geared up divers descend into the cave via a gated stairway. TOP CENTER: On a convoluted map of the cave system, the guide shows the route to the dive team





## Budapest

enthusiasm peaked.

At the same time, a tram rumbled through the street.

It's a strange place for a cave entrance. Aren't caves supposed to be somewhere in a desolate landscape in the middle of nowhere? Usually, one will just find something like a small muddy pond near which the entrance is hiding. This was completely different.

We were in the middle of a European capital, on a busy street with trams and cars passing by.

Here, an old public bath house was located, built around 1600 with architecture influenced by the Turks. It was hardly noticeable with that big wall around it

and the old crappy gate hiding the entrance.

We met our guide Joseph Espanol, who goes by the nickname 'Joe' among those distinguished fellow divers who find it hard to pronounce Bulgarian names. Joe is one of the divers exploring this cave system and an avid cave diver.

After some dragging and lugging, our equipment was spread all over the pavement in front of the wall, and Joe opened the gate. We geared up in a former spa of a hospital across the street, which was in some places almost completely collapsed. There was an empty pool that was

After passing through the narrow tunnel, the cave opened up

once dedicated to medical treatment in the warm thermal water.

Most of the chambers looked completely deteriorated, and beams of sunlight penetrated through the holes in the ceiling and the entrances, giving the place a theatrical ambiance like that of a film set.

While we rigged up our gear and analyzed the gasses, Joe briefed us on the specifics of the cave, which is known as

Molnar Janos (named after the pharmacist, Janos Molnar, who explored the dry parts of this cave around 1860).

Joe produced a color-copied



map of the system, which—with all its psychedelic colors and lines—had a remarkable resemblance to a cobweb made by a spider on LSD. His finger flashed swiftly over the small folded paper with its incredible amount of colored lines.

It took a while before I realised that Joe was showing us the direction of our planned route through the cave. After three T's, I was already lost.

We questioned Joe about the condition of lines and how the T's were routed and marked, but the answer wasn't what we expected and hoped to hear. The lines in the cave were thick, too thick for



Divers edge into a narrow rock corridor, barely able to fit in sideways





Squeezing through the entrance to the cave

when he started telling us about the walls which were covered with crystals that we could expect to see, and the gin clear water of 20°C. I thought, "Who cares about double-enders anyway?"

### Plunging in

We got into our gear and walked toward the pond. In front of us, we found a small iron staircase entering a narrow dark tunnel into the ground. While we climbed down, I felt the temperature rise. I stepped into the steamy water, a weird sensation considering it was cold winter upstairs.

our cookies (markers that cave divers use on lines to mark a change in direction or an intersection between lines) and in several places, they were kept in position by thinner lines, so each intersection looked a bit like an exploded web.

On the route we were supposed to follow, this would not be just one intersection, but more like 22 of them. To make it all a little easier, each intersection was marked with a big white arrow pointing towards the exit.

We secretly brought extra double-enders instead of cookies, so we could mark each intersection on our exit side, although it was questionable whether or not we could swim with 22 double-enders in our dry suit pockets.

Joe captured our attention again

We floated into the narrow rock corridor and were barely able to fit through while positioning ourselves side ways. With small movements and kicks, we shuffled a little further until we all had some space to perform bubble checks, valve and s-drills.

Joe descended into the narrow tunnel, and when he reached the bottom, I could see him disappear through a small hole. One by one, we descended, pulling ourselves through the narrow entrance, and started a swim of approximately 200 meters through narrow passages and restrictions.

Although the water temperature was perfect, the visibility was disappointing as the water was a little milky. I still enjoyed the sneak-throughs and

## Budapest

the narrow passages, combined with the bluish light effects given by the disappearing HID lights of divers, Marloes and A-M, who were swimming in front of me.

Suddenly, the cave opened up, and I saw the first of many line intersections in front of me. A cluster of



lines exploded in all directions, kept in place by a thick rope dropping from the ceiling. And as promised, in the middle was a big white arrow pointing towards the exit.

