

*Skin & Hair Care for Divers*



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the Atlantic**

Palau  
**War Wrecks**

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**El Hierro**

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Can Corals Adapt?  
Great Conveyor Belt  
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ARGENTINA  
**Patagonia**

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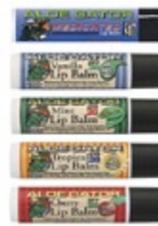
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*Humpback Whale, Patagonia*, by Marcelo Mammana

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Delicate Sea Anemone, Patagonia, Argentina. Photo by Marcelo Mammana



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# Reefs

*Artificial and Real*

## Reefs really made the headlines lately.

First we learnt of the depressing news that huge regions of coral reefs in the Indian Ocean, tens of millions of years old and the basis of the food net, have now irreversibly collapsed. I don't know about you guys, but I find it hard to stomach. It I like a nightmare you can't get out of.

**Ka-BOOM!** Down it went! The former aircraft carrier USS Oriskany now rests on the sea-floor off Florida as the latest and biggest addition to the growing list of artificial reefs worldwide. Make Reefs, not War. What a fitting end for a warship in this day and age.

But can we ever restore, or even aid nature in compensating for the ravages humankind has set loose? Can we counter the effects of global warming? Some research, as reported in this issue, seem to indicate that some species of coral may be able to adapt to some rise in temperature. And isn't it good

that we are putting down artificial reefs like never before and that the world leaders finally seem to have gotten the message.

Just to name a few prominent names, California Governor Schwarzenegger has implemented new laws striving to curb the state's contribution to greenhouse effect. Former US vice president Al Gore has turned environmental crusader and has just come out with a documentary film on global warming. And now even an arch-conservative as Newt Gingrich the former republican speaker of the House, has written to US president Bush urging him to help create a huge marine park around the Hawaiian islands protecting the corals here. Even Bush himself, who came from the oil industry and who was behind pulling the US out of the Kyoto agreement has now finally come around and acknowledged that something's amiss and something has to be done.

That's at least a start.

But is it enough, and is it timely?

The main issue at hand is that some changes can be restored and developments reversed, while others cannot. This may seem like a trivial general observation but the area of nature and environment and it's protection has too often proved fertile ground for some dangerous misconceptions. "The balance of nature" for one. Some die-hard eco-romantics have often referred to this inbuilt 'wisdom' of mother Nature as an almost fundamental principle often with some spiritual overtones of higher purpose thrown in to pot. We're sorry, but that it not how it works.

Ecosystems are either stable or unstable. While they are arguably always undergoing some degree of dynamic transition, the point in case is whether the rate of transition is what we could call an "orderly" natural, gradual and expected progression where a high level of

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# editorial

complexity is preserved - or a catastrophic collapse where complexity and diversity is lost. Ecosystems are characterised by a web of complex relationships between numerous species interacting among themselves and with the physical environment - and complexity often evolves with time as do overall stability.

Think of a tall building with many stories, compartments, shopping malls and apartments. Tenants may move in and out, shops may open and close as they compete - but the overall structure is in a steady state. This building can even sway elastically when subjected to external forces, perhaps even resist an earthquake. But jolt it too hard and the whole structure will come crashing down and turn into a pile of rubble. This is what happened with the coral reefs in

the Indian Ocean, which have now transformed into a completely different ecosystem of much lesser complexity, productivity and diversity. The former coral reefs are now just fields of dead limestone covered with algae.

And like putting a collapsed building together again it would be a Herculean task restoring these as you would both have to remove the cause in the first place (the heightened water temperatures) and only then start piece it all together again, which would take ways and technologies even this undersigned biologist cant glimpse at this juncture.

Perhaps in the future.

The present shift in perceptions and acknowledgement of the problems at hand is one big step in the right direction, but only a first one out of

many. The issue with the emissions of greenhouse gases and global warming can only be dealt properly with on a higher political level - we need another summit. Meanwhile the rest of us can both help keeping the issue in focus by initiating a lot of small scale projects, like the artificial reefs.

While a sinking like the Oriskany surely creates headlines that go around the globe, lets not forget the significance of the thousands of other artificial reef projects, or say hundreds of thousands of reef balls, some sources mention half a million, laid down globally to restore ailing reefs or create new fishing and scuba diving sites.

Bottom line is there are a lot of projects that you and I can participate in. It won't save all these reefs, but it may make the difference that could save the world.



## Please also support SOS-SeaTurtles

Sign the Petition online, click here ☀

Click **here** to send an email with a "Letter of protest" to the Governor of Bali, with copies to other important officials

Link to SOS Sea Turtle's main webpage ☀

KURT AMSLER / SOS SEATURTLES

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News from NAUI in X-RAY MAG:

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X-ray mag

News edited by Catherine GS Lim and Peter Symes

# awesome NEWS



This shrimp was supposed to have died out 50 million years ago

## Ancient species still alive

"It's a new species of the genus Neoglyphea. The Glypheides were well known from the Jurassic and Cretaceous periods and were supposed to be extinct at the Eocene, about 50 million years ago, explains CenSeam researcher Bertrand Richer de Forges

In 1906, the US research vessel "Albatross" caught one live specimen off the Philippines but the significance was not recognised until 1975. In October 2005, Bertrand Richer de Forges conducted an oceanographic cruise to the seamounts below the Chesterfield Islands, on the edge of the Lord Howe Rise. Trawling on the Capel Bank at 400 m, they caught a strange shrimp a new species of the genus Neoglyphea!

For invertebrate scientists this is equivalent to the discovery of the second species of coelacanth in Indonesia some years ago. ■

THE FULL PAPER "DISCOVERY IN THE CORAL SEA OF A SECOND SPECIES OF GLYPHEID (CRUSTACEA, DECAPODA, GLYPHEOIDEA)" IS PUBLISHED BY THE JOURNAL ZOOSYSTEMA (VOLUME 28, ISSUE 1, 2006).

## New species of hammerhead shark discovered

The yet unnamed species resembles the scalloped hammerhead so closely that the only ways to tell them apart are to compare DNA and count vertebrae.

Researchers at NSU Oceanographic Center use genetics to identify sharks exploited in the international fin trade, which is how they stumbled on the previously unknown species of hammerhead. Hammerheads are particularly vulnerable because their fins are worth hundreds of dollars in the Far East, while their meat is much less valued. In trying to develop a DNA forensic marker for scalloped hammerheads, the researchers collected tissue samples from around the world. They were puzzled to find that the test worked on all the sharks except for three, which were caught by recreational anglers off Fort Lauderdale.

But more extensive testing on the three South Florida sharks

showed their DNA was completely different from all other specimens of scalloped hammerheads, suggesting a separate species in the Southwestern Atlantic.

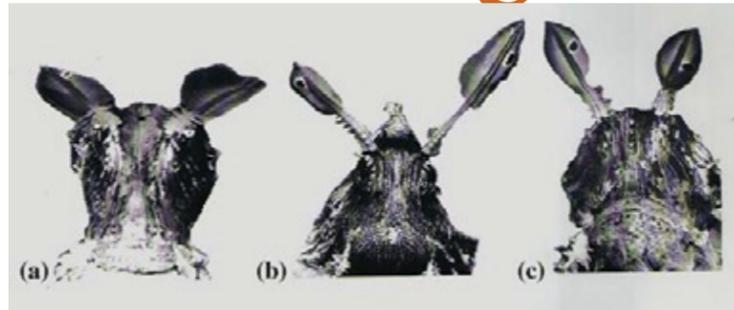
Mahmood Shivji director of the Guy Harvey Research Institute at the NSU says the two species share the same waters but do not interbreed. Shivji adds that the unrecognized species may be less abundant than the scalloped, making it more susceptible to fishing pressure.

"They're catching these things they don't know they're catching. You could wipe out a whole genetic lineage if you are not managing these species separately." Shivji said. ■



FISHBASE.ORG

# New form of lionfish is evolving in Red Sea



Variation in the ornaments of Pterois volitans tentacles: (a) eye-mark on right tentacle only; (b) tentacles feather-like on the upper part only, eye-mark on left and right side of the tentacles; (c) eye-marks on left sides of tentacles (photos by the Lev Fishelson and R. Myers). Environmental Biology of Fishes (2006) 75:343-348

A new form of lionfish has been evolving in the Red Sea during the past four decades, according to a study undertaken by Lev Fishelson of Tel Aviv University.

Rather than the normal ray-like tentacles which appear just above the eyes of the lionfish, the new form has evolved feather-like tentacles in which one or both have a sharply defined black eye spot with a white ring

around it, not unlike the appearance of a peacock feather. In adults, this new form of tentacles are much broader and can measure up to 5cm in length and over 1cm in width at the tip.

### Evolution

Fishelson has been monitoring lionfish populations in the Red sea for the past 25 years, but in 1975 study, also by Fishelson, none of the lionfish specimens had this spotted, feather-like tentacle although five specimens did have wider tentacles than normal.

The additional ornamentation of the tentacles has been known about for some time, and Fishelson has been monitoring the structure and its spread through the lionfish populations of the Red Sea. It is believed to have been first recorded in the Red Sea at the southern tip of Sinai, but fish bearing the same characteristics have steadily progressed up the Gulf of Aqaba. Over the past decade, both lionfish morphs have been found living together at the northern end of the Gulf. The feather-like tentacled

The peacock feather like ornaments. Photo: Lev Fishelson

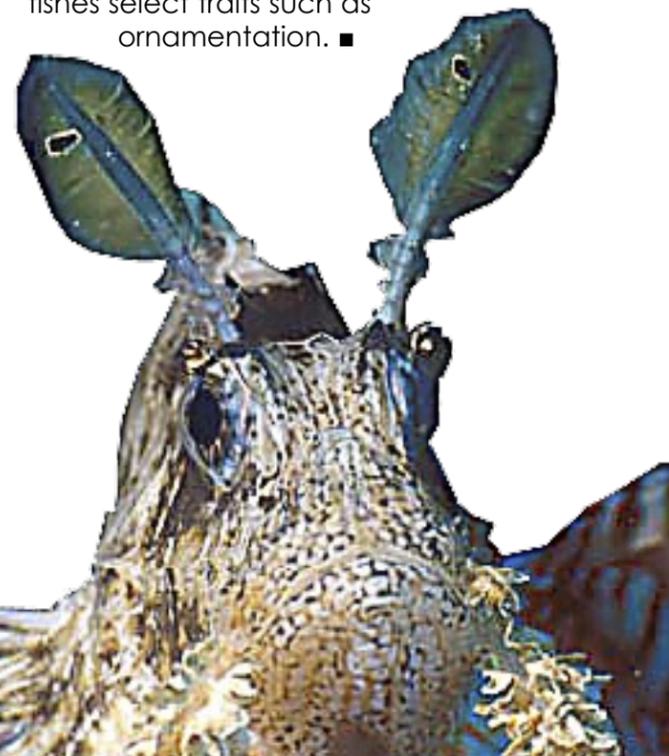
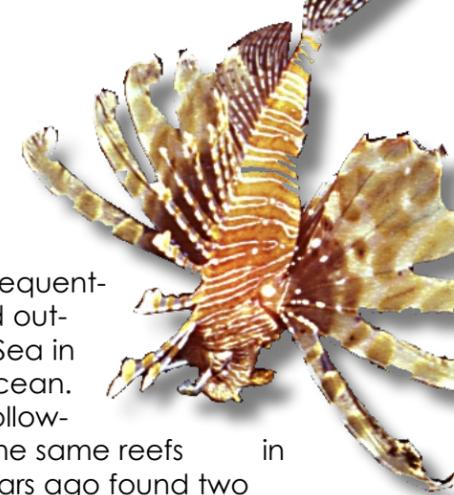
form has subsequently been found outside the Red Sea in the Pacific Ocean. However, a follow-up study on the same reefs in Eilat a few years ago found two of the new form of lionfish among 35 specimens examined, but these fish had the eye-spot on just a single tentacle. Precisely why lionfish in the Red Sea have been undergoing this evolution to produce a new form isn't known.

### Function

One hypothesis is that the eye-spots serve to artificially enlarge the head of the fish, which might be important in communicating with members of the same species, or defending itself against other species.

The other hypothesis is that the elliptical tentacles imitate tiny bait fish to attract small predators that the lionfish can then swallow with its capacious mouth.

The evolution of these tentacles might also be due to sexual selection as many fishes select traits such as ornamentation. ■





## Twelve new species found in deep sea in Bermuda Triangle

**The quantity and diversity of tiny creatures found in a deep-sea survey in the Bermuda Triangle region of the Atlantic Ocean amaze the researchers.**

During a 20-day cruise an international team used trawling nets and scuba divers to explore down to 3 miles beneath the ocean surface to better understand the beady-eyed life forms that are a key part of the ecosystem and could provide crucial information on the effects of climate change.

So far they've found at least 12 new species and catalogued 500 animals after

taking samples five kilometres beneath the ocean surface -- well beyond the usual depth of 1,000 metres for such studies.

Catches from the deep include a possible new species of dragonfish. Several of the animals—tiny zooplankton, shrimp-like things, little squid, bizarre worms and pulsing jellyfish—are featured in a new image gallery.

The expedition has provided a new understanding of the diversity of gelatinous zooplankton, which the researchers describe as "the gooiest, stickiest, and most transparently fragile animals of the sea." They are rarely captured without being destroyed. Zooplankton are tiny

marine animals. Many live on floating plants (phytoplankton), and many are in turn eaten by fish, mammals and crustaceans.

One of the aims of the Census of Marine Zooplankton (CoMZ), part of CoML, is to provide a global inventory of these tiny organisms which will help scientists look for changes induced by climate variations or other factors. ■

*Part of this work was to try to go where we know the least about our planet, which is the biggest habitat on Earth.*

—Peter Wiebe, Woods Hole Oceanographic Institution

## Corals may survive global warming by gorging themselves

**A new study published in Nature says some species of coral are able to survive bleaching events by gorging themselves. An experiment showed that when bleached, one species sharply increased its intake of food, increasing the likelihood that it would survive elevated water temperatures.**

is why in some bleaching events, some corals quickly died off while others close by were able to recover.

The researchers collected samples of *Montipora capitata*, or "rice" coral, and *Porites compressa*, "finger" coral and placed them in sets of tanks supplied with natural seawater. Water from the reef was filtered to remove any plankton and flowed through the tanks in the same way it does in their natural environment. In one set of tanks, the water was

heated, mimicking the rising temperatures leading to a bleaching event.

After a month, fragments of the coral were measured for energy reserves, photosynthetic rates and growth rates of the coral. The results showed that both *Porites* and *Montipora* used up their internal energy reserves. However, after a month of recovery on the reef (where plankton is naturally available) *Porites* continued to use up its reserves while *Montipora* had somehow managed to completely replenish them. ■



JIM MARAGOS

Finger coral, *Porites compressa*, at Oahu, Hawaii. This species faces a bleak future if global warming is permanent

The findings were unexpected said James Palardy, co-author of the Nature paper. "Previous studies showed that thick tissue layers or mounded shapes made corals resilient. But we found a new resiliency factor – feeding. In evolutionary terms, corals that eat more may win."

The study has broader implications for the health of coral reefs worldwide, given the predictions that bleaching events are going to become increasingly frequent and severe as the world's oceans warm. But what has puzzled the researchers



JIM MARAGOS

Rice coral, *Montipora capitata*, (at Oahu, Hawaii) seem to be able to somehow adapt to warming



# Putin: We Must Act To Protect Lake Baikal

*Greenpeace hails pro-environment decision as 'wonderful'*

Russian president Vladimir Putin came to the rescue of what is called one of the seven underwater wonders of the world, Lake Baikal which is also the world's largest body of fresh water. Reaching more than 1,620 m at its deepest point, Lake Baikal contains one-fifth of the world's fresh water and up to 1,500 unique species of plants and animals. At 20 to 30 million years old, it's the oldest lake in the world

Putin chose the 20th anniversary of one of the world's greatest environmental catastrophes, the Chernobyl nuclear disaster, to make his ruling following months of protests in defense of Lake Baikal. Speaking at a discussion with regional governors over Siberia's development, Putin said that the route for a planned Siberian oil pipeline should be moved more than 40 km north of the lake. That distance would put the pipe-



Our late colleague John Neuschwander with the lake's signature species, a gammarid

Putin, following a presentation by the deputy head of Russia's Academy of Sciences who proposed the move, surprised both pipeline officials and environmentalist by announcing, "The pipeline must go further north than has been indicated. If there is even the tiniest chance of pollution" then the risks must totally eliminated, he said later. "This means that the pipeline must go beyond, to the north of, the watershed of Baikal."

The Kremlin-backed, 4,100 km pipeline is set to run from Siberia's Irkutsk region to the Amur region on the Chinese border, then on to Russia's Pacific coast. Officials had

proposed routing the pipeline less than a kilometer from Baikal, alarming environmentalists who said the lake's unique ecology could be destroyed if the pipeline were to rupture.

The chief of the state-run pipeline monopoly Transneft, Semyon Vainshtok, reiterated his position that just a small amount crude oil would end up in the lake "if something unbelievable happened." Afterward, he told reporters later that he was surprised by the announcement.

"Fifteen minutes ago, the decision was taken that fundamentally changes the economics of the project," he told reporters. He did not say how much moving the pipeline would add to the project, but in the past he has said moving it would make the project uneconomical.

Environmentalists say that the regulatory agencies responsible for vetting the planned route manipulated the review process in Transneft's favor.

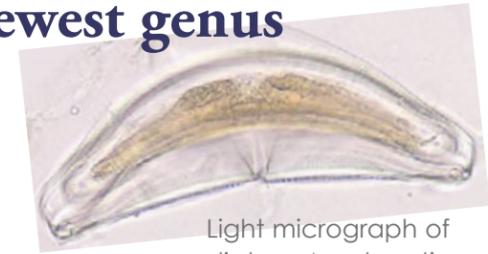
Greenpeace Russia spokesman Yevgeny Usov called Putin's decision "wonderful." "We are very glad that the authorities have finally decided to listen to the opinion of the public, scientists and experts," Usov told The Associated Press. ■



line beyond Baikal's drainage area,

Lake Baikal's unique ecosystem is very old and affectionately known as the "green reef"

## World's oldest lake holds also world's newest genus



Light micrograph of diatom *Amphorotia sp*

Scientists from Natural History Museum in London have discovered a new genus of diatom. Named *Amphorotia*, the genus contains 14 species, including six new to science. Diatoms (Bacillariophyta) are a group of single-celled algae that photosynthesise - a process that converts sunlight into chemical energy used by animals. Diatoms live in marine and fresh water and are extremely important for many animals as they form the basis of the food chain on our planet.

The diatom diversity in Lake Baikal, especially in its deeper waters, is almost entirely unknown and unstudied. It is estimated that there are over 500 species of diatom found only in Lake Baikal. This number increases with each new biodiversity survey carried out making Lake Baikal home to one of the most diverse diatom communities in the world. ■

Source: *Natural History Museum*



Russian president Vladimir Putin has come to the aid of Lake Baikal. Photo: ilexikon.com

Photos: Peter Symes

## WWF: New species of freshwater stingray discovered in Thailand

The Wildlife Fund Thailand (WFT) and the Smithsonian Institute have jointly identified a new species of aquatic ray living in a river in Kanchanaburi province.

The stingray, measuring 60 centimeters in width, was first observed in 2004 but has only now been confirmed as a new species by the researchers.

"After research and comparing its features with known species, we have found this is a new species in the family of Dasyatidae," said WFT expert Dr Chavalit Vithayanont. The new species was named Himantura kittipongi after prominent Thai fish expert Kittipong Jaruthanin who first observed the ray in 2004.

The ray's outstanding features are its dark, yellowish-brown shade on its back and as many as 15 rows of small teeth in its mandible. Chavalit said he thought

the discovery of Humantura Kittipongi was proof of the Mae Klong's good ecological system.

"Ray species are generally very sensitive to ecological changes," he said. However, Chavalit expressed concern at the fact the rays were often caught in fishing nets and any changes in the river, such as a construction of a dyke, could adversely affect its existence.

"If the species disappears from the river, it becomes extinct. Unlike marine fish, the species in the river does not have the possibility of spreading its species into the vast expanse of seas or oceans," he said. Thai rivers have been plagued by serious pollution, overfishing and dam building, which have taken a deadly toll on Thailand's once diverse and abundant river life. The ray is believed to exist in only small numbers. ■



WIKIPEDIA  
A new species of freshwater stingray has been discovered in a river in western Thailand, but its chances for long-term survival are slim, warns WWF.

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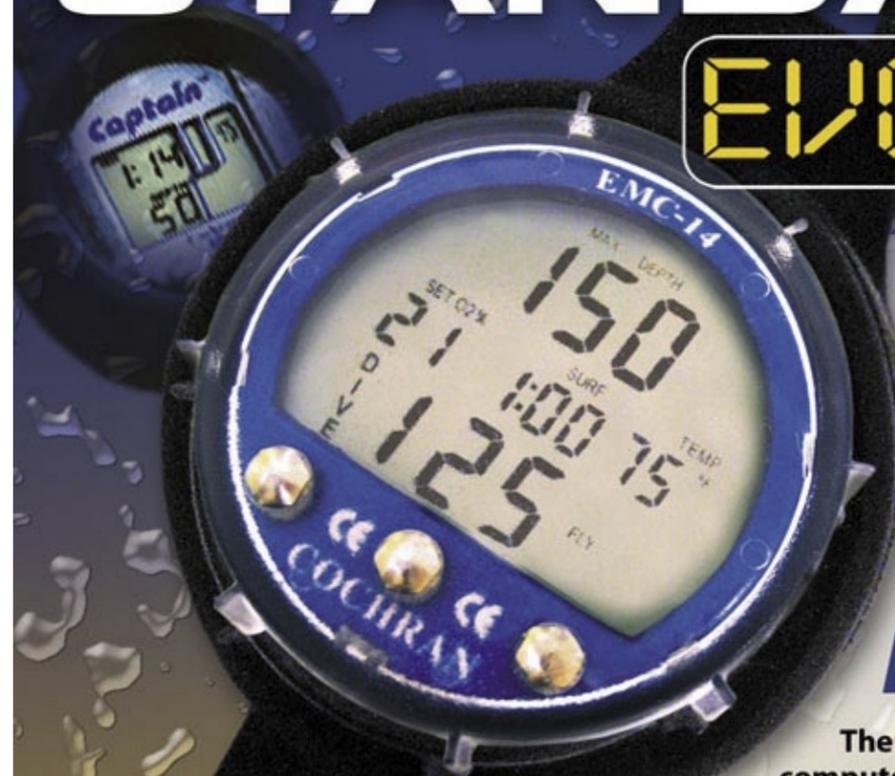
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## NAUI EUROPE workshops

To create a bigger and stronger NAUI in Europe and to assist the members better in the local language NAUI Europe works with NAUI REP's to promote NAUI and to assist with quality control.

A NAUI REP is an active status Course Director and designated to teach course director workshops. Before some one can call himself a NAUI REP he or she first goes through a REP- workshop with the NAUI Europe trainings department. In this workshop the candidates will be prepared to do their job in their area

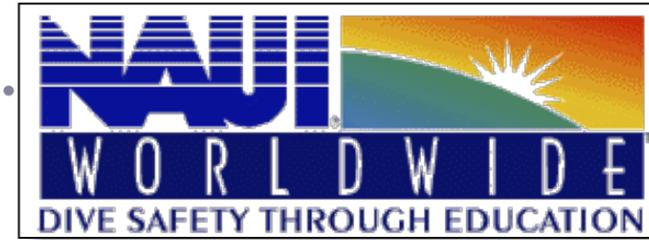
The workshop handles the following topics;

- ▶ Standards and policies leadership courses
- ▶ Quality control
- ▶ Marketing and sales of the NAUI educational system
- ▶ Why NAUI
- ▶ Translations
- ▶ Administrative requirements
- ▶ Certifying instructors-instructor trainers and course directors
- ▶ Evaluations of class room sessions

- ▶ Micro teaching demonstration
- ▶ Stock keeping
- ▶ Cap program
- ▶ Prospecting and recruiting new members

The final exam is a combination of an instructor-instructor-trainer and course director exam. These workshops are held on regular basis in the NAUI Europe office.

The schedule is available on NAUI Europe website. [www.naui-europe.com](http://www.naui-europe.com)



## NAUI Master Scuba Diver Course Materials get even Better!

NAUI is pleased to announce the upgrade of the audio component of the NAUI Master Scuba Diver Education System from audio cassette to compact disc. With this new component, your students can now receive the same high quality information previously contained in the Master Scuba Diver audio cassette using compact disk technology.

The Master Scuba Diver CDs (item #20611) are also available for individual purchase if you wish to upgrade Education Systems you may already have in inventory. For your convenience, the Master Scuba Diver Education System item numbers have remained the same: #91200D (DVD version) and #91200 (VHS video version).

The content has not changed, just the media. Audio cassettes are still available upon request for a limited time. Along with other courses, be sure to stock up on your Master Scuba Diver educational materials today!

For further information on NAUI affiliated stores, resorts, and certified diving instruction, contact NAUI at (001) 813-628-6284 or [marketing@nauiww.org](mailto:marketing@nauiww.org), or visit [www.naui.org](http://www.naui.org).

## NAUI Europe at the MOSCOW dive shows

This year there was two concurrent dive shows in Moscow. NAUI was present at both shows and represented by the Russian NAUI representative and a delegation of four from the NAUI Europe office. Both shows were well organized with a lot of international attendance. NAUI had a big presence on the

shows with several booths and it is clear that the Russian market will be an important market for NAUI in the coming future. Besides manning the booths NAUI Europe's CEO, Dick Lucas, presented prize winners of the Dive Tek magazine with their prizes on the gala evening of the show. During the shows he also spoke to several NAUI instructors and dive professionals about NAUI, "Why NAUI?" and the possibilities and future develop-

ments of NAUI in Russia. NAUI Europe's training manager Jelle Buisman was also present at both shows, where he also taught the new NAUI N-tec to a group of technical divers and instructors as well as assisting the NAUI representative in Moscow with the evaluation of instructors in an IQP. The diving was be done in the Olympic swimming arena where they used an 8 meter deep pool confined water

presentations. The 7-day trip was done during a very cold period in Moscow, under with the temperatures went to -30 C and where the masses of snow sometimes made getting to either of the dive-shows feel almost like an expedition to the Arctic. NAUI Europe will go to great lengths to reach and meet their members through out entire Europe. NAUI Europe believes in the value of being present where assistance is needed and of course to meet with existing and coming NAUI members. ■



**The NAUI Training Progression**

- NAUI Scuba Instructor**
  - NAUI Leadership Certifications
    - Divemaster
    - Skin Diving Instructor
    - Assistant Instructor
  - NAUI Technical Diver Courses
    - Introduction to Technical Diving
    - Technical Support Leader
    - Technical EANx Diver
    - Helitrox Diver
    - Decompression Techniques Diver
    - Hellair Diver
    - Cavern Diver
    - Cave Diver
    - Ice Diver
    - Wreck Penetration Diver
    - Trimix Diver
    - Closed Circuit Rebreather Diver
    - More...
- Master Scuba Diver**
- Advanced Scuba Diver / Junior Advanced Scuba Diver**
- Scuba Diver / Junior Scuba Diver**
- Skin Diver / Skin Diver**
- NAUI Specialty Diver and Recognition Courses**
  - Night Diver
  - Underwater Environment
  - Search & Recovery Diver
  - Underwater Photographer
  - Underwater Archaeologist
  - Underwater Ecologist
  - Scuba Rescue Diver
  - Training Assistant
  - Dry Suit Diver
  - Deep Diver
  - Nitrox Diver

## On becoming an new NAUI Rep .....

**Michael Henrichsen is his name, NAUIs first local representative in Denmark. While NAUI is one of the big classic training organisations it has never had a presence in Denmark before, so we went to ask Michael what made him take on the challenge of spearheading NAUI's entry into this homeland.**

We meet him in the spacious office of 'Superdive' - his Copenhagen based dive center.

Michael explains that he has been a PADI instructor since 1999 when he received an attractive offer to go to NAUI Europe's headquarters in the Netherlands to cross over and train as a Course Director. The organisation is presently undergoing a rejuvenated

expansion in Europe and was soon enough also looking for new local reps that could carry the banner into the new territories. Needless to say one step quickly led to another and Michael found himself appointed NAUI's first representative in Denmark.

Queried about what led him to accept the position, the first answer came promptly: It was a matter of economy. First of all becoming a course director opens up a whole new professional venue and revenue stream for you personally. Secondly the NAUI system makes it easier to conduct instructor courses as, compared to the present alternative, is less requirements to the dive centers wanting to conduct instructor courses. In this system they don't have to be an 'Instructor Development Center' or any of the sort.

As regards to rising to the challenge of implementing a 'new' organisation, Michael shrugs his

shoulders. "I have been positively surprised how many people, both existing and prospective divers who already have a good prior knowledge about NAUI when they come here. It seems that the customers have already done their homework and learnt about the options. I have been very pleased with this."

Michael also fancies that the courses seems to be a little more thorough, mentioning that the OWD course have 5 open water dive and includes first aid.

Having a dive center of his own while marketing the concept to other dive centers hasn't clouded the matter either, Michael says. There are more degrees of freedom and also a better economic incentive in this system, he adds. The centers can conduct their own instructor courses if they have an instructor trainer. As a course director he only needs to there as an examiner, making the overall requirements less stringent and much easier to meet for the long list of small and medium size centers that make up the bulk of the industry. So what's the plan we wanted to know.

### The next steps

Establishing the organisation firmly is a long term project that requires a joint effort with active involvement from the Headquarters in the Netherlands. First of all there are a range of training materials awaiting translation and distribution. Secondly it is about building up working relationships with all those centers for whom doing instructor courses is presently out of reach.

*It is exiting to be the first, Michael can't quite quench a smile as we say our goodbyes. ■*

## Meeting Michael Henrichsen



# Paid Vacation



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Outside the US call 813.628.6284 Or visit our Web site at [www.naui.org](http://www.naui.org)





Photography  
by Alex Mustard

## Barge crashes into Sipadan

The international dive community was in for a crude awakening to the news that a barge - carrying thousands of tonnes of coarse gravel, sand, steel tubes, iron mesh, prime movers, a large bulldozer and a gigantic crane - has crashed into Sipadan, one of the world's most coveted and renowned dives sites and completely scoured one of its famous dive sites down, wiping off the whole top coral reef down to the unsightly limestone rock below between the old pier and Barracuda Point. The

materials were intended for the construction of improved rest facilities for divers visiting the island during the day, to replace the current temporary facilities.

Writes Alex Mustard: It is



important to note that this accident has not ruined diving on Sipadan. It has just heavily damaged a section of the reef. It is important to publicise this damage to insure it does not happen again.

It is also important that divers are not put off from going to Sipadan - because without the income generated by tourism Sipadan would soon be consumed by the fishermen just as the rain forests and reefs around Semporna have been. If the island didn't have the divers and Malaysian army there it would be ravaged in days. In fact a fisherman was caught with nets filled with Barracuda at Sipadan at night during my stay.

Down the same vein, the dive operators expressed in a joint statement that they are collectively committing to working with local and national government parties, who are currently conducting a damage assessment survey, to devise and implement a program for rebuilding and restoring the affected area as soon as possible. ■

## Viet Nam succeeds in changing seahorse colours

Vietnam's Nha Trang Institute of Oceanography has succeeded in a feat once thought impossible. Normally seahorses are black, but with a little ingenuity, the institute can make a black seahorse yellow - increasing its value for aquariums. A trial red-colour seahorse project, which is currently underway, has also achieved good results.

Raising seahorses is by no means easy but is gaining popularity in Vietnam as the latest form of aquaculture, developed to improve farmer-livelihoods in the Southeast Asian country. Dr Ky believes the seahorses can be marketed for high profit by raisers without a lot of risk. The price of an ornamental seahorse is US\$3-5 locally, but as much as \$70-300 in Hawaii, Ky pointed out.

Export markets are in Singapore, the US and the EU as aquaria fish and in China and Hong Kong as tonic med-

icines, Ky said. The number of ornamental seahorses exported is currently between 5,000 to 10,000 per month. However, Viet Nam's seahorse producers have not found access to the China and Hong Kong markets, which demand seahorses for medicinal use.

Although the fishery industry has yet to focus on a brand name, Ky feels the markets are there and more studies are necessary on their marine environment to perfect rearing for local aqua farmers. ■

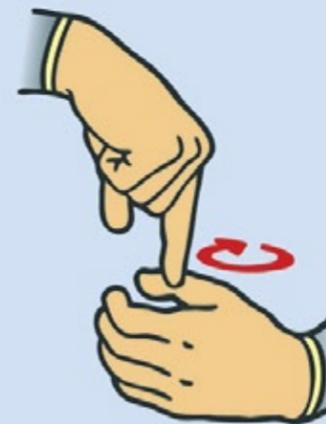
MANIPULATED  
PHOTO: PETER SYMES

## COMMUNICATING IN DIVING The Most Common Handsigns

PART 17



1. I am on my way to watch penguins, do you by any chance know where South Pole is?



2. I need some ice for my drink, do you by any chance know where North is?



3. Do you want to boldly go where no man has gone before?



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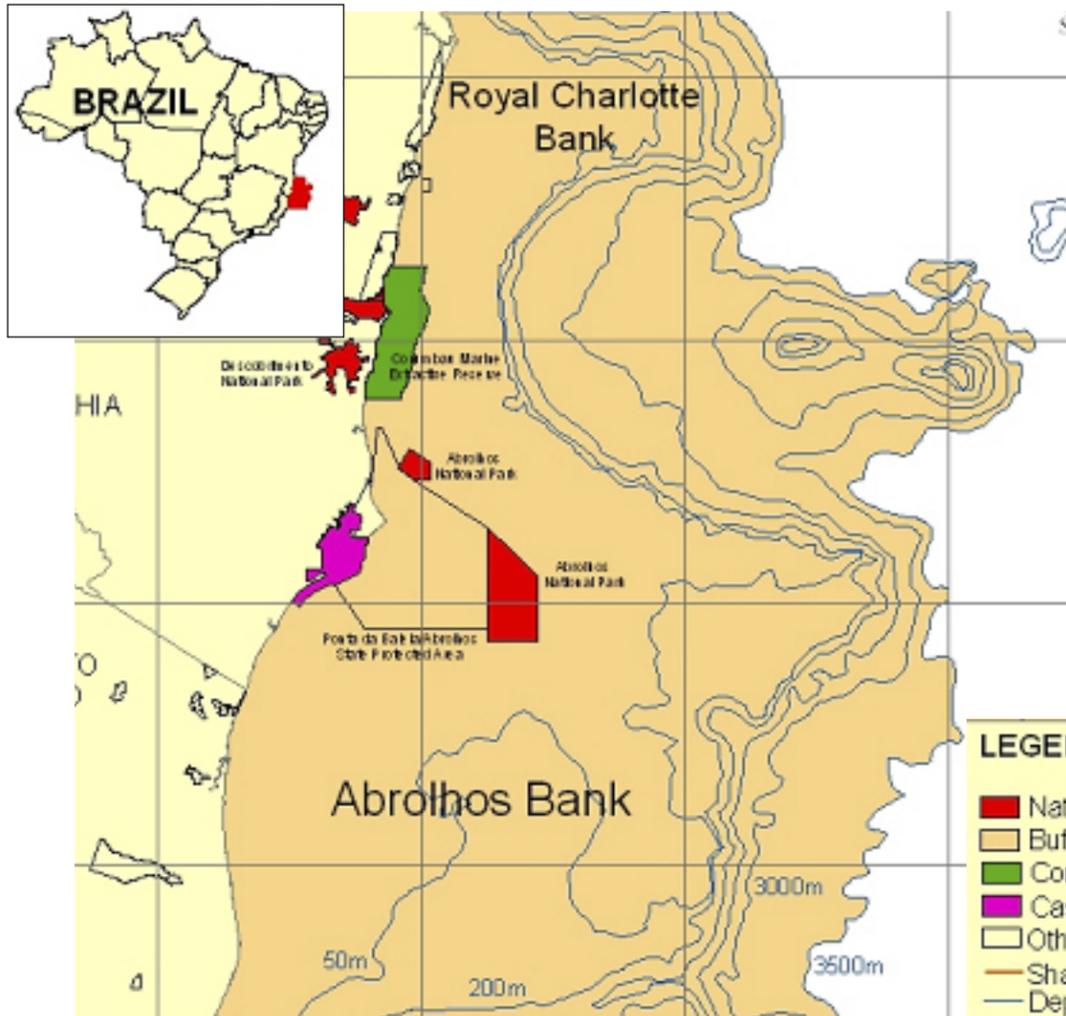
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### Designation Limits Oil Exploration In Unspoiled Marine Area

## Brazil Creates Buffer Zone Around Coral Reefs Off Atlantic Coast

The Brazilian government has created an official buffer zone around the Abrolhos National Marine Park to protect the biologically richest coral reefs in the South Atlantic.

Brazil's Institute of Environment and Natural Resources (IBAMA), encompasses nearly 95,000 km<sup>2</sup> – an area larger than Portugal – and protects the entire Abrolhos region off Brazil's central coast, including several types of coastal and marine ecosystems with unique and endangered species, such as the humpback whales.

Under Brazilian law, buffer zones around protected areas offer strong protection, with special permits from environmental authorities required for any economic use.

"The buffer zone will guarantee the biodiversity integrity in the Park and ensure that local communities can continue car-

rying out their means of livelihood through traditional fishing and eco-tourism activities," said Guilherme Dutra, director of CI-Brazil for the marine program.

The Abrolhos region, located off the coastal town of Caravelas in the far south of Bahia, northeast Brazil, is home to mangrove forests and restinga (a uniquely Brazilian ecosystem of sparsely vegetated sand ridges) and a complex of small islands, coral and algal reefs. Its natural resources directly support more than 100,000 people.

Since 1996, CI-Brazil has conducted biological monitoring at Abrolhos National Marine Park, including assessments of the



Conservation has a long tradition in Brazil

effects of oil and gas exploration and possible oil spills that helped motivate the effort by IBAMA to get the buffer zone declared.

Under the government declaration, oil and gas activities are prohibited in 75 percent of the buffer zone, and approval for such development in the other 25 percent would require detailed studies showing no adverse impact. ■

Reporting by Catherine GS Lim

# ADEX 2006

& Celebrate the Sea

ADEX is tiny compared to shows in the United States and Europe, and I was told beforehand by more than one person to "not expect much." But what I discovered when I arrived was a tight network of dive operators, tourism representatives, manufacturers, distributors, publishers, editors, and photographers working together to further the industry as a whole (for the most part). Three days hardly seemed like enough time to meet and befriend all of the people I wanted to see, and evenings were spent out dining and hanging out at bars, often into the early hours of the morning. — Eric Cheng / wetpixel



Celebrate the Sea contest finalists

Photos: Eric Cheng/ Wetpixel



ADEX 2006 were held in the Suntec venue

**We had waited two years for it to return to Singapore. When it did, on 21st to 23rd April, Asia Dive Expo (ADEX) 2006 turned out to be well worth the wait.**

For one thing, it was ADEX's biggest showing in 12 years, bringing a record 9,200 visitors face-to-face with 809 exhibitors from 26 countries. There was something for everyone, from the novice diver looking for great deals on scuba gear and photographic equipment, to the dive professional looking to touch base with

industry peers and old friends at the Dive Business Seminars and the exhibition proper. School students got a taste of the action as well, at the ADEX Sea Star Programme where they took part in interactive talks and workshops. Even members of the public were able to take the plunge (literally!) for the first time, donning scuba gear and diving into a large see-through tank at the Asia Scuba Tour.

A main highlight at ADEX 2006 was the joint presence of Celebrate the Seas, the largest underwater film festival and competition in Asia Pacific. Held in conjunction with the World Festival of Underwater Pictures,

Celebrate the Seas comprises, among other things, a master photographers gallery, photo and video competitions, workshops, seminars and sales of imaging and dive equipment. That it took place alongside

ADEX was perfect, as a large number of divers are also photographers.

At least, that was what I had come to realise after manning the X-Ray Magazine's booth at ADEX. It was my first time as an exhibitor here, and it was enlightening to put a face to the people who read our magazine. All along, I knew that divers were a friendly bunch, but I had never been privy to it on such a large scale. It didn't matter which part of the world you came from, it didn't matter whether you had a camera hanging from your neck or a brand-new regulator in a shopping bag, we all spoke the same language and shared the same passion for the underwater world. There was a wonderful feeling of camaraderie, and I was forced to forget my shy nature as I made new friends in the industry and encouraged visitors to sign up for free subscriptions to X-Ray Magazine and DivePhotoGuide.com, an online resource for underwater photographers with whom we shared a booth.

And then, all too soon, it was over. Packing up (amidst lamenting the fact that ADEX lasted only three days), I was grateful that everyone I met was happy to welcome a newcomer like me into its midst, and I knew that I would cherish the experiences and friendships I had acquired here for a long time to come. ■

Where friends come to meet. Eric Cheng and Harald Hordosch of Seacam. Photo: Paul Ng



Ron and Valerie Taylor talk about sharks



Papua New Guinea: Emily Kamioka (PNG Japan), Tim Rowland (Aqua Ventures), Vilia Lawrence (PNG Divers Association), Max Benjamin (Walindi/Febra/Star Dancer) Dive Expo - Singapore



Edited by  
Peter Symes

## Plankton may give early warning about quakes



NASA

Phytoplankton blooms can be seen from space

Concentrations of the natural pigment chlorophyll in coastal waters have been shown to rise prior to earthquakes. These chlorophyll increases are due to blooms of plankton.

A joint US-Indian team writing in the journal *Advances in Space Research* say the chlorophyll blooms are linked to a release of thermal energy prior to an earthquake. This causes the sea surface temperature to rise and increases the amount of energy moving from the surface to the air due to evaporation.

In turn, this leads to enhanced upwelling - the process by which cold, nutrient-rich water is transported from the deep sea to the surface. Upwelling boosts phytoplankton productivity and gives rise to blooms, which can be seen. They say that monitoring peaks in chlorophyll could provide early information on an impending earthquake. ■

## The use of flippers by snorkellers banned at all marine parks in Malaysia

Resort operators have been instructed to notify their guests of the new directive.

The move follows a recommendation from the Fisheries Department after the use of flippers had damaged corals at popular snorkelling sites in the marine parks.

Officials state the lure of the beautiful coral reefs was irresistible and snorkellers often

stepped on them when trying to get a closer look. There was widespread concern that the damage to the corals would become more extensive as the number of visitors to the marine parks increased, especially during long holidays.

However, divers will be allowed to use flippers at dive sites identified by resorts and chalet operators. ■



PETER SYMES

No, sorry - you can't bring them

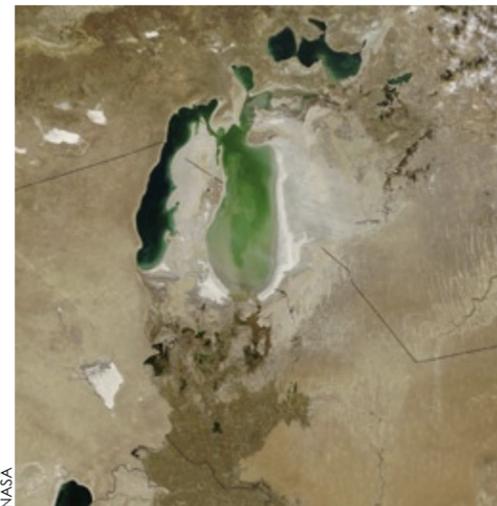
## Perhaps we can dive there soon Life seeps back into the Aral Sea

The Aral Sea is set for a return to life thanks to a \$60 million project to restore its water supplies.

The lake, which straddles the border between Kazakhstan and Uzbekistan, was once the fourth-largest inland body of water in the world but a Soviet-era programme of irrigation for nearby cotton and vegetable farms saw it shrink from 70,000 km<sup>2</sup> in 1960 to 17,000 km<sup>2</sup> in 2004. It has since divided into three separate lakes and seen

its salinity go up from 10 grams to 45 grams per litre. Seawater has a salinity of 35 grams per litre. The disaster left fishing boats rusting in the dustbowl of the former lakebed, which agricultural chemicals that ran into the lake during the Soviet era were reported to have contaminated the dust and been linked to respiratory disease among the population bordering the former lake.

A World Bank-backed project rebuild the canal system has



NASA

The Aral Sea, in 2003, had shrunk to well under half of the area it had covered fifty years before.



P. CHRISTOPHER STAECCKER

redoubled the flow of the Syr Darya river, which feeds the northern half of the lake and restore the northern lake has already seen 775km<sup>2</sup> of the former seabed covered with water anew. Initial plans envisaged it would take up to a decade to reach this level. But hope that the entire lake could be restored is still far off. The southern portion of depends on the Amu Darya river, which is so heavily irrigated that its waters rarely reach the former shores of the lake. ■

Orphaned ship in former Aral sea, near Aral, Kazakhstan, 2003

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# Training

Edited by  
Peter Symes

## DAN Announces the DES Quest

Diving Emergency Specialist is a DAN Training recognition program designed to commend divers who have continued their education and training in order to obtain knowledge and be both better buddies and better divers. It incorporates DAN Training programs with those of other training agencies, providing the diver with a well-rounded dive education.

To achieve the level of Diving Emergency Specialist, a diver must:

1. Be a rescue level (or higher) diver with their training agency
2. Hold a current CPR and First Aid certification
3. Hold a current certification in Oxygen First Aid for Scuba Diving Injuries (or equivalent)
4. Complete three of the following:
  - Advanced Oxygen First Aid for Scuba Diving Injuries (or equiv.)
  - First Aid for Hazardous Marine Life Injuries (or equiv.)
  - AEDs for Scuba Diving (or equiv.)
  - On-Site Neurological Assessment for Divers (or equiv.)
  - Remote Emergency Medical Oxygen (REMO2™)

The DES Quest will run from June 1 – Dec. 31, 2006. During the Quest, when DAN is notified of a diver's achievement of DES, the diver will receive a specially designed T-shirt and ballcap prize package. In addition, the diver will automatically be entered in a drawing for a DAN Gift Certificate worth \$250. ■

[www.DiversAlertNetwork.org](http://www.DiversAlertNetwork.org)

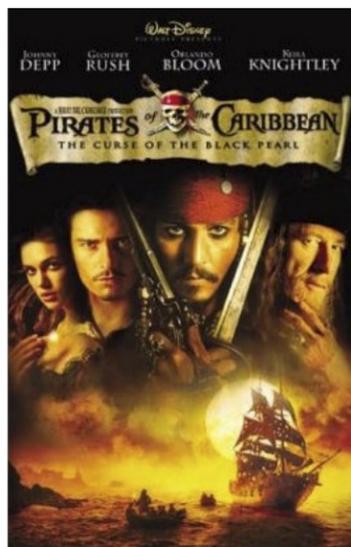
## PADI now recognised by Greece

PADI has been officially recognised as a diver training organisation in Greece by the Greek Ministry of Merchant Marine. Official recognition was granted on May 4 2006.

Recent changes to the laws governing recreational diving in Greece have considerably improved the local business climate there for the diving industry. PADI's proven compliance

with current European Diving Standards enabled the Greek authorities to easily establish its suitability for recognition.

The recognition of PADI by the Greek authorities will assist PADI dive centres and resorts in their use of the world's most popular diver training programmes. It means that PADI instructors can now work as professional instructors in Greece. ■



Pirates of the Caribbean, starring Johnny Depp, was just but one movie having production staff work underwater

Historically, there has been inconsistency in the training of grips and an inability for film production companies to easily know if a grip they are hiring has the skills needed to perform the required duties of a specific production. The SSI Motion Picture Diver recognition rating system has four levels to identify the diver's experience and training level. ■

## SSI Creates Motion Picture Diver Rating for Movie Industry

Scuba Schools International has joined forces with the Local 80 Divers Association to create a recognition rating system that will help motion picture production companies hire underwater "grips" (technicians) for filming movies. This alliance will help with the safety and efficiency of making movies underwater.

## PADI Chamber Endowment Fund to distribute more than US\$30,000

Many divers assume there will be a hyperbaric chamber near their diving destination, but this is not always the case. To support these critical facilities, PADI established The Chamber Endowment Fund in 2004. This fund is supported by a \$2 donation from every enrollment in the Diver Protection Program – which is available to all divers globally and accepted by institutions worldwide. This year, more than \$30,000 is available to qualified applicants. ■

## Marine archeologist & "Sea Hunter" James Delgado gets new job

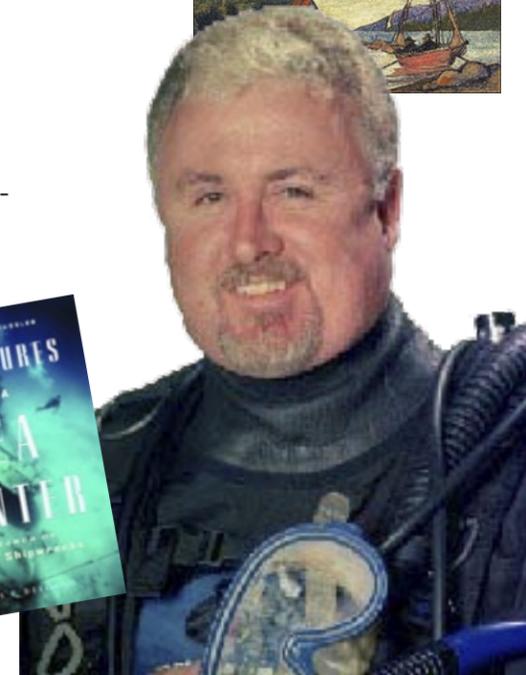
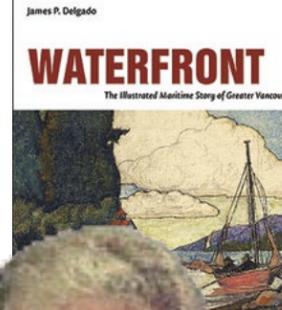
Marine archeologist James Delgado, co-host of The Sea Hunters TV series, has resigned as executive director of the Vancouver Maritime Museum. to become executive director of the Institute for Nautical Archeology, a Texas-based research group that has underwater archeological projects around the world. Delgado will leave the Vancouver Maritime Museum on June 30, but is discussing whether to remain on its board of directors. He will remain based in Vancouver.

A California-born Canadian, Delgado was the head of the U.S. government's maritime preservation program and maritime historian for the U.S. National

Park Service before joining the Vancouver Maritime Museum in 1991.

As co-host, with Clive Cussler, of National Geographic's The Sea Hunters, the California-born Canadian Delgado was part of a team of underwater archeologists who explored famous and unknown shipwrecks. The show, produced by Halifax-based Eco Nova Productions, has been sold to more than 170 countries.

He also has trained archeologists in surveying and preserving sunken vessels and their contents. ■



*The Thief*  
28 x 18 in. US\$625.00

Award winning Fiber Artist, Alma de la Melena Cox, creates "Telamadera Fusion," by bringing fabric and wood together in a dynamic and unique mixed-media expression. Her fine artwork can be found in galleries in California and Oregon and by contacting the artist directly. Please visit her website at:

[www.almaart.com](http://www.almaart.com)  
Alma de la Melena Cox



*Canyon*  
24 x 24 in. US\$625.00

Edited by Peter Symes



## Tiny Kiribati Creates World's First Deep-sea Marine Reserve

The tiny Pacific island nation of Kiribati, located between Hawaii and Fiji, has created the world's third-largest marine reserve. Commercial fishing will be banned in the reserve, called the Phoenix Islands Protected Area, to protect more than 120 species of coral and 520 species of fish inside its 184,700 km<sup>2</sup>.

