



# Shark attacks

## — facts & myths

Text and photos by  
Andy Murch

**Of the 465 or more species of sharks that are currently described, only a handful are regularly implicated in shark attacks.**

The most commonly identified (or perhaps misidentified) sharks include the bull shark, white shark, tiger shark and various reef sharks. Historically sandtiger sharks (AKA grey nurse sharks in Australia, and ragged tooth sharks in Southern Africa) were held responsible for many attacks due to their menacing appearance.

### Not guilty verdict

They have, more recently, been found 'not guilty' in the majority of cases, but the bad press that they initially received plus their docile nature when in contact with spear fishermen, left them wide open to exploitation, and their numbers have been seriously depleted. It is estimated that the schools once common off the east coast of Australia have dwindled to the point of pending extinction with somewhere around 300 individuals remaining.

In most attacks where the

shark escapes, it is difficult (if not impossible) to identify the exact species involved.

### Identifying the culprit

One of the ways that shark attack investigators figure out who is the culprit in an attack is by the examination of teeth that are sometimes left at the scene having been torn

from the shark's jaw during the struggle or embedded in the victim's flesh or equipment. For example, teeth are sometimes lodged in surf boards during attacks on surfers. Another good way to identify individual shark species is by measuring the bite radius, the shape of the wound, and the clean or ragged cut of the teeth. For example, a tiger shark, which has an imposing set of cutting teeth capable of sheering through the shells of large sea turtles, would leave a cleanly severed bite out of its victim. Whereas, a sandtiger or Mako shark, which have dagger-like grasping teeth, would leave a ragged wound if trying to pull away a portion of flesh.



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### Subjectivity

It is often difficult for victims and observers to report objectively on their experiences due to the traumatic nature of the encounters. This combined with a general public's lack of knowledge of shark species leaves investigators lacking for accurate information.

Sometimes, geographic

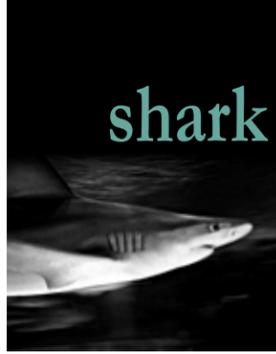
location is the best clue to identification. Some species inhabit areas where few other large sharks enter such as the freshwater range of bull sharks. Attacks occurring far up river are inevitably attributed to this species although in some areas, there are other fresh water sharks, which may be responsible such as the Ganges shark in the river systems of India.

Bull sharks are indeed one of the most gregarious of shark species and have been implicated in attacks as far reaching as New Jersey to South Africa, and the Zambezi River to Lake Nicaragua. In attacks off of the surfing beaches of California, white sharks are most commonly implicated.

Although other species inhabit this area (such as blue sharks), the white shark is responsible in the majority of cases, as its natural behavior and tendency to frequent surf zones lend to the likelihood of attack.

### Hunger, curiosity or mistaken identity?

Attacks occur in many different ways. The majority of white shark attacks do not result in the death of the victim leaving researchers wondering why. Obviously, a large great white shark would have no trouble dispatching



a human if that was its intent, but in many cases, the shark bites the victim once and then leaves. There are many theories as to why white sharks do this.

One theory is that the shark is simply using its sensitive taste, touch and smell to attempt to identify the object in front of it. Unfortunately for the victim, this 'mouthing' can result in catastrophic injury. If the shark is indeed trying to ascertain the victim's content in order to decide whether it is worth eating, then its tendency to leave after the first experimental bite would imply that it finds human flesh either distasteful, or not fatty enough to waste precious energy trying to digest.

## Hypothesis

Another hypothesis is that the

white shark is following its natural 'bite and bleed' instinct that it uses when tackling dangerous prey such as California sea lions. White sharks have repeatedly been documented to attack large seals explosively and then retire to a safe distance while the animal bleeds out. This strategy probably saves the shark from serious injury from the teeth and claws of the wounded prey. But, if this is the reason that humans are only bitten once and then abandoned, one wonders why the shark does not return before the individual is dragged from the water or manages to swim to safety.

Even if the extent of the injuries

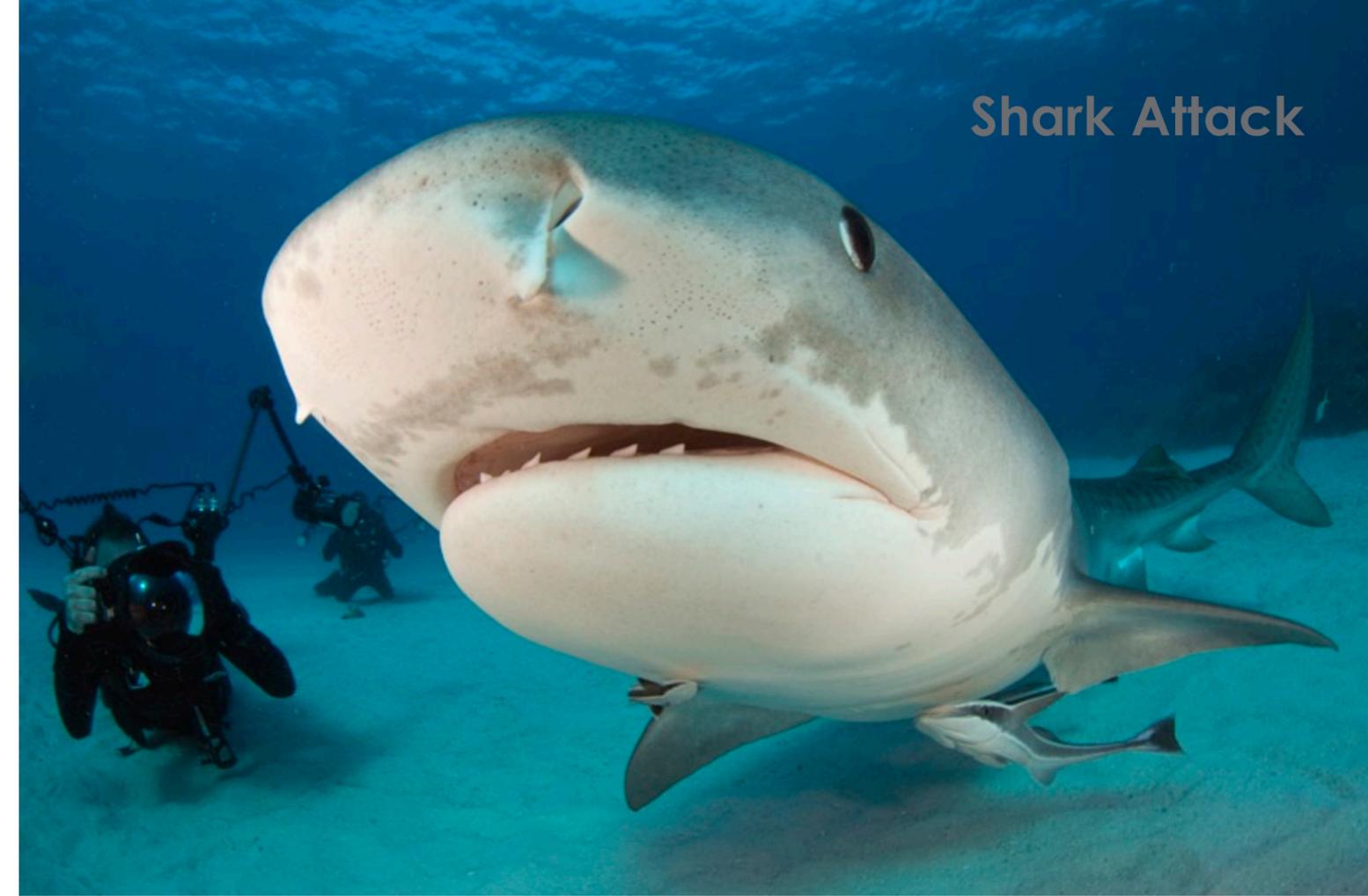
*There are probably a multitude of correct reasons why sharks bite depending on circumstance. What really goes on in a shark's brain may never be truly understood.*

Islands off the western seaboard of Australia in March 2005. The ferocity of the attack, which was witnessed by other swimmers, indicated that the shark was single-mindedly attempting to eat the victim and a cursory search for remains was almost immediately called off. At that time of year, transient white sharks arrive from South Africa having spent many weeks crossing the open ocean where food is in limited supply. It is suspected that the resulting hunger of these sharks is such that they are likely to attack and consume whatever is available upon their arrival off the Australian coast.

## Turbid waters

Many attacks on swimmers occur in turbid water. This lends weight to the idea of mistaken identity i.e. the shark sees the moving light colored leg of the victim thrashing around in the surf and instinct kicks in. The shark expects a wounded fish and clamps down on the visible appendage only to find out that it is attached to a large struggling human. This mistaken identity scenario has also

prove fatal, the body of the victim is rarely consumed by the shark although this does happen. A snorkeler was killed in the Abrolhos



# Shark Attack

been attributed to attacks on surfers where the silhouette of the surfer on his/her board, when viewed from below, looks like the outline of a sea lion. In both of these instances, the shark, which generally has excellent vision, is made out to be somewhat less intelligent than it probably deserves.

## Not food related

It may be that some shark bites are not food-related at all. How better for a curious shark to explore its environment than to chomp down on an interesting object. There are probably a multitude of correct reasons why sharks bite depending on circumstance. What really goes on in a shark's brain may never be truly understood.

## Shark attack capital

In the summer of 2003, a 'feeding frenzy' occurred in Florida. At

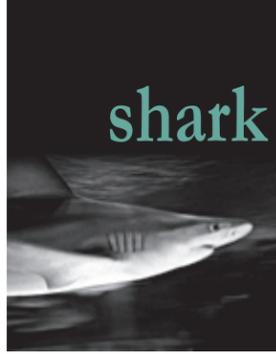
the same time, there were also a few shark attacks, some of which tragically ended in fatalities. The 'frenzy' was a product of the media that was blown completely out of proportion. The coverage resulted in serious repercussions in the shark world. Although the amount of attacks was no greater than previous years, the media starved for real news, worked the attacks until politically motivated officials called for a ban on shark feeding in state waters. The bill was passed, and the operators feeding nurse sharks around Boca Raton and other places suffered financially. Divers looking for their first shark interaction in the wild also suffered. The next year, the attacks continued.