Joe led on, and after a few more hair balls of line, we followed a line leading steeply downwards and broke through a thermocline. The result was



Scenes from the cave dive under Budapest





THIS PAGE: Divers explore Molnar Janos cave, which has giant caverns of sparkling crystals and impeccable visibility

crystal clear water and a remarkable decline in temperature.

I heard my buddies yelling in amazement, and my own “WHOA!” shortly followed as I saw an irregular, high room in front of me that continued as far as the eye could see. I never expected something like this, especially not after the somewhat silty narrow tunnels we had just passed through. Immensely impressed, we followed Joe as vertical canyon-like corridors with walls like snow-covered sugar pies were followed by big cathedral-worthy rooms. It felt like flying. The environment could—in my opinion

—have been compared to the caves in Florida or even Mexico. What a thrill! I felt so lucky to be here and hoped this dive would last forever.

### The cave

We passed several rooms in which five trucks parked next to each other could easily fit. I heard Todd laughing in his regulator when I pulled Robert’s fin, and we performed a dance together at the sight of this much beauty. Flying through this extraterrestrial world—or rather inter-terrestrial world—gave one an intense feeling of life and peace at the same time.

*The cave was awesome. We swam through huge rooms that were meters high, without exception. The visibility was superb, the water was warm, and everywhere our lights went, there was the reflection of crystals on the walls.*

—Anton van Rosmalen  
(Team 2)

## Budapest

Several times, Joe drew our attention to the cave’s beauty by moving his light to the walls of crystals. They were sometimes dark brown and sometimes clear as glass, but everyone of them exploded with a rainbow of color when our light beams hit the crystals. It was almost unreal.

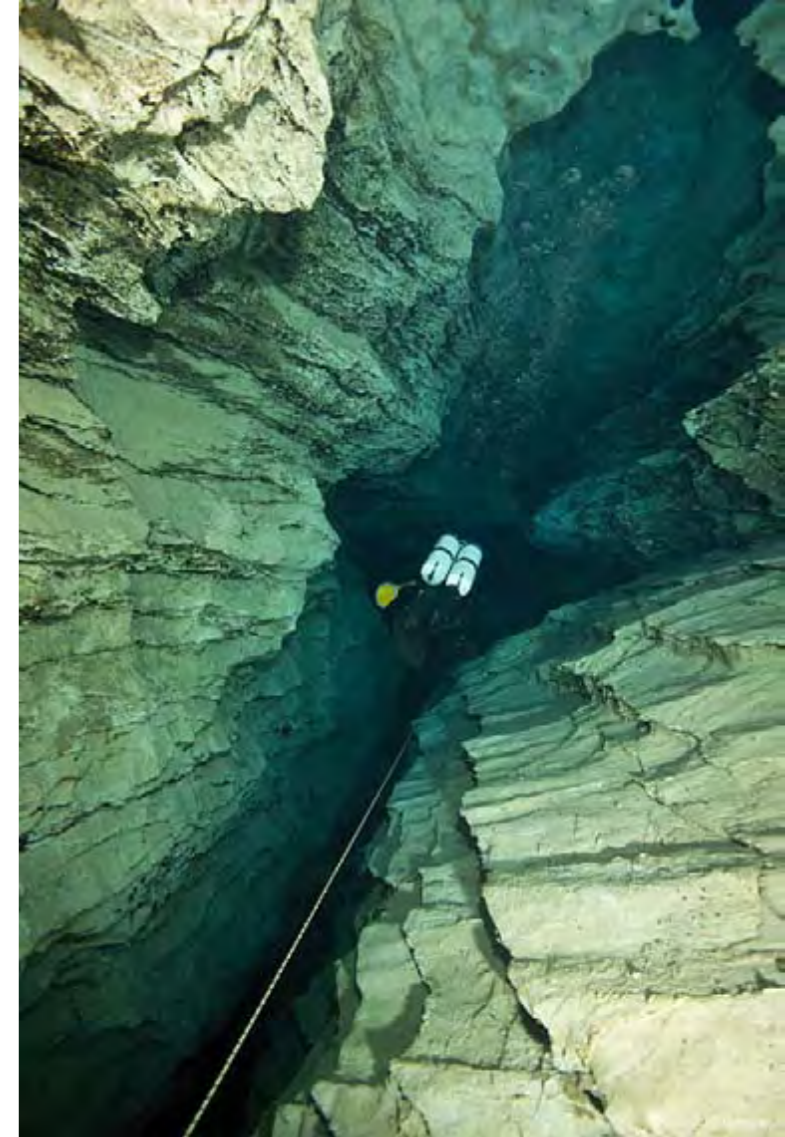
Unfortunately the nasty reality of the end of the dive hit us when our gas limits forced us to turn back. We gave a thumbs-up signal and returned with the anticipation that our way out would be another great experience.