Kiribati comprises three coral island groups and one volcanic island with a total land area of only 717 km<sup>2</sup> spread over more than 3 million km<sup>2</sup>. It is the largest atoll nation in the world, with 33

islands stretching across several hundred kilometres.

It is the world's first marine park with deep-sea habitat, including underwater mountains, and the third-largest. The largest reserve is the 65,000 km<sup>2</sup> Heard Island and McDonald Islands Marine Reserve in Australia

*"If the coral and reefs are protected, then the fish will grow and bring us benefit,"* said Kiribati's President Tong. *"In this way all species of fish can be protected so none become depleted or extinct."* ■

## Taiwan urged to create coral reef protection agency

The Taiwanese government has been urged to establish an agency exclusively devoted to the protection of coral reefs in waters near Taiwan and the removal of shipwrecks. Presently at least four government agencies has to get involved whenever the issues of shipwrecks and coral depletion are raised.

Various wrecks litter the coastline and contrary to widespread belief that these sites could become underwater artificial fishing reefs or foster coral growth the wreckage has instead continued to impair the growth of coral. The combination of the sharp metal edges and the ocean's currents turn these areas into "coral graveyards." As the debris is spreading, coral coverage continues to drop. The only option is to remove it before more coral, the local ecological system and Taiwan's tourism resources are further compromised. It is estimated that unless something is done immediately, new coral growth isn't expected to appear in these areas for the next 20 years. ■

SOURCE: TAIWAN NEWS



Læsø lies in the Northern Kattegat. Skagerrak and Kattegat connects the North Sea with the Baltic.

## Denmark To Get Its First Marine Reservation

The European Union has granted Denmark 2 million Euro to restore the marine seabed around the island of Læsø in the Northern Kattegat, and create a diver's paradise. Stone reefs are going to be restored or created as they have previously been mined for construction materials. The big stone reefs in Kattegat harbours a very diverse marine life and is covered with kelp, small sponges and softcorals. The restoration of the reefs are going to cost DKK 35 million and will require up to 80,000 m<sup>3</sup> of new rocks which has to be shipped to the island from Norway or Sweden. ■

## Convention on Biological Diversity Flopped

The Convention on Biological Diversity (CBD) in Brazil in April failed to do more than reiterate the previous calls for immediate action. "The decisions on high seas reflect that governments now recognize the grave threats to the unique high seas biodiversity and the need for urgent actions. But countries have shifted the responsibility for action to the United Nations, and

missed the opportunity to act themselves," said Kristina Gjerde, World Conservation Union.

This was in spite of a proposal for a moratorium on high seas bottom trawling presented to the meeting by Palau. On the 22 March Palau banned bottom trawling making the practice in Palau's waters or by any citizen of Palau anywhere in the world, illegal.

EU Environment Commissioner Stavros Dimas: "We should put in place an interim prohibition of destructive

fishing practices in international waters, including bottom trawling." Such a ban should remain until appropriate conservation and management measures have been established under international law. The threat of loss of biodiversity is bigger than climate change if we consider that once a species is lost, no mitigation measure can help bring it back Dimas added.

As the debate continues, high seas bottom trawling vessels continue to destroy biodiversity. ■

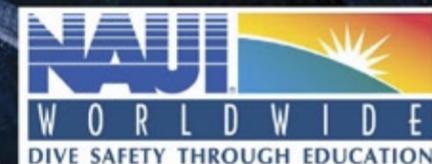
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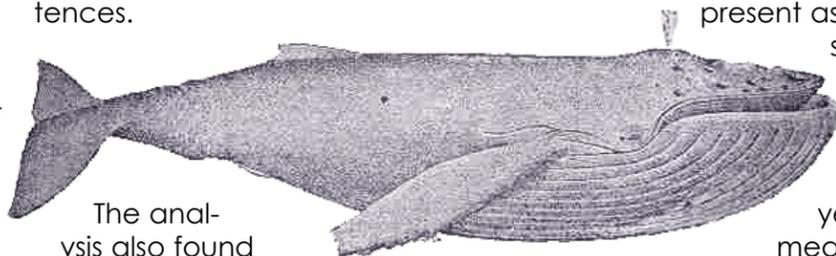
**Humpback whales have structured songs, with phrases and themes, that contain elements of human language, a detailed new analysis shows.**

Whale researchers have discovered that whale songs like human language can be broken down into a series discrete sound units arranged within a hierarchical structure, or grammar. While the scientists led by Ryuji Suzuki at the Massachusetts Institute of Technology are not ready to conclude that whales have their own language as such, they find that the similarities between human language and whale songs are striking.

### Information theory

Recording of whale songs were broken down in its segments and subjected to a structural analysis using information theory, which puts a measure to its complexity and struc-

ture (but does not necessarily give away any underlying meaning). In human language a text consists of paragraphs, a paragraph consists of sentences, and a sentences of clauses. In terms of humpback songs, a song session consists of songs, a song consists of themes, a theme consists of phrases, a phrase consists of units. Put together, all of these elements indicate that whales have something akin to their own syntax, which normally refers to the grammatical arrangement of words within sentences.



The analysis also found that whale songs convey around one bit of information per second (bits). By comparison, humans generate 10 bits of information for every spoken word. Each

spoken vowel or syllable contains at least a few bits of data that correspond to different sounds produced by the speaker. One versus 10 may appear unimpressive, but whales communicate in water, often over long distances, which carries sound four times faster than air.

Jennifer Miksis-Olds, a research associate at the University of Massachusetts at Dartmouth's School for Marine Science and Technology, agrees that marine mammal songs and sounds cannot be classified at present as language, but she agrees with the findings and both she and Suzuki admit that they do not yet understand the meaning of whale songs and that more research is needed.

The findings are published in Journal of the Acoustical Society of America. ■



**Dolphins know each other by name**

Bottlenose dolphins call each other by name when they whistle, making them the only animals besides humans known to recognize such identity information, scientists reported. The evidence suggests dolphins share the human ability to recognise themselves and other members of the same species as individuals with separate identities.

Furthermore, two dolphins may refer to a third by the third animal's name, said Laela Sayigh, one of three authors of a paper published in the Proceedings of the National Academy of Sciences. Each animal develops an individually distinctive signature whistle in the first few months of its life, which appears to be used in individual recognition. The research, on wild bottlenose dolphins, will lead to a reassessment of their intelligence and social complexity.

Donald Broom, professor of animal welfare at Cambridge University, said most species living in large groups have advanced communication skills. "They have a complex social structure where they have to live with others, negotiate friendships and find mates. If dolphins are using names I expect we will find the same in other species with similar lifestyles." ■



Krill (*Euphausia superba*). Krill is the basic food source for all baleen whales, most penguins and seabirds

### More Krill In Warmer Polar Seas

Australian researchers on Antarctica have returned from a 10-week survey of the Southern Ocean with some surprising results. They found that deep waters off the Australian Antarctic Territory are getting warmer and saltier and have higher populations and wider distribution of krill than expected.

"We're used to finding krill associated with cold water in near the coast but we found that as you go further off shore away from the coast, you're also finding krill out there," said Dr. Nathan Bindoff, from the ACECRC

Once a better estimate of the krill biomass has been calculated to set a commercial catch limit to protect the population. The amount taken by trawlers has diminished from 400,000 tons to 120,000 tons in the last 10 years. Krill is fished commercially, mainly for use as aquaculture feed. ■

### US States Ban On Taking Krill

In a move to protect the Pacific Ocean's array of fish, seabirds and whales, the Pacific Fishery Management Council, which advises the U.S. Department of Commerce, unanimously approved the ban on netting the oily inch-long krill. If the Commerce Department accepts the council's decision, fishermen won't be allowed to take the large zooplankton called euphausiid in federal waters. ■

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# whales

Edited by  
Gunild Symes



## China Builds Reserve For Rare Dolphin

China is to set up a sanctuary for the highly endangered white dolphin, a spe-

cies unique to the country. writes Xinhua News Agency. The reserve, n the eastern province of Fujian on the southern coast of China, will include a rescue centre near the city of Zhuhai. The reserve be about 460 km<sup>2</sup> with building to begin by

the end of the year.

Pollution from factories, paper mills and chemical plants has destroyed much of the dolphins' habitat, the director of the project said. Only around 2,000 white dolphins are thought to exist, with most living in the Pearl River estuary.

Some 19 white dolphins, also called "pandas in the ocean" because of their rarity, have died over the past three years as a result of pollutants, Chen Jialin, director of the Chinese White Dolphin Natural Reserve, said. ■

## Australia Sees Recovery Of Humpback Whales

Whale conservation-ists are celebrating evidence of a come-back by humpback whales in Australian waters and a decision by private backers of Japanese whaling to quit the industry.

An International Whaling Commission committee meeting in Hobart in April was told humpback whales off Australia's east and west coasts now numbered about 16,000, compared with fewer than 1000 in the 1960s. However scientists cautioned that the recovery should not provide any comfort to Japan, which would begin killing 50 humpbacks a year in 2007-08 under its so-called scientific program.

They said Pacific populations near Tonga, Fiji and New Zealand were still failing to recover from commercial whaling. ■



## Killer Whales Set Traps for Gullible Gulls

Orcas learn from each other how to set traps for prey. Michael Noonan, a professor of animal behavior at Canisius College, have observed how a four-year-old killer whale set up a trap for seagulls by spitting fish onto the water's surface as bait. The whale would sink below the wa-

ter and wait. Once an unsuspecting gull would come down for a meal, the whale would lunge at it with open jaws. The whale, pleased with the results, set up the trap over and over again. After a few months the whale's younger brother gave it a try.

"It looked like one was watching while the other tried," says Noonan. Next, his mother adopted the trick, and pretty soon all the orcas at the facility were at it.

"In general, humans have long pictured themselves as separate from nature, but one of the lessons that we repeatedly learn when we study animal behavior is that animals and humans are much more alike us than we ever imagined. It was once believed that most animal behavior, from the food they ate to the places they slept, was based on instinct," Noonan said. "This new discovery supports the growing view that animals like killer whales are very prone to learning by imitation, and that they are 'cultural' in nature. ■

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## Newborn dolphins don't sleep for a month

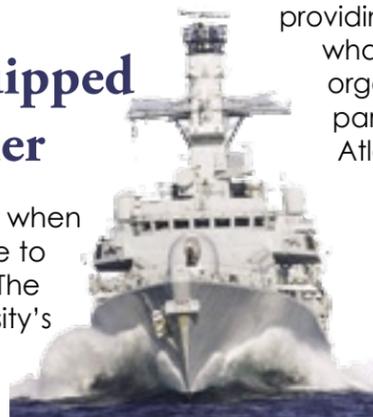
Newborn dolphins and killer whales do not sleep for a whole month after birth, new research has revealed, and neither do their mothers, who stay awake to keep a close eye on their offspring.

The feat of wakefulness is remarkable given that rats die if forcibly denied sleep. And in humans, as any new parent will know, sleep deprivation is an exquisite form of torture. But the newborn whales and dolphins were continually active, surfacing for air every 3 to 30 seconds. They also kept at least one eye open to track their mothers, who seemed to set the frenetic pace by always coursing ahead of their offspring. ■

## UK warships are to be equipped with whale-sensitive scanner

To limit the danger of killing marine mammals when powerful new sonars are used UK warships are to be equipped with whale-sensitive scanners. The Royal Navy is working with St Andrews University's sea mammal research unit on a sonic database of whales and other marine animal calls. They hope to use the calls to detect any marine mammals within a two-mile range.

The move follows post-mortem examination of beached whales in Spain which linked their deaths to military emissions disrupting their echo-location systems. The RN's 2087 sonar, which cost £160m to design, uses low-frequency pulses to seek out lurking submarines hiding in ambush in the cluttered waters close to shore. ■



## NOAA Helps Ocean Racers Avoid Right Whales

The round-the-world Volvo Ocean Race that ends in June, after covering more than 28,000 miles of open oceans. With considerable time spent in the active (marine mammal) waters of the Atlantic, the safety of race participants and marine species such as the endangered North Atlantic right whale is improved greatly with the help of the NOAA Right Whale Sighting Advisory System. Throughout the race's trek across the North Atlantic, the NOAA Fisheries Service has been providing reliable and timely information on whale locations to Volvo Ocean Race organizers to ensure the safety of race participants and the endangered North Atlantic right whale. ■

## 104 hurt after ferry hits whale

More than 100 people were injured when a hydrofoil hit a whale off Cape Sata, Kagoshima Prefecture, on April 10. According to the Regional Coast Guard 98 of the 103 passengers and all six crew members on the high-speed ferry Topy 4 were hurt. Of those, 12 were seriously injured. Thirty-six were hospitalized. ■



# wreck rap



Texas Navy ship *Invincible* was lost outside of Galveston after fight with two Mexican ships on August 27, 1837.

## The Search for Republic of Texas Navy ship *Invincible*

National Underwater and Marine Association (NUMA) and the Texas Navy Association has partnered with **Cochran Undersea Technology** to find the *Invincible*

In the fall of 1835, with the Mexican Navy blockading Texas ports, the provisional government of Texas created the first Texas Navy. The flagship was the fast clipper *Invincible* which was built in Baltimore and arrived in Galveston for duty on January 1, 1836. Upon her arrival, the *Invincible* was immediately outfitted with 9 cannon. She then joined her sister Texas Navy ships and the privateers to protect Texas shipping by breaking

the blockade and driving the Mexican Navy from Texas waters. But the *Invincible*, the Navy's finest, was given an additional order - find and destroy the *Montezuma*, the Mexican Navy's newest and most formidable warship.

On August 26, 1837 the Texas Navy returned to Galveston triumphantly. The *Brutus* towed a prize ship crossing the bar into Galveston Bay, while the larger, heavily laden (with booty) *Invincible* anchored

outside the bay, when two Mexican brigs were spotted chasing a Texan supply ship headed for Galveston. The *Invincible* engaged the two larger Mexican warships. The course of the battle saw the *Invincible* run into the shoals as a storm were approaching. The ensuing storm broke up the *Invincible* and over the next 48 hours she sunk below the water and ultimately below the sand where her nine cannon and a storehouse of other historical artifacts lie today.

### Finding her

The National Underwater and Marine Association (NUMA) began searching for the *Invincible* in 1985. In 2004 the Texas Navy Association joined NUMA to locate the *Invincible*. Last year the joint venture completed a Marine Magnetics (Canadian company) magnetometer survey of the new high-probability area which resulted in the discovery of several promising targets. Test excavations will be conducted using Cochran Undersea Technology DDRs (Dive Data Recorders) and EMC-20H dive computers. Dive profiles will be recorded using Cochran Analyst software. ■

## Photo-mosaics help scientists map Florida shipwrecks

Scientists with NOAA have documented five historical shipwrecks off the Florida Keys using a custom-made underwater sled fitted with advanced SONAR and video equipment.

Now they will use their findings to produce photo-mosaics which will provide NOAA with supplemental data of the ships' remains and educate the public about the sanctuary's wrecks. The five-member team

worked for more than a week to create never-before-seen pictures of five historic wrecks that make up the sanctuary's shipwreck trail - *the City of Washington, Benwood, San Pedro, Adelaide Baker and North America*. The images will be made available this summer at **maritimeheritage.noaa.gov**. ■

Archeologists at work  
NOAA filephoto



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The Endeavour

## Captain Cook's *Endeavour* may be found off Rhode Is.

Four ships from a British fleet used during the Revolutionary War have been found off Rhode Island. One of them may be the *Endeavour*, the ship that Captain Cook commanded on his first voyage across the Pacific Ocean. The *Endeavour* was the first British vessel to reach New Zealand in 1769 and Australia in 1770.

Researchers with the Rhode Island Marine Archaeology Project said they believe the four ships, and two others previously discovered, are part of a 13-vessel transport fleet intentionally sunk by the British in Newport Harbor in 1778 to keep French ships from landing to aid the Americans' drive for independence.

Archaeologists said it was unclear which ship could be the *Endeavour*. "There is a 47 percent chance that we have our hands on the *Endeavour*," said D.K. Abbass, executive director of the Rhode Island Marine Archaeology Project. Four of the ships were discovered in August 2005 by the use of historical materials and sonar by Professor Rod Mather of the University of Rhode Island and graduate student Jamin Wells.

Divers found ballast piles about 30 feet underwater, with the ship's keel and other parts embedded in the sea floor. They also found at least one cannon, an anchor with a 16-foot shank and a cream-colored fragment of an 18th-century British ceramic teapot. "As is the case with many 18th Century shipwrecks, the newly discovered vessels were pinned to the bottom of Newport Harbor with their own ballast stones," said Mather. ■

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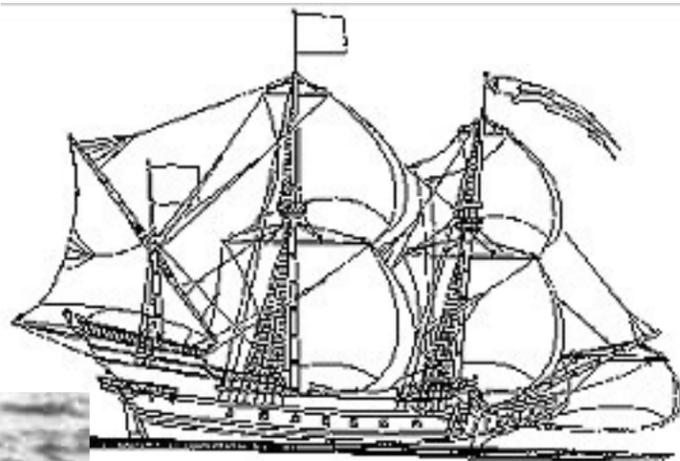
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# wreck rap



Divers have found two gold bars and 15 silver coins which had been buried beneath the ocean floor off Florida Keys for almost 400 years. The objects are believed to be from the shipwreck of the Nuestra Senora de Atocha, a Spanish galleon that sank in 1622. The bars were discovered by divers from Mel Fisher's Treasure Salvors on the treasure-hunting ship the Magruder about 35 miles off of Key West. They were found beneath about 12 feet of sand in 20 feet of water. ■

## Thai Firm Wants To Search For WW2 Minisubs

A Thai marine-supply company based in southern Phuket is seeking permission to salvage what it believes are two British "human torpedoes" or Chariots, that have been lying in the sea near Phuket since World War II. The Chariots sank near Dok Mai Island of Phuket Province during a mission in World War Two.

However, authorities in Phuket would first like East Marine to get British government confirmation that the two vessels really belonged to the British Royal Navy.

Some records say the British submarine Trenchard carried two Mk-2 Chariots for a mission at Phuket harbor on Oct. 27-28, 1944.

"We need to have the evidence first, otherwise it could create problems for us later if the torpedoes are found to belong to another country," Governor Udomsak said. Salvaging of the Chariots

is related to national security, the environment and archaeology, and hence the province had to first consult several agencies, such as the Fine Arts Department, the National Resources and Environment Ministry and the Harbor Department, he added.

The Chariots are archaeological finds under the authority of Thai Fine Arts Department, as they have been submerged in Thai waters for more than 60 years. "We also have to study the environmental effects," he said. "We still need information about how deep the naval weapons are under the water and how thick is the soil burying them." ■

Source: www.chinaview.cn



HMS Trenchard

## Rare Spanish Ship Found On US Navy Base

A rare Spanish ship possibly dating as far back as the 1500s has been unearthed at a navy base in Florida by construction crews rebuilding after Hurricane Ivan. The discovery could mark the earliest of its kind dating back to the first Spanish settlement in the U.S. but the presence of iron bolts makes it more likely the ship is from a

later period. The ship had been hidden under sand for centuries, and researchers estimate the ship is currently buried in about 22 metres of sand. The exposed keel of the ship points upward from the sandy bottom of the pit and gives some indication of the vessel's form.

During initial work to determine the ship's ori-

gin, archaeologists found ceramic tiles, ropes and pieces of olive jars. The Spanish settlement was founded in 1559; its exact location is a mystery. The Spanish did not return until more than a century later in 1698 at Presidio Santa Maria de Galve, now the naval station. The Navy plans to enclose the uncovered portion of the ship. ■

## The Search For The El Salvador Exploration Of Sunken Shipwrecks On Hold

A team of six scuba divers from Utah hopes to salvage gold, silver, and jewelry from the El Salvador, a Spanish ship they believe went down in a hurricane in 1750 and now rests in about 70 feet of water. Wilf Blum, president of Deep Blue Marine, and leader of the expedition, claims the ship's manifest indicates there may be up to \$500 million worth of treasure among the wreckage. If the hull is intact, Blum's team will attempt to bring it to the surface in one piece. Otherwise, they intend to use dredging equipment to sift the seafloor for treasure.



## Admiralty Pulls Out Of Search For US\$1.2 Billion Spanish Booty Off Jamaica

US-based Admiralty Holding Company has pulled out from its search for Spanish precious metals and artifacts valued at US\$1.2 billion on the Pedro Banks, and instead conducted a bathymetric search for oil also on the Pedro Banks which has just been concluded. ■

In 2004, Fathom Exploration found four shipwreck sites near the mouth of Mobile Bay. Needless to say they then wanted to salvage the sites and claim any valuable artefacts that may exist. But those efforts have been tied up in federal court, where both the state and federal governments have laid claims to the sites. A private citizen also has challenged Fathom Exploration.

### Whose wreck is it then?

The federal government maintains that the ships are U.S. property if the vessels belonged to the United States or a foreign country. State authorities contend the vessels belong to Alabama if they lie sunken in state waters and that Fathom Exploration would have to get a permit and negotiate an arrangement to split any proceeds it reaps. At one point, the Alabama Historical Commission was negotiating with the company for such a permit.

All parties agreed in December to put the case on hold for a year, while they came to a consensus on how to proceed with the identification of the ship or ships. Although Fathom Exploration found four locations, the sites may have come from a single sunken vessel that has broken into pieces over the years. ■



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# wreck rap



S.S. Baychimo was sighted still afloat in 1969 by Eskimos, fast in the pack-ice of the Beaufort Sea between Icy Cape and Point Barrow. Image shows her at S. S. "Baychimo" at anchor, Port Burwell, NU, June 1921

## 'Arctic Ghost Ship' Keeps Spooking

For decades, mariners in the western Arctic reported sightings of an unmanned Hudson's Bay Company cargo steamer. Since 1931, the S. S. Baychimo was seen drifting back and forth across hundreds of kilometres of ocean. Its last recorded sighting was in 1969 and the question of its whereabouts has become one of the North's most enduring mysteries. Now, a new Alaskan government project to locate and protect historic shipwrecks could finally answer that question.

The 1,300 tonne steel ship was built in Sweden in 1914 and acquired by the Hudson Bay Company in 1919. The steamer was a key player in the opening of Northern waterways with beginnings in 1920's and set several long distance records during its annual 3,000 kilometre runs between Vancouver and the North West Territories.

### Getting caught by ice

Each trip was dangerous and each year it had to escape the grip of the polar ice. In 1931, the steel ship encountered one of the worst years for ice and she was caught good in the ice masses.

The Captain realizing he and his crew were stuck and radioed for a rescue initiating what would become the first "air lift" from the Arctic. Twenty of the ships crew were flown out in two aircraft. The crew decided to winter in a close by coastal area and rescue the ship in the spring of 1932 as she would free herself from the icy arctic grip. However a severe storm in late November freed the ship unexpectedly, setting her adrift and she disappeared only to be seen occasionally ever since.

### Spotted repeatedly since

In 1932 an arctic explorer caught sight of her as he was sledging across the arctic. The next year, Inuit hunters saw the ship and boarded it just as a storm approached encouraging them to leave. The ship was spotted again in September of 1935 and November of 1939 near Wainwright Alaska. In 1962 another group of Inuit kayaking the Beaufort Sea, sighted it. The last sighting was in 1969 when a US oil tanker Manhattan was crossing the Northwest passage and a party of Inuit said they spotted the SS Baychimo once again. ■

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## Historic Schooner Shipwrecks Added to US National Register of Historic Places

The wrecks of the coal schooners Frank A. Palmer and Louise B. Crary, which rest on the Stellwagen Bank National Marine Sanctuary seafloor, have been listed on the National Register of Historic Places, the National Oceanic and Atmospheric Administration has announced.

The Maine-built wooden-hulled schooners Frank A. Palmer and Louise B. Crary played a vital role as coal carriers during the urbanization and industrialization of New England at the beginning of the twentieth century. The schooners rest on the seafloor, their bows touching in the same orientation in which they plunged to the seafloor after their collision in 1902. A miscalculation by the Louise B. Crary's mate caused the schooner to smash into the Palmer's portside bow. Within minutes of the collision, six of the 21

sailors onboard the vessels lost their lives when the ships plummeted to the bottom. The remaining 15 sailors made it into the Palmer's longboat with only the clothing they were wearing, but without food

or water. During the following four days, five more men perished from exposure in the open boat before being rescued more than 60 miles east of Cape Cod. Investigations of the site revealed the vessels' hulls to be nearly intact with rigging splayed across the deck from the toppled masts. At no other located New England

coal schooner archaeological site is there the same opportunity to study two vessels with such extensive preservation. How the schooners sank, and the condition of the wreck site, provide a unique archaeological opportunity to compare two similar, but slightly different vessels, engaged in the same trade. ■



Schooners Frank A. Palmer and the Louise B. Crary

NOAA/SBIMS AND NURC-UCONN

## Treasure Left Unprotected In Indonesian Capital

Southeast Asia's richest underwater archaeological find in decades is stored in a leaky stable in Indonesia's capital, guarded by marines who claim a solitary gun between them. At risk is priceless Indonesian history. Timber and iron beams from a tenth-century wreck - which could provide information about ancient trading routes and the arrival of Islam in Indonesia - lie in a bath under the tropical sun behind yellow police tape. Several thousand centuries-old Chinese ceramic bowls, fragile copper mirrors, beautiful glass bottles and ancient ship parts are also being stored. After sitting under the ocean for a thousand years, the treasures urgently need complex preservation treatments. Of particular concern are the ship's structural timbers and iron bars, which are sitting outside in a tank of salty water. While the fragments are not financially valuable, they provide important clues to trade between Indonesian kingdoms, Persia, Africa, and China, said Horst Liebner, a maritime historian. ■

## Finally! The USS Oriskany Sent To The Seabed Off Florida

It took only 37 minutes for the 888-foot ship to sink below the surface while hundreds of misty-eyed veterans looked on after strategically placed explosives were detonated on May 17. The



NAVAL HISTORICAL CENTER

32,000 ton ship now rests upright on the ocean floor in a north-south orientation at an existing artificial reef site at a depth of approximately 212 feet, as requested by the state of Florida. The Navy will start to offer additional ships for artificial reefs later this year. ■



MILITARY NEWS



ROYAL NAVY

## But Who Can Sink This One? Frigate Centre Of One Last Battle

Tenders for the sale and disposal of the 36-year-old Leander class frigate will be closing as X-Ray Mag goes to press with at least six groups known to be interested in securing the old Navy vessel.

The Bay of Islands Group wants to add to a Northland dive trail covering Tutukaka, Bay of Islands and Matauri Bay. However, Dive Tutukaka director Jeroen Jongejans, who hopes to add the frigate to two other wrecks off the Tutukaka coast, believes the Bay of Islands group has left its run too late. Dive Tutukaka has already applied and been approved resource consent to scuttle the frigate. "If you haven't got a resource consent you're wasting your time." ■

The Oriskany was the first ship to be environmentally prepared using the US' Environmental Protection Agency's "Best Management Practices for Preparing Vessels for Use as Artificial Reefs."



Edited by Peter Symes

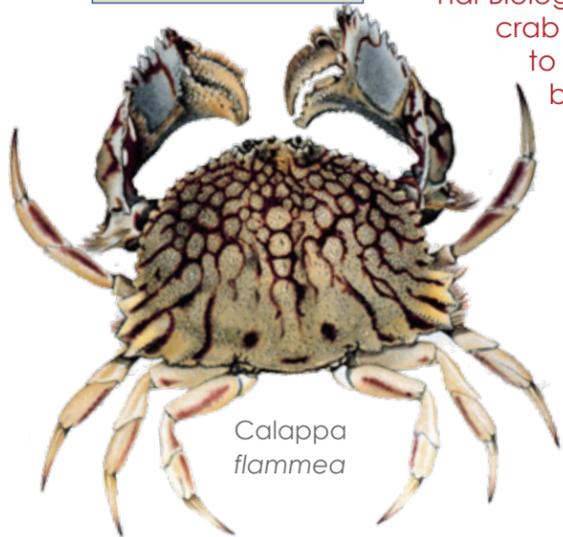
Just 0.6 percent of the oceans are currently protected as reserves, compared with 12 percent of the world's land, according to UN data

## Scientists Find Four New Fish Species Off Western Australia

During a four-day research trip scientists from Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) has found four new species of fish including a stingray in deep waters off Western Australia's coast, just beyond Rottneest Island.

Scientist Peter Last he is amazed that the new species were found so close to Australia. More than half of the 100 species of fish collected are only found in the south-west of Western Australia. Dr Last says the fish are yet to be named. "It's a fairly long process naming fish, not a five-minute job," he said. ■

Arnold Schwarzenegger starring as Mr. Freeze in *Batman & Mr. Freeze*



Calappa flammea

## Secret Of Snail's Escape

Snails with left-handed shells can have a big advantage in life - predators may find it impossible to eat them. Scientists writing in Royal Society's journal *Letters* have found that the crab *Calappa flammea*, is unable to open left-handed shells because it only has a tool - a 'canopener' - for peeling them on its right claw; so it discards them. ■

## African Fish Leaps For Land Bugs

Scientists have described a fish that can hunt and catch its prey on land. The eel catfish, *Channallabes apus*, is found in the muddy swamps in western Africa. The 30-40cm-long fish is able to propel itself out of the water and bend its head downwards to capture insects in its jaws. The researchers hope this discovery will help to explain how fish moved from sea to land millions of years ago. ■

## Anti Freeze Gene

Fish such as cod that live in subzero polar waters possess special anti-freeze proteins that work by binding to ice crystals to prevent the crystals growing larger and causing problems



Now scientists at the University of Illinois have discovered how the antifreeze-proteins have evolved from existing proteins by natural selection. Since the creation of these antifreeze proteins is directly driven by polar glaciation, by studying their evolutionary history the scientists was hoping to pinpoint the time of onset of freezing conditions in the polar and subpolar seas. However, Professor Christina Cheng and her group have found the gene for the cod antifreeze protein has come from a non-coding region of their DNA known as "junk DNA".

"This appears to be a new mechanism for the evolution of a gene from non-coding DNA", says Professor Cheng. ■



## Fossil Of First Fish That Crawled Onto Land Discovered

About 400 million years ago our fishy ancestors began hauling themselves onto dry land, evolving from fish into land animals. Now a fossil from the very beginning of that crucial transition has been found in a river delta on Ellesmere Island in Arctic Canada

### Tiktaalik

The fossilized remains included a near-complete front half of a fossilized skeleton of a crocodile-like creature, whose skull is some 20 centimetres long and with joints in its front arms. The new animal, which lived some 375 million years ago, has been named Tiktaalik after suggestions from Inuit elders. The name means "large freshwater fish".

Palaeontologists describing their find in the journal *Nature* calls the specimen from the Devonian a true 'missing link', as it helps to fill in a gap in our understanding of how fish developed legs for land mobility, before eventually evolving into modern animals.

The fish-like tetrapods it seems did not so much conquer the land, as escape from the water. They have bony scales and fins, but the front fins are on their way to becoming limbs; they have the internal skeletal structure of an arm, including elbows and wrists, but with fins instead of clear fingers. The team is still looking for more complete specimens to get a better picture of hind part of the animal. ■

Food for thought

## Can Cod Help Clean Up The Baltic Sea?

Imagine being out on a fishing trip in the Baltic, hauling in cod for dinner. But rather than gutting the fish and throwing the offal overboard for gulls to feast upon, you put them away in plastic boxes carrying them ashore to make sure they are safely incinerated.

### Why?

There would be an underlying meaning to this seemingly irrational behaviour. In doing so you will have helped removing some ugly toxins from the sea. The Baltic is still one of the seas most polluted with chemical contaminants are long-lasting pollutants such as PCBs (polychlorinated biphenyls) which are poisonous compounds that can impair reproduction.

They have entered the Baltic Sea via the atmosphere and rivers and although manufacture of PCBs stopped in 1976, they are still in the marine environment and likely to be there for many years to come as they do not break down easily. Because PCBs are easily absorbed by marine organisms, they tend to get magnified up the food chain

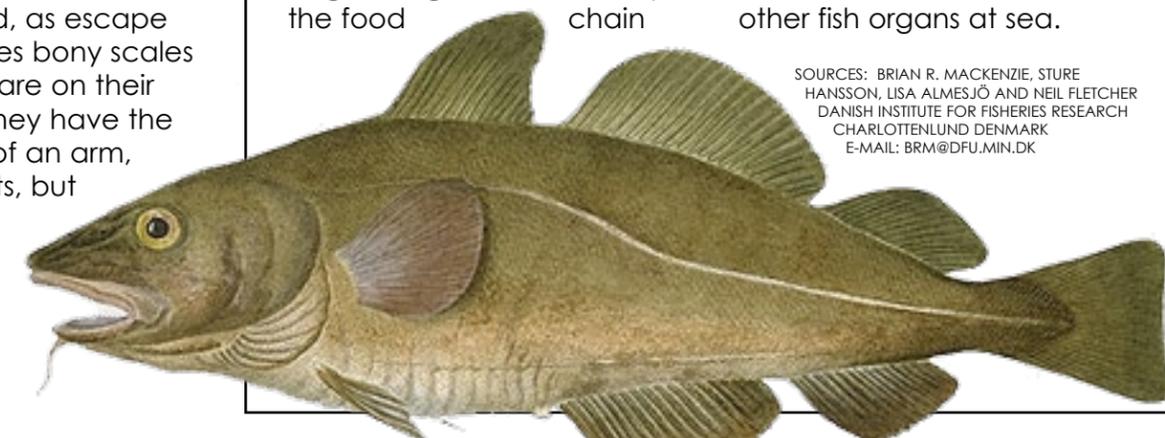
through the microscopic plants and tiny animals of the plankton into fish and seals and seabirds, which end up getting the biggest doses.

In particularly strong concentrations are found in cod livers and researchers from Danish Institute for Fisheries Research has shown that fishing removed as much or more PCBs from the Baltic than some other natural processes known to eliminate PCBs - as for example by break-down in the water column, export to the North Sea by ocean currents.

### The numbers

For example the Baltic Sea contained 260 kg of PCBs in the late 1980s-early 1990s. During the same time period, fishing for herring, sprat, cod, and salmon removed on average at least 31 kg of PCBs per year.

Because fishing also appears to be the only method of PCB removal over which we have some control, one might ask whether environment and fisheries agencies around the Baltic should consider banning the discard of cod liver and other fish organs at sea.



SOURCES: BRIAN R. MACKENZIE, STURE HANSSON, LISA ALMESJÖ AND NEIL FLETCHER DANISH INSTITUTE FOR FISHERIES RESEARCH CHARLOTTENLUND DENMARK E-MAIL: BRM@DFU.MIN.DK

# Turtles

## Leatherbacks in the Caribbean make a come-back

Twenty-five years of conservation and monitoring have helped the endangered Caribbean Leatherback turtle to increase their hatchling numbers from 2,000 per year to 49,000 according to a report published in

of Planning and Natural Resources. In the 1990s, the U.S. Fish and Wildlife Service made the nesting beach at Sandy Point a national wildlife refuge and participated in the monitoring program.

Despite the good news for these Caribbean turtles, leatherback turtle populations world-wide have declined recently from destructive fishing practices such as longline fisheries and human impact on nesting beaches. Despite beach conservation measures in the Eastern Pacific,

Biological Conservation.

It is the first time increasing trends for leatherbacks have been linked to nesting beach conservation researchers told Earthwatch. Intensive monitoring efforts take place at St. Croix's Sandy Point National Wildlife Refuge under a project that started in 1982 by the US Virgin Islands Department

leatherback populations there have virtually collapsed and show little signs of recovery.

Scientists supported by Earthwatch and working with leatherbacks in Costa Rica report that nearly twice as many turtles came to nest this season than last, but it is still 90% less than the numbers 20 years ago. ■



PHOTO BY MATTHEW GODFREY, NOAA

## Red Tide kills endangered turtles

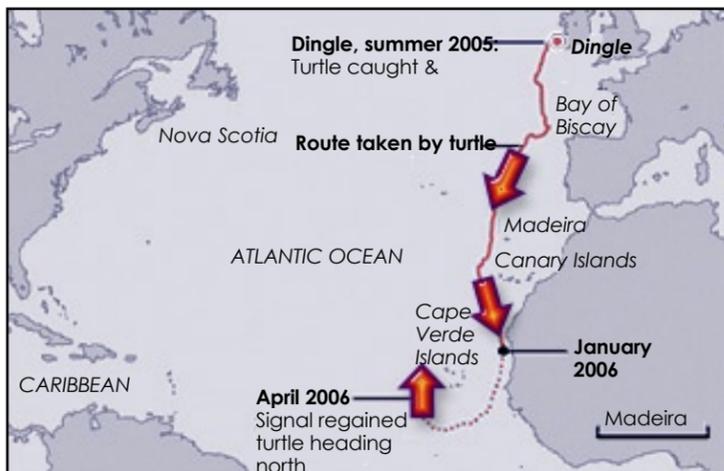
A mass die-off of sea turtles on the Pacific shores of El Salvador was triggered by a lethal algal bloom called "Red Tide" reported a U.S. conservation group. Two hundred turtles perished last year from exposure to Red Tide. Traces of saxitoxin was found in their blood, which is produced by a species of sea plankton and algae found in Red Tide, according to a report by the Wildlife Conservation Society based in New York. Most of the affected turtles were Olive Ridley sea turtles and some were Green and Hawksbill turtles.

Scientist say that Red Tide is becoming more common around the world and causing profound impacts on wild marine animal populations such as shellfish, the industry of which has suffered massive economic losses. Human waste such as agricultural fertilizer run-off and urban sewage contribute to the increase in algae blooms. ■

## Tri-national protection for Pacific sea turtles

The Bismark Solomon Seas eco-region is set to initiate a conservation partnership between three governments for the protection of Western Pacific Leatherback Turtles. Indonesia, Papua New Guinea and the Solomon Islands are joining forces to conserve and manage the sea turtles, their nesting sites and feeding areas as well as their migratory routes in the region.

It is the first partnership of its kind between three countries according to a statement from the WWF Solomon Islands. The move will help conservation efforts of these endangered turtles to continue in the Solomon Seas Eco-region or BSSE, which is recognized area of globally important biodiversity, and covers the Birdshead Peninsular of the province of Papua in Indonesia, crosses the Admiralty and Bismarck archipelagos of Papua New Guinea and makes it way to Makira Island of the Solomon Islands. ■



## Leatherback takes 5,000 mile journey

Marine biologists have been tracking a 15 year-old Leatherback turtle found first and tagged off the British Isles and journeying south all the way to the Equator around the Cape Verde Islands off Africa. The animal was rescued from entanglement in lobster pots in Dingle, Co Kerry, UK, by scientists from Oceanworld aquarium. The turtle was fitted with a satellite tracking device by experts from universities in Cork and Wales. It is thought that the turtles long journey was a quest for food rather than nesting beaches. This the first time a leatherback has been tracked from the North Atlantic southward. Data gathered will help conservationists save this endangered species. According to experts, the turtles numbers have decreased from 115,000 adult females in 1980 to less than 25,000 worldwide today.

Other tracking projects

have been started by the University of Exeter who are focusing on the leatherbacks who travel south from the UK down to nest on the beaches near Gabon, West Africa. It is the animals last global stronghold, It is thought by researchers that the turtles may be traveling as far south as South America and the Indian Ocean in search of jellyfish prey. ■



PHOTO BY NANCY BLACK, NOAA

The advertisement features a blue background with a yellow border. On the left, there is a logo for Layang Layang Island Resort Malaysia, which includes a stylized bird and the text "Layang Layang ISLAND RESORT MALAYSIA". In the center, a scuba diver is shown swimming. On the right, a large, colorful fish is swimming near a coral reef. The website address "www.layanglayang.com" is written in a blue, cursive font across the middle.

Edited by  
Gunild Symes

## Inuit see signs of Arctic change

The Arctic, where 155,000 Inuit people in Alaska, Canada, Greenland and northern Russia, make their home, is disappearing. The warming trend and melting of ice caps is forcing the people to face a new way of life and abandon traditional methods of survival.

Global warming has hit the Arctic the hardest, where fish and wildlife are following retreating ice caps northward and polar bears are starving as the ice floes they need for hunting become fewer and fewer. Seals are also affected according to local reports. They are not able to find stable ice upon which to give birth. Newcomers such as robins, barn owls and hornets are showing up in Arctic villages where they were previously unknown.

Inuit elders say they cannot pass on traditional knowledge to the next generation because it is no longer reliable. They say everything has changed including cloud and wind patterns

and other elements the Inuit use for predicting the weather.

The Canadian government reported the warmest winter on record since 1948, and NASA satellites have measured a meltdown of the ice sheet in Antarctica and Greenland over the past ten years. Some regions are transforming from arctic to subarctic climate such as the Bering Strait according to researchers at the Oceanography and Climate Science program of Canada's fisheries department.

Scientists predict that the changes happening here in Inuit country is just the beginning, that the phenomena will move southward to affect the rest of the planet. ■

## Arctic ecosystems see major changes from global warming

Animals are struggling to survive as the profound impact of climate change on their ecosystems, which may be irreversible, affects life and feeding grounds in the Arctic including the Bering Strait where whales, walrus, seabirds and fish are starving and dying off.

Researchers state from observations and surveys they have witnessed a major transformation of an entire ecosystem which hosts almost half of all American commercial fishing.

The northern Bering Sea is retreating and the sub-Arctic system of the south is taking over formerly Arctic regions according to experts. These changes could be irreversible even if cold weather returns say Canadian and U.S. researchers who are part of the Arctic study sponsored by the University of Tennessee, the National Science Foundation and the National Oceanic and Atmospheric Administration (NOAA).

Scientists say the Arctic is warming twice as fast as the global average. Waters of the Bering Strait have risen dramatically in the past ten years. Seals, polar bears and walrus are struggling to survive. Pacific grey whales are heading northward to find food in cooler currents. The hole they left in previous pastures have been filled by millions of pink salmon, which affected bottom-dwelling species unable to adapt. ■



Polar Bears  
*Ursus maritimus* PHOTOGRAPH COURTESY U.S. FISH AND WILDLIFE SERVICE

## UK Pop Stars support new climate laws with song

Several famous British singers played at a concert to support Friends of the Earth's Big Ask Live campaign. Rockers such as Thom Yorke and Jonny Greenwood of Radiohead and Gruff Rhys, of the Super Furry Animals according to local reports. First in a series of concerts to draw attention to the campaign to change laws on CO2 emissions, participants said the experience was empowering, taking away the sense of powerlessness

over global warming. The UK government recently stated that the UK will most likely not meet its target emissions reductions goals of slashing 20% of CO2 by 2010.

The new law supported by Friends of the Earth would force government to cut emissions of carbon dioxide by 3% each year. The organization says that most people want their government to take action regarding climate change according to surveys. ■

# Morning Commute



## Become a NAUI Instructor

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Outside the US call 813.628.6284 Or visit our Web site at [www.naui.org](http://www.naui.org)



# Patagonia

*Diving at the end of the World*



The rugged coast of Patagonia

Text and photos by Marcelo Mammano

**Consider a windy place—** I mean, very windy—so windy you must ask the wind about what you can do today. Consider the wind as “mobile” as the “Donna” of the opera. He changes his mood at any time with no warning. Mood, in terms of wind, is direction, force, temperature, humidity and all the weather changes that come with them. Now, put yourself in a flat place, a plateau, with no mountains or trees to protect you and where the wind surrounds you all the time. Stay there and wait. Take your time to look around. You begin to notice that the soil upon which you are standing is covered with marine fossils and guess rightly that this was the sea floor some millions of years ago.

You walk a few steps to the end of the cliff and watch the sea and the sandy coast 100 meters below you. Depending on what part of the region you are right now, you can see some different animals. Big animals, small animals. Say, some fifty or more right whales and calves, hundreds of elephant seals basking in the sun, or thousands of Magellanic penguins toddling everywhere—some of them walking right beside you. Perhaps you are lucky enough to see a killer whale grounding on the beach and catching a sea lion pup. Then you realize that you are in a very special place—wild, almost untouched. That is Patagonia.

Patagonia is a region so vast that it would take more than one article to describe it. So, that is what we are going to do. First of all, and from our point of view (scuba divers and underwater photographers), there is a marine coastal region and there is a river and lakes region. The first faces the Atlantic Ocean and is dry and—you guessed it—very windy. The most attractive places for diving are the Valdés Peninsula in the north and the Beagle Channel at the end

Female Southern elephant seal, *Mirounga leonina*, showing us that we are too close





A dazzling Patagonia coast



LEFT: A curious sea lion bathed in sunrays peers into the camera lens



CENTER: The barnacle encrusted hide of a Southern Right Whale



BOTTOM: Large male elephant seal snoozes under a warm sun on the dark rocks along the shore

of the world. The other place lies at the foot of the Andes, which you can imagine are like the Alps, but much more extensive, with beautiful lakes surrounded by mountains and green everywhere. You can dive in both places, which both share one similar condition: cold waters. But they are very different in other ways.

### The country

A few words about the country will serve you to understand its diving attraction.

A friend of mine used to classify countries as those that "are" diving places and those that "have" diving places. Argentina is in the second group. It is not a dive destination, but has some pretty, interesting and seldom dived spots that are worth a visit.

Today, it is not the expensive country it used to be—economic crisis and the devaluation of the local currency are to blame—so expect to see lot of tourist activity.

Buenos Aires is considered by many as the least "Latin American" of Latin American cities. This is due to European influence and immigration. Cultural offerings in this city are incredible, people are kind and helpful with tourists, coffee shops are open until very late in the night (some never close), tango is everywhere and although Spanish is our language, you will find that most people can help you in English.

### Patagonia

Patagonia is in the southern half of the country. Life there is more expensive due to the distanc-

es. You better travel by plane to reach your destination. Once there, no matter where it is, try to rent a car if you have some time to spare. This will give you time and freedom. Many places like the Valdés Peninsula offer so much in such a big expanse that it would take some days to really enjoy all the attractions.

The places we are about to describe are perfect for a family vacation and especially the kids will enjoy truly wild contact with nature. This is neither a zoo nor an African safari. There will be times where you will find yourself watching a colony of thousands of elephant seals with no human around you except your family members. Of course, if you choose to visit them in a tourist bus, you should adhere to their schedules and rules. Going by yourself will



LEFT: Strawberry anemone  
RIGHT: Bright yellow sponge  
CENTER: Delicate blue anemone attached to rock on the sea floor



the Valdés Peninsula, water temperature is around 10°C, so a 5-7 mm wetsuit is okay for a couple of dives, but in the Beagle channel, expect less than 3°C, so drysuits are mandatory. You can rent or buy diving equipment, but I would advise you to bring your own mask and fins just to avoid fitting problems. Photo or video equipment rentals are seldom available.

take more time, but will allow you to enjoy a more personal approach. Go to Punta Tombo, for example. There, millions of Maguellan penguins form the biggest colony in the continent. You will be literally surrounded by these funny little animals. This is definitely a place for the family. But diving is better left for advanced divers. Although you don't need to be an expert, it would be ideal that you feel comfortable in cold and sometimes not so clear waters. With the exception of a few deep wrecks, diving is done in places no deeper

than 20 meters, mostly in the range of 12-15 meters.

You must ask special permission (in advance) if you want to dive with some of the animals in this region, because this is a protected area. An officer goes with you (not underwater) explaining what you can and cannot do. You can learn a lot from these guys. Some rules are a bit... (look around first to see if there is one of them around, please) ridiculous. For example, a diver cannot appear in the photograph with the animal.

(What?!?!?) But others rules are simply logical and perfectly understandable.

In the gulfs that surround



**Valdés Peninsula**

After a few days in Puerto Madryn (Argentina's diving capital) where we have dived some nice shallow wrecks in not so clear waters, we decided to head to the peninsula.

Puerto Madryn is a big city that was the first place touched by the Welsh immigration to Patagonia. This is a very nice spot to use as a base and visit the different places of the region.

Welsh tradition can still be enjoyed by visiting a couple of small and beautiful towns not so far from Madryn: Dolavon and Gaiman. There, you can enjoy a typical Welsh tea. Believe me, you won't want to eat anything the night before, so you can reserve your belly for it. Just try it. I will not tell you anymore.

Near Puerto Madryn there are some small beaches where, during the whale season, you can see those giants swimming and playing a few yards from the coast. El Doradillo, just 15 km. north of Madryn, is the best spot. You can dive in Madryn, and it is there where you can find most of the dive shops.

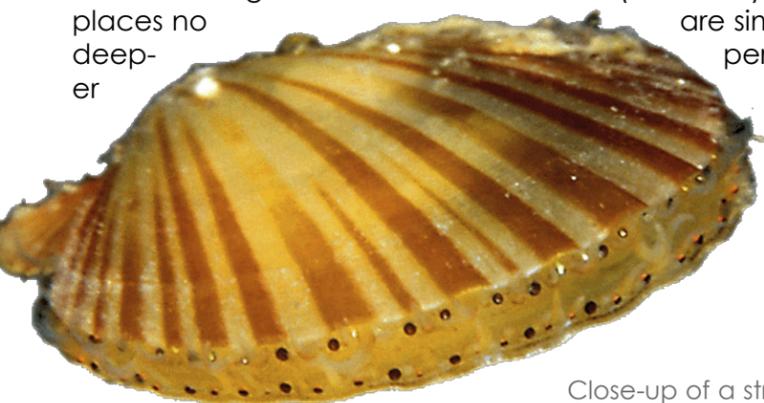
There are a couple of artifi-

Internet is everywhere today, but don't expect to find a good connection (or a connection at all) in some small villages. That's what you get when you want to

go to a wild place far from civilization.

We will leave the Beagle channel and the Andean region for future articles. Let's try first to

cover the Valdés Peninsula, as it is probably the most widely known place, and join me in a typical Patagonian diving adventure.



Close-up of a striated mollusc





Rugged coast of Argentinian Patagonia

# Patagonia

a main road and two short streets that connect it to the beach, a few houses and shops, some beach bars and that's it. It gets crowded during the summer months, but in winter, even with some tourist buses around, the place is still a paradise. There are a couple of nice small hotels in which to stay. You will enjoy the solitude, the silence, maybe some kids playing football in the streets, small houses with windows ornate with conchs and fossils, and very quiet and smiling people. A few dive shops can advise you about the better places for beach diving, which are not so far away.

In the afternoons, a walk in the surrounding cliffs will show you the vast expanse of the Patagonian

plateau. Marine fossils are everywhere. The air is clean, and you feel lucky enough to be able to enjoy such a place.

Let's go back to our diving.

## Punta Pardelas

For a few days, the wind doesn't help our whale watching, so we do some beach diving instead. The most beautiful place is very near Piramides: Punta Pardelas. There, submerged in a rocky bottom, you can find colorful and delicate little creatures.

Be warned, however: Patagonia is not like the Caribbean where you can buy a card illustrated with fish and corals, which, once underwater, you can find and identify effortlessly. Here, you must look for them.