## Baiting

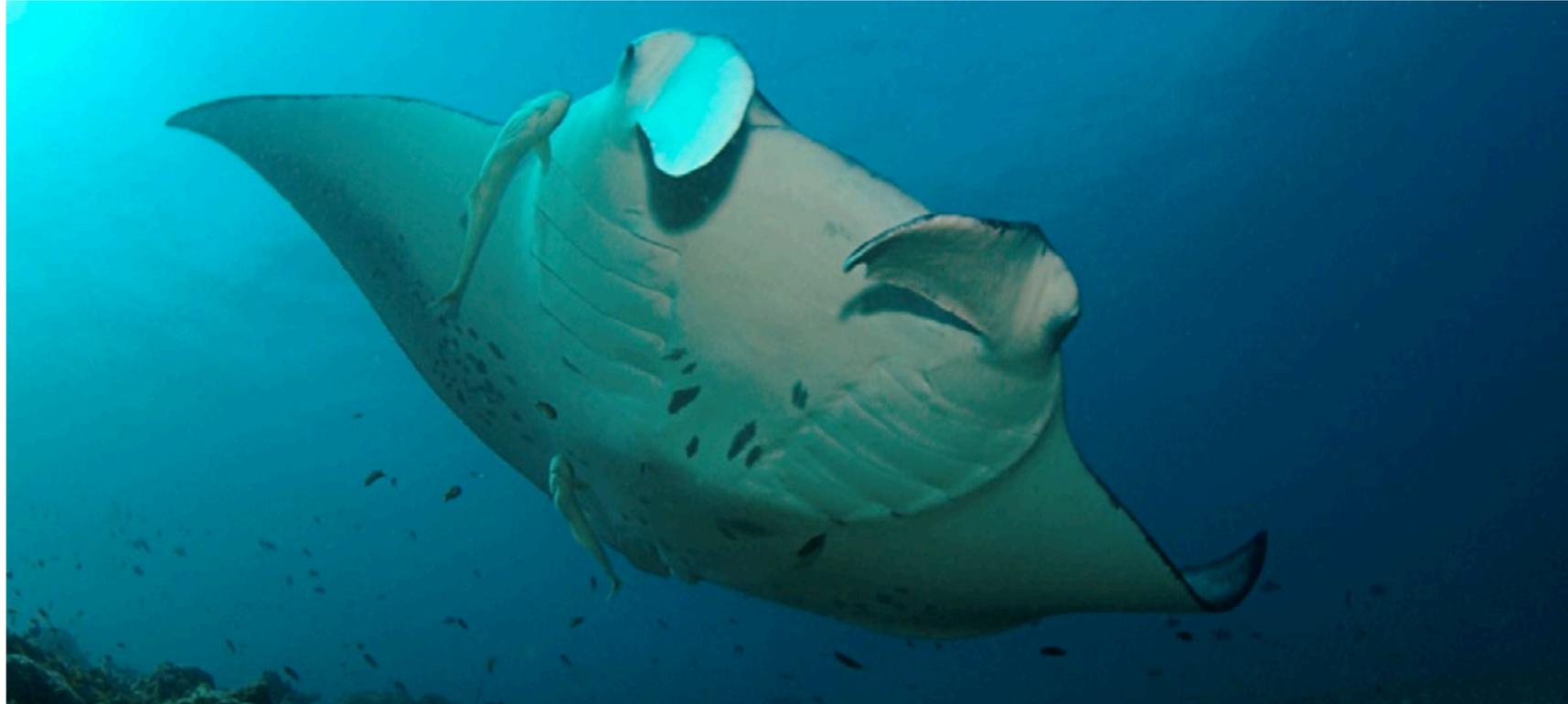
What is worth pointing out is that the fishing charters and pier fishers were still allowed to bait indiscriminately for sharks. The main beach attack grounds are surrounded by fishing piers where bait and fish scraps are tipped into the water mere yards from frolicking beachgoers. The nurse shark feeds took place way off shore and attracted sharks that have not been implicated in the Florida attacks, and even if they were, their dentition would result in minor wounds compared to the reef sharks that were being fished off the beaches. Presently, the dive operators negatively affected by the ban are lobbying for its removal, but with limited funds at their disposal, a return to shark diving in Florida is unlikely. ■

For more information on caring for a victim of shark attack, please visit: <http://elasmodiver.com/Shark%20Attacks.htm>





# Mantas designated vulnerable species



MICHAEL AW

## Giant and reef manta rays added to the Red List of Threatened Species by the International Union for Conservation of Nature (IUCN).

IUCN's Shark Specialist Group (SSG), a worldwide network of scientists based at Simon Fraser University (SFU) in British Columbia, Canada, and co-chaired by SFU biologist, Nick Dulvy, has declared manta rays 'vulnerable' with an elevated risk of extinction due to intense fishing and a growing scarcity of food.

The IUCN Shark Specialist Group has recently completed the Red List assessment of all 1,044 chondrichthyan (cartilaginous fishes

– Ed.) species. Manta ray populations have declined by as much as 80 percent in several regions over the last 75 years and by more than 30 percent worldwide.

### Two species

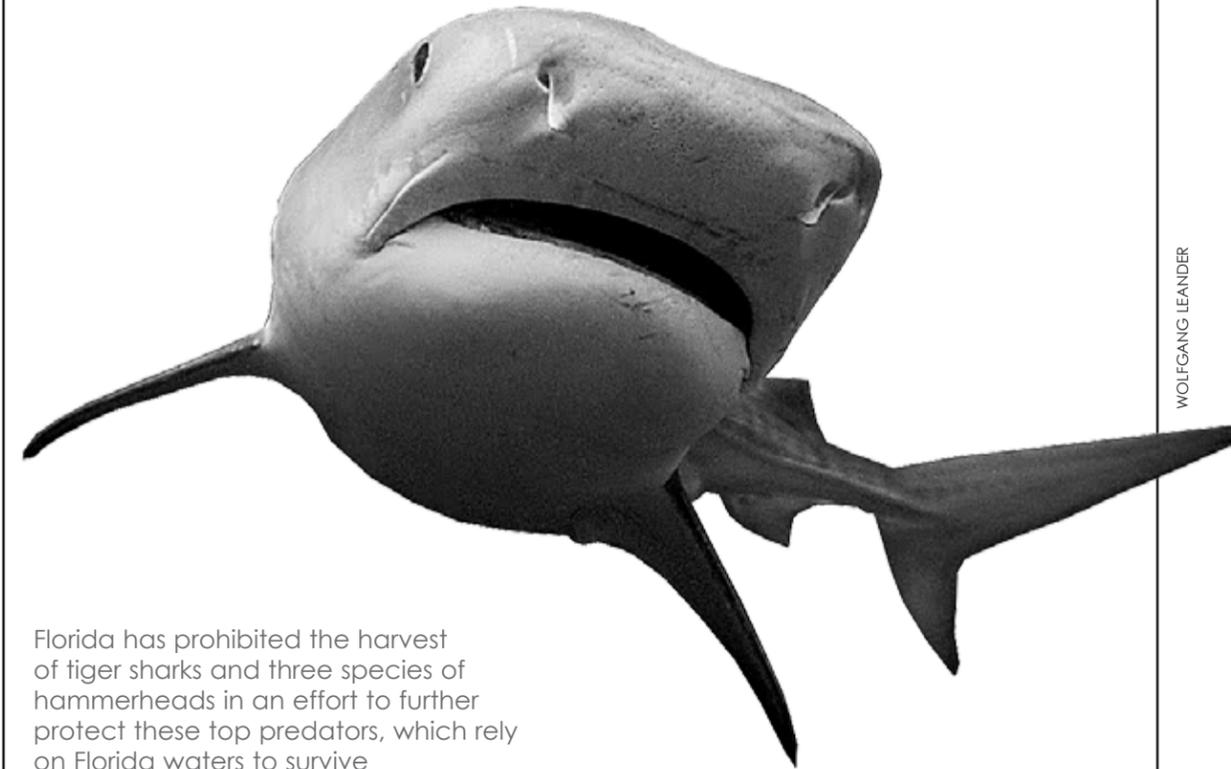
Comparisons of field observations recently revealed that there are actually two species of 'manta': the reef manta ray (*Manta alfredi*) and the giant manta ray (*Manta birostris*), both of which are now classified as vulnerable.

The Giant Manta Ray is the largest living ray, which can grow to more than seven meters across. Manta Ray products have a high value in international trade markets and targeted fisheries hunt them for their valuable gill rakers used in traditional Chinese medicine.

Monitoring and regulation of the exploitation and trade of both manta ray species is urgently needed, as well as protection of key habitats. ■

*Swimming, diving and filming with manta rays are major eco-tourism activities generating US\$100 million annually worldwide.*

# Florida steps up protection of sharks



WOLFGANG LEANDER

Florida has prohibited the harvest of tiger sharks and three species of hammerheads in an effort to further protect these top predators, which rely on Florida waters to survive

## The U.S. Florida Fish and Wildlife Conservation Commission (FWC) prohibits the commercial and recreational harvest of four shark species.

An estimated 800,000 sharks were killed by recreational fisherman off the Gulf coast and Atlantic waters between 2004 to 2008.

The new measures, which also prohibit the possession, sale and exchange of tiger sharks and great, scalloped and smooth hammerhead sharks harvested from state waters, became effective on 1 January 2012. These sharks can still be caught and released in state waters and can be taken in adjacent federal waters. The change got its start in 2010, after concerned citizens, shark researchers and shark anglers expressed their desires to the Commission to see increased protections for sharks.

Florida waters offer essential habitat

for young sharks, which is important for species such as the slow-to-reproduce tiger shark, which takes about 15 years to reach maturity.

Sharks have been strictly regulated in Florida since 1992, with a one-shark-per-person, two-sharks-per-vessel daily bag limit for all recreational and commercial harvesters and a ban on shark finning. Roughly two-dozen overfished, vulnerable or rare shark species are catch-and-release only in Florida waters.

The FWC is also working on an educational campaign highlighting fishing and handling techniques that increase the survival rate of sharks that are caught and released while ensuring the safety of the anglers targeting them. ■



*“If it hybridizes with the common species it can effectively shift its range further south into cooler waters, so the effect of this hybridizing is a range expansion. It’s enabled a species restricted to the tropics to move into temperate waters.”*

— Jess Morgan, University of Queensland

## First observation of shark hybrids



UNIVERSITY OF QUEENSLAND PRESS RELEASE

This hybrid blacktip shark contains both common and Australian blacktip DNA

**The newly discovered hybrid shark is a combination of Australian blacktip shark and its global counterpart, the common blacktip shark.**

Scientists have found that sharks on Australia’s east coast display a mysterious tendency to interbreed, challenging several accepted scientific theories regarding shark behaviour. Researchers from

University of Queensland have discovered widespread hybridisation in the wild between two shark species commonly caught in Australia’s east coast shark fisheries—the Australian blacktip shark and the common

blacktip shark. Initial studies suggested the hybrid species was relatively robust, with a number of generations discovered across 57 specimens.

Some of these hybrids were first generation or what is technically referred to as “F1”. This means that one parent was a common blacktip and one was an Australian blacktip. Others were backcrossed (“B+”), which means that one parent was a common blacktip-Australian blacktip hybrid, and the other was a “purebreed” of one of those two species. According to the study’s lead author, Dr Jess Morgan of the University of Queensland, this means that these animals are reproductively viable. The hybridization and backcrossing has probably produced many more generations of mixes, but the existing genetic markers can’t distinguish how many generations past the second cross have occurred.

The two blacktip species are very closely related (termed sister species), and this is probably why their hybridization has been successful. The Australian blacktip is slightly smaller than its common cousin and can only

live in tropical waters, but its hybrid offspring have been found 2,000 kilometers (1,243 miles) down the coast, in cooler seas.

### Reaction to climate change?

This has led to some speculation in the media that the Australian blacktip could be adapting to ensure its survival as sea temperatures change because of global warming. However, there is no evidence that supports the notion that the hybridisation is a reaction to climate change, and much of the debate displays an all-too-common lack of understanding of how evolution works.

Common blacktips have a much wider distribution and are found worldwide, including throughout the more restricted range of the Australian blacktip. The area where the ranges of two species capable of interbreeding overlap is called a “hybrid zone”. Scientists expect to see more hybrid zones as climate change

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SHARK DIVING AT SANDTIGER CENTRAL, MOREHEAD CITY, NORTH CAROLINA, USA

alters the ranges of numerous species.

### Are they the only ones?

These animals may be the first hybrid sharks to be detected by scientists, but are likely not the world’s only hybrid sharks. Other closely related shark and ray species around the world may be doing the same thing; we just have not discovered it yet. Different shark species often have varied mating behaviors, which was thought to make such hybridization extremely unlikely. Though hybrids have long been known in many other groups of organisms, it’s just the first time that it has been observed in sharks.

It has also been hypothesized that the hybridisation is a reaction to overfishing, which has reduced the populations of both

*“We do not believe that climate change triggered the hybridization event.”*

— Jess Morgan, University of Queensland

species. However, assessments suggest that they are relatively productive species and that populations are not at dangerously low levels. It should also be noted that sharks have long generation times, so the original hybridization detected in this study has to have been going on for at least several decades. That long ago, shark populations were much healthier than they are now. ■



# Diving in the Jungle

*Kan – Maanghit Cave Samar, Philippines*

Text and photos by  
Bruce Konefe

**The island of Samar is located in the Eastern Visayas region of the Philippines. It is known for its serene living. The island has a beautiful coastline with beautiful rainforests and a rugged limestone terrain. As you travel through Samar, you will see many low level mountains with beautiful waterfalls and streams. The island of Samar does not have a distinct rainy or dry season, but if you would like to go, the months from April to July would be considered best.**

This past August, our group of underwater cave explorers arrived in Samar to explore new cave systems and a system that we had discovered the previous year. As team leader, I met with divers, William Hudson and Thomas Bodis, and our local Philippino guide, Joni Bonifacio—owner of Trexplore in the capital city of Catbalogan in Samar.

