

Sea Glass Jewelry: Recycling Ocean Gems



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Number 35

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Cozumel

Tech Talk
**Choosing a
Tech Instructor**

Profile
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Wrecks
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Canary Islands
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DOMINICA
Sperm Whales

Hot Rod Sea Sculpture
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COVER PHOTO: *Pod of Sperm Whales, Dominica*
PHOTO THIS PAGE: *Sperm Whale, Dominica*
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Legal matters

Case 1

On page 10 of this issue, there is an article about the lawsuit being filed against ScubaBoard by a Maldives-based dive tour operator over allegedly libellous comments posted and statements by users on ScubaBoard's forums, as members discussed and vented their opinions on the incidents surrounding and the subsequent handling of a fatal accident that occurred on a liveaboard in 2008, when a young Russian diver tragically lost his life due to contaminated air in scuba tanks. The case is still pending.

While we are naturally bothered by the lawsuit—which at first glance looks to be a frivolous one—on behalf of our media colleagues, it is the far-reaching implications we are more worried about. If at any time a member of the dive industry, or somebody else for that matter, feels miffed about receiving bad publicity in the press when reports on defective products or services appear—or, as in this case, accidents—and thereafter tries to censor the media, then there is a direct threat to our function and obligation to readers and consumers as reporters of information and opinion, a threat that must be fought at all costs.

While the dive industry media may be a far cry from the Washington Post—and we do not exactly uncover scandals of Watergate magnitude or bring down presidents—it is still our function, duty and obligation to act as an independent, authori-

tative and investigative press that keeps an unbiased and critical eye on the industry and its service providers. It is sad that the aforementioned dispute has now come so far that it has to be resolved in the courts, but as far as X-RAY MAG is concerned, we will not be cowed. We will remain critical as always.

Case 2

It was only days prior to going to press that we received a conspicuously short press release from Teledyne—the manufacturer of oxygen sensors used in many brands of rebreathers—that they were pulling out and ceasing delivery to the dive industry effective immediately, no further reasons given. Several industry insiders close to the magazine who have asked not be named, or directly quoted, have pointed to the lengthy legal case *Barrett v. Ambient Pressure Diving, Ltd.* (the manufacturer of the Inspiration and Evolution rebreathers) as the underlying cause of Teledyne's exit.

The case, which APD won after a four-year trial, was brought by Stephanie Barrett, widow of Robert Barrett, who claimed that a design defect in the Inspiration rebreather caused her husband's death. The details can be read here <http://www.davidconcanon.com/recentcases/barrettvambient.html>.

We haven't been able to obtain a comment directly from Teledyne, but it is alleged that Teledyne, who in some respects

can be seen as co-defendant, settled the matter out of court with a large sum and pulled out, leaving a string of rebreather manufacturers with a bit of a headache, as they scrambled to find a replacement.

We cross our fingers that these legal cases are just aberrations and not the harbingers of a new trend in the dive industry in which members just sue somebody else for what is really only their own fault, or risk, that they should have accepted in the first place.

As our societies seem to be growing steadily more litigious, it is disconcerting. Clearly manufacturers and other service providers should be held accountable for their products and services, but this should be regulated by official bodies that test and approve products according to quality standards set forth in legislation. If the official inspectors are indeed doing their jobs—protecting consumers from faulty products and services—and frivolous or gold-digging lawsuits are still allowed in the already overloaded backed-up court system, then we will undoubtedly see more manufacturers shun the dive industry and take their businesses, products and innovations elsewhere.

And who could blame them?

— Peter Symes
Editor-in-Chief



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X-ray mag

News edited
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wazzup NEWS

THE CHAGOSSIANS

The native islanders, the Chagossians, were evicted to make way for a U.S. Air Force base on the largest island, Diego Garcia. The former residents have since fought a long-running battle in the British courts for the right to return. The islanders, who now live in

exile, have expressed concern that the reserve may in effect ban them from returning, since the protected zone could prevent them from fishing—their main livelihood.

The islanders, numbering about 2,000, were removed by the simple means of denying them any supplies. The British govern-

ment bought the company that employed them to harvest coconuts into fibre and lamp oil and then told them the business was closed.

The islanders were dumped in Mauritius and an Immigration Order preventing anyone from going back was issued in 1971. In 2000, a court held

that the Immigration Order was unlawful, and it was said of the commissioner who issued it that he was supposed to govern, not remove the people.

It withdrew the 1971 order, and in fact, allowed islanders the right of return, but nobody could exercise it because there was nothing to go back to. ■

Chagos Islands world's largest marine reserve

The UK government has designated an area around the Chagos Islands as the world's largest marine reserve. Conservationists say the islands possess up to half the healthy reefs in the Indian Ocean. While no one lives there permanently now, people once did, and that could be a problem.

The Chagos archipelago, part of the British Indian Ocean Territory, is a group of 65 tropical islands, spread over half a million square kilometres of Indian Ocean, that have belonged to Britain since they were captured from France in 1814 during the Napoleonic Wars. The islands include Diego Garcia, the site of a controversial joint British-American military base.

Since the 1960's, they have been exclusively set aside for defence purposes, with no inhabitants except for military personnel and civilian contractors on Diego Garcia. As a consequence, between 1967 and 1971, an estimated 2,000 Chagossians were evicted from the archipelago to make way for the Diego Garcia military base. The islanders were

taken to Mauritius and the Seychelles, more than 1,000 miles away, where many have lived in poverty ever since.

In 2008, the islanders lost a long-running battle when the House of Lords, as the final court of appeal in the UK, ruled in favour of the British government by overturning the lower court rulings and finding no right of return on the part of the Chagossians.

Most of Diego Garcia is a Ramsar site, and five islands and their reefs are Strict Nature Reserves. The Archipelago provides important habitat for marine wildlife and seabirds for all or parts of their lives.

The Chagos archipelago boasts the world's largest coral atoll and the world's cleanest, most pristine waters, which is home to at least 220 coral species and more than 1,000 species of fish. The underwater landscape of 6,000-meter deep trenches, oceanic ridges and sea mounts, is also a refuge and breeding ground for large and important populations of sharks, dolphins, marine turtles,

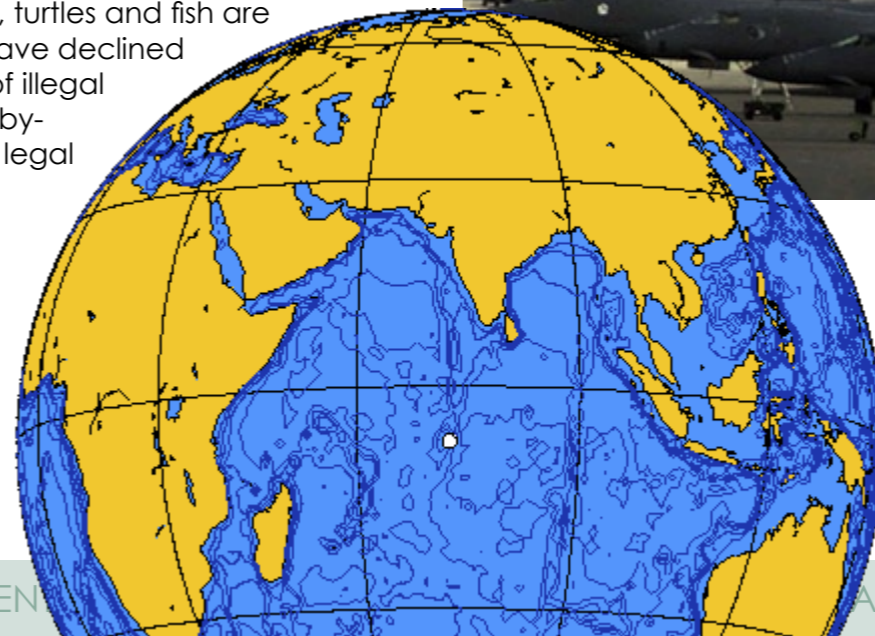
rare crabs, birds and other vulnerable species.

Pollutant levels in Chagos waters are exceptionally low because of minimal human influence. As a result, the ecosystems of the Chagos have so far proven resilient to climate change and have been largely immune from threats to other reefs worldwide.

Despite a Fisheries Conservation Management Zone with commercial catches limited by licence, legal and illegal fishing has impacted the area, for sharks, sea cucumbers, turtles and fish are known to have declined as a result of illegal fishing and by-catch from legal fishing. ■



In 2004, the government made a new order that nobody had a right to live in the British Indian Ocean Territory, and citing fears of terrorism in the post 9/11 world, it said a permit would be needed to go there. The image shows a U.S. B-1 bomber taking off from the U.S. Air Force base on Diego Garcia. During the Gulf Wars, bombers based on the Chagos Islands—including coldwar era B-52's—conducted bombing missions over Iraq and later over Afghanistan



The new marine reserve would cover a 544,000 sq km area around the Indian Ocean archipelago, which is regarded as one of the world's richest marine ecosystems. This will include a "no-take" marine reserve where commercial fishing will be banned.

Atlantic Octopus Mimics Flounders

the Atlantic longarm octopus can shapeshift into the likes of a flounder. Several Atlantic longarm octopuses have been captured on video imitating the sand-dwelling peacock flounder, mimicking not only the shape of the flatfish but also its color and swimming style.

Mimicking octopus were first reported off the coast of Indonesia in 1998, and now, the first one has been found in the Atlantic Ocean. It is the fourth octopus species known to disguise itself as a completely different species.

Normally, Atlantic longarm octopuses swim with their arms trailing behind their heads. But a newly released video shows

the cephalopods folding their arms back into flounder shapes and undulating in a way that mimicks the peacock flounder, a common flatfish that shares a sandy habitat with the octopus in Caribbean waters. It swims along the contours of the sea floor, even torquing its soft body so both eyes move to the left, just like a flounder.

The animal only assumes flounder form when it's on the move, the scientists observed. Study leader, Roger Hanlon of the Marine Biological Laboratory (MBL) in Woods Hole, Massachusetts, thinks the octopus uses flounder mimicry to avoid predators, which might be alerted to potential prey by motion. "The animals have good camouflage, but when they move, motion gives away camouflage.

Instead of trying to be camouflaged while they're moving, which is difficult if not impossible, they turn themselves into flounder."

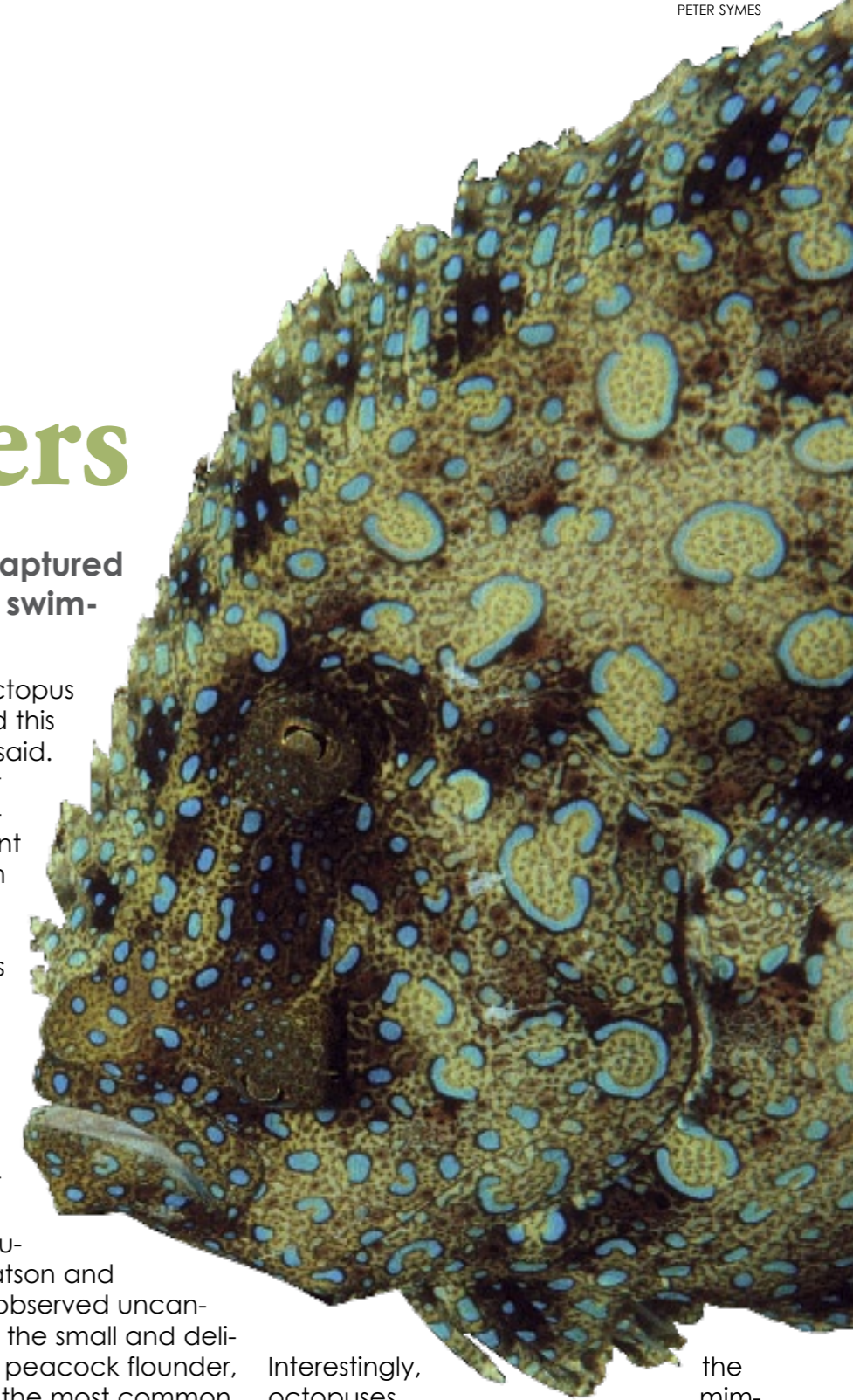
How exactly the octopus picked up its flounder-like behavior is still a mystery. When Hanlon saw the wild Atlantic octopuses "becoming" flounders like the species in Indonesia, he went back and looked at snapshots of the lab animal taken in 1985.

In the 1980's, Hanlon had captured Atlantic longarm octopus larvae and brought them back to his lab, eventually raising one to adulthood. The captive animal displayed a weird swim pattern, but the scientists didn't recognize it as mimicry at the time. "It had

never seen another octopus or a flounder, but it did this flounder mimicry," he said. "We didn't know what that meant in the mid-1980's. But it gives a hint that there might be an innate component to this swimming behavior ... that maybe this is hardwired."

Comparing still photographs and video footage from five Caribbean locations collected over the last decade, Hanlon and co-authors—MBL graduate students, Anya Watson and Alexandra Barbosa—observed uncanny similarities between the small and delicate octopus and the peacock flounder, *Bothus lunctus*, one of the most common sand dwellers in the Caribbean. They compared not only coloration, which in each animal resembled the sandy seafloor, but swimming speed and form.

The octopuses not only contoured their bodies to hug the wavy seafloor, but also swam with the same fits and starts as flounder at the same speeds.



Interestingly, the octopuses mimicked flounder only when swimming, when movement would compromise their camouflage. How well the animals blended in with their background differed. The octopus showed more highly controlled and rapid skin patterning than the flounder, whose camouflage was slower and less precise. ■

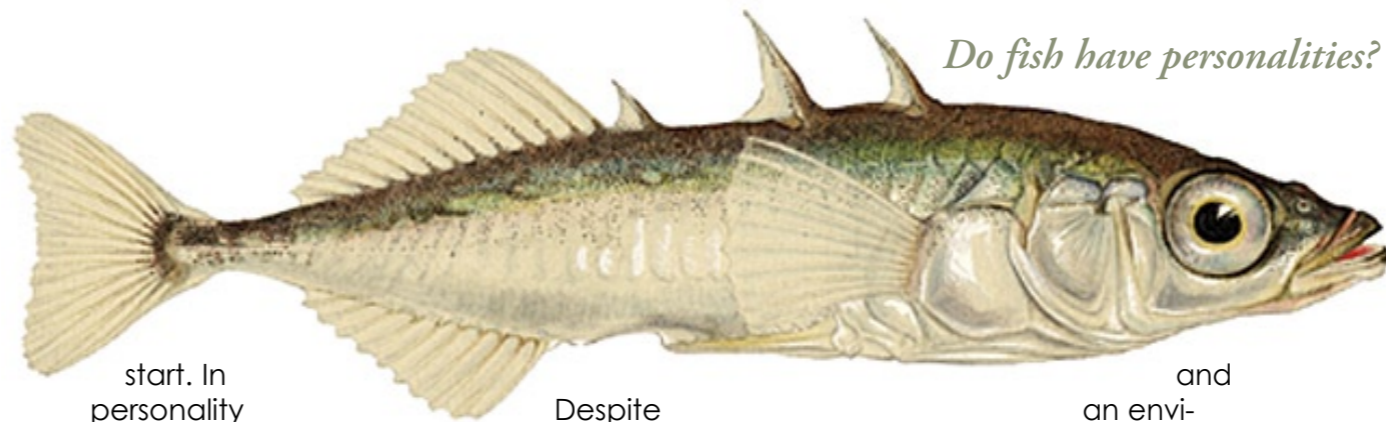


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Atlantic longarm octopus (*Octopus defilippi*) at the Blue Heron Bridge



Fish with attitude



Do fish have personalities?

Sticklebacks have different personalities, a team of researchers from University of Illinois led by behavioural ecologist, Dr Alison Bell, has found. Although it sounds like an almost heretical term to use for fish, "personality" is nothing more than consistent, individual differences in behavior, a co-researcher, Katie McGhee, explained. It means that even if their environment is the same, one individual will consistently act dif-

ferently from another.

Classic traits include shyness or boldness in response to threats such as the presence of a predator, and aggression to other members of the species, but also how actively an individual explores a new environment—curiosity, one might say—or how sociable it is, or its general level of activity.

While these are the traits most widely studied so far, Bell and others say they're prob-

ably just a start. In some cases, personality traits might be inherited, while in others they might develop as a learned response to differences in conditions of an organism's life—the kind of parental care it receives.

For example, the team has demonstrated that sticklebacks raised by a father (the species' sole caretaker) tend to take fewer risks with predators than fish raised in incubators.

Despite the environmental component, personality can be more than just a learned response to environment, since a learned behaviour can be forgotten relatively quickly. Scientists hope to probe the genomic underpinnings of this behavioural variation.

Bell likens personality to factors such as height or weight, which clearly can have both a genetic

and an environmental component, while being more stable. "I would say the key thing to personality is that there is individual variation and individual consistency," she said.

That variation and consistency might also explain why some individuals might learn from their environment faster than others.



Dr Bell explains her research

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Red groupers transform undersea landscapes



A new study led by researchers at Florida State University reveals the red grouper to be an architect and ecosystem engineer at heart.

Most abundant along Florida's west coast but also found on watery ledges and in crevices and caverns from North Carolina to Brazil, the red grouper excavates and maintains

complex, three-dimensional structures on the seabed. Marine creatures like the spiny lobster and the vermilion snapper then use these structures as their habitats.

Led by Florida State University's Felicia Coleman, the research-

ers watched red groupers remove sand from the sea floor. Ala dam-building beavers, the fish excavate and maintain distinct holes, thus providing coral, sponges and other marine life a place to congregate.

"The research is incredibly valuable because it demonstrates how interconnected species are in the sea," said Dr Susan Williams, a professor at the University of California, Davis, who has collaborated with Coleman on an earlier, related study.

"Its sea-floor associates include commercially valuable species such as vermilion snapper, black grouper and spiny lobsters. If the groupers are overfished,

the suite of species that depends on them are likely to suffer."

Working along the West Florida Shelf, Coleman and her colleagues observed the red grouper's excavating activities during both its juvenile stage in inshore waters and its adult stage at depths of 300 feet.

Coleman said, "We found through a series of experiments that they not only dug the holes but also maintained them by carrying mouthfuls of sediment from the centre of the pit to the periphery and expelling them through their gills and mouths, then brushing off the rocks with their tail fins."

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Fish Communicate in Secret

Certain coral reef fish use ultraviolet (UV) vision to tell the difference between their own and other similar species.

of the same and a different species (with similar overall body coloration but different UV facial patterns) in conditions in which the UV markings could and could not be seen. They observed that there was only a difference in territorial reaction when the UV facial patterns could be seen, demonstrating that these patterns are necessary for the fish to discriminate between their own and another species.

In further experiments, in which the fish were shown pictures of the different facial markings, the team demonstrated that they were reacting to the specific shape of the ultraviolet patterns on the intruder's face, not simply to their ultraviolet colour, she says.

"We came to the conclusion that the fish are using ultraviolet reflecting facial patterns to discriminate between their own species and other, similar-looking fish species—also that they are reacting to the actual pattern, not simply the ultraviolet light they were seeing."

Differences between patterns on the faces of individuals suggest that Ambon damselfish may also be able to use the patterns for the discrimination of individuals, in a

manner directly comparable to the face-based recognition of individuals performed by humans. However, major predatory reef fish like coral trout, wrasse and rock cod do not seem to have the ability to see ultraviolet markings.

"This means the damselfish are effectively exploiting a secret channel of communication among themselves and with other similar, but harmless species—one which cannot be detected by the fish that prey on them.

"It also means damselfish can see a wider spectrum of colours than we can, which is remarkable when you consider how colourful coral reefs are naturally. They must find them even more colourful places than we do." ■

The UV vision may act as a secret channel of communication because it is invisible to the fishes' predators

Indeed, the otherwise rather plain-looking Ambon damselfish may even be able to recognise individuals by their faces, in much the same way as humans do, researchers have found

The UV vision may act as a secret channel of communication because it is invisible to the fishes' predators.

"We observed that certain fish had very distinctive ultraviolet markings on their faces—and we wondered what they were using them for," said Dr Ulrike Siebeck of the Vision Centre and the University of Queensland (UQ).

Ambon damselfish may even be able to recognise individuals by their faces, in much the same way as humans do

In a series of carefully controlled experiments, the team exposed male Ambon damselfish to males

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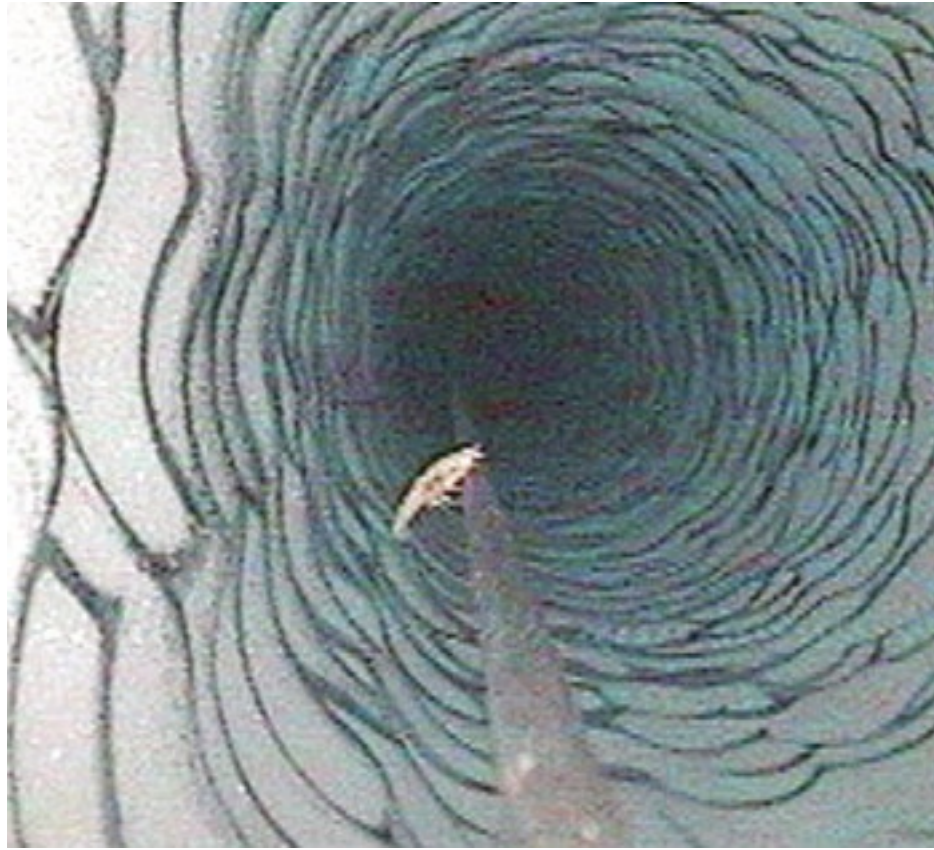
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Shrimp found *under* the Antarctic ice



NASA

Lyssianasid amphipod found beneath Antarctica's Ross Ice Shelf

Scientists have expressed surprise over the discovery of a shrimp-like creature found beneath the Antarctic. The shrimps and a jellyfish were discovered some 200 meters below the ice where it was previously believed that only microbes could exist.

A team from the National Aeronautics and Space Administration was surprised when they lowered a video camera to get the first long look at the underbelly of an ice sheet in Antarctica. A curious shrimp-like creature came swimming by and then parked itself on the camera's cable. Scientists also pulled up a tentacle they believe came from a foot-long jellyfish. ■



Click to view video

New website for jellyfish affectionados

A new website set up by Monterey Bay Aquarium Research Institute (MBARI) researcher Steve Haddock combines marine biology and social networking to create a resource that both scientists and ocean lovers can appreciate. Visitors can not only post their sightings and photos, they can also compare their sightings with those of beachcombers around the globe.

"People have been talking about jelly blooms increasing around the world, but we don't really have a lot of data on this. So, it's hard to know how localized these events are. That's why we created this website. The idea is that everyday people can get involved in a real ocean research project. Their eyes are important instruments in this study," said Haddock.

In addition to tracking jelly blooms, the Jellywatch site also allows visitors to report other unusual ocean events such as red tides or mass strandings of other marine creatures. Haddock and his fellow researchers are also interested in historical observations of jelly strandings. "The historical record is really hard to reconstruct" said Haddock. He also encourages people to report the lack of jellies at times or places when they might be expected. "No-jelly observations are useful as well," Haddock said.

Designed with input from the Monterey Bay Aquarium, the Jellywatch site is kid-friendly and very easy to use. Visitors can report sightings anonymously or register to simplify the entry of multiple observations. www.jellywatch.com ■



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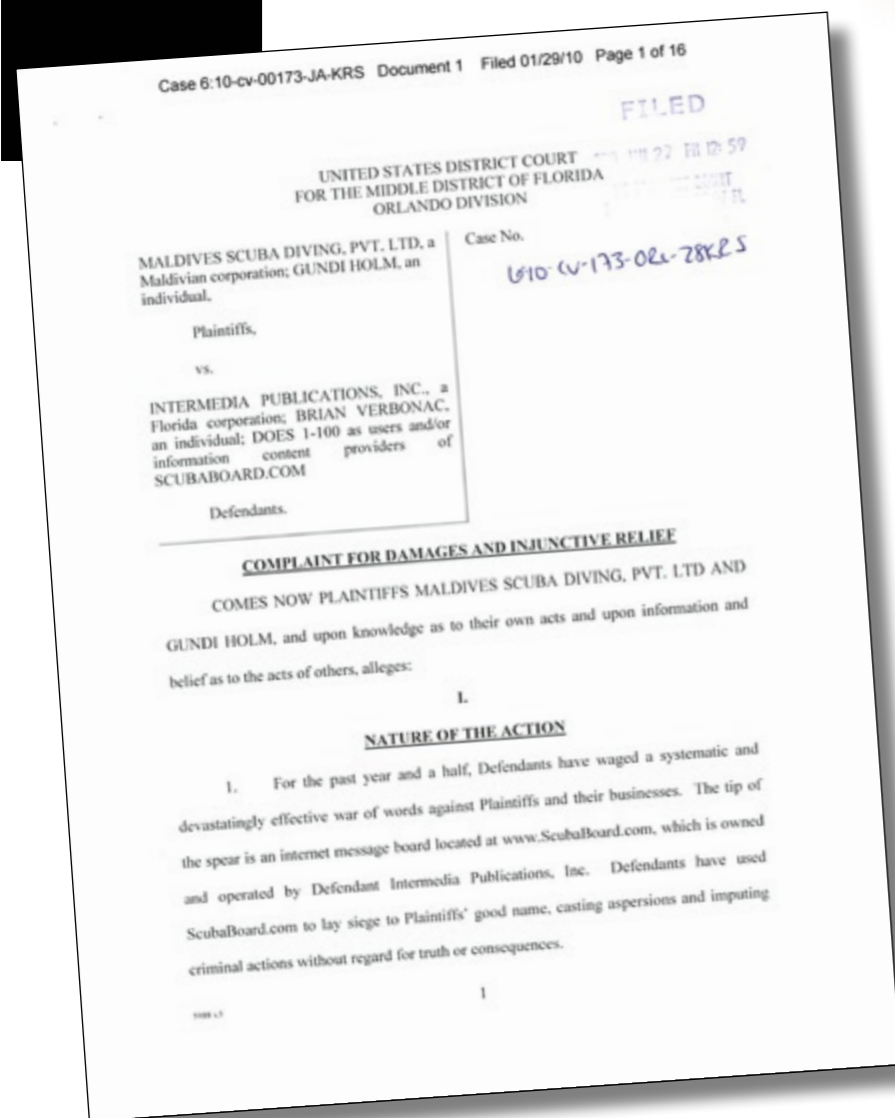


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Click to read the full lawsuit

Text by Peter Symes

Maldives Scuba Diving, a Maldives-based company that organises dive trips to the Maldives sues Scubaboard over 'torts, injury — Assault, Libel, and Slander'

This tall tale has its beginnings in the tragic events that happened during a liveaboard trip in the Maldives on 28 May 2008 when 11 divers suddenly fell ill and one diver—the 36-year old Russian national, Roman Rudakov—died due to contaminated air in the scuba tanks. According to one first hand witness, the levels of carbon monoxide were measured to be ten times that of acceptable levels.

The incident was reported by much of the global dive media and widely discussed on many scuba diving forums and discussion boards, including ScubaBoard, which resulted in a great deal of negative publicity for the organiser of the trip, a company, which at that time traded under the name, Strictly Maldives.

Sometime after the incident, the company either changed their name or the company's owner, Gundi Holm, who is an Austrian national, started up a new company named, Maldives Scuba Diving (MSD). When members of

ScubaBoard caught wind of this, they began to spread the word on the forum, warning others about the owner's history.

According to MSD—who claims they were nothing more than the travel agent for the diving trip and the local crew was the one responsible for the safety of their guests—the tone on the forum crossed into libel and slander.

Ten million dollars

On 29 January 2010, MSD filed a libel suit against InterMedia Publications, one of the forum's members—a Canadian they identified as Brian Verbonac—as well as one hundred "John Does" they do not know the identity of. MSD is seeking an excess of ten million dollars for "damages". Their lawsuit can be **downloaded here**.

In response, members of ScubaBoard have rallied around their administrators, raising money to help defend the case, which they anticipate may cost them up to US\$100,000. The administrators at ScubaBoard have not (as of the date of publication of this issue)

removed any of the allegedly libellous posts.

The letter of the law

As far as we could ascertain in most countries and jurisdictions, the administrators of online forum cannot be held accountable for utterings of their users and bloggers.

Since this case has been filed in a Florida court, the U.S. Communications Decency Act applies, which in its section 230

states that, "No provider or user of an interactive computer service shall be treated as the publisher or speaker of any information provided by another information content provider."

In other words, merely giving someone a platform that they use



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The boomerang and a ten million dollar lawsuit brought against Scubaboard

to make a libelous statement does not make one liable for those statements.

Libel cases are generally regarded as very difficult to win even in the best of cases, as a heavy burden of proof rest on the plaintiff. And after we have read through the posts and available background information, there seems to be no meat on that bone. So, what motives really drive the plaintiff to push forward with a case that seems largely frivolous and unfounded? Hold on to that thought—we'll get back to it shortly.

Typical lines of defence in libel cases would be:

- **Truth:** The statements were derogatory but were accurate.
- **Opinion:** The statements were not intended to be taken as fact and were merely an expression of one's beliefs.
- **Fair Comment on a Matter of Public Interest:** Statements reasonably believed to be accurate on a matter of public interest, such as a scuba diving accident.
- **Statements Made in Good Faith:** Statements reasonably believed to be true and can be supported, but later turned out to be false (such as quoting an incorrect news article).

On all these accounts, it seems that ScubaBoard would have a pretty good case. A fatal accident did happen. Opinions will be formed and aired. The incident was a matter of public interest and of public debate and so forth.

A legal counsellor told to us that lawyers have a saying about libel suits, which goes approximately like this: "The one who thinks of suing for libel should make his/her deliberations at the ethnographic museum's Australian exhibit where the

boomerangs are on display, as they will hopefully serve as a reminder that these cases tend to swing around and hit one in the neck."

Indeed! Just by placing the complaint, MSD has now cast the spotlight—and not a very flattering one—on the incident and made sure that most of the global diving community now knows what went down and how they handled the event. Secondly, it is generally perceived bad form to shoot the messenger or blame members of the public for forming an opinion.

How not to handle PR

This seems to be a classic example of how not to handle public relations.

In real life, bad things happen also to good people, conscientious professionals and quality- and safety-oriented companies. So, let us assume, just for the sake of the argument, that the plaintiff's operations were indeed quality-oriented and diligently-managed, and this fatal accident occurs nonetheless. Do we believe the plaintiff was at fault? Not really. Obviously, it was a case of dereliction of

Freedom of the press, is the freedom of communication and expression through vehicles including various electronic media and published materials. While such freedom mostly implies the absence of interference from an overreaching state, its preservation may be sought through constitutional or other legal protections.

duty by an employee of a subcontractor.

But as tour operators, they are expected to vet their subcontractors and vouch for their quality, too. So, when incidents do happen, the operator is left with an unpleasant and challenging situation to clear up and public relations to handle. That is just the nature of the business, and one has to be prepared to face the music and take responsibility.

Don't shoot the messenger

Imagine if Toyota had sued the press for reporting the recent accidents involving Toyota vehicles, some of which were fatal, too—accidents presumably caused by faulty pedals—and sued members of the general public for airing their opinions or outrage? Instead, the president of the carmaker apologized to the public and to the U.S. Congress and took action to correct matters. Nobody is perfect. Products will occasionally fail even after diligent and thorough testing—accidents will happen. What really matters is how these situations are handled.

PR 101

Handling situations correctly, such as the



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fatal accident on the liveboard, is not only paramount to protecting the company's good standing, but it can even be turned into an advantage. That is why businesses hire spin doctors and press officers, and why executives get training in how to handle the press. What it comes down to is that, in such cases, one must assume responsibility for what happened, be humble and deal with the critics tactfully, explaining what measures one is going to take to prevent the problem from happening again. Denial or blaming others are the worst things one can do.

Had MSD handled this incident properly from the onset, issued the required statements to the press and the public, engaged in the necessary dialogue and responded professionally to the public outcry, they would have eventually come out on top and probably even won some respect, too, for proper and professional conduct, because that **builds trust**. Instead, they elected to pursue this matter by filing a case in court, which will only serve to ridicule the dive industry and enriches nobody but the lawyers. The boomerang has indeed come around. ■

DETAIL OF THE U.S. CONSTITUTION / PUBLIC DOMAIN



Purple Heart Dive Team develops dive program for Purple Heart recipients

Purple Heart Divers, a non-profit organization dedicate to supporting wounded heroes—American soldiers wounded in action—have developed a dive program for Purple Heart recipients who want to experience scuba diving as part of the rehabilitation process.

One of the organization's goals is to "give something back" to these national heroes and thank them for their service and sacrifice, as stated on their website: "Over 30,000 of our military have been wounded during the engagements in Iraq and

Afghanistan. Regardless of your stand on the war issue, the fact is that we are there, and that many brave men and women have been killed or wounded while serving our country ... They are awarded the Purple Heart in appreciation of their injuries."

The organization is interested in the heroes' stories and wants to help them share their heroic experiences and rehabilitation process with children and adults of the community.

The team finds funding for training and certification of Purple Heart heroes. First dives are reserved for divers who are already certified.

Purple Heart Dive Team was established in South Florida to provide an in-water scuba diving opportunity for Purple Heart recipients. They provide the scuba experience as a self-esteem building and rehabilitation program in a setting where boats are close to artificial and natural reefs.

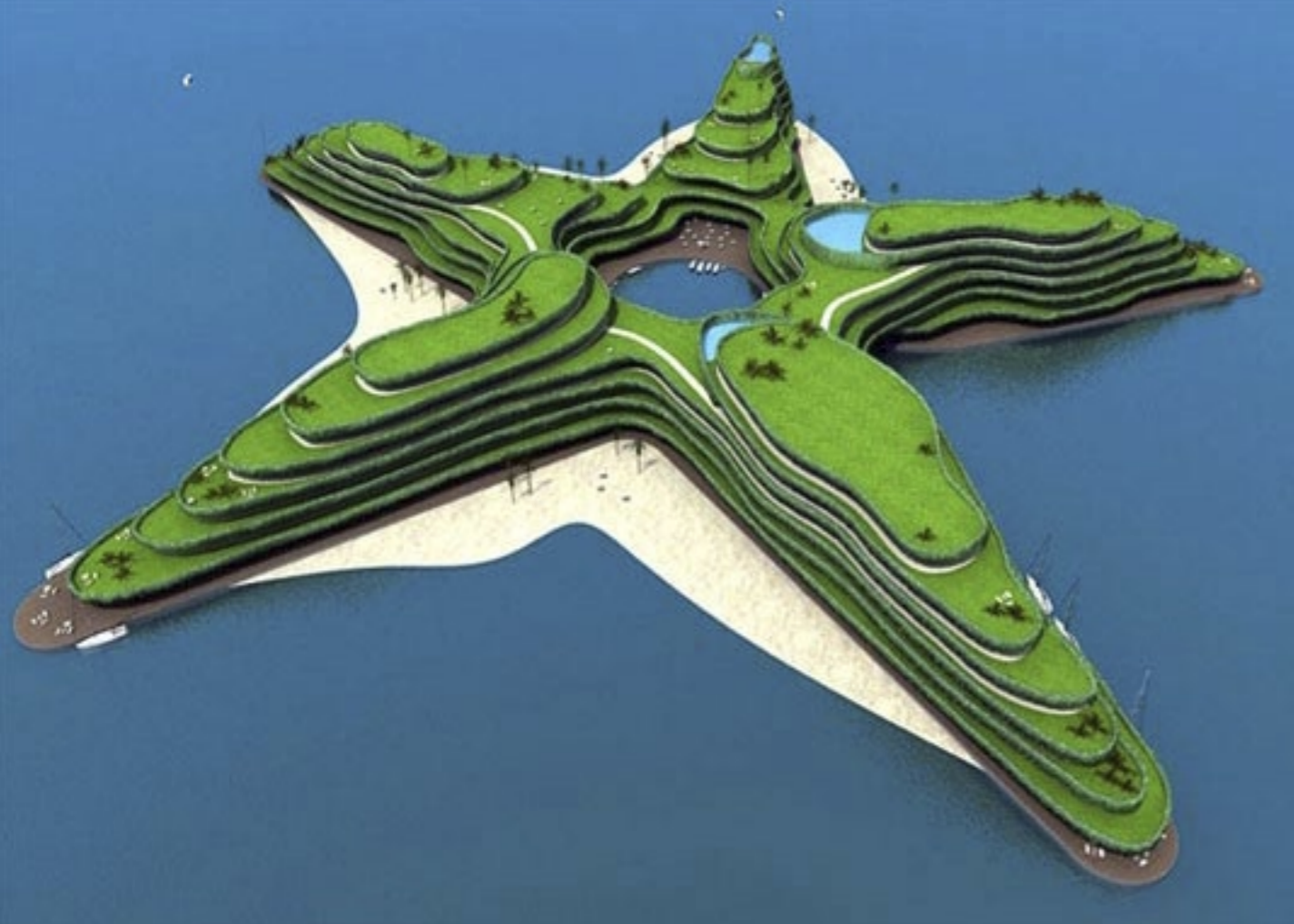
"Our mission is to provide a unique and memorable form of rehabilitation combining the physical exercise

of underwater diving with camaraderie of team efforts in a unique sub-surface experience. Through these programs, those who have been wounded in the line of duty will take part in programs designed to accommodate their special needs while providing them a life-altering perspective often needed to adjust to the severe injuries they endured."

Purple Heart Dive Team's primary goal is to help disabled heroes get "Back in Action" while readjusting skills to lead normal lives.

Divers interested in getting involved with the Purple Heart Dive Team and want more information or to make a donation can email Gary Levine: diveteam@rocketmail.com





In the Future: Architecture on the ocean

Flotating cities for the Maldives? The tiny island nation of the Maldives is under serious threat from rising sea levels caused by climate change as no part of the 1200-island republic is more than six feet above sea level. Now, in one of several counter measures, the tiny country has teamed with Netherlands-based Docklands/Dutch Watervalley to create a series of floating islands complete with leisure facilities like a nine-hole golf course, pools and a convention centre.

