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GLOBAL EDITION

June 2016

Number 73

Storm Wreck

Singapore Pulau Hantu

Tahiti
Humpback
Whales

Cayman Islands
Grand
Cayman

Focke-Wulf 58

British Columbia
Sunshine Coast

FLORIDA Manatees

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Humpback whale in Tahiti. Photo by Gregory Lecoeur



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BY FRANKLIN PRICE

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Annapolis Anniversary British Columbia BY BARB ROY

IN SEARCH OF SEAHORSES ITALY BY MARCO DATURI

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COVER PHOTO: Florida manatee, Crystal River, Florida



Accept it

Beina a diver is a choice.

In pursuing my interests and going about enjoying my various adventures. I both understand and have accepted that there is always some level of risk associated with the activity, however bia or small.

I can choose to minimize that risk by just going for some easy shallow diving, which I actually often enjoy, rummaging quietly about the reef or sandy bottom with my camera.

Or I can partake in some demandina technical divina expeditions, under challengina circumstances requirina high levels of skill and training. In both scenarios, I can go a long way to mitigate risks by making sensible decisions, being situationally aware and by being properly trained and equipped for the tasks at hand.

In any case, it is each our own personal choice to do so.

Should I, despite all of my efforts and diligence, suffer a mishap as result of my divina, I don't want anyone to sue my dive buddy, the manufacturer of my equipment, the operator or the trip organiser.

Granted, there are cases where somebody else should indeed be held accountable, such as when boat operators foraet divers at sea and other such glaring incidences, but what I am aettina at here is this culture of blaming somebody else, which seems to be taking hold of people.

Only two issues ago, we published an extensive report about British diver, Steve Martin, being held liable for his airlfriend's traaic dive accident while on holiday in Malta.

As this issue goes to press, we just got the news that Dive Rite finally, after four long years of litigation, got acquitted in a wrongful death and product liability lawsuit and reauest for US\$25 million compensation, filed by the widow of Wes Skiles—the world-renowned underwater cinematographer, conservationist and cave diving pioneer who tragically died in 2010 during a seeminaly routine shallow dive. (X-RAY MAG will be running a full analysis of this case in the next issue).

While we must be compassionate and sensitive to the deep grief and loss that families of accident victims experience, it is apparent that the sad trend—a festerina blameculture—is counterproductive and has to be curbed. In the case concerning Dive Rite. the verdict could have had a far-reaching impact. Had the company been held responsible, it could have opened a Pandora's box of lawsuits, potentially stalling innovation, with much of the dive industry at risk of being held responsible for the bad choices or foolish actions of a few individuals. Thankfully, the verdict fell in favour of common sense.

What it all boils down to is this: We have to assume responsibility for our own choices and actions. Not just because we are divers, but because that is what mature adults do.

And as such, we answer to our families, dependants, friends and other loved ones who are the ones that will be immediately and deeply affected should we be so unfortunate as to suffer injury.

— Peter Symes

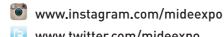
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NEWS

Jellyfish stings: Hot water better than ice

There has long been a debate on whether it is best to treat jellyfish stings with heat or cold, and now a team from the University of Hawaii claims to have found the answer.

After combing through more than 2,000

articles and conducting a systematic review of the evidence for the use of heat or ice in the treatment of cnidarian envenomations, the team concluded that the majority of studies to date support the use of hot-water immersion for pain relief and improved health outcomes.

Immersion in hot water (~45°C or 113°F) is a well documented and commonly recommended therapy for being stung by many marine creatures, including the painful stings from echinoderms and venomous

fish. The mechanism of action is not entirely clear, but there is evidence that marine venoms are heat labile, and thus immersion of the sting area in hot water is thought to inactivate key venom components.

Ice no longer recommended

ing envenomed areas in ice water might slow the movement of venom towards the core (heart), and thus might lead to better outcomes in deadly envenomations. However, experimental evidence does not support the use of cryotherapy or cold-water immersion in reducing pathology or improving clinical outcomes, and the practice is no longer recom-

mended.