Traveling one and a half hours by jeepney to nearby Barangay Campo Uno Paransas, our team of four met the owners of the three boats that would take us and our equipment up the Ulot River.

The boats were about four meters

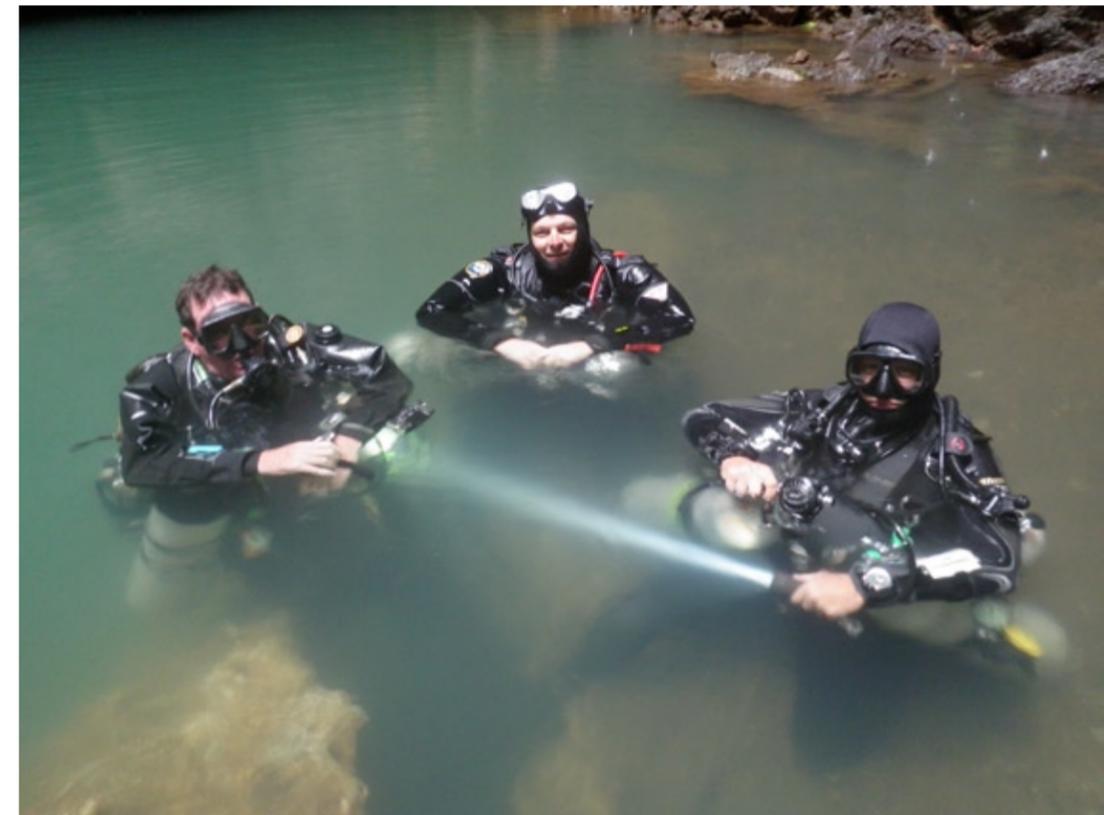
long, powered by 10-hp Honda motors. The boats road so low over the water, that one could stick a hand over the side and into the water. It was quite amazing that we were able to fit a compressor, 18 dive tanks, three large dive equipment bags and a few other bags into the boats without sinking them. The ride up the Ulot River was a beautiful and exciting ride, which took 2.5 hours before arriving in the village of Barangay Salvation in eastern Samar.

The villagers told to us about a cave entrance that ran out of the mountains, which was just ten minutes up the stream. Upon arrival, we found a crack in the stone wall, but once we descended down to about 24 meters, it opened up wide

enough to get through.

The water was very cold (luckily, some of us wore drysuits) and also had a very strong current coming out of the cave. We pulled our selves down, squeezing through the large lime stone rock. The visability was quite good, and the passage widened a lot. However, it was a good thing that the team had decided to use sidemount equipment to get through some of the smaller holes.

We worked our way down to about 34m when we hit our rule of thirds and turned the dive. At 34m, the cave kept getting deeper, and the passageways got much larger. To explore the cave further, we would have needed trimix and nitrox to do the dive safely.



THIS PAGE: Scenes from Kan —  
Maanghit Cave in Samar, Philippines





THIS PAGE: Villagers from Barangay Salvation look on as the dive team prepares equipment and packs the boats that will take them up the Ulot River toward the cave



There had been excellent visibility going in, but when the three of us turned around, the visibility decreased a lot. After a few meters of crawling our way out, the visibility cleared up. The problem we had to concentrate upon now was holding onto the large boulders so we would not get blown out and miss the decompression we had built up on the dive.

Once everybody was safe and sound back

on the boat, we headed back to the village where we started planning the next day's trip into the jungle.

Samar is really just starting to expand into cave diving activities. So, to acquire dive tanks, the team had to have them sent by minivan from the town of g1, which is five hours away from the local BFAR (Bureau of Fisheries and Aquatic Resources).

The village of Barangay Salvation is located

in a very remote area. The town has electricity for only about four hours each evening when there is enough fuel to run the generator. The people of Salvation were wonderful to us and let us stay in their own houses. They fed us some fabulous meals. On one special occasion, they served us *carrabo*, which was the most tasty meal of the trip.

The village is the local haunt of a Philippine military post, which has a lot of guys with



CLOCKWISE FROM LEFT: The crack leading to the Kan – Maanghit Cave; Riding the Ulot River to the dive site; Carrying dive equipment through the jungle; The dive team's camp near the cave



ies for us in the evening.

Our guide, Joni, organized a group of 18 porters from the village who helped carry all of our equipment into the jungle to Kan – Maanghit Cave. The journey to the cave took us about 2.5 hours, hiking

through fields, steams and jungles.

**At the cave**

As we walked through the waist-

deep water, there were thousands of bats swarming around. It was not unusual for the bats to fly right into us as we were walking.

We reached the place where we would dive, but not everybody had arrived yet. As we were waiting for the rest of the team, there was suddenly a lot of screaming, and porters were running in all directions. It turned out that the porters had come across a four-meter-long python snake.

For the next four days, we camped in the area in order to explore Kan – Maanghit Cave. Our plan for this trip was to extend the line we had previously laid last year. But, from the very first dive,

nothing went as we had planned.

During the past year, the water had risen so high that the people in the village had to move into the mountains. At the dive site, the flow of the water had strung the line all over the inside of the cave.

On the way to the cave, William and I made a small bet on whether the line would still be in the cave or not. I bet that the line was still there but almost wished it had been washed away. The line actually become a hazard while we were in the cave and really complicated the dives. We decided to repair the line as best as we could but then focus on exploring other parts of the cave.



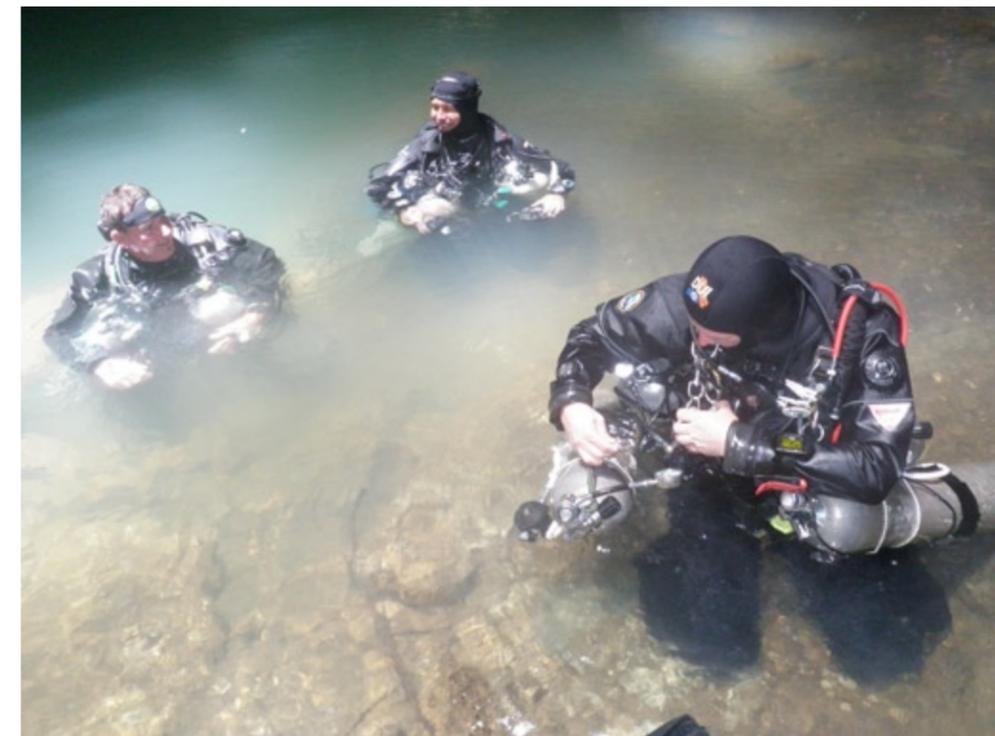
M16's and machine guns. The military personal were a great group of guys, very helpful. They even charged our primary light batter-



We explored the other side of the cave, and it turned out to be an awesome dive with a lot of stalactites and stalagmites. In one section, we were able to surface and see how beautiful the dry chamber was—a sight that took our breath away.

As we were getting ready to pack up the gear and start heading back to Barangay Salavation, the porters decided we had too much gear and that it was too heavy to carry out. We ended up having to hire more porters—a total of 28—a water buffalo and a small boat to get all the equipment back to the village.

After getting back to Catbalogan and getting some work done on our equipment, we headed off to Guiuan, which is located in the southeastern part of the Philippines. We had been there before and had had a lot of luck finding caves. On this trip, we went back to dive a cave we had found a couple years



THIS PAGE: Dive team prepares to dive Kan – Maanghit Cave as porters look on



THIS PAGE: Porters carry dive equipment back out of the cave and pack it onto a water buffalo for the return trip to the village



ago. We tried looking for this cave before, but instead we found two other caves to dive on the same path in the jungle. Because of the difficulty locating the other cave, we brought pictures of the cave and the porters, to show the porters what the cave looked like, in hopes that they could remember.

In order to reach this cave, we needed only six porters to carry the tanks and equipment. Once we found the cave, it was nothing but crystal clear water. Thomas and I spent an hour diving around the beautiful clear water. There were some other passageways we wanted to check out but our bottom time came to an end.