The project will include a star-like formation of floating cities, providing the Maldives' people with a place to live after the rising sea levels have washed away their island nation.

Designed by architect Koen Olthuis, the renderings for the amphibious mini-cities with the Citadel floating apartment complex and the amazing floating homes appear to depict star-shaped, tiered islands with indoor spaces hidden under lush green-roof terraces, complete with interior pools and beaches. While exact design details of these new floating islands are still unavailable, the Dutch Docklands has built a special expertise in creating water developments using methods and procedures that reduce impact on underwater life

and minimize changes to coastal morphology.

Gyre Seascraper

The Gyre by the Canadian visionary Keith Dewey, the man behind the Zigloo, is a conceptual floating development that has been designed as an underwater skyscraper. The development will bring scientists and vacationers together to understand the ocean, without polluting its delicate ecosystem. Peaking at a depth of 400m, the development will provide space for a comfortable living and working environment, including space for shops, restaurants, gardens and recreation.

As much as a skyscraper is an economical method of reducing humankind's footprint on land,



THIS PAGE: Citadel floating apartment complex

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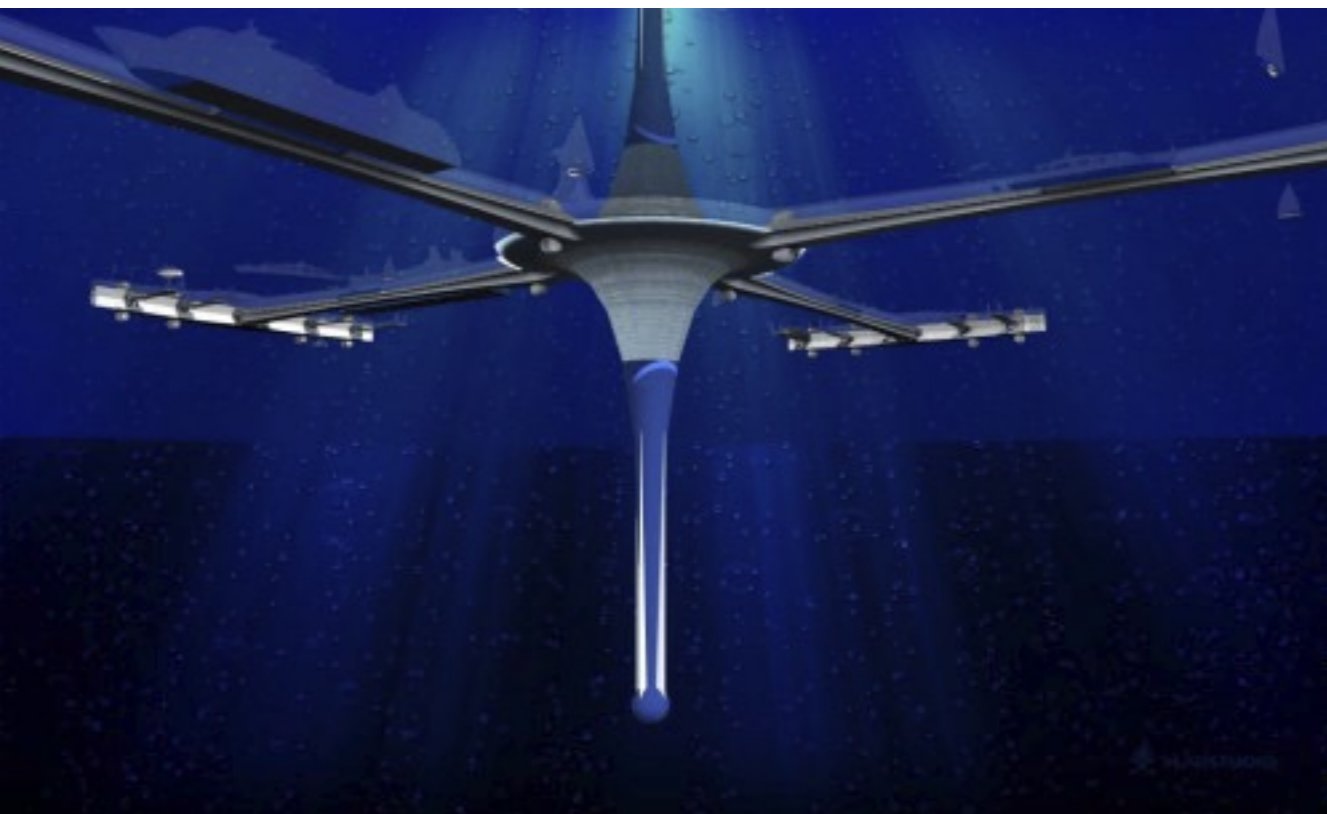
For more information, go to:

www.lawsonwood.com

Gyre goes a step further by juxtaposing that footprint to the ocean, and is perhaps its greenest feature. Its unique design permits the simultaneous application of wind, solar and tidal energy generation technologies thereby making it truly 'off-grid'.

The center piece of the design features a double-hulled vortex with both hulls being clad in reinforced glass, where each of the floor levels are essentially a layering of concentric rings ranging in size from 30,000m² down to 600m². Inclinator riding along the inner structural ribs provide for vertical/diagonal transportation between floors. Total floor area of the entire structure (levels, radial arms, barriers) is approximately 212,000m² (or roughly 40 football fields). The Gyre's radial arms feature a pedestrian upper level and a transit system





on the lower level to access to the outer protective barriers. The barriers create an inner harbor and port of approximately 1.25km in diameter, accommodating the needs of even the world's largest ships.

Water-Scraper

Sarly Adre Bin Sarkum's Water-Scraper is a futuristic self-sufficient floating city, which

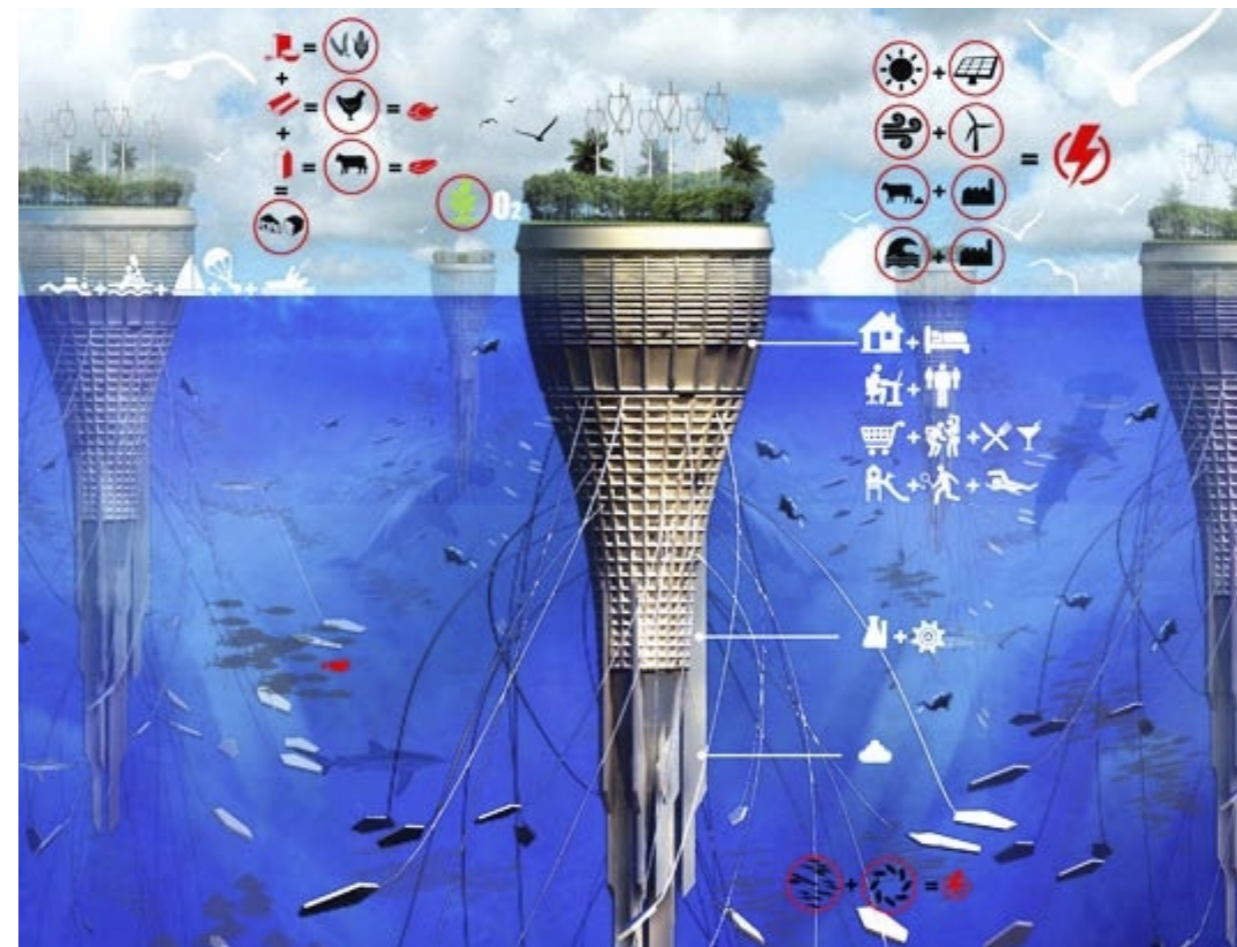
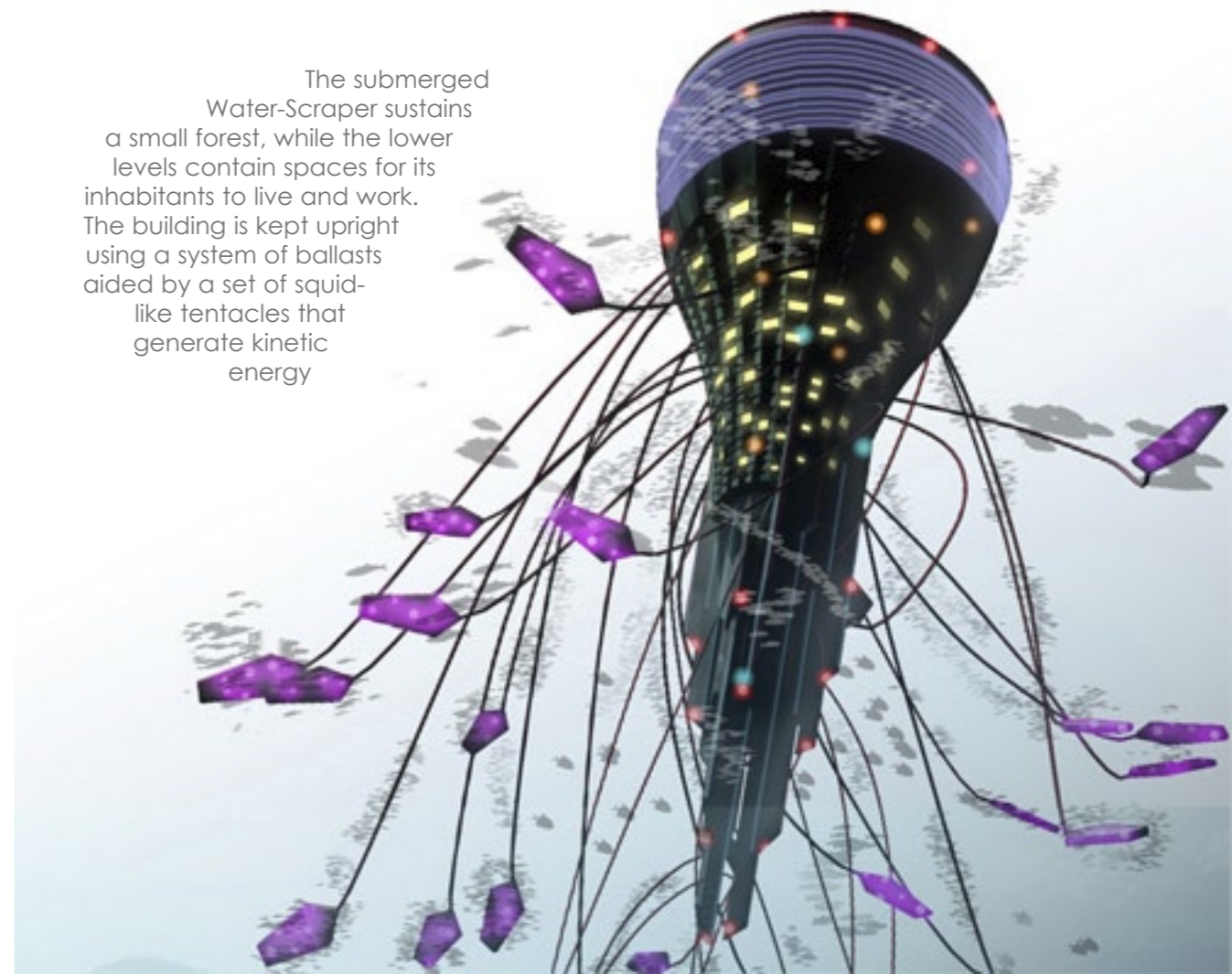
generates its own electricity using wave, wind and solar power, and it produces its own food through farming, aquaculture and hydroponic techniques. The design, which won a special mention in this year's eVolo Skyscraper Competition, expands the concept of a floating island into a full-fledged underwater skyscraper that harvests renewable energy and grows its own

The Gyre's radial arms feature a pedestrian upper level and a transit system on the lower level. The barriers create an inner harbor and a port big enough for even the world's largest ships

food. The surface of the submerged skyscraper sustains a small forest, while the lower levels contain spaces for its inhabitants to live and work. The building is kept upright using a system of ballast aided by a set of squid-like tentacles that generate kinetic energy. The building itself is kept upright using a system of ballast and balancing tanks. The tentacles also serve as balancing elements as they, in generating their power, are constantly moving with the rhythm of the tide. The buoyancy and ballast controls are placed at the lowest portions to create the proper counterforce for keeping the building upright. ■

evolo.us/competition
zigloo.ca
dutchdocklands.com

The submerged Water-Scraper sustains a small forest, while the lower levels contain spaces for its inhabitants to live and work. The building is kept upright using a system of ballast aided by a set of squid-like tentacles that generate kinetic energy



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Water-Scraper





"Peek-a-boo"
Capernwray Diving Centre has just created an incomparable new dive by sinking the largest underwater attraction ever installed at a UK inland dive site

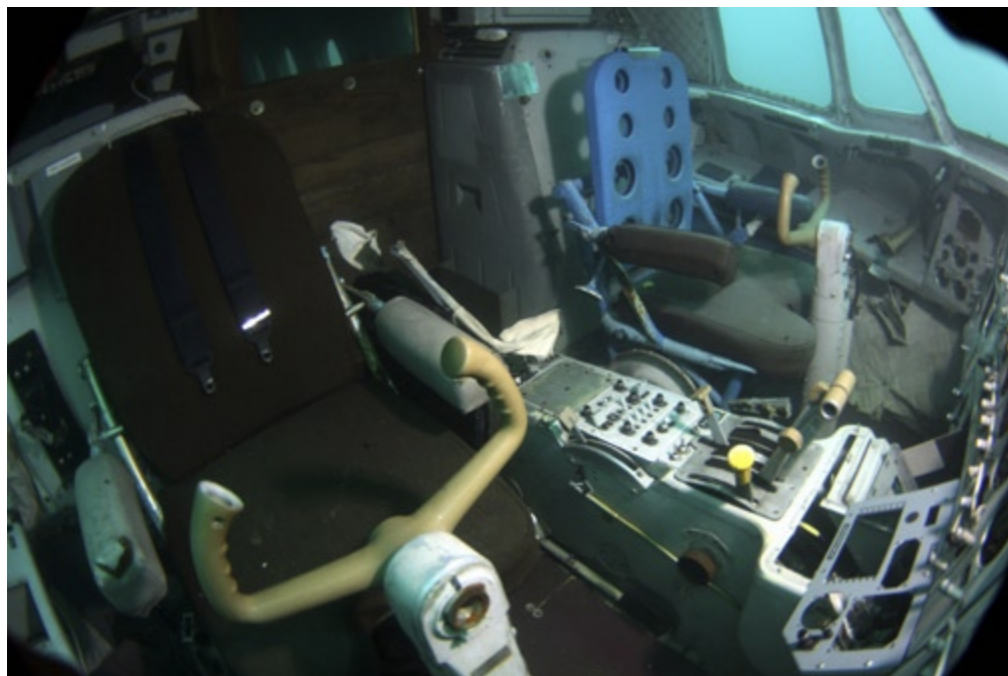
Airliner becomes new dive site in England

A 70ft Hawker Siddeley 748 was submerged into a quarry at Capernwray Diving Centre in Northern England.

Capernwray Dive Centre has created a new reason to head to the Lake District in the North West region of England, a newly sunken massive airliner, the largest underwater attraction ever installed at an inland dive site in the United Kingdom. Months of preparations over the winter and some GB£25,000 invested by the center brought the Hawker Siddeley 748, a 1960's full-sized 48-seat airliner powered by two Rolls Royce Dart turboprop engines, to its final resting place.

In a recent press release, Capernwray Dive Centre described the aircraft: "What is particularly impressive is the size of this aircraft; she is simply huge! The fuselage is 67 feet long, the wingspan is 100 feet and the whole thing stands 25 feet high! The first divers have already visited this stunning wreck and have returned to the surface in awe at her sheer scale and visual impact underwater ... With a shining white fuselage, she is resplendent in her Emerald Airways paint scheme and new 'Northern Diver' logo, added as a 'thank you' to a great Lancashire company who kindly contributed to the costs of the project."

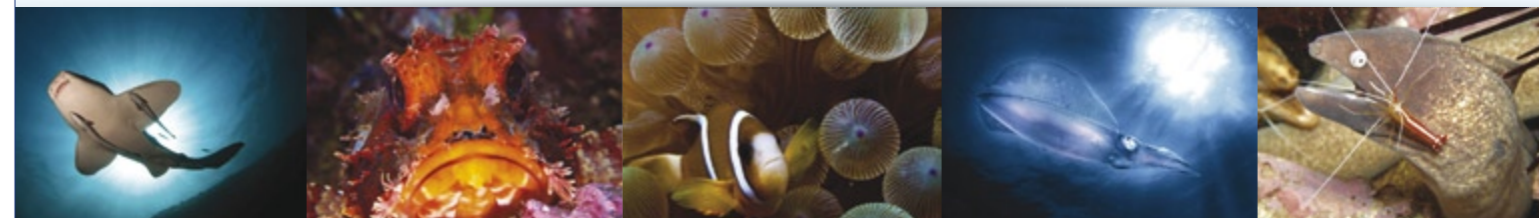
The aircraft, which is a series 2A HS748 having an official registration of G-BVOV, has an interesting history. Built at the end of this aircraft's production run in 1980, the craft was first employed by a Portuguese airline, flying between Lisbon and the Azores. Then, she was re-registered in the UK and flew routes from Liverpool under the Emerald Airways banner until 2006 when that company finally closed its doors. The craft experienced some adventures along the way including a dodgy landing at Guernsey Airport in early 2006 when the pilot had a bit of a mishap and managed to run off the end of the runway. ■



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Diver badly burned by heat packs in freak accident

Surgeon warns scuba divers against using heat packs on deep dives after treating a man who received severe burns in a freak accident off the Cork coast last year.

A 31-year old diver was part of a team diving the *Lusitania* when the accident occurred last September. Inside his undersuit he had four air-activated heat packs, one at each shoulder and hip. The pads generate heat through a chemical reaction using sodium

acetate, water and metal. About 20 minutes into the dive when he was 80 metres below the surface, his pads ruptured. The diver suffered deep chemical-related burns to 35 percent of his body. They were made worse by the fact that the polyester and nylon in his dive suits melted.

Doctors believe that due to high pressure and the high concentrations of oxygen in his suit, the chemical reaction happened faster than normal, generating higher temperatures.

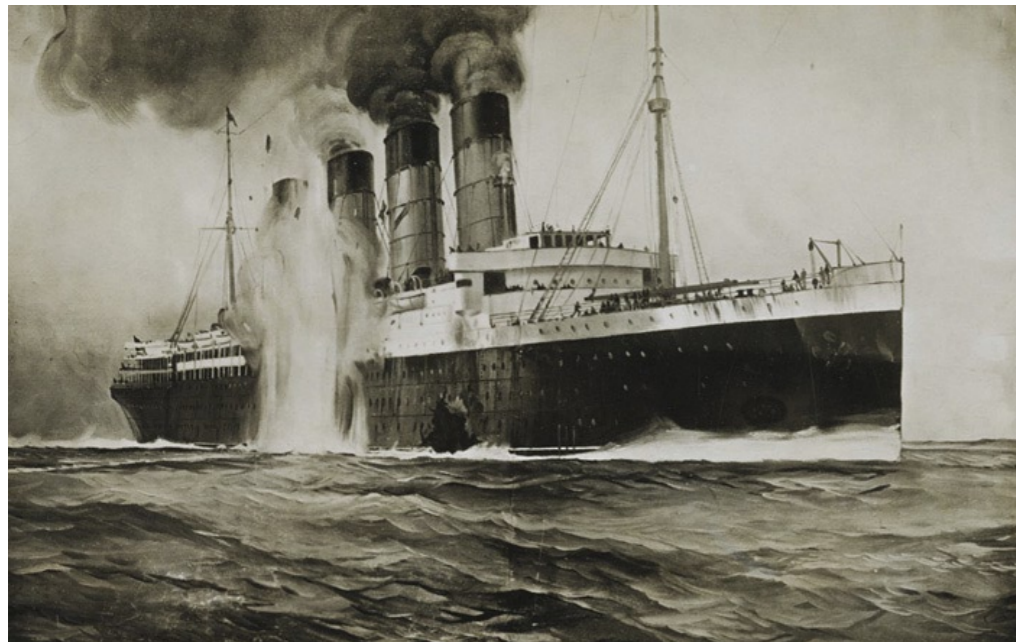
Despite his injuries and agony, he

managed to ascend and complete decompression stops, which took about two hours to complete. He was airlifted by Coast Guard helicopter to Cork Airport and was rushed by ambulance to Cork University Hospital (CUH). He has had seven operations but has since been discharged and is recovering well.

"Air-activated heat packs should never be used at high pressures," John Curran, the plastic surgeon who treated the diver for his burns said in an article in the latest edition of the *Journal of Plastic, Reconstructive and Aesthetic Surgery*. "Because of the high pressure and high oxygen, auto-ignition started. The suit was dry on the inside and completely sealed.

"He was lucky that the fire burst his suit open and the in-flowing of sea water put the fire out and relieved his excruciating pain. That allowed him to make a controlled ascent in two hours," Curran added.

Editors note: We haven't been able to ascertain whether the heat packs in question were intended or designed for scuba diving activities. ■



RMS Lusitania was torpedoed by German U-boat U-20 on 7 May 1915



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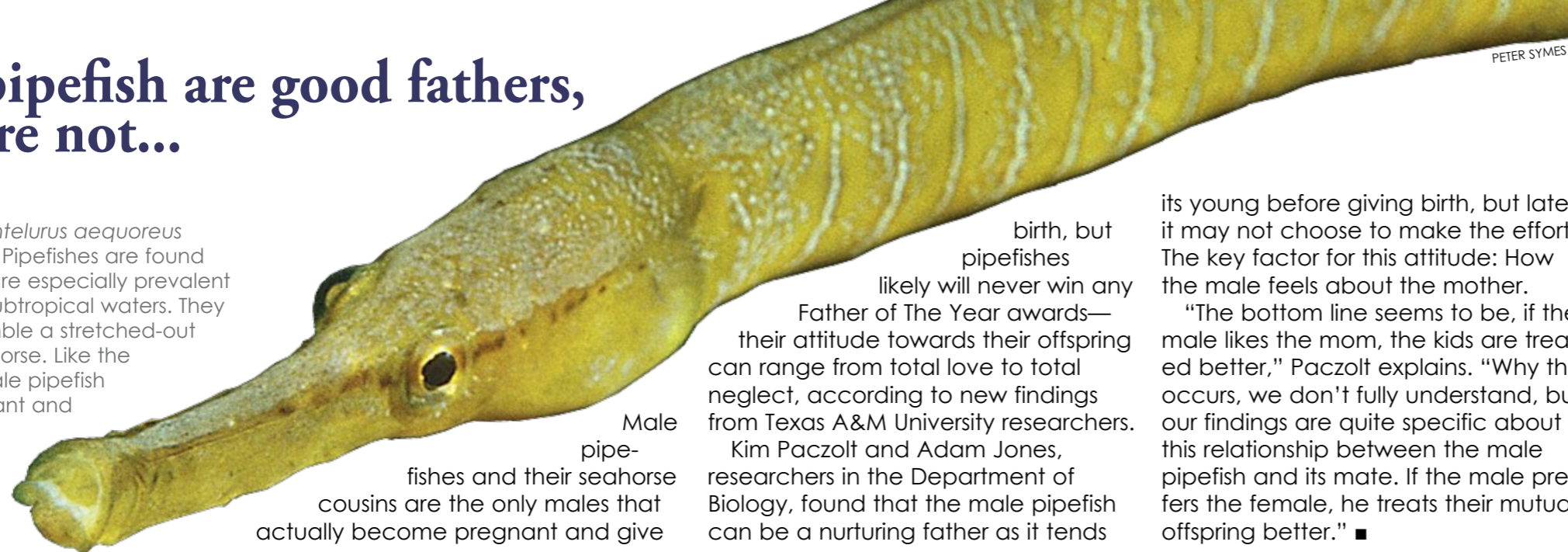
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Some pipefish are good fathers, some are not...

Snake pipefish *Entelurus aequoreus* (Linnaeus, 1758). Pipefishes are found worldwide and are especially prevalent in tropical and subtropical waters. They somewhat resemble a stretched-out version of a seahorse. Like the seahorse, the male pipefish becomes pregnant and gives birth.



Male pipefishes and their seahorse cousins are the only males that actually become pregnant and give

birth, but pipefishes likely will never win any Father of The Year awards—their attitude towards their offspring can range from total love to total neglect, according to new findings from Texas A&M University researchers. Kim Paczolt and Adam Jones, researchers in the Department of Biology, found that the male pipefish can be a nurturing father as it tends

its young before giving birth, but later it may not choose to make the effort. The key factor for this attitude: How the male feels about the mother.

"The bottom line seems to be, if the male likes the mom, the kids are treated better," Paczolt explains. "Why this occurs, we don't fully understand, but our findings are quite specific about this relationship between the male pipefish and its mate. If the male prefers the female, he treats their mutual offspring better." ■

Advocacy group vows suit to stop swimming with manatees at Crystal River, Florida



Citing record manatee deaths this year, an environmental watchdog group wants to close the popular Kings Spring in Crystal River to swimmers and divers.

Public Employees for Environmental Responsibility filed a notice of intent

to sue on Monday giving the U.S. Fish and Wildlife Service 60 days to close the spring or face a lawsuit.

Annually, an estimated 100,000 tourists swim with manatees in and around Kings Spring at the headwaters of the Crystal River in Kings Bay. The spring is one of the primary sources for the river for the warm water that manatees seek when

temperatures fall.

A record 641 manatees were counted in Citrus and Hernando county waters in January during the extended cold snap. By mid March, cold stress had driven the death count to 431 for 2010, topping last year's record of 429 deaths for the entire year. ■

Deep Sea Fish finish up their Spinach

Scientists have for the first time captured footage of one of the most abundant species of deep sea fish feeding on plant material. Though the fish were artificially fed—with spinach—it demonstrates they have much wider tastes than previously thought.

Dr Rachel Jeffreys and her colleagues of the Royal Netherlands Institute for Sea Research simulated a plant food fall by dropping spinach bait into the deep North Atlantic sea, 185km off the coast of Portugal. Attached to a rig containing the bait was a video camera, which recorded any animals that ventured close.

Soon after the bait was dropped 3000m underwater, at least three species of deep sea fish, grenadiers (*Coryphaenoides armatus* and *C. mediterraneus*) and cusk eels (*Spec-tunculus sp*) began to attack it, eating away at the spinach.

"We were very surprised and excited by the results," said Jeffreys. ■

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Egypt creates its first marine reserve on its Mediterranean coast

Egypt wants visitors to discover its Mediterranean coast at a newly declared marine reserve being established near the border with Libya, the government said. Falling within the Gulf of el-Salloum, the 383 km² protected area is home to over 160 species of birds and over 10,000 marine species. The reserve falls under a number of international and regional conventions, including the Convention on Biological Diversity along with the World Heritage Convention. The declaration of the protected area as a nature reserve aims to protect it against the environmental problems. "The goal is to protect endangered species ... and encourage ecotourism in the reserve area, putting it on the global ecotourism map," Environment Minister Maged George said. ■

“New hope for divers with disabilities” Disabled Divers International

A new approach to teaching people with disabilities to scuba dive is promised with the formation of a new non-profit organisation, Disabled Divers International.



Fraser Bathgate

Founders of the DDI are two men with a combined 30 years of working with disabled divers—Fraser Bathgate, its first president, and Vice-President Flemming Thyge, both previously leading lights of the International Association of Handicapped Divers (IAHD). All the DDI's board members are volunteers.

“Our intention with DDI is to ensure that our students and their needs always have priority,” says Bathgate. “The new training programme we're offering moves away

from traditional methods of teaching divers with disabilities.”

Scuba diving has been shown to offer numerous benefits in terms of the social and physical rehabilitation of people with disabilities. Many find that, given the correct equipment and appropriate training, the restrictions they experience on land disappear with the near-weightlessness they experience under water.

“Regular recreation involving physical exercise engenders better physical and mental health,” says Fraser Bathgate. “Scuba diving is also a social sport, and being able to interact with non-disabled divers can have a tremendous positive effect.” The official launch of DDI took place on 27 March at the London International Dive Show, but Bathgate said he had already gathered extensive international support for its formation.

Its courses are designed to dovetail seamlessly with the

work of Depththerapy, the charity Bathgate set up to help rehabilitate through diving Coalition forces personnel seriously wounded in the Iraq and Afghani conflicts.

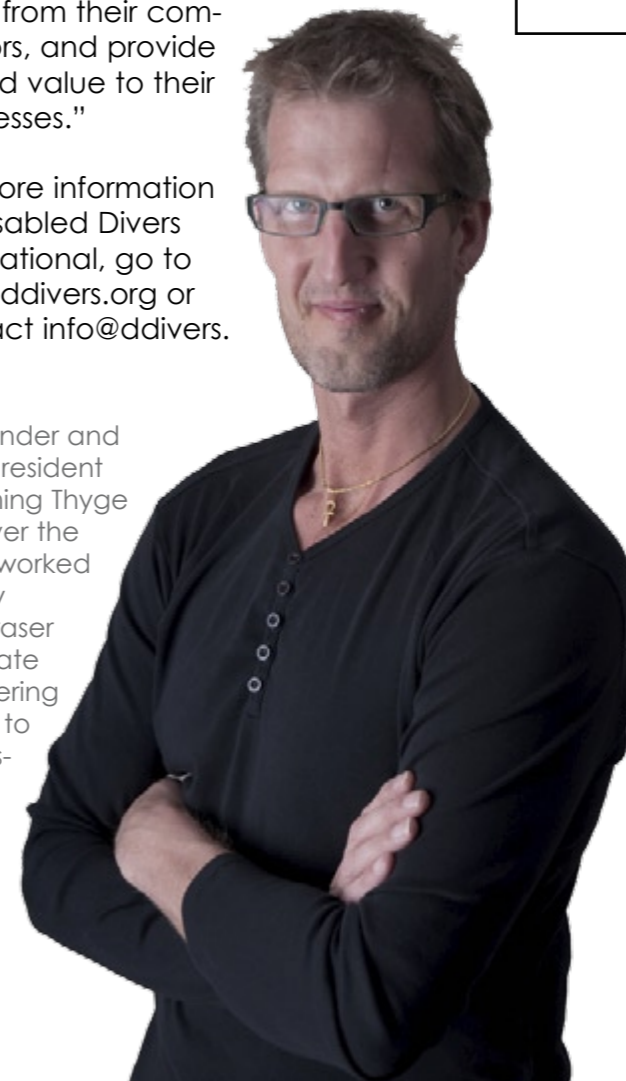
“DDI programmes are designed to work in conjunction with those of existing diver training agencies,” said Fraser Bathgate. “Our new layer of courses allows people who would have difficulty fulfilling standard agency requirements and standards to experience diving safely. We achieve this through modifications and enhancements to standard procedures and equipment.”

Another set of DDI courses is available for training instructors. “For the professionals, we provide the tools and knowledge required to train and certify disabled divers safely, within the various limits imposed by individual students' ability. Work with disabled divers is very rewarding, because the students share the excitement and joy of their experiences with their instructors,” said Bathgate.

Bathgate hopes that individual diving professionals and dive centres will be quick to take up the opportunities offered by DDI courses. “These training programmes can help to differentiate them from their competitors, and provide added value to their businesses.”

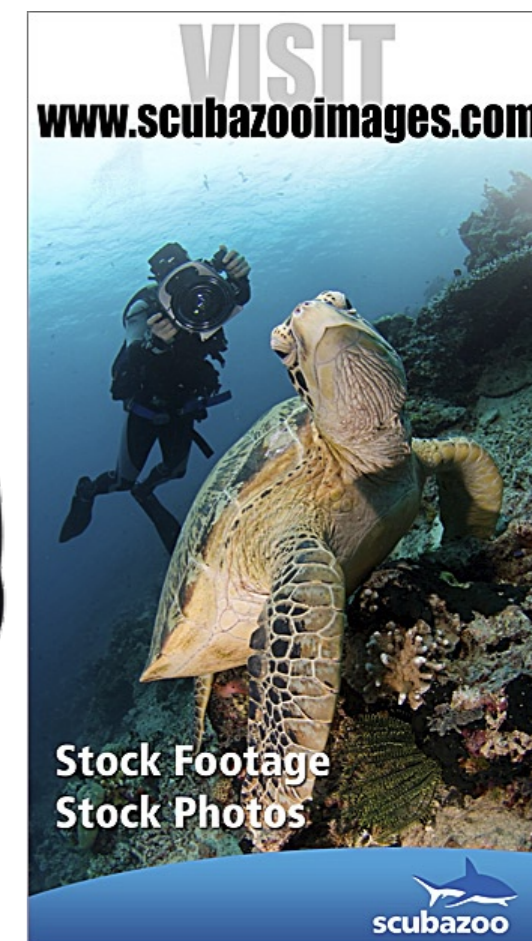
For more information on Disabled Divers International, go to www.ddivers.org or contact info@ddivers.org. ■

Cofounder and Vice-President Flemming Thyge has over the years worked closely with Fraser Bathgate on offering diving to the disabled



Shark Life launches Shark Diver courses

Choose from seven different shark species. Learn about feeding behaviour, biology, habitats. Have a greater understanding of sharks. ■



Underwater CSI training course

If you are a diver and are interested in taking a new look at the underwater world through the eyes of a forensic scientist, then a novel 3-day course may be just the thing you've been waiting for. Not only will you play a legitimate part in conducting an actual underwater crime scene investigation, but you will also learn how to analyze the data and construct a proper defense, using forensic techniques that you will learn in the program.

So, what exactly is Underwater CSI? Essentially, it is a set of protocols and techniques for investigating underwater crime scenes; as such, it can be quite useful in determining short-term violations that have had negative impacts on our reefs. The results of these investigations can be documented, recorded and analysed in a systematic fashion using tool kits developed to support these types of investigations. Similar techniques are now being used worldwide by marine enforcement officers, environment assessment agencies, coral reef researchers, litigators and natural resource managers.

The application of the forensic sciences to detect and document illegal activities related to coral reefs provides a tool to find and prosecute suspects, assign monetary value to damages caused to a reef as part of illegal activities, and to provide information to the judicial system regarding the magnitude of some of these crimes.

Unlike search and recovery operations, underwater forensic activities focus on identification and documentation of potential

evidence. The evidence is not removed from the water until the underwater crime scene has been properly and completely documented, all facts and potential information are obtained, and the best possible way to remove the evidence with minimal dam-



age is determined.

The objective of this study is to develop methodology to accurately describe unlawful activities, quantifiable damage to the resource, and associate a monetary value useful in determining mitigation relevant to damage inflicted to a reef in addition to current fines and penalties. The experimental design focuses in adapting and validating underwater forensic techniques currently in use in other areas of the forensic sciences. Further, divers will look and discuss ways to utilize this methodology to identify human activities that affect coral reefs that are negligent or unlawful. The findings of this research will be incorporated into Coral Reef Crime Scene Investigation proce-

dures in an effort to increase successful prosecution of violators.

The course is hosted by The Central Caribbean Marine Institute (CCMI) Little Cayman Research Centre as part of its Dive with a Researcher (DWAR)

Program. CCMI, which is located on Little Cayman in the Cayman Islands, was established to create a regional centre for excellence in coral reef science. With a programme of continuing education and outreach to school children, students and coral scientists, it offers a base for the study and monitoring of reef biology on Little Cayman Island.

The lead diver and instructor will be marine forensic biologist, Dr Hector Cruz-Lopez, who is a professor of Forensic Science at the Palm Beach State College Criminal Justice Institute and serves on the National Forensic Science Initiative at West Virginia University. ■

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Image courtesy of NASA

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Edited by
Mathias Carvalho

800-year-old shipwrecks found in Baltic Sea

Swedish experts say dozens of centuries-old shipwrecks have been found by a gas company building an underwater pipeline between Russia and Germany.

The oldest wreck probably dates back to medieval times and could be up to 800 years old, while the others are likely from the 17th to 19th centuries, said Peter Norman, of Sweden's National Heritage Board.

"We have managed to identify 12 shipwrecks, and nine of them are considered to be fairly old," Norman, a senior advisor with the heritage board, told AFP. "We think many of the ships are from the 17th and 18th centuries, and we think some could

even be from the Middle Ages," he said, stressing that "this discovery offers enormous culture-historical value".

The shipwrecks were discovered during a probe by the Russian-led Nord Stream consortium of the sea bed route its planned gas pipeline from Russia to the European Union will take through the Baltic.

"They used sonar equipment first and discovered some unevenness along the sea bottom ... so they filmed some of the uneven areas, and we could see the wrecks," Norman explained.

The Nord Stream project, in which Russia's OAO Gazprom holds a 51 percent stake, has uncovered scores of other objects during seabed searches of the route, including about 80 sea mines and a washing machine. ■



Bronze age wreck found off Devon

One of the world's oldest shipwrecks has been discovered off the English coast after lying on the seabed for almost 3,000 years.



SOUTH WEST MARITIME ARCHAEOLOGICAL GROUP

Archaeologists have described the vessel, which is thought to date back to around 900 B.C., as being a "bulk carrier" of its age, carrying an extremely valuable cargo of tin and hundreds of copper ingots from the continent when it sank.

Archaeologists believe the copper—and possibly the tin—was being imported into Britain and originated in a number of different countries throughout Europe, rather than from a single source, demonstrating the existence of a complex network of trade routes across the continent.

Academics at the University of Oxford are carrying out further analysis of the cargo in order to establish its exact origins.

The wreck has been found in just eight to ten metres of water in a bay near Salcombe, south Devon, by a team of amateur marine archaeologists from the South West Maritime Archaeological Group

who were initially investigating a 17th century wreck, which went down close by.

In 2004, the team decided to concentrate on the southeast area, and a palstave axe head was located in September that year. No longer was the team looking for 17th century artefacts, but Bronze Age ones. It turned out that the pot handle and adze located in 2002 are also from the Bronze Age, and following a re-assessment of the original assemblage at the British Museum, some of the original artefacts recovered were also identified as Bronze Age.

Since 2004, SWMAG has located and recovered a significant number of Bronze Age artefacts that date to the Penard period and are believed to originate predominantly from France. This makes them contemporary to the artefacts from Moor Sand found by Phillip Baker in 1977 and Keith Muckelroy et al during subsequent

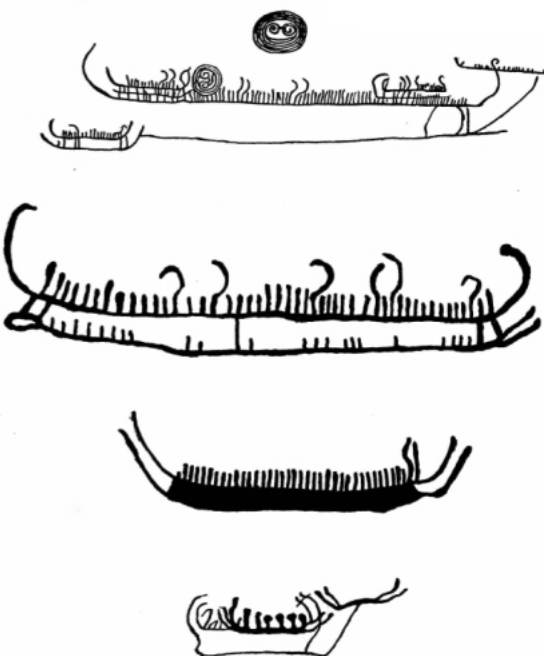
surveys of the site; given the closeness of the two sites (the designated areas overlap) it seemed probable that there was some connection between the two. The Bronze Age site was named the Salcombe B Site to differentiate it from the original 17th century site.