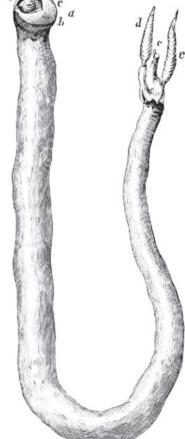
The preponderance of evidence demonstrates that hot-water immersion is a safe and effective method of reducing pain from cnidarian envenomations, and is also associated with improved clinical outcomes. No studies or cases were found where hot-water immersion led to worsened symptoms or poorer clinical outcomes. Fears

of negative effects of immersing a stung limb in 45°C water for 20 minutes are not supported in the literature. This is not surprising, given that hot-water immersion is considered safe and is recommended for the treatment of stonefish stings and other life-threatening marine envenomations with potential cardiovascular complications. ■ SOURCE: TOXINS

from the deep

Shipworms now found in the Arctic

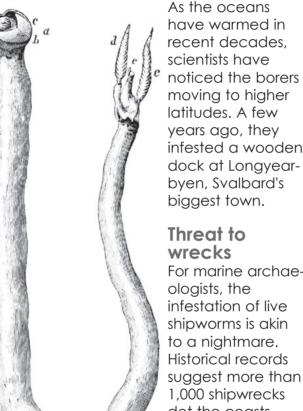
Shipworms—mollusks adapted to tunnel into and eat wood, including historic wrecks have now been discovered in Rijpfjorden, a fjord at the northern side of Nordaustlandet in Svalbard, Norway. Shipworms have never been documented so far north, just 1,100km from the North Pole, and at such a depth, where the temperature was only 1.8°C (35°F).



FRESHWATER AND MARINE IMAGE BANK

For marine archaeologists, the infestation of live shipworms is akin to a niahtmare. Historical records suggest more than 1,000 shipwrecks dot the coasts around Svalbard. harboring centuries of secrets. Studies suggest that the

most common shipworm species, T. navalis, cannot reproduce at temperatures below 10°C, so scientists are now debating how the molluscs found on Rijpfjord could possibly survive. One scenario is that the log became infested in warmer waters to the south or east of Svalbard, then recently drifted into the fjord and sank. Another possibility that it is a new species, or variant, able to thrive near the freezing point of saltwater. Ample black sediments inside the log, as well as stringy marine organisms growing on its side, suggest it may have been on the sea floor for a year



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Conversely, it was once thought that immers-

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or more. ■ SOURCE: SCIENCE

BOOKS SCIENCE & FCOLOGY TFCH

FDUCATION



Nesting sea turtle making its way back to the ocean

Clearing debris off beaches increases sea turtle nests

Clearing the beach of flotsam and jetsam increased the number of nests by as much as 200 percent, a new study shows, while leaving the detritus decreased the number by nearly 50 percent.

A field experiment was conducted to understand the effects of large beach debris on sea turtle nesting behavior as well as the effectiveness of large debris removal for habitat restoration.

From May 1 to September 1 of each year between 2011 and 2014, a team of researchers studied nesting sea turtles along the US Gulf Coast near Eglin Air Force Base in the Florida Panhandle. They sought to understand the effects of large debris on sea turtle nesting activities. The study area has one of the highest nest-ing densities of loggerhead sea

turtles in the northern Gulf of Mexico.

The debris in the area was both natural, such as fallen trees and stumps, and man-made, including concrete, pipes and metal fencing that remained on the beach after old military structures were demolished. Large natural and anthropogenic debris were removed from one of three sections of a sea turtle nesting beach.

During the experiment, researchers recorded locations of nests and false crawls, defined as the number of times that sea tur
was not removed, the number of the number of times that sea tur-

tles emerge from the Gulf waters but do not lay eggs.

Distributions of nests and false crawls in pre- (2011–2012) and post- (2013–2014) removal years in the three sections were then compared.

After researchers got rid of debris, sea turtle nest numbers increased 200 percent, and the number of false crawls increased 55 percent, the study showed. In beach sections where debris was not removed, the number of nests declined 46 percent.



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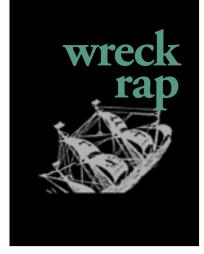
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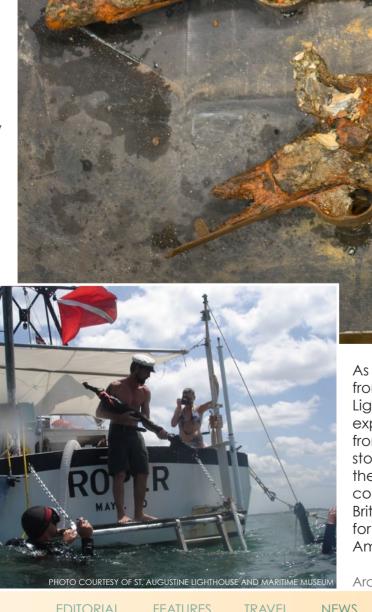
EDUCATION



Text by Franklin H. Price Photos courtesy of the St. Augustine Lighthouse and Maritime Museum and Sara Brockmann, Florida Department of State

In 2009, underwater archaeologists from the St. **Augustine Lighthouse and** Maritime Museum discovered a site dubbed the "Storm Wreck" in the murky waters off St. Augustine, Florida. Analysis of the artifacts revealed that the Storm Wreck dates to the end of the American Revolutionary War. The

vessel was apparently one of 16 Loyalist refugee vessels that left Charleston in December 1782, bound for **British-controlled** Florida, only to wreck off the coast of St. Augustine.