In our next adventure to Samar, there are three virgin caves that we plan to explore. Each year, we think it will be our last, but

we always manage to find new places to explore. Cave exploring is very expensive, especially when

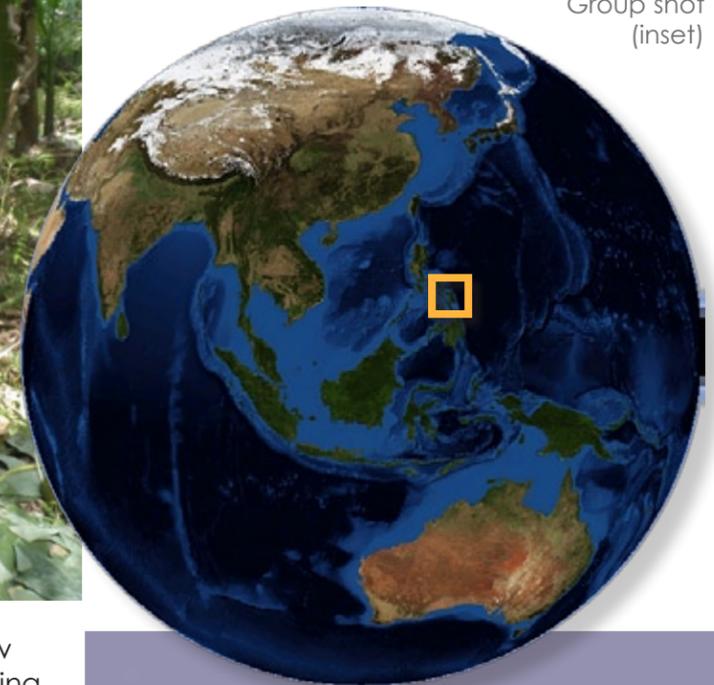


you are looking to find what no one else has explored before. ■

*A special thanks to John Griffith of Ocean Management Systems, ANDI—American Nitrox Divers International and Cochran computers for their help and support of our expedition.*

## Jungle Cave

Location of region on global map (below); Location of Samar on map of the Philippines (bottom); Group shot (inset)



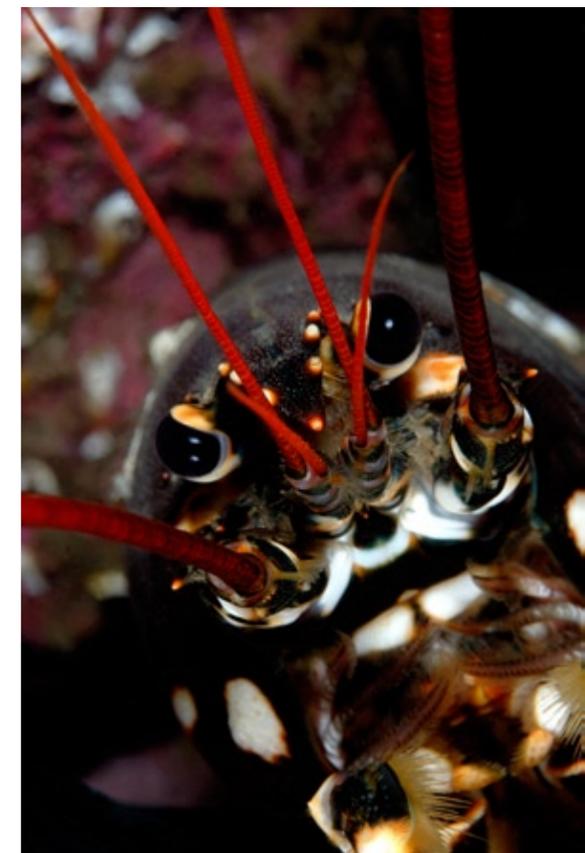
# Gladiators of the Sea

*Paralithodes camtschatica*  
(left)

*Homarus gammarus*  
(below)

Text and photos  
by Christian Skauge

As the night draws its blanket of darkness over the oceans, thousands of strange creatures begin to appear. Covered in spiky protrusions, an army of crustaceans begin their march towards domination.



The Crustacea is a large group of invertebrates belonging to the phylum, Arthropoda, an animal group which also includes the insects. Thanks to the tiny planktonic copepods, the crustaceans are probably the most numerous animal

group in the world, and with over 50,000 described species, they make a significant impression in terms of diversity, habitats and sheer numbers.

The crustaceans include many animals familiar to divers and can be encountered

in the oceans, in fresh water and even on land. Come with us into a creepy-crawly world of stone crabs, nut crabs, camouflage crabs, lobsters, hermit crabs, edible crabs, long-legged crabs, arrow crabs, spider crabs, squat lobsters, crayfish, shrimp

and sea spiders—and marvel at the wonderful world of the crustaceans.

## Exoskeleton and compound eyes

The crustaceans differ from other animals in many ways, but one of the most out-





LEFT TO RIGHT: *Lithodes maja*; *Paralithodes camtschatica*; *Pagurus bernhardus*

are made up of repeating units, each of which functions as a separate visual receptor. This gives the crustaceans a composite image—a mosaic—a pattern of light and dark spots.

Interestingly, the same gene is responsible for producing eyes in both crustaceans and human beings—the process is just repeated over and over again. The compound eyes makes crustaceans apt to be active in dim light or darkness, and this is why night dives will leave you the best chance of spotting many of the species.

Despite sharing a com-

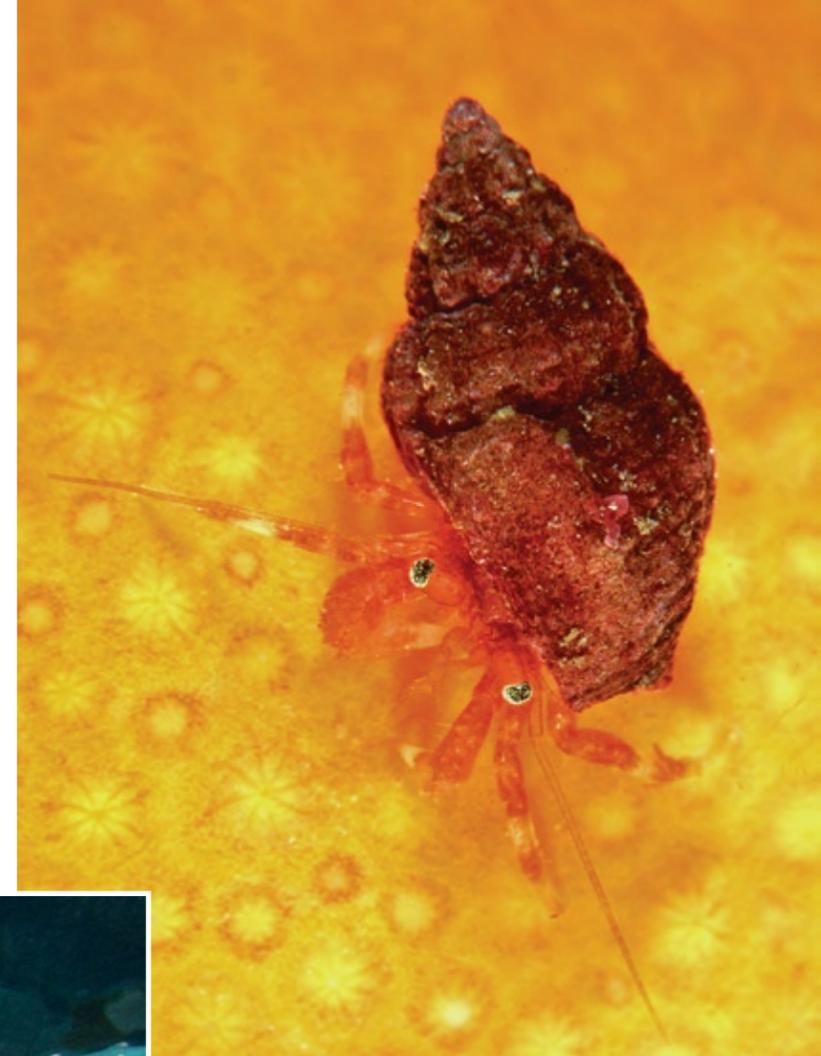
mon bodyplan, crustaceans come in an endless variety of shapes, sizes and even personalities. Some are extremely shy and will dart off to safety as soon as the torchlight comes anywhere near them, while others are inquisitive and have no problems interacting with divers. Between the smallest copepods and the giant Japanese spider crabs with a leg span of up to 12,5 feet there is literally a whole universe of different species.

### Giant intruder

One of the true giants of the crustacean world, the

red king crab *Paralithodes camtschatica*, is a mighty sight. It can reach a leg span of more than five feet and the carapace can be as big as 11 inches. It is heavily targeted by fisheries, and the natural population in the North Pacific is in decline. In the Barents Sea, however, the population has exploded since Russian scientists released the crab outside of Murmansk in the late 60's.

The incredible increase is a major cause for concern among environmentalists and fishermen alike, as the crab devours more or less everything in its path. The king



crabs are spreading rapidly towards the south and northwest at a pace of more than 30 miles a year—and no one knows what they will end up calling home.

### Mobile home

Speaking of homes, the clever hermit crab uses an empty sea snail shell for protection rather than having to cover its entire body with armour. But what seemed like a good idea at the time soon becomes a problem for this assiduous little crustacean. When the hermit crab grows, it will have to find a bigger shell—and this is not always as easy as it sounds.

Hermit crabs are extremely investigative, and will try on almost any empty shell when it is in need of a new one. Other hermits quickly pick up on this, sensing that there might be a new house on the market very soon. This can cause whole groups of hermits to move around on the bottom, one following another and constantly fighting and bickering over empty



standing features is the lack of an internal skeleton. Instead, they rely on a hard, outer shell, called an exoskeleton, to support them and, at the same time, providing excellent protection against predators.

The shell is made of calcium and a horny substance called chiton, and it is not continuous but made up of divided sections. The crustaceans have a number of jointed legs, two

pairs of antennae and often a pair of claws. Many of the species share the same bauplan of 20 body segments divided into a head, thorax and abdomen—as is the case with the Malacostracans, the largest of the six classes of crustaceans with over 25,000 species.

Another feature of the crustaceans (as well as the insects) are their unique compound eyes, so called because they



CLOCKWISE FROM BOTTOM LEFT: *Lebbeus polaris*; *Pagurus prideaux*; *Astacus astacus*; *Galathea nexa*

picking up whatever scraps are left over as the hermit feeds.

In return for the hospitality and generous spills—hermits are really messy when they eat!—the anemone will protect its host by flinging out

its beautiful, poisonous stinging threads if threatened or attacked. Many a predator has learned the hard way that this mouthful is better left alone, and the anemone hermit crabs enjoy relative safety thanks to their stinging partner.

shells. Sometimes the need can be so great that they will attack a fellow hermit and try to steal its mobile home.

Some hermits run into dire straits already when they are babies. Most sea snail shells are spirally coiled in a right-handed fashion, but a few species are wound the other way. If a hermit starts out with a left-handed shell, it will have to keep finding these oddities for the rest of its life, because the back part of the body is shaped to fit

and cannot be turned the other way—making househunting a much more difficult and laborious task.

In tropical waters, some hermits have shed the shell completely, so to speak, and instead live with their posterior parts well protected in abandoned tube-worm burrows. This prohibits them from moving around—but if the food supply is good, this does not seem to pose a big problem.

**Symbiosis and chemical defence**

Many crustaceans rely on chemical defence in addition to, or even instead of, a shell. Certain hermit crabs live in symbiosis with the anemone, *Adamsia palliata*, which completely covers their back-side. The mouth of the anemone is located on the hermit's underside,





Gladiators



The northern stone crab has a very spiky carapace, which in itself provides excellent protection, and combined with being of a certain size, it does not have to rely on anemones growing on its back. Still, there are times when even the most heavily armoured gladiator needs a little extra help. When it is time to moult, the stone crab often seeks protection under a large deeplet anemone.

Like all other crustaceans, it has to shed its exoskeleton in order to grow larger, something which occurs at regular intervals. During this transition, the crustaceans are

vulnerable, as the new carapace takes a while to harden. In soft times like these, the tentacles of a large anemone provide excellent protection—and in return, the soft-bodied actinian often grabs hold of the old, nutrient-rich carapace, which it devours with apparent pleasure.

#### The friendly blade shrimp

*Spirontocaris lilljeborgii* is another species very fond of stinging tentacles. Whole families, sometimes up to 20-30 members in different sizes, may shelter under large anemones, often deeper than 30 meters. As the name implies, these shrimp are very

curious and friendly, and divers may have several of them coming out from under the anemone to investigate and clean his or her hand after a few minutes of patience. Their brilliant colours make them look like exquisite, little gems, and they are favoured by many underwater photographers.

#### The difficulties of getting laid

Reproduction can be something of a challenge when your entire body is covered in armour. The time of moulting is the only time the crustaceans are able to mate, as they have internal fertilization

of the eggs. In order to “get laid”, the male has to wait for the female to shed her all-covering chastity belt. In order not to lose out on the opportunity, he will grab onto a suitable mate and hold onto her for days before the moulting occurs.

Exactly how the crustaceans know when this is going to happen is unclear, but it is suggested that enzymes that help to soften and loosen the exoskeleton seep out into the water. This scent might be picked up by the males, sensing an opportunity about to arise.

All kinds of crustaceans can be observed dragging a smaller

LEFT TO RIGHT: *Spirontocaris lilljeborgii*; *Ebalia tumefacta*; *Lithodes maja*



female along, holding her in a vice-like grip. After moulting and mating has occurred, the female will carry the eggs underneath her tail-flap until they hatch and the larvae drift off to start a new life somewhere else.

In this planktonic stage, the crustaceans are very vulnerable, and most of them will be eaten before they take to the bottom and develop proper protective armour. Even this early in life, many crustaceans know how to take advantage of protective stingers, and

often tiny larvae can be seen hitching a ride on top of small jellyfish or hydromedusae.