At first glance, all you see are just rocks. But then, you carefully begin to watch below the rocks and notice that the colors you have seen in warmer waters are also here. You simply cannot believe that such variety can exist in these rough conditions.

From time to time, small groupers, no longer than 15 cm, begin to bite you, trying to get you out of their territory. You let them try, and then go on your way. At no more than a meter behind you, you discover a sea lion that is watching you. It is big, bigger than you thought. Then, in a second, she (they are almost always females) disappears.

You spend more than an hour in waters no more than 12-15 meters deep. It is cold and you

cial reefs used mostly for diving "baptisms" no deeper than 12 m made with old cars and buses. Groupers, sea salmons, octopus and occasionally a sea lion will join you in most of the dives.

Wrecks were sunken on purpose here and are very interesting for black and white wide-angle photography. They are also in shallow waters, so when current is present, backscatter is a problem. The best wrecks are the *Emma*, the *Folías* and the *Albatros*.

With special permission (not difficult to get if you ask the dive operator), you can dive under some piers, which are covered with sponges, soft corals and anemones.

Best and less crowded places for diving are, however, in the peninsula. The waters are usually clearer and beach diving is pos-

sible with rock reefs very close to shore.

To cover the 90 km to the main village, Puerto Pirámides, we cross the Istmo Ameghino, a thin strip of land that, from time to time, lets you see the sea on both sides of the road: the San José Gulf at north and the New Gulf at south. Diving is currently not allowed in the northern gulf. This is to protect the fauna, especially the southern right whales. But don't worry. In the proper time of the year, you can see whales even from the balcony of your hotel room.

## Puerto Pirámides

Puerto Pirámides is a small town (no more than 200 people living there) but is visited daily by thousands of tourists. Whale watching is a controlled and well-organized activity. That is why tourists

come here. But not us. Besides, I just get seasick even in a carousel. I prefer to see those beautiful beasts underwater.

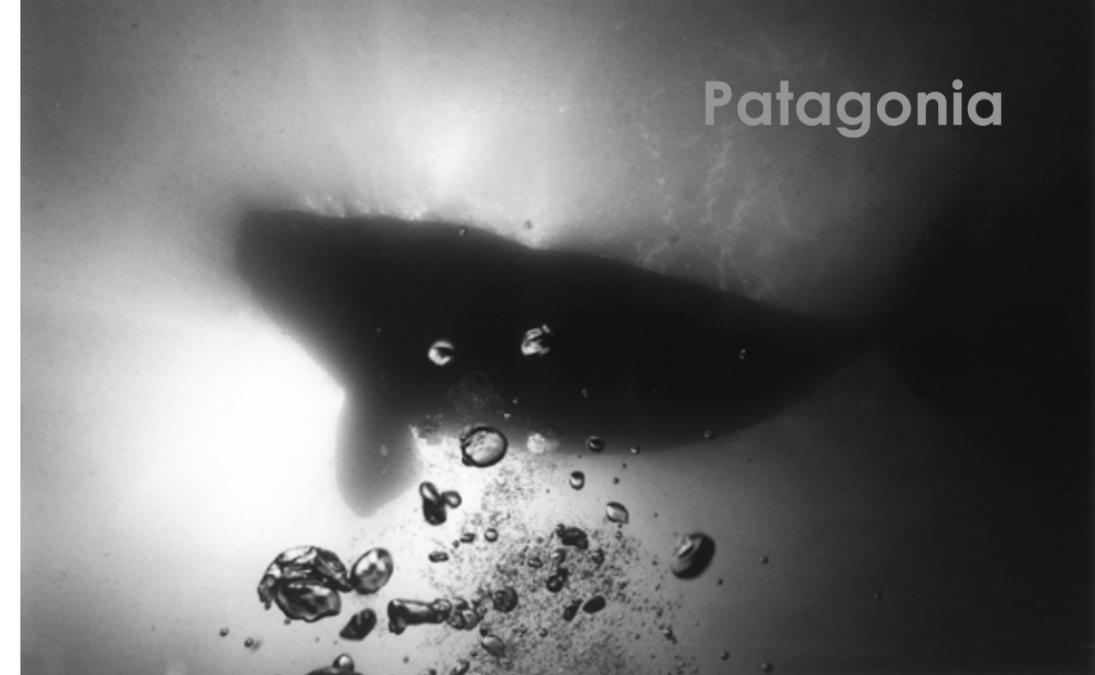
Southern right whales come every May and stay here until late November. In these calm waters they mate, give birth and feed their calves. In summer, they depart to feed in colder and more plankton-rich waters, perhaps near Antarctica. These areas are still under study and not clearly identified.

During the whale season, boats depart from early in the morning until there is enough light to see the whales jump, rest on the surface, or play with their calves. A very nice experience indeed. Then, late in the afternoon, the last bus leaves the little town, and you find yourself almost alone.

Puerto Pirámides is very small—



Turquoise blue sea wraps around cliffs



TOP LEFT TO RIGHT: The impressive barnacle encrusted face of a Southern Right Whale; Dramatic view from under a whale; Giant silhouette of a whale enjoying a bubble bath expelled from a diver's air tank  
BELOW LEFT TO RIGHT: Whale eye; Diving sea lion



feel the cold in your hands and lips. So, you decide that's it for the day.

### Whales

On the next day, the wind calms. So, we go for whales. Rules are simple: you don't hunt them—just spot one, approach her very slowly and see her attitude towards the boat. If she is willing to stay, she will begin to make some passes below the boat, scratching her back against the boat bottom.

The officer says that we should look for young adults. Mothers with calves are a bit jealous and will not allow us to approach. Calves are also very curious, but still can't control their enormous bodies very well, which makes them a bit dangerous.

You can spend some days until you eventually find the whale that stays around long enough to be photographed. Maybe you are lucky and she is there the first time. But this is not the rule. On the days the whales decide not to "collaborate", there are other animals that would love to dive with you.

### Sea lions

Sea lions are very common in these waters. From April to December, they can be found at Punta Alt, where a colony lives in the coast and little islets around. In the sum-

mer months, they migrate a few kilometers to the Punta Pirámides colony, where the shallower waters allow the puppies to swim safely.

We approach them slowly. We are still gearing up, but they have already jumped into the water. They are females. The males just stay at the top of the rocky islets, watching and monitoring us. It is better to dive a bit far from them, just in case.

Diving with sea lions is so magic that you can spend hours with them. They are fast, elegant, funny. You try to photograph them, but they move so fast, it is very difficult to compose an image. Worse yet. They bite you all the time. With their lips, they bite your hoses, snorkels, fins, everything. Yes, trying to photograph them is a nightmare. A wide-angle lens is a must. Since the dive is in very shallow waters, you must use strobes just for fill lighting, but most of the time (especially for black and white) you just use ambient light. With such movement, shallow waters and fine sandy bottom, backscatter is a problem, so you surely will end up leaving the strobes in the boat.

### Elephant seals

Other animals we wanted but could not dive with were elephant

seals. They live in an enormous colony (population around 3000) in Punta Delgada. It's open sea, so water is neither clear nor calm, and these guys aren't as friendly as sea lions. So, we just visit them to photograph them on the beach. Males are big (5-6 meters long) and very, very heavy. But also, very fast if they think you are invading their territory. So, you better approach them slowly.

In a quiet afternoon, the big boss sleeps while some young males fight not far from him. He doesn't pay attention to them. They are still very young to compete with him.

All around, beautiful faces watch us. They are females. They are basking in the sun, blowing from time to time, to get rid of the sand that enters into their noses from the wind. We approach them as close as they allow us. Some ignore us, some show us their open mouth, and we slowly retreat.

In the afternoon, while the sun disappears on the horizon, we head back to Puerto Pirámides. We see some ñandúes (Patagonian ostriches, smaller than the Africans), maras (world biggest hares) and guanacos along the road. It's a long trip however, and we arrive late at night.

We left Punta Norte for another





LEFT TO RIGHT: Magnificent tail fin of a Southern Right Whale; Sunning elephant seal gives a territorial bark; Detail of a red starfish; Green sea anemones cling to a mussel; Curious penguins grin for the lens



opportunity. It is far in the north, and it is better to visit in autumn to witness nature in its wildest form: killer whales grounding on the sand trying to catch sea lions. Maybe this year...

**Diving with whales**

This is the day, I say to myself. The wind is calm, the sea is almost flat, and some whales can be seen from the coast. There we go.

To dive with a whale is different from anything you have ever done before. It's kind of magic. It's a privilege. Not from the government, but from Nature. A gift.

After looking for a "collaborating" whale for our photo session for more than a couple of hours, we spotted one that was in a typical position: head down, with the tail out of the water. Scientists still don't agree about why they do this. Some say they are just resting, others say they are "sailing", using their enormous tail as a sail, pushed by the wind. Others just admit they don't know.

Anyway, as we approach her, she adopts a more "normal" position, but doesn't go away. On the contrary, as the captain shuts off the engine and the boat slowly drifts to her, she begins to circle us. Usually, the photographer

goes first with a mask and snorkel to try to secure some photos, and then, if the whale remains around, the shooter goes back to the boat for scuba gear.

I am not the strong, athletic kind of diver. I am small, and diving with a drysuit and weights and snorkel is almost a torture for me. So, I decided to risk the opportunity, spend the time to gear up completely and go for her in scuba. My choice was correct. For the time, I begin my descent, she was still there, curious to see what was that black thing that was approaching her.

We are close to shore, in a place no

deeper than 12 meters. The water is green and visibility is scarce, no more than 5-6 meters. I will use my Nikonos V with a Nikonos 15 mm lens, an SB105, and TMax100 black and white film pushed to 400 ISO to increase the contrast.

I adjust my buoyancy and begin to swim. I can't see her. I am alone. A "safety" (!) diver, a boy who goes with us in the boat, snorkels on the surface. He signals

somewhere, but I can't see anything. Suddenly, a cloud covers the sunlight. A big, fast moving cloud. A cloud with an eye! There she was. With a delicate stroke of her tail, she passes beside me almost effortlessly, but fast enough to not giving me time to compose a first shot. I try to follow her, but it's impossible. She continues to play the same game, again and again. After ten minutes of swimming I am so tired, that I decided to rest on the sandy bottom.

Many have asked me if I was afraid of swimming with such giant animal. To tell you the truth, my biggest fear was

returning without a photograph. And after those initial minutes, I had almost breathed half of my tank and still had no photographs in my camera. You definitely need to learn to dive with these guys. That was what I was thinking about, when I saw the cloud again. Right over me, in the very place where my bubbles reach the surface. I begin to ascend with the air bubbles rising up. It seems that she enjoys the bubble bath, because she is completely turned upside down, with her belly to the sun and her back receiving the caresses of my bubbles.

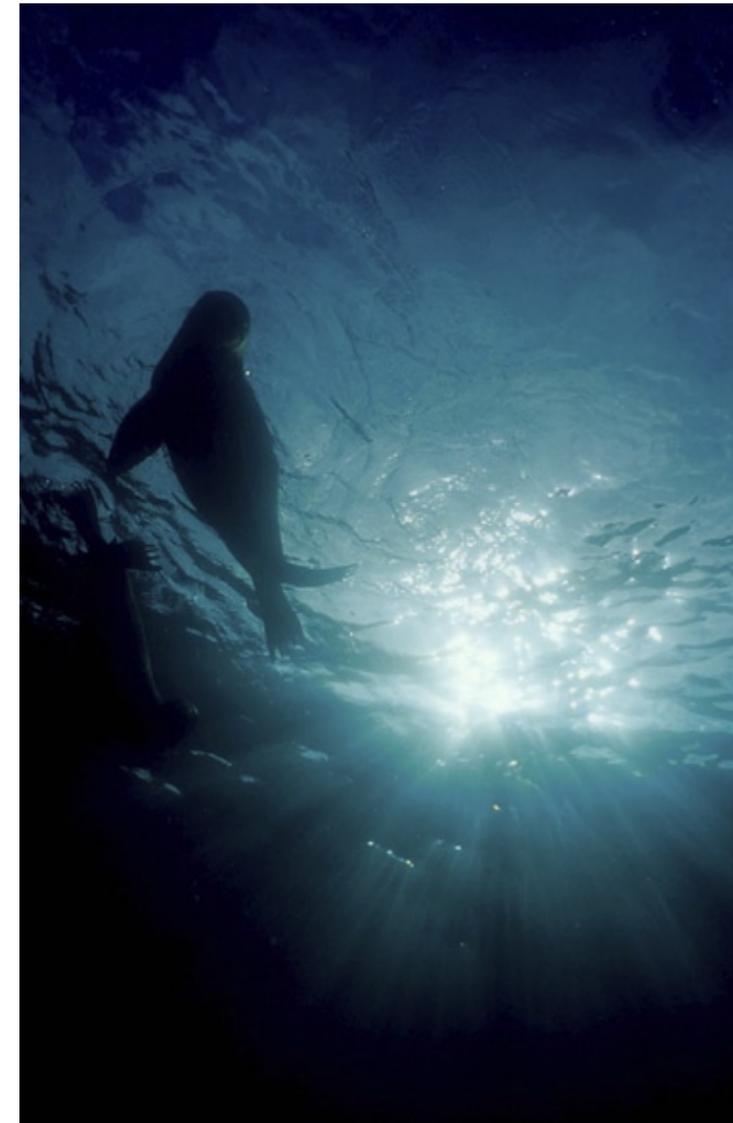
As I approach her, she notices me and begins to turn very slowly. I get a shot of her eye at no more than a few centimeters. As she turns her enormous body, all the water moves around me and we emerge together in an explosion of foam and waves, like a submarine. I grab a shot of her respiratory operculi and the little parasitic cyamids that surround them. I turn to my right and notice her tail approaching me, so I begin to move my legs trying to get far from her. I think to myself, I am going to die. Well, maybe not die, but I'll definitely

end this dive with some broken bones. The four-meter wide tail gets closer and closer and I stay still waiting for the best (or the worse). But nothing really happens. Like the pilot of a big Boeing, she maneuvers her body so perfectly that the tail passes beside me at no more than a few centimeters, without touching me. Amazing!

I lost her for



Penguins pruning their feathers populate the stony beaches to rest under the sun



TOP CENTER: Detail of sea anemone  
 TOP RIGHT: Poka-dotted nudibranch  
 LEFT: Sea lion swims under a gleaming sun  
 INSET: Smiling female elephant seal

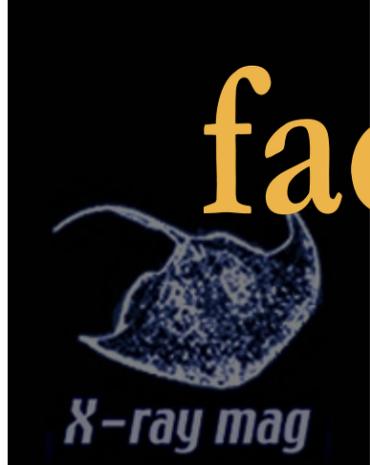
awhile. I have a few PSI in my tank and only one frame left in my camera. The “safety” guy keeps pointing at her doing some gestures I cannot understand. After swimming with no direction for a couple of minutes, I eventually see her. She is in the upright position again. With the tail outside, her head almost touches the bottom, so she must measure about 14-16 meters. I begin to meter the background as I approach her from behind. I don't want to fail. I reach her holding my breath and shoot a vertical photo just before she moves on and disappears into the green water.

I get back to the boat. I am really exhausted. But it was a great dive and I am really happy. We slowly go back to

Puerto Pirámides. I have decided I was too tired and sick—seasickness is my karma—to repeat the dive. It was the last friendly whale of that trip. The wind blew so hard the following days that the port was closed and we couldn't dive anymore.

I dedicated those bad days to getting some photos of the penguins at Punta Tombo Reserve, some 180 km south of Puerto Madryn. But the whale dive was the highlight of the trip and will remain with me forever. Fortunately, whales keep coming every year, so I plan to dive with them again. There is a cycle to their movements and the same whale is supposed to come to Valdés every three years. Maybe, I can find her again. She is the one that loves

bubbles. The guys in Pirámides (they know about whales) had never seen such behavior before, so if you ever dive with a whale that uses you as her personal “Jacuzzi”, please, just give her my regards. ■



# fact file

## Patagonia, Argentina



**History** Argentina gained its independence from Spain in 1816. The following period saw internal political conflicts between liberals and conservatives and between civilian and military groups. The end of World War II saw the establishment of Peronist authoritarian rule in Argentina, after which continued political turbulence led to a military junta taking power in 1976. Democracy made a comeback in 1983, and remains despite challenges including a severe economic crisis in 2001-02 that erupted into violent public protests forcing the resignation of several interim presidents. Government: republic. Capital: Buenos Aires

**Geography** Argentina is located in the southern end of South America. Patagonia (a region shared geographically with Chile) occupies most of the southern half of the country. The Valdés Peninsula is on the coast of Chubut, one of the five provinces that are located in the region. Coastline: 4,989 km. Terrain: to the north, rich plains of the Pampas; to the south, flat to rolling plateau of Patagonia; to the west, rugged Andes along the border. Lowest point: Laguna del Carbon 105 m. Highest point: Cerro Aconcagua 6,960 m. As mentioned in the article, Patagonia is a vast plateau with the Andes to the west. This plateau ends in pebble beaches or sandy coasts usually (but not always) enclosed by high cliffs. Millions of years ago, sea level was 100 m or higher, so the current soil was once the sea bottom. Marine fossils are everywhere. Natural hazards: heavy flooding, earthquakes in San Miguel de Tucuman and Mendoza areas in the Andes, *pamperos*, or violent windstorms, hit the Pampas and north-east. Environmental issues: deforestation, soil

degradation, desertification, air pollution and water pollution. Argentina is a world leader in making voluntary greenhouse gas targets

**Climate** The coastal area of the Patagonia is arid and dry, due mainly to scarce rainfall (no more than 200 mm/year) and strong western winds that blow almost continually. Their intensity increases in the warmer summer months. Temperature: 15-18°C in summer and 6-7°C in winter. Water temperature: about 16°C in February and 8°C in August. Tidal variations are among the world's greatest, so in some areas there are strong currents. This, associated to wind and the topographic characteristics of the terrain (with some places with strong "up wellings" or cold water ascending currents) produces a rich biological area (plankton)

**Seasons** in the Southern Hemisphere, summer goes from December to March, and winter, from June to September

**Economy** Advantages: rich natural resources, high literacy rate, export-oriented agricultural sector and a diversified industrial base. Disadvantages: inflation, external debt, capital flight, budget deficits. Negative growth in 2000 due to skepticism of the government debt repayment while maintaining peso-US dollar exchange rate, bond problems, massive bank withdrawals, sliding consumer and investor confidence despite the government efforts to rectify the situation with reforms. Following a stabilization at a low level, growth is making a comeback driven by domestic demand, solid exports, and positive external conditions strong revenue performance and a budget surplus



while inflation rose to 12.3 percent in 2005. Agriculture: sunflower seeds, lemons, soybeans, grapes, corn, tobacco, peanuts, tea, wheat, livestock. Industries: food processing, motor vehicles, consumer durables, textiles, chemicals and petrochemicals, printing, metallurgy, steel

**Currency** Argentine peso (ARS) Exchange rate: 1 peso = .32 USD, .25 EUR

**Population** 39,921,833 (July 2006 est.) Ethnic groups: white (mostly Spanish and Italian) 97%, mestizo (mixed Amerindian and white ancestry), Amerindian, or other non-white groups 3%. Religions: Roman Catholic 92% (about 20% practicing), Protestant 2%, Jewish 2%

**Language** Spanish (official); English is widely spoken in main cities and tourist areas; Italian, German, French

**Travel** How to get there: definitely, go by plane. It's a long trip to Madryn. Once there, you can rent a car to travel the area. The only airline that currently flies there is Aerolíneas Argentinas. Check before you go to see if they go to Puerto Madryn. They usually don't, and you must fly to Trelew (about 70 km south of Madryn) and then take a bus. Your travel agent can arrange it. Once there, take tours, or better yet, rent a car. Distances are large, and the whole round trip to the Peninsula (from Puerto Madryn) is about 400 km. The only paved road is the one that joins Puerto Madryn to Puerto Pirámides. Drive easy and beware of the stones that other cars can throw when they are passing you. They can break your windshield.

**Security** The usual recommendations for big cities: don't walk alone, ask before venturing in some places (especially at night), don't leave your values unattended, etc. Life is definitely more peaceful in Patagonia. Voltage: 220 v.

**Food/water** Don't miss Argentine "asados" (barbecues) and "dulce de leche". Water is Ok for drinking, although many would prefer to dilute it with a good Malbec (especially with the "asados")

**Seasonal fauna** Whales: from May to December. Penguins: from January to December, but best from September to March. Sea lions: All year round. Elephant seals: All year round. Killer whales: from February to April. Dolphins: from December to April

**Dive Links**  
Scuba Duba, Puerto Madryn  
[www.scubaduba.com.ar](http://www.scubaduba.com.ar)  
Golfo Azul, Puerto Madryn  
[www.pinosub.com](http://www.pinosub.com)  
Patagonia Scuba, Puerto Pirámides  
[www.patagoniascuba.com](http://www.patagoniascuba.com)  
The Paradise, Puerto Pirámides  
[www.hosteriaparadise.com.ar](http://www.hosteriaparadise.com.ar)



Marcelo Mammana is an Argentine underwater photographer (and physician). He was born and lives in Buenos Aires. He has dived since he was 13, and has done so in the Patagonia, Brazil and the Caribbean. He is a self-educated photographer (he actually first learned to photograph underwater before top-side), and although he uses color film for editorial work, he prefers to shoot in black and white. Visit his award-winning website [www.light-underwater.com](http://www.light-underwater.com). He is currently working on a photographic project on Patagonia.

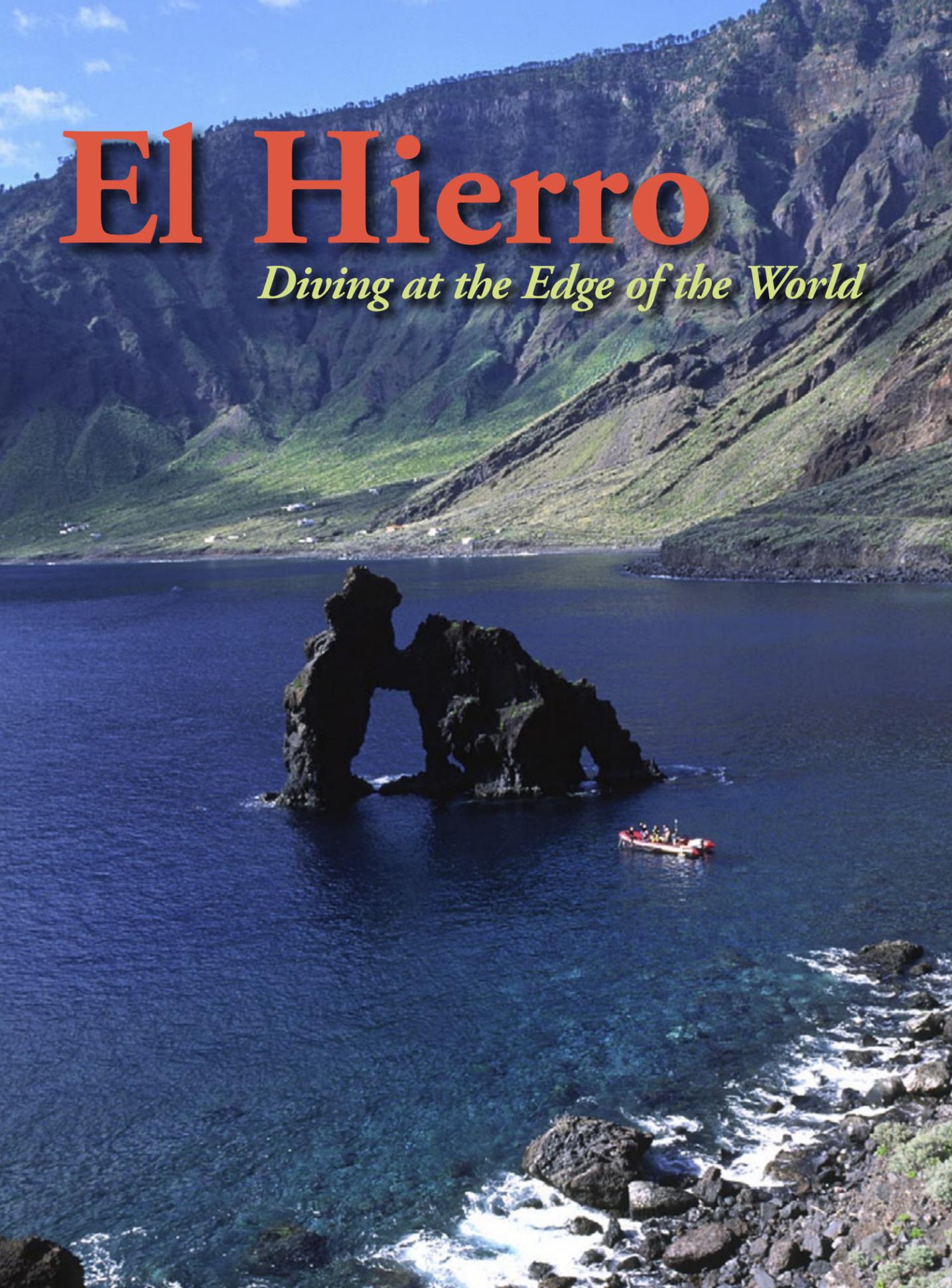
Marcelo's black and white images are taken with Kodak TMax100 (pushed 2 stops to increase contrast, in whale and sea lions images). He uses Fuji Provia for color shots. Underwater shots are taken with a Nikonos V, Nikonos SB105, Nikkor UW 15mm, Nikkor UW 35mm + extension tubes. Land shots are taken with a Nikon F601, Nikon AF 24 mm.

Contact info: Marcelo Mammana, Buenos Aires, Argentina, [mmammana@yahoo.com](mailto:mmammana@yahoo.com) [info@light-underwater.com](mailto:info@light-underwater.com)

**Websites**  
Puerto Madryn Tourist Office  
[www.madryn.gov.ar](http://www.madryn.gov.ar)  
Province of Chubut  
Protected Areas Office  
Contact them in advance for permits  
[www.chubutur.gov.ar](http://www.chubutur.gov.ar)  
AR Tourism, LLC  
Argentina & Patagonia Travel Specialists  
[www.artourism.com](http://www.artourism.com)  
SOURCES: M. MAMMANA & CIA.GOV WORLD FACT BOOK

# El Hierro

*Diving at the Edge of the World*



In Columbus' time, El Hierro was considered the limit of the known world in Europe. For over 1700 years, the smallest island of the Canaries was the land of the Zero Longitude and the ocean beyond was the realm of the unknown. Today, a lighthouse at the Western end of this enigmatic island marks the meridian site. Hierro's claim to fame does not end here. It is a beautiful and wild island of many contrasts. One of them being a near absence of tourists...

Text and photos by Jerome Hingrat

Hierro is not stuck in time. It's just that very few tourists choose to make the trip and the island has been spared the ghastly developments of its Canarian sisters. Besides, Hierro is still uncharted territory to many scuba divers from mainland Europe. Underwater, the spectacular diversity of its landscape is every bit as striking with a bewildering variety of cliffs, pinnacles, caves and lava fields. Dives have that special flavour that result from the meeting of Atlantic species with subtropical ones. Having dived in the rest of Canaries, I am struck by the diversity of the fish life around Hierro. It surpasses anything I have seen in the Canaries. The marine reserve and the absence of large-scale fishing around the island has something to do with it. But it is also due to Hierro's greater distance from the colder upwelling found off the African coast. As a warm Caribbean current encircles the island, the water here is warmer than off the eastern islands of Fuerteventura and Lanzarote. It is June and the water is 24 degrees!

TOP: Scorpionfish  
LEFT: Roque de la Bonanza



I soon learn to distinguish between chucos and ratones, I mean eagle rays and stingrays. We have come across all manners of rays: electric rays, eagle rays, stingrays and the stunning

butterfly ray with a wingspan of over 2 metres, one of the trademarks of Hierro. Antonio, my dive guide, tells me that Maromas (Manta rays) are also regularly spotted about the local dive

ABOVE RIGHT: Curious grouper with diver





ABOVE: A few meters below the surface  
LEFT: Fireworm on lava sand

sites. I put this down to a bit of Spanish blarney. But, back at the centre, a glance at the many photographs taken locally tell the story of their regular sightings. They even have a video of their last sighting filmed around the site of El Bajon. And the list doesn't just end here. Last month, a whale shark was spotted further off the coast and photographed by local divers.

**Deep waters**

In the absence of a continental shelf, deep waters are found very close to the shore. And it is not uncommon to encounter dolphin and pilot whales on

your way to a dive site. In the case of El Bajon, the most popular dive spot, the shore is within swimming distance. A steep double-humped pinnacle, El Bajon combines spectacular scenery and fish life. Oceanic currents ensure a constant supply of nutrients and a regular supply of visitors such as barracudas, bonitos, triggerfish, amber jacks, etc. I find myself drawn back to this site during my stay, which is less than ten



INSET: Stingray

minutes by RIB from the harbour. The temptation to go deeper in 30 m visibility is hard to resist... And if you want depth, El Bajon has plenty of it with maximum depths down to 70 metres! The saddle part in 10-15 metres is full of action and great for fish life. The place teems with a great variety of fish, from large pelagics to the shy Canarian lobster. One of its highlights is the swarms of bright ornate wrasse spawning en masse. If

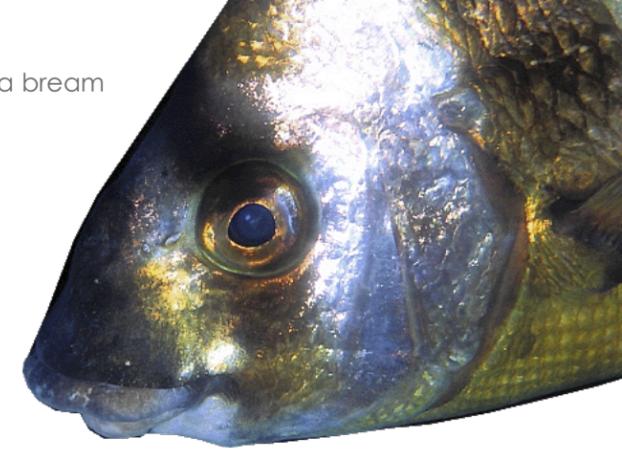


## El Hierro



ABOVE: Phoenician Juniper (*Juniperus phoenicea*) at El Sabinar, El Hierro  
LEFT: Moray eel with shell  
INSET BELOW: Fast moving Zebra bream  
RIGHT: Pancho, the friendly grouper

Up close with a Zebra bream



### Fish life

The ray saga continues off El Dessierto (the Desert) where we come face to face with an impressive electric ray perfectly camouflaged with its beady eyes peering at us. If it wasn't for our guide, I would have missed it in spite of its size. On every dive, bright fire worms can be seen crawling on the dark volcanic sand and to say they're hard to photograph would be the biggest lie of the century. That's the thing with Hierro, macro or wide-

angle, you can find subjects for every lens.

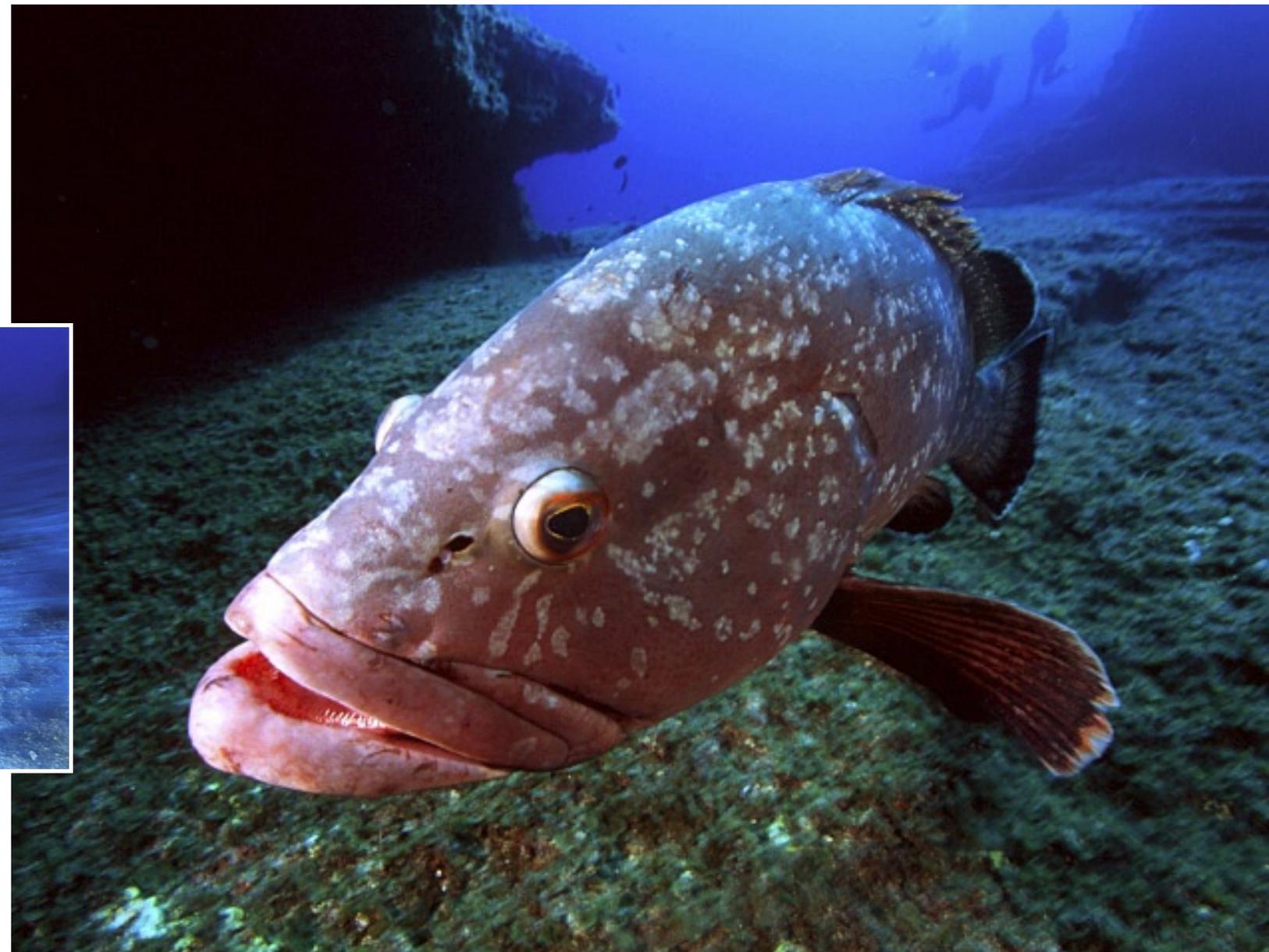
For a second, shallower dive, local caves around this end of the island. This is where the boxfish and tamboril are found hiding in the dark and it

you want action and exciting photo opportunities, look no further, El Bajon has it all, strong currents included. The cliff-like walls of the pinnacle offer protection for a safety stop.

In between dives, I decide to check the harbour after talking to Antonio. I slip off the moored RIB while everybody heads for lunch. As I make my way to the bottom, the dark sand seems to lift off: a large butterfly ray takes off like a magic carpet. Who says my camera should be turned off when the horizon looks deceptively clear? While I curse my luck, two large sting-rays take off in the opposite

direction. On another lunch dive, I come across a large nurse shark asleep in the sand. All this, in just eight metres off the harbour mouth, where the rays are known to hide in the dark ripples of the lava sand. Returning to the pier after nearly 80 minutes in the water, I find a turtle within meters of the pier. I'm out of film but not out

of luck as a local man tells me that the turtle is always around. Before I know it, I find myself considering another dive in the harbour!



# travel

takes a torch to ferret them out of their crevices. Some grow to considerable size and inflate their spiny body to scare off their predator. In a local cave, we spot six Canarian lobsters on a ledge and a beautiful pair of red nudibranchs. On the way out of another cave at El Salto, we come across a shoal of trumpet fish, resting motionless in a dense formation, oblivious to our presence.

## Marine reserve

Since 1995 the south tip of the island has been declared a marine reserve by the Spanish government. The protected zone runs along an area known locally as Mar de las Calmas (sea of calms). The area runs from the Orchilla lighthouse (historical landmark of the Zero degrees meridian) all the way to the har-

bour of La Restinga. The whole area is in the lee of the island and offers shelter from the prevailing winds. There's not that many diving areas that offer calm and crystal waters all year round with protection for both

divers and fish! A sizable portion of these coastal waters form the reserve and is divided into no take zones or restricted zones. The central chunk of the reserve is closed to both diving and fishing. Restricted areas are

open to sport divers but not to commercial fishing. This ensures the conservation of a pretty unique ecosystem. It is not hard to imagine that the presence of such a large concentration of fish attracts larger preda-



Red mullet find their food in sand



tors spotted regularly by divers and fishermen alike. This also means that large specimen and numerous species can be found all year round. Needless to say, fishermen and divers can be said to get on like a house on fire...

At El Desierto, the cliff dives along a black sandy slope which is home to a large colony of sand eels. The site is anything but a desert with a large sand eels colony the Red Sea would be proud of. Hundreds of them stick out in the black lava sand and are a sight to behold. Further along, a large grouper takes over the dive master duties and decides to escort us over its territory. The friendly and curious animal shadows us during every dive, posing for a

Angel shark

## El Hierro



Moray with cleaner shrimp

few snaps. Back on the boat, I wonder about the life expectancy of this magnificent grouper. How long before Pancho (that's his name) strays away from the reserve and gets fished? Esther reassures me: Pancho is very territorial and dive centres have informed local fishermen about their grouper friend who have promised to release him should

they catch him by accident. How will they tell him apart? His size aside, the grouper has one clearly shorter spine on its dorsal fin that sets him apart from the rest...

## More fish...

At La Herradura, I spot no less than five moray eels dotted around the rock formations, including the beau-



tiful fang tooth moray and golden tail morays.

But after several encores at Punta Restinga, just off the harbour, I've yet to exhaust the diversity of this site. It combines scenic and deep diving with a wide array of species. The beautiful pairs of scrawled file fish, a colourful variety of unicorn fish, are worth the dive alone. They can be a challenge to approach and photograph when swimming in pairs.



They seem more skittish swimming together than on their own. We follow a series of ledges and stop to look at a shoal of jacks hidden in a cave. The current picks up and we drop down to the temporary shelter of a spectacular arch at 45 m. While photographing the specimen of black corals, I stir up a large black stingray from the white sandy patch that lights up the water below the arch.

Trumpet fish (also known as cornet fish)

abound in the water around Hierro and I cannot recall any destination with such numbers. It is almost impossible not to see them on a dive. Their tube-shaped body is unmistakable and they're fascinating to watch. They sometimes join forces with a parrotfish or a non-carnivorous reef fish and follow them like their shadows. This is a handy way of getting prey by using the camouflage of their host. When grub is in sight, they harpoon it swiftly under cover of their host. On their own, their hunting behaviour is just as arresting. As they hover closer to their prey, they freeze, dip forward and hit their victim in a flash. They feed on tiny fishes, which only they seem capable of spotting. Many a diver has passed by them wondering if these weird looking fish had not smoked the weed. After a few days, you might think you've seen too many of them, but look again, you will eventually spot their strange feeding behaviour.

The major dive sites within the reserve are also marked with permanent moorings that are maintained by the local council and fishing patrols. We dived off a large RIB that our skipper Antonio has moored, only our skipper is also our dive master and so gets in the water with us. This is a feature of our diving week and we get used to the sight of RIBs floating seemingly unattended.

### More to find...

The following Sunday, the Atlantic reminds us of its unpredictability. While sheets of rain unfurled, the locals are sorting out their differences on the black sand of a football pitch. Spectators watch the game from the shelter of their car and honk every time a goal is scored...

As I peered over a map of Hierro, I realise that there's a lot more left to dive. We decide to venture along the coast as far the impressive Roque de la Bonanza. A natural arch carved by the wind and sea sits in a large bay. The dive matches the spectacular scenery around

Jacks in slow motion

## El Hierro



Diver has a chat with Pancho, the friendly grouper

us. Antonio tells me that the Northeast coastline offers spectacular diving and is virtually undived. Something tells me that I'll be back on Hierro...

### Diving

The harbour of La Restinga is located at the southern tip of the island and offers plenty of accommodation within walking distance of the pier. The island has an impressive network of quality roads and is easy to visit. It is also a hill walker's paradise with some of the most stunning vistas in the Canaries. You can easily spend a week walking across the island without meeting any tourist. Most of the walks are quite steep and you will come across sleepy villages and isolated haciendas... The population is less than ten thousand that lives mostly in the two main towns of Valverde (capital) and La Frontera. With its relative isolation, it is the home of a large, prehistoric lizard that had seemingly gone extinct and has reappeared a few decades ago. We spotted a ridiculous number of birds of prey similar like kestrel. One of the islander's favourite past time is hunting, and they use typical Canarian hunting dogs.

### Dive operators

With more than 10 dive operations, there is no shortage of dive centres and packages to suit all tastes. Another proof of the quality of diving here. We dived with El Tamboril [www.eltamboril.com](http://www.eltamboril.com) that overlooks the harbour of La Restinga. Run by a friendly Spanish couple, we had the RIB virtually to ourselves for 2 weeks and could go back to our preferred dive sites as we got more familiar with Hierro. Esther and Antonio went out of their way to please us and waited patiently for the photographer... Esther speaks fluent French and English, Antonio will help you brush on your Spanish. They offer full dive packages, with substantial discounts if you stay 10 days or more. They can also arrange accommodation locally if necessary. Our apartment was located 5 minutes from their dive centre.

*Jerome Hingrat is a freelance underwater photo journalist. His articles and images have been published in Sport Diver in the UK, Océans in France and FINS in Ireland. He is an avid traveller and is currently working on his first book of photographs. For more information, please visit: [www.jeromehingrat.com](http://www.jeromehingrat.com) or email [jeromehingrat@eircom.net](mailto:jeromehingrat@eircom.net)*

# fact file



## El Hierro, Spain



Canary Islands, Spain ▶



The island of El Hierro, Canary Islands, Spain



**History** In the 16th and 17th centuries, Spain was a powerful world empire. However, by the end of the 17th century, Spain's command of the seas finally yielded to England. In addition, Spain was slow to embrace the industrial and mercantile revolution, which put it well behind Britain, France and Germany in economic and political power. During the world wars, Spain remained neutral but suffered a devastating civil war in 1936-39. Following the death of dictator Francisco Franco in 1975, a peaceful transition to democracy came with rapid economic modernization. In 1986, Spain joined the EU. Nowadays, Spain is one of the most dynamic economies in Europe. It has become a global champion of freedom. However, the Basque Fatherland and Liberty (ETA) terrorism continues to plague Spanish politics as well as relatively high unemployment; Government: parliamentary monarchy; Capital: Madrid

**Geography** Spain lies in southwestern

### El Hierro International Underwater Photo Competition

The local council runs an open competition of high standard every year (usually around October) that attracts mostly Spanish divers from the mainland and a smattering of foreigners. It is run over 2 days with 4 dives on the top sites of the marine park, more information at [www.openfotosub.com](http://www.openfotosub.com)

Europe bordering the Bay of Biscay, the Mediterranean Sea, North Atlantic Ocean and Pyrenees Mountains of southwest of France. Spain is home to two autonomous cities—Ceuta and Melilla—and 17 autonomous communities including the Canary Islands and Balearic Islands. There are three small Spanish possessions off the coast of Morocco—Islas Chafarinas, Penon de Alhucemas and Penon de Velez de la Gomera. Coastline: 4,964 km; Terrain: Plateau—large, flat to dissected—surrounded by rugged hills and the Pyrenees in north; Lowest point: Atlantic Ocean 0 m; Highest point: Pico de Teide (Tenerife) on Canary Islands 3,718 m; Natural resources: coal, lignite, iron ore, copper, lead, zinc, uranium, tungsten, mercury, pyrites, magnesite, fluor spar, gypsum, sepiolite, kaolin, potash, hydropower, arable land; Environmental issues: raw sewage and effluents from the offshore production of oil and gas pollutes the Mediterranean Sea; water quantity and quality nationwide; air pollution; deforestation; desertification

**Economy** From 1986 to 1990, the Spanish economy boomed, averaging five percent annual growth. In the early 1990s, Spain experienced a European-wide recession, but resumed moderate growth starting in 1994. It has a mixed capitalist economy, which supports a per capita

GDP that is 80% that of the four leading West European economies. The euro was introduced on 1 January 1999. President Aznar's administration advocated liberalization, privatization and deregulation of the economy. Tax reforms were introduced to that end. Unemployment fell steadily but remains high at 10.1%. Growth from 2003-2005 has been satisfactory given the background of a sluggish European economy. Economic and social reforms initiated by socialist President Zapatero, are generally popular but opposed by religious and conservative groups. Spain's challenges: adjusting to monetary and economic policies of an integrated Europe, reducing unemployment and absorbing widespread social changes. Agriculture: grain, vegetables, olives, wine grapes, sugar beets, citrus; beef, pork, poultry, dairy products; fish; Industry: textiles, apparel and footwear, food and beverages, metals and metal manufactures, chemicals, shipbuilding, automobiles, machine tools, tourism, clay and refractory products, footwear, pharmaceuticals, medical equipment

**Climate** Temperate; Interior: clear, hot summers and cloudy, cold winters; Coast: more moderate, cloudy summers and partly cloudy, cool winters

**Population** 40,397,842 (July 2006 est.); Ethnic groups: Mediterranean and Nor-

dic types; Religion: Roman Catholic 94%, other religions 6%

**Currency** Euro (EUR) Exchange rates: 1 EUR = 1.28 USD, .68 GBP, 2.02 SGD, 1.68 AUD

**Language** Castilian Spanish (official language) 74%; Catalan 17%, Galician 7% and Basque 2% (regional languages)

**Diving** Dive conditions are good all year round in the Canaries as the water is warm and CLEAR. Water temperature is 20-22°C in winter, 24-26°C degrees in summer

**Travel information** Flight to Tenerife, ferry from Los Cristianos (harbour nearby Las Americas), 4-hour crossing. It is possible to fly over. Hierro, in spite of its size, has its own airport

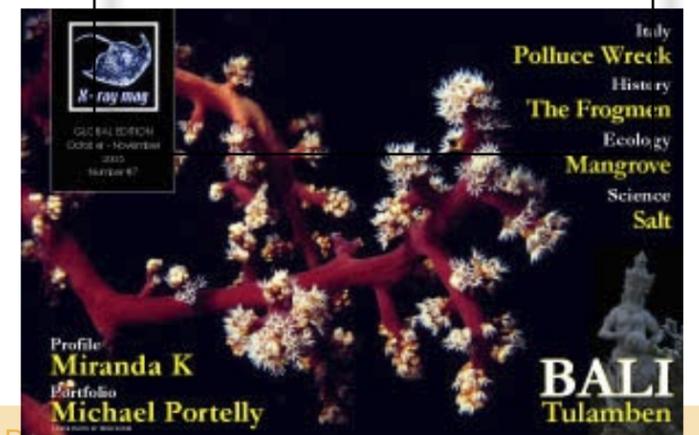
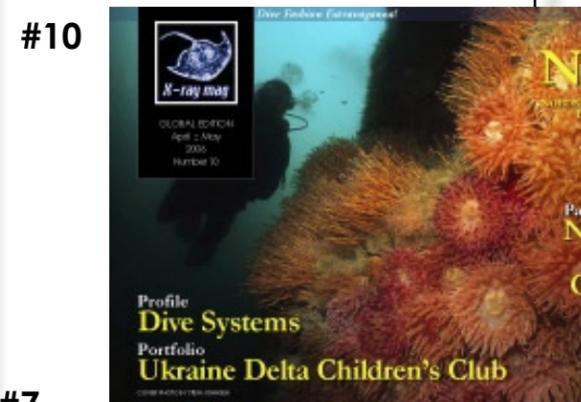
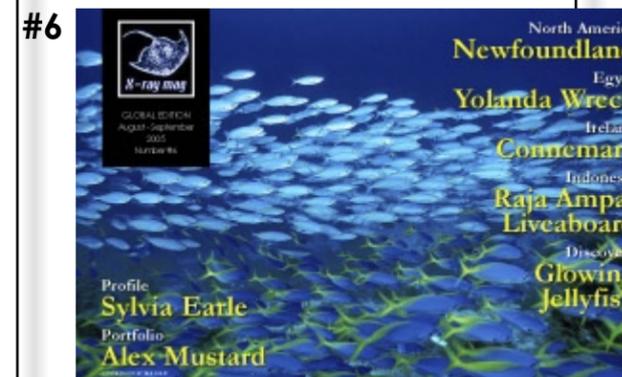
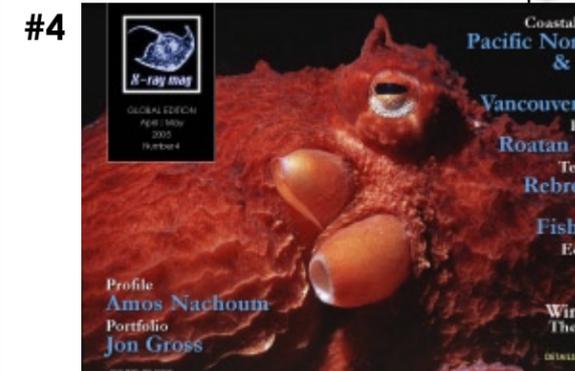
**Websites** El Hierro tourist office [www.el-hierro.org](http://www.el-hierro.org)

**Dive operators & resorts** Actividades Turísticas El Submarino El Matorral, 78. El Matorral

Base de Buceo El Submarino Avda. Marítima, 2. La Restinga 34.922557068. Fax: 34.922557068

Centro de Buceo El Hierro Avda. Marítima, 16. La Restinga 34.922557023. Fax: 34.922557023 ■

Back issues of X-Ray Mag  
**Do You Have Them All?**  
You can link from here



# Opinions Letters &

All perspectives expressed in this section are those of the individual author and do not necessarily reflect the views of X-RAY MAG, DiveGuru.Net, or their associates

Edited by  
Millis Keegan

**Vacation! This is the time for you to forget your worries, relax and enjoy yourself. Stay away from the news, that way there will be no reminder of all the bad things happening in the world. Well in these days, in these times, don't! As part of your risk assessment, make it a habit to check in on the news and the weather.**

**Q:** I have a ticket to Sharm-El Sheikh a week from now. Vacation is approved, the dive bag is packed, passport and money, all ready to go, but my mind is not. In the lights of recent events in Dahab (April 2006) I must admit I am scared. I go over the bombings in my mind, over and over again. I can't even begin to understand how the families of the victims feel, or the survivors. A week ago I was dead certain that I would not let some bleeping terrorists rule my life. If we let their terror rule our life and make us alter our plans, they win. Right? It's so easy to be brave on your couch in the safety of your home. Now that I'm actually holding a ticket to Egypt in my hand, all my certainty and bravery is floating away in a wave of cowardice. Part of me wants to cancel the trip; another part of me says to stay with my conviction. Should I go? *Jenny / Odense, Denmark*

**A:** This is one tough decision you have to make, and as much as I would like to help you out on this one, I am sorry to say, you have to make it alone.