As archaeologists from the St. Augustine Lighthouse Museum explained, "Artifacts from this ship tell a story of plight." When the Revolution ended, colonists loyal to Britain fled the newlyformed United States of America with whatever

they could carry. As the wreck revealed, this included arms. Among numerous other artifacts, archaeologists recovered three Brown Bess muskets from the seafloor. They were later transferred to the Florida Department of State, Bureau of Archaeological Research Conservation Laboratory in Tallahassee, Florida, for treatment.

Florida's

When archaeologists recover artifacts on land or underwater, the precise location of each object is meticulously recorded, because the spatial relationship of artifacts to one another can reveal enormous amounts about the past. This is one of the reasons why divers should never disturb historic shipwreck sites. However, what is not as widely

known about maritime archaeology is what happens to artifacts once they have been removed from the water. Here, just as much care needs to be taken.

Conservation measures

When an artifact leaves a wet environment, most materials require some sort of treatment, from moderate to quite exten-

Archaeologists recover a musket on site (left); Three muskets (above) from the Storm Wreck, at the conservation laboratory in Tallahassee



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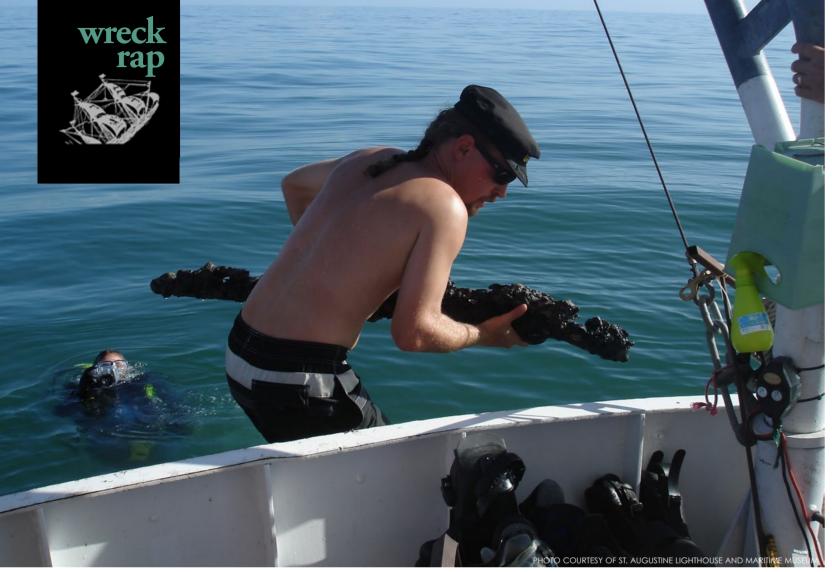
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- Conserving Three Muskets Found Off St. Augustine

PHOTO & VIDEO

PORTFOLIO



sive, in order to reach equilibrium with their new, dry environment. Artifacts removed from the ocean need special care because materials can be infused with salts that

wreak havoc as the object dries, causing structural damage. The treatment of artifacts removed from water has spawned a subset of archaeology, marine artifact

> conservation, practiced by archaeological conservators, who guide artifacts through the transition from aquatic to terrestrial environments. This can be a complicated process, depending upon what materials

make up an artifact.

The consequences of leaving artifacts untreated can be readily apparent. Old anchors and cannons are a common sight in front of restaurants or hotels in seaside towns. Sadly, these are often slowly disintegrating because they did not receive proper treatment. You may also have seen what can happen to wood that's been submerged for long periods and then quickly dried. It splits, cracks, and falls apart.