### Making a swim for it

In spite of being well protected by full armour, many smaller crustaceans still face the imminent danger of being swallowed whole by a much larger predator. Their exoskeleton isn't of much use if the predator doesn't have to chew, and whole armadas of smaller crab, shrimp and hermits are devoured every night by mean cod and other



fish lurking in the darkness. Adopting the protection of stinging anemones may be a great help for some, but others have come up with equally efficient methods of getting out of harm's way.

The swimming crabs rely, as the name implies, on a quick dash to safety using its posterior legs on which the tips have developed into a flat, oar-like shape. When they wave the "oars" furiously back and forth in the water, they can reach impressive speeds and will very often disappear in a sudden blur of motion—escaping

both hungry fish and underwater photographers.

### The art of camouflage

Other crustaceans, especially different kinds of spider crabs, have adopted even more elaborate ways of evading their predators—camouflage. They often have special spikes protruding from their carapaces allowing them to attach algae or sponges to their backs, and in terms of general cleanliness and personal hygiene, they look a total mess. Some of them will happily let almost anything





## Gladiators

CLOCKWISE FROM LEFT: *Galathea strigosa*; *Eualus pusiclus*; *Nymphon gracile*; *Macropodia rostrata*; *Mysidium sp.*; *Polybius pusilus*

grow on their shells, making them blend perfectly into the reef background. Being invisible is not such a bad idea. Whenever I encounter a camouflage crab, I cannot help thinking about how many I must have missed along the way.

Some shrimp species go even further when it comes to blending into the background. They don't use any decoration at all—they simply change their colour to match whatever they are sitting on. The chameleon shrimp, *Hippolyte varians*, can be found in almost any colour ranging from completely transparent, via

addition, these masters of concealment love to hide in between kelp and algae, making them very hard to spot.

### The cardinal of the sea

The European lobster is another large crustacean, some individuals weighing as much as ten pounds. Unlike its American cousin (and most other crustaceans), this majestic animal is normally all black in colour, and is a very impressive sight. They tend to be very curious, and will readily check you out using their long,

green, yellow and red, to dark brown depending on its whereabouts. In

beautiful red and black antennae. Normally they are very gentle and seem almost intelligent—but the lobster is territorial and can be quite aggressive, even towards divers. When a large specimen comes running against you on the bottom with its claws fencing wildly above its head, it takes some nerve not to move instinctively out of the way.

Interestingly, the lobster has two different claws. One, normally the left, is slender and used for slicing and cutting, while the other is almost disproportionately

large and is made for crushing—and, trust me, a large lobster can crush pretty much anything it wants to.

Along the Norwegian coast, the lobster is consid-

ered an endangered species and is off limits for divers, whereas further south, they are abundant and not threatened at all. This has to do with temperature—they cannot reproduce if the water is too

cold, and years can pass between successful batches if the northern summers aren't warm enough.

Extensive illegal fishing makes it very hard for the lobster to sustain a viable population, and over the last few years, measures have been taken to protect them. Hopefully it is not too late—this magnificent creature is a great experience for any diver and underwater photographer.

The next time you hear talk about strange creatures with numerous legs, compound eyes, heavy armour, hefty claws and maybe even chemical defence mechanisms, you don't have to worry. The aliens are *not* coming—but the crustaceans certainly are! ■

*Christian Skauge is an award-winning underwater photographer based in Oslo, Norway. [www.scubapixel.com](http://www.scubapixel.com)*

# turtle tales



Edited by  
Bonnie McKenna

## Loggerhead turtles take 45 years to grow up

Scientists from the University of Swansea have determined that it takes loggerhead sea turtles a long time to grow up and will not lay eggs until they are 45 years old. The estimate is based on decades of data.

The length of time until maturity means that the turtle population is “less resilient” than previously thought.

The longer the turtle takes to maturity, the more vulnerable to deliberate or accidental death—long before it has been able to reproduce itself through breeding.

Scientists made the age determination through a three-part trawl. To estimate the growth rate of hatchlings, the team took measurements of hatchlings at a nesting

site in Florida. Then they compared the results with the sizes of the same turtles when they drifted across the Atlantic to the Azores (approximately 450 days). The team then extrapolated their data from hundreds of measurements made by scientists who had captured, marked and recaptured individual loggerhead turtles.

The estimates reinforce the fact that sea turtles will take a very long time to recover from human caused population declines. ■

## Green sea turtles hatched in Delaware

The hatchlings are from the first documented sea turtle nest in Delaware.

In mid-August a female green sea turtle came ashore, dug a nest and deposited 194 eggs. The nest was found by a Cape Henlopen park ranger during a routine beach patrol. The eggs were deposited in the high tide zone, an area vulnerable to high surf and waves. After getting permission from the U.S. Fish and Wildlife Service the nest was moved park rangers were afraid the

eggs would not hatch. Two storms deposited a lot of sand on top of the nest, then in October there was an unusual cold snap in the area. Temperatures dipped below 66°F (19°C).

The hatching of the eggs was delayed several weeks. The eggs have now been moved to the Pine Knoll Aquarium in North Carolina where scientists will keep the hatchlings until they are healthy enough to be released into the sea. ■

## Jellyfish may be helping leatherback sea turtles

Massive blooms of jellyfish along the coast of Florida are a big source of food for leatherback sea turtles, but the bane of thousands of ocean swimmers who have felt the sting.

Leatherbacks are rare visitors to Florida, but over the past 20 years, the number of nests has increased. This year's count was 600 nests, one of the highest counts ever.

Jellyfish are the favorite food source for the leatherback. When jellyfish are abundant, females reproduce more often.

Although there is some evidence that the blooms are increasing, there is no historical data to compare.

The turtles are reaping the benefits from the jellyfish feasts because the females need to fatten up to reproduce.

A typical nest contains 100 or so eggs and turtles often nest two to three times a season—all of which takes a lot of energy. ■

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## Egg release in Malaysia

Kuala Terengganu, Malaysia, fisheries department release approximately 66,000 turtle hatchlings into the sea this year. The hatchlings came from a total of 100,000 eggs that the fishery incubated.

The hatchling program was devel-

oped to ensure that the turtles of Terengganu do not become extinct.

The fisheries department also carried out a terrapin hatching program resulting in 1,590 baby terrapins being released into the wild. ■





Looking back two decades

# Gary Gentile: Deep Wreck Diver

— aquaCORPS #3 DEEP, January, 1991

Text by Michael Menduno

**“Deep diving is a matter of mind, not physique.” Gary Gentile should know. As one of the pioneers of deep wreck diving, Gentile, a 20-year veteran, has logged over 1,000 decompression dives—70 on the *Andrea Doria*—and spends six months out of every year diving wrecks from the eastern seaboard to the Great Lakes.**

When he's not diving, Gentile, 44, father of one, is busy at the library researching a lost ship, giving lectures or writing. With 16 titles under his belt, including seven science fiction novels, and two new shipwreck guides on the way, Gentile's writing is as prolific as his 200-foot plus working dives. One of his books, *Advanced Wreck Diving Guide*, covering everything from decompression techniques to artifact recovery, has become almost a bible in serious wreck diving circles.

Long regarded as one of the crazies, Gentile began his deep diving career back in the early 70's, and was regularly making hour hangs before recreational divers could even pronounce the “D-word”. Since helping put together his first charter to the *Doria* in 1974, he's had a lonely sojourn waiting for the rest of the industry to catch up. Perhaps it finally has.

Like the old adage, “you can always tell a pioneer from the arrows in his back”, Gentile's depth is easily recognizable. With a well-worn pair of Beuchat Pro's strapped to his console, double over-pumped “Gen 100s”, a Luxfer Slim 30 pony, a 300-foot decompression reel and a rust-covered BC that's seen its share of flooded corridors, Gentile's as comfortable shooting turrets alone at 250-feet as he is explaining the history and stature of a ship he's planning to dive, in methodical detail.

## **USS Monitor**

Quiet and self-directed, tending to keep to himself, Gentile gained notoriety through his protracted six-year battle with the U.S. Federal Government to dive the *USS Monitor*, a civil war ironclad, 16 miles off the coast of Cape Hatteras, North Carolina, which was

declared a National Marine Sanctuary in 1975. Recounts Gentile, “It's what I call bureaucratic territoriality. The people at NOAA who are working in the Marine Sanctuary Program feel they own the wreck. They don't want private sector encroachment. They look upon it as their wreck, and they view me—the public—as a trespasser.”

But the *Monitor* battle was more than a struggle for the diving public's right of access, it became a struggle for the recognition of technical diving as well. The National Oceanic and Atmospheric Administration (NOAA) refused the 11 permit applications filed by Gentile and others on the grounds that diving the wreck, which lies in 220 feet of water, was too dangerous using ordinary SCUBA, placing it beyond the limits of sport diving.

Gentile's court victory earlier this year and long-awaited-for permit to dive the *Monitor* was a professional and personal vindication. The verdict? NOAA's standards were deemed antiquated and failed to account for advances in diving technology and techniques.

Furthermore, the court found that Gentile and his colleagues were wrong-



ly and improperly classified as recreational divers.

Interestingly enough, Gentile's July victory dives on the *Monitor* were conducted as practice runs for a deep dive on the *Ostfriesland*, a German battleship lying in 380 feet, that he and his diving partner, Ken Clayton, successfully dove on six months later.

### His motivation?

"It's about freedom," explained Gentile, "a battle I've been fighting all my life. There will always be people who'll tell you, you shouldn't be doing this. It's dangerous. It can't be done. That's their problem."



USS *Monitor* in action with *CSS Virginia*, 9 March 1862  
Aquarelle facsimile print of a painting by J.O. Davidson

"I just want to live my life the way I want to and for me, that's what these dives are all about."

**aquaCORPS:** Gary, you've been on the cutting edge of wreck diving for 20 years, and you were one of the first people to dive the *Andrea Doria* back in '74. Did you take a lot of heat for your diving back then?

**Gary Gentile (GG):** All my diving career, the local people—the people in dive clubs—looked upon me as a madman. I've gotten back on the boat many times only to have people say to me, "What were you doing down there? Why were you just hanging on the anchor line?"

People didn't know anything about decompression dives. And those who did, didn't approve, because I was doing long decompressions. It wasn't that I liked decompression diving; it was that I wanted more bottom time. I was willing to sacrifice for it.

**aquaCORPS:** How did you get trained in decompression?

**GG:** I had the good fortune of falling in with a small group of divers who were doing deep decompression dives. At the time, deep was considered 160, 170 feet. That was the group I first dove the *Doria* with back in '74, and we took a lot of flak for it. People looked at us as crazies because we were doing dives no one else would do.

That's how I picked up most of my early experience in the water—the things I wasn't taught in courses. I studied their techniques and developed my own, just like everybody else does. Wreck diving tends to be an evolving sport; everybody who gets into it looks at what other people are doing and adds his own little improvements. I got into that as well. I was really fortunate to get into a group of expert divers.

**aquaCORPS:** Would you say that deep wreck diving as practiced today is fairly safe?

Absolutely. It's much safer than it was. Of course, it all depends on your level of expertise. The people that are serious about diving deep wrecks and doing decompression diving are as comfortable with what they're doing—probably more comfortable—than the common tourist reef diver who dives to 25 feet, but only goes to Florida or the Caribbean once a year, and is out of shape.