When we ascended to shallower areas again, the warm water embraced me like a blanket. The game of sneaking through the small passages and restrictions began again for a second time, and with a heavy heart, I surfaced into the small tunnel where we had started our dive. Yelling and screaming with excitement, we tried to tell each other about all our impressions of the dive.

### Lasting impressions

In a small room almost at the end of our dive, we took a 5-minute deco stop to compensate for the yo-yo dive we had just made. Todd used this time to teach us the basics of geology using Robert’s wet notes. Again, I got to appreciate how four people could hover in a small room like this without creating a complete silt-out.

While we undressed in the surreal surroundings of the old bath house, we agreed not to spread enthusiastic stories about this awesome cave. We all suffered nightmares from “Ressel, France on a sunny summer day” where cave divers had come from all over the world to combat each other to be “first” in the cave and have a more or less acceptable visibility before colleague divers ruined the joy of clear cave water with lousy swimming techniques and lots of



*On the way back, I swam most of the time on my back and enjoyed the vastness of the enormous rooms we passed. We stopped at some of the beautiful crystal formations to study them more closely.*

—Anton van Rosmalen  
(Team 2)

imprudence.

So in case anyone asks, this dive was officially made in a cave under Brooklyn, New York City, because in Budapest, they have never heard of sub-capital-caves, and we will keep the exact location a secret to ourselves. ■

# Jo Wooler



*“It is mainly the idea and wonder of nature, in particular the sea and it’s inhabitants, that influence and inspire me. I am in awe of the sheer magnificence of our oceans and seas and what lies within, and celebrate this through my work.”*

*— Jo Wooler*

*Mother and Calf by Jo Wooler  
Stainless steel sculpture  
70 x 10 x 10 cm*

P O R T F O L I O

*Sea Horse III* by Jo Wooler  
Stainless steel sculpture  
50 x 20 x 4 cm

**Avid diver and Australian metal sculptor, Jo Wooler, has always been artistically inclined, enjoying the process of creating whether it be drawing, painting, writing, sculpting, or playing musical instruments. Through her life she has always made gifts for loved ones, and explored many mediums in the process.**

It was through her husband Drew that she discovered the medium of stainless steel. He had a boat building business, and used to pick up work in various ports during the four years when they lived on their first catamaran and sailed up and down the east coast of Australia.

"I loved drawing the sea creatures we encountered on our years on board, and playing around with some of Drews' stainless steel off cuts one day when we were in port earning some money, I created a fish," said Wooler. "This I gave as a gift to a friend, who was quite impressed as was everyone my friend showed it to."

Wooler has no formal training, but she did study art through school, and took on a mentorship at an engineering firm when she became interested in stainless steel as a medium for her work. She now has a Diploma of Engineering, Cert III in C.A.D. and Cert III in Engineering, Fabrication Trade—education which enabled her to explore and develop her skills. "I love the consistent challenges faced with working with such a difficult medium, and realizations and discoveries I make along the way as I develop new techniques and processes of working with stainless."