In total, 295 artefacts have so far been recovered, weighing a total of more than 84kg. The cargo recovered includes 259 copper ingots and 27

tin ingots. Also found was a bronze leaf sword, two stone artefacts that could have been sling shots, and three gold wrist torcs—or bracelets.

The team have yet to uncover any of the vessel's structure, which is likely to have eroded away.

www.swmag.org ■



The battle for Ancona's bounty

Courts curb bounty hunters seeking torpedoed liner's £15m bullion

It is still not very clear what exactly happened on 7 November 1915, between the German U-boat 38 and the Italian-American passenger ship, the *SS Ancona*. The U-boat attack, near Sardinia, sunk the liner and sealed the fate of more than 200 people, out of the total 760 on board, when the transatlantic vessel went down.

What could be considered a war grave also hides immense riches: 12 barrels of gold and a silver shipment, a treasure estimated to be worth €17m (£15m / US\$ 23.2m), a loot that entices the imagination of many bounty hunters around the globe.

The Italian government has joined the race for the recovery. Another heavy competitor is Odyssey Marine Exploration. A spokeswoman for the Florida-based firm, currently searching for the lost treasure, said that it had filed a joint motion with the Italian government

"preserving the administratively closed status of the case". She stressed that, "There is no dispute between Odyssey and the Italian government."

A foreign ministry spokesman, however, declared that lawyers in America had taken action in the U.S. courts. That could mean that neither the salvagers nor the government could take any initiative without first giving 45 days' notice to the other party.

Italian officials view the site as untouchable. Sebastiano Tusa, head of the government's Marine Heritage department on Sicily, declared to the local press: "It is a war cemetery that cannot be defiled by a company looking to

make money. The only acceptable project might be a non-profit-making one for scientific and historical research, with the agreement of all the nations involved in the disaster." ■

In June 2009, a Florida court judge instructed Odyssey to hand over to the Spanish government about US\$500m in gold and silver coins, recovered from the "Black Swan" site, identified as the *Nuestra Señora de Las Mercedes*—a Spanish frigate that sank off Portugal in 1804. The firm is appealing against the judgment. Future dealings with the Italian government on the *SS Ancona* case will tell if the salvage firm will have a better outcome this time around. ■



The German U-boat 38 and the Italian-American passenger ship, the *SS Ancona*, on 7 November 1915

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It is believed that a cargo ship dated from 620 B.C. ran aground near Isla Farallon and Isla Grosa, off La Manga, Spain. Now, 26 centuries later, archaeologists from eleven countries are bringing these antique objects to the light of day once again. The ship was carrying an elephant tusk with Phoenician inscriptions, copper ingots and stones containing silver and lead



J.M. RODRÍGUEZ | EL MUSEO NACIONAL DE ARQUEOLOGÍA SUBACUÁTICA

Wreck from 600 B.C. discovered off Spain

The discovery of a Phoenician wreck beneath the sea off La Manga del Mar menor in Murcia, is being hailed by archaeologists as one of the most important discoveries in the Mediterranean.

The find, which has been described as one of the most important of all archaeological discoveries, appears to be the cargo of a commercial ship carrying ivory from African elephants, amber and lots of ceramic objects. The discovery has been kept secret for the past three years by the team of divers led by the Spaniard Juan Pinedo Reyes and the American Mark Edward Polzer. The recovery is taking place around Grosa Island and El Farallon Island, just off La Manga. Over the last three years,

1,400 objects have been collected. Even some of the wood from the bottom of the ship has survived since the 7th century before Christ (620 B.C.), and has been recovered. It is believed the vessel measured approximately 15 metres long.

The ivory tusks found measure between 70 and 150 centimetres with Phoenician writing inscribed. They have come from a race of elephants, which are now believed to be extinct. There are also copper ingots and stones containing

silver and lead. Ceramic pots, which were used for transporting fish and oil, have been found, too, as well as plates, bowls, combs, ivory knife handles, bronze needles and chandeliers.

It is believed the ship crashed into rocks off the island, which are just a metre and a half below the surface. The ship would have set sail from Cadiz and was probably heading towards Guardamar to a factory there, or to deliver items to a prince living in the area. ■

Asterix – the Mighty Gaul Endures

A rare sea-going Roman-Celtic barge found on Christmas Day in 1982 is considered to be the largest, most intact sea-going vessel of its antiquity found outside the Mediterranean. First located in Guernsey's St. Peter Port, England, the vessel's remaining timbers were found by diver Richard Keen, lying in the centre of the narrow entrance to the harbor, thus being exposed by the propeller wash of vessels passing overhead.

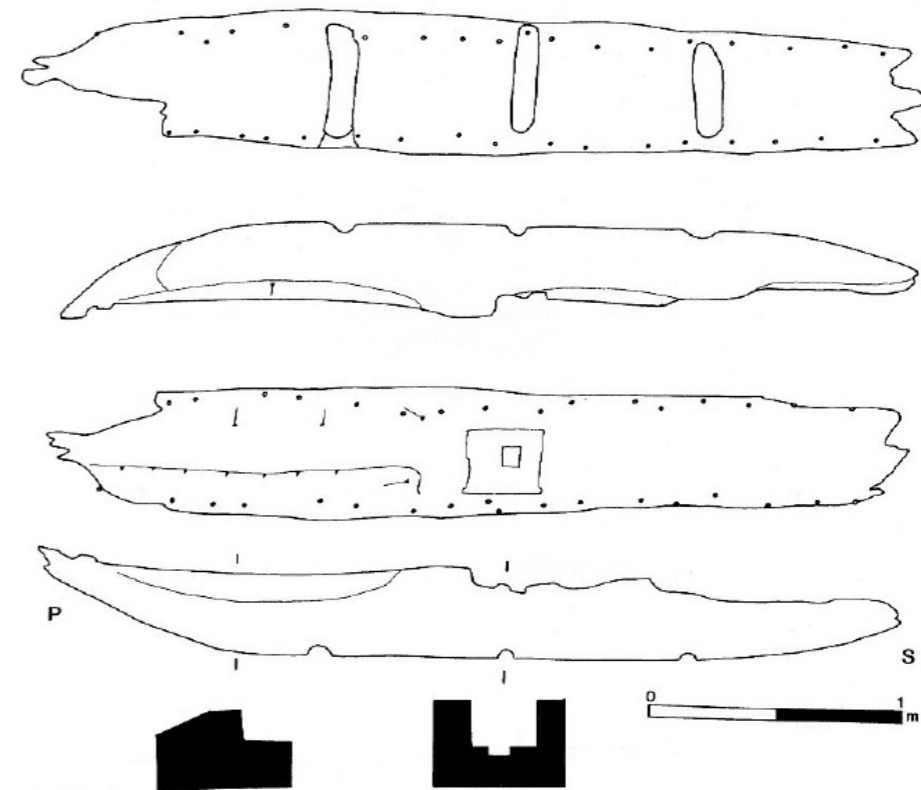
The find is considered an opportunity to expand the understanding of the trade routes used in the period, due to the pottery found that could have been made in areas as far away as Spain and Algeria. Dr Jason Monaghan, from the Guernsey Museum, said that the *Asterix* is "one of only two of its type surviving and it is Britain's largest Roman object".

Banked by the Guernsey Maritime Trust's private funding, the wreck was studied and cleaned up before eventually being

sent to The Mary Rose Trust in England for preservation procedures. Rule is better known for her work on the preservation of King Henry VIII's famous flagship. The preservation work is believed to be largely completed by early this year, and the feasibility of relocating the wreck back to Guernsey in being considered.

It is supposed to be a risky, costly operation. Monaghan declared that, "It would need to be displayed in a 'giant goldfish tank' or glass tank to keep the bugs and dust off and keep the humidity stable... if it gets too dry it will fall apart or too wet it will go mouldy."

A monograph written by Rule and Monaghan is available, describing all facts and the exploration missions that were undertaken: *A Gallo-Roman Trading Vessel from Guernsey – The Excavation and Recovery of a Third Century Shipwreck*. ■



A Gallo-Roman Trading Vessel

The ship's nickname, created by the media, refers to a small and fearless French comic book character, from the only remaining free village in Gaul, when it was a part of the Roman Empire. www.asterix.com

New Underwater Archaeological Site Designated Off Polyaiagos Island, Greece

A shipwreck located off the small uninhabited Cycladic island of Polyaiagos in the central Aegean will be designated as an "underwater archaeological site" by Greece's Culture Ministry.

The shipwreck, which was first spotted in 2004, was excavated in November 2009 by underwater archaeologists who recovered valuable archaeological objects, including amphorae and ceramic vases dating back to the 4th and 5th centuries B.C.,

as well as fragments of the vessel's anchor. The ancient vessel was loaded with amphorae, which are scattered around the wreck in two main concentrations in depths of 25-49 meters off the coast of Polyaiagos.

In addition, the shipwreck was photographed and filmed in detail, which allowed the creation of a high-definition photo-mosaic, while procedures have been set in motion to designate the area as an underwater archaeological site.

An analysis of the amphorae recovered dated the wreck

to between the end of the 5th century B.C. and the first half of the 4th century B.C. At least three types of amphorae were identified, one of which originated from ancient Peparithos (the island of Skopelos), while the others were closely identified with Classical Era amphorae workshops of the northern Aegean. The Polyaiagos shipwreck, according to the ministry's announcement, cited by the media, sheds light in the study of sea-borne commercial routes of the Classical period and the movement of goods in the southwestern part of the Cyclades island chain. ■



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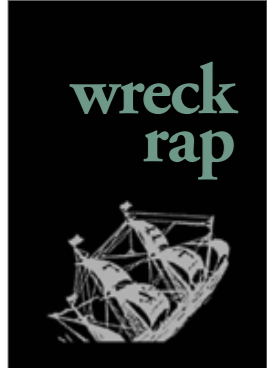
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THIS PAGE:
Examples of the
rare 1 reale coins

The Treasures Within the Treasure

Text by Carol Tedesco

Many people will say that they experience their “a-ha” moments, or flashes of sudden insight while in the shower. These people are very fortunate. When I am in the shower, I typically think about how I need to clean the tiles. My insights occur at about 3:11 in the morning. With the rationale for doing so a complete mystery, I will suddenly sit bolt upright in bed, startling the be-Jesus out of my partner Michael and cat Bleu. Then, I stumble off in the dark to my office, bumping into walls and furniture, muttering about die-punches and assayer initials, to record whatever insight about shipwreck-recovered coins has surfaced from the subterranean depths of my subconscious.

Since 1992, my life has revolved around shipwreck-recovered coins. I have helped to clean them, have documented and authenticated them, and for some time have been writing a book about them. As I've said, dreams of coins wake me up at night.

Since people first began trading with one another for goods and goodies, money—in one form or another—truly

has made “the world go around.” Today, we go online to move money—sometimes lots of it—from place to place. But not so terribly long ago, money was transported on wooden ships, and though these ships are often romantically memorialized as “golden galleons”, prior to the California gold-rush of the mid-

1800's, they were in truth silver galleons.

With a desperate need for money and a conviction of entitlement to acquire it at any cost, the kingdom of Spain's approach was to plunder the resources of others. By 1622, little more than 100 years after the first voyage of Christopher Columbus, Spain's

boundless lust for riches—and glory as well as souls to convert—had resulted in the conquest of much of the Caribbean, Mexico and the Americas.

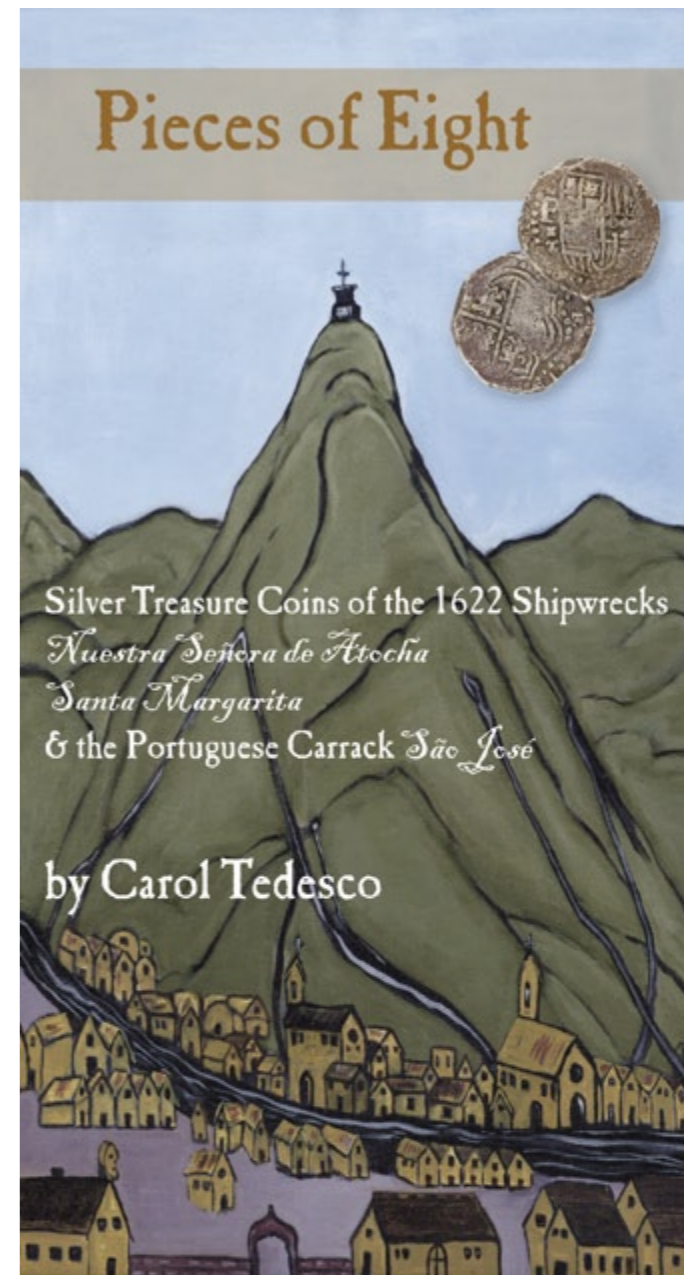
Silver was the most abundant treasure of the “Indies”, and royal mints were established to control and regulate a seemingly endless torrent of mineral wealth pouring from the mines. By 1622, New World silver in the form of the Spanish dollar was the most coveted and widely traded money on earth.

History

The 1622, Tierra Firme Fleet galleon *Santa Margarita* was carrying almost 150,000 silver coins when she sank in the Florida Straits, but due to the widely scattered nature of the wreck and the deep, rapidly shifting and treacherous sands that conceal her remains, only about a third of these have been recovered to date. Therefore, when I received a call that a conglomeration of encrusted silver coins discovered by Keith Webb's Blue Water Ventures of



A 16th century woodcut provides a glimpse into the workings of a mint; blanks being cut from sheets of silver, struck into coins, weighed and documented

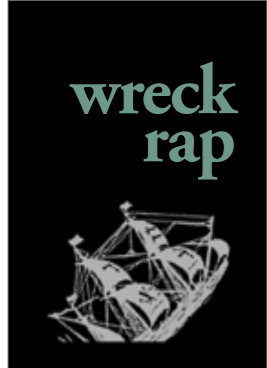


Silver Treasure Coins of the 1622 Shipwrecks
Nuestra Señera de Atocchia
Santa Margarita
& the Portuguese Carrack *São José*

by Carol Tedesco

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

To be released in 2010 by
SeaStory Press, Key West Florida.
To be on our availability e-mail alert list,
please inquire at lostgalleons@aol.com.



Key West had completed the conservation process—and some of the coins were quite unusual—I was out the door and headed to the conservation laboratory almost before the call was ended.

At the Key West, Florida, conservation lab of Mel Fishers Treasures—Blue Water Ventures' joint-venture partner, chief conservator, John Corcoran, had carefully placed 35 shimmering, newly cleaned silver coins on a soft cloth. Among them were the expected eight reales value coins minted in Potosi, Peru, (now Bolivia) during the reign of King Philip III, which have been the majority of Tierra Firme Fleet coin discoveries. But marvelously, this discovery included seven small and delicate one reale coins—almost unheard of on shipwrecks of this period—that were not from Potosi; they were from



A set of recreated coin dies help to illustrate the labor that went into crafting most money up until the 18th century. Photo by Carol Tedesco



the Mexico City mint, another Tierra Firme Fleet rarity. And, they were old—some of them among the earliest coins minted in the Americas.

Their story was epic. The desire to reach out and touch them was irresistible.

In 1521, Spanish troops led by Hernán Cortés laid siege to Tenochtitlán, a magnificent Aztec city built on an island in a lake and connected to the mainland by a series of causeways.

The Spanish soldier and chronicler, Bernal Díaz del Castillo, in his *True History of the Conquest of New Spain* wrote:

“When we saw so many cities and villages built in the waters of the lake and other large towns on dry land, and that straight, level causeway leading into Mexico City, we were amazed, and we said that it was like the enchanted things related in the book of Amadis because of the huge towers, temples and buildings rising from the water, and all of masonry. And some of the soldiers even asked whether the things we saw were not a dream.”

The conquistadors then proceeded to reduce Tenochtitlán to ruins. On that spot, they erected a new Spanish city. Here, Cortés built his own residence atop the dead Aztec ruler Moctezuma's palace

Blackened and encrusted silver shipwreck recovered coins are cleaned by a technique called electrolytic reduction. First, coins are separated from the conglomeration, then suspended individually from metal alligator clips into a tub of soda ash and water. The clips are secured to rods with stainless steel wire, and the rods are wired to a battery, with voltage and amperage determined by the number of coins in each batch. Next, the power supply is engaged, beginning a process of reverse electrolysis. After cleaning, each coin is studied, photographed, documented, graded, and certified. Photo by Carol Tedesco



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LEFT: *The Entrance of Cortés into Mexico*, artist unknown. (Library of Congress Prints and Photographs Division Washington, Jay I. Kislak Collection, D.C./Public domain)

ruins; and here, the first Spanish colonial mint was established.

When it was originally founded, the municipality was known as México Tenustitlán. In 1585, it became officially known as ciudad de México—Mexico City. The city's mint was established in 1535, during the monarchy of Johanna and Charles I (reign 1516-1556) and produced its first coins in 1536. These earliest issues expressed the kingdom of Spain's expansionist ideology symbolically: Mexico coins produced from 1536 to circa 1544 display a pillars design with the motto *Plus Ultra*. The pillars represent the Pillars of Hercules, portal to the world beyond Europe, and is Latin for "more beyond".



Around 1544, the design was appended to include the waves of Gibraltar beneath the pillars. Finally, a royal edict issued in 1570 (probably put into practice by 1572), declared a new type—with a crowned shield obverse—compulsory.

The pre-conservation conglomeration that contained seven extremely rare one reale Mexico City mint coin specimens. Because of a chemical reaction between the metal and the salt water, a residue of silver called silver sulfide formed, blackening the coins, and fusing them together into the shape of the object (in this case probably a pouch) that once held them. This fusing helped to protect and preserve the small and fragile one reale coins. Photo courtesy of Mel Fishers Treasures, Inc.

Making money

Money was valued by weight; it was spent by weight; and what is astounding to consider is that every coin that came out of every mint in the Americas until the 1700's was made one at a time by hand.

To begin production, blanks were cut from strips of silver. A heated blank, or planchet, was then sandwiched between double dies and struck with a hammer. Any silver in excess of the requisite weight was trimmed from the outer edges of the coin until the weight was correct. This resulted in irregularly-shaped coins whose insignia were frequently off-center.

The dies themselves were made of steel with insignia impressed into them by direct engraving or by the sinking (stamping) of multiple die punches, each punch being a component of the coin's design.

Appropriately-sized dies were made for each denomination of coin:

- Eight reales of silver equaled the one-ounce silver dollar of approximately 27.2 grams—which is less than the troy ounce standard today.
- Four reales coins, at half an ounce each, are half the weight and were half the value of the eight reales coin.
- At a quarter of an ounce, two reales coins are half the weight and were half the value of four reales coins.
- Lastly, at an eighth of an ounce, the exceedingly rare one reale coin is half the weight and was half the value of the two reales coin, having an eighth of the value of the eight reales coin.

Blue Water Ventures chief archaeologist, James Sinclair, commented concerning the rarity of one reale denomination coins on shipwrecks of this period, "It was far more practical to ship large denomination coins—the full 'piece-of-eight' as they came to be called. Small denominations would almost always have been personal property rather than a merchant consignment or royal revenue."

Sinclair then explained why it is that Mexico City mint coins are uncommon on the *Santa Margarita* wreck site, "Every fleet had a specific purpose and route, and the Tierra Firme Fleet ships were loaded in Portobello, Panama, with

MEXICO CITY MINT
A Mexico City mint eight reales coin (inset) from the reign of Philip III is the denomination and reign—but not the mint—most widely represented on the 1622 Fleet shipwrecks.



The shield side of a Mexico City mint coin is the front, and is called the obverse. On the reverse are the lions of León and the castles of Castile, quartered by a cross with four flared extensions each ending in an orb, surrounded by a curving Moorish design called a tressure, or quatrefoil.

○ above M to the left of the shield is the Mexico City mintmark. The D below is the mint assayer's initial, in this case Diego de Godoy. To the right of the shield is an Arabic 8, expressing the coin's value. This value can also appear in the form of traditional Roman numerals, or in a manner that reflected the handwritten style of the times.

On either side of the coin, the symbols are encircled with a border of dots and a legend. Hand-trimmed to achieve the correct weight when it was originally



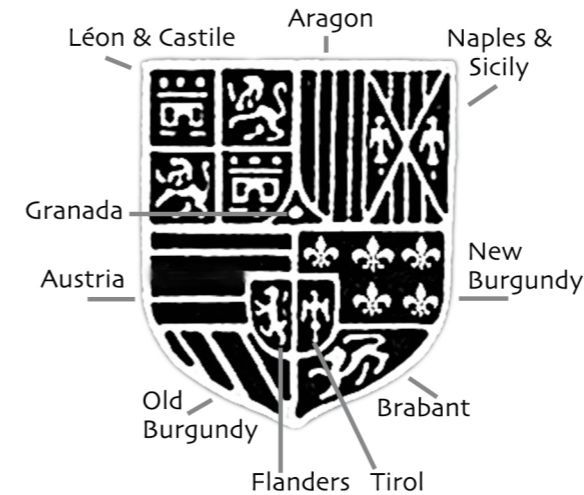
crafted, and later exposure to the elements, have left a portion of this coin legend visible. Obverse: PHILIPPVS III DEI GRATIA 1620. Reverse: HISPANIARVM ET INDIARVM REX. The letter "U" is presented as "V" in the classical Latin style. The Mexico mint did not introduce dates into the legend until the year 1607.

Obverse and reverse of Mexico Mint eight reales. Photos by Scott Neirling © Mel Fisher Maritime Heritage Society



The Conquest of Tenochtitlán, artist unknown. (Library of Congress Prints and Photographs Division Washington, Jay I. Kislak Collection, D.C./Public domain)

The shield pictured below is the Habsburg Shield, the arms of King Philip III of Spain, and, with some variations, of the other Habsburg Kings: Philip II, Philip IV, and Charles II. The symbols that compose the shield are the various individual arms of lands under Spanish rule at the time. So, the shield side of the coin represents the power of Spain, and when the power changed, the shield changed as well. (Illustration courtesy of Walter Zacharchuk)



TYPES OF RARE COINS
Assayer L, Luis Rodríguez, was assayer of the Mexico City mint circa 1548-1567. Visible portions of the legend on this rare 1 reale coin are CAROLVS (of CAROLVS ET IOHANA REGS) and a portion of the word INDIARVM. Between the pillars, above the partially visible PLVS ULTRA motto, a single dot represents the coin denomination.



The assayer initial L may appear either to the left or the right of the crest. Here a portion of IOHANA REGS (i.e. Charles and Johanna Royals/Monarchs) is visible.



Though the reign of Philip II began in 1556, during the office of Luis Rodríguez the names Charles and Johanna continued to appear on coins into the term of the following assayer O, Bernardo de Oñate.

The shield-type coin is introduced during the office of Bernardo de

Oñate, here with his initial "O" to the right of the shield. Portions of the words GRATIA AND REX are visible on obverse and reverse.



Coins here are shown larger than actual size

South American treasures—hence, the predominance of coins from Potosi, Peru. Coins minted in Mexico City were transported overland to Vera Cruz, on

the east coast of Mexico, and there, consigned to New Spain Fleet ships. The owner of these seven coins may have been from Mexico or had dealings with a business that paid with these Central American coins."

Dr Eugene Lyon, Blue Water Ventures consulting historian and the foremost authority in the world on the 1622 Tierra Firme Fleet shipwrecks, provided a fascinating insight about Mexico City minted coins found mixed into chests of mostly Potosi coins on 1622 Tierra Firme Fleet shipwrecks. "The Tierra Firme and New Spain fleets had one port-of-call in common, the port of Havana,

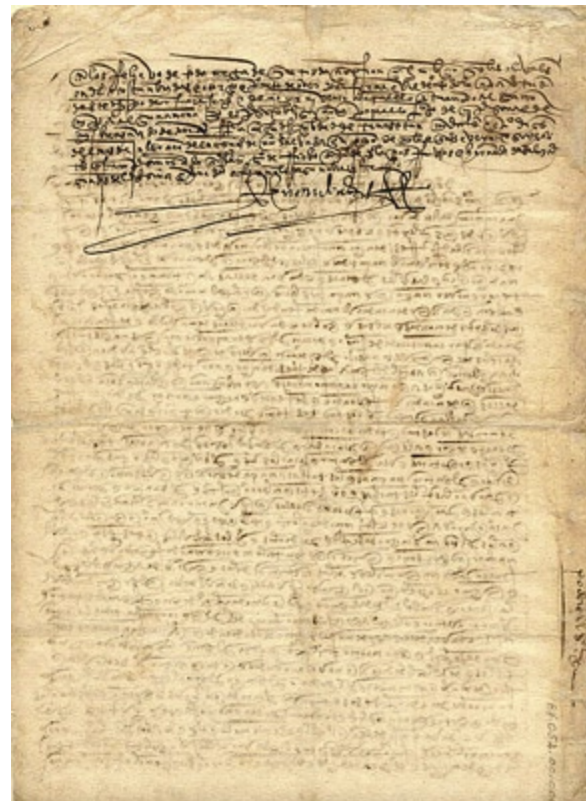
Cuba," he said. Havana was the final port-of-call for all ships before undertaking the return voyage to Spain. In 1622, the Tierra Firme Fleet, which had joined forces in Portobello with a guard fleet under the command of the Marquis de Cadereita, was traveling far behind schedule. The New Spain flota—with its cargo of Mexico City mint coins—reached Havana in advance of the Tierra Firme and Guard Fleet ships. With hurricane season and its dangers upon them, the New Spain flota chose not to wait. It departed for Spain—unfortunately leaving its valuables behind in Havana for the well-armed, but ill-timed, combined Guard Fleet and Tierra Firme ships to transport.

SOURCES:
Portions of this article are excerpted from the forthcoming book, *Pieces of Eight: Silver Treasure Coins of the 1622 Shipwrecks Nuestra Senora de Atocha, Santa Margarita and the Portuguese Carrack São José*, by Carol Tedesco

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Author Carol Tedesco is an internationally recognized Spanish Colonial coin expert and historic shipwreck professional who has worked with projects in North America, South America, Africa, and the Pacific. A member of the Explorers Club, she is a popular radio guest and speaker throughout the United States on the subject of the 1622 Fleet shipwrecks. Today, she consults for some of the most prominent historic shipwreck search and recovery companies in the world. She likes to relax by hula-hooping on the pier in Key West at sunset.

For more information about Keith Webb's Blue Water Ventures Key West and the treasures of the Santa Margarita shipwreck, visit www.bwvkw.com. ■



Signature of Hernán Cortés on a document appointing power of attorney to his agents during an investigation into his administration, 1526. (Kislak 213 Cortes, Hernan Power of Attorney 1526) (Library of Congress, Rare Book and Special Collections Division, Jay I. Kislak Collection, Washington, D.C./Public domain)

Edited by
Scott Bennett



SANTIKA SEASIDE RESORT



UK operator Divequest offers tailor-made trips for solo divers

Tired of paying the single supplement? UK specialist tour operator, Divequest, is now offering a selection of trips to Manado in Indonesia with solo divers in mind.

The 13-day holidays feature accommodation at Santika Seaside Resort and diving with on-site Thalassa Divers of Manado, home to some of the world's best diving. The diving package includes 20 dives, which can be taken across a maximum of nine diving days, with the option locally

of "adding in extra dives, night dives, and trips to the world-famous Lembeh Strait or the Bangka archipelago".

"These are special trips for solo divers who would like to travel with like-minded solo companions," said Divequest. "You can meet new, like-minded friends and not have to worry about the hassles of travelling or sitting in a restaurant alone. In addition, two of the departures will be for female divers only. www.divequest.co.uk ■

World airlines see blue skies ahead

Global airlines are undergoing a surprisingly strong recovery.

According to the International Air Transport Association (IATA), carriers began bouncing back late last year after posting record losses during the global economic crisis.

The group, which represents 240 airline companies worldwide, had predicted in December that 2010 losses would total US\$5.6 billion. However, a year-end rally in 2009 resulted in the group halving their 2010 loss forecast to US\$2.8 billion.

Leading the way are Asian and Latin American carriers, whose surge in passenger traffic has helped offset lagging demand in Europe and the United States.

Passenger demand should grow 5.6 percent for the year, while cargo demand could jump 12 percent according to the IATA. "We are starting to see some blue skies ahead of us," said IATA chief executive,

Giovanni Bisignani. ■

British Airways greenlights deal for UK jet biofuel plant

Deal will establish first plant in Europe to produce jet fuel from waste matter.

Construction of the plant in east London will commence within two years and is set to produce fuel from 2014 and create up to 1,200 jobs. Some 500,000 tonnes of waste will be used by the UK facility to produce 16 million gallons of fuel annually.

According to BA, the plant will cut the amount of waste that is sent to landfill, reducing the amount of methane that is produced. Methane is thought to be a more potent greenhouse gas than carbon dioxide.

It will be another four years before it starts producing fuel, and it is unlikely to work at full capacity straight away. The waste is fed into a high temperature "gasifier" to produce BioSynGas. A chemical process is then utilized to convert the gas into biofuel. Waste products from the process can be used to power the plant as well as supply electricity to the national grid. ■



Flight management aids aviation emission cuts

Better air traffic control determining how, when and where planes fly could help quickly achieve significant emission cuts.

An Oxford University study has discovered better flight management may be the quickest route to reduce aircraft emissions. These include more direct flight paths to airports and less waiting to land, according to Dr Carey, aviation expert at Oxford's Smith School of Enterprise and the Environment.

Better traffic control systems should also help aircraft reduce the time spent with their engines running while still on the tarmac. In addition, the inaccuracy of current control systems means planes must be given a wide berth to avoid collisions. "If that

was improved, landing and take-off's could be quicker, stacking would be reduced and planes could fly closer together by taking advantage of prevailing winds," Carey said.

In contrast, technological advances, such as better engines or reduced weight, tend to take a long time before they have an impact. In addition, investing in new technology is both expensive and risky." Major technological innovations are a massive financial risk because you could be making a plane that no-one's going to buy," he added. ■

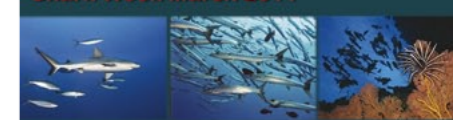


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New Flight-Delay Rule in the US



Airlines threaten more flight cancellations ahead of the new ban on extended tarmac waits

A new federal rule that takes effect April 29 aims to end such horror stories by imposing fines on carriers as high as US\$27,500 per passenger for flights that sit for more than three hours without allowing travelers to disembark.

It should be good news for travelers, but some airline industry analyst warn the law of unintended consequences is about to strike air travel, as the seemingly helpful mandate prompts airlines to cancel flights that face a reasonable

prospect of getting stuck in a take-off queue.

In response to the regulation, furious airline executives are hoping air travelers blame the Transportation Department for increased flight cancellations. "Many passengers at two hours and 45 minutes, they really want to go to L.A. or Mumbai or wherever, but the government, by God, says 'We're going to fine you \$27,500.' So, guess what we're going to do? We're going to cancel the flight,"

Continental Airlines (CAL) CEO Jeff Smisek told an investor conference on March 9.

A Transportation Department spokesman, Bill Mosley, said airlines can schedule flights "more realistically" to avoid cancellations, and that the rules will help travelers "choose carriers that do not have tarmac delays, do not routinely cancel their flights, and will provide adequate assistance to passengers." ■

How old is your plane anyway?

The average age of the fleet of the seven large U.S. passenger airlines—including American, Alaska, Continental, the merged Delta and Northwest, Southwest, United and US Airways—is about 14 years old, according to *The Airline Monitor*. It found American and Delta/

Northwest had the oldest fleets, at about 16 years on average. As of the end of 2008, a small percentage of the merged Delta/Northwest's planes dated back to the late 1960's.

According to aviation analyst Richard Aboulafia, U.S. fleets are

among the oldest in the world, "I'm not really sure that people should read that much into that," Aboulafia said. "From a safety standpoint, a lot of the older planes were built tougher and with proper maintenance, there's no reason why a plane can't stay safe for 25 to 30 years." The United States and most of the developed world have superb standards and maintenance regulations, the result of decades of experience that have made the system incredibly safe, Aboulafia said. It's also important to remember that a plane may be 20 years old, but its engines and other major systems could have been recently manufactured or upgraded, said Todd Curtis, founder of AirSafe.com. ■

American Airlines Douglas DC-3 used in filming a war film in 1943



NASA

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Sperm Whales

Text and photos by Eric Cheng

Of Dominica



The memory of my first sperm whale encounter is so visceral that I can almost *feel* myself there again if I close my eyes. As is common to most whale encounters, it wasn't a particularly long one; the juvenile male merely drifted by slowly, effortlessly, turning on his side so he could stare at me with a tiny little eye before disappearing into the blue. To him, I was probably nothing more than a passing curiosity—an awkward sack of meat wrapped in neoprene—but the experience was an overwhelming one for me, and I knew that I wanted more.

The sperm whale is the canonical whale, its form immortalized by books and drawings centuries old. When you ask a child to draw a whale, it is likely that what will come out of her developing mind most likely resembles a sperm whale, an animal with a huge, box-like head and tiny pectoral fins whose evolution seems to defy logical explanation.

Given that there seem to be sperm whales distributed all over

THIS PAGE AND PREVIOUS PAGE: Sperm whales are common and have a wide geographic distribution, which means that they can be found in almost every part of the world. Sperm whales often only have teeth on the lower jaw (left) used to hold and eat their prey, giant squid





Sperm whales are social animals that form family pods which interact. A group of whales in close formation surface for air (above). Close-encounter with a sperm whale that likes to get close to humans (left)

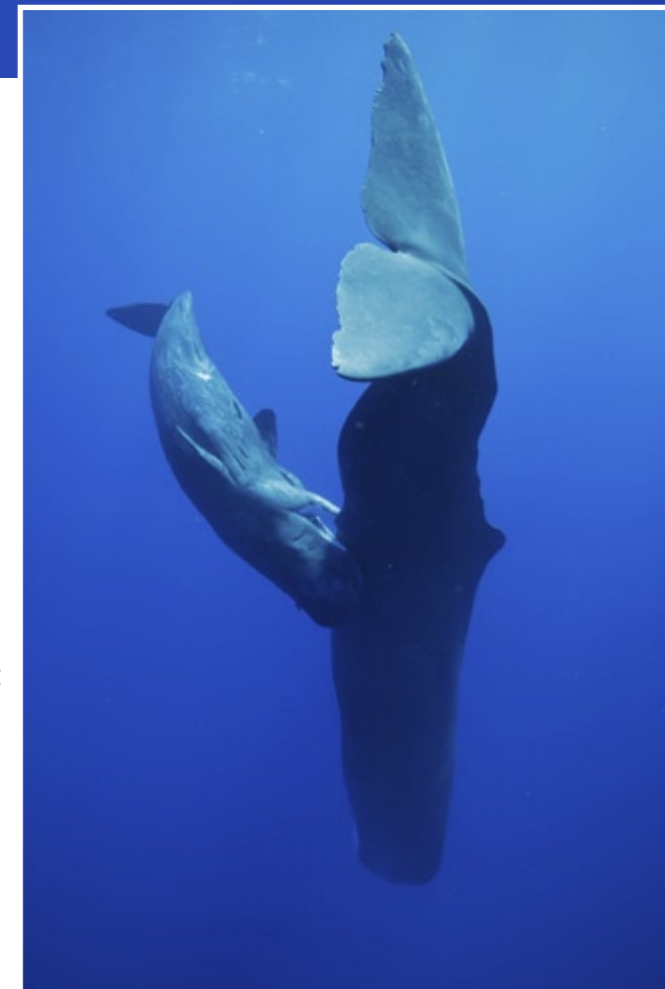
the world, why is it that they are so shrouded in mystery? Most whale enthusiasts I know talk fervently about humpback whales, but grow quiet when sperm whales come up. Few of them have ever seen a sperm whale, even on the surface. Sperm whales are not rare. I'm told that sperm whale populations are quite healthy, and that their geographic distribution is wide, which means that they can be found in almost every area of the world.

I don't mean to state the obvious, but it turns out that all you have to do to see a sperm whale is travel to where they live. Although mature male sperm whales do migrate from polar regions to mating grounds in the tropics, juvenile and

female sperm whales do not migrate, making it much less probable that you will have a random encounter with a sperm whale unless you go to the places where they live.

So where do sperm whales live?

Sperm whales live where their food lives. I've had luck at both of the places I've traveled to in search of the mighty cetaceans: Ogasarawa, a group of islands 620 miles south/south-west of Tokyo, and Dominica, an island in the central Caribbean. Both island chains sit at the intersection of grinding tectonic plates and have ridgelines that drop off steeply under the ocean's surface. In both locations, sperm whales are



A mother sperm whale and her baby calf descend



Sperm whales are found on the surface of the water down to about 1,000 meters deep where they hunt giant squid. ABOVE: A sperm whale named Scar has enjoyed meeting humans since the day he was born and is thought to have encouraged other whales to tolerate human presence, too

found on the surface along underwater topography about 1000 meters deep, where their prey — large and giant squid — live.

In Ogasawara, I photographed a sperm whale with an *Architeuthis dux* giant squid carcass in its mouth — a first, I'm told — but it was in Dominica that I had the most incredible whale encounters of my life. Scar, a 10-year old male sperm whale, has been initiating human encounters almost literally

since the day he was born. Andrew Armour, our local guide in Dominica, has spent countless hours in the water with Scar and believes that Scar has been a “gateway whale” in that others whales in the area seem to also tolerate human presence in the water.

Getting into the water with Scar for the first time was a bit intimidating. Although he is a young male, he is still about ten meters long and comes barreling at snorkelers, sometimes not stopping until physical contact is made. Indeed, I spent as much time swimming away from Scar as I did trying to photograph him, and in the end, I ended up putting my camera down and giving him a good rub. Scar closed his eyes, and his huge body wiggled slightly under my hands, like a 12-ton puppy might do in the same situation.

Our group spent a lot of time in the water with other sperm whales in Dominica as well. Local researchers and whale watch operators have identified dozens of resident

whales, and two local pods happened to be aggregating into social groups while we were there. During social gatherings, the whales let us get as close as we wanted to (we were careful of flukes thrashing up and down, of course — there was a lot of surface activity!). Still, we never tried to touch any of these whales because they are fundamentally wild animals, and lack of respect could easily lead to a response that might cause injury or death.

During social gatherings, sperm whales rub against each other and communicate non-stop by clicking, clanging and wheezing (like dolphins do). I observed that a good number of the juvenile males became sexually aroused when rubbing against each other. Photography conditions were fantastic during the beginning of each social gathering, but after ten minutes or so, the water around the cluster of whales was often filled with micro-bubbles and sloughed-off sperm whale skin, which looks like sheets of thin, black plastic.