Muskets from the Storm
Wreck present archaeological
conservators with the challenge of conserving complex
artifacts. The muskets are
made from multiple materials
that require different treat-



Conservator Jessica Stika uses an airscribe to remove concretion (above); Archaeologist Brendan Burke carefully brings an artifact aboard (left)

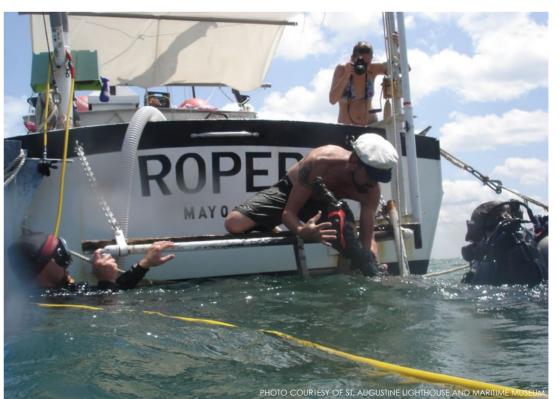
ments. The locks and barrels are made of iron, the stocks are wood, and the trigger guards, ramrod pipes, and side and wrist plates are made from brass.

Documentation and treatment

To begin the conservation treatment of the muskets, conservators

document and photograph the objects. The muskets are constantly kept wet, and pneumatic chisels, called airscribes, are used to clean concretions (iron corrosion products) away from the surface of the wood stocks and brass parts.

In most cases, iron objects from underwater sites are surrounded



A musket is guided gently out of the water.

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At the laboratory, archaeologists discuss conservation methods.

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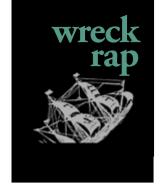
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Researche inspects a musket recovered from the Storm Wreck.

by concretion. Sometimes, the original iron artifact can dearade or corrode completely. However, within the concretion, the original dimensions of the object are preserved as negative space.

Even though the artifact is gone, the void left behind retains the object's shape. In this case, conservators can fill the cavity with epoxy to make a perfect copy of the oriai-nal object. They use x-rays to help deter-mine when this is necessary, and where the voids are and where they can be filled with epoxy.

After the concretion is removed, an epoxy replica remains in the shape of the original artifact. The iron locks on the muskets are preserved in the surrounding concretion in the same way. Because the locks have completely corroded away, conservators can make casts of the empty cavities.

Extensive treatment

In other cases, the iron artifact survives and requires more extensive treatment. Electrolytic reduction is used to remove chlorides from iron objects, such as cannons or anchors. This stops the corrosion caused by the presence of chlorides. Not much of the original iron remains on the Storm Wreck muskets—only parts of two barrels have survived—but what is left will



undergo electrolysis. Following electrolysis and the removal of the electrolyte using consecutive boiling rinses, the objects can be treated with tannic acid and micro-crys-

> talline wax, to seal them off from the surrounding environment.

The conservation of wood often requires soaking in water with a progressively higher concentration of the bulking wax. polyethylene glycol (PEG). Various processes at play in the aquatic environment greatly degrade the cell walls in wooden objects, and these interior areas need to be fortified with wax. PEG helps reduce or eliminate these effects. In the case of the Storm Wreck muskets, the wooden stocks are soaked in PEG while conservators slowly add higher concentrations, which allows the PEG to fully infuse into the wood. The entire process takes months to complete, but the treatment results in a stable wooden object that can be displayed.

The brass parts of the muskets will undergo a treatment similar to iron objects. They will go through electrolysis to lower the

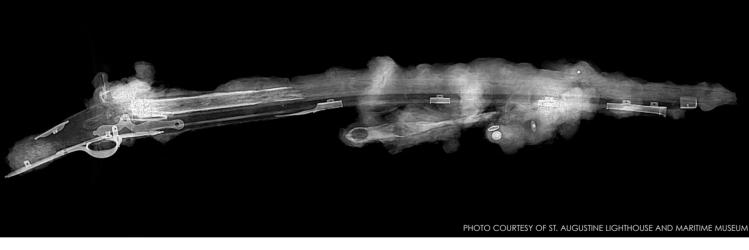
chloride levels. After three boiling rinses, they will be dried and coated in an acrylic resin sealant.

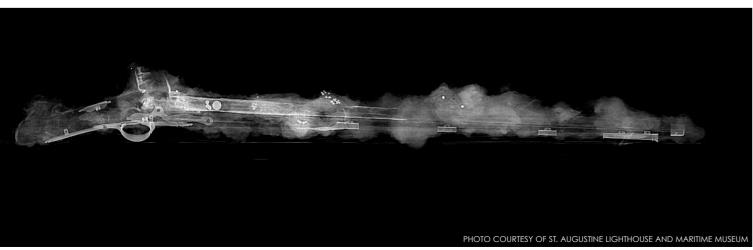
When all of the components are conserved, the muskets will be reassembled and put on display. This example of the three muskets from the Storm Wreck demonstrate the importance of artifact conservation. Now invaluable pieces of history will survive for future generations to learn from and enjoy. To learn more about the Storm Wreck, visit the St. Augustine Lighthouse and Maritime Museum to see their exhibit. "Wrecked!" that opened on 5 May 2016 (Staugustinelighthouse.org).