### Artistic process

In the beginning, Wooler used off cuts of stainless steel, and hunted around scrap yards for her materials. As her arts practice developed, she realized she wanted to be specific with the grade of stainless steel she was using. So, in order to be certain that it was marine grade, she started buying it from manufacturers by the sheet. She returns her scraps and off cuts to be recycled.

Wooler primarily works with sheet stainless up to 3mm thick. "When I have a design idea, I will either draw it directly onto the sheet, and then cut it out with a cutting wheel on a grinder. If the design is quite intricate, I will use my plasma cutter to cut the design out.

I then go around the edges cleaning up the dags with a grinding wheel. Depending on what I am trying to achieve, I may polish or texture the piece. I use heat to shape and colour the stainless. I use a tig welder to weld my pieces together."

### Inspired by the sea

As for choosing fish and marine life as subject matter, Wooler says it is a profound interest for her. "I am inspired artistically and aesthetically by the beautiful shapes, curves and colours in nature."

*"My artistic mission is to inspire all who appreciate my art work of the wonders of our sea, and how vitally important it is that we protect our seas and oceans. I love to inspire my fellow artists, and help them see that they can be self sustained within their arts practice if that's what they want." — Jo Wooler*



*Coral Trout* by Jo Wooler  
Stainless steel sculpture  
65 x 25 x 5 cm

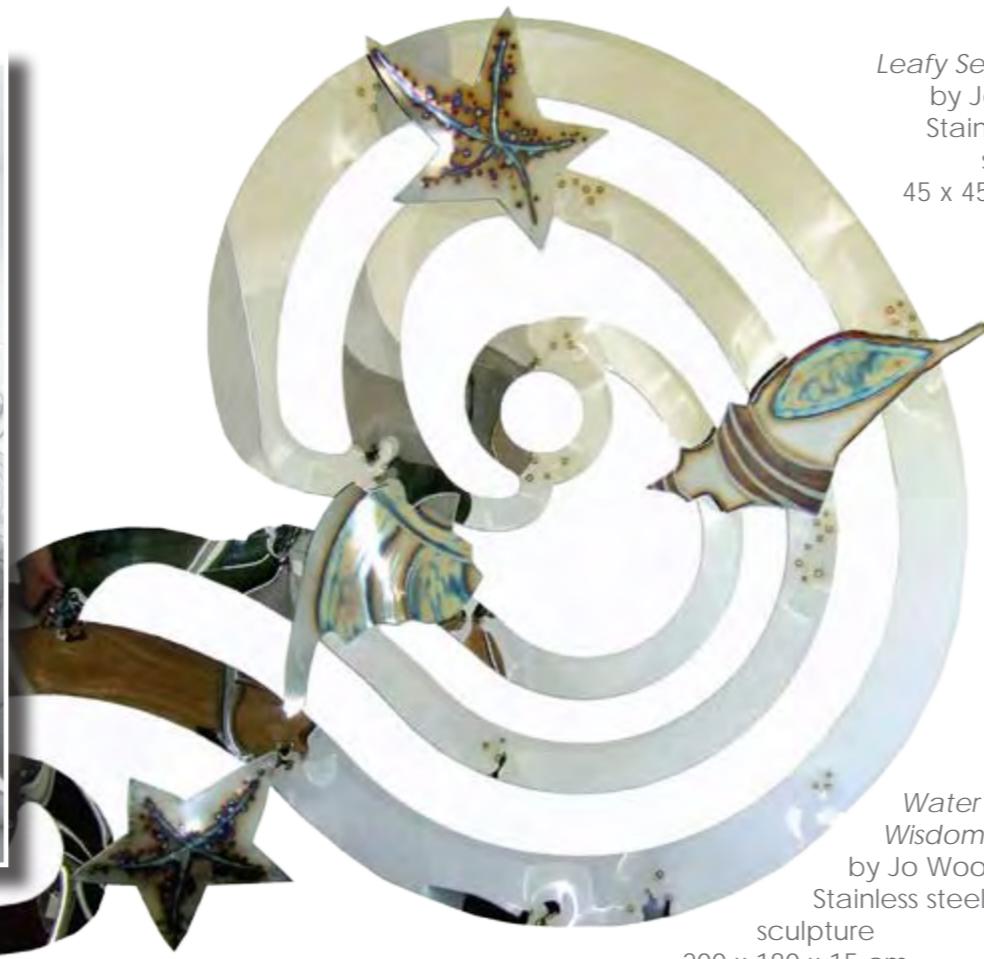


*Lionfish* by Jo Wooler  
Stainless steel sculpture, 30 x 30 x 10 cm

Text edited by Gunild Symes  
All artwork by Jo Wooler  
Photos courtesy of Jo Wooler



Artist and diver, Jo Wooler



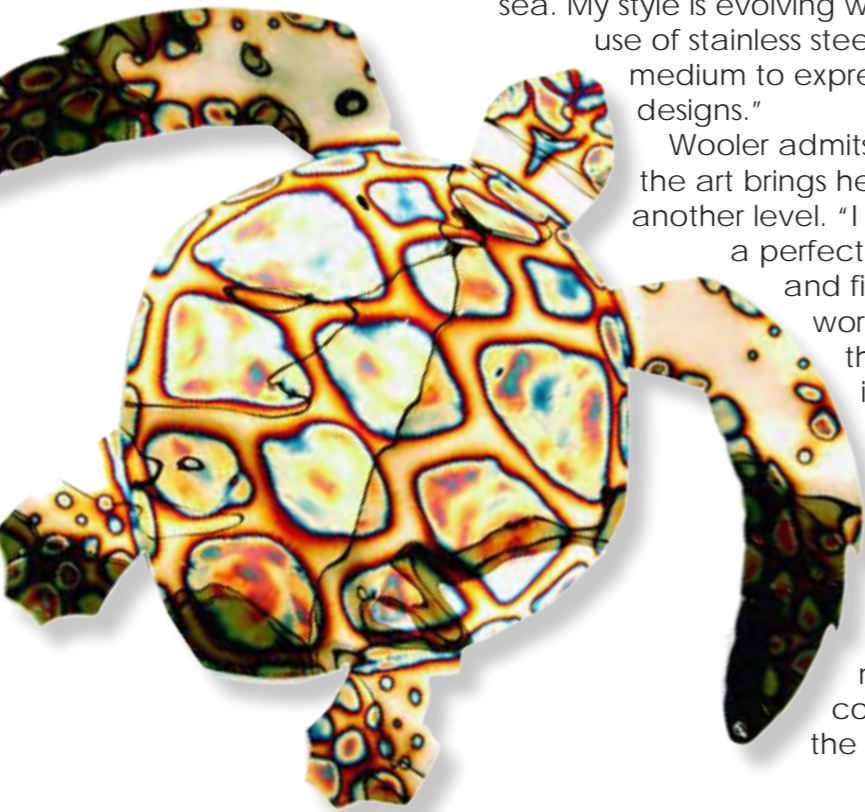
*Leafy Seadragon*  
by Jo Wooler  
Stainless steel  
sculpture  
45 x 45 x 10 cm

*Water Wisdom*  
by Jo Wooler  
Stainless steel  
sculpture  
200 x 180 x 15 cm

Jo Wooler



*Turtle* by Jo Wooler  
Stainless steel sculpture  
100 x 80 x 10 cm



She added, "I have a contemporary artistic style that is colourfully simple. A lot of my work is representative of marine creature developed through my passion for the sea. My style is evolving with the

use of stainless steel as a medium to express my designs."