A piece of sloughed-off sperm whale skin floats by

Sperm Whales

During social gatherings, sperm whales rub against each other and communicate continually by clicking, clanging and wheezing (like dolphins do). As sperm whales are a protected species, in-water whale encounters are illegal without the necessary research permits



I hope to return to Ogasawara and Dominica next year for more opportunities to photograph and film sperm whales. Six months ago, the thought of seeing a sperm whale underwater was just an abstract dream. It was only through a combination of careful planning and incredible luck that I was given the opportunity to capture the images presented in this portfolio. Tourist operations in Dominica

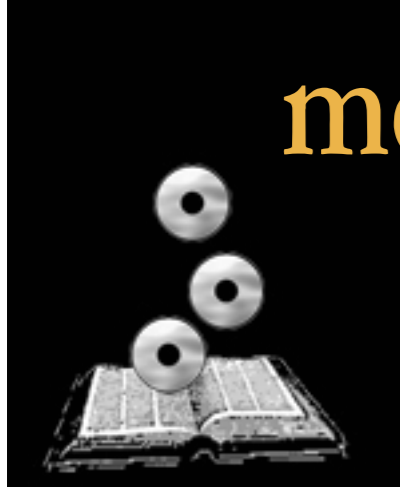
have been inundated with requests for sperm whale snorkel trips since these images were released to the press. For the most part, in-water whale encounters are illegal without the necessary research permits, and I don't know of anywhere in the world where casual hobbyists are allowed to get into the water with sperm whales. However, Tonga and the Dominican Republic

regularly book tourists on charters to swim with humpback whales. I highly recommend an in-water experience with a large cetacean, but remember: always follow your guide's instructions, and get in good swimming shape before you go!

See Eric's Dominica trip report (including video of sperm whales) here: <http://echeng.com/journal/tag/dominica2010/> ■

Underwater photographer and writer, Eric Cheng

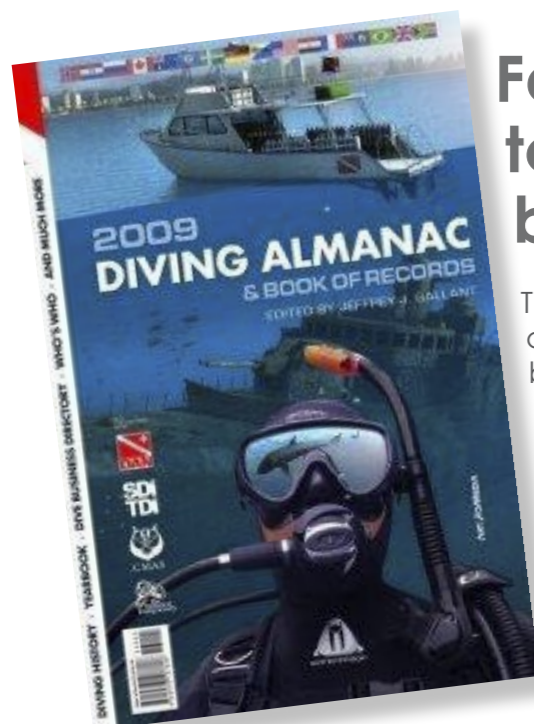




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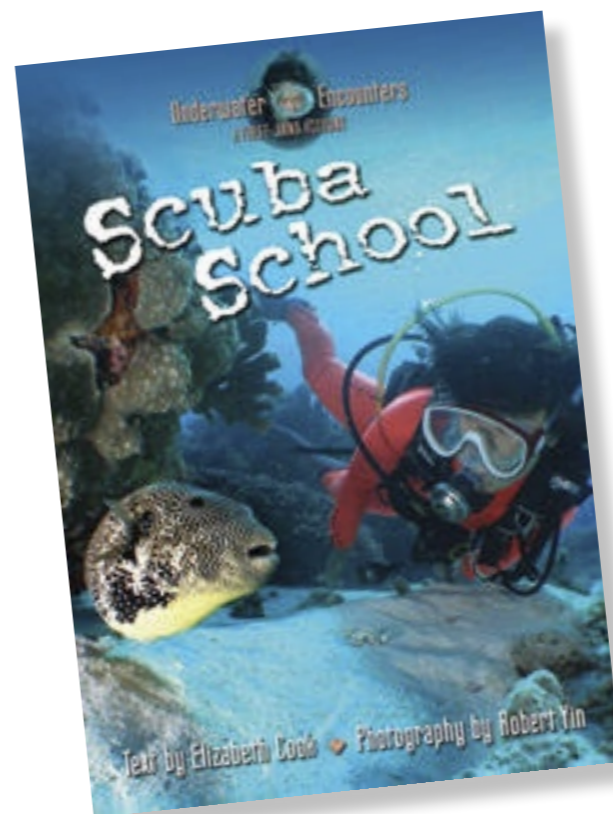
The biggest compendium of diving facts has become the best deal too. Jeffrey Gallant has moved his *Diving Almanac* to Facebook, the social networking Web site. More than 3,000 indexed articles, 500 records, 600 who's who profiles, 1,200 businesses and centuries of diving history are available

free of charge. All readers have to do is click through to the Facebook page and establish a password to gain access to regular updates and the archive of facts and figures. What's more they can exchange ideas with other readers around the world through the networking site. For those who like the feel of paper books, the 2009 almanac can still be ordered on-line as well. This 694-page soft cover from Porbeagle Press is a handy reference for settling discussions at dive club meetings and for quick reads in moments between tasks. It is the definitive toilet-tank topper for the complete diver. Soft cover ISBN: 978-0-9781078-2-6 www.divingalmanac.com

Hammerhead nails shark facts

Of all the sharks in the sea, hammerheads have to be the strangest with their unique wide snouts. Learn why scientists feel the creatures developed this hammer formation and a myriad of facts about the species in "Hammerhead Sharks" by Alessandro de Maddalena and Alex "The Sharkman" Buttigieg. The 128-page book from Ireco Press is filled with color photos and black and white drawings of hammerheads that the authors have produced over decades of studying sharks. De Maddalena is president of the Italian Ichthyological Society and a member of the Mediterranean Shark Research Group. The book is a compendium of centuries of shark research by scientists around the world. Although the authors present information in scientific terms, they explain everything in laymen language that is easy to read yet highly informative. The text is bilingual (Italian and English.) The foreword was written by Ron and Valerie Taylor, the Australian shark experts who helped produce classic films

such as "Jaws" and "Blue Water, White Death". The book can be ordered directly from the publisher, which is accessible through the author's Web site. ISBN: 978-88-86253-34-5 www.alesandro-de-maddalena.webs.com



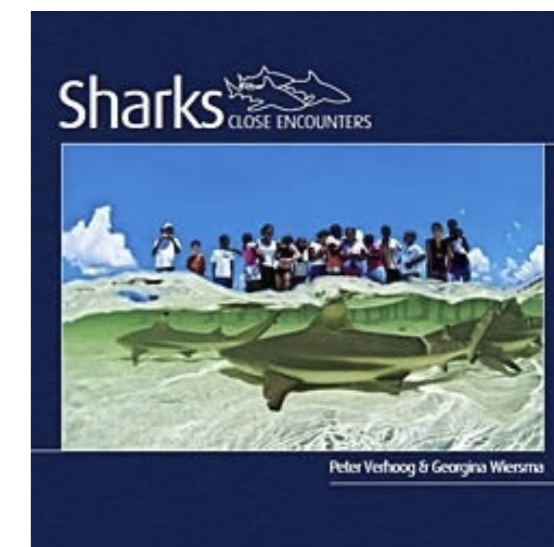
Take your kid to 'Scuba School'

If your young guppies are becoming interested in scuba diving, consider getting "Scuba School". The 50-page soft cover from Hameray is one of a series of books Elizabeth Cook wrote to draw interest to the sport among the younger generation. Its six chapters introduce readers to the Underwater Zoo of creatures and plants. They then progress through Classroom, Learning About Gear, More Things to Learn, First Open Water Dive and Earning the C-Card. The book closes with appendices on protecting the planet, fun facts, a glossary and an index. Cook says the text is aimed at third- through eighth-graders, although it seemed more fitting to the youngest readers of that age spread. She covers scuba basics, the fun and the hazards without getting too technical or scary. The layout is breezy, lending a fun mood to the contents. Adding to its sense of excitement are color images of underwater photographer Robert Yin. ISBN: 978-1-60559-097-4

www.hameraypublishing.net/underwater-encounters1

Sharks: Close Encounters

This new book is dedicated to sharks and tells the story of the authors' close encounters with this fascinating species. Compiled by Peter Verhoog and Georgina Wiersma, the book has 18 exciting chapters covering personal adventures with many species of sharks, from the small sharks of the kelp forests to the great white shark photographed without a cage. On Verhoog's website, you can find an exciting video clip of him diving with a very large tiger shark that tries to pull his expensive underwater camera out of his hands. Public interest in the oceans and sharks has grown immensely. Most publications about sharks, up to now, have been biological texts and guide books. *Sharks: Close Encounters* is one of the first books to describe personal encounters with these ancient predators in a compelling, fast-paced style, with over 100 full-colour, high-quality photographs, all taken by Verhoog. Holland's famous diving couple has done it again, "We do not write about the experiences of others, but present our own unique adventures." The book is also published in Dutch, and available on the new webshop: www.peterverhoogart.com



Peter Verhoog & Georgina Wiersma



Mexico's magical island
Cozumel

Text by Mathias Corvallo

Photos by Mathias Corvallo, Erick Cruz and Scott Johnson



SCOTT JOHNSON



SCOTT JOHNSON

Cozumel

Cozumel combines the great reefs that one might find at the best dive spots around the warm Mexican Gulf waters with the laid back island life, where everything is close enough...

CLOCKWISE: Seahorse hides among fronds of soft coral; Octopus changing color for the camera; Tobaccofish hovers over purple coral on the reef off Cozumel

PREVIOUS PAGE: A diver explores the bright orange and gold colored sponges and coral growth of the reefs off the island of Cozumel

Yes, I know, Cozumel must have already been reviewed several times since you took up scuba diving, but the fact remains, that it is still one of the Caribbean's top destinations for diving enthusiasts from all over the world—from the novice to the very knowledgeable—and now it's safe again to go there, as Mexico has been cleared off the CDC's travel warning list for swine flu. It's time once again to enjoy the treats of this enchanting tropical paradise.

Cozumel combines the great reefs that one might find at the best dive spots around the warm Mexican Gulf waters with the laid back island life, where everything is close enough with a short taxi ride or a pleasurable bicycle tour. Indeed, the island has few routes, and a great set of beaches and coves. Almost every place offers gentle waves lapping warm sands. And there is always a beach bar or "tienda" around where you can get great refreshments at very low prices—an "honest-to-God" diving paradise, but then, you already knew that!

What can we say? Good ol' Jacques Cousteau baptized Cozumel as ze most beautiful div-

ing spot in the world, back in the 60s. Who are we to discredit the old master?

Since the French sanction of Cozumel as a divers' paradise on Earth—and just to make sure it sticks—the Mexican authorities established a huge marine park for the preservation of local flora and fauna as well as the means of income, based on sports tourism, that is the lifeline of the island.

Palancar Reef

There are many areas for scuba enthusiasts to choose from, but a great start is the internationally renown Palancar Reefs located between the Playa del Carmen coastline and the western side of



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COUNTER-CLOCKWISE:
Blue Tang; Lizardfish;
Gray angelfish (inset)

the island. This sheltered section has the clearest water. The best spots are a mere 20-30 minutes ride away, depending on where you start from.

El Arrecife Palancar (Palancar Reef), stretching for many kilometers on the western side of the island, is where divers can find amazing coral formations and a 'horseshoe' of coral heads, making for some of the world's finest underwater scenery with a stunning 70m (230ft) visibility range.

A haven for underwater photographers, Palancar is populated by many sea turtles (as large as they come), groupers, nurse sharks and the elusive "Palancar Catfish"—a crazy sight, if you can spot it hiding under the coral. Depths range between an easy 12 meters (40ft) at the north end, called Palancar Gardens, to more than 24 meters deep (80 ft), providing pros opportunities for fantastic deep-water diving.

There are some opportunities for great cavern diving, such as Devil's throat at 42 meters (139 ft) down at the south end called Punta Sur. See the video of it on YouTube.com at: <http://www.youtube.com/watch?v=8ECFvuLBUNA&feature=fvw>. There are enough brightly colored fish and anemones to fulfill any underwater photographer's dreams.

Palancar Reef is as popular among divers as it can be, therefore its much-lauded coral formations are in constant peril. Visitors must purchase a wrist band pass and acknowledge the marine park regulations—one of them being the mandatory use of bio-degradable sunscreen lotion.

Cozumel

Many well-known brands offer such products, and it is in your best interest to get a few bottles at home, as prices on the island tend to be a trifle steep, and stocks aren't always plentiful. Boat rides to the diving spots on the reef are under a mile away from the shore (over one kilometer), so the best choice is to sign up for a day cruise or charter a boat from a local tour agency.

Sea life

Cozumel has so much underwater wild life that it is hard to mention every one of them, so I selected three I liked best—sites I think you will want to keep a lookout for and snap a few great shots of to show the folks back home. The variety of fish and other wondrous animals, apparently more than 250 species to choose from, might not be too apparent at first, but the more you dive, the better it gets!

Sea turtles

Here's one marine animal you can count on having a "tête-a-tête" with. Cozumel is full of them, some of which are quite large specimens, idly searching for their next meal and will cruise by you at a leisurely speed, not minding much to what's going on around them. And that is the great thing about these cute turtles—you really feel like a spectator of nature's great drama when you are with them. But fight the urge to piggyback a lift on one of them. They look sheepish, but have great beaks that can snap a coconut to piec-

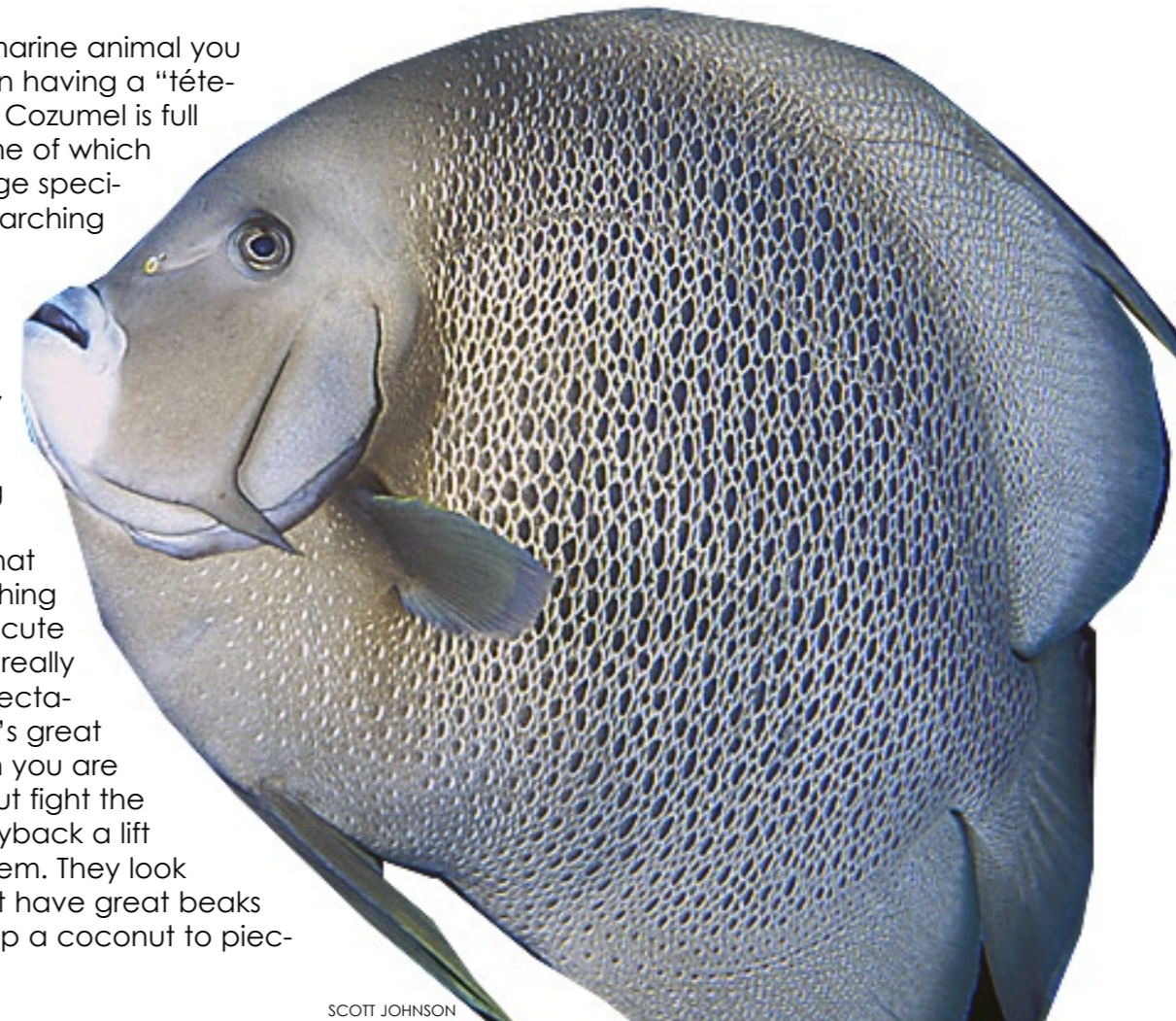


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Underwater photographer with friendly green moray eel



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Diver swims through a school of silversides (above); Cozumel Catfish, otherwise known as the toadfish (right); Local map illustration of the island of Cozumel (far right)

es, let alone your pinkies. Besides the danger of injury to oneself, there is also the risk of injury to the animal. The first rule of the responsible diver is to look only, don't touch—leave the wildlife alone. and don't harrass the critters.

Sea turtles have been around forever and consider Palancar their own backyard. Hence, they are one of the main protected species in the area. They have a sanctuary on the south end, where nests are kept under surveillance and have their own



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Diver investigates a giant sponge formation. RIGHT: Angelfish

protection program.

If you want to witness the miracle of baby sea turtles hatching and dashing off to sea, just contact the Turtle Salvation Program at the Cozumel Volunteer Connection office, located at 602-B (upstairs) Raphael Melgar Avenue right next door to the Naval Base. The program's director, Rodrigo Navarro, along with several committee members and dedicated volunteers, are doing whatever they can to keep the Turtle Salvation Program going with what little



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Barracudas

Nasty looking, long fairly compressed, elongated bodies covered with small, smooth scales led by large mouths with fang-like teeth... Sounds scary? Like sharks, barracudas have a bad, although undeserved, reputation. Rare and unproven reports of unprovoked attacks are known, however, the fish are sea scavengers and will respond to shiny objects. So, if you are sporting a bellybutton ring, it pays not to dangle it in front of these lighting fast beasts.

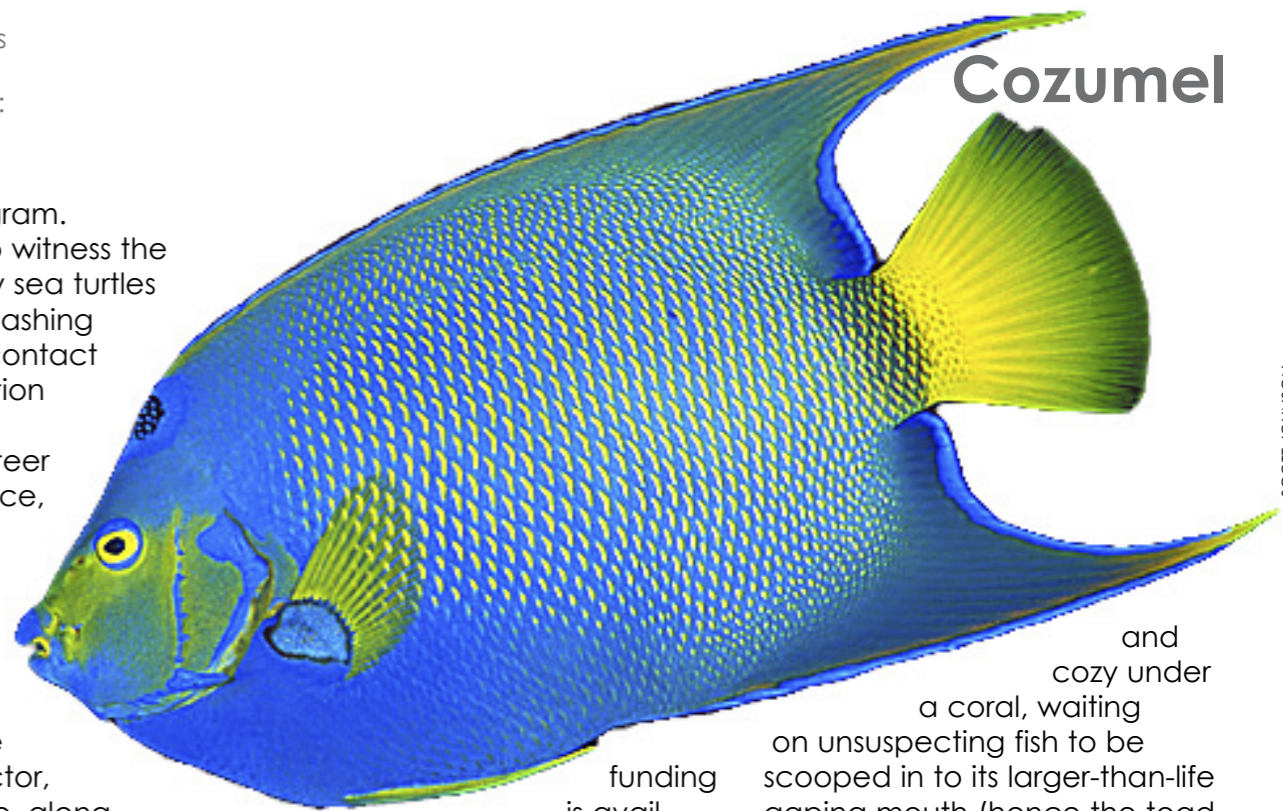
Cozumel Catfish

Cozumel Catfish (a.k.a. toadfish) are Cozumel's endemic catfish and a sight to be seen. Bearded, freaky-looking, striped like a yellow bug-eyed zebra, the catfish favors holing up, safe



MATHIAS CORVALLO

you managed to see one. Ask your dive guide to keep a look-out—it's a real treat!



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Cozumel

and cozy under a coral, waiting on unsuspecting fish to be scooped in to its larger-than-life gaping mouth (hence the toad reference) as the next meal. It can move very fast when attacking, and you rarely see it outside its lair. Cozumel has this unique species as their local attraction, and you'll be glad funding is available. If you are feeling grand, you can help, too. Just check out the information at www.cozumelinsider.com/TURTLESEE and make your donation.

and cozy under a coral, waiting on unsuspecting fish to be scooped in to its larger-than-life gaping mouth (hence the toad reference) as the next meal. It can move very fast when attacking, and you rarely see it outside its lair. Cozumel has this unique species as their local attraction, and you'll be glad





Cozumel

CLOCKWISE FROM FAR RIGHT: Spotted goatfish; Black seahorse; Yellow seahorse wraps its tail around purple sponge; Yellow stingray emerges from the sand of the sea floor; Yellow seahorse swimming through fronds of soft coral

You can probably book your daily dives at a very convenient location—by the pool, near the snack bar, and so on...



Diving menu

There is a little something for all tastes in Cozumel. As you will probably stay in either a small inn or a large all-inclusive hotel, you'll find that there are hundreds of dive operations that will be able to take you to all the best spots. Unsurprisingly, there is a trade-off between one type and another, so descriptions of each follow to give you an idea of what's available.

All you can eat buffet

Ever been to one of those places where the host sets up a long table piled with goodies up to the roof? Customers pay a 'reasonably cheap' fixed fee and can then help themselves to as much food as they wish to eat in a single meal. Depending on the customer, that can get ugly.

Well, diving can be pretty similar to this in some areas. Like buffet menus, a very big dive operation can offer you a reasonable price for a couple of scuba tanks, but there is a catch—you don't get to choose where you 'eat' each

day; everybody gets the same meal. Not that it matters much, as Cozumel has more than 20 spots to choose from and all of them very, very nice.

Typically, divers are told what sort of dive profile each boat will provide, the main difference being deep versus shallow, so you can be sure to keep those N₂ bubbles under control. These big operations are usually associated with a big hotel or resort, and you can probably book your daily dives at a very convenient location—by the pool, near the snack bar, and so on.

I dived with Dive Palancar, a very professional outfit located within two of the largest Occidental Hotels on Palancar Beach. Customers can get instructed at all levels with PADI, NAUI and SSI. The operation offers guided tours, deep-sea fishing trips, snorkeling outings, and even private tours. Ask for Radames Solis—he'll set you up.

Dive Palancar has been around for many years, and their crew is very experienced. Dive Palancar's dive masters are a great group, and I had

nice chats with several of them: Pingo, William, Sergio, Lobo and the rest of the gang. Most of the team are bilingual professionals, but if you manage some Spanish, they will be happy to tell you a

few colorful stories.

Specialty bistrô—diving à la carte

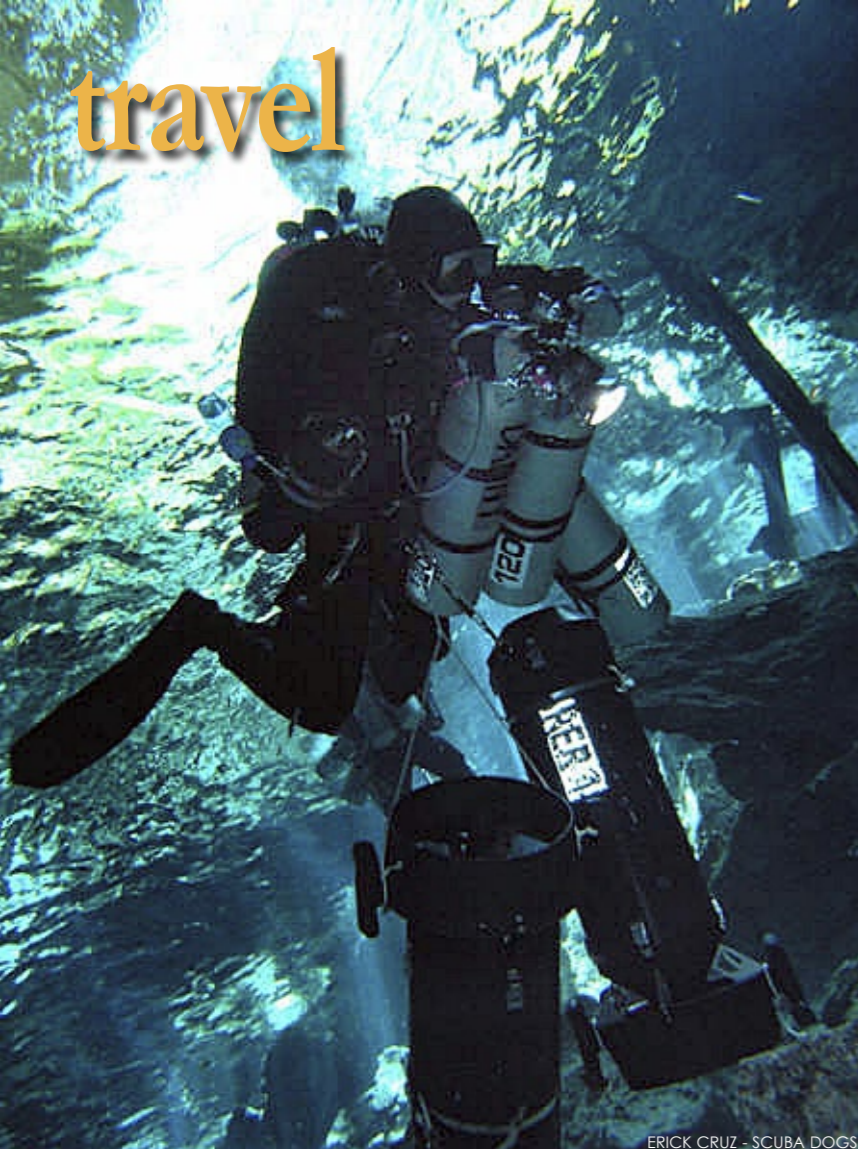
Dining in a smaller, off-the-beaten-path restaurant can bring excellent surprises.



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ERICK CRUZ - SCUBA DOGS



ERICK CRUZ - SCUBA DOGS

Diver submerges in a cenote for a cave dive; Onlookers at Plata Forma cave site; Underwater videographer catches some underwater rays in a cenote



ERICK CRUZ - SCUBA DOGS

The chef is usually the owner himself—a professional with great experience, who takes you under his wing every step of the way.

Diving with a smaller operation in Cozumel can be as special. He or she knows every reef, has been to every spot on the island, and can give you a marvelous private tour. All that know-how usually comes from working a number of years with other dive operations before opening up a shop.

This professional will go the distance to provide a quality experience that does not necessarily translate into luxury but certainly great experiences for the client—a special taste of the island's underwater scenery, especially when it takes you away from the crowds.

For some divers, being on a

choose and chat about how, where and when one is going to dive is priceless. And—more often than not—such dives are worth every penny of the slightly higher fees paid. Also, for those “absolute” beginners in diving, there is much to be said when you have a personal guide all to yourself and get to choose your destination.

Our prize chef was Erick G Cruz, ScubaDogs' Dive Operation owner. Cruz took us under with his wing and conducted our dives with extremely professional dexterity. He is one of the very few DAN instructors on the island, besides being an accredited instructor for PADI and NAUI. There are not just reefs on the menu, but you can also find the occasional great “cenote” experience

smaller, less crowded boat and having the option to

—just what you might be looking for. Cruz knows the way.

If you get the opportunity, have a nice cup of coffee with Cruz after your dive. He has many stories to tell, and knows all about the diving industry on the island, as well as the coast. I've discovered that “decompressing” over a nice cup of java, makes Cozumel's easy pace seem like it has slowed down time, itself.

Who's who?

I am very picky about whom I dive with, and I usually never repeat a mistake, unless I have no choice. But I would definitely dive again with both operators, Dive Palancar and ScubaDogs. If you think you want to give them a try, here is their contact information: Divepalancar.com and ScubaDogs at: erickdivers@hotmail.com

Some great spots

Cozumel has lots of great spots for

scuba as well as snorkeling. Just about any place can provide marvelous experiences for all tastes, levels and wallets. But a few of these are especially recommended, and I have had the opportunity to visit some of them personally. Most require a short boat ride and are accessible from your average hotel, resort and dive club, as most are located along the west coast.

Some dive spots are classified in two categories: “shallow” and “deep”. Some of the deeper areas will have great walls that offer a smaller variety of sea life but much greater thrills, as over the edge, you can glimpse a very deep drop indeed while circling towering coral reef formations.

Brief accounts of the dives I managed to do follows. Rest assured, there is much more to be seen.

Colombia (Deep)

Great coral turrets starting at 15 meters deep (49ft) on a white sandy bottom behind which a bottomless abyss looms. It's a thrill to hover over it and a superb photo setting—just be careful not to drop your underwater camera, for there is no chance to go get it without the use of a deep sub! Here, one can find a variety of fish life including large sea turtles, rays and a few nurse sharks that will occasionally pay a visit.

Colombia (Shallow)

At only ten meters deep (30ft), divers will see a colorful coral garden with abundant marine life—too many species to count. It's an excellent spot for the snorkeling and scuba enthusiasts alike. This is where I met the (in) famous Cozumel Catfish—a weird cross between a zebra, a yellow brimmed sombrero and a cross-eyed toad. It is as elusive as it is ugly, but you gotta love the little guy!



CLOCKWISE FROM FAR LEFT: Blue-striped grunt; Porkfish and grunts school together; Diver sheds torch light on giant sponges on a reef wall; Spotted moray eel (inset); Diver with green sea turtle cruising the reef off Cozumel

groupers, some large octopus (fun to follow and see change colors and shapes!), a lot of lobsters, many kinds of morays, some holed-up nurse sharks and wandering sea turtles. Very warm waters, but bring a windbreaker for that speedy ride home afterwards.

We reached about nine meters deep (30ft), and saw scattered islets of coral and sponges amid a flat sandy bottom. Over the reefs, there is always an abundant marine life, which will include groupers, sea turtles and rays. My buddy was a novice diver, and she felt very much at ease. We just followed the currents and relaxed.

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Palancar "Horseshoe"

Starting at seven meters (25ft), this spot has beautiful marine life, large coral formations, and a lot of large sponges before sloping down to the ocean floor. We dove around the coral turrets and through a few caves around 30 meters deep (99ft) and saw a few lonely turtles passing by. Clear waters!

Palancar Gardens

Reaching a maximum

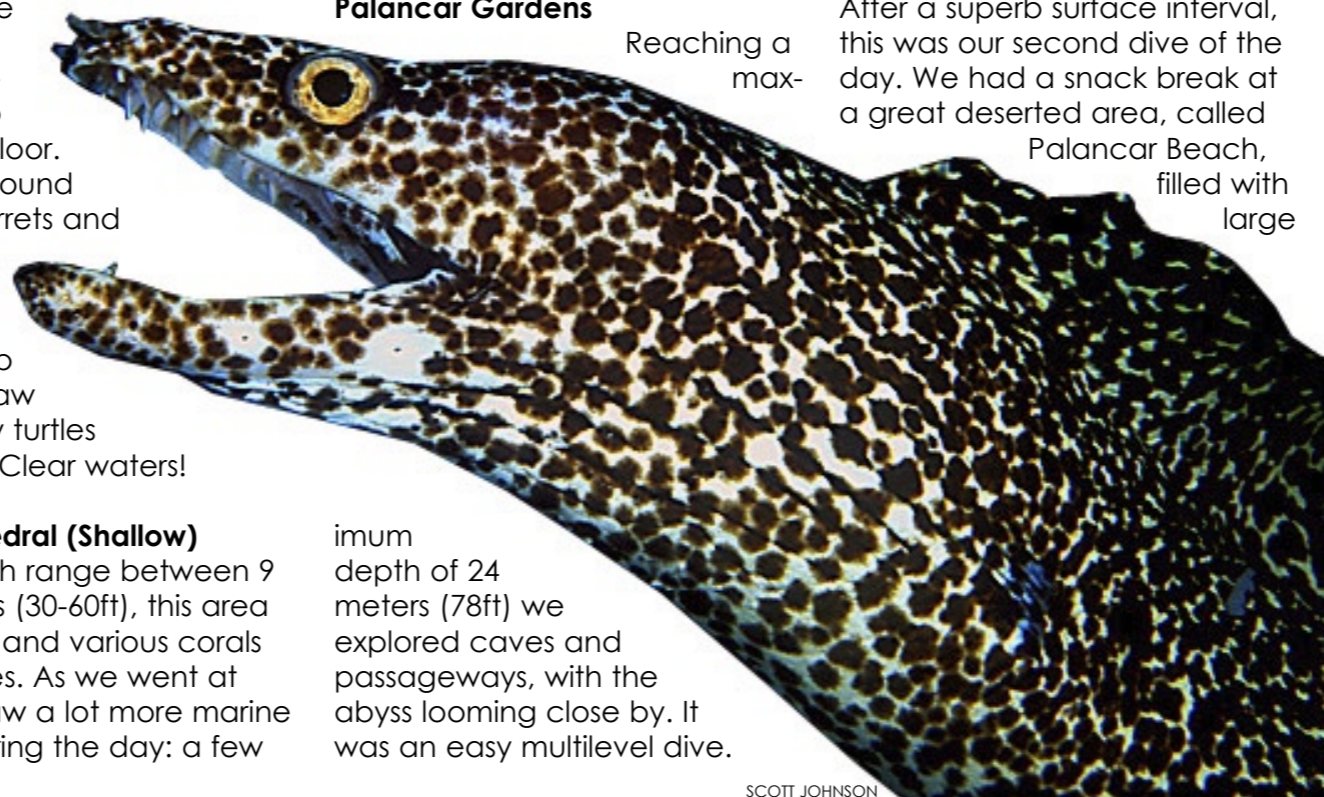
La Francesa

After a superb surface interval, this was our second dive of the day. We had a snack break at a great deserted area, called Palancar Beach, filled with large

Paso del Cedral (Shallow)

With a depth range between 9 to 18 meters (30-60ft), this area has colorful and various corals and sponges. As we went at night, we saw a lot more marine life than during the day: a few

imum depth of 24 meters (78ft) we explored caves and passageways, with the abyss looming close by. It was an easy multilevel dive.



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CLOCKWISE: Octopus changing colors as it hides in a nook along the reef; Diver and Queen angelfish in coral encrusted passage; Curious moray eel under large sponge greets diver

Cozumel

BEWARE OF THE STINGING HYDRA MONSTER FROM THE DEEP

Slim Fire Coral cousin is no feeble foe.

A close relative of the fire coral, this hydroid colony animal is found all over Palancar Reef, and believe me – its sting hurts!

Divers should beware of diving too closed to the coral (how's your buoyancy control these days?), as these hydroids are usually nothing more than a thing black bush, often invisible, until you brush past it. The pain is quite immediate and shocking, although not serious.

The affected areas can become quite itchy (whatever you do, fight the urge to scratch it!) and, depending on each individual's skin sensibility, will take quite some time for the marks to go away, long after the itching ends. Of course, if you are a dumbbell like me, you will get a kick of parading your "war scars" to more novice divers.

Prevention is the name of the game, so dash off to your local diver outlet and purchase that sleek looking dive skin you had your eye on – the water in Cozumel is so warm that you will need little else.

A smart measure is to check with your local physician and take along some skin lotion to treat any unavoidable encounters with this sea monster—after all, they are on their home turf.

Gymnangium longicauda, Feather Hydroid. 3 1/2 to 12" tall. Thin, close-spaced individual branches with whitish branchlets. Found worldwide in tropical seas. <http://www.wetwebmedia.com/hydrozoans.htm>

Punta Dalila

This was the first time I've ever seen nurse sharks doing anything other than sleeping or strolling. A couple of them actually hunted down a group of fish and ate most of the poor things on the spot. I don't think I will ever see that again. No one else on the group seemed to have noticed it. Life goes on.

Amid plenty of coral and large sponges, we spotted a lot of wandering angelfish, surgeons, groupers, parrotfish (some big ones) and boxfish. This is another strong

current and fire coral area, with depths ranging between 9-18 meters (30-60ft).

"It's all in the wrist!"

Mexican conservation law charges a visitation fee of 20 pesos for all marine protected areas. Besides wearing your wrist band, make sure to request and keep your proof of payment to ensure your money will go where it should.

Due to their intensive use and ecological importance and frailty, most of the reefs surrounding the Cozumel Island, and some lagoons



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empty shells that covered the sands and the pier. Surreal!

The dive was terrific. We met no less than six nurse sharks and a very large Loggerhead Sea Turtle (*Caretta caretta*) with the thickest neck I've seen in some time.

La Francesa has small sand hills covered with scattered coral and sponges, where you can find a lot of sea turtles, rays and nurse sharks. The spot is not very adequate for the novice, or inexperienced divers, as there are strong currents and A LOT of fire coral

(as I can personally testify to my chagrin). Depths between 12-24 meters (40-80ft).

Santa Rosa Wall

The area features small coral ridges, caves and—you guessed it—abounding marine life.

Another strong current and fire coral spot, Santa Rosa starts at 12 meters (40ft) and then slopes into—you guessed again—the abyss.

Palancar Ladrillos

This was a very large wall, with really amazing canyons. We stayed at 28 meters (92ft) average, where there was not much of a current. We didn't see a lot of marine life around, other than a few wondering lobsters and smaller species (their day off?). The geological formations, however, are a spectacle in themselves, and the complex navigation requires an experienced guide. Watch out for the corals' sharp edges; be sure to wear a nylon skin or even some light exposure suit, despite the very warm waters.



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Gaping spotted moray eel



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also prevent littering and try to use oil drip-free engines on their vessels. These operators deserve your patronage. It will be a great incentive for current operators to maintain healthy environmental practices, but will encourage more

Cozumel

operators to follow suit. When you go diving, one thing you mustn't forget is to apply sun-block lotion, lest you'll catch those strong rays while on board and turn into a lobster by dinner time. But be sure to choose a biodegradable, oil-free brand, as the residue of regular makes can very hazardous to the coral's preservation.

A few extra dollars can go a long way to keeping the reefs healthy.

During the dive

Once you dip those fins in that clear-blue sea, you'll drift right down to the bottom, avoiding the stronger surface currents. That is when you will need to make sure to maintain good buoyancy control, and avoid contact with corals and other marine life. Try and keep an average of five meters (15ft) distance, and you'll still be able to see a lot. Touching the reef might damage it, and, depending what you get in touch with, yourself as well. Resist the urge to feed the



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fishes, and make sure all your dive gear is securely attached and not dangling behind you. Needless to say, don't go swimming through reef caves, avoid stirring sand and never stand, rest or hold on the reef. That is why the use of gloves and knives is strictly forbidden.

During surface intervals

While you swap through those great photos you and your dive mates took, try and have a chat about your performance during the dive and ways to improve it. After all, practice makes perfect.