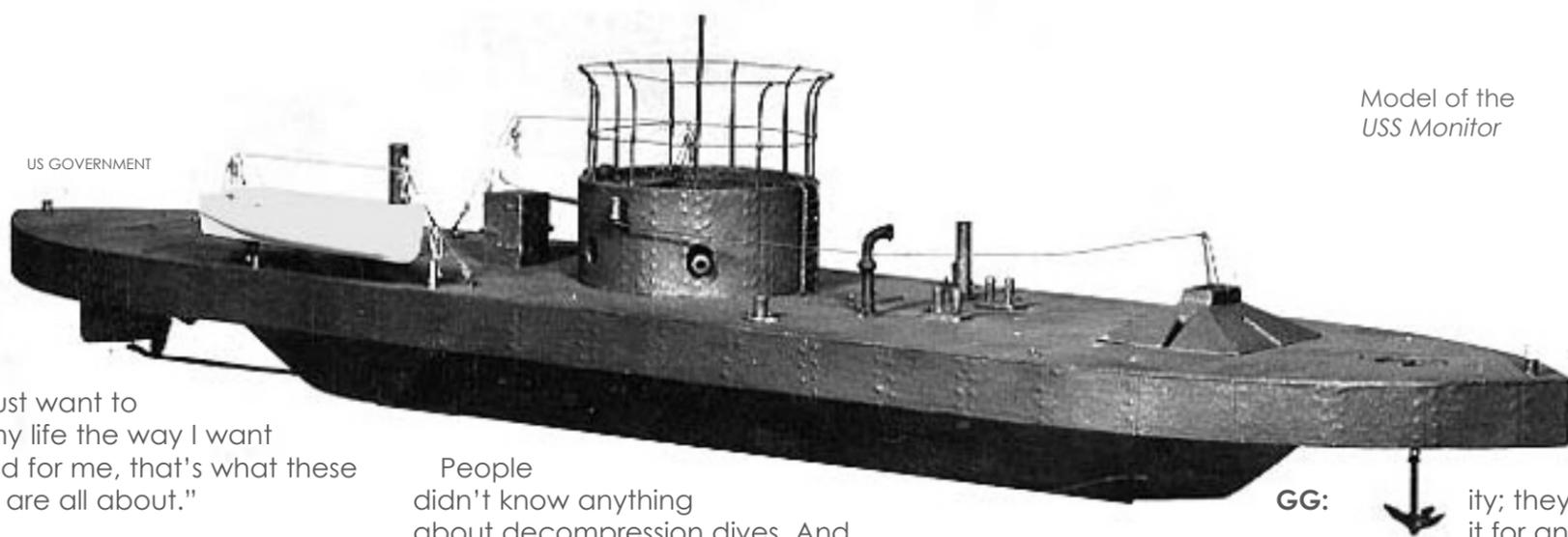
**aquaCORPS:** How many serious wreck divers are there?

**GG:** I'm finding, as I travel more that there are many thousands. For example, when I first travelled to the Great Lakes a couple of years ago, I discovered a whole new group of wreck divers I had never known existed. I was astonished at how many good deep wreck divers were there. And that's just one area. The same is true all around the country.

**aquaCORPS:** Communication has been a problem, then?

**GG:** A real problem. Most wreck divers are just doing their own thing. They're not seeking public-

Model of the *USS Monitor*



GG:



ity; they're not in it for an ego trip (some are, of course,

but most aren't). So, there's not a lot of publicity about it.

**aquaCORPS:** Would you say it's a competitive field—people looking at what others are doing, and wanting to be the "first", wanting to be acknowledged? That's certainly the case in the cave diving community.

**GG:** It's funny; when I first got into diving, I thought it was the greatest sport in the world because everyone was working with everyone else, and everyone was trying to see that everybody had a good, safe dive—no competition. I very quickly found out that wasn't true.

There were people who wanted to be the first to discover a wreck, or the first to collect an artifact. Artifacts have ruined more friendships than anything I know.

On the other hand, a certain amount of competition is probably good. It means people are interested in exploration and are willing to go out and do something—take action. That helps advance the sport.

### Ironclads

*USS Monitor* was the first ironclad warship commissioned by the United States Navy during the American Civil War.

She is most famous for her participation in the Battle of Hampton Roads on 9 March 1862, the first-ever battle fought between two ironclads. The *Monitor* fought the ironclad *CSS Virginia* (the former frigate *USS Merrimack*) of the Confederate States Navy.

SOURCE: WIKIPEDIA

**aquaCORPS:** It's my impression that the cave diving community is generally better organized than the wreck diving community, and, I would guess, has a much better safety record. Is this true?

**GG:** If that's true, I think it's mostly because of better communication among cave divers than among wreck divers—communication of techniques. And that means safety efforts would naturally evolve faster.

But there may be another factor involved in the safety issue. By and large, wreck diving tends to be done in an uncontrolled environment. There are a lot of factors that can compromise safety. Storms can kick up very quickly at sea when divers are in the water; currents can come in when divers are decompressing. A lot of things can go wrong.

It's the changeable conditions that wreck diving necessarily encounters—being out there in the ocean or on a boat—that compromises safety. There are a lot of injuries just on the boat; Getting on, getting off—that kind of stuff. All in all, I think it's probably true that the safety record among cave divers is better. But it doesn't have so much to do with

*I picked up most of my early experience in the water—the things I wasn't taught in courses.*



the diving as it does with the conditions under which the diving is conducted.

**aquaCORPS:** What are the skills and expertise required to be a serious wreck diver?

**GG:** Number one is awareness. There are a lot of potential hazards in wreck diving that can be created simply by being unaware of them. For example, entan-

**Andrea Doria**

SS *Andrea Doria* was an ocean liner for the Italian Line (Società di navigazione Italia) home ported in Genoa, Italy, most famous for its sinking in 1956, when 46 people died. She had a gross register tonnage of 29,100 and a capacity of about 1,200 passengers and 500 crew. For a country attempting to rebuild its economy and reputation after World War II, *Andrea Doria* was an icon of Italian national pride. Of all Italy's ships at the time, *Andrea Doria* was the largest, fastest and supposedly safest. Launched on 16 June 1951, the ship undertook its maiden voyage on 14 January 1953.

On 25 July 1956, approaching the coast of Nantucket, Massachusetts, bound for New York City, *Andrea Doria* collided with the east-bound *MS Stockholm* of the Swedish American Line in what became one of history's most infamous maritime disasters. *Andrea Doria* was the last major transatlantic passenger vessel to sink before aircraft became the preferred method of travel.

Due to the luxurious appointments and initially good condition of the wreck, with the top of the wreck lying initially in 160 feet (50m) of water, *Andrea Doria* has been a frequent target of treasure divers. It is commonly referred to as the "Mount Everest of scuba diving".

SOURCE: WIKIPEDIA

*Shallow wreck diving is essentially the same as reef diving in terms of the kind of expertise that's required*

glement in monofilament—fishing nets—is a very serious problem for wreck divers.

After awareness, I would say it comes down to experience. When you talk real wreck diving, you're talking about a combination of penetration, deep diving, and decompression diving. Put all three together and you've got quite a package.

You have to be expert at decompression diving. And you've got to have the proper equipment for each one of those disciplines, including emergency backups like decompression reels and ponies.

Equipment is important. That's something you learn only through experience. Get out there and do it; find out what equipment is necessary for decompression when an anchor lines breaks loose, for example. You can't stage bottles like you can in a cave, so you've got a problem there if you want to set up a deep dive. And, like the caves, you can't come right to the surface. So, once you gain awareness and then gather experience, you also need to be properly equipped.

**aquaCORPS:** Would you say most wreck divers are well equipped?

**GG:** The average wreck diver isn't equipped—not for technical diving. But you have to understand that the average wreck diver is still the kind of person who dives on a weekend once or twice a month. He doesn't get that many dives under his belt. He's under economic constraints and probably won't be buying the top-of-the-line regulator or BC. He buys equipment he can afford.



The *SS Andrea Doria* sinking after being struck by the *MS Stockholm* in 1956. Half of the ship's lifeboats are still onboard, a result of the severe list that developed after the ship was struck

Most of these divers are diving wrecks in the 80-100 foot range, and a few in the 100-130 foot range. Then there are the people who are diving 130 feet and beyond. You'll find that their equipment, generally speaking, is far superior to the so-called "tourist divers" running the shallow wrecks.

Shallow wreck diving is essentially the same as reef diving in terms of the kind of expertise that's required. It's when you start doing things—recovering artifacts, inflating lift bags, penetrating the wreck, getting into decompression—than you're talking about a different area. Then you really need the proper equipment.

**aquaCORPS:** In your book *Advanced Wreck Diving Guide* you talk a lot about equipment techniques and methods. How did you develop those?

**GG:** I can't claim to have developed all those techniques. I was part of the wreck diving community when those techniques were being developed. What I can claim credit for is setting them down in writing.

Some of the things I worked on myself, but it was an evolutionary process. To make a decompression reel, you'd look at what someone had said and say, "That's good, but I can add this and make it better." Then someone else would look at it and say, "Yes, but let's do it this way."

I saw the development occurring; I was in the middle of it. I remember one time trying to trace back to who actually developed the idea of making a decompression reel with the disks on the end to prevent the rope from coming out around the pins. No one knew.

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It had evolved; no one had any conscious awareness of who had done it. It was a group effort that was done incrementally.

**aquaCORPS:** Do you think recommended procedures and techniques will eventually evolve?

**GG:** Yes, I do. Most of the procedures in *Advanced Wreck Diving Guide* are now the lowest common denominator.

*Equipment is important. That's something you learn only through experience. Get out there and do it; find out what equipment is necessary for decompression when an anchor lines breaks loose, for example.*



*We did it on air: 290 feet. I personally felt that it was pretty close to stretching the envelope.*

That book is not the end result. It's a take-off point for the next generation, and I expect to see evolution coming from that. In fact, the sport is evolving already. Some of the things we're doing now, like using oxygen to add a safety margin in decompression—mostly for deep diving—or using nitrox decompression and custom tables for accelerated decompression times, are still being worked out.

**aquaCORPS:** How about mixed gas?

**GG:** I think mixed-gas diving is going to be the wave of the

future in wreck diving because people are already reaching or exceeding the limits of air diving, and yet they still want to venture further to the deeper wrecks. The only way to do it is with mixed gas; at least it's the only way to do it and remember it!

**aquaCORPS:** What do you see as some of the advantages of mixed gas besides "remembering what you saw"?

**GG:** I've had a very curious thought about mixed gas. It's clearly the wave of the future, but for some people, I think it may also become an end in itself; becoming proficient in managing the technology. I see people wanting to do

mixed-gas diving as much to do the dive as to see the wreck. They want to do something that other people haven't done. That's what the new frontier is all about—to do something that other people haven't done. That's exciting—a real challenge.

**aquaCORPS:** How about you?

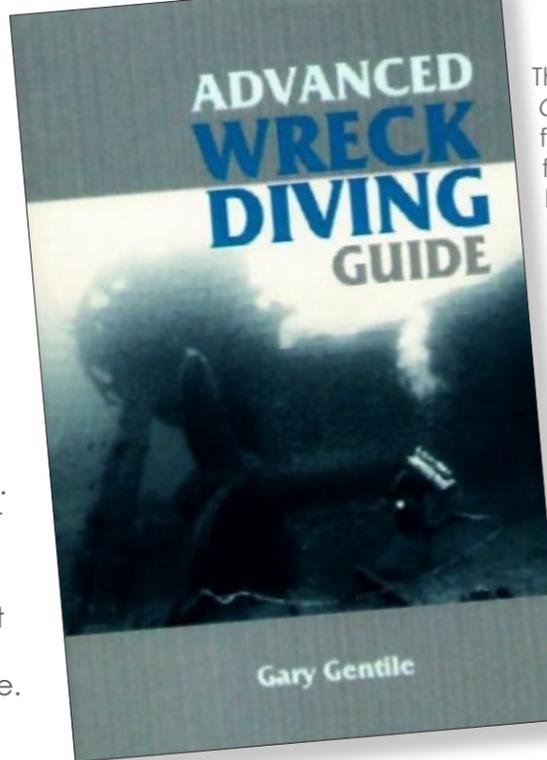
**GG:** Personally, I'm a wreck diver. My goals are to be able to use it to get to a wreck, not to gain the expertise in mixed-gas diving itself.

You mentioned that "deep" used to be considered 160 or 170 feet. What's considered deep today in the serious wreck community?

These days 200 is not



Ostfriesland in 1915 with German naval zeppeliner L31 overhead



The *Advanced Wreck Diving Guide* from 1988 was the first in a long string of books from Gary Gentile, which became classics and must-haves for any ambitious diver. He also published the first books on technical diving

Its position had been lost since that time; nobody cared about it. But it's been relocated, first through historical records, and then by taking the boat out there and checking the various fishermen's LORAN coordinates that coincided with the records. It appears to be in some 380 feet of water, so it's definitely a mixed-gas dive.