I know what you are going through, from personal experience, and so does a friend of mine that faced the same decision, in April 2000, after the kidnapping and killings of tourists in Malaysia. He went ahead and made his trip, with the reasoning that lightning doesn't strike twice at the same location. He later found out that lightning does strike twice, but that's another story. Check <http://travel.state.gov/> for travel advice and travel warnings.

**DON'T LET TERRORISM DICTATE YOUR LIFE** I say don't let terrorism dictate your life! I am not going to let any stupid suicide bombers intimate me. I say we all make a commitment not to change our plans because of terrorist threats. *Mikael / Gdansk, Poland*

Big words in a small world, and quite a statement. Although I agree with you in theory, it is not that easy, as Jenny from Denmark quite accurately points out. This has to be a personal decision and should be made without pressure from anyone.

## Hurricanes in the Caribbean, Tidal Waves in the South Pacific area, Terrorist attacks in the Red Sea area. Is there even a safe place left for a dive?



**The recent bombings in popular dive destinations in Egypt are upsetting. Egypt is one of the most popular dive destinations in the world, and we have received a number of questions in the matter. Here to address your worries is MAGNUS NORELL, PhD and Director of the Center for the Study of Low-intensity Conflicts and Terrorism (CLIENT) and a Senior Analyst at the Swedish Defense Research Agency.**

**Q:** Is there anything I can do to protect myself and help my chances of not being a victim of a terrorist attack? *Johnny, Florida*

**Q:** Are there dive places or countries that are more dangerous and more prone to terrorist attacks? *The Dive Hippies*

**Q:** Is Egypt an especially bad choice for a dive trip? *Lotta, Stockholm, Sweden*

**Q:** Will it help to be more observant? I mean, will a suicide bomber show any tell-tale signs, like extra bulky clothes, or carrying unnaturally big bags (this must be a stupid question, in a back packer place like the Sinai everyone carries big bags). Or do they wear like a secret tattoo or badge, or scarf that proves they belong to some secret organization of suicide bombers? *Lena, Gothenburg, Sweden*

**A:** Yes, unfortunately some countries are more prone to terrorist attacks. And Egypt (Sinai especially) right now at this junction in time is such a country. There are active cells in the area that I don't think Egyptian authorities have a complete check on. And, as someone said, lightning can strike twice in the same place (and have, in the case of Egypt). But then again, it can happen in London or Madrid as well.

The name of the game is terror, and it can strike any time, anywhere. I am sorry to say, there are no telltale signs to speak off. I only wish... It has happened on a few occasions in Israel that guards became suspicious of people wearing clothes to warm for the weather, in order to cover up a bomb vest, but it is not at all common.

As for the kind of terrorism we witnessed in Egypt (namely Islamic terrorism), they do very often target 'non-combatants' for example tourists as they consider them to be 'a bad influence' (spreading western 'corruption' and so forth) in their home countries. The same kind of motivation lay for example behind the bombings on Bali. It deserves to be pointed out that these are views not shared by most Egyptians!

I don't think Egypt is 'an especially bad choice'; there are risks but at the same time the Egyptians are fully aware of the importance that the tourist trade have, and they are therefore prepared 'to go the x-tra mile' to protect people (it's not like the police and security forces are just sitting around waiting for the next attack). No 100% guarantees though!

**Q:** I am going to Tanzania this summer, to study for ten weeks. Should I be concerned? Is there any registered terrorist activity there, and if so, what can I do to keep out of "the line of fire" so to speak. *Marlene, Uppsala, Sweden*

**A:** A few years ago Tanzania was being targeted, back in 1998. At the moment I will assume Tanzania to be "safe". However, there are reasons to be cautious in general, but seeing that you are going to study, you should be safe.

Of course there are Islamists in Eastern Africa as well, but as far as I know, no national government has assessed Tanzania as especially dangerous.

--

**The Diveguru:** Thank you Magnus Norell. And on a finishing note, there are measures you should take; making a risk assessment is one of them, and something you as a diver already should do as part of your dive plan. When traveling, always leave your travel itinerary with a friend or with family. When traveling to countries that have a higher risk of terrorism than others, also contact your embassy before you go and ask if they want your name and travel information as well. It won't help you prevent an attack, but it helps the authorities in the aftermath of an event.

## What do you think?

Get heard! Send us your opinion to [diveguru@xray-mag.com](mailto:diveguru@xray-mag.com) by July 1 2006 and get a chance to win these exquisite *Silver Hammerhead Cufflinks* generously sponsored by **Reef Jewellery**. ( See more details next page)



*When traveling, always leave your travel itinerary with a friend or with family.*



PETER SYMES

# The Hurricane Season is near



Caption

Planning a dive trip to the Caribbean this year? Florida, Mexico, Belize? Hurricane Season is here, be ready. Check the weather report regularly during your stay and do not ignore hurricane warnings. You have to prepare for loss of drinking water, and food for a long time. For how long depends on where you are, since some countries have better infra-structure than others, but drinking water and Non-perishable food for a minimum of a week even in the best of countries is recommended. Make sure you have cash, can opener, matches or a lighter with you, as those items can be hard to find.. Keep

your cell phone dry and battery charged, as that might be your only way to communicate with your family for a while.

Locals have enough to worry about in the aftermath of a hurricane, taking care of ignorant tourists should not have to be part of that job. Listen to the authorities and follow their recommendations, before and after.

Evacuate any coastal areas. Hurricanes can flip cars and mobile homes up-side down, tear walls and roofs off a building, and bury a house in sand up to the ceiling. Do not make the mistake of thinking you can sit one out.

## This month's sponsored prize

Honour your Father whilst promoting Shark Conservation with a pair of Hammerhead Cufflinks by Reef Jewelry. With a percentage of sales going to the Shark Trust, a price to suit everyone's pocket and free postage and packing Worldwide,

Prices range from £70.00 / 102.35EUR / \$130.19 for a solid Silver Hammerhead Cufflinks,

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## Do we even care any more?

Rising ocean temperatures, urban and agriculture run-offs, evidence of Prozac, estrogen, the ever popular anti-bacterial soap and other chemicals have been detected in and the oceans and around our reefs. The environmental stress makes it harder and harder for the reefs to recover.

This year entire colonies have died all over the Caribbean area, leaving ghostly white skeletons of once colorful reef behind. It's an unprecedented die-off, never seen before.

Are we to blame? Do we even care any more? We want your opinion.

## About the DiveGurus

Millis Keegan, owner and founder of [www.diveguru.net](http://www.diveguru.net), the homepage that answers questions for divers, snorkelers, anyone with a love for our oceans is a new member of X-Ray magazine. With the help of reputable experts [www.diveguru.net](http://www.diveguru.net) will find the answer.

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## DISCOVER THE MAGIC OF DEMA SHOW!

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POINT & CLICK  
ON BOLD LINKS



Edited by  
Andrey Bizuykin  
& Peter Symes

# Gotta have it Equipment



## Tusa

Why be conventional? Who said that diving equipment can't be fashionable? Check out Tusa's new colour combinations

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



## Dive data logging

Sensus Ultra is ReefNet's third-generation dive data logging device – and still a simple and convenient tool for collecting detailed dive log data. Inside its diminutive size (1" x 1.3" x 1.75") are a sophisticated sensor, flash memory and processor capable of storing 1500 hours of dive data with a 10 second sampling interval.

[Reefnet.ca](http://Reefnet.ca)



## Halcyon

The new Evolve dual cylinder wing owes its design to Halcyon's successful Eclipse circular bladder single-tank wing, allowing for precise control of in-water buoyancy and trim. Horizontal trim is easily accomplished through the addition of lift at the base of the cylinders. Gas trapping on one side or the other of the wing is virtually eliminated.

The Evolve wing integrates seamlessly with Halcyon's existing line of MC systems, and is available in 40 lbs. (18 kg), and 60 lbs. (27 kg) lift capacities, either individually, or as part of their complete MC System.

[www.halcyon.net](http://www.halcyon.net)



## Oceanic VT3

The VT3 is Oceanic's next generation dive computer combines design and technology with ease of use and customization, allowing the user to focus on what's important, diving. With Oceanic's wireless transmitter, the diver can also monitor gas pressure from up to three independent cylinders – ideal for both technical diving applications and recreational diving with our new Buddy Pressure Check feature. The Oceanic VT3 can be switched during the dive between up to three different Nitrox mixes containing 21-100% oxygen.

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

## DUI

So drysuits are meant to go with cool water. Well, think again. The 30/30 Tropical drysuit from DUI is meant to go with colourful fish. Available from June 2006 this model comes with a shoulder-entry zipper and slim fit designed to be worn with light insulation. Comes with suspenders, latex ankle seals with protective cuffs and valves from Apeks

[www.dui-online.com](http://www.dui-online.com)



## Blackwave

Blackwave Dive Assistant is the complete Pocket PC and PC tool for logging, planning and managing your dives, as well as keeping track of your dive kit, qualifications and other diving information. Download and try a copy from:

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





## Noisemaker

How do you get your buddy's attention, or help from others? The solution Give ReefNet's new "H2YO" a shake to emit a loud and distinctive rattle that can be heard at great distances underwater. To make sure you sound unique, H2YO is offered with two sounds:

- \* **Rattle** - several balls inside
- \* **Clank** - one large ball inside

[reefnet.ca](http://reefnet.ca)



## Ralftech

The Travelight from Ralftech must be the lightest buoyancy compensator on the world market today. Depending on size it only weighs in at 1,9 to 2,4 kg depending on sizes. It is also simple as there are no rigid parts, so it can quite easily be rolled up into a small pouch for travelling.

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



DEALERS WANTED

## Nocturnal Lights

The new SLX LED dive light from Nocturnal Light combines a 5500k beam with a 4 hour duration on a set of 6 AA batteries, making it well suited for photographers and technical divers. Simply add a light diffuser and the ball joint adapter to the handle and you'll have an auto focus assist light. Because the bulbs used do not generate too much heat, it can also be used as a flashlight above water, making it a great all-around dive light for all kinds of divers. The batteries which will easily last several regular dives can be easily replaced between dives.

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



## Redtech

Slovenia based RedTech have put on the market a series of high end buoyancy compensators, suitable for technical and more demanding recreational diving. The innovative Quick Slide System (patent pending) – provides a safe and easy way of adjusting and securing straps, which enables easy and quick donning. One of the original unique aspects of the RedTech system is the complete modularity of the system enabling the diver to build a personalized configuration that will meet his or her exact needs and ideas

[www.redtech.hr](http://www.redtech.hr)



## Scuba Hides

Scuba Hides can transform a tank into a billboard only your potential customers, and other divers will see. With layout and color choices as limitless as your imagination, your message will be heard loud and clear. As Scuba Hides will be used and seen by divers, they offer a unique target marketing opportunity to anyone in the diving industry

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

## 2x Mares

Mares Demon mask known for its wide field of vision and soft skirt which makes it very comfortable to wear for long durations will now be available in new colours clear/blue and clear/yellow. Three additional colours will be available in early September. Avanti Excel full foot fin is an offspring of the acclaimed Avanti Quattro Excel open heel and will be available in June in colours Blue and Yellow.

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





## Cis-Lunar Returns

When Cis-Lunar launched the legendary MK V rebreather back in 1998 it was state-of-the-art, fully automatic and built for ultra long dives with the safety and ruggedness necessary for advanced cave exploration was available. A little over 100 units were built and most are still in use. The dot.com crash in the early 2000 stopped the Cis-Lunar from financing serial production and that seemed to be the end of it. But now Cis-Lunar is teaming up with a Swedish industrial group, DP Scandinavia, based in Marstrand, to commercialize underwater technology developed by it's inventor Dr Bill Stone and his team.



## Aunoc

Believe it or not, this little cool baby with the intense output is - with its 3 inches in length - only the size of a lipstick. Yet, thanks to its sturdy construction in hard anodised aluminum alloy 6061, it is rated to

a depth of 60 meter. Small enough to even be carried in a pouch on a bcd strap this is a handy emergency backup light request. Powered by a Lithium battery and sealed by a single o-ring. Lamp is switched on and off by simply twisting the lamphead.

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



## Why be dull?

Mouthpieces in Lego-colours from Apex can either liven up your diving day, or help you locate your kit on the drying rack on the liveboard. [www.apeks.co.uk](http://www.apeks.co.uk)



## Polespear

Free diving legend Manny Puig stands behind the introduction of perhaps the finest polespear on the market. The modular three piece pole-spear is constructed from thickwalled 6061T6 anodized aluminum. The use of pole-spears for under water hunting differ from that of spearguns because our arms can only hold so much band pressure and our muscles tire quickly. Where a polespear can make up for its shortcomings is by providing a

blow with more mass and momentum at close quarters than a traditional spear flung from a speargun. A streamlined and stiff design is crucial in the rendition of a more striking and accurate blow at prey in close range where the higher mass, or "backbone" as we call it, delivers a striking blow at even large fish. In developing the Manny Puig Polespear all these principles were kept in mind with the aim of keeping it versatile enough for small and medium fish and with the necessary characteristics to take down big fish. [www.omersub.com](http://www.omersub.com)

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

button is depressed to activate the unit, it is held depressed until the Diagnostic Mode screen completes its countdown and the Serial Number screen appears displaying the module's SN and software firmware revision (r2A). The unit will shut Off when released.

Authorized Oceanic dealers sold Versa Pro 2A modules, that were manufactured between March 21, 2003, and February 7, 2005, in wrist and console mount configuration during March 2003 through April 2006 for between \$429 to \$639, depending on the configuration with other instruments.

Consumers should immediately discontinue further use of Versa Pro 2A Dive Computers for User Selected Digital Gauge Mode operation (as a Depth Gauge/Timer) and take it to any Authorized Oceanic Dealer, or return it directly to the factory for an Upgrade to Versa Pro revision 2B. Should you have any questions, please contact our toll free Recall Helpline at (888) 854-4960 or locally at (510) 562-0500 between 8 am and 5 pm Monday through Friday Pacific Time.

Oceanic Versa Pro revision 2A Digital Dive Computers. While operating in the User Selected Digital Gauge Mode, displayed Elapsed Dive Time can be in excess of actual elapsed time.

Oceanic has received a report of two Versa Pro revision 2A units that experienced the offset time displayed while operating in User Selected Digital Gauge Mode. No injuries have been reported.

Oceanic Versa Pro 2A Dive Computers subject to the recall are only the revision 2A units which have serial numbers 12000 through 18176 which is located on the side of the module and can be viewed if after the front

## Oceanic Worldwide Announces Voluntary Recall of Versa Pro revision 2A Dive Computers

In cooperation with the U.S. Consumer Product Safety Commission (CPSC), Oceanic Worldwide of San Leandro, California, is voluntarily recalling

## IAHD Scandinavia

Pirate Fish  
Open Water Diver  
Advanced Open Water Diver  
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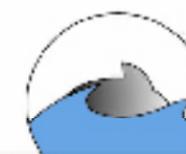
Pro-trainer  
Staff Instructor  
OWD Instructor  
Nitrox 36% Instructor  
Assistant Instructor  
Divemaster  
Dive Leader

[www.iahd.org](http://www.iahd.org) [www.iahd.dk](http://www.iahd.dk)



for further info email [flemming@iahd.org](mailto:flemming@iahd.org)

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[WWW.THYGEDIVE.DK](http://WWW.THYGEDIVE.DK)



## Poseidon underwear

Poseidon will deliver a base layer underwear with all standard Jetsuit TNG Technica and Unisuit Exclusives at no extra cost. This means that we will give the divers the start kit to a total system for isolation under water. The layer closest to the body is the base layer which helps to wick moisture away



from the body so that you stay dry and warm. The outer layer is the protection against the outside environment and the cold. In this case it is the suit. This part of the system is what you get when you buy a Poseidon suit. The base layer with the suit is the minimum you should wear at all dives. In addition to this you can add the heat layer that consists of three parts (sold as a kit). A pair of trousers, a zipped sweater and a zipped west. This gives the diver total flexibility to adapt to the situation and his own preferences.

[www.poseidon.se](http://www.poseidon.se)

## Six Gill

The Six Gill fin is Deepoutdoor's bid for the next step in the evolution of dive fins. The gills expands during kicks to create a pump action and on the downstroke they create a vortex that channels water off the blade. The scoop on the front expands during upstroke and contracts during downstroke reducing resistance. The short blade is also reef-friendly

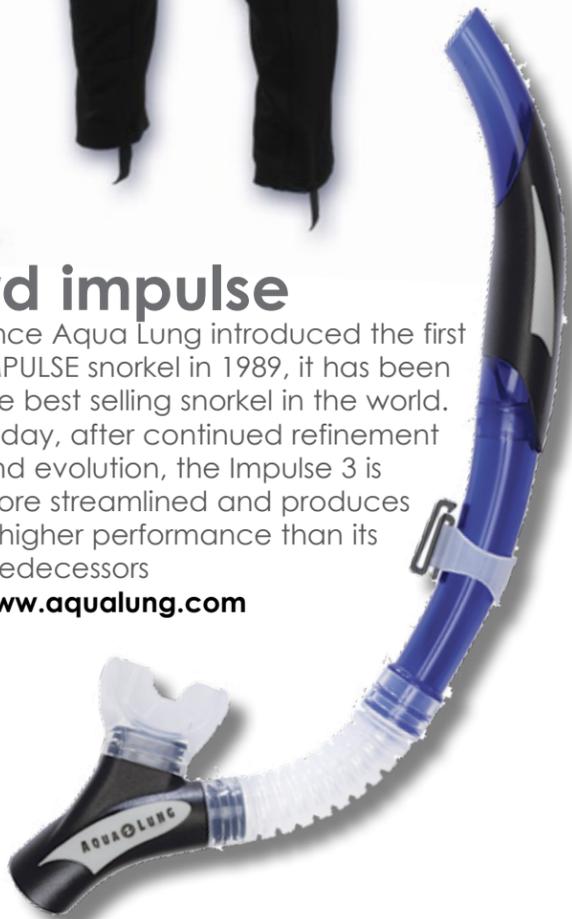
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## 3rd impulse

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



pressrelease

## Poseidon to be acquired by DP Scandinavia.

A Letter of Intent has been signed with regard to the acquisition of Poseidon Industri AB by DP Scandinavia AB. The takeover date is planned for June 30th 2006.

### Poseidon Industri AB

Poseidon was founded 1958 to manufacture diving equipment for the rapidly growing diving industry. The company has ever since been a technology leader in the world diving industry with the first single-hose regulator, the wet suit and the dry suit.

Manufacturing and operation is located outside Gothenburg, Sweden. For further information, contact;

Stefan Jennefalk  
Stefan@poseidon.se  
+ 46 (0)31 734 2900

### DP Scandinavia AB

DP Scandinavia is located in Marstrand on the west coast of Sweden. The company has recently acquired all rights to Cis-Lunar Closed Circuit Rebreather and related technology.

For further information, contact;  
Kurt Sjoblom  
Kurt.sjoblom@cislunar.se  
+46 (0)303 248540



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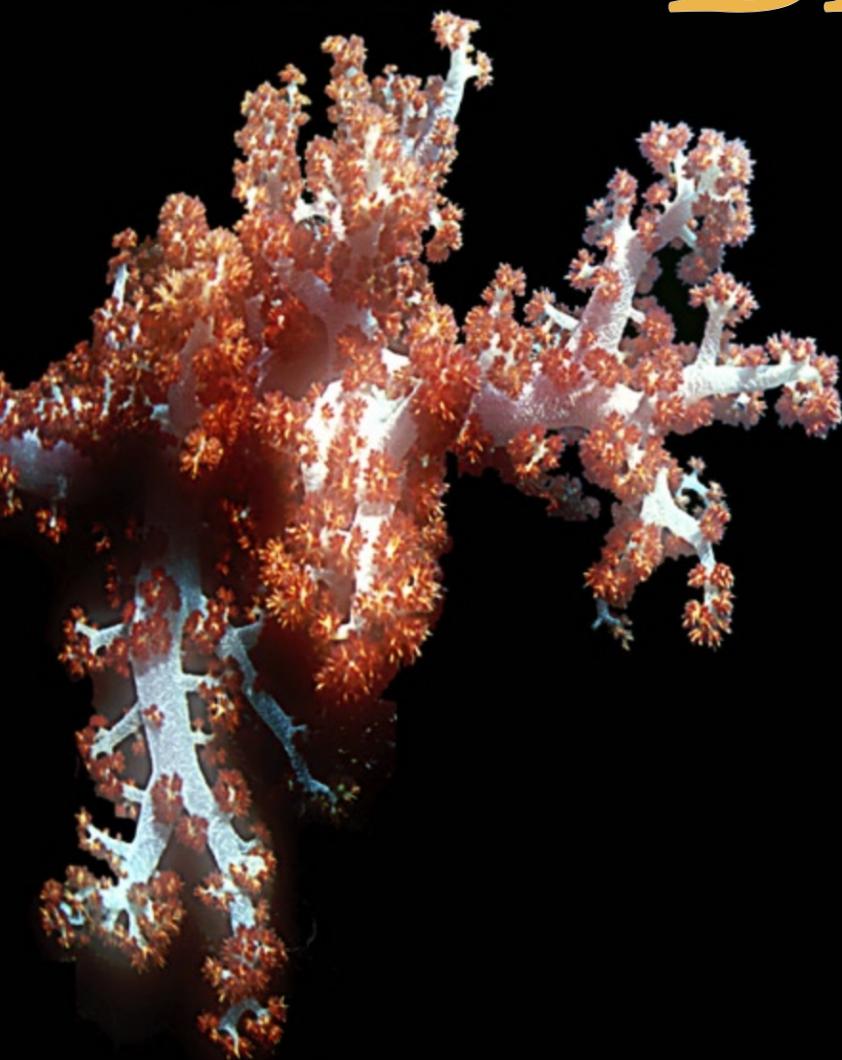




Edited by  
Michael Arvedlund, PhD

# Coral Bleaching

*Can tropical stony corals adapt to bleaching?*



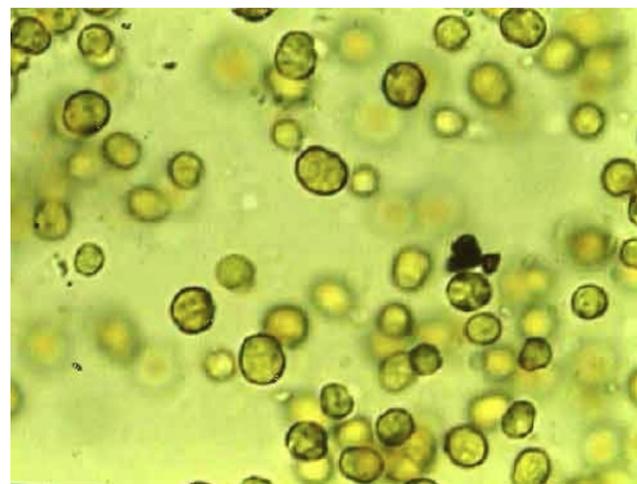
Text by Tyge Dahl Hermansen,  
Michael Arvedlund & Peter Symes  
Photos by Peter Symes

**You may have heard or read about it – coral bleaching is happening with an increasing frequency in tropical areas. Worst was the global bleaching event in 1998. And coral reef researchers are now fearfully awaiting the next bleaching event. Will it be just as devastating as the 1998 one?**

But what is coral bleaching actually? No, it is not mum that has stinted bleach over the lovely colourful tropical corals....although it looks like it. The explanation is quite different. Normally, tropical shallow-water stony corals only exist to dept's where sunlight is able to reach. This is because they contain in their tissue a specialized kind of brown algae called zooxanthellae. These algae are crucial for the survival of the coral.

The coral is supplied with nutrients from these zooxanthellae. They produce energy and nutrients through

photosynthesis. However, this relationship can only exist at temperatures above 18°C. and below 31°C. When very hot summers occurs, and they do with a fast increasing frequency, the zooxanthellae instead produces something called "super oxygen", that is oxygen with extra energetic levels donated by electrons. This is poisonous for the coral. Therefore the coral rejects the cell with the zooxanthellae. Thereby the coral loses the green and brown colour nuances from the zooxanthellae, and looks "bleached".



Microscope photo of zooxanthellae algae,  
Courtesy of NOAA



Corals are animals with unicellular yellow-brown algae called zooxanthellae living symbiotically within their tissue. It is the nutrients supplied by the zooxanthellae in the form of photosynthetic products that make it possible for the corals to grow and reproduce quickly enough to create reefs. In turn, the coral provides protection and access to light for the zooxanthellae. These coral polyps of the Goniopora family are individual animals in a colony who filter the water for food particles

## **Coral bleaching can have many causes**

Coral bleaching is a phenomenon that can be caused by a lot of different factors that stresses the coral. It can be caused by different kinds of pollutants or by an elevation of the average temperature in the specific habitats or microhabitats. But in all cases it is caused by changes in the surrounding milieu that stresses biological ecosystems as the subtropical and tropical coral reefs.

### **Temperature**

Especially phenomena that include temperature elevations as the greenhouse effect and El Nino have been discussed in details through the last years. Such phenomena have involved a general decrease in the coral reefs of subtropical and tropical regions. Calculations have shown that if such conditions are maintained, all coral reefs will become extinct in the year 2050.

## **Can corals adapt?**

Some researchers, such as the two world famous scientists, Daphne Gail Fautin and Robert W. Buddemeier introduced in the nineties a hypothesis called "adaptive coral bleaching." This hypothesis builds on the assumption that an adaptation by the coral to the new conditions (the elevation of the temperature) has taken place through symbiotic adaptation with zooxanthellae that are able to resist the increase in temperature, by which the host coral avoid to be poisoned by super oxygen.

### **Adaptive bleaching**

The adaptive bleaching hypothesis (ABH) is based on lots of observations in the field. Professor Daphne Gail Fautin and Professor Robert W. Buddemeier have worked out a generalized conclusion on their qualitative description of the ABH, in light of the existing field observations and data. The conclusion of this qualitative description of adaptive bleaching is that the coral-zooxanthellae symbiosis is able to make a dynamic response to the environment.

Zooxanthellae of various corals have been found to belong to at least 10 different algal taxa. Curiously, zooxanthellae found in closely related coral species are not necessarily closely related themselves, and zooxanthellae found in distantly related coral species may, in fact, be closely related

*“It turns out that there is information that corals and their symbionts may be capable of acclimatization and selective adaptation to elevated temperatures that have already resulted in bleaching resistant coral populations.”*

# Coral Bleaching

*“Clearly, there are limits to acclimatory processes that can counter coral bleaching”*

## Evidence of adaptations

In a recent science review, the coral reef researchers Stephen L. Coles and Barbara Brown have summarized the existing evidence for adaptive coral bleaching. “It turns out that there is information that corals and their symbionts may be capable of acclimatization and selective adaptation to elevated temperatures that have already resulted in bleaching resistant coral populations, both locally and regionally, in various areas of the world.”

## Mechanisms

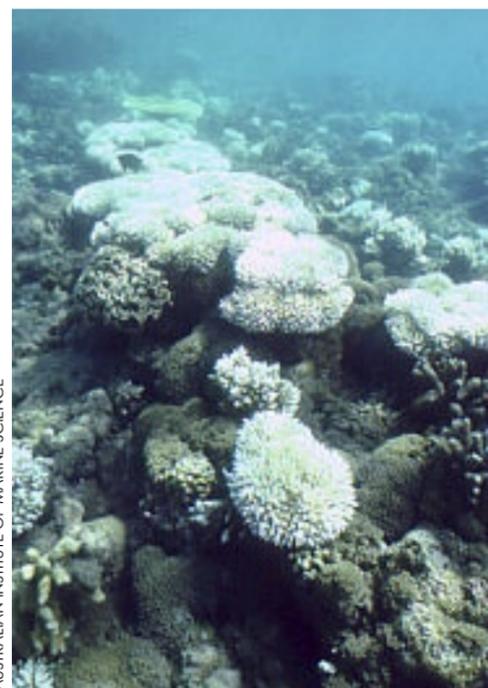
There are possible mechanisms that might provide resistance and protection to increased temperature and light. These include inducible heat shock proteins that act in refolding denatured cellular and structural proteins, production of oxidative enzymes that inactivate harmful oxygen radicals, fluorescent coral pigments that both reflect and dissipate light energy, and phenotypic adaptations of zooxanthellae

and adaptive shifts in their populations at higher temperatures. Such mechanisms, when considered in conjunction with experimental and observational evidence for coral recovery in areas that have undergone coral bleaching, suggest an as yet undefined capacity in corals and zooxanthellae to adapt to

conditions that have induced coral bleaching.

## Limits

Stephen L. Coles and Barbara Brown continues: “Clearly, there are limits to acclimatory processes that can counter coral bleaching resulting from elevated sea temperatures, but scientific models will not accurately predict the fate of reef corals until we have a better understanding of coral-algal acclimatization/adaptation potential. Research is particularly needed with respect to the molecular and physiological mechanisms that promote thermal tolerance in corals and zooxanthellae and identification of genetic characteristics responsible for the variety of responses that occur in a coral bleaching event. Only then will we have some idea of the nature of likely responses, the timescales involved and the role of ‘experi-



AUSTRALIAN INSTITUTE OF MARINE SCIENCE

When corals bleach they commonly lose 60-90% of their zooxanthellae and each zooxanthella may lose 50-80% of its photosynthetic pigments

PETER SYMES



ence' in modifying bleaching impact."

## The Future

If global temperatures rise as predicted by the current climate models, water temperatures in 100 years will be much greater than those that cause bleaching now. Consequently corals would need to acclimatise continually to survive. However, most research indicates that acclimatisation is limited and unlikely to allow corals to adapt in due time, to the predicted rise in water temperatures.

## Natural selection

A second process by which coral populations could adapt to new conditions is by natural selection. This results in a gradual change in the temperature-tolerance of the population through the elimination of the corals that cannot

tolerate higher temperatures. As described elsewhere in this issue (see page 6, "Corals may survive global warming by gorging themselves") some species will be better at adapting to changes than others. Also, different colonies of the same coral species may respond to thermal stress differently. If only the most temperature-tolerant corals survive a bleaching episode, the offspring from those corals might be on average more temperature-tolerant than the previous generation.

Again, there will be limited how high the temperature can rise before corals reach the limits of survival, and thereby their possibilities of adaptation. This would invariably also lead to extinction of species. Such adaptations are thought to occur slowly, over several generations (with most corals having generation times of at least 5-10 years), but potential rates of adaptation



Bleached corals off Hawaii. *Porites* spp

have never been estimated.

## Replacing the algae

Corals can host several types of zooxanthellae in their tissues. Another possible adaptation to warmer conditions could be changing the dominant type of zooxanthellae within their tissues. Corals with a certain type of zooxanthellae can tolerate up to 1.5°C higher temperatures than corals of the same species without that type.

It is not known how many of

the almost 800 species of reef building corals can change the type of dominant zooxanthellae or, indeed, what stimulates the change.

However, results from the laboratory shows that some corals can adapt to the heat resistant types of zooxanthellae under artificial circumstances. Increased temperature tolerance may also come at a cost. For example it has been observed that juvenile corals with heat-tolerant zooxanthellae grow up to three times slower than those with a different zooxanthellae type. The type of zooxanthellae that occurs in the corals may also affect other aspects of coral health.

It is possible that a combination of natural selection and switching of zooxanthellae may help corals cope with climate changes. Faster rates of change are possible for zooxanthellae than for the coral because the algae have much shorter generation times

## Moving

A third process is one in which larvae from warm-adapted coral populations may disperse

# Coral Bleaching

to cooler areas as they warm, thereby changing the distribution of species creating new reefs further from the equator. However, this is also likely to be a very slow process and as there are other ecosystems already in place elsewhere the whole picture becomes quite complex and unpredictable. But because the cooler areas warm, these warm adapted species gain an extra advantage in advance. But only the future will show if such settlements will succeed.

## Recovery

There has been short-term recovery of coral reefs after bleaching events. When a reef is only slightly stressed, a few scattered corals will die, and the effect will be barely noticeable. When a reef has been exposed to prolonged heating, most corals will die, and it can take many years for the area to recover, in particular if large, old corals have been killed.

The long-term recovery of reefs from bleaching will depend on the frequency of bleaching events. If bleaching becomes more frequent reefs may change greatly in character. Unless there is a greater capacity for adaptation in corals than scientists currently believe to be likely, today's diverse community of corals may be replaced by a smaller number of tolerant species. Or worse still, replaced by completely different and less diverse ecosystems such as dense algae cover. Some vulnerable coral species may come to be found only in cooler areas. ■

**Sarawak - Malaysian Borneo**

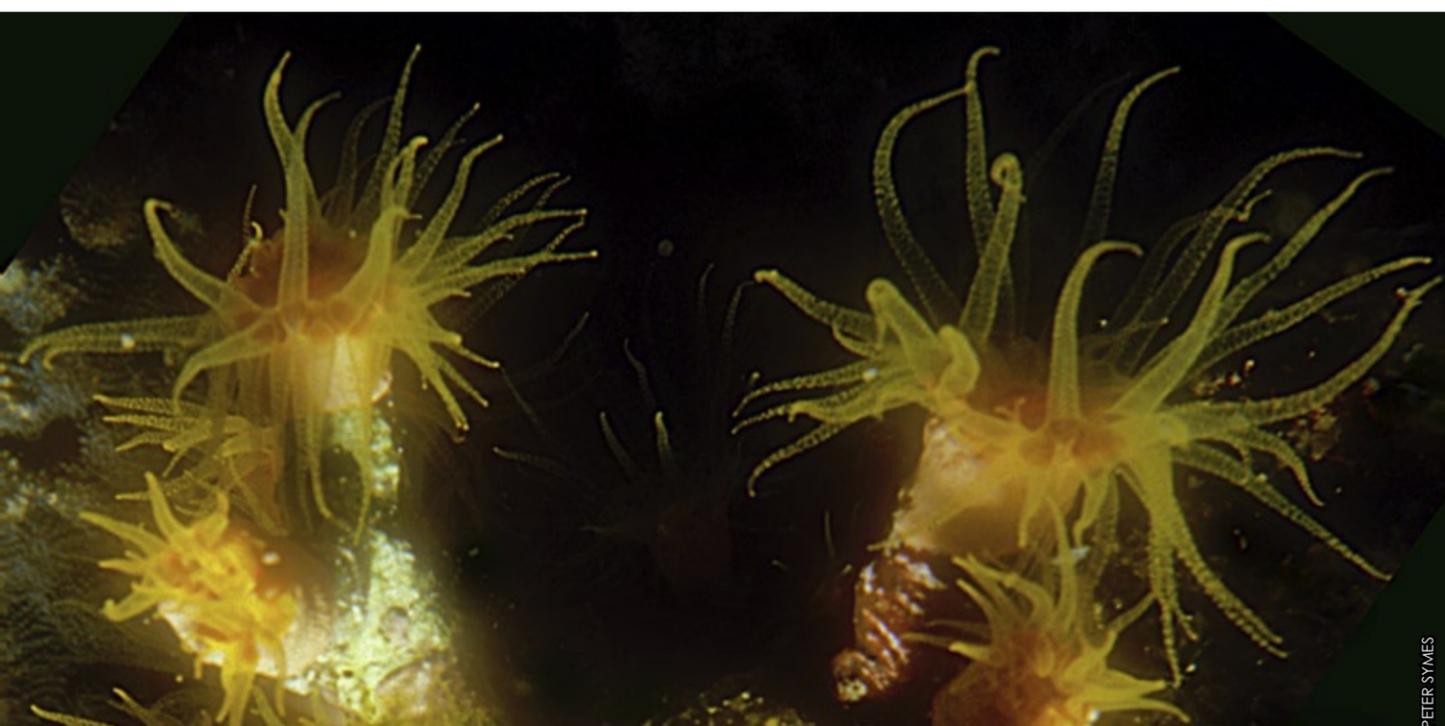
**Miri Reef Map**

- Dive Site
- Oil Rigs
- Grouper Patch
- Tusan Reef
- Sri Gadong Reef

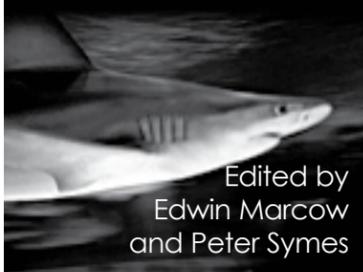
Sarawak's ecological heritage is among the most distinctive in the world. Being part of the Indo-Australian Archipelago, the evolution of marine biodiversity, the region comprises nearly 1,000,000 square kilometers of coral reefs or 34 percent of the world's total, housing 600-800 reef-building coral species in the world. It is home to more than 3,000 species of fishes and the highest concentration of invertebrate species.

**Underwater Jungle**  
www.sarawaktourism.com

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Coral polyps  
*Tubastraea* spp



Edited by  
Edwin Marcow  
and Peter Symes

## Bits & Bites

### Student Study in the Bahamas

An exciting new study hosted by the CCU's Costal Carolina University study-abroad scheme will allow its students at a cost of US \$2000 dollars per head. To participate in a series of lectures, discussions, analysis of research papers and best of all personal encounters with many different species of shark.



## Java Sharks Now in the Med

The Java Shark (*Carcharhinus amboinensis*), a threatened species, has a greyish colour with a white belly. It has a thick-set head, a short, broad and blunt snout, small pig-like eyes and large, triangular, saw-edged upper teeth. It is considered potentially dangerous to humans although there have been no recorded attacks to date.

### CSI – Shark?

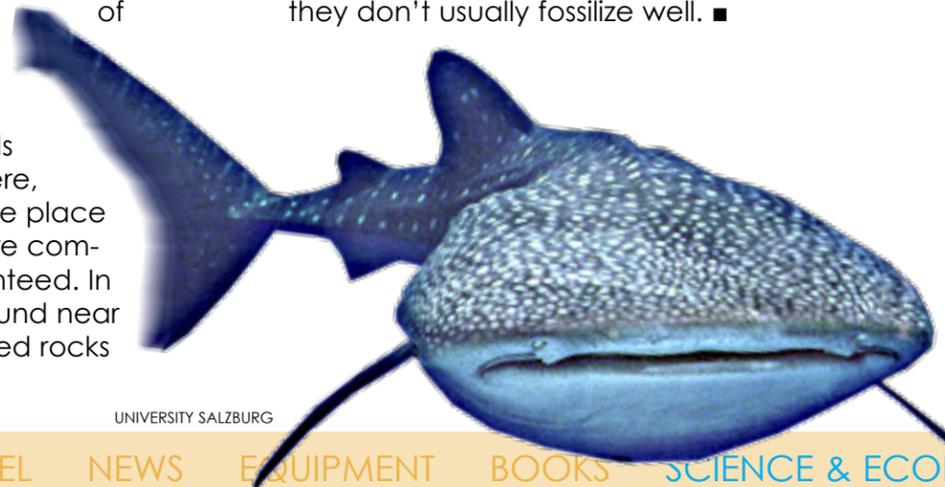
Experts and conservation enforcement officers have a new weapon in their fight against the illegal marketers: A database. The database will contain DNA profiles of nine protected species of sharks his will enable fisheries officers to prosecute poachers in the courts. "Having DNA fingerprints for these species gives us a legally defensible method of checking evidence in cases of illegal fishing," said fisheries biologist Rory McCauley of the Australian Department of Fisheries. Interest in this database may well come from government agencies in the US, South Africa, and Asia. "Illegal fishing is a global issue", added Dr Ho – explaining that this system could be adapted to any species. ■



## 400 million years old

An American scientist is hoping to use medical technology to better understand the inner workings of a 400-million-year old shark which is the oldest known intact shark fossil in the world. The shark has been encased in rock for 400 million years and is almost flat but John Maisey, a paleontologist with the American Museum of Natural History in New York, plans to use CT scan to allow him to construct a three-dimensional picture of the ancient shark and use computers to calculate its original shape.

"Obviously we can't chop it up or section it mechanically, but CT scanning allows us to look inside the fossil to see its anatomy in greater detail." Says Maisey. The Campbellton specimen is the size of a small, modern shark and. It is a rare find, because it includes skin, cartilage and bone. Because sharks are mostly cartilage, they don't usually fossilize well. ■



The sighting of a huge and rare species of shark off Italy's Calabria coast is both good and bad news for the environment. The fact that a Java Shark has been spotted swimming near the town of Crotona is a sign that the Mediterranean in is relatively clean and healthy. On the other side it may be another ominous sign of global warming that this shark which usually inhabits tropical waters off Madagascar, Sri Lanka, Indonesia, Papua New Guinea and Australia are now being sighted in the Mediterranean. The Java, which is also known as the pigeye shark, can grow up to a length of three metres. It feeds on a variety of fish, rays and smaller sharks, squid, shrimps, cuttlefish, octopi, lobsters and marine gastropod and such a large predator would not be wandering around the Mediterranean if there were not plenty of prey for it to feed on.

**"Tropicalization" of the Med** Italy's Central Institute for Scientific and Technological Research (ICRAM) said that it first observed this 'tropicalization' of the Mediterranean in 1995 and that the process is accelerating. "In recent years an increasing number

of tropical species have been coming into the Mediterranean from the Atlantic Ocean and the Red Sea," says Dr. Alessandro De Maddalena, the president of the Italian Ichthyological Society. "It is normal for the odd Whale Shark and Tiger Shark to come here occasionally, but this trend is a little strange. "We're pretty sure they don't breed here, so they are coming into the Mediterranean because it's warmer. "In the long term this could be a problem for the Mediterranean species that are used to temperate waters".

Around 50 different species of shark have been identified in the Mediterranean up to now.

It is hard to predict which Mediterranean marine species are most exposed to the impact of global warming on their habitat.

Dr De Maddalena stresses though that the survival of the sea's 16 endangered species of shark and many other types of marine life is threatened by a much more immediate threat - the fishing industry. "Over-fishing is a problem because it takes away the sharks' prey and because the sharks themselves are often caught in the nets too. ■

### Whale sharks on the rebound?

Constant sighting of whale sharks in both the Phillipines and Thailand may indicate improving.

Sightings of whale sharks along the seas in Barangay Buhisan in the Phillipines is an indicator of an improving environmental condition in the 60,000-hectare Davao Gulf, an council official said.

"This is the result of the consciousness of the people in the barangay as they become vigilant in guarding their waters of illegal activities including illegal garbage disposal." Whales could also be seen almost every week.

Meanwhile there has also been regular sightings of a group of five whale sharks about 8 metres long were just seen again at the famous diving point of Richelieu Rocks near Surin Islands in Thailand. The whale sharks are looking for plankton near the islands as there are rich sources here, and as this is also a favourite place for divers whale sightings are common but not always guaranteed. In Thailand they are mostly found near the Richelieu, Purple and Red rocks in the Andaman Sea. ■

UNIVERSITY SALZBURG



## Great White Sharks Trek to Holiday Town!

Holiday makers looking to relax, swim and surf in the warm waters of Plettenberg Bay a holiday town this author knows well from growing up in South Africa are not alone in their pursuit. They are being joined by increasingly large numbers of Great White Sharks most likely enjoying the last of the sardine run in that area. The sharks have been sighted swimming close to shore and circling the beaches. National Sea Rescue Institute local station commander Ray Farnham said. "The sharks, ranging in length from 3.5 to 7m, are visibly patrolling along our stretch of coast". Marine biologists were quoted that the sharks will likely remain in the area until about the middle of this month. ■

EDWIN MARCOW



EDWIN MARCOW

## Counting Sharks at Myrtle Beach, South Carolina

For most people drawn to the warm waters to swim and surf – seeing sharks are about the very last thing they would want to see. Unless you are one of the researchers from Coastal Carolina University – who make their annual trek to the coastal waters of Georgetown County. "If shark or stingrays populations are declining, it could indicate problems for other

species", said Dan Abel, associate professor of marine science at Coastal Carolina University. The professors and students go into the waterways several times a week through from May to November. Through a catch and release program sharks and stingrays population fluctuations can be monitored.

"If the local shark population is not carefully managed, an unpre-

dictable ripple can go through an entire ecosystem", Abel said.

"If sharks aren't around to feed on large fish, those fish in turn eat more smaller fish, which in South Carolina can lead to large populations of sea trout or red drum and a corresponding drop in smaller fish – important to the ocean environment". ■

## New Zealand considers protecting great white sharks

The New Zealand government is reportedly considering joining other nations, including Australia and the United States, in protecting the great white shark.

New Zealand Conservation Minister Chris Carter said. "They are an object of fear and fascination, but sadly there is growing evidence that this magnificent and rare species is in trouble internationally."

Carter said the great whites are often caught by mistake, their fins are sought in Asia, and trophy hunters will pay thousands for a great white.

Among actions being considered by the government, are fines of as much as \$250,000 for deliberately killing a great white. ■

## Professor discovers mysterious gathering of lemon sharks

Why was about 100 adult lemon sharks hovering over the ocean floor in about 90 feet of water off the Jupiter inlet in Florida?

Professor Samuel Gruber, who's an authority on sharks, has been trying to find the answer to this phenomenon which hasn't been observed elsewhere in the world

Gruber's initial theory is that female sharks are emitting chemical signals called pheromones that attract male sharks. He plans on collecting water samples around some of the female sharks and testing the water chemistry or

possibly extracting urine samples from the females.

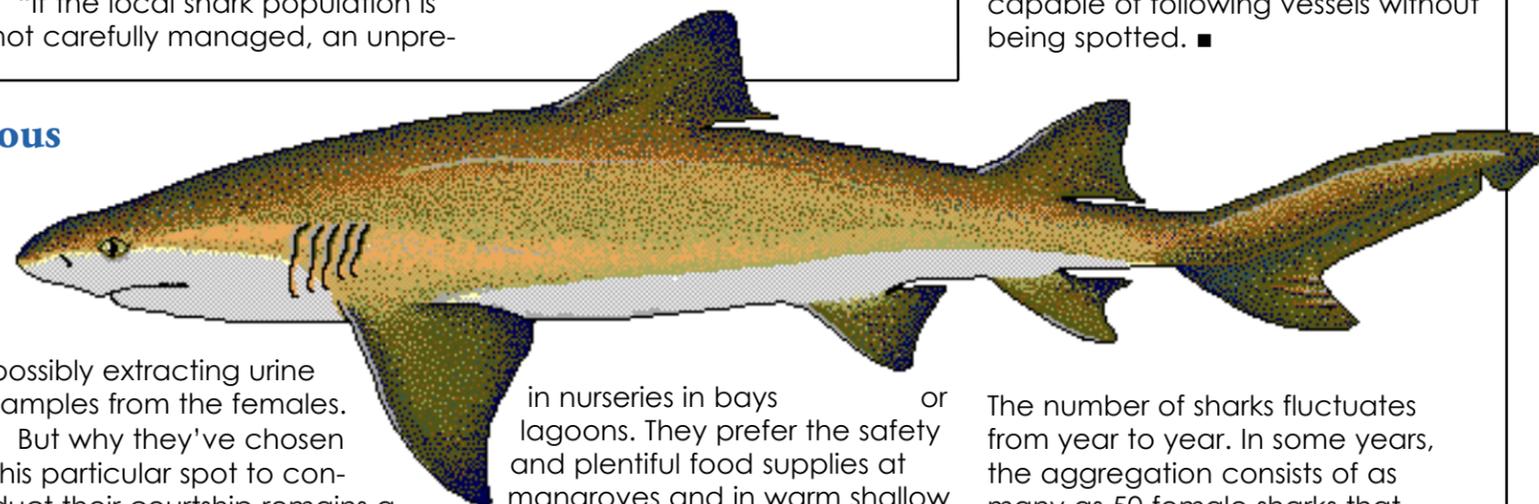
But why they've chosen this particular spot to conduct their courtship remains a mystery. Does it have something to do with a combination of the currents, water temperature, and its salinity?

While little is known about the adult lemon sharks, juvenile lemon sharks congregate

in nurseries in bays or lagoons. They prefer the safety and plentiful food supplies at mangroves and in warm shallow waters. Because so many gather in such a small place, the sharks are particularly vulnerable. The aggregation of lemon sharks near the inlet could prove attractive to commercial and recreational fishermen as well as divers.

The number of sharks fluctuates from year to year. In some years, the aggregation consists of as many as 50 female sharks that produce 600 to 700 babies per reproductive cycle. If the site gets heavily fished, it could decimate the lemon shark population all along Florida's coast.

Once the sharks reach about 3 years old they vanish. ■

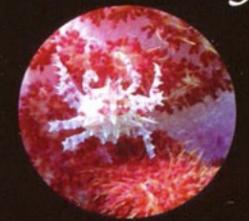


## Robosharks? Pentagon's next spy recruits could be sharks

Soon we may be able to get inside the mind of a shark and experience how it is to swim silently through the ocean, sensing faint electrical fields, homing in on the trace of a scent, and navigating through the featureless depths for hour after hour. Engineers funded by the US military's Defense Advanced Research Projects Agency (DARPA), have succeeded in creating a neural implant designed to enable a shark's brain signals to be manipulated remotely, controlling the animal's movements, and perhaps even decoding what it is feeling.

Neural implants consist of a series of electrodes that are embedded into the animal's brain, which can then be used to stimulate various functional areas. Pentagon hopes to exploit sharks' natural ability to glide quietly through the water, sense delicate electrical gradients and follow chemical trails. By remotely guiding the sharks' movements, they hope to transform the animals into stealth spies, perhaps capable of following vessels without being spotted. ■

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# Medical

Michel Tagliati, M.D.

## Motion sickness medication gave me hallucinations at depth

Being a labdlubber, going out on the Baltic usually means that it necessary to take some kind of motion sickness medication.

Most divers have been told that the side-effects of medication will be altered with increased pressure. Most commonly in relation to drugs which will alleviate swollen mucous membranes in the upper airways and problems to equalize, which as all know is contraindicated and relates to risks of reverse block and ruptured tympanic membrane (eardrum). With motion sickness, the use of scopolamine, and anti-cholinergic substance has been on the increase since the introduction of transdermal patches which permitted slow release over a 72-hour period.

The known side include impaired accommodation (blurred vision) bradycardia<sup>1)</sup> or reduced salivation and can occur regardless of the mode of distribution. and these need to be considered when diving.

Another aspect which technical divers need to take into considera-

**Bradycardia**, as applied in adult medicine, is defined as a resting heart rate of under 60 beats per minute, though it is seldom symptomatic until the rate drops below 50 beat/min

tion is that an unusual but reported side effect of scopolamine is "disorientation, anxiety and hallucinations". The occurrence is set to be less than one out of thousand cases, but, needless to say, this wouldn't be a good experience when trying to read your computer at 70m in 4° C pitch black waters, right?

Scopolamine passes the blood brain barrier, in other words it can exercise its pharmacological effects on receptors in the brain. Personally, I have experienced a level of anxiety, stress and fear and after nearly 20 years of diving along with medical training I realized that there were no sensation or cognitive input that explained these sensations. The dive was



GRAPHIC: PETER SYMES

fine, the conditions very good, the equipment perfect and the dive went according to plan. Also, after taking off the transdermal patch and diving again under the same conditions as the first dive there was a remarkable difference in awareness, calm and cognitive abilities. However these observations must be considered a case-report only and not full fledged scientific investigation to be reproduced. In general very little research has been done, it has been pre-clinical and in laboratory environment only. No case reports has been published. Yet more alarming is the combination of trimix gases and the lack of mental sedation which nitrogen otherwise brings (which we of course do not want).