Franklin H. Price is a maritime archaeolo-aist with the Florida Department of State in Tallahassee, Florida, where he conducts research, supervises diving operations and manages Florida's Underwater Archaeological Preserves. Visit: DOS.MyFlorida.com

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FLORIDA DIVISION OF HISTORICAL RESOURCES COLLECTIONS AND CONSERVATION LABORATORY (HTTP://DOS.MYFLORIDA.COM/HISTORICAL/ARCHAE-OLOGY/COLLECTIONS-AND-CONSERVATION) ST. AUGUSTINE LIGHTHOUSE & MARITIME MUSEUM - STORM WRECK, (HTTP://WWW.STAUGUSTINELIGHT-HOUSE.ORG/LAMP/RESEARCH/STORM-WRECK)

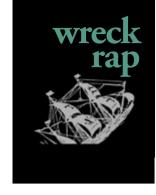




X-rays of two of the muskets in side view



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Diver observing marine life near Annapolis in Howe Sound (right); HMCS Annapolis arriving in 2008 (below); Divers enjoy easy wreck access to Annapolis (lower left)

Text and photos by Barb Roy

For the local diving community, it is hard to imagine a full year has already passed since the sinking of the HMCS Annapolis in Halkett Bay, off Gambier Island in British Columbia, Canada. It only seemed like yesterday when crowds of onlookers gathered to watch the sinking on 4 April 2015. In little over two minutes, the ship was on the bottom, and Howe Sound had its first substantial wreck at 371ft (113m) in length! Divers joined in from around the northwest to be one of the first to dive the new underwater reef of steel, keeping local dive charter operators busy for months to follow.





According to Jan Breckman, co-owner of Sea Dragon Charters out of Horseshoe Bay, business continues to be strong a year later: "Yes, it looks like another areat year is comina up! It takes time for dive stores and trip leaders to organize group charters, so we will continue to have new business for some time. We already have many bookings for 2016 and visibility has really been good since last summer."

Annapolis Anniversary

Breckman also agreed the new wreck has without a doubt contributed to the local economy by attracting new divers to the area, similar to other artificial reefs put down around coastal BC by the Artificial Reef Society of British Columbia (ARSBC). "Yes, for sure it has contributed as the media attention on the *Annapolis* has let divers know that there is a great artificial reef in close proximity, which is very inviting to new customers from Washington and Alberta," said Breckman.

Over the past year, Sea Dragon Charters (Seadragoncharters.com) has added snorkeling and kayaking tours in Howe Sound to their adventure tours. When asked if Jan and her husband Kevin has

had a chance to dive on the new wreck, she replied:

British Columbia's newest wreck celebrates first year

"Of course, we have both been diving on the wreck! I actually cried when the wreck was first being towed from Long Bay to Halkett Bay, because it meant the project that we had been working on for eight years was actually going to happen, and the blood, sweat and tears would all be worth it. I cried again when she actually went down perfectly on sinking day, and I cried one more time in my mask when I was on my first dive right after the sinking. The fact that this artificial reef is shallower than most of the other artificial reefs makes it great for training and beginner divers can also partake because there are plenty of areas shallower than 60ft (18m) that they can explore safely."

Indeed, the wreck is somewhat shallower than the other retired military ships, making it very accessible year round. According to reports, the bow is to the south at around 105ft (60ft at top) and the stern to the north at 98ft (77ft at top) with plenty of the other sections in 35 to 65ft (10.5-20m) of water. As with the other artificial reefs scuttled by the ARSBC, large holes throughout the vessel make it easy for divers to see inside the wreck and watch how marine critters begin to take hold. Just make sure you are trained for penetration diving if you wish to venture inside.