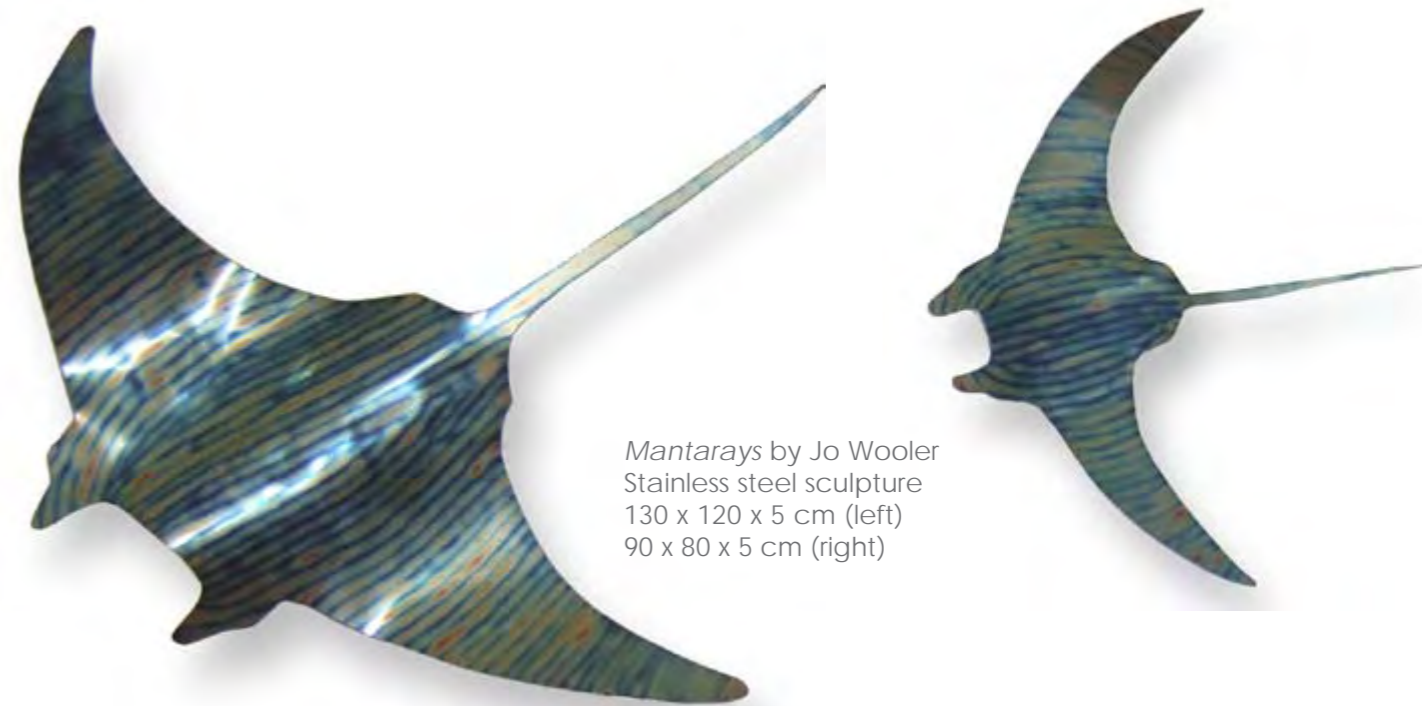
Wooler admits that the art brings her to another level. "I am a perfectionist, and finish my work to a standard that I see present in the miracles of nature. So much so, that when I'm sitting hand filling or finishing edges of a piece, I quite often go into a meditation that connects me with the moment, letting

everything fall away. I find this same peace when I am surrounded by nature and still in the moment, the way nature is—every minute of every hour of every day."

*"I believe if you have a dream and determination, you will succeed."*

Wooler said that she is not aware of any other female stainless steel sculptor, and would be very interested to find out if there are any out there. "I am in quite a unique position, and regularly get surprised responses from people in the industry when they learn of what I do. I certainly feel the respect of my male counterparts who work within the stainless steel fabrication industry and are in awe of what I create with stainless steel."