After the dive

Make sure to thank your dive guide for enforcing sound preservation practices. Before you step on dry land, don't forget to contribute to the crew's tip, which will always help the cause. While shopping, refuse to purchase any souvenirs made from coral or other

Big grouper checks out awestruck diver

SPACE INVADERS

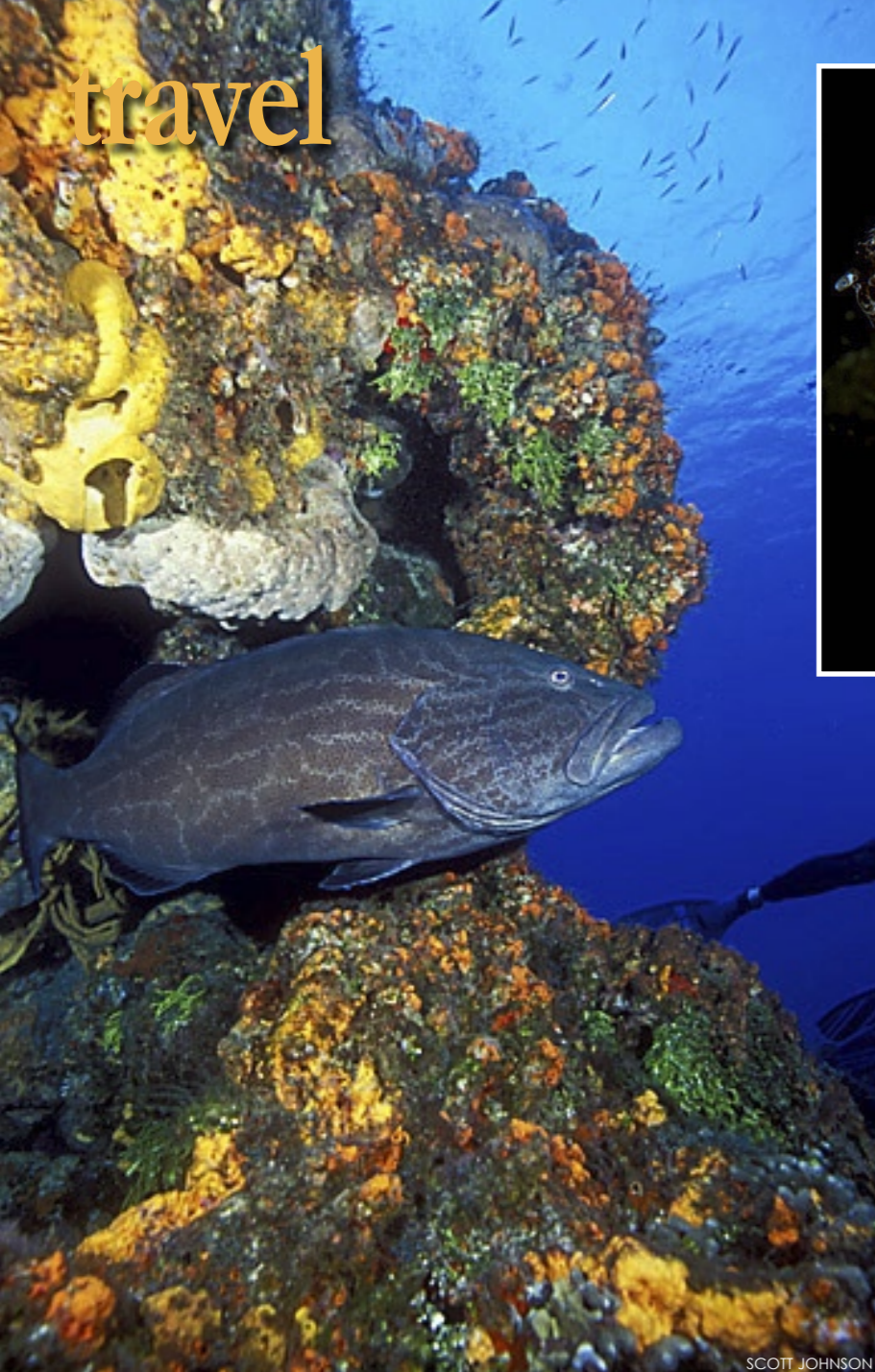
Lionfish are invading the reef and creating havoc among the local fish population.

Lionfish, originally from the Pacific Ocean, are an aggressive species that usually take charge of the coral where they settle around. In Cozumel, these foreign animals have no natural predators, and are laying waste to what is easy prey for them: the local fishes.

By the time we left Cozumel, our dive operator alone captured three different specimens. There is a rising concern for both the maintenance of the marine fauna and the safety of divers, unaccustomed with the hazards involved.

The lionfish's dorsal spines, loaded with venom, are normally used as a defense mechanism. Although not "ordinarily" fatal for humans, the sting of a lionfish is extremely painful and can cause everything from headaches to vomiting and even breathing difficulties. If you are a scuba diver and you spot one while diving off Cozumel, be very careful, do not try to touch it or capture it. It is a better idea to call on the attention of your divemaster and have them immediately contact the marine park authorities, so that it can be captured.

Here is a NOAA – sponsored documentary about capturing these misguided creatures: It describes the steps taken to study this phenomena and guidelines for the general public on what to do if you spot on.



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Large grouper hides under a ledge; Diver and giant sponge (right)

the south side, are part of a national preserve since 1996. Tourism is the main engine that keeps the economy of the island afloat, but it is also the major threat to its preservation. Receiving around 1,500 visitors per a day, Cozumel needs everyone's cooperation in order to maintain its reefs healthy. Below are a few tips for you to show how responsible a diver you are and promote sustainable use of the reefs.

Dive preparation —choosing your operator

There are many dive operators in Cozumel, and a great deal of them officially contribute to reef conservation programs by way of providing thorough orientation lectures to their clients and making sure that they follow the rules. They



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marine life. Never eat in establishments that won't keep endangered or fragile marine life species off their menus.

Currents Ahoy!

Cozumel diving requires good buoyancy control, as all spots will have moderate to strong currents. Drift diving is a skill that you definitely want to have before wetting your fins. Therefore, it is strongly advised to either hone your abilities or invest in a short diving specialty course at home before taking off to Mexico.

I speak from experience. I was there with my girlfriend, and she is somewhat a novice, although quite capable. But she

LEFT TO RIGHT: Luscious nob of healthy corals and anemone; Gray angelfish plucks coral; A Coney grouper sports its spots and stripes

was not ready to sink beneath the waves fast enough (and within safety ranges, of course) to follow the guided group. We ended up drifting away, some ten meters (30ft) below the surface and—as the currents are stronger at shallow depths—we soon were separated so far apart that I had to call the dive and go back up.

What followed you can well imagine: I had to call the circling boat to pick us up, lost one precious dive (that's a lot if one considers that we were only there a week) and

she gave me hell about it—like it was my fault? It was indeed a tough call to make, as we saw, from above the waves, several nurse sharks swimming by. It would have been a great dive, no doubt. But safety comes first, so we decided to take a personal guide next time around until she could acclimatize herself. If you have to do that on site, it can get a tad expensive.

It goes without saying that I went diving by myself most of the time, and I would have liked to share those precious moments with her. Therefore, whatever your dive certifications are, if you are diving with a friend or significant other, remember that your buddy should have the same skills as you do. If any of you are not comfortable with drift diving, try and fix that beforehand.

Topside attractions

Visit the ruins of Cozumel and make the Indiana Jones in you a happy camper.

Cozumel Island, like the coastal Quintana Roo area, has a few archeological sites that will interest those with a weakness for the ancient world. Visiting tourists have a choice of ruins and sites that are unique to the island such as La Palma—an 800-year-old Maya ruin—and Castillo Real—an inspiring 1200-year-old ruin overlooking the Caribbean Sea, El Cedral and San Gervasio. Their availability and current restoration efforts provide an important understanding of the ancient history and culture of the



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Cozumel

island.

In town, beside the main church, is an Hispanic relic. There is also the Museo de la Isla Cozumel (Cozumel's Island Museum), located near the city's ferry docks. It's a nice tour to do between meals and the mandatory knick-knack shopping at local tiendas (Cinco Soles is a must, if you are shopaholically inclined—just have an intervention team prepared).

The museum displays the island's range of endangered species, ancient and modern topographical references (Mayan pilgrimage, Spanish conquest, Pirate's den and Social revolutions theatre) as well as artifacts that are relevant to the island's culture, namely pre-Colombian and Spanish colonial and nautical pieces (cutlasses and cannons available). The terrace has a simple yet honest restaurant offering a lovely scenic view. Find it at Avenida Rafael Melgar at Calle 6 Norte, San Miguel.

El Cedral is widely advertised as being the oldest Mayan structure. It still bears a few traces of paint and stucco applied by the original Mayan artisans. However, there is little archaeological evidence left these days, mainly because the conquistadors destroyed much of the original temple structure.

By the turn of the last century, the site was uninhabited, suffering from the elements—the worst event being hurricane Wilma in 2005, which tore much of the

structure down. Whatever remained of the original structure was rebuilt after the storm.

There are other off-island tourist attractions on the Mayan Coast, just off the ferry boat.

Tulum (Tulum.com)

Tulum is one of Mexico's most well-known archaeological sites, primarily due to its location on top of a 12-meter-high cliff facing a spectacular ocean view. It was one of a series of Mayan towns, shrines, and forts established along the coast of the Yucatan Peninsula. Although considered to be a rather small enclosure when compared to other archeological sites,



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Tulum is still the largest fortified area on the Quintana Roo coast.

The name "Tulum", in local Maya dialect (there seems to be several variations), means "wall on the ground", and, in fact, the area is enclosed by a stone wall about three to five meters high and several meters thick. Within this wall lie some 60 well-preserved structures that are gems of Mayan history. The once obsidian-covered walls (obsidian is a black stone created from lava) gave birth to the City of Gold myth, as well as sealing the fate of many a greedy conqueror, not to mention the Mayans themselves.

Tulum's architecture is in fact a wonder of engineering. In specific days of the year marking the solstices, each building will channel the early morning sunrays through a window or hole on the wall of a given structure, and that will create a beam of light that will pinpoint agricultural milestones. To this



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Queen angelfish portrait (left); Playa Bonita enjoys a turquoise blue surf (above); Dive boat off to sea (inset)

day, the timing is quite precise.

Visitors will notice another peculiarity regarding the buildings in the area: each seems

beaches alone will make the trip well worth it.

Xel Ha (Xelha.com)

On the spot where the blue Caribbean waters meet the Yucatan Peninsula's underground rivers was created a natural water park, located right outside of Playa del Carmen. The park includes all the amenities of a family day outing with the natural beauty of a protected habitat for regional marine life, offering great snorkeling, hiking, and exploring of the two local "cenotes" (freshwater sink-holes).



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to be slightly eschewed, as if leaning a bit to one side. That was also done on purpose, as the area was (and is) regularly hit by ocean storms and hurricanes (well known by their devastating effects over the Caribbean Islands). The idea was to build an aerodynamical structure that would hold fast and not be blown away—clever folk, the Mayans.

If nothing else, a visit to the nearby

Chichén Itzá (Chichenitza.com)

The ancient city of Chichén Itzá was, at its height between 800 and 1200 A.D., the political, religious and military center of Yucatán, and a veritable seat of power



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in the southeastern Meso America region.

A close look at the buildings can show a gradual change in architectural style, starting from the Puuc and culminating with the so-called Mayan Toltec style, given its similarities with those found in Tula—the ancient capital of the Toltecs—and with other sites in central Mexico, such as Oaxaca and the Gulf Coast. Chichén Itzá was a large city and well-populated with citizens distributed around the area. They had relatively easy access to water coming from various caves (Cenotes) of the region.

Located about three hours south of Cancun, this site went under massive



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restoration in 1923, but still has enough uncovered mounds to ensure exploration efforts over the next few decades. To date, more than 18 structures have been excavated and restored, although their usage is still a mystery. Archeologists today can only hypothesize from the evidence uncovered. ■

Cozumel

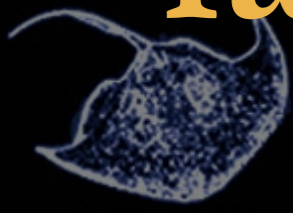


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TOP TO BOTTOM:
Ruins at Tulum;
Temple of the Frescos at Tulum (left)



fact file



Mexico



SOURCE: CIA.GOV WORLD FACTBOOK

History Cozumel is a well known tourist destination. It is an island located in the state of Quintana Roo, Mexico. It is famed for its sandy beaches, clear water seas and the Palancar Coral Reef National Park (established in 1996). Eons ago, Cozumel was an entirely different place. The island was a sacred area, inhabited by the Mayan people, long before it was visited by Spanish explorer Fernández de Córdoba (1517) and later by infamous (and bloodthirsty) conquistador Hernán Cortes (1519), who was responsible for the subsequent decimation of the local indigenous people. Later on, the area was repopulated and suffered through wars with the French and an even bloodier civil war, until it was "discovered" again by French explorer Jacques Yves Cousteau. While it became a favored scuba diving destination, the island was not extensively developed for tourism until the 1960s. Today, it is also a popular cruise and tourist destination.

Geography The island of Cozumel is found on the Mesoamerican Reef (also known as "Sistema Arrecifal Mesoamericano" in Spanish)—the largest reef system of the Americas, extending nearly 1000 kilometers and located at the Easter tip of the Yucatán Peninsula. The island was formed

by coralline limestone rock and sandy soils, being today the largest inhabited island in Mexico and the Caribbean's premier dive spot. With c.190 sq mi (490 sq km), the island is 48km (30 miles) long from north to south but only 16km (10 miles) wide from east to west. On either side, beaches form a long, white sandy coast washed by gentle waves and transparent waters on its western board, while huge waves crash against the eastern side.

Climate The average daily air temperature on Cozumel is 80°F (27°C). In July-August, the highs range from the upper 80s to the low 90s. (32°C). In December and January, the daytime temperatures average in the mid-70s. (24°C). Winter months: Cold fronts may create windy, cloudy and cooler weather. Afternoon thunderstorms are common, usually lasting for an hour. Water temperatures range from 77°-82°F (25°-28°C) throughout the year.

Environment Hurricane season — Cozumel suffered extensive

damage from tropical storms, the latest being in 2005, affecting the economy, public safety, archeological site integrity, the marine reef and the tourism trade. The island keeps bouncing right back, although not without a constant upkeep of its natural and cultural resources.

The island was struck directly by two category four hurricanes during the 2005 Atlantic hurricane season. First to arrive was Hurricane Emily in July. Despite it being a powerful storm, it was the slower moving Hurricane Wilma that caused the most destruction when it hit the island in October.

More significant—and virtually impossible to humanly repair—was the damage to the underwa-

ter marine life. This included both the coral reefs, which suffered particularly at the shallower dive sites, and the fish that inhabit the reefs.

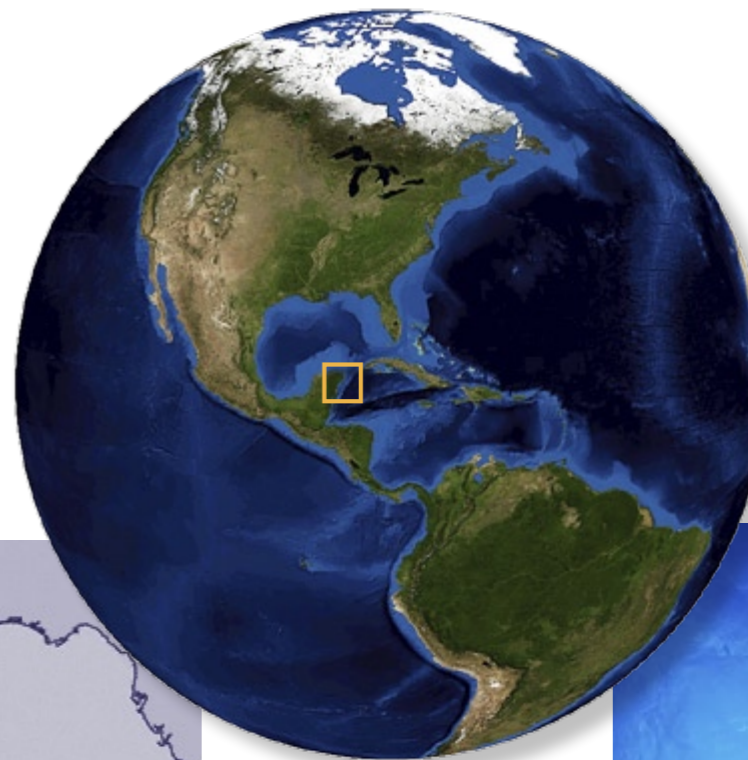
In short, if you decide to be a daring spirit and take the gamble to travel to Coz during hurricane season—that's between June 1 and late October, early November—it pays to visit this webpage: www.cozumelinsider.com/Hurricane. It contains several tips and sound advice for weathering down those storms, just in case.

If the goal is to chomp up some cheap rates, going for potentially sizable discounts offered in this period, it is much better to pick offerings during the official off-

RIGHT: Location of Cozumel Island on global map

BELOW: Location of Cozumel Island on map of Mexico

FAR RIGHT: Diver investigates giant sponge formations on reef wall



season period, from October to December when the weather is not too hot and the chance for a late-arrival storm is unlikely.

Ecology The Conservation Management and Environmental Education effort—established by social programs, parks, museums and community commitment—helps preserve Cozumel's rich eco-heritage to the direct benefit of their population. Founding and monitoring research projects about prioritized species and ecosystems are also a priority.

Among the existing programs, there is the Punta Sur Turtle Camp. It includes 8km of beach for marine turtle nesting with activities in the field that mark the nests, follow the process of incubation, liberation of young hatchings, and the introspection of every brood for the management of statistical data. During the nesting season, student and community

groups are allowed to watch the nighttime emergence process of the hatchings.

The Crocodile Conservation Program conducts periodic specimen capture and tagging, as well as morphology measurement data and sex gathering, a census and observation of the population conditions maintained in the Colombia Lagoon Reserve.



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Bird nesting and conservation activities are also performed in order to keep data regarding reproduction and animal general condition in the island.

A permanent fauna and reptile management program works side by side with educational programs distributed among different social groups. They concern solid waste management, proper use of water, different ecosystems on the island and their interaction.





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CLOCKWISE FROM TOP LEFT: Ruins at Tulum; Silhouette of sculpture of divers and corals on Cozumel; Detail of sculpture; Sunset at Playa Bonita

Cozumel

in Cozumel, it is no different), but that's not enough. Be very careful when eating buffet style food (especially at all-inclusive resorts)—make sure you eat the food as soon as it is served on the steam tables. It's very easy to get food poisoning from these buffets because they are not kept at the right temperatures and spoil very quickly. Some places will also mix leftover foods with fresh made foods. Bottled water is an

absolute must, even for brushing your teeth. It is also suggested that you eat at restaurants that use bottled water to prepare their food, as well as purified water used in their ice cubes. Bring your own stomach meds just in case.

Hospitals

Cozumel Medical Center, Calle 1 Sur 52 987 872 94 00 English spoken www.centromedicodecozumel.com

Clinica San Miguel Calle 6 Norte, tel. 52 987 872 01 03

Hyperbaric Chamber

Buceo Medico Mexicano Cozumel Recompression Center Calle 5 Sur; tel. 52 987 2 1430

Websites

Tourism Mexico www.visitmexico.com

Tourism Cozumel www.islacozumel.com.mx ■



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Credit cards Most establishments such as restaurants, hotels and rentals will accept most credit cards. Stores will sometimes charge a higher rate for credit card purchases.

Traveler's checks Most tour operators, hotels and restaurants will take traveler's checks, but make sure that your signature is exactly the same on each when signing. Otherwise, you will have a hard time—a legal form of ID will always be required.

ATMs There are a few ATM machines available at banks downtown, but they will only give out money in local pesos.

Exchange Your local bank branch may be found in Cozumel, probably at the airport, in hotels, banks or exchange booths. You'll get the best exchange rates at the banks, but it's not as convenient since you need to find one first. The exchange booths around town tend to have competitive

exchange rates, and that can be to your advantage. Hotels generally have the worst exchange rates. For currencies other than USD, exchange rates tend to be lower than expected.

Health Issues Good news: the CDC Travel Health Warning for Novel H1N1 Flu in Mexico has been removed as of 19 March 2010. However, as Montezuma won't let go of his infamous curse, everyone knows that you "don't drink the water in Mexico" (and

nowhere else in the world.

The waters surrounding the island have an astounding 40- to 50-meter visibility (120-150ft).

Cozumel also has some of the biggest and most spec-

tacular sponge formations in the world, such as the Elephant Ear sponge that can grow as large as four meters (12ft) across. Other sponges, like the Barrel sponge, gain considerable size as well.

On the surface, Cozumel has a number of unusual features and include certain endemic species, such as the dwarf raccoon (*procyon pygmaeus*) and the Cozumel wren (*nasua nelsoni*) Migratory birds, that gave

the island its Mayan name, also rely heavily on the richly productive feeding grounds of the reef, which supports populations of magnificent frigate birds, brown pelicans, olive cormorants, and many others. The prehistoric iguana—the island's ancient guardian—and the crocodile are the state's largest lizards, and there are a host of amphibians. Tree frogs are particularly colorful; their bright hues are a warning to predators.

Currency Mexican Peso (MXN). The U.S. dollar is widely accepted in Cancun and Cozumel, mainly in tourist and hotel areas.

Shopping When should you use dollars or pesos? When purchasing inexpensive items (i.e. at the grocery store), you'll be better off paying in pesos. Otherwise, a higher exchange rate may be used to calculate your bill. Large USD denominations (50 and 100 dollar bills) may be hard to exchange outside of banks.



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Biodiversity Crystal-clear water and an incredibly diverse marine life makes Cozumel's reefs an unforgettable underwater experience. As many as 250 different species of fish can be seen in Cozumel's waters; one of the most spectacular is the Queen Angelfish, possessing bright blue-and-yellow markings and the distinctive blue "crown" on the top of the head. You can even catch a glimpse of the Toad fish found

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ON BOLD LINKS**

Equipment

Bodylicious

Shewee Go



The Shewee Go is a urinating device for active sports-women, which may be worn for all adventure sports pursuits and is also suitable for medical applications. Its unique design allows women the comfort and freedom of urinating on the go with ease. Shewee Go is worn like a g-string or thong and is fitted inside tight fitting elasticised shorts for comfort and privacy. Held in position with three adjustable and flexible straps, the soft rubber Shewee Go seals comfortably in place outside the body.

Customdivers.com

Frog plus

Cressi's new fin has been created for those who are trying scuba diving for the first time or who dive occasionally and want to perform long kicks and dives without any specific training. The shoe pocket is positioned under the blade, a system that is now used by Cressi on all its models to guarantee a larger and more uniform surface area of the blade. The shoe pocket, made from soft elastomers, is extraordinarily comfortable, making the fin easy to put on and take off, even in the water, a remarkable feature, capable of helping the diver in any situation.

cressi.com



Short Deluxe Harness

The Short Deluxe Harness is a comfortable, streamlined harness designed for women or any diver who is smaller in stature. Using only eight feet of webbing versus the standard 11, this version of the Deluxe Harness is better suited for divers of shorter or leaner build. Special two-inch, low-profile D-rings are smaller in order to give a more proportional fit, yet they are still easy to access and use. Swivel points on the shoulder straps ensure a comfortable fit, which is especially important for women due to the bust line.

diverite.com

Definition

Subgear re-defines Definition wetsuits, making them more protective and better looking than ever. And they continue to be one of the most technical, feature-rich wetsuits on the market, no matter what you compare them to. Definition suits truly define what a diving suit should be.

[More info](#)



Oceanic Veo

The Oceanic VEO 3.0 continues Oceanic's tradition of designing rugged, feature-rich personal dive computers that are intuitively easy to use and reasonably priced. Featuring Oceanic's exclusive Dual Algorithm, 2-Nitrox Mix Compatibility, Audible Alarms, 3-Button Interface with settings "Step Back", and so much more. All in a strong, lightweight "hockey-puck" module for your wrist or console.

oceanicworldwide.com





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www.DIVEGEAREXPRESS.com

Waterproof Silicone seals

These new silicone seals are deemed to replace the latex seals currently in wide use in drysuits. Not only do they have a superior tear resistance, but the hypoallergenic medical grade silicone produces no latex allergy. It is considerably more stretchy than latex, and therefore, easier to don and duff and comfortable to wear. Silicon also has a higher resistance to UV-radiation, ozone and chemicals than latex does. These seals are compatible with most common wrist ring systems and drysuits and are easily replaced.

www.waterproof.se



MB Sub

The X1-VB allows an incredible signaling effect with the full-focused light beam with 17.500 lux. Just turning the front by half a turn generates a really good illumination with a beam of 25 degrees.



The fixed-focus version X1-FF is also an excellent backup lamp. This version uses only the extreme narrow beam of 3 degrees, which allows signaling in very poor visibility. The X1-FF has a brightness of 21-000 lux. The X1 family is designed with a modular system with two different battery containers, one for three AA cells and one for three C cells. All components are interchangeable. mb-sub.com

Backplate fasteners

These stainless steel knurled M8 fasteners provide an easier fit and allow flush fitting when mounting backplates to twinning bands and may be preferred as an alternative to wing nuts or mushroom fittings. There is no more need to search around for your screw driver with these backplate fasteners. Available singly at GB£9.50 each, remember to order two off for use with twinning bands. Made from stainless steel. customdivers.com



XP10

New all round diving computer designed for divers who appreciate detailed, yet easily accessible information. It is truly a complete dive computer for all levels of adventure. It displays all important dive and decompression data plus full dive data memory. Nitrox settings between 21% and 50% in 1% increments. Full watch functions. Basic choice of adjustments without the need of a PC. Adjustable ppO₂ between 1.0 and 1.6bar. Data can be transmitted via infrared interface (IrDA) with Dive-Log software. Available in wrist or 3-gauge console. subgear.com



2ndSkin

Lighter, more comfortable, warmer and modular, the shorty is made of Metalite to create a water barrier for your second skin. In addition, the steamer is equipped with a back SilverSeal zip and zipped wrists and ankles to complete the concept. TIZIP silverseal. Dry and easy. Spine pad. Protection and comfort. Neck seal with zip. Perfect fit. mares.com



EZ Solenoid Inline Shutoff

Brainchild of rebreather diver and instructor, Gregg Stanton, the EZ Inline Solenoid Shut-off gives control to the rebreather diver dealing with ascents and troubleshooting. Located near the manual addition valve, it also allows for easy connection of an off-board oxygen source. Only one hose leaves the oxygen cylinder and plugs into the manifold mounted to the oxygen addition. diverite.com

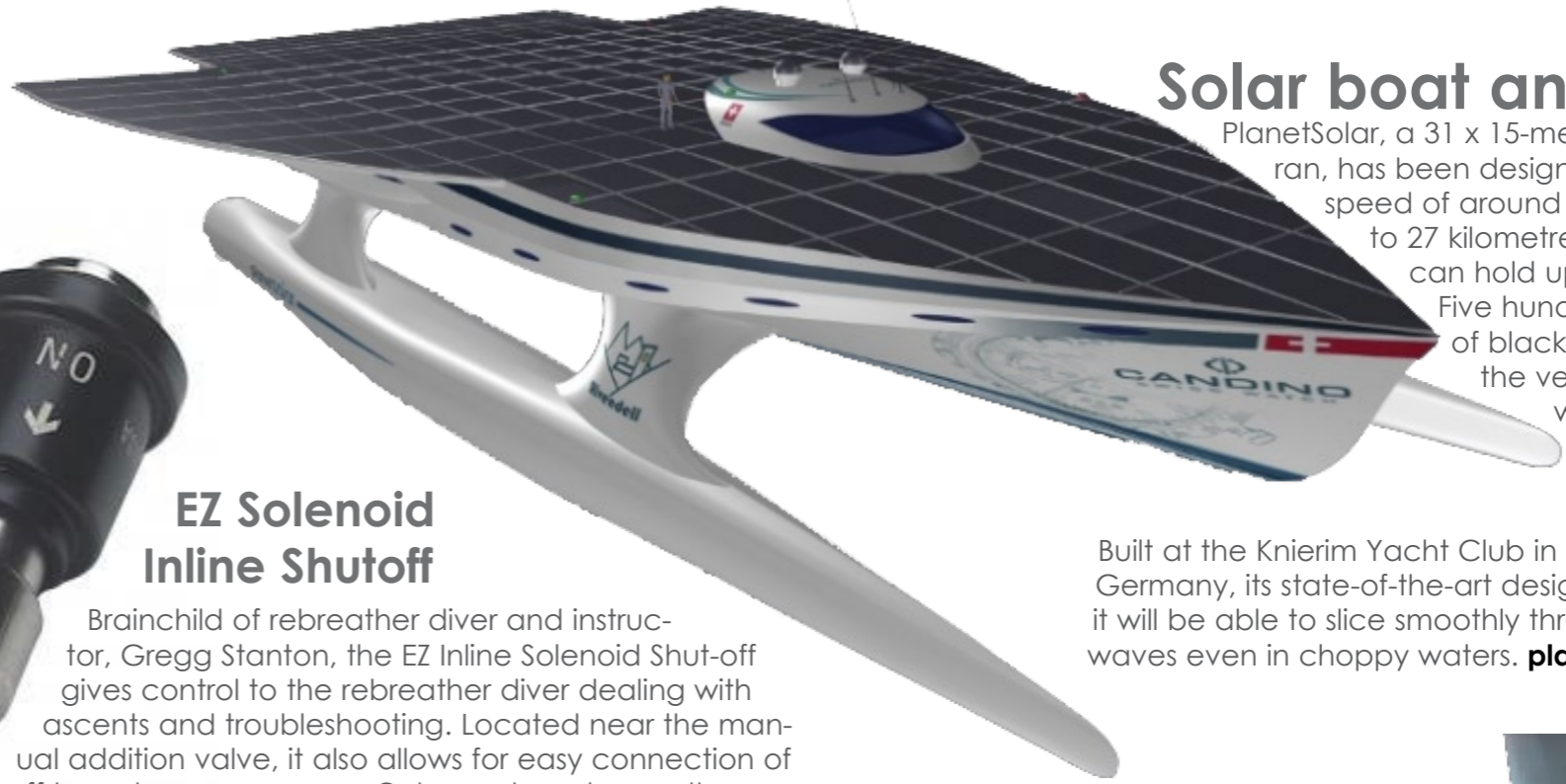
Hollis Sidemount Harness

The Hollis SMS100 system will be shipping by the end of April. Hollis calls this a "complete sidemount system" because it includes not only a kit for the harness, but a kit for the primary regulator system and deco system as well. All the regs, hoses, clips and such are included in the kits. The harness is prestrung and ready to dive out of the bag. Much easier for beginners, transitioning divers and, of course, the techies to understand. Pricing is still pending. www.hollisgear.com



Solar boat anyone?

PlanetSolar, a 31 x 15-metre white catamaran, has been designed to reach a top speed of around 15 knots, equivalent to 27 kilometres per hour, and can hold up to 50 passengers. Five hundred square metres of black solar panels top the vessel, with a bright white cockpit sticking up in the centre.



Built at the Knierim Yacht Club in Kiel in northern Germany, its state-of-the-art design also means it will be able to slice smoothly through the waves even in choppy waters. planetsolar.org

O'Three heat packs

A truly controllable heat source. The HUV's outstanding feature is the innovative combination switch. This compact unit enables the user to be in total control of not just the power supply, but one's direct feed as well. With today's techniques, it is not unusual for run times to exceed 120 minutes, and in the extreme, 500 minutes and more. Combine this with the variation between the heat that can be experienced whilst kitting up and waiting around at the surface, to those chilling temperatures endured at depth, finished off by long hangs just as fatigue is truly taking hold—it's a tall order to say the least to produce an under-suit that has the ability to cover all bases. During these types of exhausting dives, our bodies are at the edge, especially during the last third. HUV has been specifically designed to give you the ability to apply heat at any time throughout your dive. othree.co.uk





D-Synchro

The D-Synchro is SeacSubs top-of-the-line regulator that unites top performance with sturdy reliability. The first stage in forged brass allows excellent positioning of the hoses. The compact second stage is lightweight to guarantee efficiency and excellent hydro-dynamics for cold water diving under 10°C. The first stage is made in forged brass with shiny chrome finish and the second stage is manufactured in ultralight technopolymers. Has two high pressure ports and four low pressure outlets, two of which are inclined at 30°. seacsub.com

Recore Recycled

The Gul Surf Company of Cornwall UK has a new line of surfing-oriented wetsuits that divers may wish to take notice of. The RECORE recycled polyester Bamboo Thermospan Environmental Wetsuit line features an inner liner of fast wicking thermal fibres to keep skin dry and warm. In an eco-logically friendly 3mm non-petroleum-based super stretch neoprene, the suit is blind stitched to create a 100 percent water seal with chest entry and seam-free shoulders. G-lock wrist and ankle seals reduce cold water flush. The suit is finished with YKK zip with metal puller and Powertex knees for flexibility and durability. gul.com



Sport Sub

The SportSub is the culmination of over 20 years of product refinement. Hailed by its inventor as the world's most sophisticated and practical submersible technology for recreational, commercial, and shallow water industrial operations. Keeping the operator at ambient pressure, the air pocket in the cockpit is regulated so that it never shrinks or expands, keeping buoyancy precisely controlled. With two thrusters and a fly by the wire joystick, the sub-mariner pilot is treated to up to one hour at a maximum depth of 30 feet. www.ivccorp.com



PROPULSION

Materials science at the service of a fin.

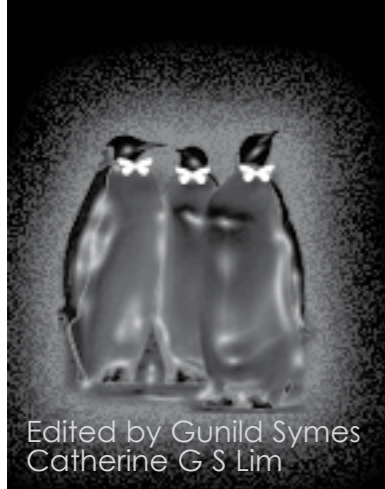
- The blade allows perfect performance/force compromise.
- The fluid dynamic channels collect, contain, and channel water with no dispersion.
- The ample shoe offers the right comfort and support.



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www.seacsub.com



Edited by Gunild Symes
Catherine G S Lim

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POINT & CLICK
ON BOLD LINKS



Sea Glass *Recycling Ocean Gems*



Jessica Lee

The subtle beauty of this necklace belies the creative energies behind its creation. Handcrafted by Oregon artist Jessica Lee, this piece showcases seven sea glass stones weathered by the forces of nature. They are encased in sterling silver, and held together by a sterling clasp adorned with semi-precious stones. Adjustable from 16 to 17.5 inches, this necklace is exquisitely designed for earth-loving individuals. Price: US\$90.00. www.greensceneshop.com

Sea glass has become very popular as a component in jewelry, chimes, sun catchers and ornaments. Tumbled by the ocean waves, sea glass comes from tossed bottles and jars that have found their way to the sea. The sand and surf softens the edges of the broken glass as it tumbles in the waves creating smooth, frosty pieces of sea glass, or beach glass.

Green, clear, and brown are the most common colors of sea glass, but other colors from pink to red to amber to blue are rare finds, since most of the glass bottles produced since the early 1900's were of the three common colors. Although it can be found world wide, sea glass is becoming more rare as beach combers around the world have been hunting for sea glass, often for their entire lifetimes. Sea glass has been further reduced by the introduction of plastic bottles and glass recycling, so less glass has found its way to the ocean as trash. But the touch of the sea still leaves gems for us to find. Another way to reduce, reuse, and recycle, sea glass jewelry and decor has become something we can enjoy that's good for the environment. SOURCE: SEAGLASSJEWELRYDESIGNS.COM

Spirit of the Sea

Imagine wearing this delicately designed bracelet on your wrist. The light tones give it an airy feel, so it easily complements any outfit or beachwear. The single red gem (you won't believe it's actually sea glass!) stand out amidst the line of seven icy white sea glass stones fitted in sterling silver. Framed by real freshwater pearls and glass beads, this 8.5 inch cuff bracelet comes without any sharp edges. The company gets their sea glass from the East Coast of North America, Bermuda, the Caribbean and Puerto Rico. Price: US\$295.00. www.spiritoftheseaglassjewelry.com

Sea Glass Jewelry Designs

Vermont artist, Jennifer Wagner has been collecting sea glass for six years along the beaches of the Californian coast. She creates jewelry from genuine surf-tumbled sea glass, which she has gathered. The artists also creates sun catchers and ornaments. Aqua Mix Earrings shown above come from her Bent Collection. See more styles: Seaglassjewelrydesigns.com



West Coast Sea Glass

Genuine sea glass jewelry created by serious sea glass hunters and trained jewelry artists of the U.S. Pacific Northwest, Mary Beth and Lindsay. Emerald Green and Aqua Blue Earrings and Pendant (above) have short stacks of aqua and limey green sea glass hanging on sterling silver earwires and feature a bright pewter sea star. Pendant on 16" sterling chain. Price: US\$74.00 www.westcoastseaglass.net Key Lime Ring (left) sports a delicious "limey-est" of gems from England's North Sea. It is a sea glass hunter's dream! It's about 5/8" long and set in .925 sterling silver. Size 6.5. Price: US\$142.00 www.westcoastseaglass.net





Sea Glass



Sea Sapphire Collection

Gina Cowen designs and creates hand-drilled pieces of sea-glass in pale aqua blues make up this necklace crafted by UK artisan Gina Cowen. Spaced with toning frosted glass beads and finished with hand-beaten silver clasps. Cowen has specialised in jewellery from sea-glass because of the beauty in these simple, tide-tossed luminous pebbles of colour. Her earliest pieces were inspired by glass picked up on a small stretch of shingle near Cape Town. she now has glass from around the world. Some she collects, some are sent by friends. Prices from GB£300.00. The earrings (right) are created with hand-forged and filed, swan-hoop silver or 18ct gold fittings with single, double or triple drops of sea-glass. Prices from GB£60.00. www.seaglass.co.uk



Ultra Rare Red Orange Pair

EndoDay Sea Glass in Sterling Bezel® earrings created by self-taught wire jewelry maker, Linda Jereb of Florida, feature bright red orange sea glass. One must search hundreds of pairs to find a match of this calibre and of such a rare, valuable color in very old antique sea glass from the coast of England. According to the artist, it is called End of Day glass, or slag glass, and comes from a site in England where a Victorian-era glass company tossed scraps over the cliff at the end of the day. These pieces of sea glass are a once in a lifetime find for a sea glass enthusiast. Price: US\$400.00 www.bytheseajewelry.com



Sea Glass & Leather for Him

Sisters Jennifer Reed and Terri Reed-Boyer's business of sea glass jewellery originates from their passion for pairing sea-glass jewellery in sterling silver and 14k gold. This they do beautifully, utilising their knowledge gained from a college education in metalsmithing and art. Throughout their lives, they hold firm to this passion, integrating this into their family life. The sisters, from Pennsylvania, believe in using sea glass as it has been found on the beaches of Lake Erie, without any alteration or polishing. Above is a rustic braided tan leather necklace that any man would have no qualms wearing. The multi-coloured sea glass positioned on sterling silver show off the cool tones of brown, amber, aqua and clear beach glass. Available in various lengths of 17, 18 and 9 inches. Prices from US\$188.00-\$192.00. www.relishinc.com

Make a bold statement with this handcrafted leather necklace. Its centre-piece—a piece of brown beach glass backed in sterling silver—raises the wow factor without stealing attention from the wearer. Ending in a sterling silver clasp, the necklace comes in lengths from 16 to 20 inches. The brown beach glass will vary in shape, shade and size, so every piece is unique. Price: US\$70.00. www.relishinc.com



HL Sea Beach Glass Jewelry

With a simple yet handsome design, this illusion sea glass pendant works well for him or her. Professionally drilled and handcrafted with strong beading wire and sterling silver findings. Also available on leather string or sterling silver chain in various lengths. Price: US\$35.00 www.hlseabeachglassjewelry.com



For this number, beach glass of green, blue, brown, sea foam, red and clear colours show off your vibrant personality. Looking dynamic enough to leap off your finger, the beach glass nevertheless will stay put on the 8mm sterling silver ring. Price: US\$210.00. www.relishinc.com





Sea Glass



Dreamcatcher

Artisan Tina Lam of Ecstasea in Hong Kong has been collecting seaglass for almost ten years and started making sea glass jewelry two years ago. Hong Kong is one of the busiest Asian cities blessed with beaches, she said. "Visits to the beach are walking meditations for me. Seaglass found on these trips remind me of nature's amazing ability to turn humble glass shards into prized gems. I saw them as gifts from nature to those who love the sun, sea and beaches, because these are the elements that crafted them. I just add the simplest touches to bring out their best!" All Tina's seaglass components are genuine and personally hand-collected, never etched, tumbled or altered. The collection of these natural briolette shaped pastel seaglass drops spans years, and they compliment each other beautifully in this tranquil pendant with sterling silver dreamcatcher charm. Each drop measures 3/8 - 1/2 inch long, and the sterling silver bail is 3/8 inch. Price: US\$33.00. www.etsy.com



Sea Glass Bouquet

This beautiful sea-glass bouquet necklace by Katie Carrin of Berkeley, California, features a rare piece of orange sea glass from the North Sea of England, faceted carnelian gemstones and creamy white freshwater keishi pearls hanging from a sterling silver necklace. Each individual gemstone and pearl is hand-wrapped in sterling silver to create this unique flower bouquet centerpiece. Price: US\$350.00 www.katiecarrin.com



Sea Horse

This darling one of a kind genuine sea glass sea-horse (above) by Svetlana Rasuleva of Palmeras features teal colored sea glass wrapped by hand in sterling silver wire with sterling silver beads and white topaz gemstones. Pendant measure 8.5cm (3.3 inches) long. Comes with a sterling silver chain 70cm (27.5 inches) long with sterling silver clasp, adorned with white topaz micro faceted gemstone rondelles. Price: US\$240.00 www.etsy.com



Palmeras Sea Glass

Svetlana Rasuleva of Palmeras, an artist and collector of sea glass living in Mallorca (Balearic Islands), has been collecting and making sea glass jewelry for almost four years. "All my sea glass is genuine and hand-picked by me on the shores of the Balearic Islands of Spain. Each piece of sea glass jewelry

is inspired by the beauty, colors and nature of the Mediterranean and holds a unique history." One-of-a-kind, the Turkish Delight bracelet (above) is inspired by Turkish black coffee, Turkish delight sweets, caramel and turquoise gemstones. This beautiful bangle features sea glass in black (a very dark olive green), turquoise, brown, amber honey

and golden honey found on the beaches of the Balearic Islands. Wrapped by hand in sterling silver wire, the silver is given a vintage effect by being oxidized and finally polished. Length of the bangle with clasp is approximately 20cm (7.8 inches). The bracelet is rigid, having a resistant structure. Price: US\$270.00 www.etsy.com



The wave bracelet features a beautiful aqua color of sea glass that is slightly curved to fit perfectly snug on your wrist. Tina has complimented its wavy shape with a series of hammered sterling silver waves, giving a unique, dynamic character to this bracelet. The seaglass is drilled on each end and strung with dark brown leather straps and sterling silver toggle clasps. The bracelet is 7.5 inches long. The seaglass is 1 3/8 inches long by 5/8 inch at widest. Price: US\$21.00 www.etsy.com



Sea Glass



Beach Wedding Bridal Jewelry

This beautiful sea-glass bouquet necklace by Katie Carrin of Berkeley, California, features a frosty piece of white sea glass, faceted quartz crystal drop gemstones and creamy white freshwater keishi pearls hanging from a sterling silver necklace. Each individual gemstone and pearl is hand-wrapped in sterling silver to create this wedding bouquet pendant. Price: US\$165.00 katiecarrin.com



West Coast Sea Glass

Ocean tumbled sea glass hand set in sterling silver jewelry. The artists at West Coast Sea Glass beach comb each piece of naturally tumbled, vintage bottle glass themselves. Then they carefully set them in .925 sterling silver in their waterfront, metalsmith gallery. Seen here: Cornflower blue, antique medicine bottle glass set in a size 8 ring, US\$92.00. Dusty blue sea glass and freshwater pearl earrings, \$108.00. Rare, six piece bezel bracelet, \$420.00. Westcoastseaglass.net

Sea Glass Rarity

© 2006 West Coast Sea Glass



Orange



Red



Yellow



Turquoise



Pink



Black



Teal Green



Grey



UV Lime



Cornflower



Amethyst



Honey Amber



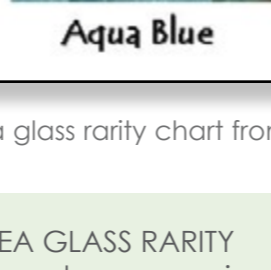
Cobalt Blue



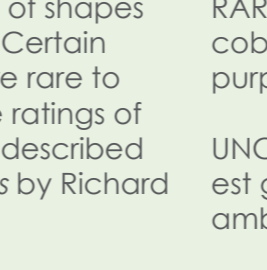
Olive Green



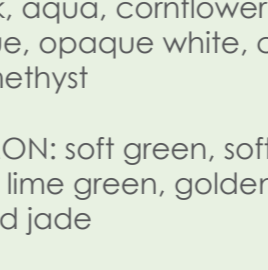
Aqua Blue



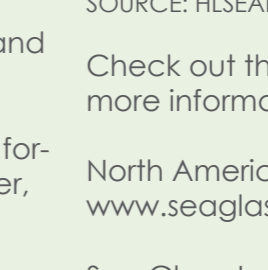
Seafoam Green



Emerald Green



Brown



White

Sea glass rarity chart from ultra rare to common (top to bottom) by Mary Beth Beuke of West Coast Sea Glass: www.westcoastseaglass.net

SEA GLASS RARITY

Sea glass comes in all sorts of shapes and sizes as well as colors. Certain colors of sea glass are more rare to find than others. Below are ratings of sea glass color by rarity as described in the book, *Pure Sea Glass* by Richard Lamotte:

EXTREMELY RARE: orange, red, turquoise, yellow, black, teal and gray

RARE: pink, aqua, cornflower blue, cobalt blue, opaque white, citron and purple amethyst

UNCOMMON: soft green, soft blue, forest green, lime green, golden amber, amber and jade

COMMON: kelly green, brown, clear white

SOURCE: HLSEABEACHGLASSJEWELRY.COM

Check out the following sources for more information about sea glass:

North American Sea Glass Association www.seaglassassociation.org

Sea Glass Journal www.seaglassjournal.com



Edited by Nick Bostic

Spring into Spring

Text by Nick Bostic

—A spring workout to get your business in shape for summer.