Personally, as a physician and starting out as a technical, closed circuit rebreather diver with the aim of taking pictures of General von Steuben (see X-Ray #8 , p 81-87) , I found, after comparing my experiences with my dive buddy back on the surface that I have had visual hallucinations and that my video footage from several dives was out of focus - I though

## Scientists isolate anti-malaria compounds from mussel



Indian scientists have isolated two compounds from mussels that have been found to have anti-malarial activity. Malaria kills more people than any other communicable diseases except tuberculosis.

The molecules, named NIO-1 and NIO-2, have been discovered by the scientists at the National Institute of Oceanography. Studies have shown that the two compounds act by directly killing the malaria parasite, "Plasmodium falciparum," rather than just causing inhibition of their growth. Importantly, the compounds were found to be non-toxic to human cells. The compounds, already patented, are cheap to obtain and can be prepared in bulk without killing the mussel. ■

that my mask was fogging up on me as it might have done on previous thousands of dives I have done.

### Lesson learned

Scopolamine transdermal patches and trimix diving is not an acceptable combination. Not everyone will hallucinate, but the compromise if you have to travel great distances at sea to get to your destination is to put these patches on 4-6 hours before your trip starts and remove them 12 hours prior to your dive. Preferably, don't use these drugs at all in conjunction with diving. Stick to the newer types of anti-histamine drugs *but do consult your own doctor.*

It is quite possible that pressures above 5 bar while breathing trimix gases increased serum concentration resulting in a higher frequency of unwanted side effects. Better be safe than sorry. There are enough task loading with CCR, trimix, cold water deep diving and video camera work without having to deal with medication problems. ■

References (links):  
**Pubmed 1, pubmed 2, pubmed 3**

### PRESS RELEASE

## Diving & Diabetes

Diabetes Communications has contributed an alliance with Diabetes Research Institute of San Mateo/San Francisco, CA.

Mills-Peninsula/Diabetes Research Institute offers knowledge, symposiums, presentations and solutions to diabetics on the West Coast and now expanding to worldwide presentations with a new Training and Skills for Diabetic Divers DVD; "Diabetics and Ocean Water Safety Tips" DVD from PADI instructor and LA County Trained instructor, Lauran Gangl-Plant.

For further information, contact Victoria Cathay at Beach Cities School 310-669-4534. To receive a copy of the DVD, please contact Diabetes Communications LTD. Email: **diabetescomm@yahoo.com ■**

MICHAEL TAGLIATI, M.D., IS CERTIFIED IN HYPERBARIC MEDICINE IN ACCORDANCE WITH THE EUROPEAN DIVING TECHNOLOGY COMMITTEE ( E.D.T.C.)

# Oceanology Crossing the Atlantic on the Akademik Ioffe

Text and photos  
by Svetlana Murashkina, PhD in Geography

**“The subject of oceanology is the study and research of the totality of events taking place in oceans, seas and lakes,” wrote geographer, academician and founder of Russian oceanology, Juli Shokalskiy, in 1917. Oceanology, or oceanography<sup>1</sup> as it is more commonly called in the West, is an integral part of natural sciences. The ratio of water to land on the planet Earth is approximately 71 to 29 percent. Furthermore, water surface is not only greater in square kilometres, but it is also continuous—whereas, land surface is finite and presented by separate parts washed over by the world’s oceans. So, in essence, oceanography studies this one continuous body of water, the World Ocean!**

By this point in history, nobody had yet taken the responsibility of determining the validity of oceanography as a science. Historically, if not considering Moses from the Bible to be the first oceanographer (as he parted the Red Sea, allowing his people to escape their pursuers at the right

moment)<sup>2</sup>, exploration of the oceans was conducted by “Homo Curious”—from the very first people to venture out into the open sea up to the great explorers of the Imperial Age.

The exploration of the oceans occurred in parallel with the development of other sciences, cartography in particular. Every new heroic expedition acquired new data, descriptive at first (as in the early period of the great geographic discoveries) rather than numerical, such as depth measurements and ocean bottom relief views, grounds, temperatures, salinity, transparency and colour of oceanic water as well as direction and velocity of oceanic currents.

British expeditions led by James Cook in the late 18th century were considered to be the first scientific voyages. Three journeys taken by Cook, aimed at finding the southern continent, enriched the era’s geographical knowledge greatly, both directly and marginally. On one hand, new lands were discovered (the eastern shores of New Zealand and eastern Australia), geographic maps were created, detailed reports were made and oceanographic data collected on the physical features of oceans and water movements.

On the other hand, the expeditions served as a challenging push for further expeditions. During the first voyage, for instance, no traces of an expected polar continent in the moderate latitudes of the Pacific Ocean were found. As a result, new French expeditions were sent there.



Crew members and research staff at work on bow of the Akademik Ioffe





Portrait of Captain James Cook RN 1782, by John Webber. Collection: National Portrait Gallery, Canberra, Australia. Purchased in 2000 by the Commonwealth Government with the generous assistance of Robert Oatley and John Schaeffer

Great Britain was the first to estimate the importance and dominant position of the sea, including its scientific significance. The idea was actively accepted by France and also Russia from the beginning of the 19th century. After Cook's enterprises and until 1872, there were 29 expeditions undertaken around the globe, 11 of which were British and eight Russian. All in all, the number of scientific marine expeditions during that period amounted to 75.

The first round-the-globe trip by Russian sailors was made on board the ships *Nadezhda* and *Neva* in 1803-1806 under the leadership of Lieutenant Captain Ivan Kruzenshtern. The expedition ships

## Crossing the Atlantic

parted company after rounding Cape Horn. *Nadezhda* turned to Kamchatka to explore Okhotskoe and the Japanese seas, and *Neva*, lead by Captain-lieutenant Juri Lisianski went to the Northern Pacific and to Alaska. The ships met up later and returned back around the Cape of Good Hope.

During that three-year journey, depth temperatures were measured as well as the first observations of vertical ranges at ocean depths made. Geographic discoveries in high Southern latitudes were accomplished within the Pacific archipelagos.

In 1819-1821, the Russian Marine Department organized the first Russian Antarctic expedition on board the military boats *Vostok* and *Mirnyi* under the general

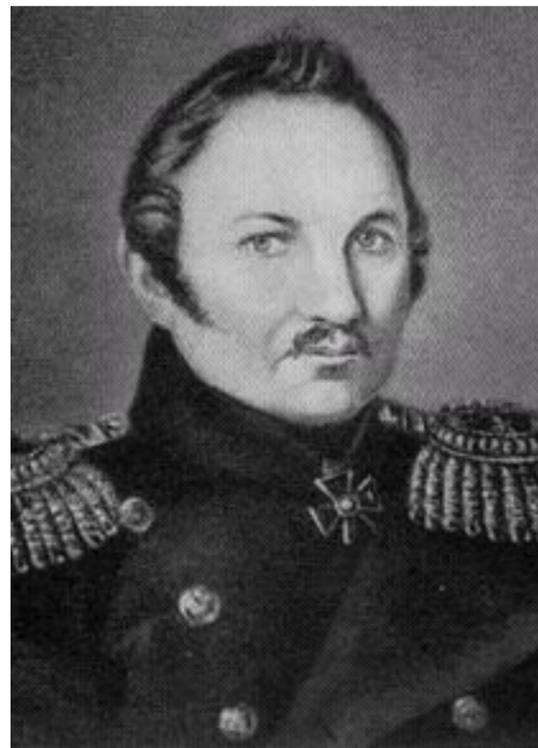
leadership of Captain 2nd rank Faddey Bellingsgauzen (Fabian Gottlieb von Bellingshausen who later rose to admiral). *Mirnyi* was captained by Michael Lazarev.

Their journey reached 69 degrees of Southern latitude when they discovered lands lying to the East of Cape Horn and made remarkable descriptions of geophysical aspects of the Southern Polar province.

The British round-the-globe oceanographic expedition of the *Challenger* (1872 -1876) was a key event in the development of oceanography. The expedition had vast aims: to study the ocean bottom landscapes and relief as

well as observe physical, chemical and biological features on the surface and at depth. The composition of officers was selected with respect to the oceanographic research-oriented character of the expedition. Detailed "field" tasks were prepared, special devices were invented and designed, and laboratories were constructed.

The Naval wooden corvette *Challenger*, having clocked 68,900 sea miles, made 362 deep stations and determination at every point of depth and grounds. Bottom water samples were taken and temperature measured



Faddy Bellingsgauzen, 1778-1852 (Fabian Gottlieb von Bellingshausen)

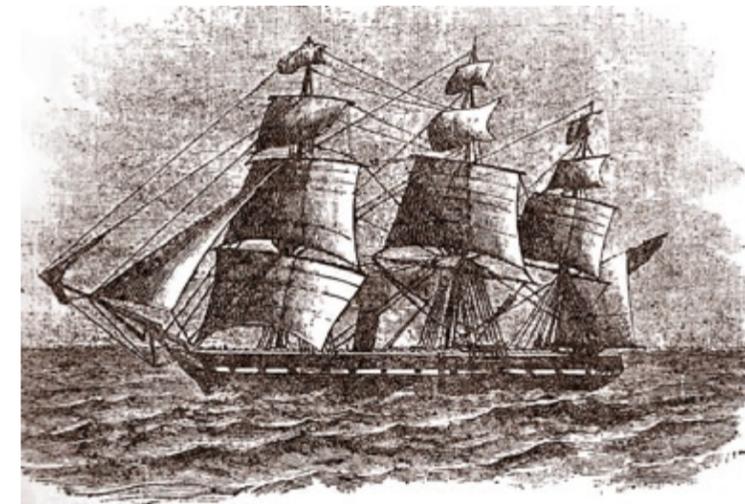
on the bottom and at different depths. Surface currents were observed as well as some underwater currents. Meteorological observations were made every hour.

*Challenger's* accumulated data and reports (50 volumes!) appeared to be a special epoch in the development of oceanography. With *Challenger* came the understanding of the neces-

sity of planned explorations. Since then, oceanographic studies have been part of obligatory programs for nearly every marine venue enterprise.

It is evident that a revolutionary change in the very approach to ocean science and to data collection has taken place during the last 100 years. This change is a transition from data collection by separate expeditions to global systematization of data collection and management of rational collection strategy.

The appearance of new technology—distant satellite research, computer processing of giant data files, new high precision measuring devices—all these provided the possibility of a qualitative jump in the 1960s, from a view of the ocean as an environment with features slowly changing in time and space to an understanding of the fact that in the ocean there exist lots of comparatively narrow zones with sharply changing parameters, oceanic fronts

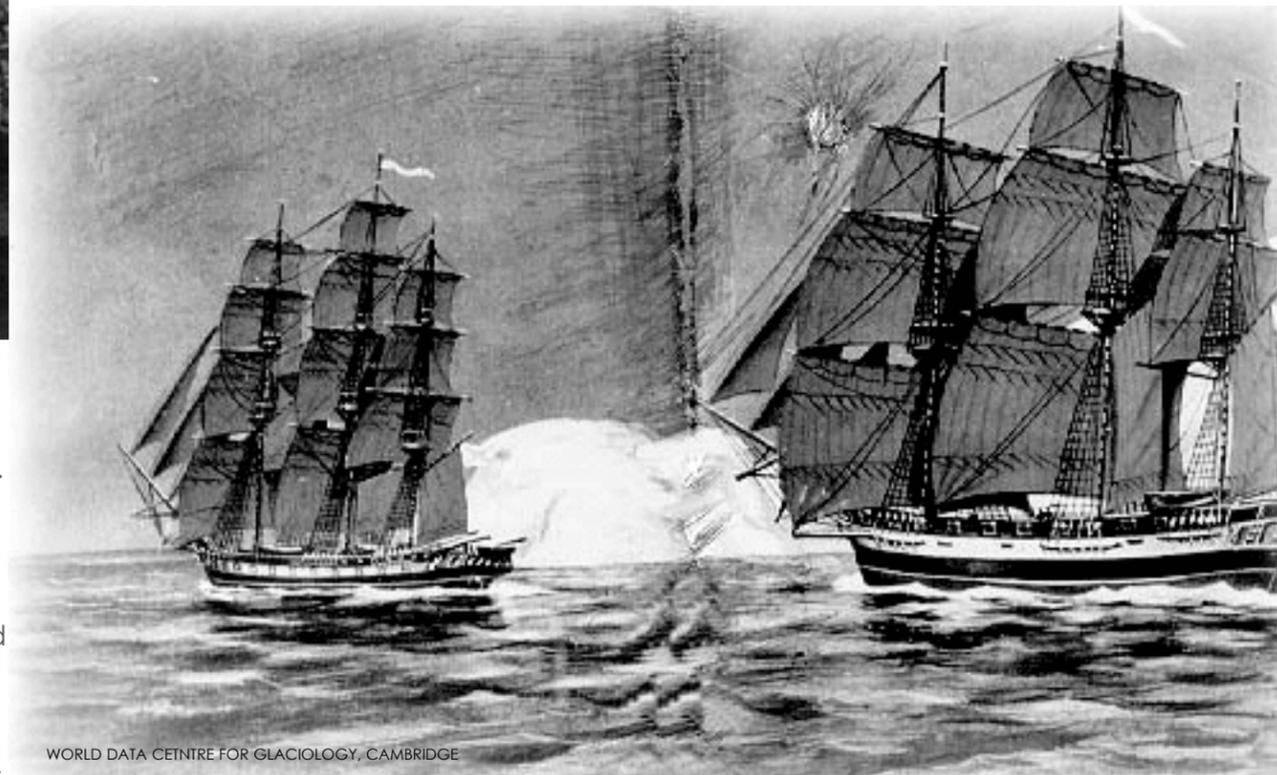


HMS Challenger, 1872. By William A. Herdman. Courtesy of the Freshwater and Marine Image Bank

many kilometres wide whirling like atmospheric cyclones and anticyclones, which appear all the time—they appear, move and disappear. We now know that a so-called "thin structure" exists, which are steady layers of water having vertical dimensions of several meters and horizontal dimensions of several kilometres.

### Modern exploration of oceans

It is true that nowadays research vessels sailing under various flags are steadily tracing the World Ocean, from the



WORLD DATA CENTRE FOR GLACIOLOGY, CAMBRIDGE

Vostok (East) and Mirnyi (Peaceful), 1819-1821



parameters. It is during the sea journey that one can touch "live" the main hydrological parameters that characterize sea water such as salinity, temperature and pressure—the so-called CTD parameters. They are some of the main topics of interest in physical oceanography. (See Block 1).

### Cast off!

It is the summer of 2005, and I am heading out across the northern Atlantic Ocean on board

consequently makes it possible to obtain a series of data with reliable observations for study of the variability of water masses, adding to repeated data gathering of sections by WOCE-CLIVAR in the North

ABOVE: The churning Atlantic  
RIGHT: Hoisting the carousel aboard

Equator to the Arctic and the Antarctic. There are nearly no "white spots", or unexplored areas on the map of our planet.

But in the abyss, strikingly blue or iron-grey, there are lots of them. Moreover, all the processes taking place within the oceans are still not an open book for scientists at all.

Modern research is differentiated

and multi-directional with sometimes fundamental and, at other times, applied importance.

First of all, there is the problem of climate and its variability.

Knowledge of the nature of climate

and the ability to forecast weather gives us the possibility to make sound decisions in the choices of prospective methods of development that are harmonious with the environment. Trade forecasts are

also very important with regard to economic concerns as well as space and defence issues.

During research voyages, studies are made from the deck of the ship by remote methods. The practice of expedition study includes current velocity measurements, observation of light regimes and biotic factors of environment as well as measurements of hydro-chemical

the Russian research vessel, *Akademik Ioffe* (Block 2), which can not, of course, be compared with the *National* expedition that took this route in 1889<sup>3</sup>. It is practically regular now, this short scientific cruise. Russian oceanographers are completing it for the fifth time. The last three times took place annually, which

Atlantic Ocean<sup>4</sup>.

The planned duration of this journey is a little less than three weeks. That much time is needed to head out of port from Gdansk, Poland, journey across the Baltic Sea, put out to the North Sea via the straits of Kattegat and Skagerrak around Denmark, reach 60 degrees northern latitude and cross the Northern Atlantic, record the oceanographic section from the Faroe Islands to Greenland, and then, turn to the south to reach Newfoundland.

Now out to sea, I see that the Gdansk port cranes disap-

ABOVE & INSETS: Sounding devices



LEFT: The windmills of Denmark  
INSET: The port of Copenhagen

# Denmark

**A day in the life of Ioffe**  
When the ship reaches 60 degrees latitude, work in the open sea begins. The scientific crew now labours in permanent round-the-clock shifts, and the chief of the expedition becomes

the main director on board (after the captain, of course). The chief scientist is the person responsible for deciding whether to

continue working or miss intermediate stations under severe weather and sea conditions. The target: to collect data until we get to the very end of this ocean section. It may sound a bit dramatic, but obtained data—input of this expedition and the whole Russian national oceanographic science community—goes to the international cooperation and research effort.

The ship sails along a marked course and makes stops at points where deep measurements are planned. These are stops for hydrological stations with CTD-

# to Canada



In Russia, scientists play different roles at the same time—they are researchers, managers, providers, etc.. In foreign countries, it is not the same. Special managers are responsible for the technical provisions of the project and equipment. In Russia, all responsibilities are carried out by the chief of the expedition and the chiefs of various departments. Transportation of all the loads on board, winding of new rope

to the operational winch, set-up of the research camp including unpacking and checking high-precision devices, preparation of work places, reliable fastening of computers and other devices onto tables —nobody can rule out roughness at sea. Vira slow!

Arriving in St. Jones, Newfoundland

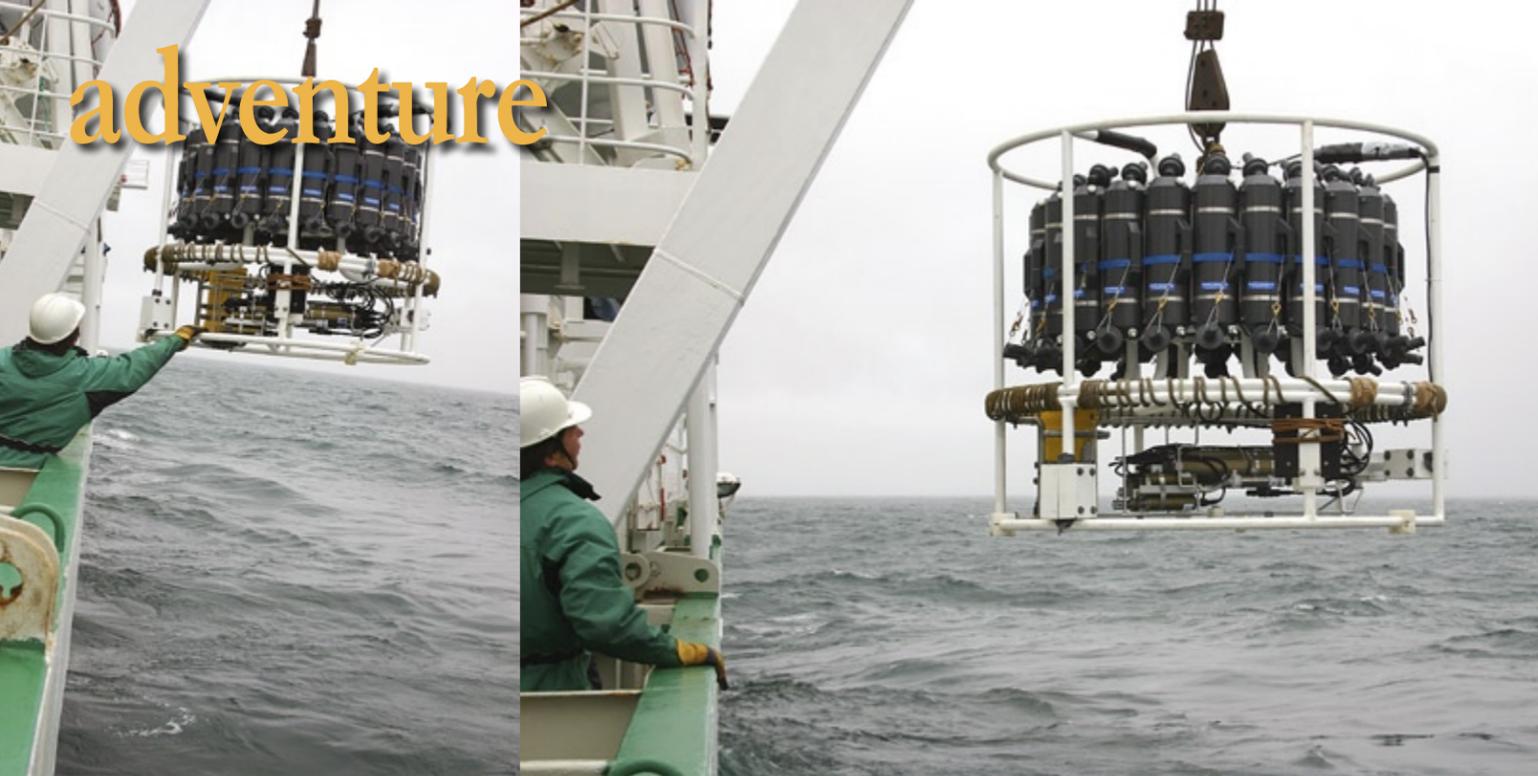


peared from sight long ago, as well as the Danish wind mills producing electricity—the symbol of modern Denmark. The huge hull of our white ship breaks waves under the sunny blue skies of summer upon the North Sea. I see the stoic silhouette of the captain's bridge and steering deck-cabin where one can take in a grand

view of all the space out to the very horizon, a forest of antennas on the upper deck and the navigator deck... Everything looks reliable and instills a sense of confidence.

But excitement is still palpable on deck. Anticipation is an essential component of the sailor's profession. And research always has a lot to consider.





THIS PAGE: Carousel deployment

## Crossing the Atlantic

extremely careful, even knowing that the ship is above a plain (lower terrain) and not above the Reykianess Range (oceanic ridge), for example.

...400 meters to the bottom... 200 meters to the bottom... "Winch, half... hundred meters to the bottom... Maina dead slow, 50 meters to the bottom, winch to stop! ...Winch here—stop."

The signal to close the "deepest" bottle is sent by a simple movement of the computer mouse. Then, a smooth ascent begins with stops at previously planned depth values. Bottles, one by one, are forced to close after being filled with ocean water. Stops occur on levels that correspond with various water masses in order to get a uniform picture of samples along all

water thicknesses and to determine the position of the nucleus of each water mass and the frontiers between them.

The next exciting moment is the

the deck. Hydro-chemists hurry to take necessary quantities of deep ocean water for laboratory tests.

The station is done, and the captain's bridge receives the order to continue moving ahead. The ship steadily increases its speed, and we move onward to the next planned station.

During this cruise, oceanographic section as long as 1,164 sea miles was completed. Complex measurements of sea water parameters from the surface to the bottom of the ocean were made at



Gathering ocean water for investigation

instant when the carousel shows itself! The winch is ordered, "Vira slow!" The sonde is pulled overboard by the hook, and the men carefully hoist the device onto

40 points. At these stations, meteorological observations were made and gigabytes of information about acoustic features of the bottom were registered. The

sensing ability (determining vertical profiles of electrical conductivity, temperature and depth) and water sampling (See Block 3).

Current ship time is 16:41:01, which means GMT (Greenwich) is 18:41:01. *Akademik Ioffe* slowly but steadily reaches the position of the planned stop for station #1152 (#36 according our section schedule), and the level of "scientific" activity on board increases dramatically.

Coordinates of this ocean section are 59 degrees 50 minutes Northern Latitude and 39 degrees 20 minutes Western Longitude. Supposed depth is 2,840 meters. Supposed duration of labour at this station is 2 hours 10 minutes.

The ship slows down. A monitor showing the parameters of our movement reveals steadily decreasing speed: 6.7 knots.... 5.6..... 1.6. One knot really means that the ship has come to a "stop". We have reached the station position, but the engines must continue to work. The captain cannot stop the engines completely under such rough conditions.

The water temperature is 9.6°C.

Air temperature is 7.3°C. The deck is wet, splashed by the salty sea.

A complex device nicknamed "carousel" is prepared for deployment. Ropes that secure it on board are undone. The winch is readied. "Vira!"—Upwards!

The rosette of devices, guided carefully by strong men's hands, loses contact with the deck and moves forward above the gunwale and over board to hang above the water. Now, the trick is to catch the next wave. This construction weighs 200 kg, but in the water, it achieves amazing buoyancy, so one must be extremely careful. Done. Slowly giving the rope to the winch, the carousel, looking like a turquoise jelly-fish, descends... disappearing from sight.

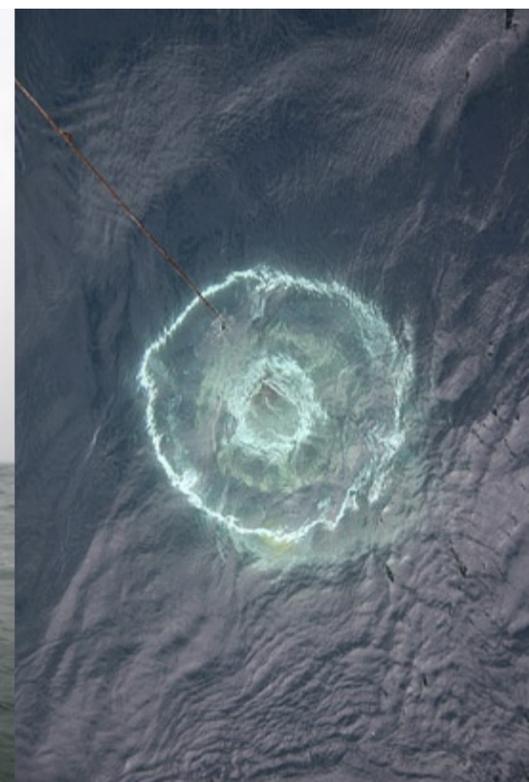
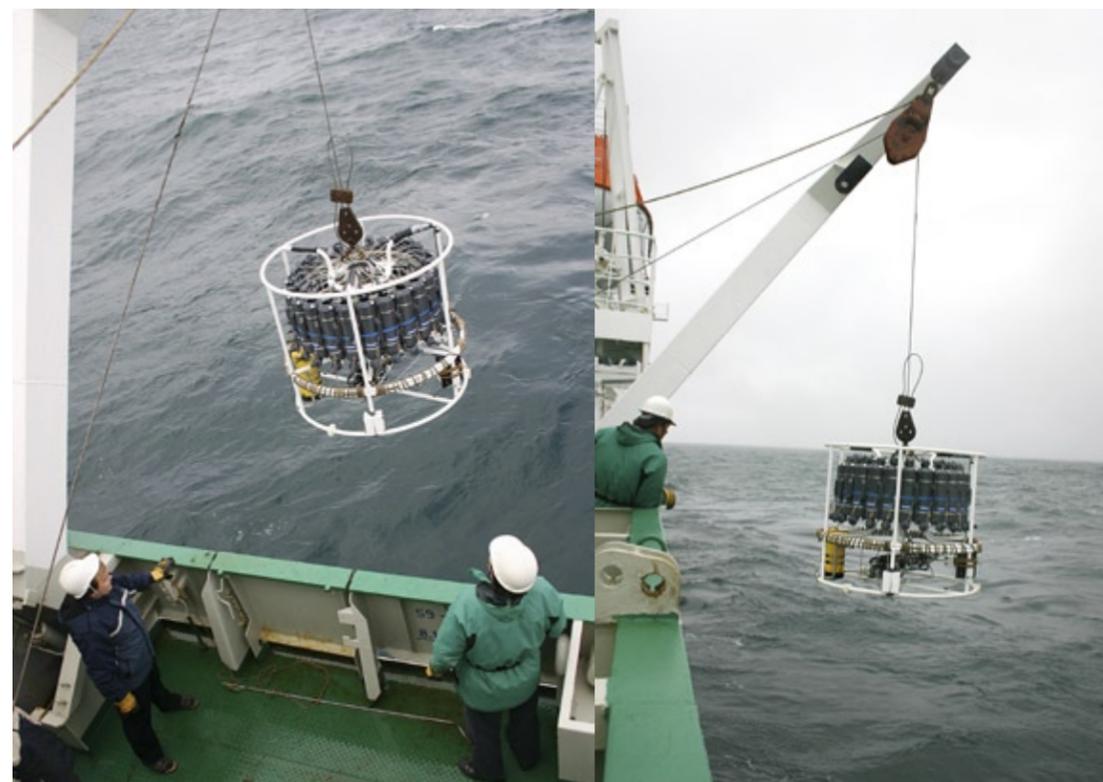
When deploying and raising up the sonde, it is very important that the process be very smooth, without jerking and bumping the deck, since it is upon these factors that the future fate of the rope, devices and cruise results depend.

In order to measure currents precisely, the rope with the devices, which reaches depths

up to 3,000 meters, must be kept in a vertical position. This can be achieved only by the fine work of the navigator, especially with the wind velocity equalling 20 meters per second and swells as high as 6-8 meters while the ship moves in a direction opposite the wind.

At this time, any unfastened objects on the ship tend to float freely in space, so wet table clothes are placed on the tables in the saloon to avoid the "running away" of plates and covers. But the deck hands continue to work.

The men on duty watching corresponding data on a monitor screen, guide the winch-men: "Winch, 1,000 m passed... Continue to descend... Continue to descend." The ship goes up and down on the waves. Velocity is 1 knot, winds are 15.8 m/sec. The monitor shows the line of the rope with sonde deployment. The two kilometre mark is passed. "Winch, 500 meters to the bottom. Maina slow!". One must be





Researchers working in labs and on deck

data will be processed later when we return home.

Everything was okay. No extraordinary situations arose. Greenland glaciers appeared in the fog, and *Akademik Ioffe* turned to south towards St. Jones. Sometimes, to the left and to the right of the deck, little fountains appeared. Then humped backs appeared—whales were passing by heading in their own direction.

We met no ships coming or going—60 degree latitude is not the most popular route. It was just us and the ocean, which changed its colour from bright silver to mysterious blue. And the people on board were still not yet tired of looking into the very depths of the ocean. They are true romantics of oceanography who dreamt of sea journeys since their college days and consider scientific data obtained on these journeys to be more precious than publication in a foreign magazine or academic status.

### International cooperation

Alex Sokov is the deputy director of the P.P. Shirshov Institute of Oceanology of the Russian Academy of Science and principal investigator of the Russian interdepartmental project "Meridian-Plus" of the Federal special program "World Ocean". Russian oceanographic research lies within the sphere of interests of international programs led under the patronage of the IOC UNESCO (International Oceanographic

Commission), the WMO (World Meteorological Organization) and other intergovernmental organizations.

The North Atlantic research cruise is a good example of Russian participation in international research. Indeed, the North Atlantic is the very place that hosts one of the world's main regions for intensive energy exchange between ocean and atmosphere, which determines the moderate climate of Western Europe and the climate of the European part of Russia.

It is also here, where the Atlantic branch of the so-called "global convective circulation of the World Ocean" locks—turning from a northerly to southerly direction and heading downward. This circulation is similar to the ocean conveyor belt on the planetary scale, which transfers giant volumes of water masses between high and low latitudes of the main oceans—the Pacific, Indian and Atlantic.

The fact that European climate is determined by the character of energy exchange between ocean and atmosphere in the Northern Atlantic and the intensity of the conveyor belt at work has been known for several decades already, but many important details of this connection still need more quantitative specifications.

One of the problems that needs to be settled for the forecasting of climatic changes is: What factors cause fluctuations in the intensity of the con-

veyor belt activity within ten-year periods, and what atmospheric processes are "reliable" for that fluctuation? The



The P-Frame, a lifting device on the stern

of thousands of US dollars. To satisfy these costs, people in the Russian Institute of Oceanology, with the support of the Ministry for Economy of the Russian Federation, created and brought to life a successful pattern of partial funding of research cruises using recruited funds from tourist

answers to these questions are very important just now when, during the past decade, unprecedented warming of the North Atlantic and Arctic Oceans have been observed.

That's why transatlantic cruises are so important. They are the Russian contribution to international programs such as CLIVAR (Climate Variability), NORDIC WOCE (North Ocean Circulation Experiment) and ASOF (Arctic Sub Arctic Ocean Fluxes). Not every state can afford to conduct full-scale oceanographic research on independent cruises. A full day's work on one of the ships belonging to the Institute of Oceanology, such as the *Akademik Ioffe* or *Akademik Mstislav Keldysh*, costs several tens

companies.

The results of every independently accomplished expedition enrich Russian science not only directly through research procedures and data obtained, but also indirectly. By contributing its input into international cooperation, Russia possesses equal rights to use the results obtained by other countries that accomplish programs within the framework of international projects—and that is necessary for acquiring an integral picture of the world.

### Heading for the Antarctic

Measurements in the World Ocean are not limited by sounding from our ship's board. Data obtained during the



The *Akademik Ioffe*

## Crossing the Atlantic

the Arctic Basin, play a major role in forming global climate. Furthermore, these regions are very sensitive to fluctuations and possible climatic changes.

Acoustic thermometry is a method of remote observation of large-scale variation of temperature in the ocean. The method of acoustic thermometry of the ocean is based upon the almost linear dependence of the speed of sound underwater upon temperature. The system includes a fixed source (acoustic transmitter) and a receiver (array) in the ocean.

The first Arctic acoustic thermometry experiment took place in April 1994. Due to the efforts of the employers of several research bodies of the Russian Academy of Science, ice camp Turpan was established 300 km north of Spitsbergen. During the whole month, powerful Russian acoustic transmitters sent signals at 20 Hz across the entire Arctic Ocean to receiving arrays located at ice camp Narwhal in the Lincoln Sea and ice camp SIMI in the Beaufort Sea, covering distances of 2,100 and 1,200 km.

It became possible to measure, with great precision, the main parameters of the signals describing features of ocean water and sea ice cover. Acoustic monitoring in the Arctic was regarded as worthwhile by administrators, and in October 1998, within the frames of first-hand actions of the Russian Federal special program, "The World Ocean", a new and autonomous acoustic source was deployed by the Russian team at the sea bottom close to the shelf border northwest of the Franz-Joseph Land archipelago. This source, together with an American autonomous receiving array, worked nearly one and a half years. The processing of the enormous amount of data received from the device is only

now being finished.

In particular, it was found that increasing temperatures of the Atlantic Layer in the Arctic ocean, which have been observed since the early to mid-1990's up to the present, did not take place uniformly, but occurred with arrivals to the Arctic Basin, from time to time, of anomalous warm "spots" of Atlantic origin. ■

### COMMENTS

<sup>1</sup> In Russia, despite the fact that discussion about the application of the terms, *oceanology*, study of the ocean, and *oceanography*, description of the ocean, continues within the scientific community, both terms are used nearly equally nowadays. In foreign literature, the term *oceanography* is most often used.

<sup>2</sup> Munk, Walter. *The evolution of physical oceanography in the last hundred years*. Scripps Institution of Oceanography, La Jolla, California, USA.

<sup>3</sup> The German expedition on board the *National*, which investigated the Northern part of the Atlantic Ocean in 1889 accomplished the journey from Northern Europe approximately along the 60th degree Northern Latitude to Greenland, and further to the south, Newfoundland, then continued on to the Bermuda Islands.

<sup>4</sup> This hydrological section is assigned to Russia within the framework of the international program CLIVAR (Climate Variability). In 2005, 40 stations along 1,164 sea miles were checked. Measurements enable scientists to determine year-to-year variations of water features in the investigated region according to their thermohaline (variations of temperature and salinity) and hydrochemical parameters in the moment of sharp climate changes as well as changing of borders between separate water masses in the section by means of comparing the results with data received during previous sections in 1997, 2002, 2003, 2004.

North Atlantic cruise of the research vessel *Akademik Ioffe* is being processed. Meanwhile, the other ship of the Institute of Oceanology, *Akademik Sergey Vavilov*, went out in October 2005 to complete the next cruise along another route: Kaliningrad (Russia) – Cape Town (SAR) – Antarctica – Ushuaia (Argentina). The Chief of Expedition was Dr Sergey Gladyshev, Russian coordinator of the international experiment researching the South Ocean for which such countries as Russia, France, Germany, SAR and USA participated and placed their research programs on board.

During this expedition and in addition to complex oceanographic measurements taken by the research staff,

two autonomous floating buoys were launched supplied with navigational instruments and CTD sensors. The buoys are to float for the next two years in the rarely investigated region between the southern part of the Atlantic and Indian Oceans. Devices on the buoys will "shuttle" from the surface to a depth of 2,000 m and back scanning CTD parameters of water masses and transmitting the data via satellite upon surfacing. Satellite information will come to the data collection centre ashore.

After the successful launch of these two buoys, Russia gained operation of several similar devices in the World Ocean, which enables Russian scientists to use results from all the other buoys

and a half-thousand similar devices (belonging to other countries) floating in other parts of the World Ocean.

### Acoustic research in the Arctic

Dr Sergey Pisarev, coordinator of the Russian-American project ATOC (Acoustic Thermometry of Ocean Climate), is a leading research scientist of the P.P. Shirshov Institute of Oceanology of the Russian Academy of Science. He said that two original systems of acoustic thermometry have worked for more than one and a half years, all in all, in the Arctic Basin—the least accessible location for traditional oceanographic "contact" measurements.

The deep regions of the Arctic Ocean,

# adventure



LEFT: Carousel deployment  
BELOW: Water sampling

water density, thus participating in peculiarities in the formation and movement of water masses, influencing the character, direction and intensity of currents.

## Temperature

Temperature depends on the quantity of solar heat meeting the water surface, water-atmosphere heat-exchange, closeness of big ice formations and oceanic currents. Ocean water temperature is measured directly with metallic resistor thermometers and thermostats. Temperature influences the instrument error (faults, mistakes) of other sensors that have direct contact with water, which causes the necessity to introduce amendments to the results of measurements of other parameters.

## Hydro-static pressure

Hydro-static pressure is needed for the determination of the depth to which measuring devices are deployed and at which other parameters are measured. At the same time, hydro-static pressure data are an inevitable part in the process of the determination of salinity and density of ocean water, sound velocity within water and some other water characteristics. The dependence between hydro-static pressure and the depth of device deployment is rather complicated, but for practical purposes, relatively simple equations connecting absolute pressure and depth are used.

## Block 2. AKADEMIK IOFFE

*Akademik Ioffe* is one of the research vessels of the P.P. Shirshov Institute of Oceanology of the Russian Academy of Sciences (IO RAS), sister-ship of the *Akademik Sergei Vavilov* based in Kaliningrad. It was built in Finland in 1989. Velocity: 10.5 knots (max – up to 15 knots). 6,700 tons displacement. Max length is 117.1 m, width 18.2 m, 6 m set. Board height is 10 m. The vessel is autonomous regarding fuel and water for 60 days. It can host 117 passengers on board with 43 crew members. There

## Crossing the Atlantic

are various weight-lifting devices on board (i.e. cranes, winches), research instruments and equipment for complex studies of the ocean: deep water, multi-radial and parameter echo-sounders, side hydro-scanner, a system of dynamic positioning, modern navigational system GPS, automatic meteorological station, acoustic Doppler current gauge (measurement device), special hydro-acoustic complex, CTD's and water sampling devices, a station of registration and processing of satellite information. There are 12 laboratories on board—their general area is 300 square meters.

## Block 3. DEVICES: CTD Sondes

CTD sondes are used widely to measure CTD parameters. Nowadays, it is the main device used during expedition research cruises. At every station of the section, a measuring complex is deployed practically to the sea bottom: a carousel with 24 5l-volume bottles (these are special vessels made of a chemically pure material for water sampling from



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## Block 1. CTD PARAMETERS

CTD parameters include conductivity, salinity, temperature and depth. Salinity is calculated through conductivity, and in fact, not the depth, but hydrostatic pressure is measured. Water temperature changes are usually accompanied by changes in other factors, most importantly in currents, which determine the physical features of water masses. CTD parameters serve as a basis for calculating important features of ocean water such as density, vertical stability, ductility, temperature of freezing, sound velocity and refraction of light coefficient. CTD parameters can be regarded as a signature, since they are the most independent group of parameters, different from the other environmental factors, which depend more or less upon salinity, temperature and pressure.

## Salinity

Salinity is the saltiness or dissolved salt content of a body of water. Prior to 1978, salinity or halinity was expressed as ‰ ("promille"). In 1978, oceanographers redefined salinity in Practical Salinity Units (psu). Salinity depends on atmospheric precipitation, river drainage and evaporation from water surfaces. Changes in salinity influences changes in

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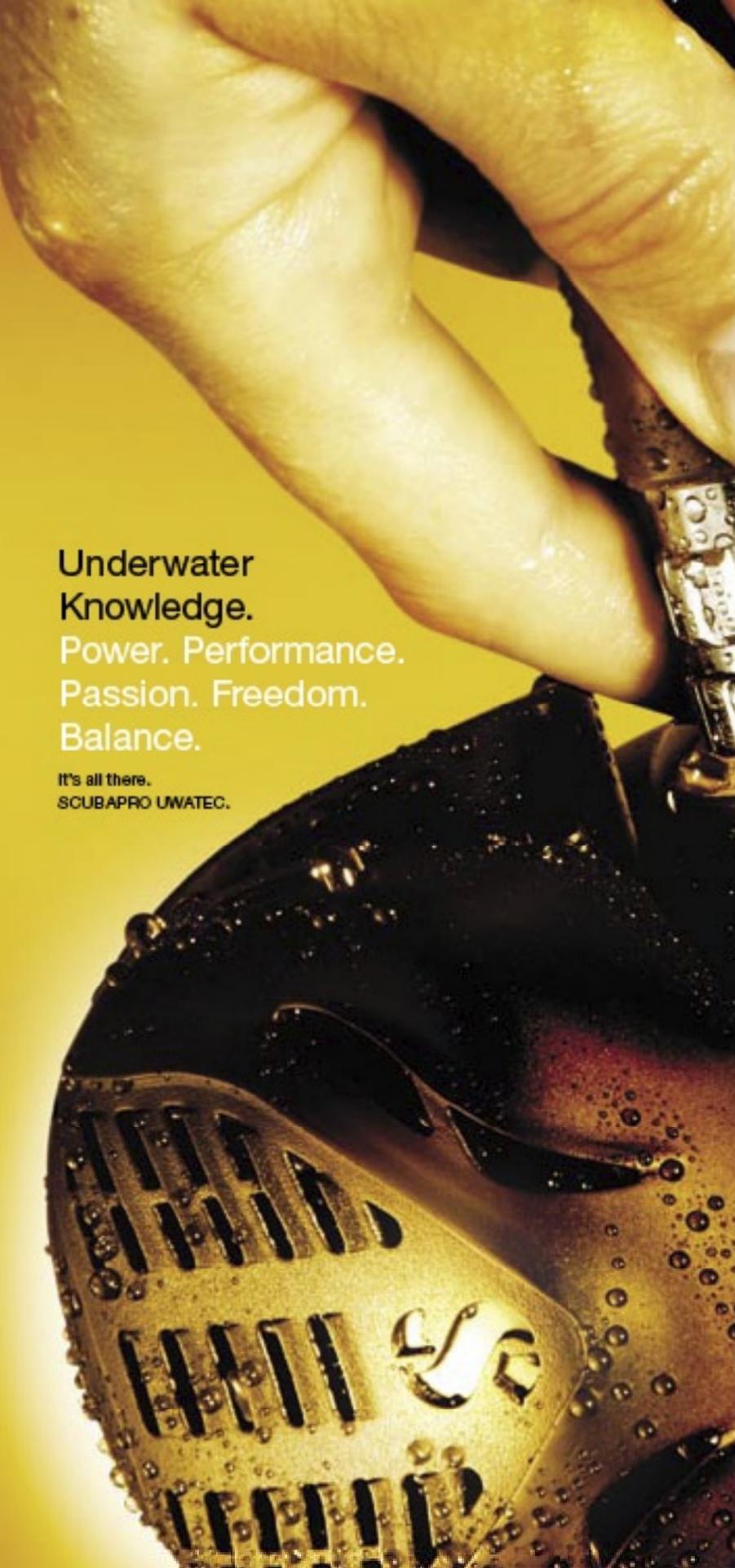
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separate depth levels in order to examine

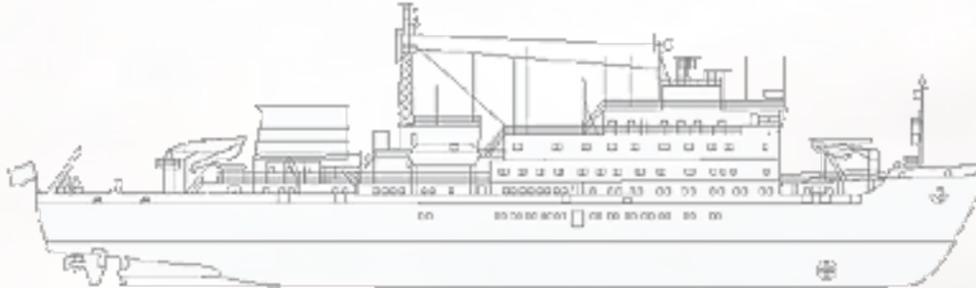
salinity, dissolved oxygen contents, silicon and phosphates); oceanographic sonde, which continuously registers temperature, electrical conductivity, pressure, transparency; acoustic current speed and direction profiler; and an altimeter showing the distance between the deployed device and the sea bottom. CTD sondes make it possible to receive profiles (during vertical descent and ascent) of the vertical distribution of temperature and conductivity (salinity). Depending on the model, CTD sonde transfers information to an on board computer via special cables on-line or accumulates data in memory blocks of the sonde itself, to be retrieved after sonde ascent. The main producers of these devices are the American companies, Sea-Bird Electronics, Inc. and Falmouth Scientific, Inc., and Italy's IDRONAUT S.r.l.

### Hydrological measurement complex

The 911plus is a premier real-time CTD accurate to the highest international standards. It features high resolution sampling (24 Hz), pump-controlled T-C ducted flow up to 10,500 meters (15,000 psi) depth capability, maximum auxiliary sensor flexibility and optional modem channel for Water Sampler control. The 911plus has eight 12-bit A/D channels, and supports redundant C&T sensors or custom auxiliary digital inputs. The 911plus consists of the 9plus underwater unit and the 11plus V2 Deck Unit.

The underwater unit for the 911plus CTD includes modular temperature and conductivity sensors with TC Duct, SBE 5T submersible pump, redundant T and C input channels, 8 differential inputs, low pass-filtered A/D channels, a water sampler modem channel, stainless steel guard cage and SEASOFT software.

The standard SBE 9plus underwater unit has an aluminium housing rated to 6,800 meters (22,300 ft) and is supplied with one



Schematic of Akademik Ioffe

conductivity and one temperature sensor (fitted with a TC Duct and constant-flow pump) and an internally mounted temperature-compensated Paroscientific Digiquartz pressure sensor for 6800 meters (10,000 psi) full-scale range. Input channels and bulkhead connectors are provided for an optional second (redundant) pair of temperature and conductivity sensors. Other standard features include an 8-channel, 12-bit A/D converter with differential inputs and low pass filters and high-power capability for support of commonly used auxiliary sensors (e.g., SBE 43 dissolved oxygen, SBE 18 or SBE 27 pH, transmissometer, fluorometer, ambient light, altimeter), a modem channel for real-time water sampler control and a port for connection of an optional bottom contact switch.

SBE 11plus V2 Deck Unit includes RS-232 and IEEE-488 computer interfaces, a modem channel for real-time water sampler control (including water sampler control push buttons and status lights), NMEA 0183 interface for adding GPS position to CTD data, 12-bit A/D input channel for surface PAR sensor, switch-selectable 115/230 VAC operation, audio tape interface (data backup), LED read out for raw data and audible bottom contact (or altimeter) alarm. The 11plus V2 also provides a remote pressure output (useful as an input signal for towed vehicle control) and a programmable serial ASCII data output containing up to seven variables in computed engineering units. Calibration coefficients are stored in EEPROM, and a separate micro controller converts raw CTD data to temperature, depth, salinity, etc. The 11plus V2 is shipped in a free-standing cabinet with a hardware kit for mounting in a stand-

## Crossing the Atlantic

ard 19-inch electronics rack.

### Receiving CTD data

SEASAVE software is used to receive CTD data. It enables one to set the connection of the board unit and computer. This software makes it possible to determine ports and data transmitting velocity from the carousel, the order of bottles closing (one by one or in a given order). The software also provides the possibility to register GPS data into a CTD file or separately. During data transmission, one can see on one diagram the distribution of four given parameters with depth range.

### Precision

Modern science demands measurement precision to the millesimal regarding temperature and salinity. During measurements in the ocean, precision of CTD measurements are lost mostly because of different inertia (Inertia: the time needed for the sensor to change its data, or testimony, due to penetration into new water layers with new dimensions of the measured environment parameters) of temperature and conductivity sensors. SBE company found the way to overcome different inertia of their sensors. The sondes are washed by water in a different regime—not like in real time, depending on descending sonde velocity, but uniformly, with fixed speed. The fixed speed is provided by a special pump that circulates sea water via sensors during sonding.

### CTD data processing

Data processing is made with the assistance of SBE Data Processing software. Data processing consists of data levelling regarding pressure; data averaging in the given interval regarding pressure, depth and time of registration; introducing amendments; calculation of all parameters; filtration of data and creation of graphs and diagrams.



Dr Sergey Pisarev on the Akademik Ioffe in Copenhagen

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By Peter Symes

ILLUSTRATION REWORKED FROM ORIGINAL FROM STUTTGART UNIVERSITY

The global water circulation starts off Iceland and Antarctica where the currents sink to the seafloor and start a long journey taking them around the globe

# The Thermohaline Circulation Conveyor Belt

The **thermohaline circulation** is the term for the global density-driven circulation of the oceans. Term is derived from *thermo* (heat) and *haline* (salt), which together determine the density of sea water.

The vertical exchange of dense, sinking water with lighter water below it is known as *overturning*. Hence, another name, emphasizing the vertical nature and pole-to-pole character of this kind of ocean circulation, is the **meridional overturning circulation**.

## Can global warming trigger a shutdown or slowdown the circulation in the world's oceans?

The globe is encircled by a pattern of ocean currents known as the **ocean conveyor belt**. Heat is transported from the equator towards the poles by both the atmosphere and by ocean currents, with warm water near the surface and cold water at deeper levels. As such, the state of the circulation has a large impact on the climate of our planet.

### Gulf Stream

The best known segment of this circulation is the Gulf Stream, a wind-driven gyre, which transports warm water from the Caribbean northwards where its effect in warming the atmosphere contributes to warming Europe, cooling all the while and eventually sinking at high

latitudes forming North Atlantic Deep Water. The evaporation of ocean water in the North Atlantic increases the salinity of the water as well as cooling it, both actions increasing the density of water at the surface. The combined processes is known as *evaporative cooling*. **Dense water flowing south** The formation of sea ice further increases the salinity as saltier brine is left behind as the sea ice forms around it. The dense water then sinks and the circulation stream continues in a southerly direction.

This dense water then flows downhill into the deep water basins, steered by the bottom topography, only resurfacing in the northeast Pacific Ocean some 1200 years later. Extensive mixing therefore takes place between the ocean basins, reducing differences between them and making the oceans one global system.