Marine life

"The ship already has lots of life," added Breckman. "The Vancouver Aquarium's project ABIS has already identified well

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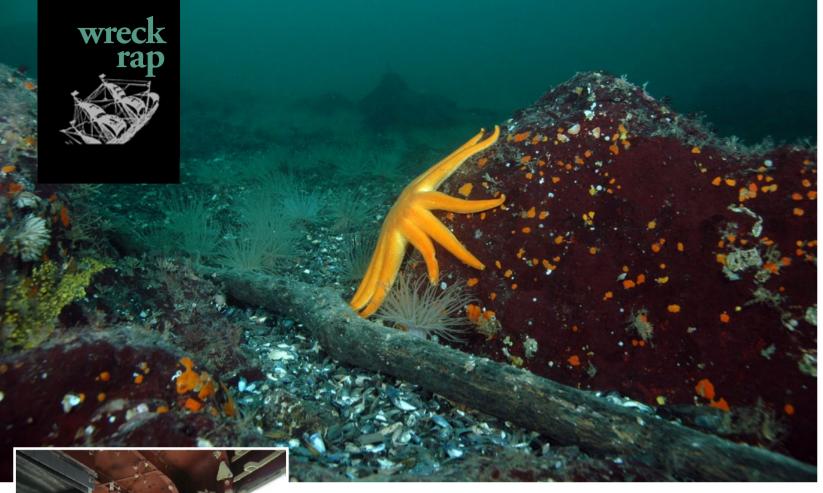
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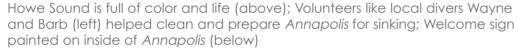
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and BC Parks. Project coordinators Doug Pemberton and Donna Gibbs are asking underwater photographers and videographers to contribute by sharing their experiences, photographs and videos whenever possible.

So far, sightings have included anemones, barnacles, gobies, shiner perch, hydroids, tubeworms and encrusting bryozoans. After a few months, diatoms, new hydroids, spot prawns, coonstripe shrimp, purple and mottled sea stars, rockfish, pollock, greenlings and sculpins were added, followed by red algae, spiral bryozoans, stout shrimp and pygmy rock crabs. For more information on the ABIS project, go to: www.vanaqua.org/act/research/annapolis.

Diving

Another dive charter operator, Marc Palay of New World Diving,

Ltd, who also departs from Horseshoe Bay, said: "We charter to the Annapolis three to four times a month with most of the divers being local, but a few groups coming from the US and Alberta. I would say we have 50 percent









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over 40 species."

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Started soon after the sinking,

Study (ABIS) was set up to observe

the Annapolis Biodiversity Index

and record marine species on

Sponsoring participants in the

the wreck for the next five years.

study include the ARSBC, Vancou-

the Marine Life Sanctuaries Society

ver Aquarium, Squamish Nations,

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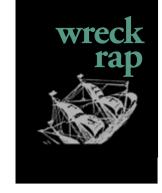
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Jan and Kevin Breckman of Sea Dragon Charters



Dive boat for Sunshine Diving Tours (top right); Dive boat for New World Diving in Howe (right)

technical divers and 50 percent recreational divers. Wreck diving courses have been very popular. I have also taken out a few handicap divers along the outside of the ship and they love it!"

For those of you who have never been diving in Howe Sound, there are plenty of other excellent dives as explained by Loretta Corbeil, owner of Sunshine Kayakina/ Sunshine Dive Charters (Sunshinekayaking. com): "Howe Sound is unique for diving as it has over 45 dive sites. We started doing dive

charters in Howe Sound after the HMCS Annapolis was sunk. then expanded the charters throughout Howe Sound, Our company has been in Gibsons Harbour for 25 years now. Most of the dive sites are only five to 20 minutes away with our charter boat."

Many of the charter operators work with local hotels to offer visiting divers a package deal similar to the one Sunshine Kayaking offers: "We work with Gibsons Garden Hotel, who offer special rates for divers including breakfast and provide a secure

place to wash and store the divina equipment. We also work with Sea Dog Divers Den, the local dive store in Sechelt, for air fills and rentals. Families can come and do a dive and then have a nice holiday here with other things to do like kayaking, fishing and sailing to accommodate the whole family."

A great reference for diving Howe Sound is the book written by Glen Dennison: The Complete Guide to Diving Howe Sound Reefs and Islands by Boat. Howe Sound is

accessed from Mainland Vancouver, serviced by Vancouver International those traveling to Gibsons from Horseshoe Bay, ferry reservations ed during the summer months. Gibsons Harbour is accessed via BC Ferries from Horseshoe Bay to Langdale (BCFerries.com).

Support and arowth To assist with the upkeep of the

artificial reefs around BC, one of the programs the ARSBC has implemented in cooperation with the Dive Industry Association of British Columbia is a voluntary \$20 annual tag fee. Divers receive a colorful, collectible small plastic tag to attach to their buoyancy vest (BCD) to show their support. Money from the program is used for replacing mooring lines, buoys and other needed maintenance on the wrecks. Tags are available from the charter operators.