In the Northern Hemisphere, spring has begun. Spring brings about many connotations: cleaning, getting in shape and vacation. With our SCUBA business, this is a time to get our marketing cleaned up and in shape to maximize all opportunities.

Promote continuing education

Although this should be a very basic concept, I rarely see resorts or dive destinations promoting continuing education.

People are more likely to be interested in diving while they are actively diving, such as while on a trip.

Choose realistic continuing education experiences like

Advanced Open Water or a variety of specialties that can be completed during a vacation. This not only creates a better, more qualified diver, but also builds a bond between your operation and the diver that will result in long-term referrals.

Continuing education also creates more equipment sales. Deep diver specialty courses sell computers, night diver

Continuing education also creates more equipment sales

sells lights, wreck diver sells reels; be sure to optimize your equipment sales in cooperation with your classes.

Distinctive specialties

At DEMA 2009, NAUI was in the process of launching several distinctive specialties in conjunction with the Roddenberry Dive Team. PADI has a wide variety of distinctive specialties (www.padiinstructorinfo.com/2008/09/distinctive-specialties.html).

Distinctive specialties are an easy class to promote because they are unique to you. Even as a Master Instructor, I took Keller Laros' Manta Ray distinctive specialty in Kona, Hawaii, because it was not something I could get back home.

Every dive destination has something unique; take the time to develop a course around those unique attributes.

Typically, once a distinctive specialty is approved by a certification agency, it is relatively easy for any instructor with the outline and qualifications to become an instructor for the course.

This allows the entire staff of a dive center to become instructors quickly and easily.

Value added services

If you are in a destination location, pick the low-hanging fruit by utilizing value added services such as photographs and videos. By collecting a stock library of images or video, producing custom



This dive cartoon by Ralph Hagen, created for X-RAY MAG, is available on organic t-shirts at Cafepress.com/xraymag. Email us to get it customized for your shop: sales@xray-mag.com

imaging products for your visitors takes very little time. Stick to CD's and DVD's for your product, and your raw costs should be less than US\$2.00 per disk. If your divers had a good time with you, they will want to take home a memory of the experience. I have personally seen divers line up to buy an US\$80.00 hour video. Be sure to include your logos and contact information on the disk to promote your business when they share with friends and family.

Promote family programs or discounts

Divers that have readily available dive buddies are more likely to continue diving. Families that dive together can be excellent buddy groups, but cost can be a prohibitive barrier to entry for some. An all-inclusive Open Water course costing US\$300 becomes US\$1,200 for a family

of four. Try offering family discounts to encourage the whole family to become certified. Four divers instead of one enhance your chances of selling equipment, travel or continuing education.

Local offline promotion

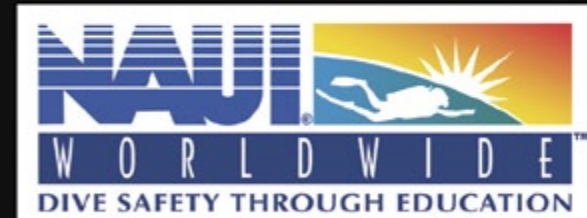
As appealing as online marketing can be, traditional offline marketing is still incredibly effective. Network with other adventure sports businesses (skateboarding, skiing, wind surfing, etc) in your area to cross-promote your activities. Offer Discover SCUBA type events in local newspapers or as fundraisers for charitable groups. Be active in your local community, both above and below water. By optimizing our marketing efforts now, we can have an excellent spring season and increase our revenues while serving our customers. ■

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Winged Wonders of the Canary Islands

Stingrays

Text and photos by Andy Murch



CLOCKWISE: A Marbled torpedo ray threatening to shock; The dramatic walls of Los Gigantes; Roughtail stingrays looking for scraps. A camouflaged; torpedo ray. PREVIOUS PAGE: Common stingray takes flight

Los Gigantes is a small fishing community on the west side of Tenerife in the Canary Islands. It is named for the enormous cliffs that dominate the shoreline to the north of the village, but the name is equally appropriate for the gigantic rays that frequent the area.

Twenty meters below the surface, the looming walls of volcanic rock terminate among boulders the size of holiday condos. Deeper still, the coral encrusted blocks give way to a featureless, lunar landscape of sparkling, slate gray sand.

At first sight, the aquatic desert appears to be devoid of life, but appearances can be deceiving. Under thin veils of sand, scores of subtly camou-



flagged rays and cryptically colored angel sharks lay dormant, waiting for divers to arrive with their tasty treats.

Rays started congregating here in 1996, when the owner of Los Gigantes Dive Centre had the bright idea of starting an organized stingray feed to attract more divers to the area. The rays responded with as much enthusiasm as the paying guests, and before long, enough animals had overcome



feature

A diver enjoys a close encounter with a fearless common stingray; Common stingrays playing tag (below)

their natural fear of bubble blowers for the feed to be pitched as a “guaranteed encounter”.

Unlike the ray experience at Stingray City in the Cayman Islands, the feed at Los Gigantes attracts many different species of rays including a few gargantuan roughtail stingrays that probably weigh upwards of 300lbs. The most abundant species in attendance are usually common and round stingrays, both of which can be seen circling the anchor chain as soon as the dive boat arrives. Other regular participants are common eagle rays that soar back and forth scooping up fish scraps as they drift

Stingrays



away from the chum barrel.

The feed itself is a seemingly haphazard affair. The feeder carries a large barrel filled with carcasses that have been donated by local seafood restaurants. Upon touchdown at 25m, he is immediately mobbed by ill-behaved rays of all shapes and sizes that employ a variety of meth-

ods to get at the scraps.

Some of the smaller rays try to work their entire bodies into the bait barrel, while their larger cousins use their bulk in an attempt to separate the barrel completely from the feeder's grasp. The ensuing battle of wits is an entertaining spectacle that can last for a good ten minutes

or more. Once the rays settle down, the feeder offers a handful of fish to any divers that want to play one-on-one with the rays, at which point the encounter fragments into a series of smaller tussles.

At the end of the dive, any scraps that are left in the barrel are unceremoniously dumped in





CLOCKWISE: Volcanic cliffs tower above the stingray feeding site; A gigantic two-meter wide rough-tail stingray; A (not so) common angel shark



Stingrays

explode from the seafloor faster than the hapless fish can register, then meld back into the sand again until another meal passes by.

Sadly, common angel sharks (*Squatina squatina*) are now anything but common. Their range once extended along the continental shelves of Europe and North Africa all the way from Norway to Mauritania including the Mediterranean and Black Seas.

Although there has never been a

a heap on the sand. The rays, which are obviously used to this eventuality, immediately bombard the pile of succulent fish carcasses from all directions until every last morsel has been consumed.

Once the feed degenerates into a free-for-all, the visibility generally plummets as well. Course grains of sand explode skyward covering rays, divers and cameras alike. Consequently, photographers wishing to capture good shots of the action should plan to get the majority of their images early on in the dive.

As chaotic as this encounter sounds, no one has ever been stung by a ray at Los Gigantes. However, there are also many marbled torpedo rays that frequent the area, and quite a few people have been shocked by dropping onto the sand directly over an angry, buried torpedo. Although torpedo rays can emit a painful electrical punch, the jolts have no lasting physical effect. If they have the chance they will also warn divers by lifting off the sand and arching their backs. If you see this odd behavior, try to quickly back away.

Sharks

Rays may abound at Los Gigantes, but shark encounters are few and far between. Although there are not many reef sharks, the area is home to a healthy population of common angel sharks that occasionally venture into the fray.

Between organized feeds, they can sometimes be found lurking under the sand in the immediate vicinity.

Angel sharks are flattened ambush predators that lay motionless on the substrate waiting for small fishes to swim close to their mouths. Once a suitable victim strays within striking distance, they

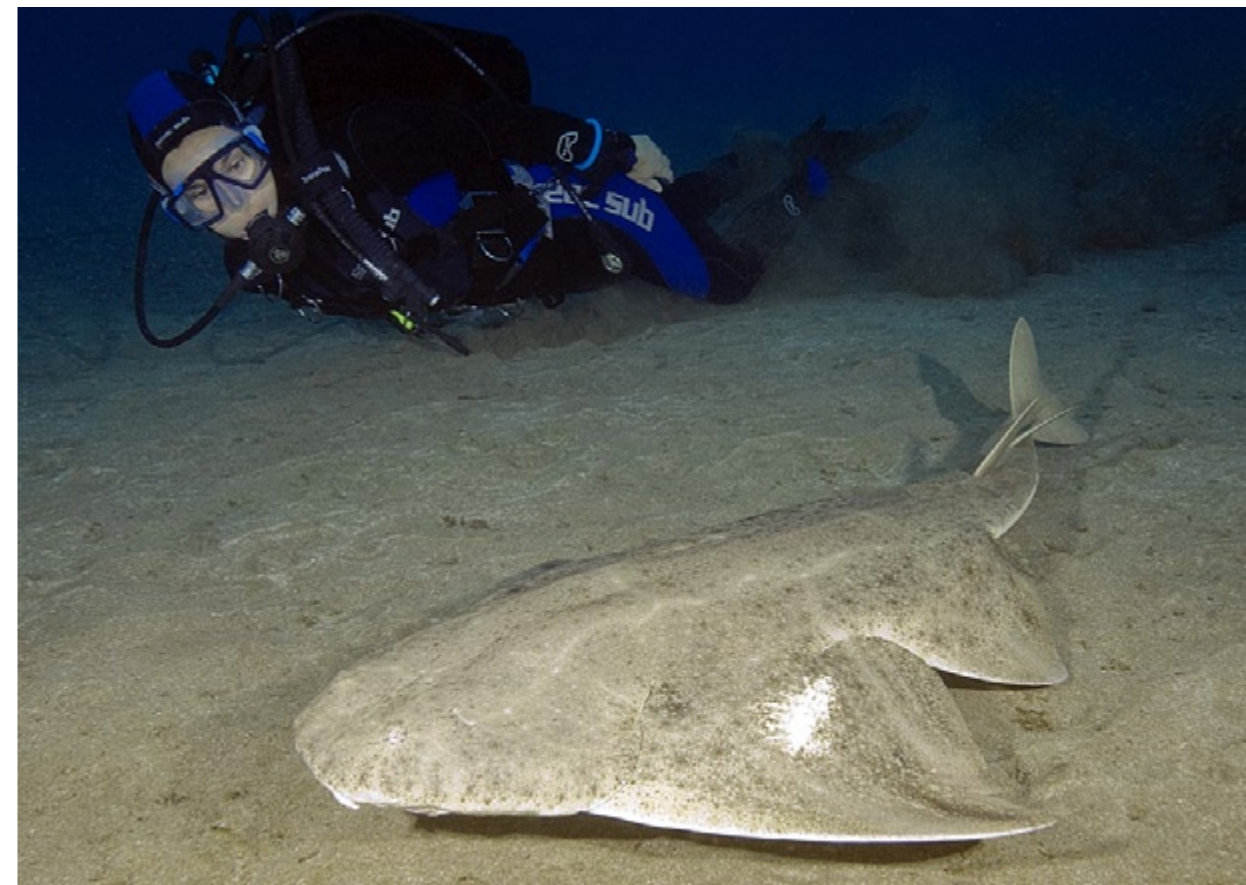
large targeted fishery for common angel sharks, their sedate, bottom dwelling nature leaves them extremely vulnerable to accidental capture in bottom trawl fisheries. Except for the healthy population around the Canaries, common angel sharks are now rarely encountered.





Stingrays

CLOCKWISE FROM TOP LEFT: An exquisitely patterned spiny butterfly ray; A lucky diver shadows an angel shark; Angel sharks are now commercially extinct in the North Sea; Spiny butterfly ray is well-camouflaged to blend in with the texture of the sandy sea floor



exquisitely patterned pectoral fins is an experience not soon forgotten.

Although the demand is great, the dive centre purposely limits the feeds to one per week in order to stop the animals becoming reliant on scraps. Fortunately, the area has a lot more to offer divers. Octos, morays and a myriad of fishes inhabit every nook and cranny, but the rays of Los Gigantes remain the star attraction. ■

In fact, they are considered to be locally extinct in much of the North Sea.

Other random elasmobranchs that occasionally stop by include large bull rays and (very rarely) a distantly passing hammerhead or two.

Perhaps the most beautiful visitors are the spiny butterfly rays, which take on the appearance of flying Persian carpets when they alight from their sandy hiding places and glide miraculously over the seafloor. Following a graceful butterfly ray as it wafts along slowly undulating its



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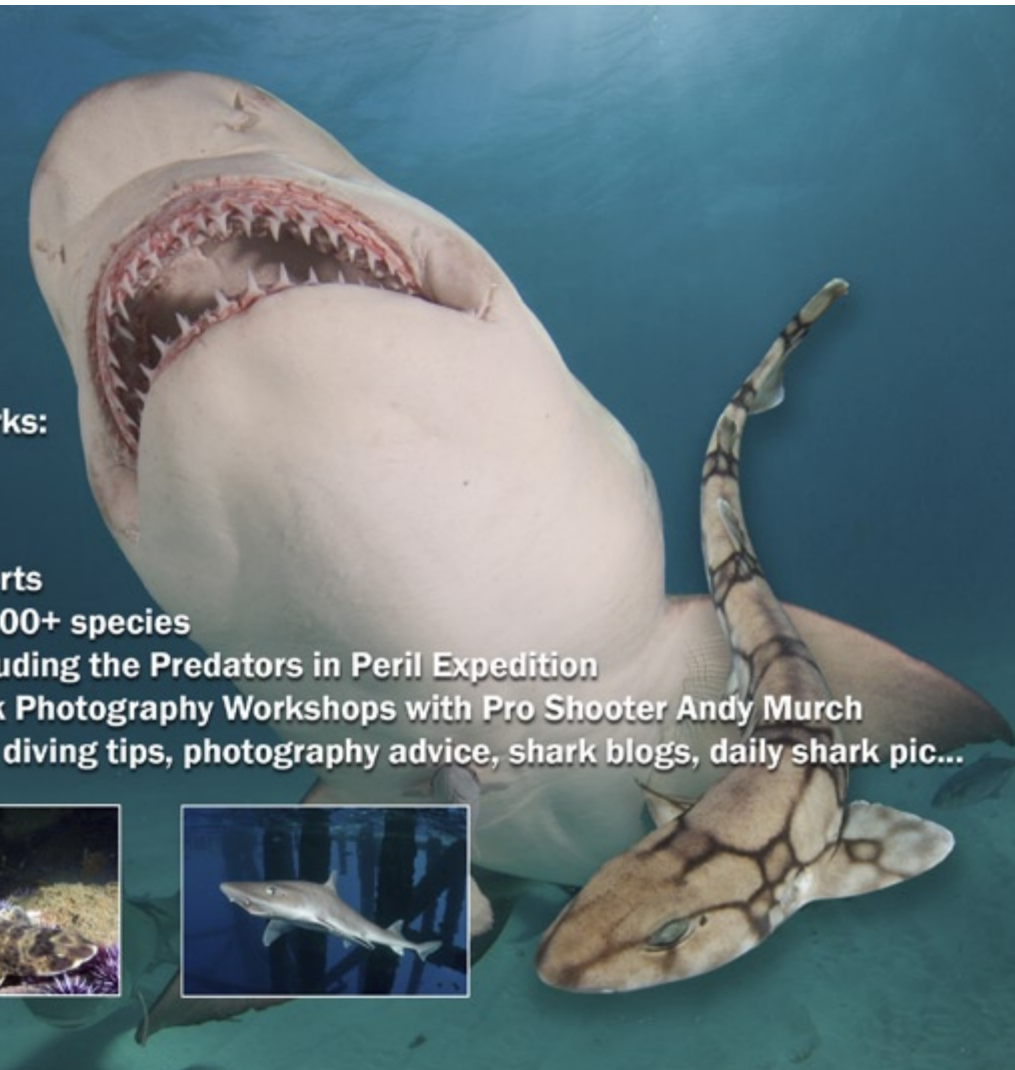
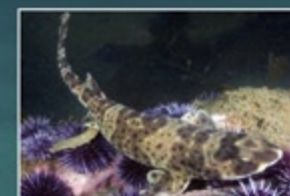
Shark diving stories and trip reports

Shark and Ray Field Guide with 100+ species

Shark Conservation Projects including the Predators in Peril Expedition

Shark Diving Expeditions & Shark Photography Workshops with Pro Shooter Andy Murch

Shark news, shark biology, shark diving tips, photography advice, shark blogs, daily shark pic...





Edited by Peter Symes

Sharks and rays queue up for a fin-icure and gill floss

North Queensland researchers say they are amazed by new images of sharks and manta rays lining up to be cleaned by smaller fish on the Great Barrier Reef.

James Cook University researchers set up cameras on the reef and captured images of sharks and manta rays visiting so-called 'cleaning stations'.

"The objective of the study was to document the occurrence and frequency of visits by manta rays and sharks to cleaning stations in the northern Great Barrier Reef and at Osprey Reef in the Coral Sea," one of the researchers, Professor Michael Kingsford, said.

He said manta rays would show up at the cleaning stations and would hold completely still while the smaller fish went to work, often for several

hours at a time.

"The manta rays would cease all movement of their fins while in the cleaning stations," he said. "Their gills were often flared and mouths open but never wide enough to suggest feeding. Several cleaner fish would then migrate upwards towards the animal and begin cleaning."

Sharks were also keen for a clean, holding themselves in a vertical position while the smaller fish worked, or swimming over cleaning sites to receive attention.

Kingsford said that shark posturing was far more elaborate and included becoming

almost vertical in most cleaning engagements. At other times, sharks would casually swim over the site and receive attention from cleaners.

"Sharks in the 'vertical posture' would typically approach with the tide before pointing head upward towards the surface upon reaching the cleaning station," the researchers wrote.

"Pectoral fins pointed down, mouth open, gills flared and a rapid paddling of the caudal fin were typical behaviours.

"Depending on the strength of the current, each interaction would last anywhere between five and ten seconds before the client would move away from the station and the cleaners would immediately retreat to the reef.

"The shark clients—in most cases—would swim back around into the current and repeat the process until cleaning had ceased."

Kingsford said large numbers of sharks gathered in the cleaning stations although not all were actively engaged in cleaning interactions.

"During the sessions captured by our cameras more than 1100 sharks were observed at Osprey Reef but no feeding or chasing was observed in any of the sightings," he said. ■

Remoras cling on to a nurse shark



A shark that glows

The velvet belly lantern shark emits a blue luminescence from thousands of tiny photophores

Contrary to self-luminescent bony fishes, which harbour a nervous control mechanism of their photophore luminescence, the light emission is under hormonal control in the cartilaginous *E. spinax*. This clearly highlights the diversity of fish luminescence and confirms its multiple independent apparitions during the course of evolution. In all animals investigated up to this point, luminescence is triggered by nerve cells. Finding a parallel pathway to bioluminescence—one that's controlled by

hormones, not nerves—strongly supports the notion that light-emitting powers have evolved multiple times in animals.

The light-emitting cells in some sharks aren't connected to prominent nerve cells, and the slow onset of their glow hinted that something other than nerves were involved. Exposing patches of skin from lantern sharks to hormones and to nerve signaling molecules confirmed that hormones turn on the sharks' bluish glow.

Melatonin, which in humans is

an important hormone for sleep regulation, induced a slow, long-lasting glow in the skin patches that persisted for several hours, researchers show. This light probably serves to camouflage these velvet belly lantern sharks, *Etmopterus spinax*, counter-illuminating them from below as they descend to darker depths of the sea, said Julien Claes, co-author of the study with Jérôme Mallefet of the Catholic University of Louvain in Belgium. ■

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Edited by
Bonnie McKenna



Turtle sniffing dogs

Text by Bonnie McKenna
Photos courtesy of
Dr Donna Shaver

Dogs can do amazing things. One of the most unusual amazing fetes is to sniff out turtle nests; specifically Kemp's ridley turtle nests.

Chief among the jobs that Donna Shaver, PhD., chief of the National Park Service Division of Sea Turtle Science at the Padre Island National Seashore in Texas,

is to find buried sea turtle nests and protect them. Specifically, the highly endangered Kemp's ridley sea turtles.

Kemp's ridley turtles usually come onshore in groups called arribadas (Spanish for arrival). Despite a number of volunteers combing the beaches, many of the turtle nests are not initially identified.

"The turtles nest between April and July. Somehow they choose the windiest day to come ashore.

This causes their shallow tracks to be blown away. Despite having a large group of volunteers and a number of staff who scan the beach for turtle tracks; we sometimes cannot find the nests," said Shaver.

Inspired

by rescue dogs that are specially trained to find survivors of catastrophic events Shaver started training her Cairn terrier, Ridley, to find the turtle nests. She began by training Ridley to find treats on the beach, then she placed the treats in evacuated nest in hopes he would begin to associate the nest with the treat. He quickly learned to find the nests. To familiarize the dog with the unique smells associated with the Ridley's nests, Shaver took Ridley to numerous nest sites and to the area where the eggs are kept during their incubation.

The nests are often several miles apart on the 70-mile long national seashore, the heat can be wicked and very hard on dogs. Ridley is only called upon when the human volunteers have given up their search and the wind has abated allowing him to sniff the air and catch the scent.

Two years ago, Shaver called her fiancé to bring Ridley to a site that had been searched for more than five hours. Within five minutes the dog zeroed in on an area near a pile of old fish bones.

"I was sure the smell of the fish bones was what got his attention, so I took him back to the area I



NICOLE MOLLETT / SEATURTLE.ORG

Nesting Flatback turtle

Australia's most common sea turtle is under threat from feral pigs

Pigs are digging up and eating eggs laid by flatback sea turtles that nest on the west coast of Cape York Peninsula. Authorities are trying to learn more about the feral pig behavior patterns in hope of being able to better manage their numbers. ■

thought the nest might be located. As soon as I let him loose Ridley returned to the spot by the old fish bones. I took him away again, but as soon as I released him he ran back to the spot and this time he pawed the sand until he uncovered an egg," Shaver said.

More than 100 eggs were found in the nest Ridley located. If the nest had not been recovered, it is unlikely any of the hatchlings would have survived. Ridley has located a number of "stumpers" (nests that humans cannot find) since starting his 'volunteer' service to the turtle rescue efforts.

"I am so please with the success of Ridley that I am now training another Cairn terrier. Her name is Kayleigh. I hope she will become as valuable a member of our team as Ridley in helping us preserve the Kemp's ridley sea turtle," Shaver concluded. ■



Ridley watches Dr Shaver remove eggs from the turtle nest



Turtle dogs Ridley and Kayleigh help in the rescue of Kemp's ridley turtle eggs



Baby loggerheads take a wrong turn

Hundreds of baby loggerheads were rescued, north of Brisbane, Australia, as they headed along a road instead of into the ocean.

A resident said the turtles were confused by a bright light near the beach. Area resident and staff from Australia Zoo helped gather the hatchlings and take them to the sea. ■



STEPHANIE KERN / SEATURTLE.ORG / CC

Baby Loggerhead sea turtle

More than 600 cold-stunned turtles found in Florida

Frigid waters in Florida during the first two weeks of January shocked a record number of sea turtles into a coma-like state that would have killed them if they were not rescued.

Volunteers and employees from Gulf World Marine Park in Panama City Beach worked tirelessly to rescue cold-stunned turtles from drowning. The turtles went into shock due to freezing temperatures; since they are cold-blooded they're not able to move once their body temperature reaches a certain point.

Allen Foley, a wildlife biologist with the Florida Fish and Wildlife Conservation Commission said, "If populations were at normal levels, sea turtle species would do just fine with an event like this every thirty or forty years. But today's populations are a fraction of what they were historically."

Most of the cold-stunned turtles have been returned to the ocean. While clearly harmful, the event may have had a positive outcome. Conservationists hope that the attention this event brought to the public will translate into action to save from extinction, creatures that have existed since the age of dinosaurs. ■



FILE PHOTO

Green sea turtle at Caymans sea turtle farm

Turtle meat price soars

The Turtle Farm in the Cayman Islands has decided to raise the price of green sea turtle meat. Turtle steaks, stew meat, manavelin (odds and ends), and bone will triple in price.

Calicia Burke, marketing manager of the Turtle Farm, said that farmed turtle meat is one of the rarest forms of food and is found only in the Cayman Islands and comes only from the Cayman Turtle Farm. The farm raises its own turtles thereby avoiding the need to take any sea turtles from the wild. Eating turtle meat holds a cultural significance to the Caymanian people. ■



MUSTAPHA AKSISSOU / SEATURTLE.ORG / CC

Turtles treated for debilitating disease

A number of scientists and veterinarians gathered at the Gumbo Limbo Nature Center in Boca Raton, Florida to treat green sea turtles suffering with golf-ball-sized tumors known as fibropapilloma.

Researchers say the tumors are turning up in alarming numbers on sea turtles all over the world. Researchers are scrambling to find a cure. Most often the tumors are located all around their eyelids and on their eyeballs compromising their survival in the wild.

The tumors were first observed in the late 1930s. The disease does not affect humans, but attaches to loggerhead sea turtles and a variety of marine fish. The prevalence of the tumors in turtles found in the Intracostal Waterway lagoons leads many to suspect the tumors are caused by runoff from fertilizer and farm waste. ■



BLUEREEFAQUARIUM.CO.UK

Newquay aquarium welcomes Homer the turtle

Newquay's Blue Reef Aquarium in the UK, welcomed a blind turtle following his rescue in Greece.

Homer was rescued by Archelon, the sea turtle protection society of Greece, after being discovered. It is believed Homer was hit by a ship's propeller. Homer is unable to hunt or feed due to the severity of his injuries and could not be released back into the wild.

David Waines, spokesman for Blue reef Aquarium, said that once he is released from quarantine Homer will be transferred in to our 250,000 liter ocean display where he will be monitored by aquarists who will feed and care for him. Waines also noted that Homer's presence in the aquarium will help raise awareness of the importance of sea turtle conservation and rescue work throughout the world. ■

Homer the blind sea turtle on his way to his new home

Loggerhead sea turtle

Bottom longline fishing in the Gulf of Mexico

U.S. Fisheries Service proposes re-opening bottom longline fishing this year despite the decline in loggerhead nesting populations. NOAA will accept 1,152 loggerhead incidental takes and 631 dead loggerheads over the next three years. Environmental groups in Florida successfully halted this fishing technique last year. Florida loggerhead nesting declined more than 40 percent over the past decade and 2009 was the fourth lowest nesting year on record. ■



PHOTO COURTESY OF TURTLES.ORG

Green sea turtle with fibropapilloma tumor



Choosing A Technical Instructor

Text by Ron Akeson
Photos by Barb Roy

As I have grown to be an experienced diver, my standard for choosing an instructor to train or mentor under, has also evolved. When I signed up for my first scuba class, it really didn't make any difference to me who was going to teach it. The excitement of learning to breathe underwater was the only thing that mattered. As it turned out, my instructor was a past Executive Director of NAUI and an ex-Navy Seal. It wasn't until I had some real diving experience to compare my skills to, that I really began to appreciate how well trained I was, and how a good instructor can make all the difference in the world.

Now, I seek only the top (and often hardest) instructor trainers when I require additional training for myself, and I love the challenge. What I have come to realize is that you can be trained by any dive center that offers technical instruction, but for the knowledge to truly stick with you and sink in, the instructor must be good at the craft of teaching.

So, what do you look for when selecting a dive instructor? Even more important, what do

you look for when selecting a technical diving instructor? The answer is not as black and white as you might imagine, because an excellent instructor doesn't have a tattoo on his or her forehead stating "top instructor". So, let's take a look at what makes a good instructor and the criteria that you can use to select one. While we will concentrate on technical diving instructors, most of

these principles can be applied when selecting any instructor, including recreational courses.



Preparation for technical class at Mukilteo, Washington State, USA

PHOTO ILLUSTRATION



Technical instructor, Ron Akeson

Compatibility

Arguably the most important characteristic has nothing to do with their qualifications; it's your gut feeling that counts. Plan to meet with your prospective mentor and see how the two of you get along. There's nothing worse than taking a course from someone you do not like or respect, no matter how qualified or experienced they are. Above all you need to have respect for your instructor, and feel that you have something to learn from them, or continue the search for a different one. This will go a long way in allowing yourself to be receptive to their teachings.

Diving experience

Once an instructor is favored, you need to know what diving experience they have. They may talk the talk, but do they walk the walk? Do they do actual dives or are most of their dives with students in a controlled atmosphere? There is something to be said for real-world experience and doing actual technical dives each month. Maybe they send out a newsletter or list upcoming dives on their website.

Some of the most important knowledge that your instructor can teach to you is from the things that went wrong or problems that arose on their personal dives. Learning from another's mistakes is an important part of the teaching process. So, during your selection process ask the prospective instructor, what is the worst thing that has happened to them on a dive, and we have ALL had things go wrong.

Similar interests

"I look for someone with the same interests that I have," comments Rob Wilson, a CCR Trimix divers from Marysville, Washington State. "For example, Ron was a no brainer for me. We both share the same interest in wrecks. Come to find out, it's the



It's a good idea to get used to using twin tanks before you start a technical diving course



Technical instructor with students at Northern Gulf Islands in British Columbia, Canada

work is like a car with no tires, it will go nowhere real fast. Does the instructor's knowledge exceed the course you are about to take. One way is to ask them the highest level they can certify to. Another is to purchase the book beforehand and read it. A good example might be whether they have an integral knowledge of decompression science and algorithms, which is extremely important for deep trimix diving. Ask to see their informational database (books, articles, certificates), which might already be on display in their classroom or the dive center. This will help you in deciding if their education and training in technical diving is adequate to answer any questions you might come up with.

Continuing education

I personally like to know if the instructor is continuing with their own education through additional courses and/or seminars.

same wrecks, too. I also would look for someone who has actually done some dives beyond their training hopefully the dives I'm planning to do.

"I wouldn't want a "card collector". A tech instructor needs to go out and actually do the dives he certifying people for. You can always find a "tech" instructor but not many are out doing "tech" dives unless they are doing a class.

"For example, we had a Trimix instructor come out on a deep dive with students. The instructor turned out to be a complete disaster. We did have a couple of unforeseen challenges but nothing that could be considered a deal breaker. It is wreck diving after all. This person had no experience outside of teaching. I wonder what kind of divers they will produce with this kind of attitude."

Knowledge

Familiarity with the subject matter should be next. No matter how much dive experience they have, a limited knowledge base of the course

Technical diver and cloud sponge on the Sunshine Coast of British Columbia (right); Using Force fins for training (below); Pool work and rebreathers (bottom left)

Reputation

A solid reputation in the local dive community can also be a valuable consideration. Being well known for their diving prowess is a strong indicator that they know what they are doing. A 'word of mouth' recommendation by a previous student is another way to find out additional opinions of how a course was conducted. This should not be overlooked

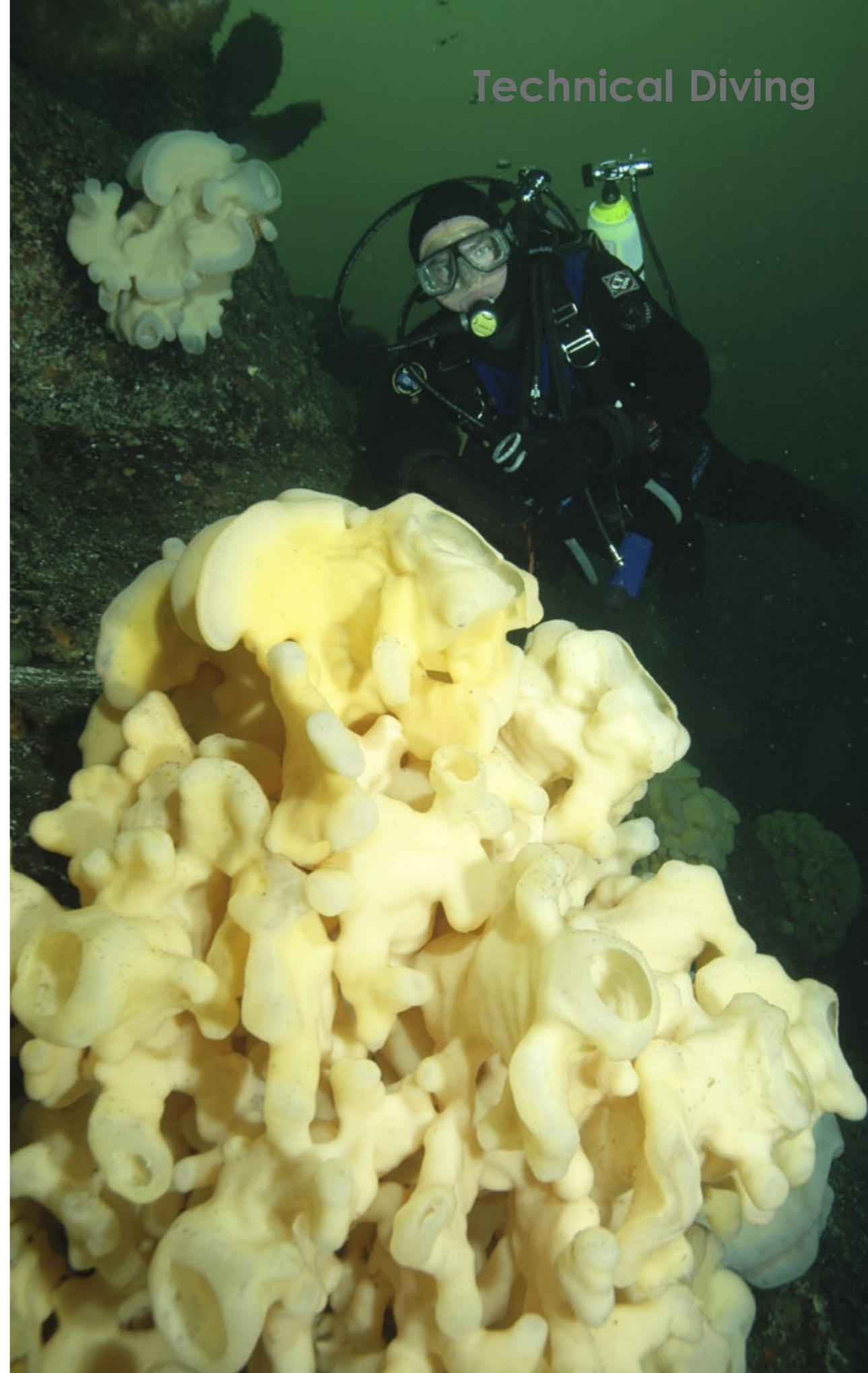


because first hand information might give you an idea if the person feels they received adequate instruction and feels comfortable to continue in that level, or do they feel they were shortchanged.