In the deep ocean, where wind is absent, the predominant driving

force is differences in density and temperature. Yet the current velocities in deep water masses can be significant although much less than surface speeds. The density of ocean water is not globally homogeneous. Sharply defined boundaries exist between water masses which form at the surface, and subsequently maintain their own identity within the ocean. They position themselves in layers according to their density, which depends on both temperature and salinity. This is known as "stratification"

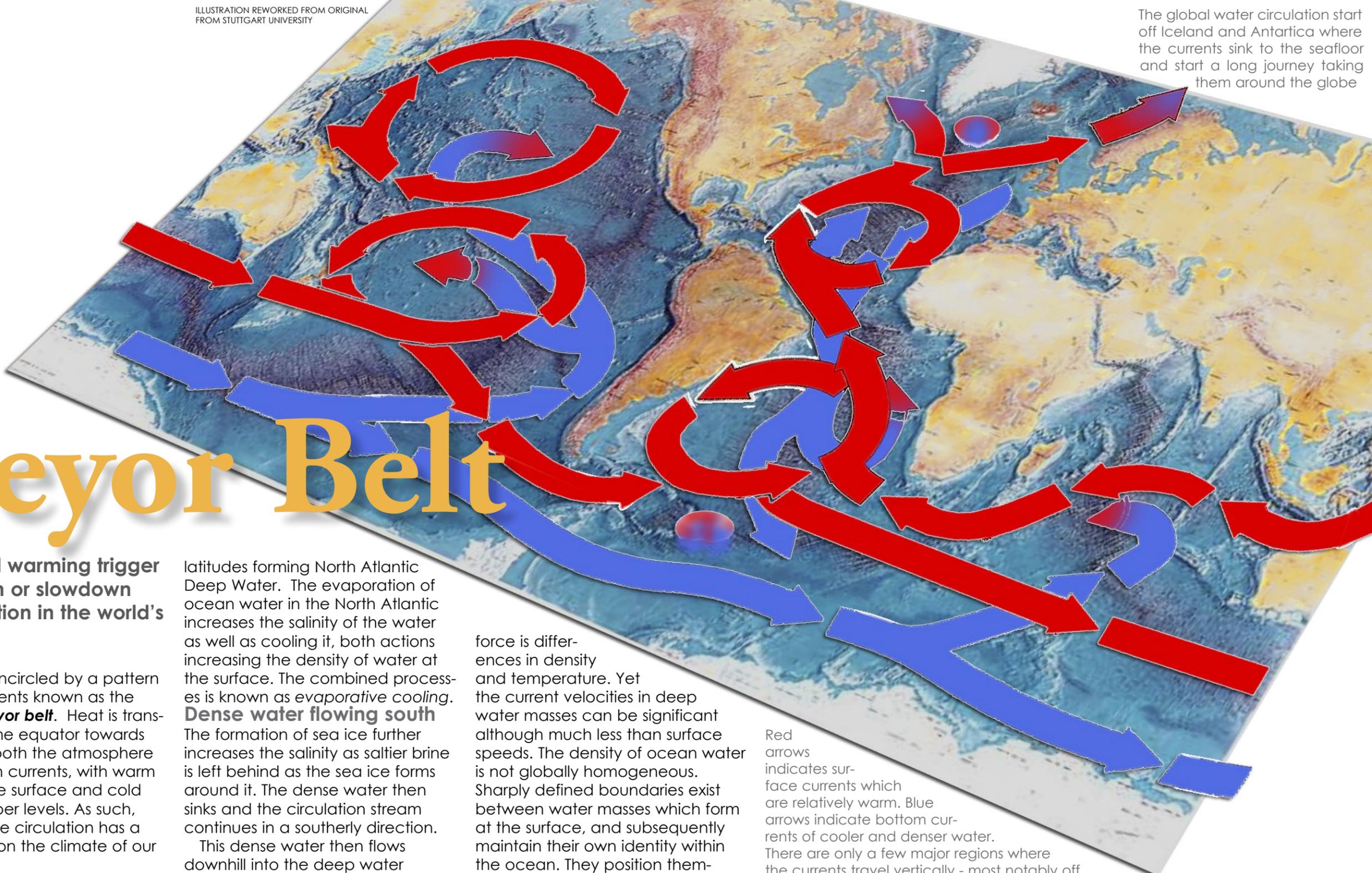
### Deep water masses

The dense water masses that sink into the deep basins are formed in quite specific areas of the North Atlantic and in the Southern

Red arrows indicates surface currents which are relatively warm. Blue arrows indicate bottom currents of cooler and denser water. There are only a few major regions where the currents travel vertically - most notably off Greenland and Antarctica where the currents sink

Ocean. In the Norwegian Sea evaporative cooling predominates, and the resulting sinking water mass, called the North Atlantic Deep Water starts a slowly southward flowing current. The route of the deep water flow is through the Atlantic Basin around South

Africa and into the Indian Ocean and on past Australia into the Pacific Ocean Basin. There is no corresponding flow from the Arctic Ocean Basin into the Pacific as the narrow Bering Strait is too shallow. By contrast in the Weddell Sea off the coast of Antarctica near the



*It is not the thermohaline circulation that is the primary reason Western Europe is so temperate. Europe is warm mostly because it lies downwind of an ocean basin.*

edge of the ice pack, the effect the sinking water masses is predominantly caused by brine exclusion when the surface waters freeze. The resulting water mass, the Antarctic Bottom Water, then sinks and flows north into the Atlantic Basin. It is so dense it actually flows under the North Atlantic Deep Water. Once, flow into the Pacific is blocked, this time by the Drake Passage between the Antarctic Peninsula and the southernmost tip of South America forcing the current eastward.

## Upwelling

What goes down must come up elsewhere. All these dense water masses sinking into the ocean basins displace the water above them, so that elsewhere water must be rising in order to maintain a balance. However, because this thermohaline upwelling is very widespread and diffuse, it has proven quite tricky to measure where upwelling occurs using current speeds, given all the other wind-driven processes going on in the surface ocean.

*However, the thermohaline circulation does warm Western Europe by about 2 °C relative to the similarly located west coast of Canada.*

Deep waters do however have their own chemical signature and tracking trace elements of silicon from deep water there is clear indications, though not solid evidence, that the bulk of deep upwelling occurs in the North Pacific. A number of other models of ocean circulation place most of the deep upwelling in the Southern Ocean, associated with the strong winds in the open latitudes between South America and Antarctica. ■

## So, Will The Gulf Stream Close Down?

In 2004 an analysis of satellite data demonstrated the North Atlantic Gyre, the northern swirl of the Gulf Stream, has been slowing markedly over time. Also The National Oceanography Centre in the UK found a 30% reduction in the warm currents that carry water north from the Gulf Stream from the last such measurement in 1992.

There is, however, presently no evidence for cooling in northern Europe or nearby seas but for quite the reverse. The bulk of available evidence seem to point that the Gulf Stream is relatively stable, whereas there is possibly a weakening of the North Atlantic drift.

In May 2005, investigations under the Arctic ice sheet found that the giant columns of sinking water, in which the cold dense water normally sinks down to the sea bed and is replaced by warm water, in turn generating

the North Atlantic Drift had virtually disappeared. Out of normally seven to twelve giant columns, only two were found, both extremely weak.

This has led to some fear that global warming may be able to trigger the type of abrupt massive temperature shifts which occurred during the last ice age. It is also thought that it was large influxes of low density meltwater from the Greenland ice sheet leading to a disruption of deep water formation and subsidence in the extreme North Atlantic that eventually caused the climate period in Europe known as the Big Freeze which lasted for about 70 years in the 1300's.

## It is very unlikely

It is, however, by no means clear that sufficient freshwater could be provided to interrupt thermohaline circulation. Present climate models indicate that it is not the

case. While previous prehistoric shutdowns have caused cooling, the current overall climate is different; and sea-ice formation in particular is less because of overall global warming. Modelling also suggests that increase of fresh water flows large enough to shut down the thermohaline circulation should be at least an order of magnitude greater than currently estimated - and such increases are unlikely to become critical within the next hundred years.

In coupled Atmosphere-Ocean models the Thermohaline Calculation tends to weaken somewhat rather than stop, and the warming effects outweigh the cooling, even locally. The North Atlantic is, actually, currently warmer than in the earlier measurements suggesting that either the circulation is not weakening, or that it does not have the hypothesised cooling effect - or that other factors are able to outweigh any cooling. ■

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# Maldives

*Sea Laboratory of Banyan Tree Vabbinfaru*

Text by Andrey Bizyukin, PhD  
Photos by Andrey Bizyukin,  
Alexander Andrians and  
courtesy of the Marine Lab  
archives

What are the Maldives in a nutshell? Astonishing lagoons of turquoise and completely transparent water, dazzling white sands under a tropical sun, lush fig trees and coconut palms... all of these elements conspire to create this world renowned tropical paradise. Hundreds of thousands of divers and other holiday-makers aspire to come to the Maldives. Now imagine all these islands with all their sunbathers, snorkellers and divers, most of whom want to experience the wonders of the underwater realm, the corals, colourful tropical fishes, turtles, dolphins, and for a few brave souls, perhaps a shark or two. Needless to say, this constant year-round influx of humans has an effect on the coastal ecosystems of these tiny islands. How long this romantic legend, this tropical paradise with a worryless life under palm trees, cloudless blue skies and an ocean full of fish, can withstand the pressure remains an open question.

Sunset on the pier





◀ The islands of the Maldives with their long jetties stretching out over the reefs are surrounded by crystal blue waters. BELOW THREE PHOTOS: Measurements are taken in the coral growth study



Enter the sea laboratory Banyan Tree Vabbinfaru, which, under the skillful direction of Abdul Aziz Abdul Nakim, is already working on solving some of these problems.

Very few individuals among the visiting divers seem to reflect much upon the fact that this wonderful underwater world can be destroyed in an instant. We need only to recollect the event of 1998 when excessively warm water brought to the islands by a very pronounced El Niño raised the temperatures of the surface layers of the ocean from 28-29° C to 30-31° C even in the area of the Maldivian islands, which lie in open ocean.

Just this seemingly insignificant increase in temperature of a couple of degrees causes bleaching, which ultimately, within a few weeks, leads to mass destruction of corals down to a depth of five meters.

The sea laboratory is located only 20 minutes by speedboat from Male, the capital of the Republic. But as you take the first step onto the island, it seems like you have reached another world.

This unorthodox scientific laboratory works in close collaboration with visiting

divers. It is a very far cry from the usually dry and, at times, seemingly geriatric academia. Here, marine science is laid out bare for everyone to see and partake. Yet, researchers who are famous in their fields come here to conduct their research and to offer popular lectures on the latest scientific advances in straight-forward language.

The Maldivian archipelago is a unique underwater world where the ecosystem has had millennia to evolve and enter a steady state. However, they still remain fragile and prone to outside disturbances.

The sea laboratory is set to study all aspects of sea life and is simultaneously working in several key directions at once, explains Abdul Aziz.

### The project: an artificial reef

The biggest flower in Banyan Tree Vabbinfaru is not something that grows on a stalk or a tree, but on a metal construction, 12 meters in diameter and four meters deep, welded from metal rods.

The structure has been nicknamed *Lotus* due to its superficial similarity to the famed flower, which in fact, does

not grow on the island.

The Lotus sits on a shoal 20 meters west of the sunset jetty on the island. A constant electrical current of 3 volts flows through the metal, keeping a slight negative charge in relationship to the surroundings. Titanium plates with a positive electric charge of plus 3 volts are located around the perimeter of the metal construction, at a distance of 1 meter.

With the exception of the Lotus construction, most experiments here have been done with small metal pyramids welded from rods. Initially these structures look very much out of place and without an obvious purpose, but soon enough they start to perform their small miracles.

With the aid of electrolysis, the growth of small corals is stimulated and the framework turns into structures of corals with remarkable speed.

Fragments of corals are stuck in place with plastic fasteners to the metal lattice where the weak current induces rapid growth in the corals. They soon grow to cover the whole structure. Even slices of coral that were very sick, or almost dead, seem to liven

up and start a phase of rapid regrowth once fastened to the structure. The symbiotic algae, the zooxantellae, which lives symbiotically within the coral, soon return to their hosts giving them their vibrant colours.

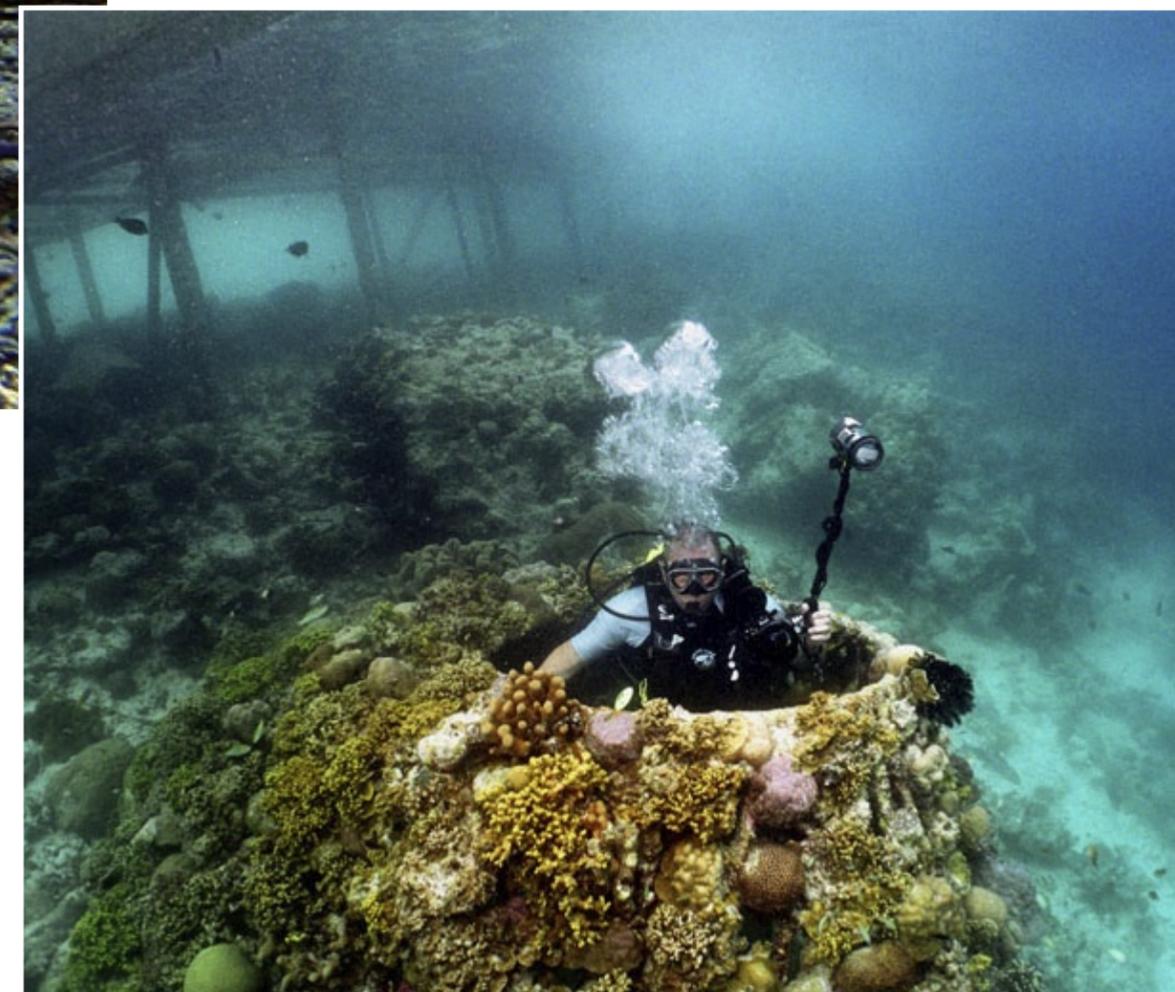
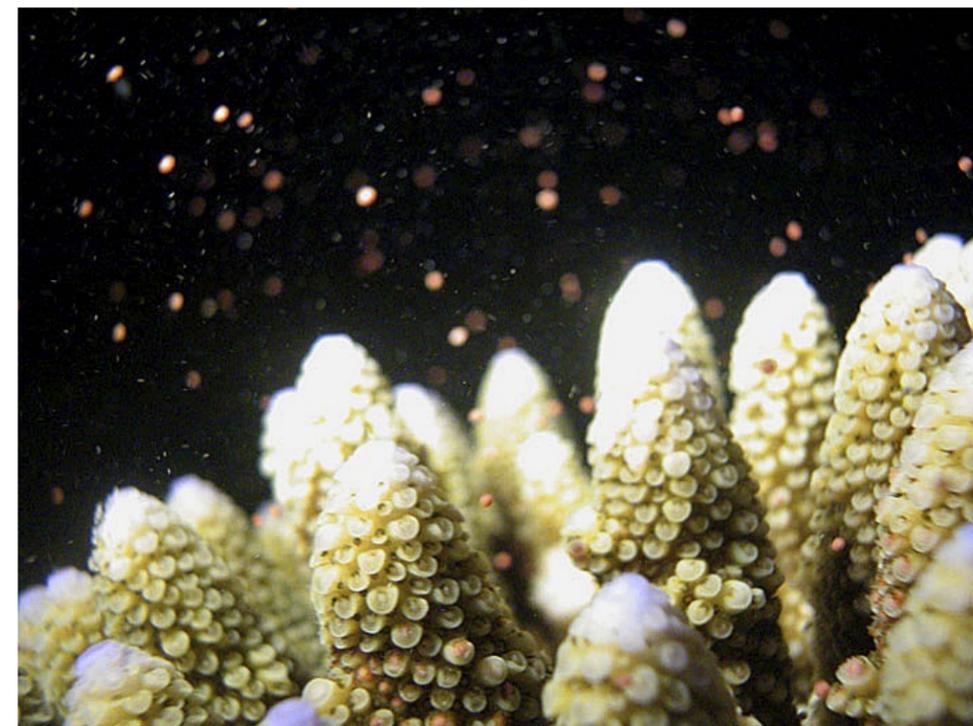
The results of the experiments have surpassed all expectations. The new corals, grown under somewhat artificial conditions, seem to be stronger and more resilient against the ravages of disease, pollution and the rising ocean temperatures.

Their apparent health is a testament to the successful growth of coral gardens even in the presence of certain other inhabitants of the sea. The predatory starfish, crown of thorns, for example.

Abdul Aziz Abdul Nakim



A diver inspects the coral growth found on the 12m diameter and 4 meter deep metal construction, *Lotus*, created to stimulate coral growth with a constant low current of electricity. BELOW: Coral spawning



These starfish live off coral polyps and have ravaged huge areas of the Great Barrier Reef off Australia. Consequently, divers on the Maldives have always been keen to collect them and take them ashore and out of harms way in order to protect the corals.

In addition to the rapid growth of corals, huge congregations of butterfly fish also signals a healthy coral colony.

In order to manage the development of coral plantation at Banyan Tree Vabbinfaru, a technique is employed whereby hundreds of meters of cable are laid underwater to form the basis of artificial reefs. In this underwater laboratory, it is possible for eco-conscious visiting divers to participate in surveys.

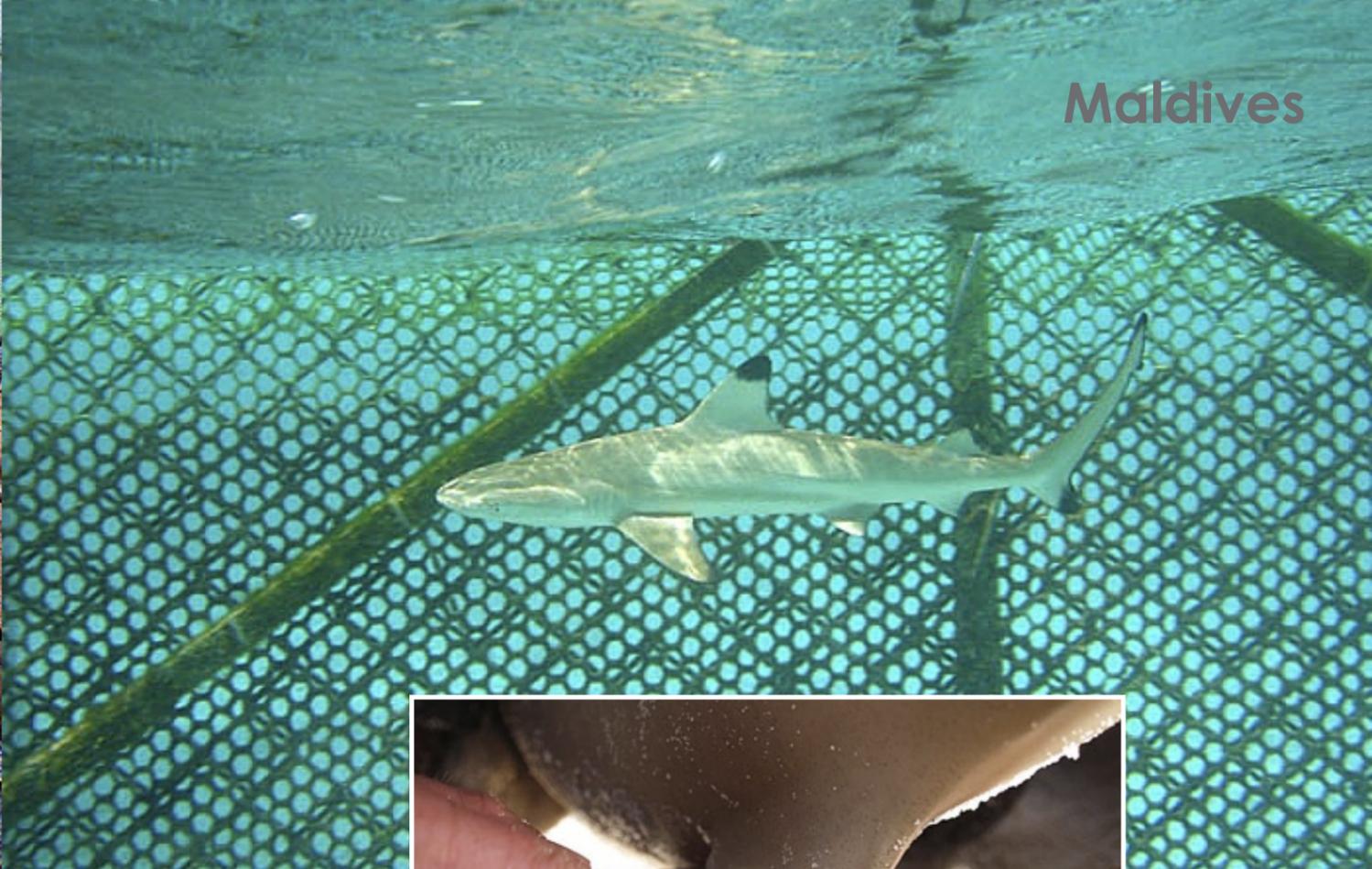
Divers quantify these new inhabitants of the sea by diving along these cables writing down their observations on slates. All the data collected this way aids in monitoring the development of the corals in more detail. For this reason, every helping hand is much welcomed. In return, the visitor gets an insight into a very interesting and promising scientific project and a rare opportunity to dive with a greater purpose.

Around the island of Banyan Tree Vabbinfaru and across a house reef in a depths to up to 30 meters, we find a lot of small flat cement tiles, now overgrown with young corals, and near which a lot of electronic temperature gauges are spread out. Scientists, volunteer divers or visitors who are simply inquisitive, regularly dive down to photograph and measure the sizes of new coral polyp colonies growing on the tiles. Thus, the laboratory staff can study the relationship between growth rate of corals and depth and temperature fluctuations of water.

An event that is exciting even for seasoned scientists is the spawning of the planted corals, which has previously only been described in Australia and Okinawa. Not until now has it been witnessed and described in the Indian Ocean.

A diver emerges from a coral formation near the pier





Scenes from the shark cage: research staff captures, weighs and measures Blacktip sharks



◀ Tagging a shark

Under the full moon on March 23, under Abdul Aziz' watch, the corals of the project spawned in unison. On this unique night, which only occurs once per year, all the polyps in a colony, as if they have all entered an agreement or following some command, spawn huge quantities of eggs and sperm giving life to new coral reefs.

"Probably in the future, our knowledge and techniques will allow us to accelerate growth to restore or even to increase the quantity of coral reefs in various areas of world ocean. We need only time and help from both experts and regular divers engaged in the sea environment to achieve a better understand-

already drawn a lot of attention from the government and has been rewarded a special prize by the Republic's President Maldivskoj.

### The shark study

In the sea, approximately 200 meters off the coast, we find mesh wire fencing off a small area in the water. This is a holding cage for Blacktip sharks. We are going to dive into it.

As we gingerly descend down a slippery rusty ladder, we grip hard onto our cameras. We enter the opposite world.

Usually divers are protected from sharks by being in a cage, but here in this research experiment, it is not the

ing of the wildlife of coral reefs," said Aziz.

The research into artificial reefs has been taking place here for only a short number of years, but the project has

case. Sharks and people will study each other, face to face, in the enclosed space. It is going to be interesting to see who will be frightened, or God forbid, who will suffer from the close encounter.

Rule no. 1: Above all, do not give the sharks an opportunity to attack. For this reason, I lie down heavily upon the bottom as I am overloaded with photographic equipment.

It is not a good idea to reason out the many different ways a shark might bite you. But it is necessary to lay easily on the sea floor and confidently repeat to oneself the same words over and over again, "I am not afraid of sharks. I adore sharks. They are white and fluffy."

At this moment, the sharks merge. Unbenownst to us, the sharks have gathered together in a flight response, hammered up into a corner and observing us. I take a deep breath and take the first series of pictures.

My self-confidence rises and I decide to aggravate the situation a bit—I begin by confidently moving toward in their

small party.

The sharks are nervous and rush at me. I fade back, nestling on a sea floor again with the continuous descent of my camera.

I notice that the sharks are led by an individual. One of them, which is larger, flies directly by my right ear.

Ah-h!!! My adrenaline flies off the scale! What was that? A practice attack or a gesture of despair? I check my camera chamber and correct the position of the flash. I am again enveloped—this time by two sharks.

Rule no. 2: Do not exhaust and pin an animal in a corner—do not create a desperate situation for the animal. Contradicting logic, it will strike out with the most desperate actions. Therefore, I decide not to come near to the sharks

the the sharks, they apparently act like old friends and understand each other.

Obedying orders, Shahid, moves the sharks as if with a magic wand, and aligns them all in a line like trained circus animals, which begin moving clockwise, circulating in an open-air cage. Here that common language means!

Rule no. 3: Do not test fate more than once. Therefore, after having finished shooting a film, I finish the dive and politely bowing, indicate that I am retiring from the shark house with a trouser full of unforgettable impressions.

"Blacktip sharks are a very rare kind in our waters. Therefore, we study them

anymore. But I ask Shahid, our dive-guide, to provoke the sharks to move in a shelter. If the expert often feeds



◀Mugshot of a sea turtle  
BELOW: A Sea turtle heads to the sea with technology on its back to track its movements

# Maldives



Some sharks live continuously in our open-air cage-cell. We feed them, we study their habits, we catch them periodically to measure and weigh them and when they have grown enough, we tag them with special labels and we set them free in the sea," said Aziz.

Sharks are absolutely amazing creatures. For example, when a couple of sharks are mating, the male holds the female with his teeth with all its force, causing some absolutely awful wounds. Any other animal would be lost from such traumas, but the phenomenally powerful immune system of sharks allows them to cope with any problems. There is a Russian saying about healing of this sort, one would say: "heals like a dog". On the Maldives, one would probably say, "heals like a shark".

To catch sharks, harmonious direction, work and skill is required, handling sharks with the magic of a conjurer. The main skill is to correctly seize a shark and confidently turn its belly up. If one manages to get the shark upside down, a sharp change of blood-pressure places the shark into almost instant relaxation. In such a sleepy state, you can do anything with a shark, pull it out of the water, measure its length from the nose to a

tail, weigh it and place labels under fins.

We also were not kept from the temptation to hold a live shark in our hands. It was surprisingly warm with gentle rough leather skin. It is simply an unforgettably pleasant sensation. The white skin of a shark is most similar to the white enamel of the teeth of mammals, only it has, of course, elastic properties.

Aziz marks the sleeping sharks, pinning an inker into their skin with a standard sized tetracycline ring. The antibiotic tetracycline stays a long time in the skin of a shark. By repeatedly catching a shark over the long term, on increased at a rate of tetracycline ring, it is possible to calculate the growth rate of an animal in its natural environment and dwelling.

In order not do too much harm to an animal, all scientific procedures are completed in no more than 20 minutes. After that, the shark is put back into the water, belly turned downwards. The hunter quietly pats it, trying



to wake it up from its sleepy, drowsy state. Gently woken, the shark starts to move, at first languidly, but then, as if having regained consciousness from a dream, it moves confidently back into its native element, the sea. It is simply a miracle.

### Green turtle study

It is considered that green sea turtles can become a dieing breed. Therefore, the work of collection by a laboratory is connected with educational lectures among the population

ABOVE: Safe from predators and other dangers, juvenile sea turtles enjoy a free swim in clear waters

Above and below shot of the lagoon at the Banyan Tree resort, Vabbinfaru



BELOW: Research staff have opportunities to relax on the beach in comfy hammocks. BOTTOM RIGHT: The shark pens where researchers study Blacktip sharks

Maldives's turtles can be vast.

**Life at Banyan**

Scientists at Banyan Tree Maldives Vabbinfaru are not isolated within the precincts of the laboratory. They give lectures at schools, invite visitors to the islands to participate in their projects. "Support us in our scientific research. Come to us and you will

get closer and more acquainted with the life of reefs and sharks. Be accurate and close to the sea. Do not collect corals and cockle shells. Help us maintain the unique underwater world of the Maldives. We are always glad for visitors," said Aziz to finish the story. For more information, email: [Abdul.azeez@banyantree.com](mailto:Abdul.azeez@banyantree.com)



A sea turtle soars through the shallows

of atolls and the study of the ways of the migration of these ancient animals. For this purpose, special labels of laboratory with the instruction of date, a place and Banyan Tree Vabbinfaru address which fasten in axillary areas of the turtle fins are used. For the same purposes, a portable radio beacon fixed on back armour of an animal is sometimes used.

If you meet such a turtle somewhere in the Indian Ocean, inform Aziz about it. Regular divers have been very helpful with the work of scientists. Observers found one of the endangered turtles near the Seychelles and another off the African coast. Now, we know that the migration routes of



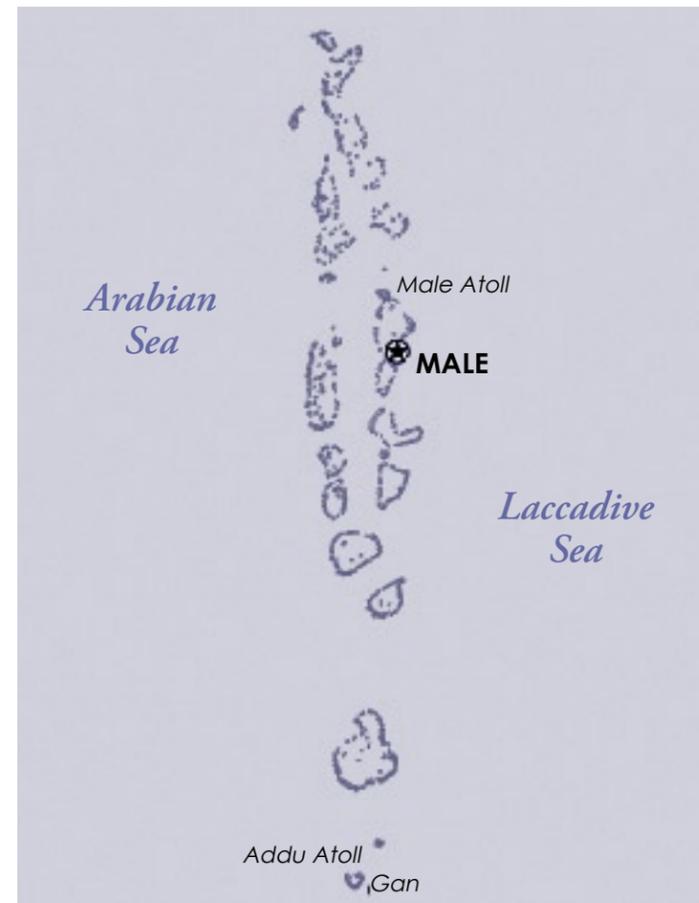
A diver inspects the Lotus, an electrified artificial reef



# fact file

## Maldives





**History** The Maldives was long a sultanate, first under Dutch and then under British protection. It became a republic in 1968, three years after independence. Since 1978, President Maumoon Abdul GAYOOM - currently in his sixth term in office - has dominated the islands' political scene. Following riots in the capital Male in August 2004, the president and his government have pledged to embark upon democratic reforms, including a more representative political system and expanded political freedoms. Tourism and fishing are being developed on the archipelago. Government: republic; Legal system: based on Islamic law with admixtures of English common law primarily in commercial matters; has not accepted compulsory ICJ jurisdiction; the US does not have an embassy in Maldives; Capital: Male

**Geography** Southern Asia, group of atolls in the Indian Ocean, south-southwest of India (3 15 N, 73 00 E). 1,190 coral islands grouped into 26 atolls (200 inhabited islands, plus 80 islands with tourist resorts); archipelago with strategic location astride and along major sea lanes in Indian Ocean. Coastline: 644 km. Terrain: flat, with white sandy beaches; lowest point: Indian Ocean 0 m; highest point: unnamed location on Wilingili island in the Addu Atoll 2.4 m; Natural resource: fish; Natural hazards: low level of islands makes them very sensitive to sea level rise; Environmental issues: depletion of freshwater aquifers threatens water supplies; global warming and sea level rise; coral reef bleaching

**Climate** tropical; hot, humid; dry, north-

east monsoon (November to March); rainy, southwest monsoon (June to August)

**Population** 359,008 (July 2006 est.) Ethnic groups: South Indians, Sinhalese, Arabs; Religion: Sunni Muslim; Internally displaced persons: 11,000 (December 2004 tsunami victims) (2005)

**Languages** Maldivian Dhivehi (dialect of Sinhala, script derived from Arabic), English spoken by most government officials

**Economy** Tourism, Maldives' largest industry, accounts for 20% of GDP and more than 60% of the Maldives' foreign exchange receipts. Over 90% of government tax revenue comes from import duties and tourism-related taxes. Fishing is a second leading sector. The Maldivian Government began an economic reform program in 1989 initially by lifting import quotas and opening some exports to the private sector. Subsequently, it has liberalized regulations to allow more foreign investment. Agriculture and manufacturing continue to play a lesser role in the economy, constrained by the limited availability of cultivable land and the shortage of domestic labor. Most staple foods must be imported. Industry, which consists mainly of garment production, boat building, and handicrafts, accounts for about 18% of GDP. Maldivian authorities worry about the impact of erosion and possible global warming on their low-lying country; 80% of the area is one meter or less above sea level. In late December 2004, a major tsunami left more than 100 dead, 12,000 displaced, and property damage ex-

ceeding \$300 million. Over the past decade, real GDP growth averaged over 7.5% per year. As a result of the tsunami, the GDP contracted by about 5.5% in 2005. Agriculture: coconuts, corn, sweet potatoes; fish; Industry: fish processing, tourism, shipping, boat building, coconut processing, garments, woven mats, rope, handicrafts, coral and sand mining

**Currency** rufiyaa (MVR); Exchange rates: 1 USD = 12.6 MVR; 1 EUR = 16.09 MVR; 1 AUD = 9.55 MVR; 1 SGD = 7.95 MVR; 1 CAD = 11.26 MVR

**Visa** Valid passport, onward/return ticket and sufficient funds required for entry. 30-day no-cost visitor visa issued upon arrival. Extension 90 days with sufficient funds staying at a resort or hotel or present a letter from a local sponsor. Stays over 60 days face heavy fines and deportation. Airport departure tax charged. Yellow fever immunization required if travelling from infected area.

**Local Customs** Alcohol, pork, images or worship and pornography are prohibited. Alcohol is available at resorts and on safari boats.

**Diving** The Maldives comprise of 7000 low-lying coral islands in a 1200-mile chain Southeast of India. About 200 of the islands are inhabited (although visitors have very little interaction with the 175,000 predominantly-Muslim residents), and several are devoted entirely to small resorts that offer average to excellent tropical reef diving with big fish action if the resort

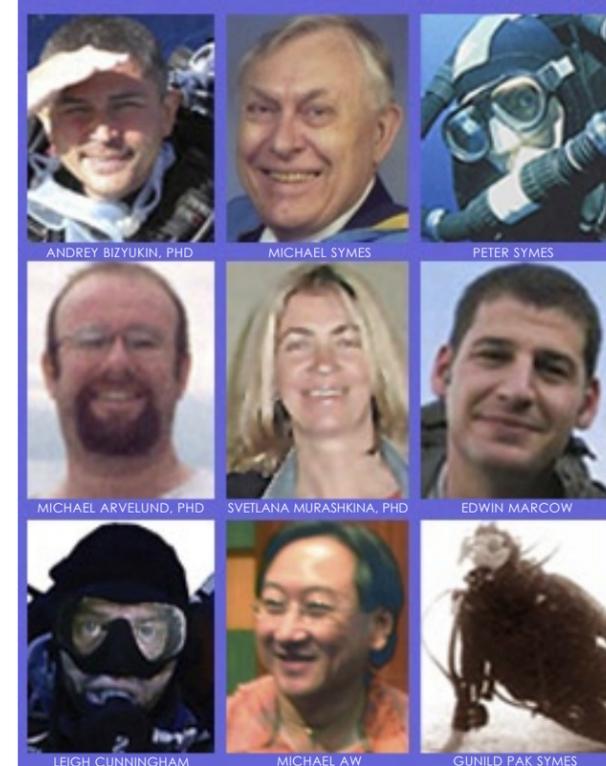
has a knowledgeable staff that knows where and when to find it. However, the Maldives are best dived from live-aboards to get to the pristine dive sites in the more remote locations.

**Decompression Chamber** Two recompression chambers are available in the Maldives. One is on Bandos Island (fifteen minutes by speedboat from Male) and the other is in Kuramathi (one hour by speed boat and about twenty minutes by air taxi from Male.)

**Health** Immunisation against typhoid, hepatitis A and polio is recommended. Precautions should be taken to avoid sunburn and dehydration. There is a good private hospital on Malé and first aid facilities are available on all the resort islands. Food and water in the resort hotels is generally risk-free. Medical insurance is advised.

### Websites

Maldives Tourism  
[www.visitmaldives.com](http://www.visitmaldives.com)  
 Banyan Tree Vabbinfaru  
[www.banyantree.com/maldives](http://www.banyantree.com/maldives)



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Edited by  
Gunild Symes

# Super protection, for fun under the sun Divers' Cosmetics

All photos are courtesy of the manufacturers

## CARIBBEAN BLUE - SUN SHIELD SPORT

100%, all-natural sun protection made with tropical oils, botanical extracts and anti-oxidant vitamins, Sun Shield is a completely natural, non-whitening cream that protects, moisturizes and soothes the skin. Instead of synthetic chemical ingredients, it contains natural zinc oxide in a new patented transparent form called Z-cote. It is made using the latest scientific research on sun protection: UVB rays cause sunburns, while the deeper penetrating UVA rays cause premature aging, wrinkling and even skin cancers. Bug n'Sun is also all-natural, non-toxic, moisturising, DEET-free—an effective repellent with full spectrum sun protection great for kids. [www.gocaribbeanblue.com](http://www.gocaribbeanblue.com)



## SPORT XTREME Ocean Potion

SPF 30 Sunblock is an advanced, light-absorbing cream designed for outdoor enthusiasts, which offers Broad Spectrum protection against UVA1, UVAII and UVB skin damaging sunrays. Very water/sweat resistant, oil free, Paba free and non-greasy. Contains Parsol® 1789 and anti-oxidant vitamins A, C and E to help reduce cell-damaging free radicals. Price: US\$8.00 [www.opotion.com](http://www.opotion.com)



Divers often find themselves out in the elements under a harsh sun in the tropics or scathed by whipping icy winds in the Arctic. Our skin, face, lips, eyes and hair take a beating. Plus there are also nasty stings to deal with from critters like mosquitoes and jellyfish. So, we searched the cyberwaves for some of the best UV protection, hair and skin care products that will help divers maintain that healthy glow and silky mane regardless of how many dives and adventures we enjoy.

**KISS MY FACE** face factor sun has spf 30 fragrance free protection for your face and neck. [www.kissmyface.com](http://www.kissmyface.com)



## Xterra Sunblock SPF 44 & Lip Ice

are the only brand of sunblock and lip balm tough enough for the Xterra off-road triathlon series, maybe they're tough enough for divers too. SolRx and Xterra's eight hour waterproof/sweat-proof sunblock have signed a global license agreement to brand and produce Xterra sunblock. They are the industry leader in function testing certifying a full eight hours of protection. Apply today...Reapply tomorrow. Visit their website at [www.solrx.com](http://www.solrx.com) for more information. For more Xterra products go to [www.xterragear.com](http://www.xterragear.com) or email: [rt@xterragear.com](mailto:rt@xterragear.com)



**ALOE UP'S** best selling sunscreen is Pro SPF 30 Sport Lotion sunsreen is a unique 8 hour water-resistant formula based with 35% pure aloe vera gel. The Pro Series sunscreen is non-greasy, sweat proof, non-comedogenic, hypo-allergenic and certified biodegradable. Priced at 4oz for \$10.99, 1oz \$4.99. Look for it and check out other useful products such as Lip Ice, Water Sports Jelly, Sunburn Relief Jelly, Facial Moisturizers and Pure Aloe Vera Gel at scuba shops or Aloe Up's online store at [www.aloeup.com](http://www.aloeup.com)



# cosmetics

## Skin Care & Protection

**Barracuda Aqua** Hydrating Body Lotion & Gel for waterlovers is a refreshing, light, quick absorbing lotion that replenishes the natural moisture in the skin. This unique lotion was specially formulated by swimmers for swimmers to help counteract damage to skin caused by repeated exposure to chlorine, hard water, wind or sun. Luxuriant texture applies smoothly with a fresh scent. Barracuda Aqua Hydrating Body Gel also replenishes skin's moisture lost to chemicals, wind, or sun. Try Aqua's Shampoo for swimmers to restore damaged hair exposed to chlorine, salt, sun and wind. Lotion Price: US\$8.50 Gel & Shampoo Price: US\$7.00 each [www.trivillage.com](http://www.trivillage.com)



**KINESYS Sunscreen Spray** with Parsol® 1789 is a fast drying oil free, alcohol free, PABA-free, water and sweat resistant, hypoallergenic and non-comedogenic SPF 30 microspray—no rubbing of tender skin! Has broad spectrum UVA/UVB protection. Mango scented. Perfect for sports. Sprays on wet and dries in 2-3 minutes leaving no residue to affect grip. Price: US\$5.00-16.00 [www.kinesys.com](http://www.kinesys.com)

**WET DREAMS ZinClear Natural Sunscreen** was formulated in Australia where clear cloudless summer days and a mostly unpolluted atmosphere means that more ultra

violet radiation reaches humans more so than any other country, leading to the highest occurrence of skin cancer per capita in the world. Skin damage occurring in youth has been found



to be a critical factor in the development of melanomas later according to experts. Therefore, the use of sunscreens is paramount. Wet Dreams All Natural Sunscreen relies upon the natural ingredient, zinc oxide to make up a sun shield. ZinClear zinc oxide works by reflecting UV light while allowing visible light to pass through the skin (unlike most synthetic chemical actives) thereby limiting the need for multiple active ingredients and reducing the chance of malignant melanomas. Contains only natural or nature identical ingredients. Great for sensitive skin. [www.wetdreams.com.au](http://www.wetdreams.com.au)



**SKINCEUTICALS Sport UV Defense SPF 45** is for people with active lifestyles. A true broad-spectrum waterproof and sweatproof sunblock, it delivers maximum protection during high-energy activities. Contains transparent zinc oxide and other active sunscreens to help protect against damaging UVA rays that cause premature aging of the skin. To reduce the chances of irritation, ingredients are encapsulated in dimethicone to provide increased SPF with fewer chemicals. [www.skinceuticals.com](http://www.skinceuticals.com)

### Dr. Andrew Weil for Origins™

Plantidote™ Mega-Mushroom Face Serum optimizes the skin's defenses against aging, skin sensitivity, extreme dryness, redness, hyperpigmentation, lines, wrinkles, puffiness and flushing due to inflammation, which Dr. Weil calls "the fire within," who believes it to be the cause of several seemingly unrelated conditions. This serum contains a unique blend of some effective natural substances including Hypsizygus ulmarius, Cordyceps and Reishi mushrooms, Ginger, Turmeric, Holy Basil, Resveratrol and Argan Nut Oil. Plantidote™

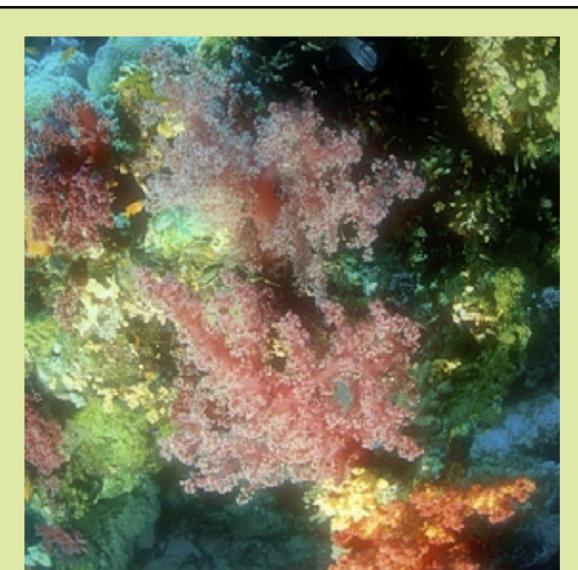
Mega-Mushroom Face Cream with Hypsizygus ulmarius and Chaga mushrooms helps to quiet and calm the skin immediately by mimicking a process that sends Narcissus Lily Bulbs into dormancy as a means of "self-protection". Menyanthus and Heather extracts keep skin firm; Fucoidan from Okinawan seaweed discourages moisture loss, Vitamins C and E defend against destructive oxidation. [www.origins.com](http://www.origins.com)



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Allergy Tested. Fragrance-Free. Aloe enriched body moisturizer soothes, cools and conditions the skin. Takes the heat out and preserves the tan. Anti-inflammatory ingredients with calming and soothing properties for men's skin includes glycerin to hold and retain moisture and help bind moisture to the skin; squalene derived from wheat germ softens and lubricates the skin; aloe vera soothes, moisturizes, calms, promotes healing and helps to restore the natural pH level to skin; grapefruit oil, a natural astringent, soothes and revives; Mandarin lessens scarring and stretch marks and tones the skin; azulene derived from German chamomile is an anti-inflammatory that calms and soothes the skin is also a natural astringent with antibacterial and anti-inflammatory properties; mint and orange refreshes, sluggish, congested skin.

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



**IS SUNSCREEN DAMAGING TO CORAL REEFS?** While chemical and pesticide runoff is known to degrade the coral reefs, it is not known what impact the sunscreen humans wear in the ocean has on corals and reef ecology. To be safe, wear a wetsuit and use sunscreen on exposed skin only, thereby limiting the amount of chemicals sloughed off of our bodies on our dives, which may negatively affect the corals we so enjoy.

**DO CORALS NEED PROTECTION FROM THE SUN?** Yes, and according to Australian Institute of Marine Science (AIMS), they have their own natural sunscreen provided by an amino acid (MMA). Current research is developing a natural sunscreen for humans based on the substance that provide protection for corals. For more information, see: [www.aims.org.au](http://www.aims.org.au)

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## Hair Care & Accessories



### Got Long Hair?

The Action and Water Sports Hair Glove® line is the first-ever hair accessory designed for us long-haired water and action sports enthusiasts. The "Extreme" Hair Glove® line is water resistant and prevents tangling and knotting even under the waves. Protects hair from sand, salt, wind, dirt and other "elements" while still stylin' in appearance. Wear it with wet suits, dry suits or jeans. Exclusive patented built-in Flex-Hook™ keeps hair stationary, tangle free and neat all day. Perfect when the look is as important as the function. [www.hairglove.com](http://www.hairglove.com)



### Biodegradable Shampoo

Sprint Shampoo and Body Bath cleans and removes all chemicals found in water using a special PH balanced formula containing a conditioner and skin moisturizers which help restore hair and skin to a healthy condition after water sports activities. Low suds shampoo is easy to apply and rinse out. Safe for the environment because its 100% Biodegradable. Only small amounts necessary for effective use. Bottle is 8 oz. in size. Price: US\$ 5.49 [www.sprintaquatics.com](http://www.sprintaquatics.com) or [www.swimsuitsforall.com](http://www.swimsuitsforall.com)



### JASON Natural Shampoo & Conditioner for Water Lovers Swimmers & Sports™

Rejuvenating Shampoo and Revitalizing Conditioner for aquatic sports enthusiasts contains no lauryl/lau-reth sulfates and are fortified with Panthenol, Aloe Vera and Vitamins A, C & E and Sea Kelp. A mild shampoo, it helps keep hair soft while stopping damage to hair and scalp due to chemicals, chlorine, minerals, salt and sweat. Hair loses its shine when it is exposed to the sun, and the water from chlorinated pools, hot tubs, health spas and the ocean, becoming brittle, dull, dry, unmanageable and prone to breakage. Sea kelp extract in the conditioner softens, hydrates and plumps up each hair shaft to give hair flexibility, fullness, bounce and shine, while a vegetal protein complex and vitamins protect, repair and reinforce hair fiber. UV protection is provided by natural sunscreens. [www.jason-natural.com](http://www.jason-natural.com)



**Apivita** Propoline Sports Shampoo for Hair and Body is a product for both body and hair, especially for after water sports. Offers anti-mycosis and anti-oxidant protection to the skin and protects from sweat and chlorine. Ingredients include extracts of echinacea, citrus, grape seed, tea tree, wheat proteins and panthenol, which all work to boost the skin's natural defense. 8.5 oz. Price: US\$14.50.

[beautyexclusive.com](http://beautyexclusive.com)



### Salt Removal with Peppermint & Eucalyptus

The Training Zone Sports Hair and Body Shampoo is a revitalizing shampoo and body wash that even removes chlorine and salt while giving your scalp a little kick of tingling eucalyptus and peppermint oils.

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



### PURE ESSENTIAL™ Hair Care

Pure plant essential extracts of natural chamomile, bergamot, rosemary, ivy, nettle, yucca, lavender, cherry bark, myrrh and other extracts gently replenish natural oils, leaving your hair shiny, soft and manageable, without synthetic oils. Aromatherapeutic natural fragrances invigorate, calm, relax or soothe. Whole wheat and soy proteins repair split ends and moisturize dry, over-brushed, permed, blow-dried or environmentally damaged hair. pH balanced from 5.0 to 6.0. No artificial colours, parabens, formaldehyde, toxins, petroleum products, harsh cleansers, carcinogens, drying-soaps, animal testing or ingredients. Visit: [www.earthessentials.com](http://www.earthessentials.com)

### DO WEAR Bandana & Stubby No-Tie for Ladies and Gents

The Wickie Wear Tie-Back is the high tech bandana for active women. It has a tie back design for a custom fit with a built in pony tail keeper, DriSmart moisture wicking shell, Transpor dry layer sweatband, CoolMax/Lycra stretch band in back for fit and comfort. One size fits all. Lots of cool colors, patterns and fabrics. The Polar SweatVac Cold Weather Cap (shown in green) has a DriSmart™ shell with Transpor™ liner and thin windproof ear panels. Extremely comfortable under-the-helmet or hood sweat management tool with sleek 'stubby' tail. Doesn't itch and dries four times faster than cotton. UPF 40+ protection. Machine Washable. Price: US\$16.95-24.95

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



### PhysiClean Sports Shampoo

is created for the active body and promote healthy hair. The mild formula is enhanced with lavender, clove, rosemary and eucalyptus. Offers key vitamins, proteins and minerals to further ensure renewed vitality in a healthy scalp and skin. Cleanses hair from oils and impurities. PhysiClean offers the first high end Spa quality line of personal care products specifically designed for active bodies.