One thing is for sure that I have heard from many of the charter operators, dive guides and divers who have been on the Annapolis, is that it takes

several dives to be able to see the whole ship. Keep in mind, the Annapolis is a helicopter-carrying destroyer escort with the hanger

still intact. On both sides of the ship are covered walkways, similar to the Cape Breton, currently scuttled in Nanaimo off Snake Island. Perhaps one day the Annapolis will also have a thriving population of cloud sponge and feather stars.

For more detailed information and the history of this and other wrecks around British Columbia, go to the ARSBC website (Artificialreef.bc.ca). Have fun! ■

> One day the Annapolis will resemble surrounding dive sites (upper and lower right)













NEWS



HM Bark Endeavour replica in Cooktown

Wreckage of HMS Endeavour located

Captain James Cook's ship HMS Endeavour, used to explore Australia and last seen during the 1770s, likely discovered off US state of Rhode Island.

Cook commanded the ship from 1768 to 1771 on his famous voyage mapping the uncharted waters of the south Pacific Ocean. The HMS Endeavour sailed around Cape Horn in Africa, and visited Tahiti, New Zealand and Australia. Cook explored Tonga, Easter Island, Norfolk Island, New Caledonia and Vanuatu on his second voyage. He was killed in 1779 during a trip to the Sandwich Islands, now known as Hawaii.

The Endeavour was sold and used to transport British troops before it met its watery grave—lost for more than two centuries. The ship—then renamed the Lord Sandwich—was scuttled in Newport Harbor by British forces in the lead-up to the 1778 Battle of Rhode Island during the American Revolution.

Now the Rhode Island Marine Archeology Project (RIMP) says it has managed to identify the wreckage of the Lord Sandwich in Newport Harbor, off the state of Rhode Island.

Sunk in shallow waters

"The American army was assembled on the mainland and the French sent a fleet to help," said Dr Kathy Abbass, the executive director of Rhode Island Marine Archaeology Project. "The British knew they were at great risk so they ordered 13 ships out to be scuttled in a line to blockade the city. They were sunk in fairly shallow waters." According to RIMP, the wreckages are spread across nine different sites, and one group of five ships includes the Lord Sandwich transport, formerly Captain James Cook's Endeavour.

The organisation is now launching a campaign to finance the excavation process.

SOURCE: RHODE ISLAND MARINE ARCHAEOL-**OGY PROJECT**

British WWII sub located in the Med

A team led by Genoabased diver wreck hunter. Massimo Domenico Bordone, found the remains at about 100m deep, about five nautical miles east of the isle of Tavolara, off Sardinia.

The wreckage is reportedly in quite good condition with only

its prow showing damage from the explosion. In all likelihood, experts say the vessel's inner chamber was not flooded as it

The HMS P 311 left Malta on 28 December 1942, on a mission to destroy the Italian battleships Trieste and Gorizia as they lay at anchor in the port of La Maddalena, located on an island of the same name off the northern coast of Sardinia. The

sub vanished without a trace after it was believed to have been hit by a mine in the Gulf of Olbia on or around 2 January 1943

Positive identification

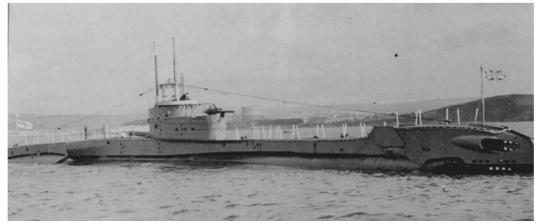
P 311 was the only boat of her class never to be given a name. She was due to have been named Tutenkhamen but was lost before this was formally done. Paola Pegoraro of the

L'Orso diving club, which provided logistics for Bondone's shipwreck search operation, told The Telegraph that Bondone was able to positively identify the submarine as the P311 by the two Chariot-style "human torpedoes" that are affixed to the outside of the vessel.

A Royal Navy spokesperson said they are examining records to determine whether or not this is indeed the Royal Navy submarine. The Royal Navy said it expects the wreck to be treated with respect while they work to confirm the identity of the submarine. If confirmed the HMS P 311 would almost certainly not be moved from its final resting place, irrespective of whether or not bodies are sealed inside: "Once a military vessel sinks it becomes a war grave and is left where it lies." SOURCE: LA NUOVA SARDEGNA

The sub was believed to have been struck by a mine during its mission.





BOOKS

HMS P311, sister ship HMS Tantalus



The wreckage is reportedly in incredibly good condition.