Teaching experience

Dan Dwarter, another CCR Trimix diver from Washington also believes experience counts; "What I look for in a technical dive instructor is experience. Anyone can go out and get a certification saying

Technical Diving



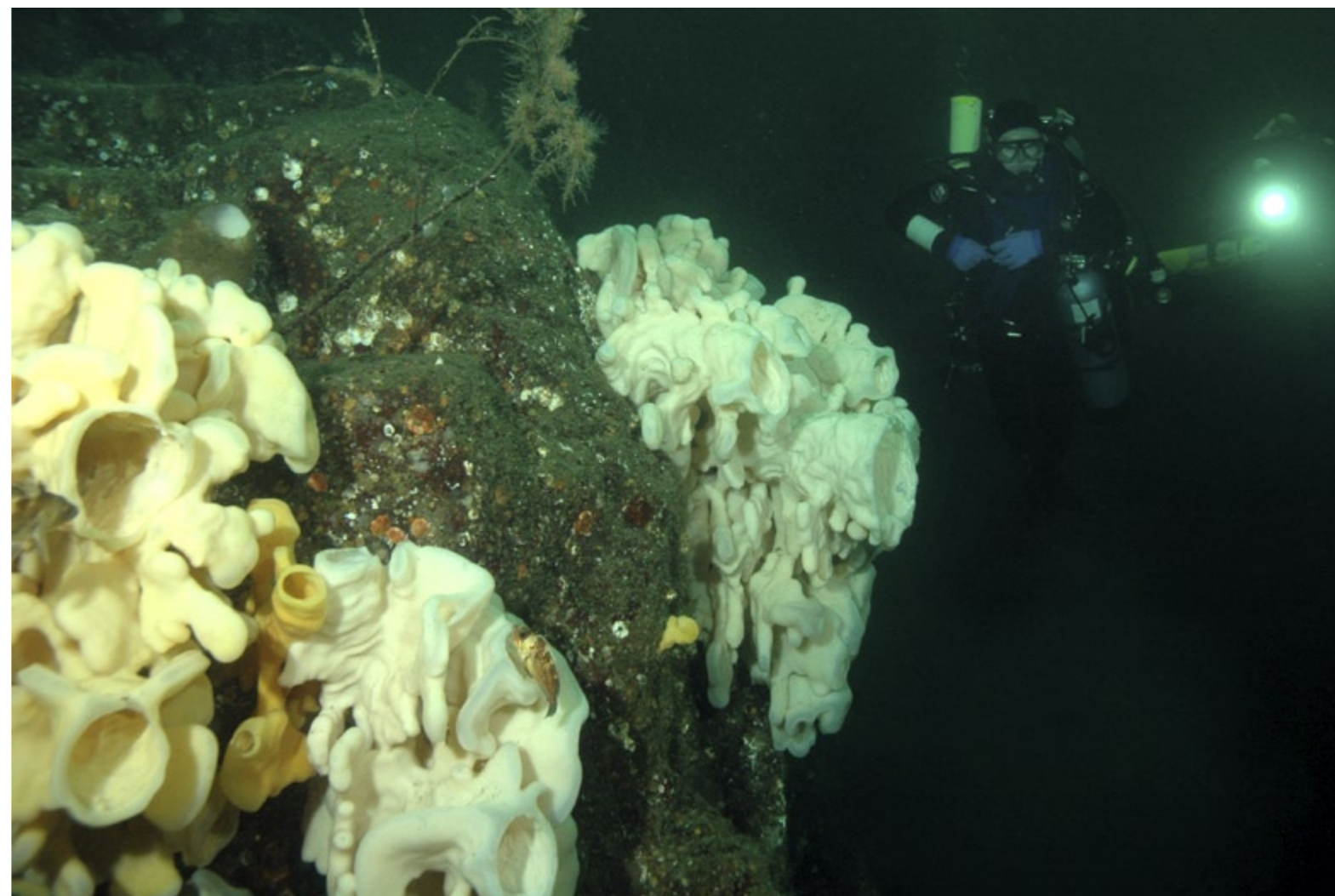


they can teach technical diving, but it is more important that the instructor is **DOING** the dives. They have the classroom knowledge, and the field knowledge for said style of diving. Basically I want to go with someone whom I feel confident diving with at those depths."

With this in mind; understandably technical diving isn't for everyone. The bottom line is whomever you choose must possess the ability to teach in a manner so you, the student, can learn to the best of your ability. Don't be afraid to travel for the instruction either. Maybe the instructor 50 miles away will make your learning experience worth the journey compared to the instructor across town. If you use the above criterion and utilize common sense for selecting an instructor, you should have a very pleasurable experience in the long run!

Ron Akeson is an Instructor Trainer, marine biologist and professional photographer and cinematographer with over 30 years of industry experience. For more information, see his website at: www.adventuresdownunder.com ■

Technical Diving



LEFT TO RIGHT:
Technical diver,
Rob Wilson, on a
deep dive in Neah
Bay, Washington
State, USA

Training for cave
diving in Mexico

Technical diver
inspecting sponge
wall off the Sunshine
Coast in British Co-
lumbia, Canada

Gear set-up at the
dock on the Sunsh-
ing Coast of Van-
couver Island, British
Columbia



Edited by Peter Symes

Ancient whale populations were probably massive

Research indicates modern estimates of a “normal” population may be way off, and that recovery of the populations of great whales is still in its very early stages.

When a particular species is said to be decimated by centuries of hunting, it's often difficult to accurately say what a “normal”, fully-recovered population might number.

Historical records indicate that past whale populations were plen-

tiful. For example, it was said that when settlers arrived in the New World in the 17th century, they found waters so thick with whales, it was said you could walk across the bay of Cape Cod on their backs. Such stories have usually been dismissed as fantasy, but DNA research that show numbers of pre-hunt populations may be vastly underestimated.

Getting the numbers right matters because it has only been since 1986 that a ban on whaling has allowed populations to slowly recover, but already, discussions are underway to potentially allow

some commercial whaling to resume when populations reach 54 percent of their “historic” levels. This is generally assumed to be the population of the mid-19th century, before the explosive harpoon was invented. Such a decision would be based on old estimates of population, mostly conducted by people working for the International Whaling Commission (IWC). But if this historic benchmark is too low, the whaling moratorium must continue.

Genetic findings

The IWC believed that before large-scale whaling began, the North Atlantic was home to about 20,000 humpback whales. With a current population of about 10,000 and rising, this meant that under the 54-percent rule, hunting could soon resume. However, genetic research published in 2003 by Stephen Palumbi and Joe Roman of Stanford University's Hopkins Marine Station calls the IWC's numbers into question.

The pair had investigated whales for

signs of genetic variation, which is a technique to estimate the size of the population in the past since large populations tend to accumulate diversity through random DNA mutations and breeding, while small populations lose it through inbreeding. The results were dramatic. The team estimated the pre-exploitation population was more than 20 times as great, at 240,000. Globally, they suggested, more than 1.5 million humpbacks may once have roamed the oceans, rather than the 100,000 estimated by the IWC.

Obviously, if the researcher's findings hold water their numbers would mean recovery is the extremely early stages—something that wouldn't sit well with pro-whaling nations keen in resuming whaling. Unsurprisingly, Palumbi got a hostile reception when he presented their findings to the IWC in 2004.

Undermining IWC's estimates further has been the discovery of “cooked” logbooks from nations like the Soviet Union. According to *New Scientist*, Soviet whaling fleets killed 25,000 humpback whales in the Southern Ocean between

1959 to 1961, while reporting a catch of just 2,710 to the IWC. The number of whales brought home also probably does not equal the number killed at sea, says Roman.

The numbers remain controversial and Palumbi and Roman's analysis is being criticised among other things for resting on a assumption that the particular whale

More than 1.5 million humpbacks may once have roamed the oceans, rather than the 100,000 estimated by the International Whaling Commission.

population under scrutiny never bred with others. Critics point out that the now-distinct humpback populations of the North and South Atlantic may well have once done just that. It could be that Roman and Pa-

lumbi have inadvertently estimated the entire Atlantic humpback population, or even the global population rather than that in just the North Atlantic.

Palumbi and Roman are not alone, however. Charles Scott Baker, a conservation geneticist at Oregon State University in Newport, has used DNA analysis to investigate minke whales. IWC estimates put their number today near their historical levels of around 600,000 globally. But Baker reckons that as recently as 300 years ago there were probably close to 1.5 million of them. This finding also suggests the species' recovery is still at an early stage. ■

Medieval whalers not at fault for decline

A DNA profile of a 450-year-old whale bone from Labrador's south coast—a North Atlantic right whale's humerus—collected from the remains of a shipwreck at the historic Red Bay whaling site along the Strait of Belle Isle on Labrador's south coast shows that Canada's most endangered species was already suffering from a critically small population and a lack of genetic diversity before Basque whalers began harvesting the giant mammals in the 16th century.

The Basques have long been blamed for decimating the right whale population off Canada's coast. But the new research by a team of Canadian and U.S. biologists, published in the latest issue of the journal *Conservation Genetics* indicates that right whales were rarely killed by the Spanish-based whalers and that oil-rich bowhead whales were almost exclusively their targeted species.

The samples revealed a relatively low level of genetic diversity among the whale's North Atlantic population both today and in the past—a result that makes clear the species' problems in Atlantic Canada began long before the Basques arrived in the region in the early 1500's, the team has concluded.

The latest findings appear to point the finger at a post-1400 cooling period known as the Little Ice Age for the restricted numbers of right whales along Canada's eastern shores. ■



Dying Struggles of the Spermaceti Whale. Image Date 1837



What killed 300 right whales?

In the last five years, more than 300 southern right whales have been found dead in the waters off Argentina's Patagonian coast, one of the most important breeding grounds for the species.

Possible causes being examined include biotoxins—naturally occurring poisons that include the venom of some snakes and spiders and the “flesh-eating” bacteria, *Necrotizing fasciitis*—disease, environmental factors and lack of prey, particularly the tiny krill that make up the bulk of the southern right's diet.

Another theory put forward has been the effect of gulls, which can act like parasites, gouging skin and blubber from the whales' backs.

The main evidence that will be examined are tests on samples taken from beached whale calves, which have shown “unusually thin” blubber, said the United States-based Wildlife Conservation Society, which described the die-off as “a perplexing and urgent mystery”.

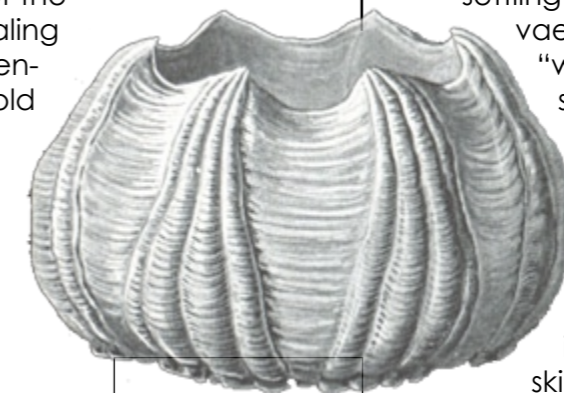
“We need to critically examine possible causes for this increase in calf mortality, so we can begin to explore possible solutions,” said Marcela Uhart, one of the WCS scientists who first discovered the problem. “Finding the cause may require an expansion of monitoring activities to include the vast feeding grounds for the species.”

Part of the concern about the recent die-off is that the dead whales have

been found around the Peninsula Valdés, where one third of the global population of southern right whales is thought to use the protected bays for calving and nursing between the months of June and December.

“Peninsula Valdés is one of the most important calving and nursing grounds for the species found throughout the southern hemisphere,” Howard Rosenbaum, director WCS's ocean giants programme, and a member of the International Whaling Commission's scientific committee told the UK daily, *The Guardian*.

“By working with the government of Argentina, the Province of Chubut, and our diverse team of experts and specialists, we can increase our chances of solving this mystery, the critical next step to ensuring a future for this population of southern right whales.” ■



Most of the barnacles are unique to the brand of whale. The barnacle *Coronula diadema* lives only on humpback whale skin, for example, while gray whales host one called *Cryptolepas rhachianecti*

What is the deal with the barnacles and ‘bad skin’?

Barnacles regularly colonize the skin of filter-feeding whales, and they often do so in huge numbers. One humpback whale, for instance, can host almost 1,000 pounds of barnacles.

So, how does a barnacle get onto a whale in the first place? Marine biologists speculate that the barnacles reproduce during the whales' breeding season, when the whales mill around in warm, shallow waters rather than moving through the open ocean. Each barnacle parent can release anywhere from 10,000 to 20,000 spawn, and they survive for several weeks in the water. When a whale does swim by, research suggests, the drifting larvae pick up a chemical signal that tells them to hop on.

Location, location, location

Barnacles are picky. They like spots where the flow of water is consistent, like the head or the fins. So, instead of settling wherever they land, the larvae use their front antennae to “walk” around the whale in search of prime real estate. Once they're satisfied with their location, the barnacles literally dig in. As they mature into adults, they form tube-shaped cavities in their shells that actually draw in prongs of growing whale skin. The result is firmly rooted attachment.

The barnacle-whale relationship is generally considered to be obligate commensalism—a type of symbiosis where one species benefits, and the other isn't affected either way. Still, it's possible that too many barnacles could cause drag, or invite infection if they penetrate too deeply into the whale's flesh. On the other hand, it's been suggested that for male humpbacks, who fight over females by ramming and slapping at each other, a sharp barnacle coating may be helpful as a set of brass knuckles. ■

Southern Right Whale off Patagonia

MARCELO MAMMANA

Whales are good for the climate too, they are carbon sinks

A century of whaling may have released more than 100 million tonnes of carbon into the atmosphere, U.S. scientists told the recent Ocean Sciences conference in Oregon.

Whales store carbon within their huge bodies, and when they are killed, much of this carbon can be released. Dr Andrew Pershing and his colleagues from the Gulf of Maine Research Institute calculated the annual carbon-storing capacity of whales as they grew. In their initial calculations, the team worked out that 100 years of whaling had released an amount of carbon equivalent to burning 130,000 sq km of temperate forests, or to driving 128,000 Humvees continuously for 100 years. Pershing stressed that this was still a relatively tiny amount when compared to the billions of tonnes produced by human activity every year. But he said that whales played an important role in storing and transporting carbon in the marine ecosystem.

Ocean forests

Pershing described whales as the "forests of the ocean". "Whales, like any animal or plant on the planet, are made out of a lot of carbon," he said, "And when you kill and remove a whale from the ocean, that's removing carbon from this storage system and possibly sending it into the atmosphere." Whereas when whales die naturally, their bodies sink, so they take that carbon down to the bottom of the ocean. "If they die where it's deep enough, it will be stored out of the atmosphere perhaps for hundreds of years." Simply leaving large groups of whales to grow, he said, could

"sequester" the greenhouse gas, in amounts that were comparable to some of the reforestation schemes that earn and sell carbon credits.

He suggested that a similar system of carbon credits could be applied to whales in order to protect and rebuild their stocks.

Iron pumps

Sperm whales in the Southern Ocean should also be credited for their role in offsetting climate change by introducing iron into the upper layers of the oceans, said Trish J. Lavery of Flinders University in Adelaide, Australia.

Skimpy levels of iron in the Southern Ocean limit growth of the floating meadows of plankton there, Lavery said. This limitation has inspired human experiments in adding iron to trigger a big plankton bloom. Sperm whales, however, feed by diving for squid in the cold depths of the Southern Ocean. This zone normally acts as deep storage for nutrients, Lavery said. So, anything the whales bring up effectively introduces something new to the upper waters.

The extra iron that whales bring up from their deep feeding encourages plankton growth. That growth traps carbon, much as human-run iron-enrichment experiments in the ocean might, Lavery and her colleagues con-

tended. According to the team's calculations, sperm whales in the Southern Ocean may be capturing a net five million metric tons of carbon from the atmosphere per year.

The first analysis of whales' effect on greenhouse gases determined that warm-blooded residents—with whales as the dominant force—might be respiring 25 percent of the carbon fixed in the Southern Ocean, she said. Later estimates have revised their share downward, and the most recent calculation puts their contribution at 0.3 percent. That's not huge compared to global output, but it's still 17 million tons of carbon a year.

Using numbers from studies of feeding and nutrition, Lavery and her colleagues calculated that each whale brings up about ten grams of iron a day from the depths and then defecates it at the surface. The beauty of this sperm whale output is that it takes the form of drifting liquid plumes that can feed life in the upper ocean, Lavery said. She noted that experiments with iron have struggled with iron fertilizers that clump and sink before upper-water plankton can eat all of the goodies. Yet, she said, those experiments documented measurable carbon trapping with even less iron fertilizer than sperm whales contribute. ■



Sperm whales in the Southern Ocean may be capturing a net five million metric tons of carbon from the atmosphere per year

ERIC CHENG



Sperm whales tracked hunting squid in teams for first time



ERIC CHENG

It appears that sperm whales work together during feeding time to corral Humboldt squid by rotating the more demanding roles of the hunt.

At least that's what data-recording tags on three sperm whales report, as the animals were tracked swimming and feeding in the Gulf of California.

According to Professor Bruce Mate from the Hatfield Marine Science Center in Oregon, the whales would herd the squid into a giant bait ball, and one of them would dive to the bottom of the ball where she would prevent any squid for escaping.

Each time, different whales would take on this specific role.

"We can see that they're actually changing their roles over time ... It may be that each individual takes it in turns to do the most physiologically demanding task—the deep dive," said Mate.

The study, conducted in cooperation with Jorge Urban of the Autonomous University of Baja California Sur, involved tags that tracked the whales' movements for up to 28 days, before detaching themselves

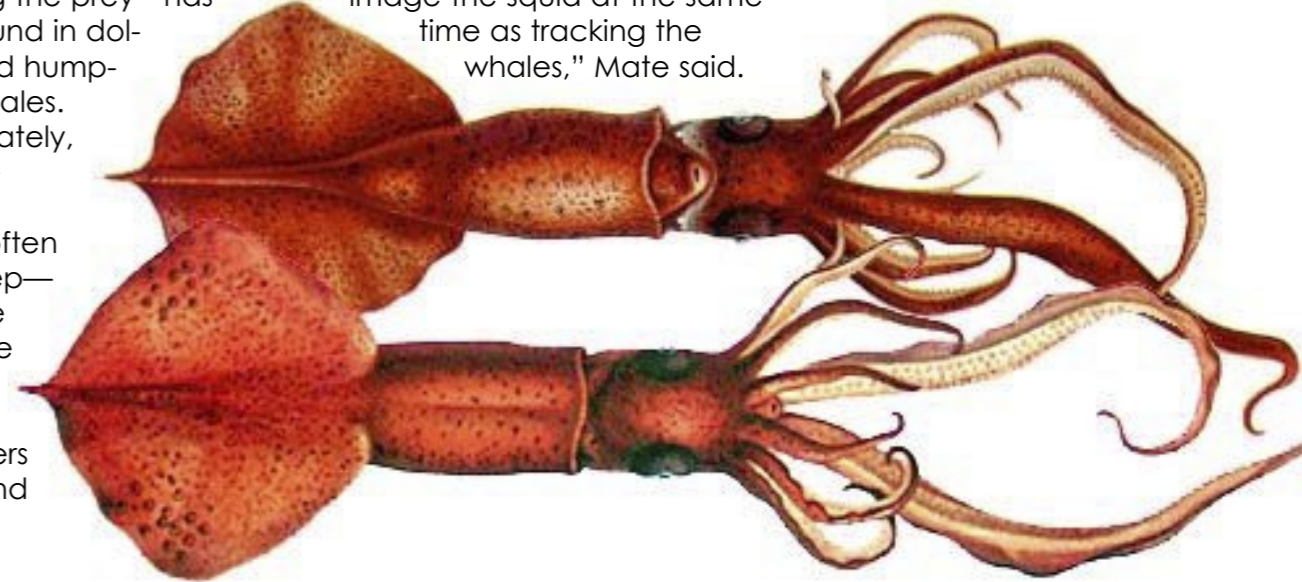
and floating to the surface where they are retrieved by the scientists.

This method of hunting—by corralling the prey—has been found in dolphins and humpback whales. Unfortunately, because sperm whales often dive deep—the three that were tracked dove to 800 meters deep, and

sometimes as deep as 1,500 metres—tracking them was more of a challenge.

"Our next step will be to image the squid at the same time as tracking the whales," Mate said.

"And to tag more members of the same group so that we can track their movements."



Humpbacks named "creatures of interest" in case of missing herring

Something is holding down the herring population of Alaska's Prince William Sound, and marine scientists are homing in on some rather large suspects—humpback whales.



Twenty-one years have passed since the Exxon *Valdez*, the supertanker, ran aground and leaked nearly 11 million gallons of crude oil causing one of the worst man-made disasters in history. In the late 1980's, before the spill, record commercial harvests of herring were landed, but the stocks took a major hit from the disaster that happened just when herring were about to lay eggs.

Many Prince William Sound fishermen still curse Exxon for the absence of herring, but the population should have rebounded by now. One hypothesis put forward by Jan Straley, a marine biology professor at the University of Alaska Southeast, is that humpbacks—traditionally summer residents in the sound—are taking a big bite out of vast herring schools that form in the deep water of the sound's fjords each autumn. Straley and other researchers have found that

humpbacks are now showing up in significant numbers, even in winter.

When summer resident whales leave, other humpbacks move in. Some summer residents are even skipping their annual transoceanic mating and birthing trips to Hawaii, Mexico or other warm waters in favor of icy Alaskan waters.

"It did show that whales were exerting predation pressure on Prince William Sound herring, which is potentially impeding the recovery," Straley said. There are, however, also other suspects in the herring mystery: disease, ocean changes, contaminants and competition from other fish. One

researcher is studying whether juvenile herring spend so much energy fighting a disease, *Ichthyophonus*, that they don't survive the winter when there's no food.

Herring play a vital role in the food chain. The silvery fish with blue-green upper bodies—considered large when they reach nine inches—are food for eagles and other sea birds, halibut and cod, and most important to humans, five varieties of Pacific salmon. ■



Rich Walker

GUE's Technical Dive Training Director

Interview by
Rosemary E. Lunn
Photos by Gareth Lock



Rich Walker is a full-time instructor with Global Underwater Explorers in the United Kingdom, but has worked for nearly 15 years at the University of Sheffield as a researcher studying how blood flows around the body. His knowledge of physiology and physics gives him a unique edge as a diving instructor. X-RAY MAG's Rosemary E. Lunn caught up with Walker to find out more about his experience and expertise.

Where did you learn to dive?

In 1990, I was a medical physicist designing electronic diagnostic equipment based at St Barts Hospital in the City of London. One day, I walked past a colleague's office and recognised a BCD and a set of regs hanging up. I've always had the desire to dive right from when I was a small child. The key influence had been my parents because Mum and Dad met through scuba diving.

From a very early age, I can clearly remember gear lying around the house and playing with it in the bath. But in the 1970's, children were not encouraged to go diving by BSAC, so it just didn't happen.

Now was my chance to embrace all things rubber, and I asked my colleague how I could start. "Come down to the club on Tuesday night," he said, and it went from there. I joined the Polytechnic of North London Sub Aqua Club.

I'd always been a swimmer, so to be able to be underwater and breath at the same time was just mind blowing. And when I dived in the sea and saw fish and wrecks, I was hooked. I trained up to BSAC Advanced Diver level and became an Open Water Instructor spending my weekends happily exploring the myriad of South Coast wrecks, from Swanage to Plymouth.

Then my boss dropped a bombshell.

He'd been given funding to move him and his team up north, and I had a choice whether to continue with my PhD or not. I was two years into modelling the Femoral Artery, and with two years work to go, Sheffield seemed the right move.

As I was still technically a student, I joined the Sheffield University Sub Aqua Club and served time as their Diving Officer and their Advanced Training Officer. It was whilst I was at Sheffield that I got introduced to Scottish diving.

My first trip was to Lochaline and the Sound of Mull. It's fair to say that it blew me away. I couldn't believe that there was all this diving completely neglected by South Coast divers. The life was more prolific, the wrecks were in better shape, easier to get to and the Sound of Mull was far more sheltered than the South Coast. For five years, I pretty much dived Oban and Lochaline solidly with an odd trip to Ullapool and Scapa Flow thrown in for good measure.

And then I dived out of Aberdeen. One of the women in the dive club came from Aberdeen, so we stayed at her house for a weekend, and we hit the East Coast. You know how



some dives are forever etched on your soul? Well, what I remember was being astounded by the incredible viz coupled with big, big wrecks and seriously large animals. It was my first experience of Wolf Fish, and they were everywhere. And then, you got the usual marine life, but it was supersized. When I eventually dived Norway, it reminded me vividly of diving Aberdeen.

What type of diver are you?

Personally, I am a cold water wreck diver, that's my history, and that is where I learnt to dive. Professionally, I am the Training Director of Global Underwater Explorers UK, a GUE Tech 2 Instructor, a GUE Tech 1, GUE Rec 1, GUE Rec 3, GUE Fundamentals and a GUE DVP1 Instructor Evaluator, and I sit on the GUE Council as Director of Technical Training, so I guess you could say I dive a bit.

Whilst it's hard to grasp now when you consider how prolific the internet is, and the sheer amount of technical diving information that is so readily

GUE's Technical Dive
Training Director, Rich Walker

profile

available at the press of a key, in 1995, it was a different story. I'd got to the point in my diving where I was doing 50-metre air diving knowing that there was so much more out there but not how to access it, when the internet magically appeared on my desk at work.

It was the gateway that would change my diving forever, and I quickly started dabbling in technical diving. I kept on coming across information about WKPP and GUE. I soon learnt that Global Underwater Explorers was established in 1998. Originally, it was a bunch of divers that had

come together to explore a vast and extensive cave system in Florida, USA, called the Woodville Karst Plain (Karst is another word for cave).

The idea was that the Woodville Karst Plain Project, or WKPP, would explore and map some 450 square miles of underwater cave systems that run from Tallahassee to the Gulf of Mexico. And today, you can access the data so far collated on this project by logging onto www.projectbaseline.org/wakulla.kml

Back to the late 90's—one night, I got a phone call from an ex-girlfriend. There was a space on a Technical Nitrox expedition in Poole, and did I want to make up the numbers? I landed at Phoenix Divers and did a course with Kevin Gurr and Phill Short.

The next year, I drove south again, this time destination Plymouth to do a course with Richie Stevenson. Rich had just relocated Deep Blue from Congleton, and it was his first IANTD Trimix Course down there.

I think it's fair to say that there were a few teething problems with his new boat, *Loyal Watcher*. That aside, I quickly learnt that Helium was good and what big deep wrecks were about. A couple of seasons of reasonable deep diving with DIR UK followed, primarily out of Weymouth, where we tended to dive off Grahame Knott's boat, *Wey Chieftain 2*, which was replaced by *Wey Chieftain 3*.

I'd been resisting it for ages, but in 2003, the lure of cave div-

ing finally got to me, and I succumbed to its embrace. My thought process was that if I was going to go cave diving, then Florida seemed the obvious choice, and I might as well train with a prolific and serious cave diver who was much respected by his peers.

The 'serious name' was the Florida Scubapro and DUI Rep, David Rhea. I showed up in Dave's course and was taught how to dive. I was utterly shocked. I honestly thought I would go into a cave, swim about a bit and come back out, and that would be me, trained.

It made me take a long cold hard stare at myself and think about the teaching I was doing

I was utterly shocked. I honestly thought I would go into a cave, swim about a bit and come back out, and that would be me, trained.

at the time. You see, I'd been teaching IANTD or TDI (can't remember which agency) advanced nitrox courses on the weekends.

I came back to the UK and stopped doing it immediately, because I didn't believe I was good enough. But I also knew I did want to teach GUE. I really liked the quality of the curriculum, the teaching style, the professional attitude of the instructors, and the higher bar that GUE were prepared to set. For me, it meant one thing—get in the water and practice, practice, practice.

A year later, I headed State-side once more and did my Cave 2 with Dave Rhea and started cave diving in Florida and France. A few months later, in September 2004, I was doing my GUE Instructor Training Course in Portofino, Italy. By day, I was



Rich Walker

now a post doctoral research assistant, i.e. a trained scientist specialising in physiology and modelling blood. (Ironically that knowledge coupled with the ability to research stuff has proved invaluable to my job now). Whilst on the weekends, I taught Fundamentals.

The Fundamentals Course or

"Fundies" is run over four days and refines and increases an individual's core skillset. It's a course for any diver, and it doesn't matter what level of training or experience the diver has, they will get something positive and good from it.

I've taught newly qualified BSAC Ocean Divers through to





Work had begun to notice that I wasn't at my desk as much as they wanted, so we came to a mutual agreement to part company.

It was the push that I needed, and I now had the perfect opportunity to work professionally as an instructor. It didn't occur to me once that I'd miss the regular pay packet at the end of every month.

What's your favourite piece of kit?

I am now going to contradict myself because in the main, one of the tools I need to do my job is my equipment, so I don't get emotionally attached to any of it. But then again, I have a double-ended piston clip that I use to snap fasten my light head to my harness. This clip has got an exceptionally smooth action, and I know I am being completely irrational, and I could use any other double-ended piston clip, but I've got very attached to this particular one.

Favourite dive site?

That's easy—it's the Sound of Mull because it's got everything! It's a beautiful location. The logistics for diving are spot on, and you can dive it in almost any weather because it's so protected. There are shallow wrecks and deeper wrecks, and everything is covered in superb life. The viz is generally good, and the people are friendly. It's a great place for a long weekend or to spend a week diving. I normally stay at Lochaline, and I always enjoy a pint in the Mishnish on Tobs, followed by fish and chips from the van outside.

Best country visited?

Underwater without a doubt it's Norway because we get to see the ships we sank, as opposed to normally diving the ones the Germans attacked. The crystal clear visibility is mouth-watering, and the wrecks themselves are so intact. The Norwegians have a great ethos when it comes to divers and wrecks, "Chisel bits off, and we'll confiscate the boat and its contents." Consequently everything is untouched, and it's like diving something straight out of the *Pirates of the Caribbean*.

You get to experience a phenomenal snapshot of history there right in front of your eyes, and it makes you think. The thing with diving is that it really puts you in touch, not only with the environment, but with times gone past, too. I have often wondered when I wreck dive, who were the people who lived on here? Did they get off the ship okay, or did they go down with it? My parents were born in WWII, so wrecks connect me directly back to my grandparent's generation and brings their lives and sacrifice into sharp and real focus.

The other thing about diving Norway is the prolific marine life. Because the water

is about 6–10°C, you tend to get more of the slow-moving stuff, such as nudibranchs and anemones. It's pretty similar to diving Scotland, but everything is so much bigger there, and there's always a chance to see King Crabs or even Orcas.

What motivates you to go diving?

Being able to dive somewhere that no one has dived before and see things that few people have had the chance to see. And it's that "making the connection with the past" thing again—wondering who walked on that deck, or secured a line around this bollard. Diving takes me one step closer to a past era.

When I first started wreck diving, I'd look at it and go, "Oh look, it's a piece of metal." Now, I've got an understanding of what bit of the boat I am looking at, so therefore, where I physically am on the wreck. And then, I tend to think about how the ship came to be where it is now and what was going through the sailors minds as the water fatally started sloshing over their boots all those years ago.

Dream dive buddy?

Someone who can read my mind. A

PADI Staff Instructors, and they've all left saying, "Golly, that was useful", or words to that effect. The emphasis is on delicate, precise position control, so bang on buoyancy and exact finning is high on the list. And we have fun too, because divers come away being able to fin backwards. What a cool skill!

Other things such as gas sharing, valve drills, DSMB deployment are also cov-

ered, along with dive planning considerations, teamwork and problem resolution. So, it's tough and challenging but well worth it and hugely enjoyable.

By 2007, I was teaching pretty much every weekend when I became a Tec 1 Instructor. This presented me with a problem because to teach Tec 1 takes five days, and I just couldn't fit it in with my day job. Something had to give.





dive buddy who intuitively knows what picture to take, which way to swim, or when to turn the dive. It's a very rare thing, but during your diving career, you will come across that odd one, or perhaps, two people that are so in tune with you underwater. Together, you become a more complete diver. I am incredibly fortunate because I sometimes dive with Brian Allen out of Plymouth who ticks all those boxes, and we are perfectly matched underwater.

tributing the fuel to balance the ship but it wasn't ideal, and as a result Hermes was deemed unsuitable for operations in European Waters. She sailed south and was employed in trade protection in the South Atlantic and Indian Oceans. On the 9th April 1942 she was heading away from Trincomali to the Maldives when she was attacked by the Japanese carriers Akagai, Hiryu and Soryu. She sunk in the Indian Ocean off Batticaloa, Ceylon in 50 metres. With conditions in Sri Lanka

Dream dive destination?

This is such a tricky question to answer because there are so many. I guess firstly it's got to be *HMS Hermes*. The Navy has a tradition of re-using names so the *Hermes* I'd like to dive was the first purpose built aircraft carrier in the World, and launched on the 11 September 1919. Her design was "cruiser" influenced and her role was intended to be of a similar scouting nature. Her design wasn't that successful however because amongst other things, she had limited high-speed endurance and stability problems caused by the large starboard island. They solved this by carefully dis-

(Ceylon) now becoming more stable and benign, *Hermes* is high on the list and I'm currently looking into the logistics of diving her.

And it's not only Norwegian Blues that pine for the Fjords; I too want to spend more time in and around Narvik. I'd love to get the side scan sonar out and explore the numerous fjords because there is so much that hasn't been discovered yet in these amazing temperate waters. (I am sure I mentioned somewhere that I'm a cold water wreck diver at heart). And then there's Greece and I'd love to go back and visit friends there again. Diving logistics are finally getting easier there, thank heavens.

Best dive book ever read?

It's got to be "Water Light Time" by David Doubilet. This book instantly transports me because the rich images superbly

portray life beneath the waves. They capture the essence of diving for me - everything and every emotion that I experience underwater. It's there on the page in front of you, how the light dances and shimmers through the sea and although it sounds slightly mad, you can almost see the life moving in his pictures. Just looking at the front cover you can feel the waves lapping as ray cruises away from you.

What bugs you most about diving?

Decompression! There's no way round it and you HAVE to do it. Typical deco for me tends to last about an hour, so I pass the time by writing notes to my buddy, reflect on the dive or tidy up my gear. Sometimes I spend it by starting to think about the next dive and the logistics involved, ie what gas filling I need to do. If it's the English Channel, then it's a bit

Rich Walker

of a long haul, but if I am lucky enough to be decoing in the Red Sea, then it's a whole new dive and something to be enjoyed and embraced.

How would you describe diving to non-divers?

A lot of people focus on the weightless aspect of diving but that's just a Fairground Ride to me. Once you've done it, it ceases to be that cool. For me it's seeing history in the wrecks and remembering the people who fought and died on those ships. Or watching fish in their natural habitat, not served up on a plate, in an aquarium or on the television. You get to see it close up and personal. Diving gives you an amazing opportunity to enter an environment that man has not yet evolved to explore in a natural way, so that makes it a very privileged visit. ■



The virtues remain the same

Insights into digital underwater photography

Text and photos by Lawson Wood

Underwater photography has been around well over 150 years and has accompanied humans as they have ventured beneath the seas to chronicle the water wilderness in all its glory, with the earliest underwater photographs being taken on large plate cameras in underwater housings of some sort or another. In fact, virtually every photograph taken since then had to use Silver Halide crystals in recording the image. Now in the 21st century, things really haven't changed that much; we still have to take

our underwater photographs in waterproof boxes of some proprietary manufacture, but now the technology has surpassed all expectations with the digital age, as this rapidly evolving format has finally removed the fear of failure, which virtually applied to all photographs produced historically.

If you look back on historic innovations, then the introduction of the digital camera has been sensational. Now we no longer need to wait years for the technology to improve. In many cases, we are witnessing improvements being made almost monthly. What was once a

curiosity, the digital camera, is very much a part of almost everyone's day to day lives, whether it actually be a camera or as part of a sophisticated "must have" mobile telephone.

The quality of the digital camera's reproduction has raised the bar so high today that even those old dedicated film users who once said that they would never make the switch over to digital, now extol the virtues of the latest cameras, housings and, of course, scanners, printers and digital editing software.

Our vocabulary has changed to include *pixels, bytes, ram, gig, jpeg, tiff, raw, nef* and many more abbreviations too mind-boggling to start with. Once you couple your new digital camera with your computer and add photograph manipulation programme software such

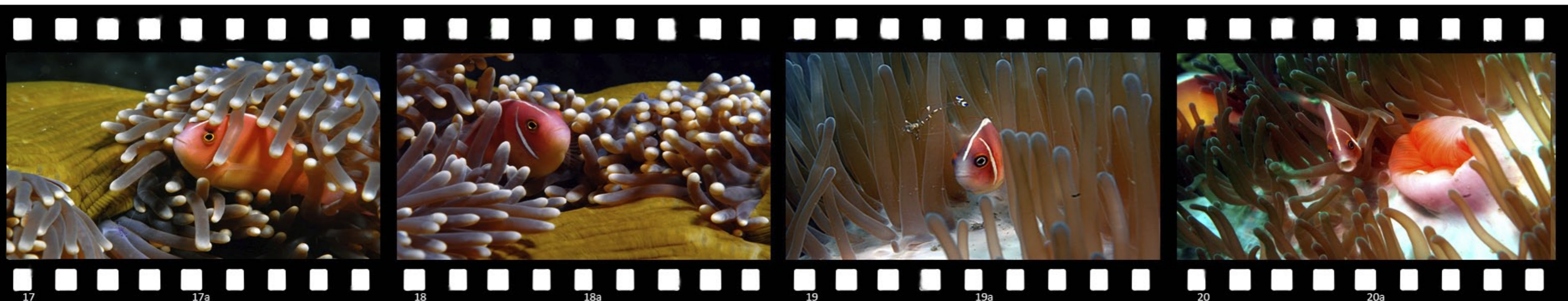
as Photoshop, then we open up another huge sack full of abbreviations and weird and wonderful tools to help or confuse the budding or professional photographer.

Firstly, let us assume that we have all taken the digital leap and either own a digital camera of some type of manufacture, or are considering buying one for oneself or a loved one. I once went to great lengths to write a synopsis on the digital format versus the film format. Now the technology has advanced so far and so fast, that one can hardly find anyone who will process film anymore. We are today well and truly into the digital age. Film is gone—for now—so let us explore the why and the wherefores of digital underwater photography.

There are several points that we have

to grasp first, and they are all generally to do with light. When we were still using film for our underwater photography, the light from either the ambient surroundings or from the intensity of artificial light by flash, the light had to penetrate at least four layers of emulsion on the film strip to be able to reproduce an accurate image. Now with digital photography, it is as if we are taking the photograph through a plain sheet of clear glass; we no longer need the high strength of powerful flashlight, and what we miss, we can generally 'fix' (to a certain extent) on our computer.

However, there is still no substitute for a good underwater photograph. A bad photograph, whether it be too 'messy', too underexposed or too over-exposed is still not a good photograph, no matter



The way we were—working a subject in film and then trying to choose the best shot



photo & video

Subject: Yellowline Arrowcrab (*Stenorhynchus seticornis*), Cayman Brac, Cayman Islands. 105mm lens, ISO 100, Twin Sea & Sea YS110 flash, 1/125th second at F11

what you do to improve it. Always remember that old computer saying "garbage in – garbage out".

We know that as you go underwater, light refracts and changes colour with the density of the water. You lose the colour red in less than two metres, and that colour gradually loses intensity until all we get are the blues (literally!) To compensate for this loss of light and colour, we either add a flash to illuminate the subject; a filter to alter the colour spectrum being 'seen' by the camera; or

by a quick fix on Photoshop.

Is this laziness? Have we stopped becoming artists? Do we now shoot for quantity and not for quality and allow the 'multiple choice' style of photography to get acceptable results without any skill attached? And, have we foregone the laboratory for the computer?

Well, the answer is probably yes to all of the above. Taking a camera underwater with only 36 frames of film available to photograph those interesting lit-



tle critters, fish behaviour or even shipwrecks, you really had to concentrate; you had to learn your craft through trial and error, and you had to work hard to get the results required for reproduction in whatever format you wanted, whether it be for personal use, audio-visual production or magazine and book work. It was in the film era that we all learned composition. Today, with large capacity memory cards, I can take several hundred photographs before I need to change memory cards, recharge cameras and flash, or run out of air!

I admit to being lazy, although I still feel that I have an artistic eye, having learnt my trade over 30 years of underwater photography. I do fall foul of 'multiple choice' photography and may now take three or four times more photographs of the same subject, but now I can afford the time to vary the angle, distance, light quality and many other variables to allow me to 'work'

the subject without it being overly intrusive, life threatening or selfish to the expense of others.

I have foregone the laboratory for the computer, and whilst I rarely use my computer software to digitally manipulate my photographs, I will invariably improve or 'tweak' a little bit here and there, particularly on the enhancement of colour saturation and sharpness, as well as the removal of particularly unsightly back-scatter or aberrant pixel problems created by the camera's sensor 'forgetting' sensor information that has to be 'filled in' later.

The photograph (left) clearly needs some additional improvement on the light, colour saturation and contrast. Due to the excellent content of the photograph with an upward angle of an Arrow Crab and a strong baseline, I also decided to remove the back-scatter at the same time. The image (above) is the completed stage, showing all of the changes rendered in Photoshop.

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silver

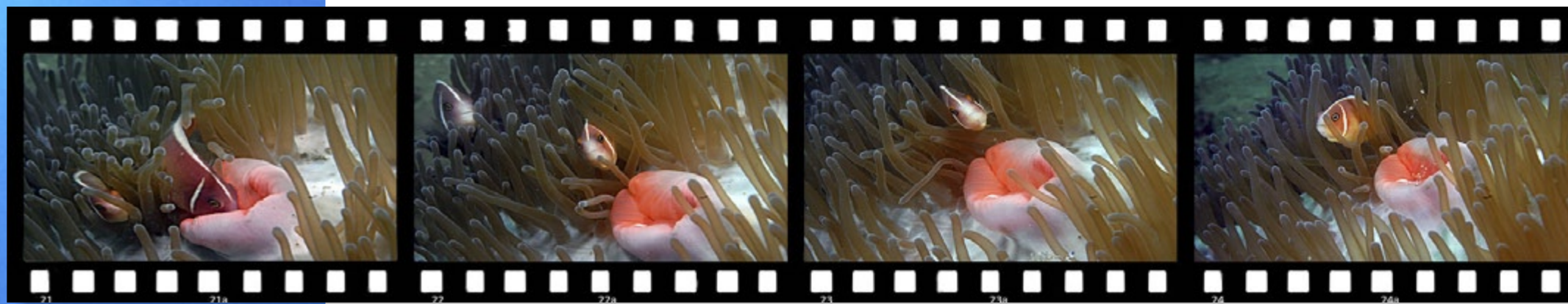


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Film on a lightbox, images for further display work, magazine or book submissions

Then again, I love to see back-scatter in photographs as I feel it gives a better rendition of the dive where the photograph was taken, and I get weary of the super-clear style of photography that many magazines print nowadays.