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Sun/Wind Burn  
Insect Bites & Jellyfish Stings*



**Safe Sea Jellyfish Sting Protection** lotion for kids and adults has SPF 30+ sun protection. No more fear of dangerous and painful jellyfish stings to keep you out of the sea! Nidaria Technology Ltd created Safe Sea Jellyfish Sting Protection to solve this problem. A breakthrough in protection gels against the stings of jellyfish, sea nettles and sea lice, it protects you from the sting and pain you might get if you bump into one of these sea creatures. Its completely waterproof, making it perfect for scuba divers, ocean swimmers and sunbathers. Price: US\$9.88 for a 4 oz bottle or four bottles for US\$30.00 [www.divesports.com](http://www.divesports.com)



**Jurlique** Day Care Face Cream from Australia provides maximum hydration and protection in extreme climatic conditions on dry and hot, cold and windy days. Free of mineral oil and petroleum jelly, it is ideal for babies. Made with plant ingredients such as, Calendula, Chamomile, Daisy, Marshmallow, Rose, Viola, Green Tea, Grape Seed, Turmeric, Shea Butter, Hydrolyzed Soy Protein, Vitamin C, Vitamin A, Bitter Orange Oil, Rose essential oil and Vitamin E, it soothes dry skin of the face and neck. All natural and herbal antioxidants, vitamins and ingredients are grown organically and biodynamically on the Jurlique Herb Farms in South Australia. No fragrance, artificial colors, petrochemical or coal tar ingredients. Not animal testing or contents. 1.4 oz/40ml. [jurlique.com.au](http://jurlique.com.au)



**BRAVE SOLDIER Friction Zone** Endurance sports formula is a superior anti-chafing, cold water and sweat resistant occlusive silicone/botanical barrier, which protects and conditions skin for hours. Help to prevent blisters and reduce rash irritations. Contains no petrolatum, so it's safe for wet suits. Long lasting protection from any sports activity where gear chafing of your skin is a problem, while the antibacterial formula helps prevent minor skin irritations. Price: US\$16.00

**Maximum Lip & Nose Protection** crystal clear non-sticky formula soothes, heals, moisturizes, protects and hydrates tender lips. Prevents chapping, sunburn, windburn, leaving lips kissably soft. Prevents trans-epidermal water loss. Forms a long-lasting film protective. Ingredients include Vitamin A, C, E, Shea Butter, Jojoba Oil, Macadamia Nut oil, Aloe Oil, Natural Citrus Flavor. Price \$8.00 .33 oz [www.bravesoldier.com](http://www.bravesoldier.com)

**SKYN Iceland** Arctic Face Mist relieves irritation, itchiness and inflammation due to stress-related histamines, instantly soothing and stabilizing irritable skin with a cooling burst of mineral water improving tone and texture dramatically. Vital minerals and nutrients help boost and energize skin for a healthy, radiant glow. Ingredients include yeast extract which soothes and helps calm inflamed skin; a Triple "T" blend of white, yellow and green teas for super anti-oxidant power; Chapparral extract to refine skin texture and enhance radiance; White Willow Bark to soothe irritation and help provide antibacterial protection. It is a natural skin-soothing analgesic.

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

Icelandic Relief Eye Cream provides immediate relief to the delicate skin under the eye, erasing deeper lines, puffiness and darker circles due to stress-related nutrient and oxygen depletion. Contains rice peptides to minimize wrinkles; Vitamin K to increase circulation and lighten dark circles; Mandarin Peel to reduce puffiness; Icelandic Kelp to revitalize and fight inflammation; and cotton powder to fill fine lines and act as an optical diffuser. [www.skyniceland.com](http://www.skyniceland.com)



**After Sting Gel** Tender Corporation's new Jelly Fish sting treatment provides immediate, effective relief. After Sting Gel stops the painful burning, itching and swelling of stings and bites and begins the healing process. The sooner you apply After Sting Gel after being stung, the sooner you will get relief. For adults and children two years or older After Sting Gel is the only sting relief product to contain Baking Soda. Price: US\$12.00 [www.tendercorp.com](http://www.tendercorp.com)

**Dry Chapped Hands?** Mode De Vie Shea Butter hand cream is an intensive treatment for dry chapped hands exposed to the harshest conditions forming a shield to protect your skin against water, wind, sun and extreme cold. This cream contains an ideal blend of rich emollients and shea butter, which is easily absorbed completely and acts as a barrier against moisture loss for softer hands. It moisturizes, rehydrates and protects with a hint of lavender. Price: 4 floz USD\$ 17.00, CAD\$ 19.75 [www.modedevie.com](http://www.modedevie.com)



**Old Faithful: Vaseline Petroleum Jelly** Diving in the Arctic? Protect your face from the extreme cold with a layer of Vaseline Petroleum Jelly, a staple in medicine cabinets since 1870. Extreme divers in Scandinavia have used this well-known product for decades. Protects skin from wind burn and chapping. Offers soothing protection for minor burns. Contains no colours, fragrances or irritants. Hypo-allergenic and non-comedogenic. Find it at your local grocery store or pharmacy.

# cosmetics

*Pamper yourself  
with sea spa  
treatments*



## From Down Under

Australian Organics understands the fundamental technical aspects of hair and scalp nutrition and treatments. They say, when the overlapping scales of hair shafts are sealed, the hair shaft appears smooth and shiny, so they try for better looking hair by promoting smoothness of the hair shaft from root to tip by careful cleansing of the roots and correct conditioning, moisturizing and sealing of the hair itself. According to these Aussies, hair is made up of about 97% protein and 3% water, and hair is a lot more fragile when wet, so gentle cleansers are necessary to avoid breakage and damage to hair shafts. Their products contain no Sodium Lauryl Sulphates, but include beneficial plant proteins and extracts such as water soluble Almond Glycerides—powerful humectants that moisturize, silken and improve manageability—Horsechestnut Extract to improve blood circulation to the scalp and Provitamins. [www.australianorganics.net](http://www.australianorganics.net)



## H2O Sea Mineral Mud Mask

Their best selling mask! Kaolin clay naturally draws pore-clogging oil and dirt from the skin while sea fennel and aloe vera gel help hydrate and act as anti-inflammatory agents. Sea extracts of neptune kelp, dulse and gigartina help reduce the production of excess oil, and soothing allantoin helps stimulate cell renewal. Other ingredients include Eyebright Extract, Panthenol/ Provitamin B, Sea Fennel, Wakame, Witch Hazel, Sea Lettuce, Birch Bark Extract, Kaolin, Oyster Shell Extract, Vitamin E, Montmorillonite Clay. 3.5 fl oz, 104 mL. PRICE US\$25.00 [www.h2oplus.com](http://www.h2oplus.com)

## H2O Sea Plankton Restructuring

Spa Shampoo and Conditioner are formulated to strengthen and protect stressed and overexposed hair. Contains Aloe Vera, Vitamin E, Provitamin B, Sea Plankton and Algae Extract, all of which protect hair color from becoming dull and flat from exposure to environmental elements. H2O's high-intensity conditioner nourishes and increases flexibility of fragile or damaged hair without weighing it down and provides maximum moisturization by delivering conditioning and smoothing agents while rebuilding the hair shaft, making the hair shine. 8 fl oz or 251 mL PRICE: US\$14.00 [www.h2oplus.com](http://www.h2oplus.com)



## H2O Sea Marine Mini Spa

Everything a traveling diver with a penchant for pampering needs for a spa experience on the go. Five nourishing, sea-derived treatments for the body and hair come in convenient travel sizes. Set includes one fluid ounce each of Sea Salt Body Wash, Sea Marine Body Scrub, Hydrating Body Butter, Sea Marine Revitalizing Shampoo and Marine Collagen Conditioner. Makes a great gift. PRICE US\$8.75. Regularly \$12.50; now only \$8.75! [www.h2oplus.com](http://www.h2oplus.com)



**OLE HENRIKSEN OF DENMARK** Spa Salt Rub n' Buff scrub is for all skin types. Do-it-yourself spa strength stimulating action and body exfoliation with this popular energizing sea salt scrub. In this dense aromatic scrub, soothing and calming Lavender is met with stimulating Lemongrass Essential Oils leaving your skin ultra soft, clean and lightly scented. It's certainly addictive. Ole Henrikson, the creator of the famous spa line, was born and raised in a tiny Danish country village, but Ole had a thirst for adventure, which took him to Indonesia. Unfortunately, his skin became inflamed with cystic acne while there. Fortunately, he found a talented aesthetician named Lagita

who treated him at her clinic in Jakarta. Using various botanicals, Lagita's magic worked and brought Ole's complexion back to a healthy glow. This piqued Ole's interest in skin care, which led him to pursue degrees in skin care and cosmetic chemistry in London before making the leap over to the United States where he continues to do skin care magic for celebrities and all who seek his wonderous treatments. [www.olehenriksen.com](http://www.olehenriksen.com)

## For Active Men

American Crew Sport Tea Tree Shampoo is a shampoo and conditioner in one with Tea Tree Oil, Panthenol, and soothing Allantoin. Gentle enough to use daily on any type of hair.

Thoroughly cleanses hair and leaves it manageable without build-up. Tea Tree Oil is a natural oil known for its antiseptic properties. Peppermint oil balances, conditions and stimulates the scalp. Allantoin is a natural humectant that helps to promote healthy scalp and hair. American Crew Sport Body Wash is a hardcore shower gel for active men. Peppermint oil and Ginseng extract help refresh the body while Tea Tree deodorizes and cleanses without stripping essential skin moisture. Vitamins A & E, containing essential anti-oxidants, also help improve the texture, feel and firmness of skin. 200ml. Price: GB£6.95 [US\$12.23] [www.blushingbuyer.co.uk](http://www.blushingbuyer.co.uk)



## Fun Suds for Kids

**Drawing in the Bath** Budding young artists will love taking a bath with Crayola Bath Gel Pens. It's the fun, creative way to get clean! Kids will surely enjoy bath time with these nifty bath gel pens designed like Crayola crayons. Set includes Crayola

Coloring Terry Washcloths with fun pictures for children to color, lather up and get sparkling clean. Kids can also draw or write on their own bodies! For ages 3 and up. PRICE: US\$10.00 [www.h2oplus.com](http://www.h2oplus.com)



# cosmetics

## Marine Cosmetics from the Sea



### MODE DE VIE

Loofa soap combines Shea butter and red algae floridiae, which swells a little when wet, so the soap becomes slightly rough to the touch resulting in a pleasant massaging effect. The exfoliating and cleansing action helps stimulate circulation and soften the skin while removing dead cells. Seamud soap is made with Shea butter and marine clays collected around the Chausey Islands in Mount Saint Michel Bay in France. The clay is full of trace minerals such as mag-

nesium, zinc, iron and sulfur. So, while the soap removes dead skin cells, it also deep cleans and softens the skin naturally. Price: \$13.50 each [www.modedevie.com](http://www.modedevie.com)

Seamud Hair Mask is a shampoo and conditioner in one. It is also made with marine clay from Mount St Michel Bay, which also provides vitamins and oligo elements to restore the coat of your hair, giving body and brilliance as well as strength to fine hair. Price: US\$6.15 [www.modedevie.com](http://www.modedevie.com)

### ALGOTHERM Power of Seaweed

Eyes Relax Fresh Mask combines active ingredients from marine and plant including red algae, cornflower and bitter orange extract to moisturize, tone and soothe the eye area. Eyes Target Gel is specifically formulated to help tired eyes by soothing, decongesting, and moisturizing the entire eye area. The active seaweed ingredient in both products is *Chondrus crispus*. Algotharm Seaweed Salts are combined with Laminaria seaweed. They dissolve quickly in water to release trace elements and mineral salts which provide fundamental elements necessary for fitness. The active seaweed ingredient in this product is *Laminaria digitata*. [www.algotharm.co.uk](http://www.algotharm.co.uk)

**SKIN & SEA:**  
**AN AMAZING SIMILARITY**  
*The human race originated as marine animals. The first living cells were formed in the sea and we have maintained a special link with this environment: blood plasma and seawater have very similar compositions and the protective membranes of seaweed and of our skin possess similar defence, protection and regeneration mechanisms.*

—Phytomer Laboratories



PHYTOMER has developed products for exfoliating and cleansing treatments to give you soft, clean, revitalized skin. The marine ingredients start to gently work from the first daily application [www.phytomer.com](http://www.phytomer.com)



**Dead Sea Skin Care AHAVA** Since ancient times, the health benefits of minerals from the Dead Sea have been used to aid beauty and well-being. King Solomon and Empress Cleopatra were supplied with Dead Sea beauty compounds, the craft of which was lost until descendants of the early apothecaries resurrected their knowledge. Now you can enjoy the all-natural skin care products made with sea water from the Dead Sea, which holds ten times the amount of minerals as ordinary sea water. Minerals such as magnesium, calcium, bromides and potassium elements necessary for glowing skin. Ahava's Hand Cream for Men is a mud-infused high performance Dead Sea Mineral enriched cream for rough and damaged hands, which absorbs quickly to treat dryness and cracking. [www.Ahavaus.com](http://www.Ahavaus.com)

### ALGAE & SEAWEEDS IN COSMETICS

According to experts, cosmetic formulae have long used the polysaccharides derived from algae. Algae polysaccharide derivatives are valued for their high gelling, bonding and viscosity-increasing properties. But, recent studies have shown other strong active properties of algae and seaweeds:

\* Algae of the *Laminaria* genus are famous for their powerful sebum-regulating properties.

\* *Chondrus crispus*, commonly known as Irish or carrageen moss, is a source of carrageenan (sulphated polysaccharide) and also acts on sebaceous functions.

\* *Rhodymenia palmate* (dulse) is a red seaweed that grows on stone at the low tide line in the Northwest Pacific and North Atlantic oceans. It is a good source of vitamins and also has anti-sudorific actions, which can be successfully used in the development of anti-perspirant products.

\* *Ulva lactuca* (sea lettuce) has some anti-inflammatory and antioxidant properties. May also stimulate the production of elastin and collagen.

Source: [Beauty-On-Line.com](http://Beauty-On-Line.com)

### White Algae OSEA Skin Care

was developed for sensitive or dry skin including rosacea. This high tech all natural treatment mask provides multiple benefits including deep hydration while visibly tightening and lifting, soothes and calms irritated skin and evens out skin tones. Contains calcium rich White Algae, Copper, Manganese and Zinc Peptides, White Wine Extract and White Tea, which help bring about healthy skin. Price: US\$48.00



**Red Algae OSEA mask** is not like traditional clay-based "purifying" masks that dry out the skin, Red Algae Mask maximizes the rich vitamins, minerals, enzymes, amino acids and trace elements of Red Algae, potent with a various antioxidants to purify pores and help heal breakouts. At the same time, Red Algae Mask employs the properties of Red Wine polyphenols, herbal extracts and a phosphoric diester of Vitamins E and C to condition, hydrate and nourish the skin during treatment. Price: US\$ 36.00 [www.oseaskin.com](http://www.oseaskin.com)



technical matters

Leigh Cunningham

# The Wake Up Call

*Confessions of a Deep Diver*



Confessions of a deep diver

A long time ago, I sat in hooshah (Bedouin tent) after a deep air dive in the Blue Hole (Dahab, South Sinai, Red Sea). My good friend and dive buddy had less than an hour ago peeled me of the wall near the bottom of the Blue Hole. I had succumbed to deep water blackout, caused by a high degree of stupidity, wrong kit and inadequate training.

I now had to make one of two choices, which I should have made sooner: Give up diving all together, or invest in appropriate

training and equipment for the type of dives I was planning and trying to conduct. Spectacular deep sites is what does it for me, staying shallow was not an option - and neither was dying.

### 60 meter dives offered

At the time I worked in a small concrete and wooden hut with a compressor in one corner and some miscellaneous well worn dive gear in another. The hut is still there today, in the same place, around 5 km south of the Blue Hole at a dive site called the Canyon. The hut is called a dive center, which at the time was quite a novel feature in the area. The order of the day was guiding groups of certified divers around local dive sites, the most popular ones being the infamous Blue Hole and Canyon. Dive guides would even offer, under the counter, recreational guided dives through the Blue Hole's Arch which is at a depth of 60 meters. I can say, hand on heart; I did not take part in this.

### No role models

Back then technical diving and training and facilities for such were as common as igloos and Eskimos in the Sinai. Things have changed quite a lot since - in the last 10 years or so - and fortu-

nately very much for the better, both from a diver training, safety, good role models and decent food point of view.

So back in the 'good old days', independent aluminum tanks were strapped together with extra long cam bands, a-clamp first stages were mounted with enough second stages to decorate a medium sized Christmas tree, BCD's seemed to have more holes than a slab of Swiss cheese and had inadequate lift for the job even without the holes, not to mention appropriate training that was seriously lacking. Having all of the above qualified you as a technical diver at the time.

### My lame excuse

To be honest, I have to admit that it took a few near death experiences (rock climbing in the blue hole being the last) to give me the wake up call I needed. In my defense I can only say that good role models did not exist then as they do now. I consider this to be a very lame excuse for being well out of my depth, but it's the only one I have.

### Relying on luck

Tragically the Blue hole have since become a sunken graveyard, giving it the undeserved reputation it has today. Much the

same goes for many other deep or particularly technical dive sites around the world which has been labeled "dangerous". There is not a dive site in the world that's dangerous - people are dangerous. I'm living proof of that. I survived the earlier stages of my diving career due to one reason - "luck". Tragically many divers were not as lucky as me.

### Changes for the better

In the modern day of diving with a lot of training, experience a good few thousand dives and a couple of scuba records under my belt, I now like to be the role model for others, in a manner that didn't exist back then.

In the Sinai the technical diving community has now come full circle. Where it didn't exist 10 years ago, now everyone and their mother seem to be a Technical diving Instructor at one level or another.

The fact of the matter is technical instructors and technical training and facilities are a necessity in an area where there happens to be awesome dive sites in deep water. The reduction of numbers of deep diving accidents now, as compared to 10 years ago, speaks for itself.

### It's your own decision

Ultimately individuals need to decide for themselves if the type of diving they do is beyond the realms of the type of training they've had, and if they want to do something about it. Experience counts for a lot, but it doesn't replace training.

After basic scuba training (OWD and AOWD) divers have a licence to conduct non-stop dives (no deco) to a max depth of 40 meters, in the type of environment they were trained in. With experience, and a level head, divers could gradually progress safely to harsher environments (colder, darker, surge and swell, surf entry and exits and so on).

### Why not stay shallow?

For the large majority of divers pushing beyond 40 meters or exceeding the NDL<sup>1)</sup>, would never be a consideration. Talking from experience, in most tropical reef environments the vibrancy of the reef and volume of tropical fish in the first 30 meters is breathtaking.

And this is a very good reason for some to stay shallow.

*I survived the earlier stages of my diving career due to one reason - "luck".*



NDL: NO DECOMPRESSION LIMIT



*I now had to make one of two choices, which I should have made sooner: Give up diving all together, or invest in appropriate training and equipment for the type of dives I was planning and trying to conduct.*



ADAM BUTLER

Due to this and the fact that NDL's between 30-40 meters rapidly becomes quite short and gas consumption increase proportionally with depth, most recreational divers in tropical reef environments stay on the shallower side of 30 meters.

In this case there is no need for technical (Advanced Nitrox, Extended Range, Mixed gases) training. Having said that I firmly believe that all divers during entry level training should be trained and certified at least in the use of Basic Nitrox mixtures, giving all divers the skill and knowledge to utilize the optimum mix for specific depths if they so desire. Basic Nitrox is not technical diving but air will become a gas of the past for recreational divers in the future.

**Definitions**

The big question is "where do we draw the line between recreational and technical diving in open water?"

Training agencies have a general definition: A NDL dive to a maximum 40 meter is categorized as a "Recreational Dive". Anything beyond 40 meters or exceeding the NDL, or a combination of both, is categorized as a "Technical Dive".

But while the answer from a training agency's standpoint is quite clear, it seems to be less clear from the diver's point of view.

**A story all too common**

I was recently made aware of a true story about a group of 10 certified divers on a day diving trip to the SS Thistlegorm (which is a very nice World War 2 wreck in the Gulf of Suez, off the Sinai peninsular resting at 32 meters); the story is all too common.

All divers had varying degrees of certification, from AOW to Open Water Instructors but none of the group had technical training of any sort. On the second (and last dive) of the day, the group entered the water for a 25 meter repetitive dive. This followed an hour's surface interval after a first dive to 30 meters. All divers exited the water after a 30-50 minute dive time and after completing between 5 and 25 minutes of decompression stops - with most of the group having 15 minutes or more. According to training agency definitions, all ten divers carried out a "technical dive" but none had technical training at any level.

**Responsibility**

In my opinion a small degree of responsibility falls on the dive guide who should have encouraged the divers to leave the bottom and initiate the ascent before clocking up required decompression stops. The higher degree of responsibility falls on the individual diver to initiate the ascent before



stops are required. What's acceptable before decompression diver training is required? Is it 5, 10, 15, 20 minutes of deco - or more? "The line is not so clear", seem to be the individual's view.

**Take more training**

For what its worth, I would advise all divers planning dives below 30 meters or making dives that require decompression stops, regardless of the duration, to at least take the first step on the technical ladder, advanced nitrox.

The line needs to be drawn somewhere, the harder you push, the bigger the bite in the arse! If you have arrived at the point where you think you might be exceeding your level of training, then you are.

Looking at the bigger picture, technical training will give you no guarantees in itself, but it will dramatically increase the likelihood of coming back. ■

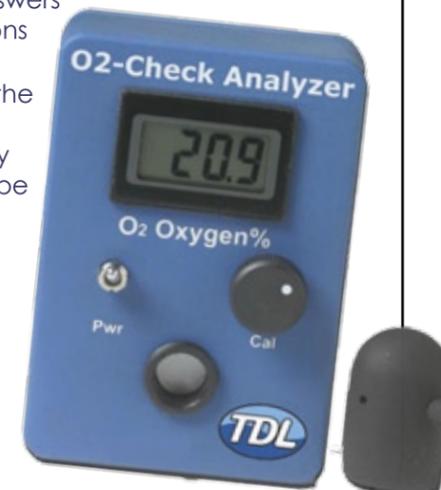


**Want to win one of these?**

Always analyze and label your gas. If you're wanting a simple solution for Nitrox analysis, take a look at the compact GA-O2 Check Oxygen Analyzer from Technical Diving Limited [www.techdivinglimited.com](http://www.techdivinglimited.com) Since it's launch, the GA-O2Check Oxygen Analyzer has taken the U.S. diving world by storm. Probably because this durable splash proof analyzer is easy to use, runs on user replaceable AAA batteries and is quick responding. So, if you fancy getting your sticky paws on one, just jump onto [www.techdivinglimited.com](http://www.techdivinglimited.com) —they ship worldwide

To win one, send in your answers to Leigh's three quiz-questions to [Leigh@xray-mag.com](mailto:Leigh@xray-mag.com) by July 20 to participate in the draw for one GA-O2 Check Oxygen Analyzer generously sponsored by TDL. Prize will be shipped directly from TDL.

Questions relate to Basic Nitrox diving and planning Editor's decision is final.



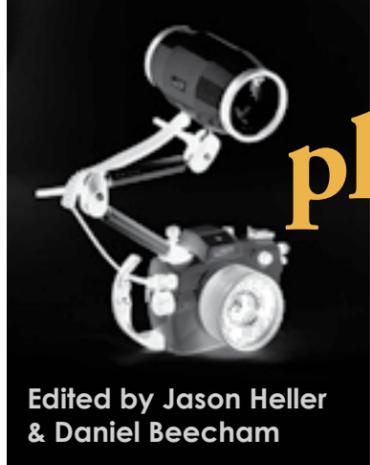
Leigh Cunningham is the technical manager and TDI Instructor Trainer for Ocean College, Sharm El Sheikh.

Probably best known for his records - Leigh once held the record for the deepest dive in the Red Sea, and is the cur-

rent holder of the record for deepest wreck dive - and attempts of reaching extreme depths, he also has a wide range of teaching credentials to his curriculum: TDI instructor trainer, DSAT Tech Trimix instructor, PADI MSDT IANTD Technical diver

**QUIZ 1 — WIN GA-O2 CHECK OXYGEN ANALYZER FROM TDL**

1. What is the recommended maximum depth and max. operating depth of EANx 40? (assuming a max pO<sub>2</sub> of 1.4)
2. What is the maximum training depth for the TDI Extended Range? And the TDI Advanced Trimix course?
3. What is the equivalent air depth of EANx 38 at 22 meters?

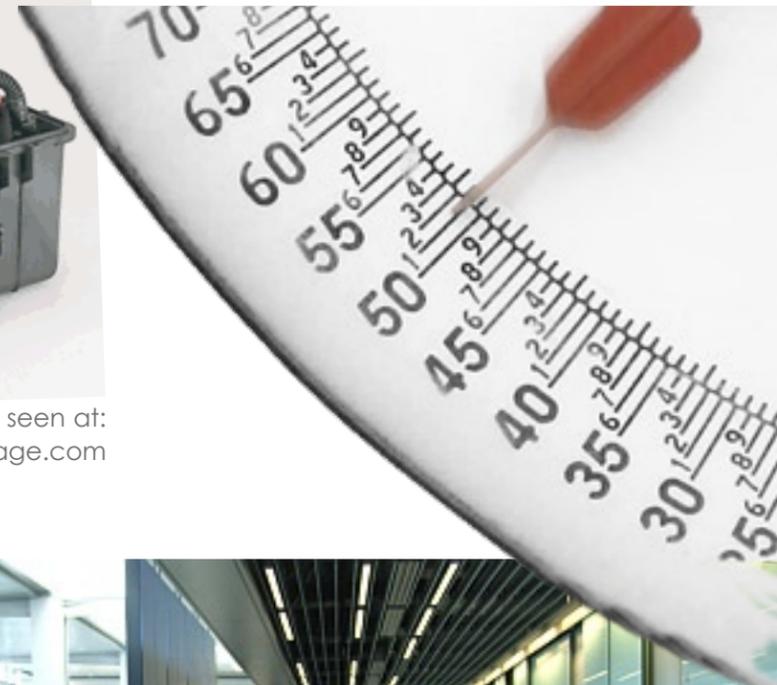


Edited by Jason Heller & Daniel Beecham

# photography



Pelican cases seen at: [www.globalsoundandimage.com](http://www.globalsoundandimage.com)



# Travelling with camera equipment Luggage

By Daniel Beecham  
Airport photos courtesy of Scandinavian Airlines

**In issue #9 we took you through some tips of the trade for selecting a dive operator that will help you properly facilitate your underwater photography. In this issue we'd like to share with you some hints and tips for getting all of your valuable camera equipment to your destination safely, and without incurring costly excess baggage fares.**

Many underwater photographers encounter problems when they begin their dive trips. With lots of

heavy equipment that must be transported as well as diving gear and normal clothes, it can become a real challenge getting all your gear to your destination. Checking your camera gear into the hold is often undesirable; baggage handlers are nicknamed 'throwers' for a reason; and the last thing you want to happen is your camera gear to arrive damaged, stopping you from shooting. You can also run the risk of getting charged large sums of money in excess luggage fares.

There are however a few tricks of the trade, and loops in the system you can use to get yourself and all your camera equipment safely without incurring those costly fines.

## Packing

Everyone has his or her own methods of packing camera equipment, so if your method is working so far, keep going with it. If not, maybe the following methods will be helpful;

Many modern camera systems are so small that they can easily be transported in hand luggage. A comprehensive camera system such as the one pictured, which includes a wide-angle lens and an external flash unit, weighs just a few kilos. This kind of system can be wrapped in a towel or piece of foam and fitted into a small rucksack. Things can get trickier if you're using an SLR or video system, which will generally be a lot bigger and heavier. If this is the case then because of weight and size restrictions on hand luggage you'll probably be forced into checking a portion of your system into the hold. If this happens I'd recommend keeping cameras and lenses with you, and check-





# photography

*baggage handlers are nicknamed 'throwers' for a reason*

ing housings, flash units and lights into the hold using a reliable brand of hard case, I'd recommend Storm Cases; they're stronger and lighter than most other brands, and they have a great range of sizes, so you'll find something to fit your system nicely without any having wasted space inside the case.

Pack cases with at least an inch to two inches between the exterior of the case and the items inside, and separate each item with a decent layer of foam to stop items knocking against each other. When repacking your box after a dive ensure all your gear is

completely dry so that no water gets into the foam. If it does the foam may deteriorate over time. Even if you carefully dry all your gear, water could be stuck inside control shafts or other spaces you can't get to. Because of this it is usually a good idea to treat a box as a dry box or wet box, you obviously don't want to get water onto your cameras or lenses.

There are a few other golden rules that I follow when transporting cameras and housings.

### Rules

Remove o-rings from housings- the change in ambient pressure at altitude can create a vacuum inside an underwater housing, this can be so great that it can be difficult to open the housing when you're back on terra firma. To avoid this simply remove o-rings from the housing and keep them in a self-seal bag inside the housing. This will allow air to flow freely through the housing.

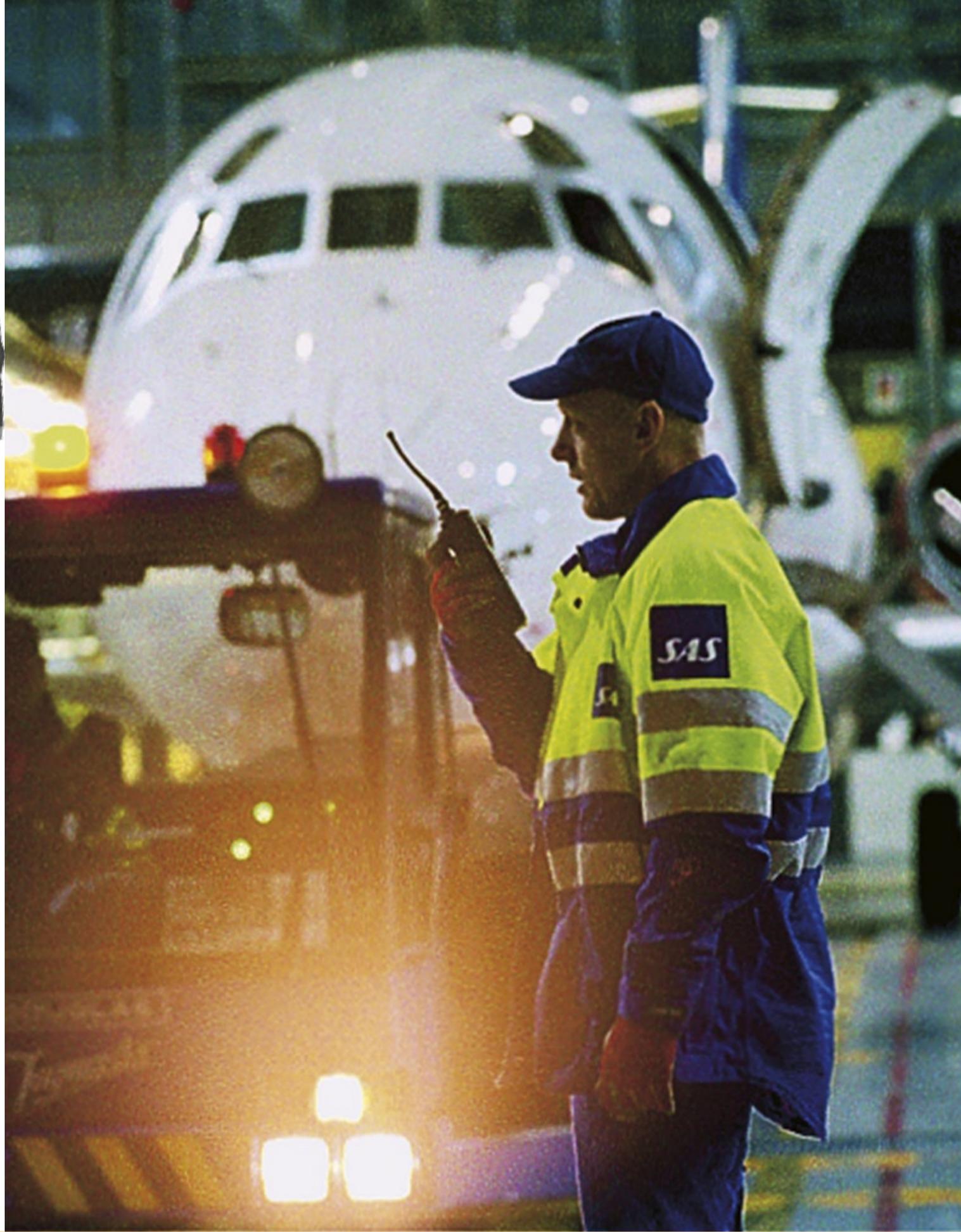
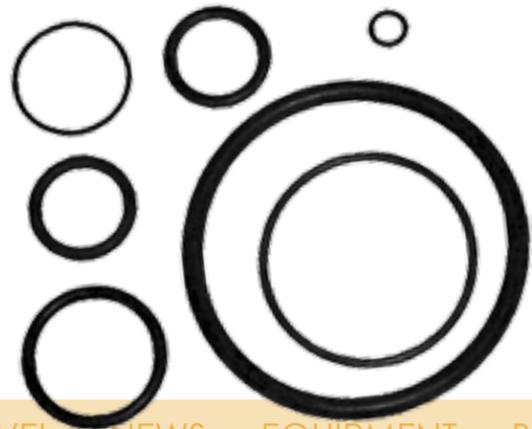
Remove cameras from housings- I would

recommend that you always remove your camera from its underwater housing when you're transporting it. Knocks and jolts can move housing controls out of alignment; transport the camera separately and use the space inside the housing to keep soft bits and pieces such as o-rings in. Just don't put heavy or sharp items inside!

Try and get caps or covers for your housing and ports, this will help to keep o-ring grooves and sealing surfaces clean and stop them getting scratched.

### Camera jackets

Photographers often use camera jackets carry bulky equipment when they do not want to use a bag or case. You can use these jackets when you're travelling; they have pockets that are designed for telephoto lenses that are perfect for



# photography



large flashguns, and you can fit camera bodies, cables or any other accessories in the other pockets. These jackets can come in handy when you've got equipment that you want to carry with you on the plane, but your carry on bag has gone over the weight allowance; having items on your person is not regarded as excess luggage. The downside is that using camera jackets can be uncomfortable, and they do not protect equipment as well as a case or bag would.

## Security

For those travelling from/to/through the US, the TSA has the right to open and inspect any checked luggage, and when your dive or underwater photo equipment goes through the main x-ray machine, you have a fairly high chance that TSA will be selecting your bags for "random inspection". The first step is to put TSA approved locks on your baggage. The security agents can open the

*Put TSA approved locks on your baggage. The security agents can open the locks and relock your luggage.*

locks and relock your luggage. If you use standard locks and they inspect your bags, they're getting clipped and your baggage continues to its destination with no locks at all.

## Add a notice

Another tip is adding a laminated notice to security agents, affixed to the inside of each piece of baggage, kindly asking them to be very careful when inspecting your equipment, which is very fragile and needs to be repacked the way it was originally. Make it obvious where everything fits into the case, this way whoever is inspecting your bag SHOULD put it back into the correct place, so it can continue its journey in safety.

Besides the TSA locks, secure the zippers with cable ties. Hand the agents extra cable ties to replace the ones they will need to cut off when inspecting your bags. Locks and cable ties are not a guarantee, but when other bags don't have any security, a thief focused on a quick fix will target other bags. Of course there's nothing that's going to stop a thief



who's targeting your equipment from stealing it. Recently there have been multiple incidents where underwater photographers travelling through San Juan Puerto Rico were consistently arriving at their final destinations only to find that their underwater photography equipment was missing. Some (probably all) of it was found for sale on e-bay.

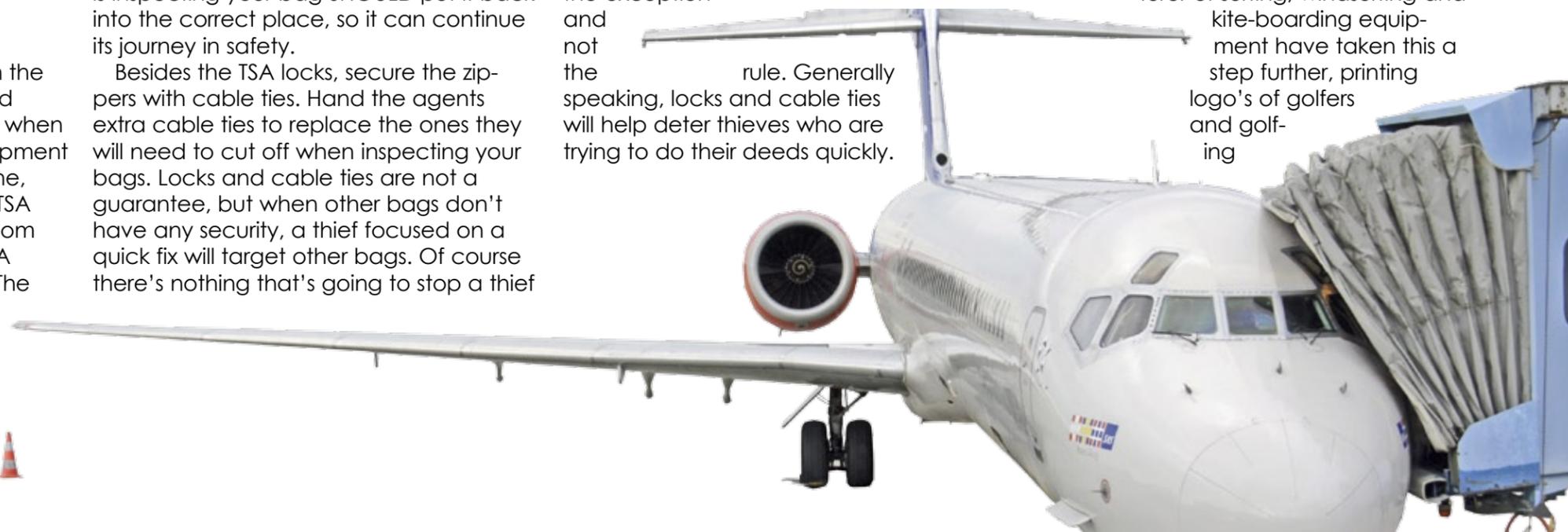
Currently we have no update on the situation in the San Juan airport. However, this example of airline security-gone-bad is the exception

and not the rule. Generally speaking, locks and cable ties will help deter thieves who are trying to do their deeds quickly.

## Avoiding Fines

Most airlines will allow extra baggage allowance to passengers carrying golfing or skiing equipment. Unfortunately this rule generally does not apply to scuba divers, although some airlines are now seeing the light. As strange as it may sound, a few divers I know actually use golfing bags to transport their dive gear or camera gear, and manage to avoid excess luggage fines that they would have otherwise incurred. Naish, the popular manufacturer of surfing, windsurfing and

kite-boarding equipment have taken this a step further, printing logo's of golfers and golfing



future  
meets



SEACAM





slogans on their bags. Maybe some dive equipment manufacturers would reap the rewards if they did the same...

Luggage going to or from the US has higher limits than other parts of the world. Excess luggage fees come in the form of 'per excess bag' charges. However, do not forget that when travelling between other countries, you will be charged 'per excess lb./kg'. Regardless of the country, your bags will be weighed, and often that includes your carry on.

### Just ask...

It sounds obvious, but approaching airline staff in a polite, civil manner may carry you a long way. Smile, joke and laugh with whoever is checking you in, then ask nicely for a few kilos grace, it'll probably work.

### Asking in advance

When booking your flight ask for extra baggage allowance, you'll often be in

luck, especially if you're booking a late flight that the airline is trying to sell. Just make sure you get in writing that they've changed the status of your baggage allowance, otherwise you may find yourself in a situation that I've been in where you've packed more equipment than you otherwise would of, and you then get told when checking in that you have less allowance than expected!

### Left luggage

This one is a bit sneaky, but it does work...

If you have a piece of luggage that you want to carry onto the plane, but you're worried that your going to be told it must be checked into the hold, take it to the left luggage counter. After you've checked in simply go and collect it; the airline staff never even knew you had it and you'll be carry it on with no problems.



the plane as well as checking more gear into the hold if you want - to as well as travelling in style!

Take the time to work out how much the excess luggage fines are going to cost you compared to the additional cost of upgrading.

### Fly via the United States

Often when flying via the states passengers are given extra baggage allowance. A sneaky way to take advantage of this is making a part of you ticket a destination in the states, even if you don't intend on going there. Make sure that the ticket you buy is fully refundable, and then once you get home you simply claim the cost of the US portion of the ticket.

Hopefully that's given you a few helpful pointers on how to get yourself and your gear to your destination safely. In the next issue we'll look at ways in which you can set your dive gear to make your time underwater easier and more productive. ■

### Frequent flyer points

Racking up frequent flyer points may make you eligible for special treatment from multiple airlines, including upgrades and additional luggage allowance. Join as many frequent flyer programmes as possible, and take advantage of the special treatment.

### Fly business or first class

For most of us it's out of our budgets, but when flying business or first class you're given much more baggage allowance. The additional cost of flying in a better class can be comparable to paying for the excess luggage fines. This means you can carry more equipment with you on



DiveFilm Podcast Video, has now become the first podcast of underwater content to make the iTunes "Featured Education Podcasts" list.

Subscribing to the video podcasts is free and they can be accessed on any computer through the free iTunes program by clicking on the following link: <http://tinyurl.com/je8ro>

This will launch iTunes on the computer and open DiveFilm's Podcast Video page.

The podcasts are produced by Mary Lunn Price, who started one of the first streaming video websites for underwater videos back in 2000.

The most recent of the 17 current DiveFilm episodes available, "Beqa, Fiji," focuses on Fiji's locally managed Marine Protected Areas. Past episodes include an interview with the late Peter Benchley, author of "Jaws", a podcast on "Diving Scandinavia," and episodes highlighting conservation con-

cerns regarding sharks and mantas. Other episodes feature a short film by renowned underwater photographer Eric Hanauer on the sunken P-38 fighter plane off the coast of Del Mar and a video featuring shark footage by renowned cinematographer Marty Snyderman a two-part series on the massive squid spawning events off the California coast that includes historic footage and interviews with a Scripps scientists. ■

Wetpixel is proud to announce a partnership with DiveFilm.com, a website dedicated to showcasing underwater video. DiveFilm features underwater filmmakers and offers high quality video podcasts about the underwater world, available through a free iTunes subscription and other podcast subscription mechanisms. Contrary to the name, video podcasts do not require a video iPod, and you can watch the broadcasted video right on your computer monitor. ■

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

Free Underwater Video



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## NOCTURNAL LIGHTS

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- \*Compact, lightweight and ultra reliable
- \*Instant power, 5600K white beam
- \*Full aluminum housing, 100m depth rating
- \*Focus beam with light diffuser for photo and videos
- \*Universal to the camera and camcorder housings and arms

Also available:



For product information and an authorized dealer listing please visit our website at [www.nocturnallights.com](http://www.nocturnallights.com)

Dealers Wanted  
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**Sealux**  
Sealux CD200 [www.sealux.de](http://www.sealux.de)



**Sea & Sea**  
X-D200 Housing  
[www.seaandsea.com](http://www.seaandsea.com)

*These days it seems to be all about housings for the Nikon D200*



**Nexus**  
D200 Housing Body  
[www.nexusamerica.com](http://www.nexusamerica.com)



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



**Ikelite**  
D200 housing  
[www.ikelite.com](http://www.ikelite.com)

PHOTO ERIC CHENG



**Hugyfot**  
HFN D200  
[www.hugyfot.com](http://www.hugyfot.com)

### A couple of Nikon D200's features

10.2 effective megapixel CCD image sensor. Shutter speeds ranging from 30 to 1/8,000 sec. 11-area AF system with selectable 7 wide-area AF mode. Fast 5 frames per second. Large 2.5" LCD monitor with 170° viewing angle.

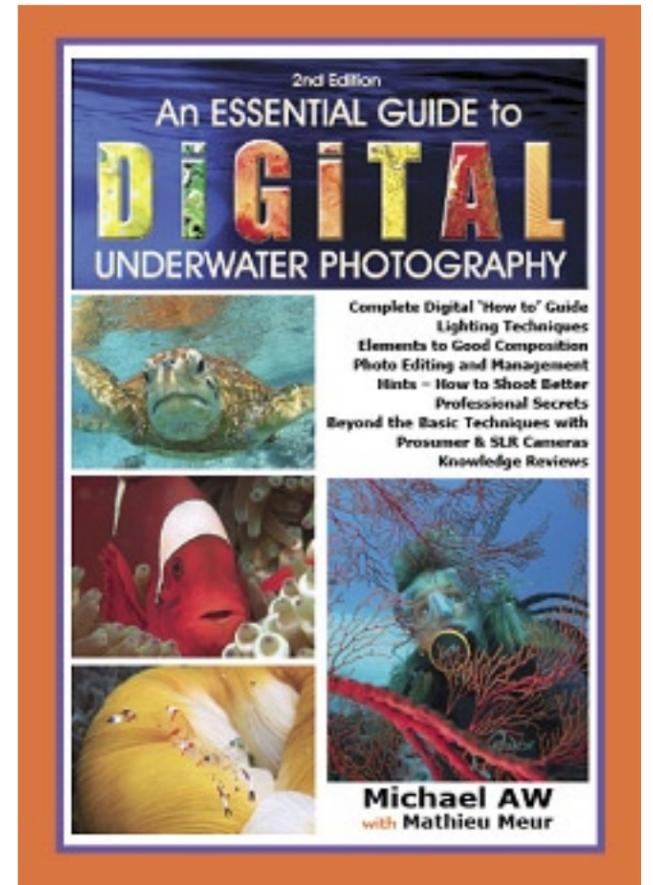
Near-instant response with 0.15 sec. power-up, 50-millisecond shutter time lag. Image sensor features high-speed 4-channel data output and a newly developed Optical Low Pass Filter.  
[www.nikonimaging.com](http://www.nikonimaging.com)

**Seacam**  
D200 housing  
[www.seacam.com](http://www.seacam.com)



( no picture of housing yet )

**Subal**  
ND 20  
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A well-structured, comprehensive work, lavishly supported with explanatory diagrams and magnificent images the, *Essential Guide To Digital Underwater Photography* will undoubtedly prove to be as much an educational tool for novices as it will a reference work for those with greater proficiency in underwater image making.

— "David Strike" Editor NEKTON



# photography news



## Casio

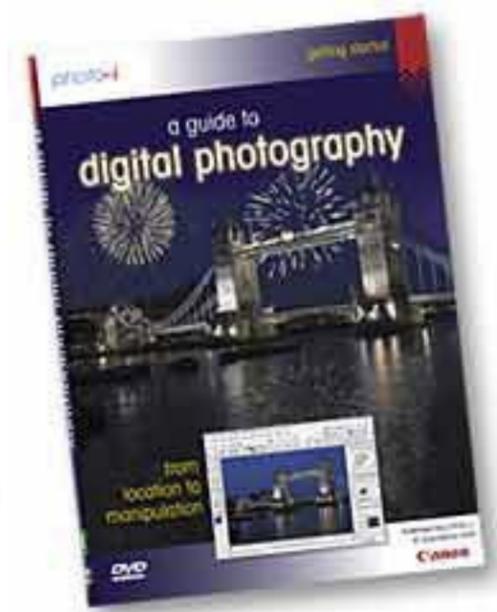
The EWC-60 underwater housing is compatible with the Casio Exilim EX S600 and EX-S500 digital cameras and should be available in retail as this issue goes to press. The Casio EWC-60 will be available at retail from April 2006. A flash diffuser, strap, silicon paste as well as an anti-condensation kit are included in the delivery package.

The 6 Megapixel Casio Exilim EX-S600 is equipped with Anti Shake DSP technology and in addition to improved resolution over the EX-S500, the EX-S600 has a 3X zoom and increased battery life allowing up to 300 shots per battery charge.



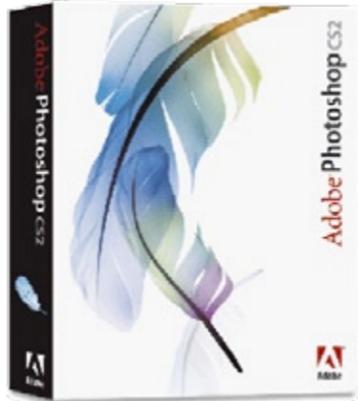
## Sony takes over as Konica Minolta pulls out

Granted, Minolta was never one of the big makes in underwater photography and there were only a few housings. But the innovative brand that introduced autofocus and anti-shake had its devoted followers. Recognising that the market had become too competitive to make a profit, Konica Minolta decided to cease the camera business all together and transfer its technology to Sony with whom there has already been a development cooperation with since last year. Sony states that it intends to develop a D-SLR called **α** based on Minolta's lens mount. The new SLR is due out "this summer". [www.sony.net/Products/dslr](http://www.sony.net/Products/dslr)



## DVD guide to digital photography

Photo-i, in association with Canon, is going to produce a series of DVDs on digital photography. The first one is 'A guide to digital photography' showing you how to get the best results from your digital camera. The DVD contains a series of assignments and tutorials and pictures are manipulated in Adobe Photoshop CS2. It's visual, informative and packed with lots of tips and ideas. PAL format, English language. Running time is 2 hours, 20 minutes. Price: £14.99 [www.photo-i.co.uk](http://www.photo-i.co.uk)



## Adobe releases Camera Raw 3.4 and CS2

Adobe has released a new version of its Camera Raw plug-in and an update to Adobe Photoshop CS2. Camera Raw 3.4 now supports the Canon EOS 30D, Leaf Aptus 65, Leaf Aptus 75, Olympus EVOLT 330, Olympus SP-320, Pentax \*ist DL2, and Samsung GX-1S. The Adobe Photoshop CS2 (9.0.1) update fixes a few problems discovered after CS2 was released.