Her sculptures are most often displayed on feature walls and as free standing pieces. Yacht, business or corporate owners can commission her to create artwork built into their project. She said, for example, that she can create "a fabulous freestanding seascape sculpture" that may serve as a partition for a saloon or galley area on



*Mantarays* by Jo Wooler  
Stainless steel sculpture  
130 x 120 x 5 cm (left)  
90 x 80 x 5 cm (right)



*Sensational Sailing II*  
by Jo Wooler  
Stainless steel sculpture  
200 x 80 x 15 cm



a yacht, or the client or office area of a business or corporation. She also creates commissioned pieces for foyer entrances and entertaining areas on yachts and business or corporate venues, which become exclusive to the owner or project.

There is no limit to the size of work Wooler can create, and she enjoys the challenge of larger works. In fact, in the future, Wooler wants to get involved in creating public art, as the medium of her work is very suitable for this application, she said.

"Amongst my creations are a host of endangered species including whales, dugongs, turtles, leafy seadragons and dolphins. The appreciation of these pieces, and subsequent understanding of their predicament will hopefully bring to the forefront of peoples' minds the importance of protecting our oceans for their future as well as our own."

### Artist & diver

Wooler has been scuba diving for 20 years. She first began diving when she was growing up in Cairns. She was fortunate to have a water loving family and opportunities to experience this wonderful sport at a young age. She served as a tour guide for several years in Cairns, taking people up through the Daintree, around the Tablelands and out West. Through industry association, she was able to enjoy diving on a regular basis on a variety of reefs within the Great Barrier Reef.

Prior to developing her art, Wooler was in the hospital-



*Southern Bluefin Tuna*  
by Jo Wooler  
Stainless steel sculpture  
110 x 45 x 10 cm

*"I believe there is much more under the surface of our oceans than we can begin to imagine. We have so much to learn, it is one of our greatest resources."*

*— Jo Wooler*



*Whale* by Jo Wooler  
Stainless steel sculpture  
105 x 50 x 15 cm



Angels by Jo Wooler, Stainless steel sculpture, 55 x 25 x 5 cm each

ity industry, through which she was able to travel easily. She traveled around Australia enjoying many dive destinations including Ningaloo Reef, West Australia.

"I love the peace and tranquillity when I'm diving. I could stay down there forever, there is so much beauty and wonder," said Wooler.

As Wooler's gallery, Mojocreations Floating Gallery, is currently based on the Capricorn Coast, Queensland, she can often be seen diving off Great Keppel Island. Her favourite places to dive include the Ribbon Reefs off Cape Tribulation, Queensland, Australia. She has yet to enjoy international diving but has aimed her sights on Papua New

Guinea and The Maldives. "I would love to swim with whales. They are the most amazing creatures."

Currently, she is working towards exhibiting in Dubai next year, with a selection of contemporary abstract works inspired by the ocean. She is also working on two *Sensational Sailing* pieces for a design, construction and development group in Queensland who want to mount them in the foyer of their newest development on the waterfront in Manly. In the future, she aspires to making her artwork totally exclusive, with limited works being made for select clients for investment purposes.

In the past, Wooler has taught art classes or workshops upon request.

However, in the future, she intends to make herself available as a motivational speaker, to inspire fellow artists to work towards a path of self-sustaining practice.

Wooler's works have been shown at the World Trade Center in Amsterdam, Netherlands, and in several Australian galleries in Queensland, Tasmania, South Australia, Victoria, Western Australia and the Northern Territory. In addition, her works appear in several public, corporate and private collections in Europe, US, Canada and Australia.

For more information and to order directly from the artist, visit Jo Wooler's website at: [www.mojocreations.com.au](http://www.mojocreations.com.au) or call +61 (0) 7 3283 6929. ■

## Jo Wooler



Seahorse I by Jo Wooler  
Stainless steel sculpture  
30 x 15 x 2 cm



Seahorse II by Jo Wooler  
Stainless steel sculpture  
35 x 20 x 3 cm

## IN OUR NEXT ISSUE

Bangram Island, India  
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White Sea Beluga Whales



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