We dove another battleship last year in Washington. That was 290 feet. It was sunk in 1924 as a Naval target.

**aquaCORPS:** You did it on air?

**GG:** Yep. We did it on air: 290 feet. I personally felt that it was pretty close to stretching the envelope. Beyond that, if you really want to accomplish something, you need to switch to mix. And that's my concern: accomplishing something. Not just getting there and saying you did it. But doing something when you get there. That's what we're planning for the *Ostfriesland*.

**aquaCORPS:** What do you hope to accomplish?

**GG:** For me, it's an historical event. I'm a researcher, and I've written about the *Ostfriesland* in my upcoming book, *Shipwrecks of Virginia*. I get a great deal of satisfaction out of doing research—concluding that, yes, a wreck is supposed to be in such-and-such a location, then going

**Ostfriesland**

SMS *Ostfriesland* ("His Majesty's Ship East Frisia") was the second vessel of the Helgoland class of battleships of the German Imperial Navy. She was launched on 30 September 1909 and was commissioned into the fleet on 1 August 1911. The ship was equipped with twelve 30.5-centimeter (12.0 in) guns in six twin turrets, and had a top speed of 21.2 knots (39.3 km/h; 24.4 mph).

*Ostfriesland* was assigned to the I Battle Squadron of the High Seas Fleet for the majority of her career, including World War I. Along with her three sister ships, Helgoland, Thüringen, and Oldenburg, *Ostfriesland* participated in all of the major fleet operations of World War I in the North Sea against the British Grand Fleet. This included the Battle of Jutland on 31 May – 1 June 1916, the largest naval battle of the war. The ship also saw action in the Baltic Sea against the Russian Navy. She was present during the unsuccessful first incursion into the Gulf of Riga in August 1915.

After the German collapse in November 1918, most of the High Seas Fleet was interned in Scapa Flow during the peace negotiations. The four Helgoland-class ships were allowed to remain in Germany, however, and were therefore spared the destruction of the fleet in Scapa Flow.

*Ostfriesland* and her sisters were eventually ceded to the victorious Allied powers as war reparations; *Ostfriesland* was transferred to the United States Navy. She was sunk during air power trials off the Virginia Capes in July 1921.

SOURCE: WIKIPEDIA



out there and verifying and identifying the wreck to prove that my research was valid. That's what'll give me the most satisfaction on the *Ostfriesland*—to actually relocate it from when it was lost in 1921.

There's also the minor satisfaction of conducting a deep dive like I've never done before. But if you were to ask Ken Clayton, who I'll be diving with, the same question, he would give you a different answer. I think Ken's answer would be that his satisfaction will be to dive deeper. Mine is not; I'm coming from the historical perspective of actually being on that wreck. And I don't mean driving an ROV on it. I'm a person who enjoys the experience of being there myself. I want to be on the *Ostfriesland* myself.

**aquaCORPS:** *What are some of the planning issues you've had to confront in putting together the dive?*

**GG:** The most difficult part was planning the mix, staging and decompression. The initial step was arranging for the gas mix; Dr Bill Hamilton worked with us on that. I see Bill and others like him as being the guiding lights on the evolution of mixed gas diving in the future because they're the ones that are providing us with the wherewithal to do it. I'm not the expert on it. I rely on his expertise, just as I rely on the captain's expertise to run the boat out there and locate the wreck.

It all has to be put together. But once you do, the dive itself becomes relatively simple because there are no narcotic effects. It's just like making any other dive, except it'll take you longer to get to the bottom. Once you get there, you'll feel just as comfortable as you do on a 100-foot dive.

**aquaCORPS:** *As I understand it, you'll be making a fairly short dive to that depth.*

**GG:** Eleven minutes. But the complication comes in that you're no longer self-contained. On air, you go down, come up, and decompress on your own air. But once you get into mixed gas diving, in order not to have to decompress for something like four hours or more, you've got to go into an accelerated decompression schedule that requires multiple gas switches during the ascent to several nitrox mixes, and finally O<sub>2</sub>, based on custom tables.

It means you need surface support personnel: support divers who are going to go down to 100 feet to clip off the nitrox bottles, and have the oxygen hoses ready for our 20 foot stop. It means you're no longer just jumping off the side of the boat, going off on your own and coming back with your dive done. There's a lot of set-up when you get there, and you can't do the set-up yourself.

We're taking clip-on stage bottles, of course, as a back-up. But

*The most difficult part was planning the mix, staging and decompression.*

the biggest thing this means to us is that we have to come back to the anchor line.

**aquaCORPS:** *What will your total decompression time be?*

**GG:** Two hours and 15 minutes.

**aquaCORPS:** *That sounds pretty reasonable. It's probably not any longer than a lot of your deep air dives.*

**GG:** We did a two hour and 45 minute decompression on the *Monitor* (Ed. the *USS Monitor* dives were approximately 220 feet.) After a 25 minute bottom-time on air, we used computers and O<sub>2</sub> as a safety factor.

**aquaCORPS:** *There's some complicated logistics.*

**GG:** Mixed gas diving is complicated, and complicated means expensive. Much more expensive. But remember, what we're talking about is not just your everyday adventure. It's not for people who just sit at home and watch the boob tube. It's for the kind of people who want to go out and experience something that not everyone can have. We're willing to do what is necessary to have that experience!

**aquaCORPS:** *Are you going to take pictures on the *Ostfriesland*?*

**GG:** Unfortunately, we don't have a camera that'll go that deep.

**aquaCORPS:** *What are your personal diving goals over the next 12 months, Gary?*

**GG:** Aside from the *Ostfriesland* trip, I'm in the middle of writing two books: one a science fiction novel and the other is *Shipwrecks of North Carolina*. That keeps me busy when I'm not diving. As for diving, I'm still adventuring—looking for dives that I haven't done before. Not necessarily wrecks that no one has seen, but photogenic wrecks that I haven't seen. My emphasis is photography. It's hard sometimes for me to say that. My interests are split between adventure and photography; I blend the two together. Sometimes I feel guilty having an adventure without taking pictures. It's like having a good time without anything to show for it, so I always temper myself. I want to share those adventures with other people.

**aquaCORPS:** *What's your advice for the people who are interested in expanding their wreck diving skills?*

**GG:** Work hard. Work hard to gain the experience necessary to do what you want to do. Everyone can enjoy these experiences if they're willing to put in the time. Just gain the expertise to do them safely.

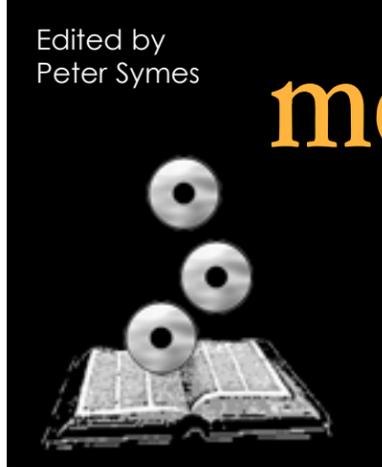
**aquaCORPS:** *From a practical point of view, how should people go about doing that?*

**GG:** There are not a lot of courses, but there are some. I know several dive shops teaching wreck diving courses and actually showing people how to make a decompression dive. So, you don't have to do it the way I did it the first time—suddenly finding myself in decompression, scared to death because I'd never done it before.

If I'd done it a half dozen times when it didn't count, when the real time came, it wouldn't have been so emotionally difficult to handle. That's why I think the first thing people can do is to take a course or read up on the literature that's available, so they can practice on their own.

Of course, there's only a certain amount you can do in a course; most of what you learn has to be gained in the field. You've got to get out there and do it. That means getting in the water a lot, practicing techniques, doing the diving, gaining the experience—you can't get that from a book. You just have to go out there and do it. ■

*You can always tell a pioneer from the arrows in his back*



produces the stage for a number of number of environmental issues. As of fantasy—it goes with the genre—but the issues addressed are real. Also, there are interesting tidbits explained. An example of such a detail in a bigger story is the explanation of what tonic mobility in sharks is. As such, these comic books are good *infotainment* for the younger generations, in particular, but I am sure that among the many divers with gray hair hide many comic book collectors who would like these, too. [IanChurchillsMarineman.com](http://IanChurchillsMarineman.com)

## Marineman

Superman, Batman, the Watchmen, the Green Lantern, Captain America—a whole string of classic comic book characters, many of which date back to an era before WWII, have in the latter years become familiar icons to new generations thanks to Hollywood blockbusters. Ian Churchill's *MARINEMAN* is something as rare and unique as a comic book about—well, perhaps not diving per se—but the marine environment. It incorporates classic style elements, conventions and old clichés from the early superheros, while also drawing on more contemporary masters and recent style. Our hero is Steve 'Marineman' Ocean, a handsome and very muscular hulk with supernatural powers such as being able to breathe underwater and swim at incredible speeds. He also happens to be a marine biologist, who presents and documentaries about the marine world. This sets storylines and adventures that evolve around a with other comic book heroes, there is a great deal