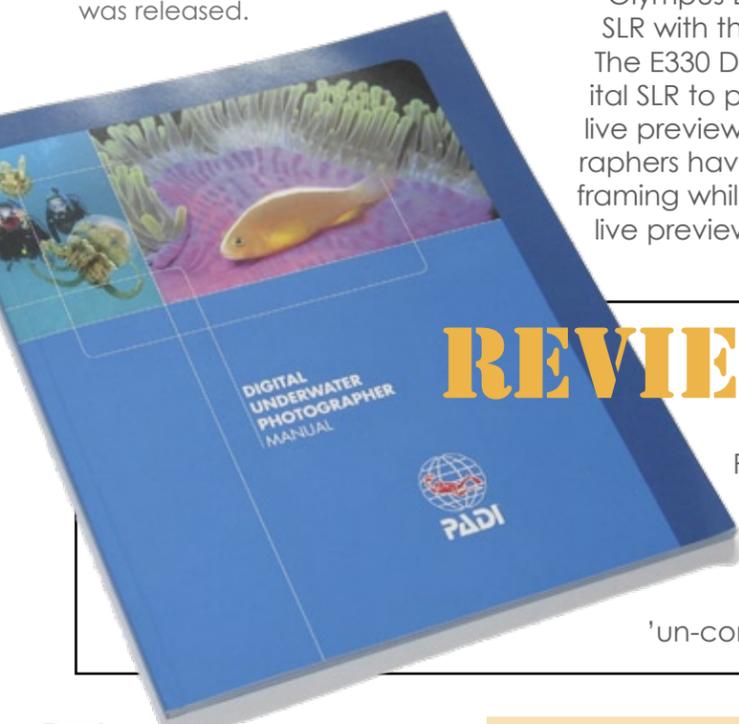
## Olympus E-330 Underwater Pro kit

era's large 6.4cm HyperCrystal LCD. For underwater photography this is of special consequence

ing it from a rough ride topside. [www2.olympus.dk](http://www2.olympus.dk)

Olympus E-330 Underwater Pro kit pairs the Olympus E330 DSLR digital SLR with the PT-E02 housing. The E330 DSLR is the first digital SLR to provide continuous live previews. Now photographers have the freedom of framing while looking at the live preview on the cam-

as the difficulty of framing a shot using the eyepiece while wearing a diving mask. The PT-E02 is depth rated to 60 metres. With its durable, high quality polycarbonate construction, it protects the camera from water while also cushion-



## REVIEW

You got to hand at least one thing to PADI. They do very good teaching materials and their products are very thoroughly made. They are very good at 'un-complicating' matters. This

Digital Underwater Photographer Manual is no exception and while it is meant as a training manual for a PADI specialty course it is still a better standalone product than so many other books on the subject out there. They should sell this book alone too. It is, with its 88 pages only a quite light booklet and it

only covers the basic concepts for the beginners- which is often the hardest to do. The manual gives you a clear explanation of the various file types, image resolution, exposure, sharpness and depth-of-field, composition, use of flash and postprocessing and organising images. ■





## Books Film DVDs CDs

Edited by Peter Symes  
& Gunild Pak Symes

POINT & CLICK  
ON BOLD LINKS



### Deep Sea Tycoon: Diver's Paradise

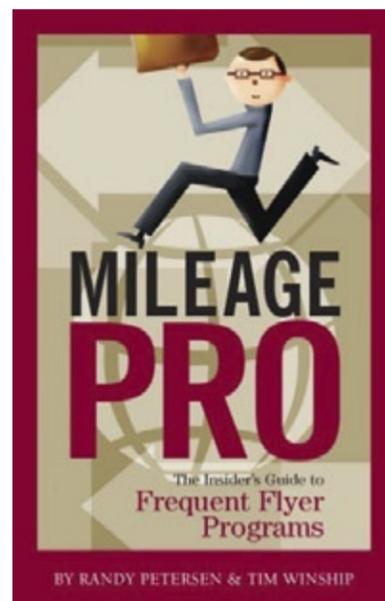
Create your own undersea getaway! The follow-up to the original by Pixel After Pixel, Deep Sea Tycoon 2 lets you enter a world under the waves to explore coral reefs, swim with whales, play with turtles, feed the manatees and ride the turtles. Slow down and enjoy dazzling lights and hypnotic sounds while adventuring your way through 30 challenging missions with multiple modes of play. Incredible graphics and new camera angles. Suitable for ages 3 and up. e-Games North American release date: 24 June 2006. [www.virginmegastores.co.uk](http://www.virginmegastores.co.uk)



**The Great Barrier Reef e-Book** Over 70 pages of everything you need to know about diving the Great Barrier Reef of Australia. Written by Lucy Joyce, an Australian diver with over 25 years experience in the area, this beautiful e-book can be downloaded FREE from the Internet. You will find information about liveboards, day trips, typical 3-day liveboard itineraries, various dive sites, dive education in Australia, accommodation, bargains, camping, land attractions, adventure activities and getting around in Cairns, Port Douglas, Townsend, Cape Tribulation and the Daintree Rainforest, marine life on the reef as well as dangers to watch out for. Visit: [www.diveadvisory.org](http://www.diveadvisory.org)

### For High Flying Divers

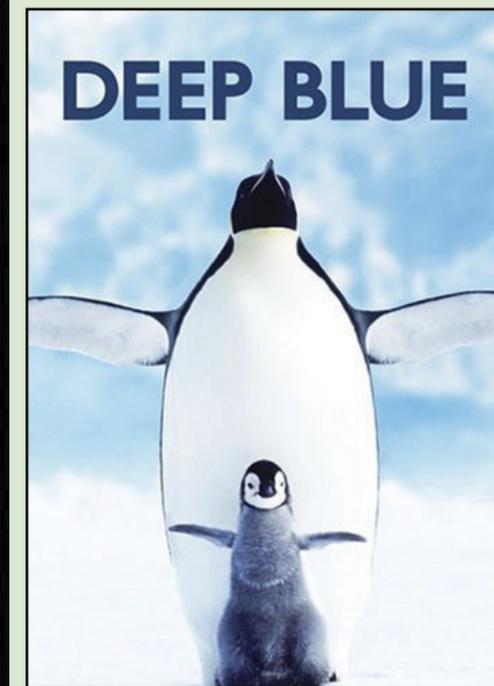
Lost and confused? Look no further, the first ever comprehensive book on mastering airline, hotel and car rental loyalty programs has just come out. *Mileage Pro: Insider's Guide to Frequent Flyer Programs* will help you manage and maximize your travel mileage with practical information on earning and redeeming miles. Co-author, Randy Petersen, a former marketing and merchandise presentation manager who spent much of his time flying has become known as one of the most influential frequent flyers in America and a leading expert on airline loyalty programs. His best effort to date is the launch of the Mileage Donation Center, which helps individuals donate unused miles to charity groups. His compatriot, Tim Winship, who co-authored the book, launched FrequentFlier.com in 1997 and has 20 years experience in the travel industry and loyalty-marketing management. Price: US\$19.95 [www.oag.com](http://www.oag.com)



### Encyclopedia Prehistorica: Sharks & Other Sea Monsters

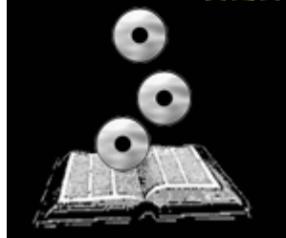
by Robert Sabuda and Matthew Reinhart  
Publisher: Candlewick Press  
Date: June 2006  
Age range: 5 years and up  
ISBN: 076362229x Hard cover  
Price: US\$27.99  
Just when you thought it was safe to go back in the water, another pop-up book about prehistoric sea monsters pops up! Co-authors, Robert Sabuda and Matthew Reinhart, have done it again. Following their best-selling Encyclopedia Prehistorica: Dinosaurs, Sharks and Other Sea Monsters is sure to enthrall and amaze young marine biologists and their landlubber parents. The book has captivating pop-ups of massive prehistoric sharks, giant squid and huge scorpions. Get it before it gets you! [www.candlewick.com](http://www.candlewick.com)

## Movies



### Deep Blue

Studio: Miramax  
Actors: Michael Gambon, David Attenborough, Pierce Brosnan  
Director: Andy Byatt, Alastair Fothergill  
Length: 91 minutes, Rated G  
Special DVD Features: Making-of 51 minute featurette, English and Spanish subtitles.  
ASIN: B000E5KQQ4  
Swarms of fish, plunging Albatross, schools of hunting sharks, sleek dolphins, polar bears stalking beluga whales, sea lions attacking a baby gray whale, killer whales, penguins caring for their young, poisonous hot gasses spewing out of ocean ridges and underwater chimneys, slow rhythmically moving jellyfish... From the creators of the BBC series "The Blue Planet", this compelling film, heavy on imagery from a spectacular setting in the Marianas Trench, sparse on script, has less emphasis on education and more emphasis on engaging adventure with breathtaking images of some of the Earth's most mysterious creatures and underwater ecosystems. DVD Price: US\$29.99 [www.amazon.com](http://www.amazon.com)



**Dive In Style**

By Tim Simond  
 Publisher: Thames & Hudson  
 Date: April 24, 2006  
 Hardcover: 288 pages  
 ISBN: 0500512922  
 List Price: US\$40.00

Get it at Amazon.com for \$25!

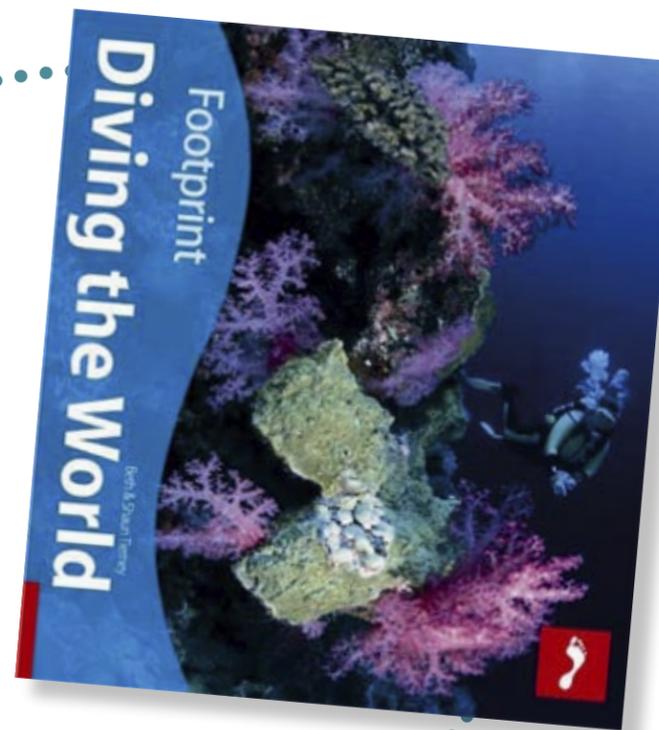
Luxury and diving? Sign me up! Twenty-six destinations from around the world, including four luxury liveaboards, are outlined in detail for dive travelers with a penchant for pampering. Each location's most spectacular dive sites are described with the marine life particular to the area and the ultimate places to stay. White sands, carpets of corals, humpback whales, sharks, private picnics on sandy beaches... The good dive life presented in over 200 full color illustrations taken by the author, Tim Simond, a keen diver and underwater photographer based in London. Well-researched and thorough, the guide gives a comprehensive look into each resort that caters to the diver in you as well as provide many activities and features the whole family can enjoy. Practicalities such as resort layout and architecture, dive center operation, what kind of boats are used, and the best time to visit are covered.



Listen to the Divester podcast review of Dive In Style:  
[www.divester.com/podcasts](http://www.divester.com/podcasts)

**Footprint: Diving the World**

An invaluable reference compiled by avid divers Shaun and Beth Tierney. Get comprehensive country-by-country reviews on dive locations in Australia, Fiji, the Solomon Islands, Papua New Guinea, Thailand, Maldives, Belize, Honduras, Mexico, The Galápagos, Philippines, Malaysia, Indonesia, Egypt, East Africa including Kenya and Tanzania and Micronesia including Palau, Yap and Truk Lagoon. Information on affordable and accessible dive travel includes descriptions of 200 dive sites and 354 pages of full colour photography. Price: GB£19.99  
[www.seafocus.com](http://www.seafocus.com)



Patricia Tobin wrote:

I cannot thank you enough for the beautiful book. I started reading my copy last night and was just amazed by the wealth of information. Such great work, it is precise, detailed, easy to use. I love the introductions and the pictures are outstanding. You truly captured the passion we all share for diving



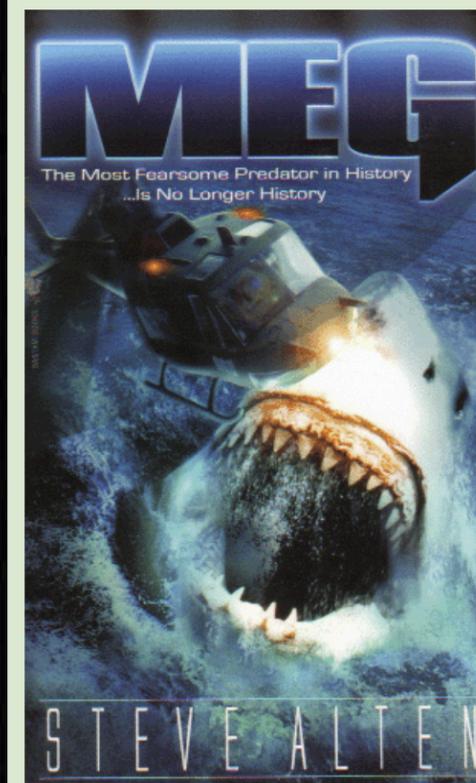
**Life on an Ocean Planet**

- Student Textbook ISBN# 1-878663-34-8, US\$62.50
- Laboratory & Activity Manual ISBN# 1-878663-35-6, US\$20.75
- Teacher Curriculum Guide ISBN# 1-878663-36-4, US\$28.30
- Transparency Pack ISBN# 1-878663-38-0, US\$291.25
- Teacher Digital Resources & Assessment Tool ISBN# 1-878663-37-2, US\$255.25

This educational package of materials written in hip language to inspire high school students integrates marine science curriculum with biology, chemistry, geology and physics. Lots of labs and activities for individual and group inquiry, easy access equipment and materials, slide show, data sheets, references, teaching strategies for teachers. Package includes Student Textbook, Activity Manual, Teacher Curriculum Guide, CDROM Digital Resources & Assessment Tool, Transparency Pack. Produced by Current Publishing division of PADI in association with the Center for Ocean Science Education Excellence in California, USA.

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

*Upcoming Movie*



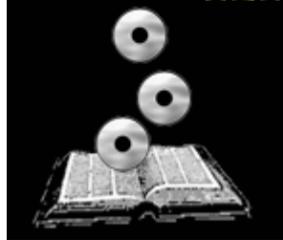
**Meg**

Release date: 2007  
 Directed by Jan de Bont  
 Writing credits: Steve Alten (novel) and Shane Salerno (screenplay)

*Meg*, short for Megalodon, a supersized prehistoric shark, is the focal point of a new movie from the director of "Twister" and "Speed". The film is an adaptation of Steve Alten's National Bestseller about the hunt for the most deadly predator of all time, the 100,000 pound, 80-foot long Megalodon shark.

This suspense novel in which paleobiologist and deep sea explorer Joanas Taylor comes eye to eye with the monster from a world seven miles under the waves was originally released in 1997 and is back due to popular demand—reprinted in a new extended edition, with a Tyrannosaurus Rex by Nimba Creations on the cover.

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



# REVIEW

## Underwater Video Guide

"Annie created this step-by-step DVD, "Your Guide to Creating Underwater Video," to teach you visually how to make better images both above and below the water. Whether you are new to shooting or have owned your camera system for years and simply want to refine your techniques, there's no better tool available to help you achieve your underwater video dreams."

### Click to view sample chapter

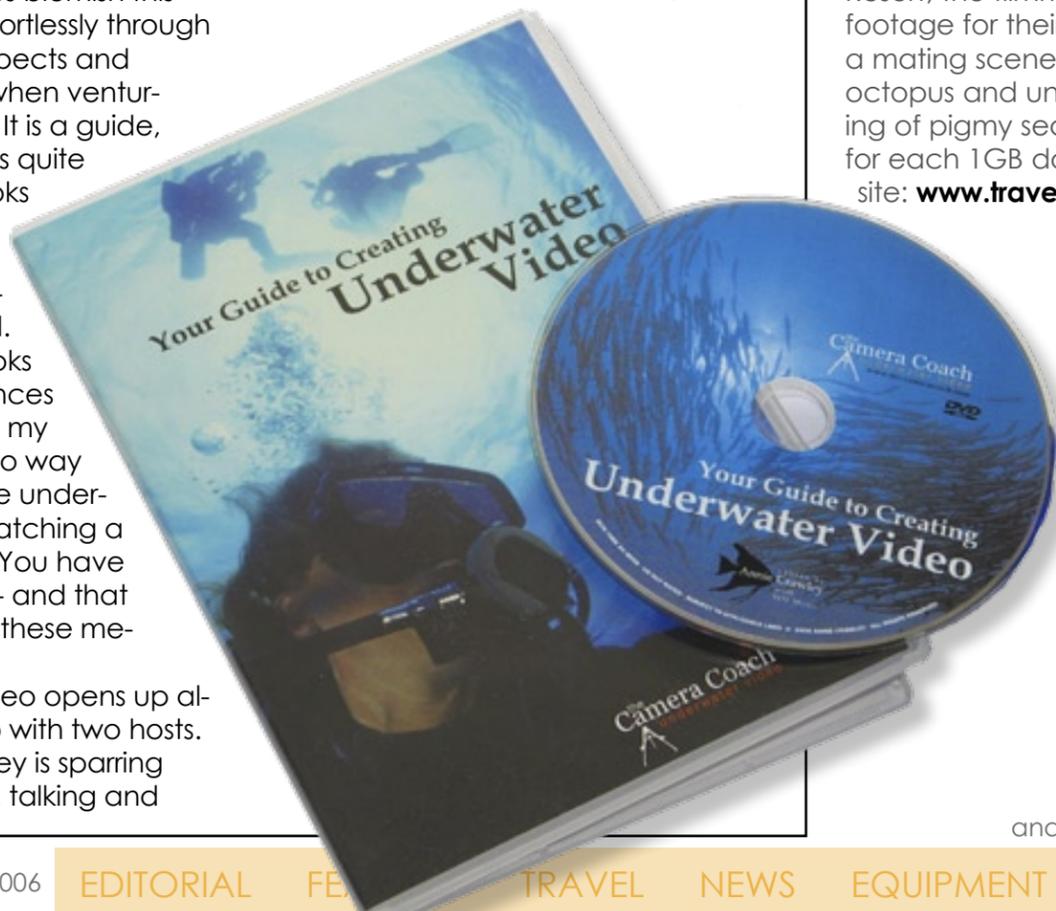
(Quicktime movie - will take a while to load)

I know... this doesn't sound very professional, but this DVD is rather cool, and extremely well produced. No unfinished patches or cutting corners blemish this DVD, which takes you effortlessly through all the most important aspects and considerations to make when venturing into this exciting field. It is a guide, the title tells us, and that is quite fitting because guidebooks are mostly meant to prepare you before a journey and wet your appetite. Which this one did. Granted, some guidebooks are also meant as references and how-to guides but in my humble opinion there is no way you can acquire a skill like underwater videography by watching a DVD or reading a book. You have to get wet and practice - and that will always be the limit to these medias.

At a first glance the video opens up almost like a tv-news studio with two hosts. Here author Annie Crawley is sparring with her editor Jeff Morse, talking and

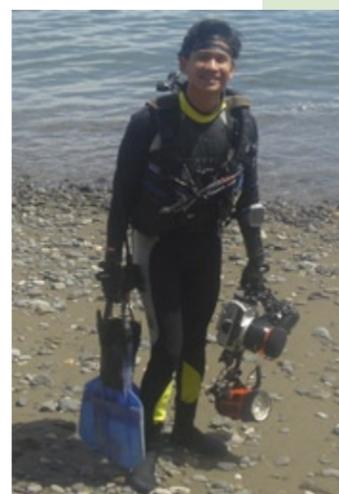
coaching you through all the chapters. At first I couldn't help feeling that the conversational format was a wee bit too articulated and teleprompted but thinking it over I couldn't see anything wrong with that, it just stood out a bit as seen from the European tradition in which I am rooted. And generally the Americans are way ahead when it comes to doing educational material, this dvd being a point in case.

And, being a still photographer, I was also rather impressed by the ease and elegance in the explanations given of some of the basic concepts like field of depth, over- and underexposure, and more. I could make good use those snippets in my own photography teaching. —Peter Symes [www.anniecrawley.com](http://www.anniecrawley.com)



## Downloadable Underwater Films: The "critters" Trilogy

The trilogy, "critters", "coral critters" and "night critters", which won the unprecedented double Palme d'Or award at the World Festival of Underwater Pictures in Antibes, France, in 2000, was filmed by John Boyle and Fionn Crow Howieson of the UK's Shark Bay Films who spent over a thousand hours submerged in Lembeh Strait, Indonesia. Watch warty frogfish, hairy ghost pipefish, Ambon scorpionfish, flamboyant cuttlefish, yellow pygmy seahorse and solar powered nudibranchs as they make a living in the underwater ecosystems of this fascinating place. Based at Kungkungan Bay Resort, the filmmakers captured unique footage for their critter flicks including a mating scene between blue-ringed octopus and unexplained head-butting of pigmy seahorses. Price: GB£4.00 for each 1GB download. Visit the website: [www.travel-dive.com](http://www.travel-dive.com)



Underwater Photographer and macro expert, Nonoy Tan

# First Philippines Dive Guide & Spotter Workshop in Mabini, Anilao

by Nonoy Tan, Philippines

On May 11-12, 2006 local dive guides and "spotters" for underwater photographers converged at Solana Bezo Resort ([www.divesolana.com](http://www.divesolana.com)) of Anilao, Philippines to participate in a workshop organized by the Mabini (Anilao) Resort Owners Association and the local government.

Conceptualized by videographer Marissa Floirendo, the workshop intended to strengthen local capability of providing world-class dive guiding and spotting services to underwater photographers. Trainers were Nonoy Tan, Gutsy Tuason, Karina Escudero and Marissa Floirendo – all Filipino underwater photographers and videographers. Also, the aim was to deepen cooperation among stakeholders (private and government) in providing alternative sources of income for subsistence fisher folks.

Throughout the Philippines, numerous dive areas continue to be discovered that are of special interest to macro underwater photographers. The potential of these areas is yet untapped because the underwater macro life have been largely unknown, even to local residents. However, as more divers explore these seemingly barren reefs, the need for professionally trained dive guides and spotters will surely increase. Hence, this workshop, which is a precursor to a series of training activities, especially targeted for those residing in coastal villages. Before becoming dive guides, some of the trainees in the workshop had been subsistence fishermen.

The trainees came from different parts of the country. Six dive guides were from Anilao, one from Calatagan (Batangas), two from Davao (southern Philippines), and two from Donsol, Sorsogon. Anilao is a popular destination for muck diving, and a frequent host to professional underwater photographers. At the same time, Davao is being explored as a macro photography destination. Donsol, albeit known for its whale shark interaction, will soon be promoted for macro pho-



Arrow crab, Dauin, Philippines

tography too. This convergence of dive guides/spotters from different parts of the Philippines was the first of its kind. Coming from varying backgrounds, the trainees were able to share experiences, learn from each other, and develop camaraderie.

During the workshop sessions, the trainees were presented with a set of protocols to follow before, during and after the dive with an underwater photographer. They were also given an introduction to basic camera setups and had an opportunity to handle different cameras. Also, the trainees were provided tips on where and how to find macro critters, including an explanation of behavioral characteristics that are of interest to underwater photographers. After completing actual dives, the trainees were able to develop maps of the dive spots, which illustrated the various critters found in the areas. Furthermore, with the aid of books, they identified their common and scientific names. The list of critters included species of frogfishes, ghostpipefishes, sea moths, dragonets, nudibranchs, commensal shrimps, eels, etc. Finally, the workshop closed with a "graduation" ceremony and night socials.

The workshop was a tremendous success and has inspired the organizers to expand the training course to other places in the Philippines, as well as convert the training materials into local dialects. The project received invaluable support from various stakeholders. These included Joel Uichico (President of the Resort Owners Association of Mabini) and Mayor Rowell Sandoval (Mabini, Batangas). ■

NONOY TAN

# Ghost Ships

## of Palau

*The Lost Japanese Wrecks*



World War II gas mask

Text and photos by Ethan Daniels

**Hidden beneath the serene waters of Palau's lagoon lie dozens of coral encrusted Japanese ships. These long lost hulks were all sent to their final resting places during a devastating American air strike over 59 years ago and have since gained notoriety as some of the world's most alluring ghost-filled vessels.**

Before dawn on March 30, 1944 Operation Desecrate One began as the American Carrier group, Task Force 58, sent an endless stream of airborne sorties over the Japanese fleet anchored in the complex maze of Palau's Rock Islands. The unrelenting bombing and strafing that continued through March 31<sup>st</sup> annihilated the unprepared Japanese defenses and destroyed over 50 ships and countless planes, the remnants of one of the



most powerful navies in the world at the time. As a whole, the sunken fleet in Palau is certainly one of the world's most unique sets of ships due to their history, accessibility, and diversity. Over a dozen world-class wrecks lie either in or within minutes of Malakal Harbor, Palau's main port. From small ships like the astonishingly colorful Buoy 6 wreck to the 150 m long Amatsu Maru the fleet contained a wide variety of naval and merchant ships, few of which survived the violence of Desecrate One. Over half a century later, most of these wrecks still remain as seawater and encrusting organisms slowly deteriorate the battered ships. The dead fleet now serves as a series of artificial reefs throughout the shallow lagoon, collecting an entirely different set of fish and invertebrates than what are found on Palau's biggest attraction, the dropoffs of the barrier reef. Most people

know of Palau as having some of the most consistent shark dives in the world like Blue Corner, New Dropoff, and Peleliu Cut. The shear walls and reef

Divers float in eerie suspension around the silhouette of a Japanese tanker

INSERT: Amunition shells from Japanese warplanes

## Japanese Wrecks



ABOVE: Japanese warplane  
LEFT: Shells and gas mask of the Helmet wreck, Palau

plateaus that jut out into the Philippine Sea generate incredible currents, which in turn support an incredibly complex reef ecosystem that includes some of the highest marine diversity in the world. Corals, gorgonians, sponges, and an endless variety of reef fishes seem to be everywhere.

The attraction of exploring rusty historical ships is quite different from sightseeing on colorful reefs, though Palau's sunken fleet does blend into the natural seascape as if they were meant to be part of the ecosystem. Each of the wrecks is completely covered with life, from black corals and gorgonians, to Giant clams, Cock's comb oysters, and assortment of inner lagoon fishes never seen along the barrier reef. When descending on Palau's

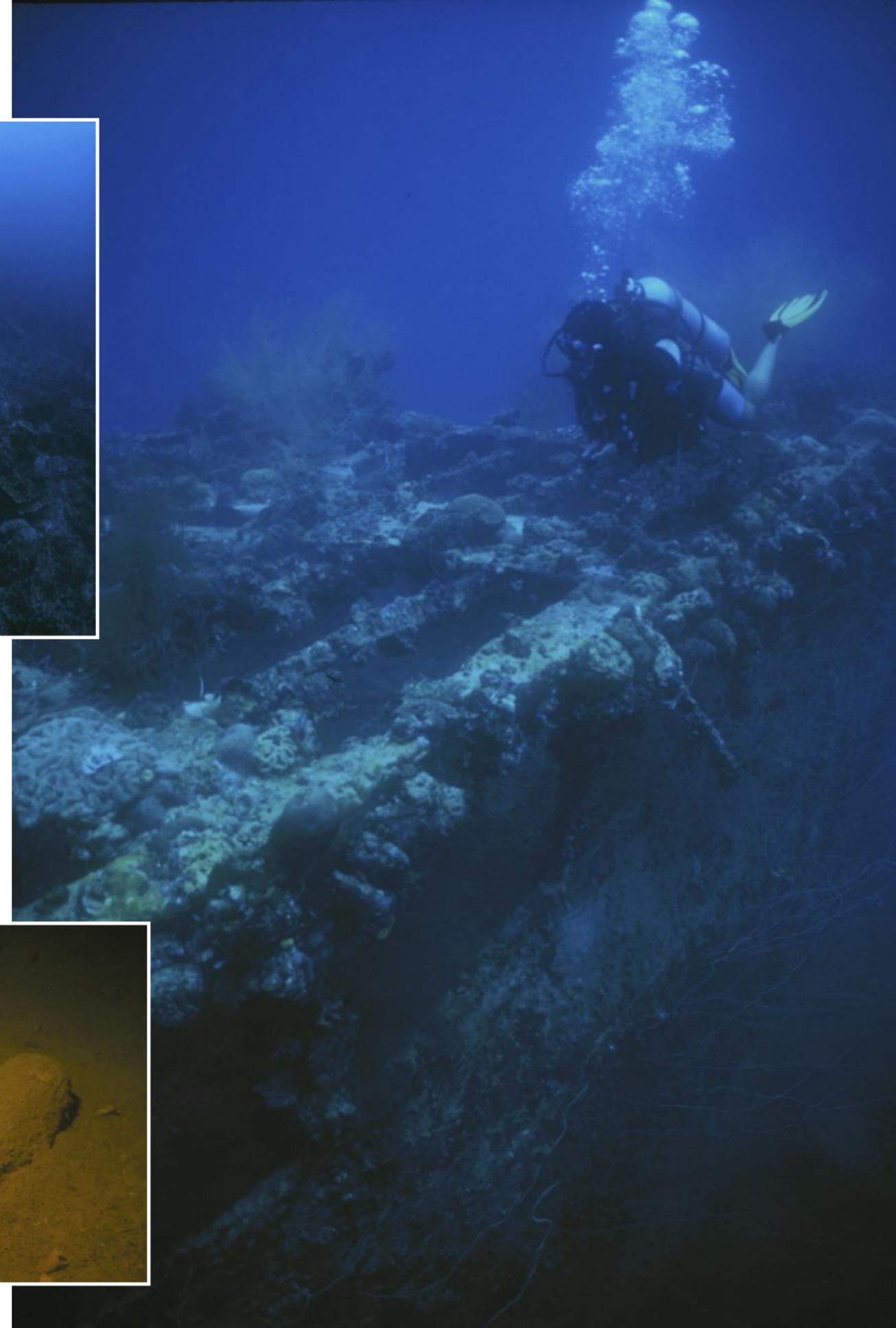
phantom-like wrecks visions of Japanese wraiths enter one's mind. Moving deeper, a large, indistinct shadow below becomes visible and causes the spine to tingle in suspense. Drifting deeper still, the dark blue shadow begins to gain detail and the ship, which went down in action, slowly comes into focus, manifesting itself out of the gloom. Overgrown equipment and wreckage litter the decks and are now lairs for reef fish of every hue, crabs, octopus, and other creatures. Several wrecks are even home territory to Spotted eagle rays.

A number of the vessels are lying upright which allows fantastic views of their decks from above. The Iro, the Chuyo Maru, the Amatsu Maru, and the Ryuku Maru all went straight down to the silty sea floor with virtually no list. On bright days when the lagoon waters provide excellent visibility these ships are astounding to drop down upon.

The marine life that has grown on the ships' equipment hides the jagged metal and unsightly gear strewn about on the decks. The upright ships are also more safely and easily penetrated as vertigo doesn't seem to be as much of a problem. As most of these ships carried cargo or oil they have kingposts



INSET: Haunting remains of the fallen  
RIGHT: Diver investigates the shipwreck





# Japanese Wrecks

The sculptural forms of a coral garden



Tail end of a dugong

and masts that still reach far above the decks toward the surface and make ascending both enjoyable and interesting.

Several planes that were shot down in Palau's lagoon during the war are also excellent dives. In particular the Jake seaplane, a Japanese Navy Reconnaissance Floatplane shot down in 15 meters of water, is one of the most aesthetic. The entire plane sits upright on a shallow, coral laden patch reef near Koror. Sunlight plays off the clean aluminum that has

resisted the attempts of most encrusting marine organisms, allowing a clear view of the plane from the surface. Another complete plane, a Zeke or Navy Carrier Fighter, lies upside down on a white sand bottom in 20 meters of water. One of the 20 mm machine guns mounted in one of the wings now has a flower-like tube worm flourishing out of the barrel, a definite sign that war is gone, but not forgotten.

The wrecks littering the lagoon bottom are not the only remind-



Wreck of Zeke (Navy Carrier Fighter)

Dugong and diver share sun rays



## Japanese Wrecks

er of the violent and brutal fighting that occurred in Palau. Between September and November of 1944, almost 13,000 men were killed on Peleliu, one of the southern most islands in the archipelago, during one of the bloodiest battles of the Pacific campaign. Caves that pock the rough limestone island still contain human remains and equipment as the jungle slowly covers scars that are long to heal. Burned out Japanese and American tanks, some with foliage growing out of them, are still evident along the coral roadsides and bullet riddled building serve as sentries from an age gone by.

Long forgotten pill boxes, some with guns and equipment still remaining, are hidden all over the archipelago, including the exquisite Rock Islands. Just a few years ago a Palauan hunting birds in the Rock Islands discovered a Japanese bomber that had been shot down. The pilot, whose remains have since been repatriated to Japan, was still strapped into the cockpit. The thick foliage that covers the limestone islands had kept this secret for almost 60 years.

The fabled islands of Palau still bare secrets, many of which will never be learned by man. This is an important dimension and part of the mystique of these isolated islands. Ghosts, long undisturbed, both above and below the water, continue to await the adventurer.

Interested in learning more details about the WWII wrecks in Palau and Truk (Chuuk)? Check these books out, as both of these authors have done extensive research on all of the known, and still to be found, wrecks in these areas. ■

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Lindemann, Klaus. 1991. *Desecrate 1*. Pacific Press Publications, Assoc. Belleville, MI.

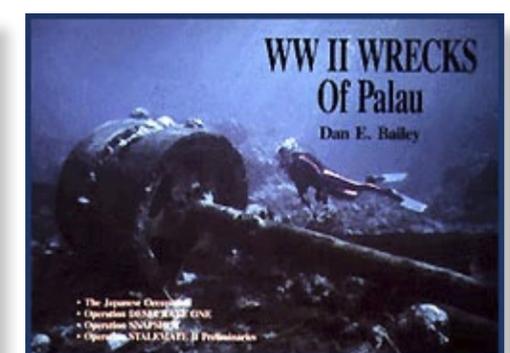
Tasselled Wobbegong



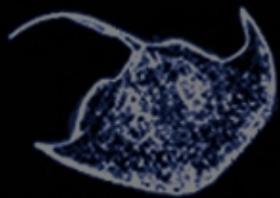
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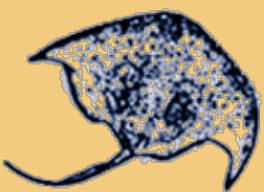
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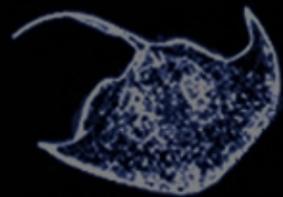
**Ugly carp rakes in the dough**

Fisherman in the midwest are making a bundle selling a pesky invasive fish called the Asian carp. The fish was introduced to the Illinois River in the 1960s to eat algae in catfish farm ponds. But the rascals escaped and are now populating waters of the Mississippi River in large numbers making their way up to the Great Lakes. It is estimated that there are about 65 million pounds of carp in

the Illinois River. Commercial fishermen who invested in new stronger nets and grinding machines are making money by selling carp ground up into hamburger-like patties according to local reports. Some are selling up to 2 million pounds of carp in the major US cities. ■  
Source: *United Press International*



Big head Asian carp competes with indigenous fish  
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EVAN BARNES/NELSON MAIL, WWW.STUFF.CO.NZ

Froggy friends line up at the starting line in this year's inaugural subaquatic cycling competition at Cable Bay in New Zealand

## Subaquatic cyclists encounter hazards

Cable Bay in New Zealand was the site of this year's Nelson Underwater Club bicycle race under the waves. While ten of the club's diving members competed without incident, one diver got caught in a fishing line and another hit a flounder in slow-motion. Others experienced buoyancy problems falling off their cycles or front wheels rearing off the ocean floor due to insufficient weight. Low vis was also a factor for competitors who could not keep an

eye on their competition. Only spectators on the beach had any idea who was winning the race by watching the meandering buoys attached to the bikes. The winner, Todd Ramsey, pedalled across Cable Bay in 45 minutes. But another pedalling diver was disqualified from the race when the ump caught him swimming. With an inaugural event as fishy as this, one wonders what next year's race will reel in. ■

Source: [www.stuff.co.nz](http://www.stuff.co.nz)



WWW.NEDO.GO.JP

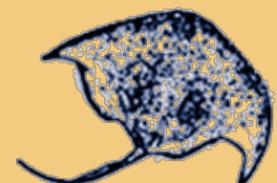
ACM-R5 robosnake slithers like the real thing in the water and crawls like a serpent on land

## Amphibious robosnake charms enthusiasts

The Japanese have done it once again, this time with a slithery 8 km snakebot ACM-R5 that takes mechanized snakery up a notch. Powered by a 30-minute lithium ion batter, the roboreptile has a snout-cam and slithers naturally in the water as well as crawls and climbs. The serpent can even to some logrolling, which is the latest required competence

of mechanical snakes these days. A 32-bit microprocessor is fed information from sensors that guide remote operation. It is thought that once released for humanitarian work such as locating victims of earthquakes and disasters, it will probably find itself fitted with reconnaissance equipment or weaponry in the long run. ■  
Source: [www.engadget.com](http://www.engadget.com)

## Wet & Weird



News edited by  
Gunild Symes



LEFT:  
*Coral Grouper & Corals*  
Oil on canvas, 46"x29"

BELOW:  
*Packed Small Mouth  
Grunts School*  
Oil on canvas

Patrick Chevailler was born in Bordeaux, France, in July 1946. All during his teen age years, he admired the paintings his father created as a hobby, thinking he would never be able to paint like his father did. Chevailler received a diploma as a medical doctor in 1972 and settled in the countryside of southwestern France as a general practitioner. Since his childhood, Chevailler always enjoyed sailing. In 1977, he sailed his boat from France to the Caribbean, where he began painting in 1978 while practicing as a doctor in the tiny islands of Les Saintes to the south of Guadeloupe in the West Indies.

# Patrick Chevailler

## PORTFOLIO



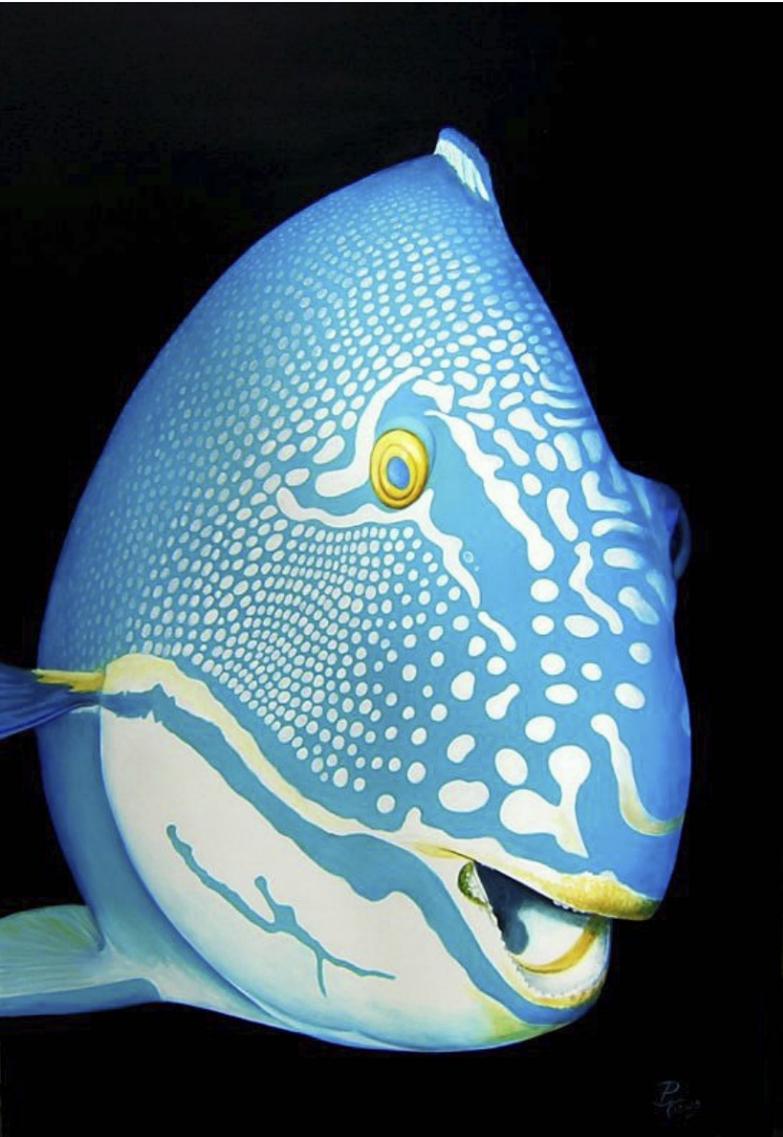


TOP RIGHT: *Glasseye School*, oil on canvas, 30x46"

BOTTOM RIGHT: *Acanthurus Leucosternon School*, oil on canvas, 20x60"

LEFT: *Surf Parrotfish portrait*, oil on canvas, 26"x40"

Chevailler



*Spotted Blue Parrotfish, oil on canvas, 26"x40"*



*Banded Butterfly Portrait, oil on canvas, 26"x40"*



*Tiger Grouper Portrait, oil on canvas, 29"x46"*



*Queen Angel Head, oil on canvas*

A few years later, Chevaller's father painted a miniature oil painting of two old fighting frigates as a gift to decorate his son's boat, and Chevaller kept asking his father to paint another one in order to have a pair. But his father was a busy man, and the painting was never made.

One day, while reading a book on naval history, Chevaller stopped on a print of the Trafalgar battle, and just thought: "Wouldn't it be ideal as part of my pair?" Then he thought, "If Dad is able to paint what he paints, why shouldn't I be able to paint too?"

With a basic oil set, Chevaller began to paint a reproduction of what he saw in the book. It took him a month to complete a 5"x 8" highly detailed copy (you can even count the number of cannons on the battleships!) of the large scale original painting. Chevaller found out that he liked doing it so much he began painting other images of naval battles.

Without any knowledge of the basics, he developed his own technique, and little by little, freed himself from copying. Over the next twenty years, he painted as a hobby, about 150

oil paintings of all sorts of old time sailing ships. They usually ended up being sold or given away, from time to time, to friends and family, directly or through some casual exhibitions.

In 1996, Chevaller resettled on Palm Island of St Vincent and Grenadines in the West Indies. There, he was commissioned to paint a large underwater scene (8'x4') by a fellow diving fan. Since it was so large, Chevaller had to paint it outside and was amazed by the interest shown by people passing by. In all respects, he had a lot of fun painting this new kind of subject matter.

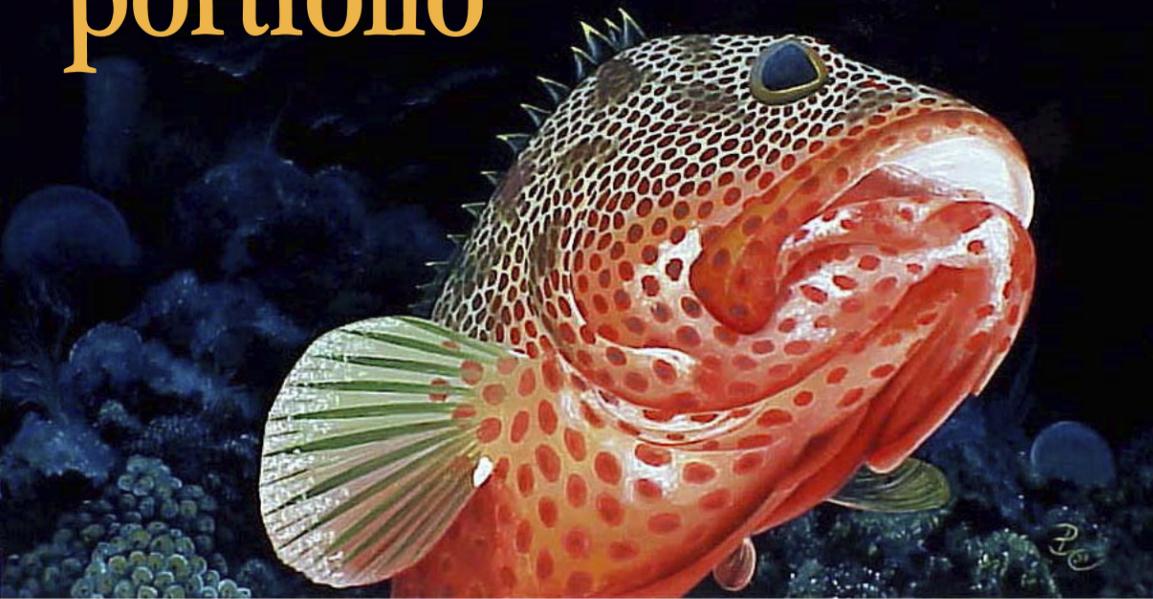


ABOVE:  
*Hamlets and Sponges*  
Oil on canvas

LEFT:  
*Cocoa Damselfish  
intermediate*  
Oil on canvas

RIGHT:  
*Lobster Couple*  
Oil on canvas





Chevaller then painted some smaller underwater scenes, which sold immediately. Since then, the painting hobby has turned into a real job, and his medical practice (he still practices as an emergency sailing doctor) has turned into a secondary activity. Chevaller barely succeeds at painting enough to complete the many commissions he already has and keep a minimum stock.

Chevaller's technique is very classic: oil paint on canvas. He uses both his own diving experiences

ABOVE:  
*Red Hind*, oil on canvas

RIGHT:  
*Indigo Hamlet*,  
Oil on canvas

BELOW:  
*Epinephelus marginatus*  
Oil on canvas, 26"x40"



(now assisted by a digital camera with housing) and a lot of various documentation about fishes, corals and sponges... for the details.

Chevaller's work is now displayed in many galleries in most of the Caribbean islands, Mexico, Florida and other US states in a gentle but constant expansion of exposure. From his original oil paintings, Chevaller produces high-end limited edition giclée prints on canvas in three different sizes as well as ceramic or glass mural tiles, which are custom made to the dimensions desired. Six dozen different subjects are now available. ■

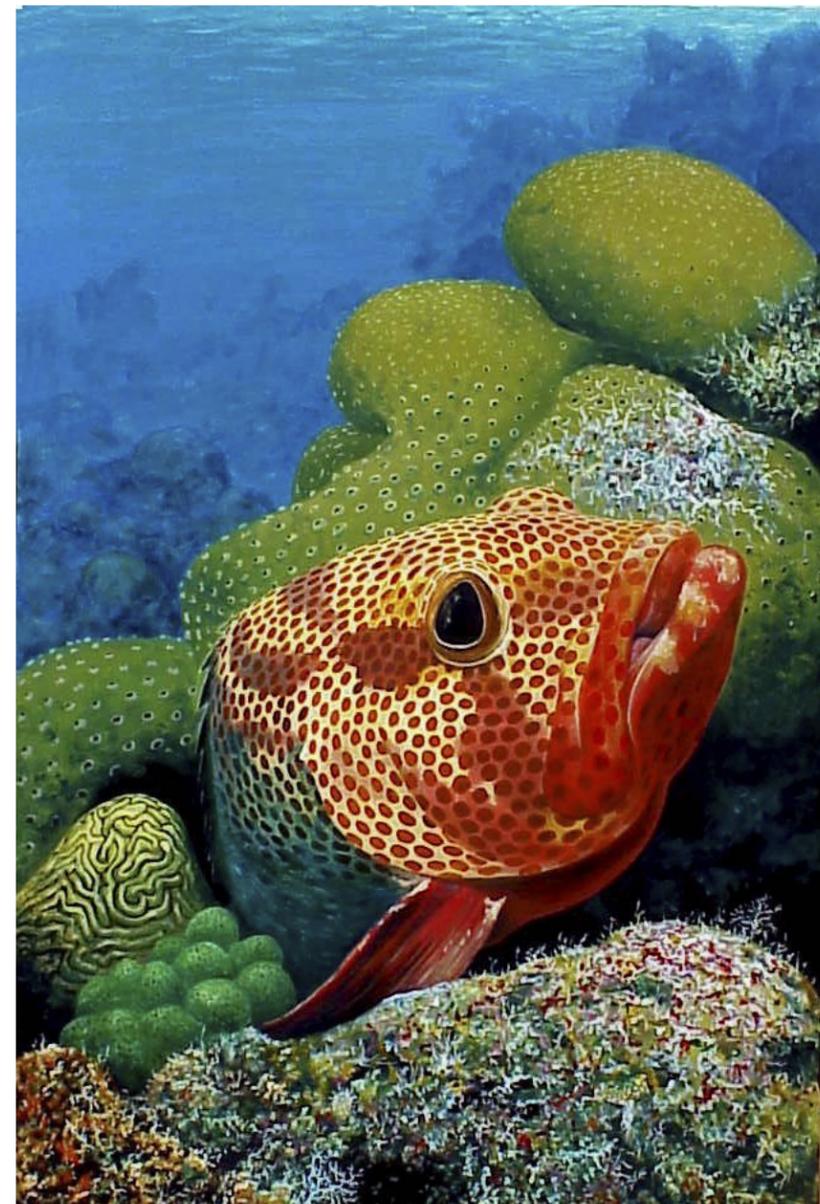
For more information or to order originals, giclée prints and tiles, please visit: [www.artandsea.com](http://www.artandsea.com)



Chevaller

ABOVE:  
*Wreck and  
Bannerfish*  
Oil on canvas

LEFT:  
*Red Hind  
Hiding Out*  
Oil on canvas





ABOVE:  
*Turtle Swimming Up  
the Drop Off*  
Oil on canvas  
26"x40"

LEFT:  
*Grey Angel and  
Orange Corals*  
Oil on canvas

RIGHT:  
*Porkfish and Grunts*  
Oil on canvas

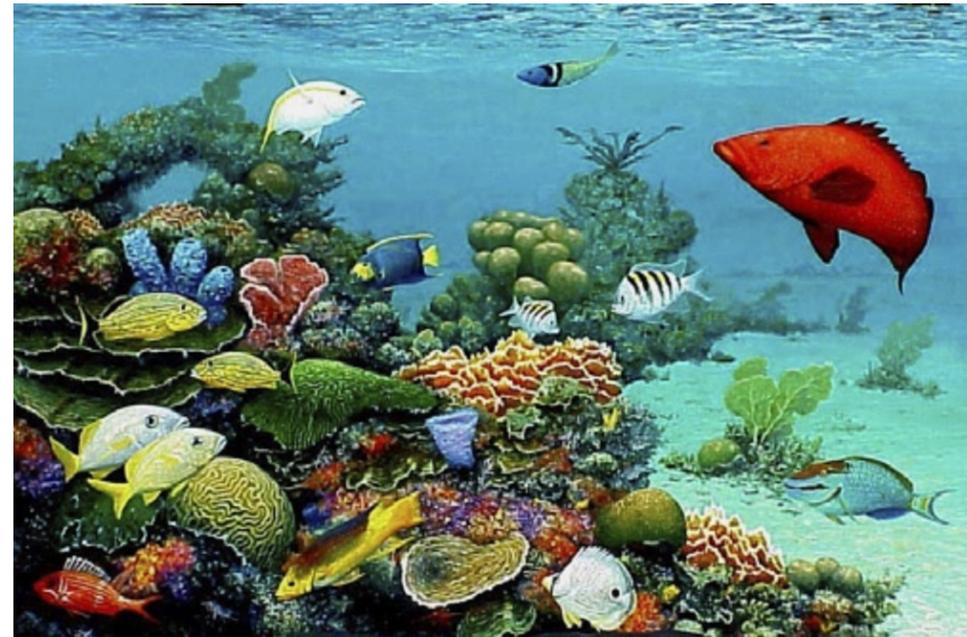


Chevaller



ABOVE:  
*Above and Under*  
Oil on canvas

*Anthias Group*  
Oil on canvas



ABOVE: *Burda's Reef*, oil on canvas  
LEFT: *Basslet's Reef*, oil on canvas

IN OUR NEXT ISSUE  
*Diving the Red Sea*  
Sharm el Sheikh  
Jordan



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