Sadly, the computer has also reduced our ability to express ourselves after a dive, as I have been witness to many après dive scenes with an entire live-aboard boatload of photographers in front of lap-top computers, downloading, sorting and manipulating photographs with no-body speaking to each other about how wondrous the dive was. It would appear that the sole intention of the trip was to get as many photographs as possible and damn to everyone and everything else!

Now that I have got that out of my snorkel, I am reassured by the many good practices adopted by underwater photographers such as great buoyancy techniques, empathy with the subject matter, not stressing the creatures by taking too many photographs—particularly of light sensitive creatures such as squid and octopus.

Tourist and traveler

One of the earliest travel writers once said that if you visit somewhere that someone else has been before 'you are a tourist', if you go where no one has ever been

before, then 'you are a traveler'. Well, in underwater photography, we are travelers in the tourist domain.

Yes, we visit all of the traditional 'hot-spots', but each time we enter the water, something magical, different and completely personal occurs. We are all travelers in another world, one rarely seen or even imagined—our underwater world.

Here, we have the advantage over our terrestrial counterparts. Here, we can fly, float, hover, duck and dive and approach virtually any subject matter from any angle.

We are not constrained by sharp angles and straight lines (except on shipwrecks), and we do not need to line up the horizon to keep the photograph straight on the horizontal plane. It is in this element that underwater photography comes into its own, and it is here that we will discuss how we can best optimize our time, our equipment, our ever-learning curve and our love of the oceans and all of its marine life.

How dare land photographers cast aspersions on our genre? We do not have the luxury of the time to set up our camp chair, erect a hide, unfold our umbrella and get our packed lunch ready and coffee pot on the boil. At best, we have perhaps 45 minutes to one hour to find the subject, compose the shot, take the picture, and

in that time, try and grab a little vignette of the myriad of colourful fishes and invertebrates that put virtually every land species to shame in colour, diversity, shape and behaviour. Oh yes, nearly forgot—and stay alive at the same time!

So, let's try to stay sensible, at least for the time being, and look at what is on offer and why we should be traveling down the digital highway, albeit a rather watery one at that.

Remember that you are entering into an alien environment, which is extremely corrosive and that will exert great pressure on you and your equipment. You are also working under pressure both literally and mentally. You are moving, the subject is moving; the element you are in is moving. You are usually in low light with the equivalent of slow speed (digital) film, and you are limited with time and depth.

Virtually every photograph will be a "one-off", never to be repeated again, even with the exact information to try and make it possible. You may also be at the whim and beck and call of a dive guide or critter-spotter who will inevitably leave you tired and confused. There may be issues with battery recharging, voltage surges and general misbehaviour by the actual critters you are trying to photograph—who said that this would be easy?

The photographs used to illus-

Sometimes it all comes together!
Whaleshark in the Seychelles



Self Portrait with Nassau Grouper in the Cayman Islands. 10mm lens, ISO 100, twin Sea & Sea YS110 flash, 1/125th second at F8

his career and has authored and co-authored over 45 books, mainly on our underwater world. Lawson is a founding member of the Marine Conservation Society; founder of the first Marine Reserve at St. Abbs in Scotland and made photographic history by becoming the first person to be a Fellow of the Royal Photographic Society and Fellow of the British Institute of Professional Photographers solely for underwater photography.



trate the various sections of the book, *Underwater Digital Photography*, were taken from my vast stock of digital photographs and film photographs that have been scanned digitally. I felt that the inclusion of the photographs helped to illustrate various points to the best of their advantage. No matter what a photographer tells you, we have all embraced the digital age, and even those die hard film photographers have

their photographs scanned. I am only dealing with underwater photography in the forthcoming issues. You will also note a distinct lack of diagrams and drawings to illustrate photographic techniques. I AM NOT A TECHNICAL UNDERWATER PHOTOGRAPHER. If you want this, then read elsewhere! There are any number of highly illustrative books on photography to give you all of the technical data that you need to fill your

brain with. However, no matter what anyone tells you, YOU ONLY LEARN FROM EXPERIENCE, SO GET IN THERE AND DO IT! Above all else, HAVE FUN! ■ With over 35 years of experience in underwater photography, Lawson Wood will look at photographic techniques; storage of photographs; picture format; photoshop quick fixes; protecting copyright; dispel-

ling the myths; explaining the jargon and explain some hints, tips and tricks of the professionals in a series of articles for X-RAY MAG. Lawson was raised in the Scottish east coast fishing town of Eyemouth and spent his youth exploring the rock pools and shallow seas before learning to Scuba Dive at the tender age of 11. Now over 44 years later, Lawson has been fortunate to make his passion

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photo & video



YS-01

The YS-01 is a new compact-type slave strobe that can be used for all applications from wide-angle to macro photography. You can switch between DS-TTL (Digital Slave TTL) and a ten-level manual control function, to enable fine adjustment of the light level according to the photographer's intentions. You can also set up a lighting system that uses two strobes in DS-TTL mode. Power comes from four AA batteries for a powerful and long-lasting strobe. You can enjoy taking pictures all day long without having to recharge the batteries. The recycle time takes about two seconds with nickel-metal hydride batteries (2700 mAh) for stress-free continuous shooting. The YS-01 is furnished with a high-luminance white LED target light (1W) indicating the optical axis of the strobe attached to its front face that is effective for night diving. www.seaandsea.com

Werner light

Werner Light Power's new RingLED introduces perfect shadow-free illumination for underwater photography. Its design is compatible with all video and camera underwater housings with a port diameter of 125 mm (with ring road 36W) and 100 mm (with ring road 54W). Photographers can choose between the Werner RingLED 36W and the brand new, more powerful Werner RingLED 54W with 3 LED rings. If using DSLR underwater housings, it is recommended that one attach the ring road at the front port. With smaller consumer cameras it should be connected to the tripod mounting and the flash hot shoe. Weighing in at a mere 480 grams, its compact design is ideal for travel. www.werner-led.de



3D

Professional aluminum housing with the utmost high-tech specially designed for the Fuji FinePix Real 3D W1, the world's first three dimensional (3D) digital imaging system, allowing users to enjoy 3D images without using special 3D glasses. With the full function buttons and control for the camera, now photographers can take 3D photos and movies underwater with the 10Bar housing. Acclaimed for superb resolution and definition, Fujinon lenses are the choice of professional cameramen and a key component of many professional imaging devices. For the FinePix REAL 3D W1, Fujifilm has developed a groundbreaking image capture system comprising two Fujinon lenses and two CCDs, and the system is integrated in the compact body with high-precision engineering. aditech-uw.com

Mangrove MVD-FX7 (SONY HDR-FX7 / HVR-V1)

The MVD-FX7 video housing's front case is constructed from marine grade aluminum, machined, anodized and protected with a special coating and the rear case is machined from solid Delrin. The camera mounts on a specially engineered stay. The housing's sleek, ergonomic design feels like a natural extension of your hands and makes capturing that perfect video sequence fluid and easy. The housing also adapts to your future Sony video cameras. Redundant double O-ring seal system on the control unit provides maximum protection and does not depend on clamping pressure for security. It is depth-rated to 200m/660 feet, making it the deepest-operating video housing on the market.

aditech-uw.com



Aquatica announces no change required for Canon 1Ds MK IV

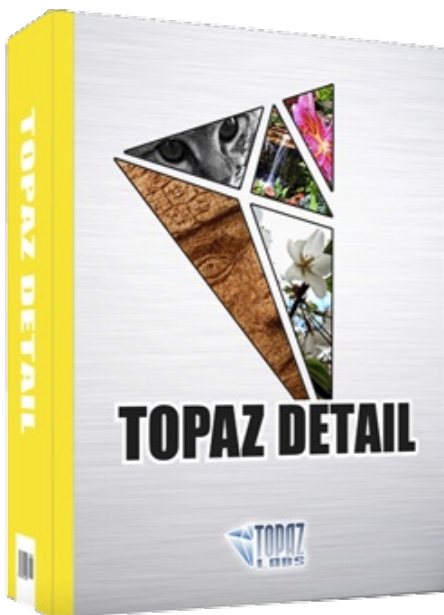
Nowadays, it seems that every time that cameras are upgraded, the required housing needs an upgrade along with it. Canon users will be delighted to learn that the new flagship Canon 1Ds MK IV is a perfect fit for Aquatica's current housing for the Canon 1DS MKIII. No modifications are required and no function or access buttons are sacrificed when using the newer Canon body. Access to the video mode of the Mk IV model is not a problem as easy access to the FEL button used to activate video capture was already in place as well as exposure compensation, ISO and the illuminator buttons. Reassignment of these functions through the DSLR's custom menu setting is not necessary.





Samsung AQ100

Samsung Digital Imaging Company has announced its newest underwater digital camera, the Samsung AQ100. Boasting a 12 mega-pixel sensor and 5x optical zoom, the camera is rated to a depth of three metres with an aqua mode button that optimizes underwater photography. Photos can be viewed on its 2.7 LCD screen. The AQ100 shoots High Definition video at 750 frames per second. A release date of April 2010 is planned. ■



Topaz Labs announces the release of the Topaz Detail 2 Photoshop plug-in

Topaz Labs has upgraded Topaz Detail 2, a detail enhancement and sharpening plug-in for Photoshop that specializes in detail enhancement without creating image artifacts or noise. Utilizing a redesigned user interface with additional tools and presets, the new technology enhances detail and micro-contrast, with no over-sharpening, edge artifacts or halos—which often occur with other sharpening tools. Compatible with Windows and Intel-based Macs, Topaz Detail 2 is offered as a free upgrade for existing customers and retails for \$39.99. To sign up for a free 30-day trial, go to: www.topazlabs.com ■

SEA&SEA product protection

SEA&SEA has just announced a one-of-a-kind program to help underwater photographers protect their valuable investments. The question is not if a flood will occur, but when. Sea and Sea's new Protection Plan enables photographers to protect their gear for a fraction of the cost of replacement equipment. Photographers purchasing compact digital cameras sets or strobes from an authorized SEA&SEA dealer may choose to



enroll in a one-year (12 month) damage protection plan against accidental damage or flooding. The new supplementary product protection is easy to sign up for online within 30 days of purchase. ■



As any underwater photographer can attest to, water and electronics is an uneasy partnership. One of my all-time most stressful moments was the first time I assembled my brand-new housing and cringing, gingerly lowered it into the rinse tank. No matter how careful you are at making sure the o-rings are clean and everything is sealed properly, the dreaded *what-if* scenario of a flooded housing can't help but creep into your consciousness.

For Hugyfot users, those cringe-worthy moments can be a thing of the past with the award-winning Hugycheck system. The premise is simple yet highly effective. HugyCheck is a pre-dive check system that tests your housing to see if it has been properly sealed and whether the o-rings are in good condition. Boasting refined electronics, a pressure sensor is installed in the housing and coupled to the unit that interfaces the camera synch on the hotshoe with the housing synchro port. Upon installing a CR123A 3V battery, the HugyCheck system will beep twice before turning to stand-by mode. The red LED on the camera's hot shoe will then blink every five seconds, indicating normal air pressure within the housing.

Checking out Hugycheck

The electrical vacuum pump will then create a slight under pressure inside the housing, which can then be monitored via the LED pressure indicator attached to the camera's hotshoe. Newer housing models will have an additional bulkhead installed, but on older housings like the model for my venerable old D200, will have the necessary valve installed via a splitter on one of the pre-existing bulkheads.

I recently tested the system on a liveaboard trip in the Philippines. The operation was a breeze! The entire procedure must be commenced at least 30 minutes prior to the dive. After lightly greasing the housing's main o-ring and ensuring it was dirt-free, I attached the back of the housing and sealed everything up. After unscrewing the cap of the top valve on the splitter, I inserted the plug on the electrical vacuum pump into the one-way valve and pressed the button on the pump. Once



the system detected a pressure between 950 and 850 hPa, the red LED started to blink once each second. When a pressure between 850 and 750 hPa was reached, the red LED started to

blink three times per second. Finally, at a pres-

sure of 750 hPa, the red LED I stopped blinking, and the green LED came on. And that was it!

Amazingly, once the procedure had been completed, the back of the housing was on tight. Even if the screws sealing the housing back are removed, the inside pressure created by the pump ensures the housing back remains locked in place. To remove the camera from the housing, the valve on the splitter must be removed first. Once air gets back in through the open valve, the back can then be opened.

On one occasion, the green ready light refused to come on indicating there was an improper seal somewhere. After removing and then re-attaching the housing back, the problem persisted. Then, I removed the adaptor for my macro-port, re-attached it, and I re-attempted the entire procedure. The green ready light finally came on, and I was safe to go on my dive.

For Hugyfot users, this ingenious piece of equipment is a welcome addition to their underwater arsenal. While small, it provides very big peace of mind indeed. Price: 295 Euro Hugyfot.com

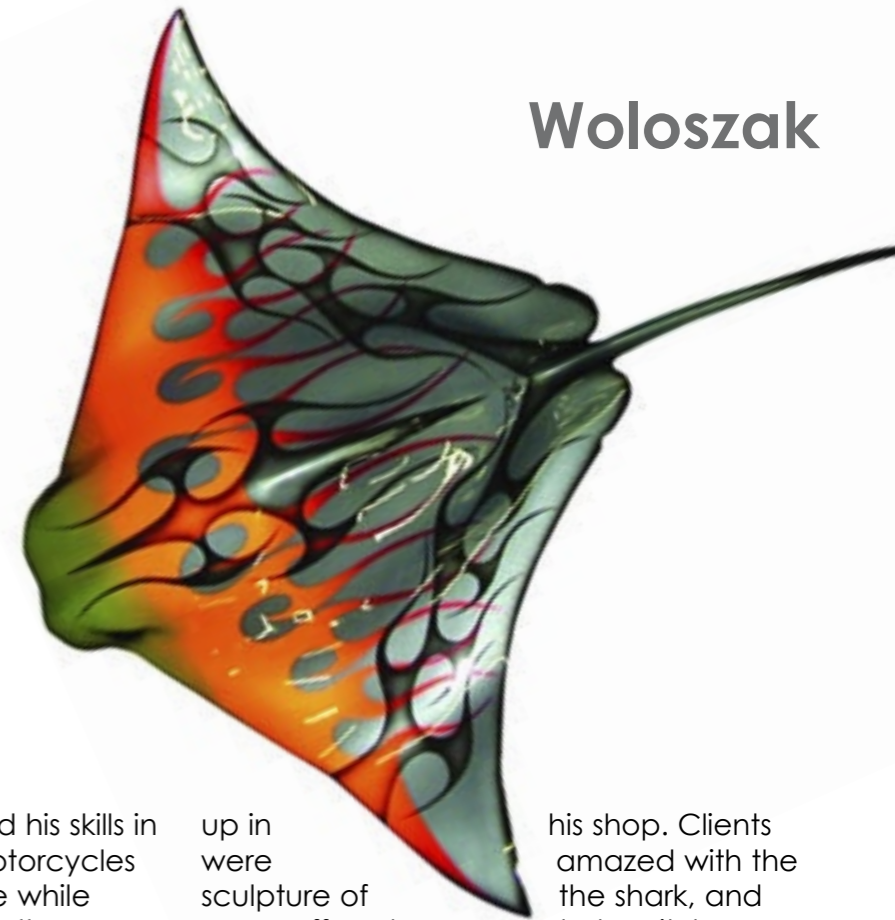
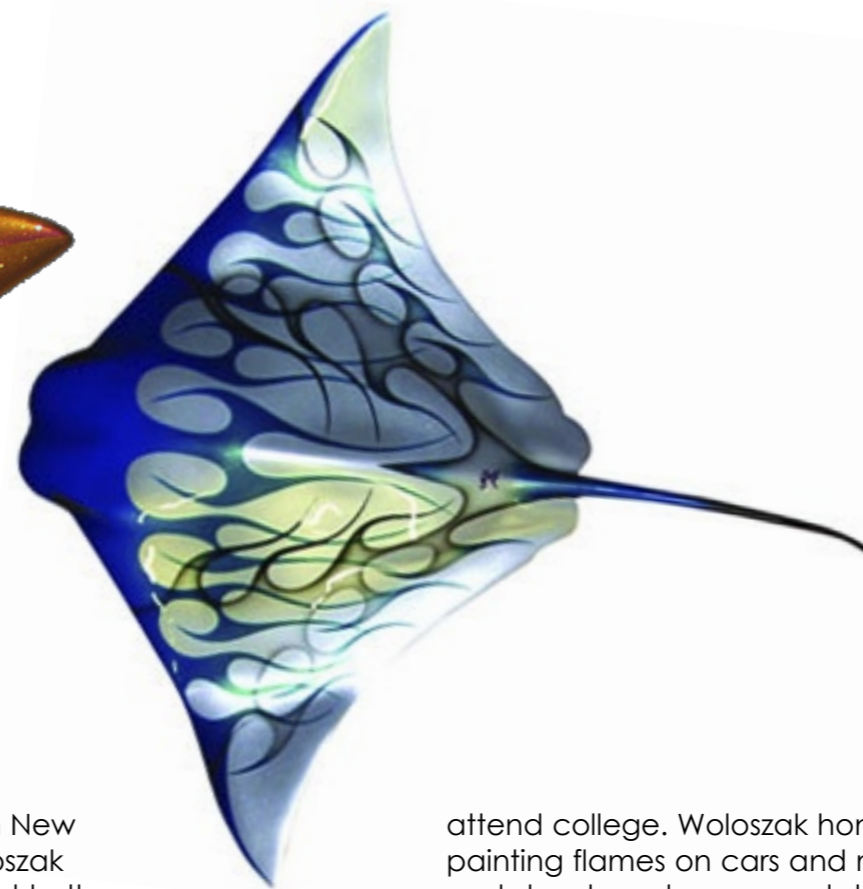
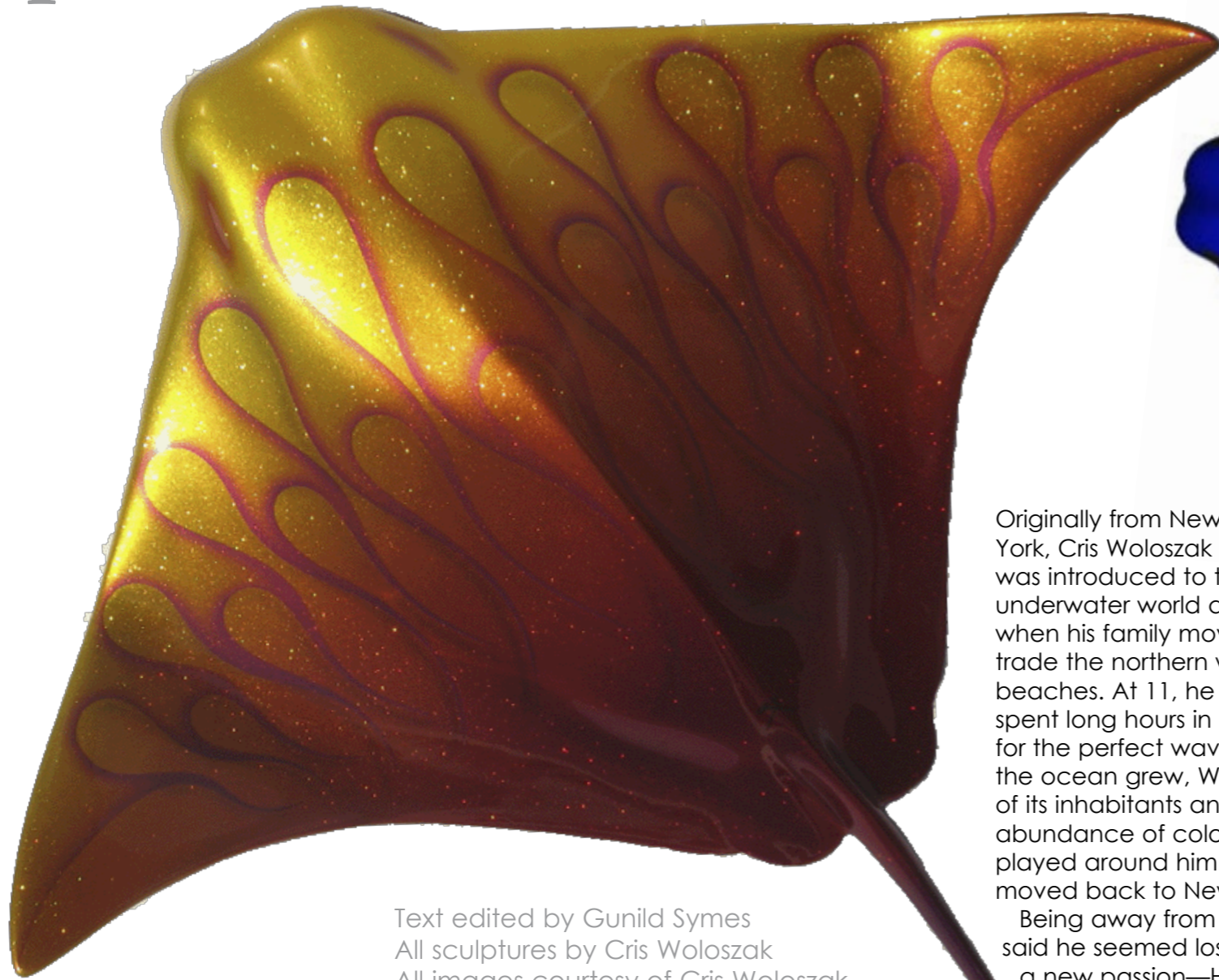
— Scott Bennett

Cris Woloszak



P O R T F O L I O





CLOCKWISE:
Tequila Sunrise Devil Ray
36 inches

Silver Devil Ray with Blue and
Black Tribal Flames, 36 inches

Charcoal Devil Ray with yellow,
orange and red flames
overlayed with black tribal
flames, 36 inches

Candy Apple Eagle Ray with
Silver, Yellow and Orange
Tribal Flames, 38 inches

All sculptures by Cris Woloszak

Text edited by Gunild Symes
All sculptures by Cris Woloszak
All images courtesy of Cris Woloszak

American sculptor, Cris Woloszak, has created sleek, fast, Hot Rod creatures from the deep in fiberglass, donning flames and sparkling, glazed paint jobs. They are revving up the waves in the dive world, and X-RAY MAG was bound and determined to find out how and why this artist does what he does and where his talents are leading him. Take a look...

Originally from New York, Cris Woloszak was introduced to the underwater world as a young boy when his family moved to South Florida to trade the northern winters for the tropical beaches. At 11, he started surfing and spent long hours in the ocean, "waiting for the perfect wave". As his love for the ocean grew, Woloszak sat in awe of its inhabitants and marvelled at the abundance of colorful marine life that played around him. At 14, his family moved back to New York.

Being away from the beach, Woloszak said he seemed lost, "that is until I found a new passion—HOT RODS!" His father had taken him to the Lead East Car Show where the young Woloszak saw his first custom paint job.

He said, "I was blown away by a flame job on a '32 Ford; it was candy teal with ghost flames!" At that moment, Woloszak became determined to learn and master the skill. "My new passion was born on that day," he said.

After graduating from high school, he threw his tools and surfboard into his car and headed back to South Florida to

attend college. Woloszak honed his skills in painting flames on cars and motorcycles and developed a personal style while painting his friends' vehicles. Shortly thereafter, his work was noticed by a growing audience, and people sought him out to paint their cars and motorcycles.

"One day," said Woloszak, "I walked into an art gallery and saw a bronze sculpture of a dolphin and thought, 'Wouldn't that look cool with a flame job on it?' Soon after, I came across a taxidermy Bull Shark and decided to apply my flame technique." He painted the shark candy red with gold flames.

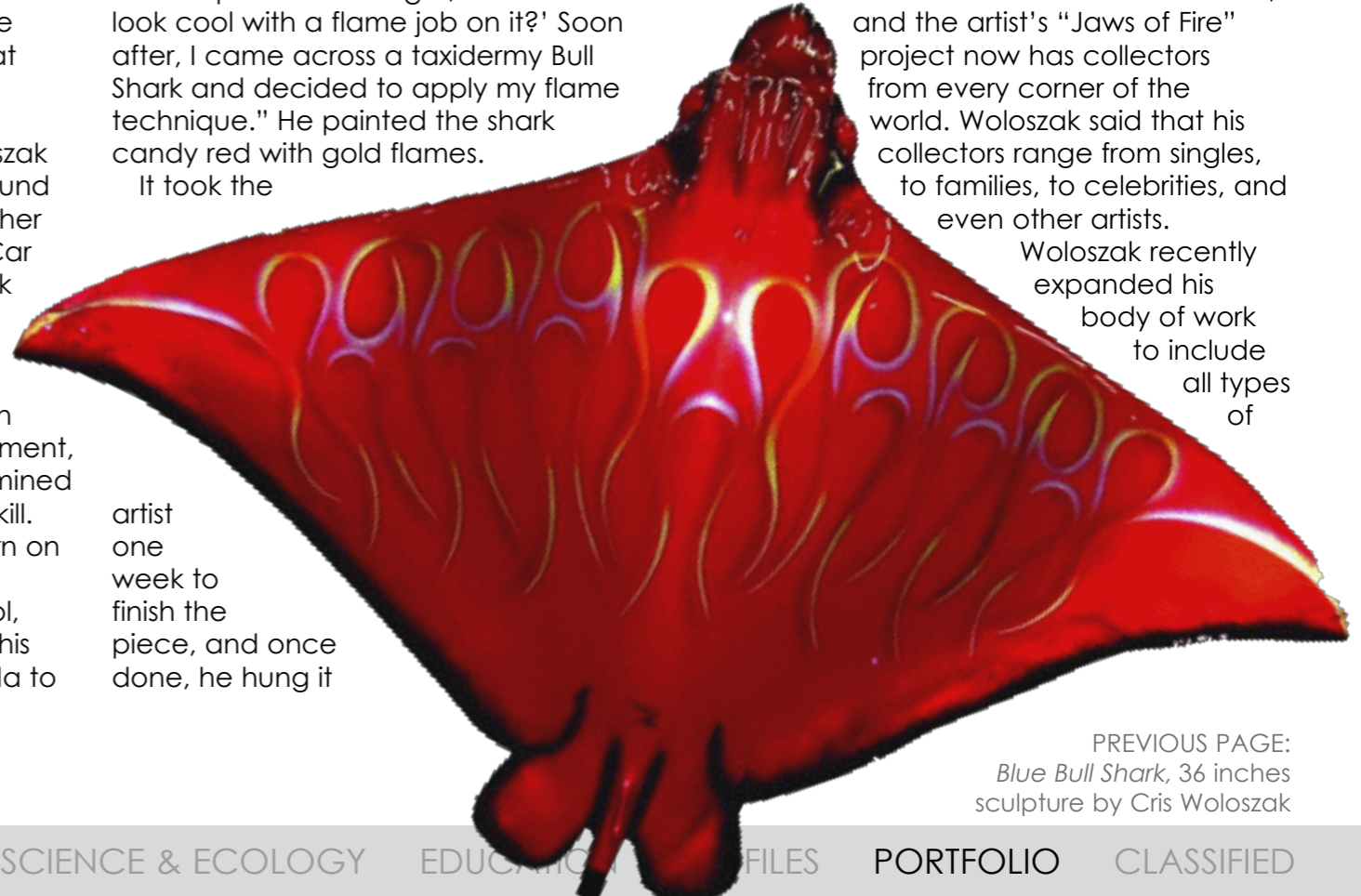
It took the

artist one week to finish the piece, and once done, he hung it

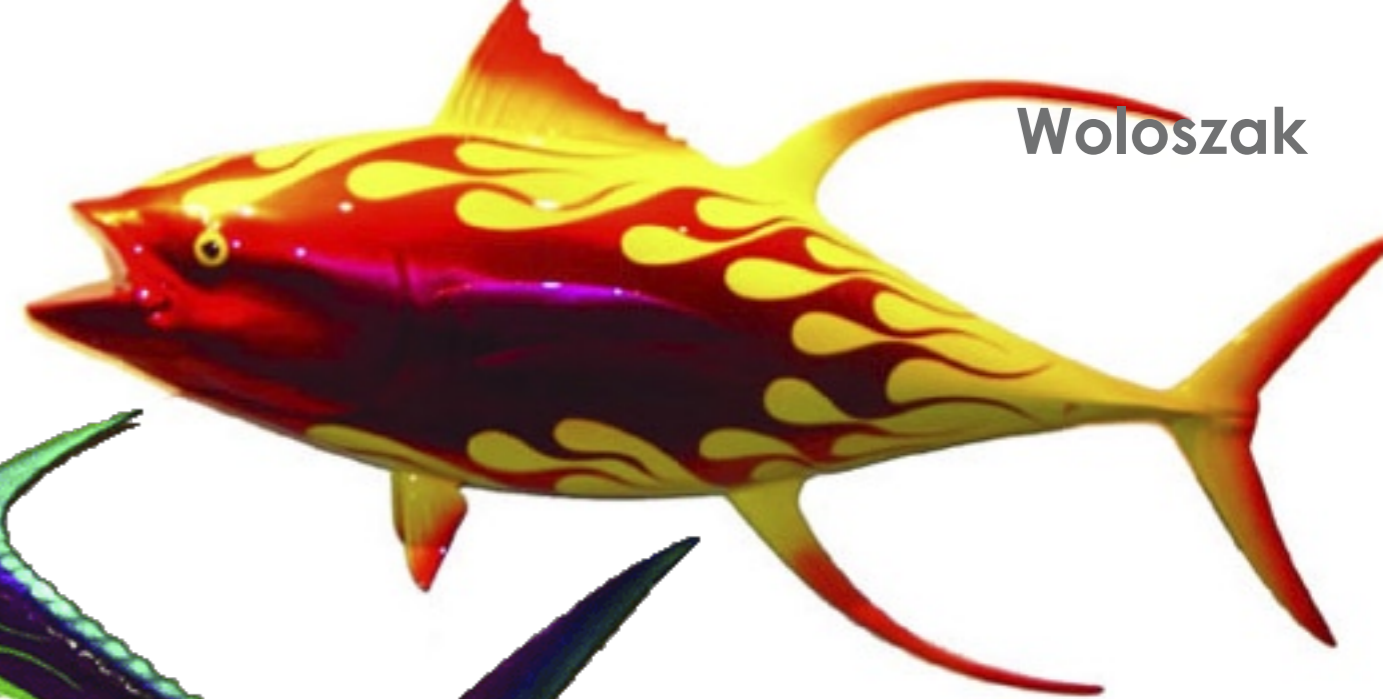
up in his shop. Clients were amazed with the sculpture of the shark, and many offered to buy it, he said. Woloszak then purchased several more mounts, and he said, "my creativity began to flow".

"The first shark I placed in an art gallery lasted three hours before it was sold," said Woloszak. Success soon followed, and the artist's "Jaws of Fire" project now has collectors from every corner of the world. Woloszak said that his collectors range from singles, to families, to celebrities, and even other artists.

Woloszak recently expanded his body of work to include all types of



PREVIOUS PAGE:
Blue Bull Shark, 36 inches
sculpture by Cris Woloszak



fish, turtles and other animal life. He has also produced and sold numerous works of metal art. The artist also accepts commissions to paint cars, motorcycles, boats, planes and other vehicles.

I was so excited to see what the next one looked like," said Woloszak. "As I got older, my dad introduced me to Bill 'Bigs' Eich, owner of Too Kool Kustoms in Lake Worth, Florida. Bigs became my biggest influence and mentor in the custom painting business." As their relationship grew, Eich allowed Woloszak to watch him work. "He wouldn't reveal his trade secrets, but I watched everything

Role models

"As a young kid, my dad, Ray Woloszak, took me to several car shows. He had hot rods, and because of his influence, I fell in love with them as

well. My dad and I would marvel at the unique paint jobs that each hot rod displayed.

he did. I would then rush home and practice what I had seen." As Woloszak continued to practice and hone his skill, he developed his own style of painting, design and use of color. "As my love for painting hot rods and the ocean increased, I was inspired to start the Jaws of Fire project of mixing marine life and custom art." After his work began

selling in fine art

galleries, Woloszak was introduced to the larger world of fine art. "Since that time, I have developed a true appreciation for fine art and have had the opportunity to meet several amazing artists," he said.

Method

As for how his hot rod creatures of the deep are created, Woloszak said that every sculpture begins as a fiberglass blank. "I spend most of the day perfecting the surface of every piece by sanding it to a

smooth finish. This step assures that each coat of candy paint lies flawlessly. Every time I begin a piece, it consumes more time than I planned for, but always comes out better than I expected. I have always done things the hard way, but in the end, it's worth it," he said.

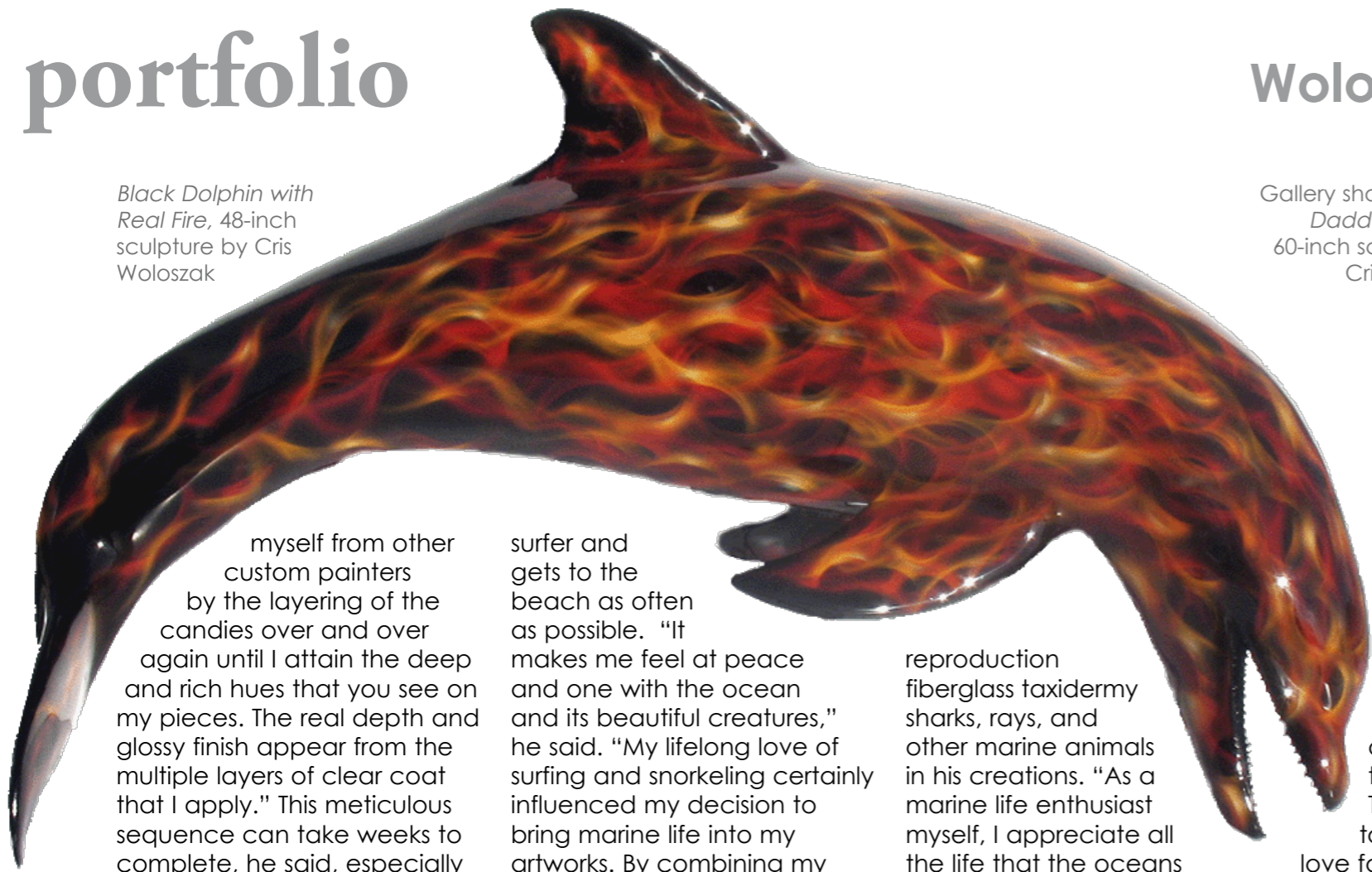
Between the base coat and the final clear coat, there can be over 40 layers of paint on a sculpture. Woloszak said, "What you see sparkling from beneath the transparent candy color are several silver layers of paint or metal flake."

The candy application is the most labor intensive process in which to achieve a flawless finish he said. "I separate

CLOCKWISE FROM TOP LEFT: Purple People Eater Mako Shark, 72 inches; Candy Violet Permit with Planet Green Flames, 32 inches; Yellow Yellow Fin Tuna with Candy Apple Red Flames, 60 inches; Candy Apple Red Hammerhead Shark with Black Ghost Flames, 40 inches. All sculptures by Cris Woloszak

portfolio

Black Dolphin with Real Fire, 48-inch sculpture by Cris Woloszak



myself from other custom painters by the layering of the candies over and over again until I attain the deep and rich hues that you see on my pieces. The real depth and glossy finish appear from the multiple layers of clear coat that I apply." This meticulous sequence can take weeks to complete, he said, especially for detailed commissions.

Diving

So, does the artist scuba dive to see his subjects? "I am not currently a certified diver, but my manager is, and he keeps urging me to get certified. He knows how much I love the ocean." Although Woloszak is not a diver yet, he is an avid

surfer and gets to the beach as often as possible. "It makes me feel at peace and one with the ocean and its beautiful creatures," he said. "My lifelong love of surfing and snorkeling certainly influenced my decision to bring marine life into my artworks. By combining my love of marine life and my love of custom paint jobs, I am living my dream day!"

The artist uses only

reproduction fiberglass taxidermy sharks, rays, and other marine animals in his creations. "As a marine life enthusiast myself, I appreciate all the life that the oceans have to offer. I hope that my artwork will inspire people to further their appreciation of marine life and its need for protection," he said.

Woloszak

Gallery shot of *Purple Daddy Bull Shark* 60-inch sculpture by Cris Woloszak



About art

Woloszak is passionate about art. He said, "Art, to me, is not only fun but a way to reach people. I developed a skill that others appreciated, and that I found exciting. Through art, I am able to express myself and my love for the oceans. I always want my collectors to feel like they have purchased a one-of-a-kind piece of art that was created out of my love for the oceans and custom painting."

Woloszak said that this is the most exciting time in the history of the *Jaws of Fire* project. "I plan on expanding the locations where my art can be seen and purchased. I am poised to have my

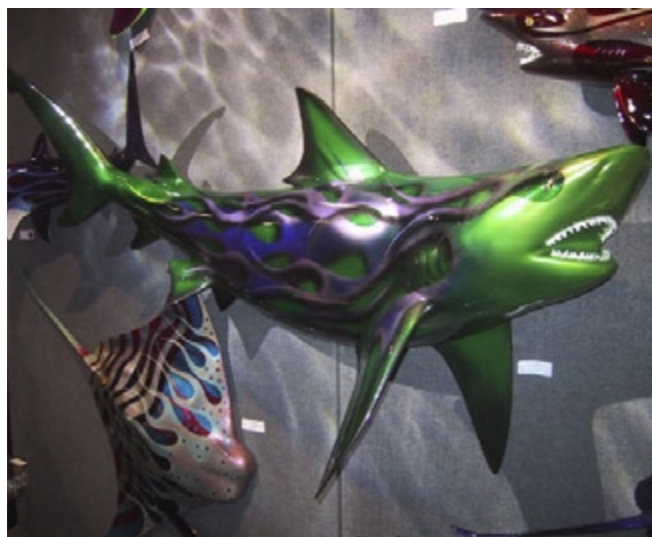
artwork displayed all over the country, in most of the major art markets." He said he is very excited about the expansion of this project and glad that he will be able to share his art with a new, wider audience.

About 20 percent of Woloszak's sales are commissions, he said. "I really like that I am accessible to my collectors and can make them happy with a custom painted piece." If any readers are interested in a commissioned work, they may contact the artist's email address at: customsbycris@aol.com or visit his website at: www.jawsoffire.com.



Black Bull Shark with Real Fire 36-inch sculpture by Cris Woloszak

Gallery shot of *Green Hornet Bull Shark* 72-inch sculpture by Cris Woloszak



IN OUR NEXT ISSUE

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Cave Diving
Churchill



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