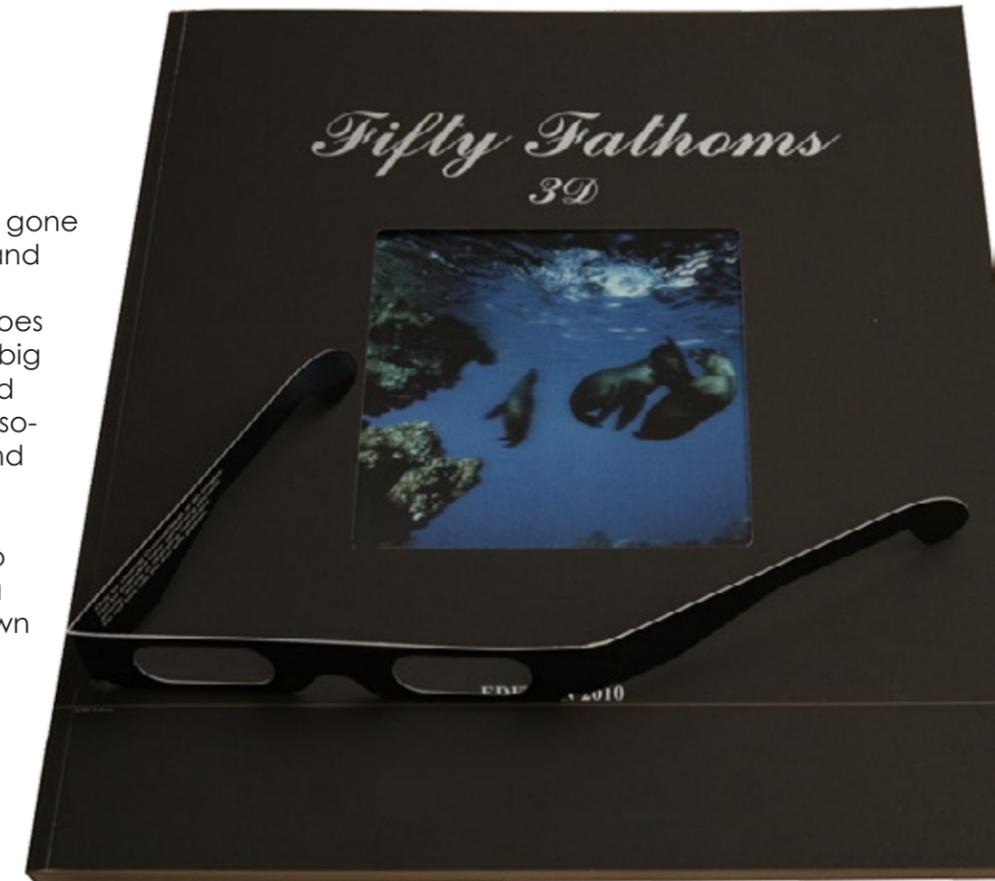


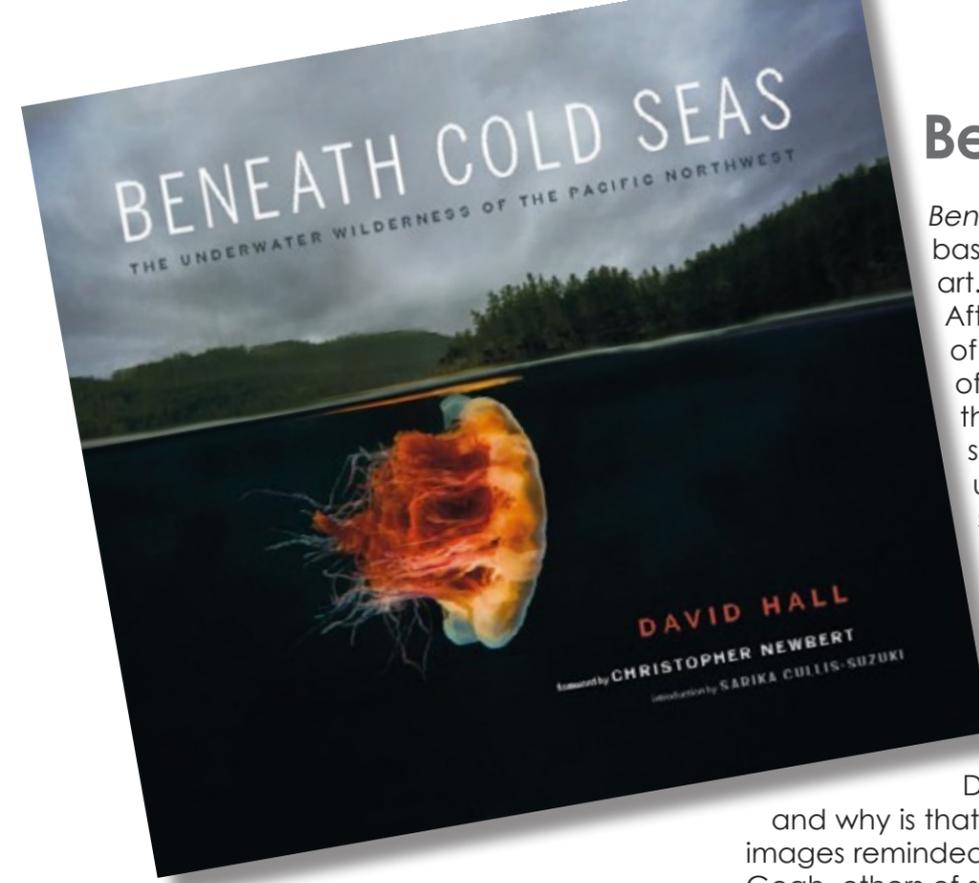
## Hidden Sanctuary

Singaporean photographer, Imran Ahmad, is a commercial photographer who works in corporate and commercial photography, portraits, wildlife and underwater photography as well as photojournalism. As such, he knows his tools and techniques, which obviously free him up to do more creative things with composition and color. In this booklet, I am particularly drawn to his work with jellyfish and the abstract work with close ups of soft corals and structures like fish scales and urchin spikes. The images were shot at the Sipadan-Mabul resort where an artificial reef complex has been constructed on the sandy slopes adjacent to the resort. [Escapeinc.com.sg](http://Escapeinc.com.sg)

## Fifty Fathoms 3D

In this day and age where everything's gone digital, paper has become expensive and coffee table books seem as rare as living dinosaurs, *Fifty Fathoms 3D* books goes straight against the main stream. It is a big and luxurious production, clearly printed with multiple inks—which increases the so-called colorspace allowing for more and deeper colors—on thick paper of that sort that makes the book softly squeak when you turn the pages. According to the information supplied, the paper is a "deckle-edged handmade paper known as *Büttenpapier*". I don't know exactly what that means, but it sounds about right. This limited edition, which has been edited by Dietmar Fuch who for many years was editor-in-chief for the leading German monthly, *Unterwasser*, features four of the grand masters of underwater photography—Kurt Amsler, who has supplied many features and a series on underwater photography for *X-Ray Mag*; Florida-based Stephen Frink; Reinhard Dirscherl and Chris Newbert. As for the 3-D effect, the book does come with a set of glasses. They are not colored, so they are probably polarising filters. The effect is there and fun to watch, but the images are also stunning without 3D. [Edition-fifty-fathoms.com](http://Edition-fifty-fathoms.com)





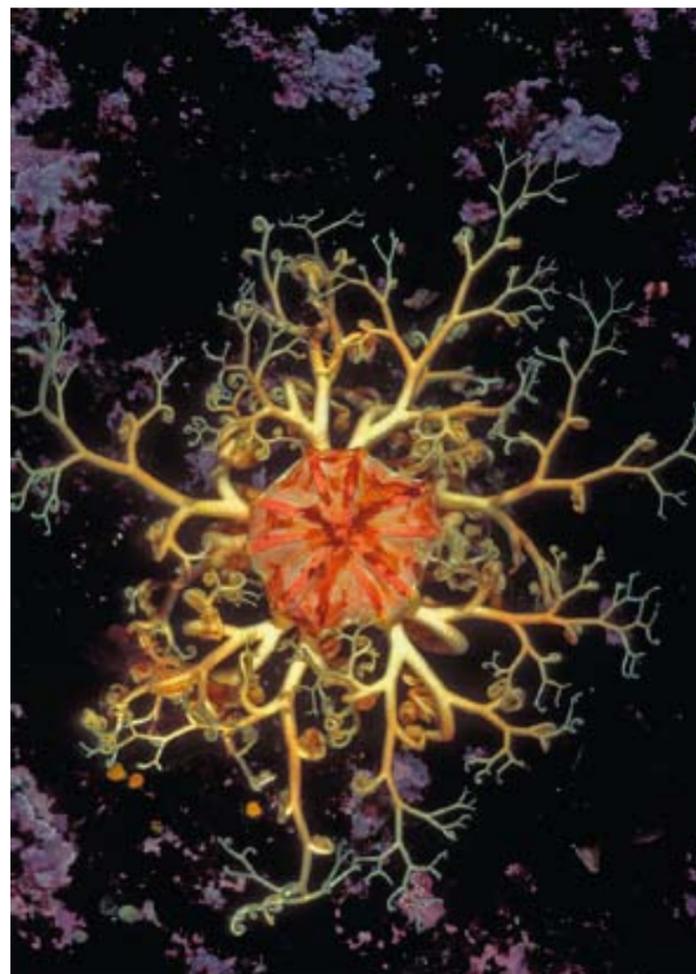
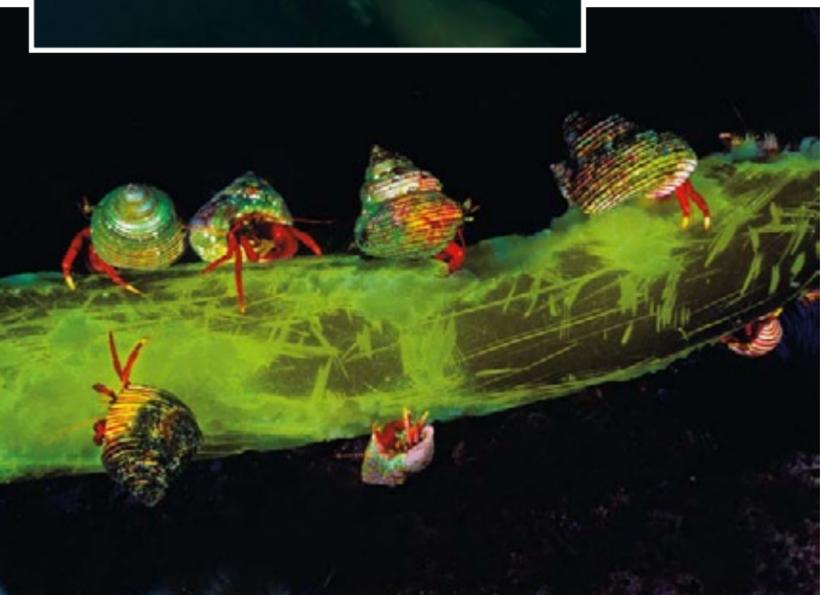
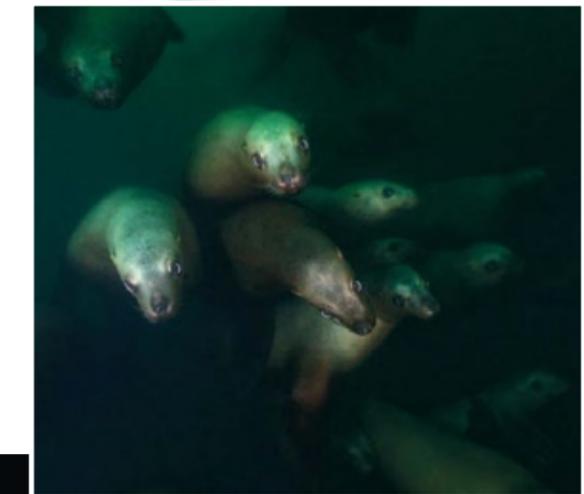
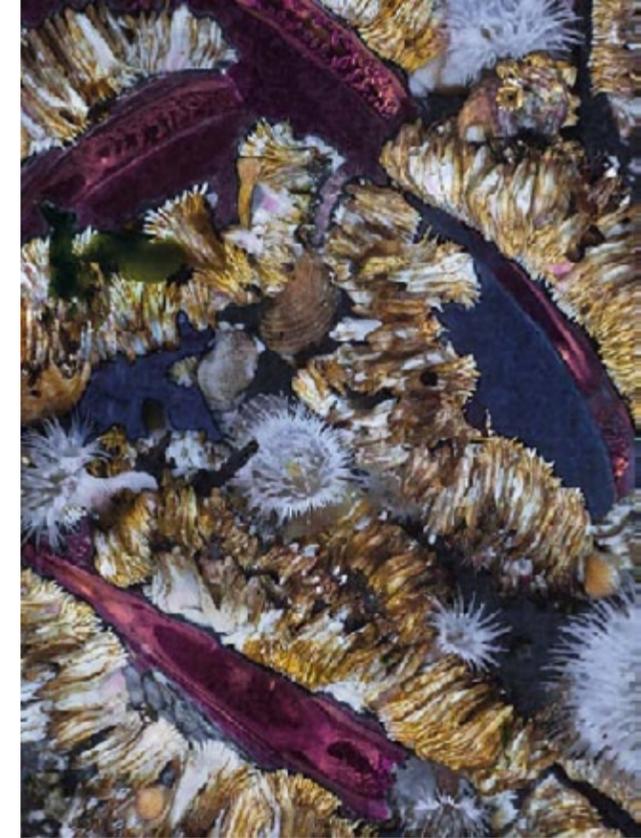
## Beneath Cold Seas

*Beneath Cold Seas* by New York based David Hall is a rare piece of art. Or rather, it is full of them. After nearly two decades in this line of work, I have long since lost count of how many underwater images that have passed my lightbox, or screen, or how many books with underwater photography I have seen. In other words, it takes a lot to impress yours truly, but this book did. I had to browse through it three times in a row, right there on the expo floor when I was first handed a copy for review.

I hesitate not to say that David Hall is in a class of his own, and why is that? Leafing through his book, some images reminded me of the work of Vincent van Gogh, others of some of the great impressionists. Some of these images felt like paintings on canvas, not just photographs. Like no other photographer I am aware of, Hall has consistently managed to capture patterns, textures and colors and used all of these skillfully in compositions in such a tight and controlled manner, as if they were created on an easel.

Yet, these images are all naturalistic photos, which document how life below the surface can also look. The macro shots play with strong colors and patterns, while many of the over-and-under water shots have a surreal and almost dream-like quality to them, as if we were standing before a portal to another universe.

The image taken at dusk where the weird hooded nudibranchs are seen populating the illuminated kelp under the surface could have been an opening scene from an episode of *X-Files*. Others paint the archipelago in soft and romantic tones as would a Victorian painter depict the English countryside. I could go on, but I'd better let the samples depicted here do the rest of the telling. There are many more great images from whence they came—the compilation went through quite



some agony of choice. If you'd like to see more, you have to get this stunning book. Not only is the book just a pleasure to go through, but the images are also an inspiration and a challenge for all other underwater photographers to go out and do better. I certainly will. David Hall is an inspirational master who clearly hasn't yet gotten all the recognition that he deserves. [Beneathcoldseas.com](http://Beneathcoldseas.com)