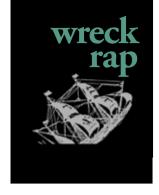


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The now decommissioned Royal Australian Navy friaate HMAS Sydney underway in 2013

UNMISSABLE

AND YOUR COMPANION VOLUME TO DIVE TRUK LAGOON



Australia to get a new artificial reef... or two

The Australian defence minister announced Ex-HMAS ships *Tobruk* and Sydney will be offered to the states and territories in June for the creation of dive wrecks.

HMAS Tobruk was retired last year after 35 years of service, including many humanitarian missions. She was launched in 1980. During her 34-year operational history, *Tobruk* sailed over 947,000 nautical miles (1,754,000km or 1,090,000mi), and was deployed on 26 major opera-

HMAS Sydnev was laid down and launched in 1980. Sydney has been involved in Australian responses to the 1987 Fijian coups d'état and the Bougainville uprising. The frigate was deployed to the Persian Gulf on five occasions in support of **United States** operations during the

Gulf War, the war in Afghanistan, and the 2003 invasion of Iraq, and has completed two round-theworld voyages. She was decommissioned on 7 November 2015.

Lots of interest

Several entities have called for the ships to be scuttled as dive wrecks. Federal Member of Parliament Keith Pitt has spent several years campaigning for the scuttling of a warship in Hervey Bay as a tourist attraction, with Tobruk his preferred vessel.

Another proposal has come from the community of St Helens on Tasmania's east coast, which wants the ship to be scuttled at Skeleton Bay. The Whyalla City Council has also expressed interest in using either the HMAS Sydney or Tobruk as an artificial reef in the Spencer Gulf.

The cost of preparing the ships, which includes the removal of asbestos and other materials, will be roughly AU\$10 million, with government funding required to get the project off the ground. It will likely take up to three years. ■ **SOURCE: DAILY TELEGRAPH**









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ROD MACDONALD

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Panorama from the viewpoint of Ko Similan over Ao (bay) Kuerk

Thailand closes popular islands to tourists

Officials have banned holidaymakers from visiting parts of the three popular islands off Phuket's east coast and some in Andaman Sea as they review the impact tourism is having on the local ecology.

Thailand's Department of National Parks, Wildlife and Plant Conservation is closing the beaches, the reef and a tourist area on the islands "to solve the environmental and natural resources impact which is caused by tourism," according to an announcement on the department's website. The order was issued on May 10.

The waters off Koh Khai Nok, Koh Khai Nui and Koh Khai Nai are renowned for their colourful coral displays and are popular with day-trippers from nearby Phuket, but the Department of Marine and Coastal Resources (DMCR) claims that up to 80 percent of reefs there have been degraded and has decided to ban tourists from visiting them. Authorities have also ordered the removal of facilities and structures used for tourist activities from all three islands.

Walking on corals

Corals in the Koh Khai area are both damaged by bleaching and from human activity. This includes the increasing number of tourists, boats that anchor on the corals, people walking on corals while playing in the water, feeding marine animals and catching them to take photos with them.

"All these activities negatively impact the marine ecosystem and cause a deterioration in natural resources. They must be stopped. We want operators and guides ... to understand the rules and procedures in conducting a tour to prevent further damages to our marine natural resources and the coastal area. They must practice environmentally friendly tourism," DMCR regional chief Watcharin Na Thalang told the Phuket News.

At least 60 speedboats per day,

as well as increasing numbers of restaurants and shops, are diminishing existing natural resources in the coastal areas around the three islands, said a recent report by the Phuket Marine Biology Centre, Watcharin pointed out.

Meanwhile, Koh Tachai in Similan National Park—about 45 miles off Thailand's southwest coast and one of Thailand's most beautiful island destinations, popular with divers and snorkelers—will be closed to tourists indefinitely in an attempt to protect it from irreparable harm, the government has announced. The park is normally closed to tourists from mid-May to mid-October because of safety concerns during the monsoon season, but will not reopen as is customary in October.



In addition to numerous prizes for wide-angle and macro, one winning image will make the cover of X-ray magazine! There will be a Post Trip Photo Gallery featured on xray-mag.com of top images from participating photographers.



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A winter's dawn is a special time to be on Kings Bay, for as the first rays of the Florida sun appear over the horizon, they light up the soft mist on the warm waters of the bay and create an ethereal, almost mystical, feeling. Listen carefully and you will hear the gentle ripples from the swirl pools formed by the paddle-like tails of the sirenians, as they make their way towards the freshwater springs that are the source of Crystal River. Look closely into the dark waters ahead of those swirl pools and you will see the large and unmistakable sausage-like shape of the Florida manatee.

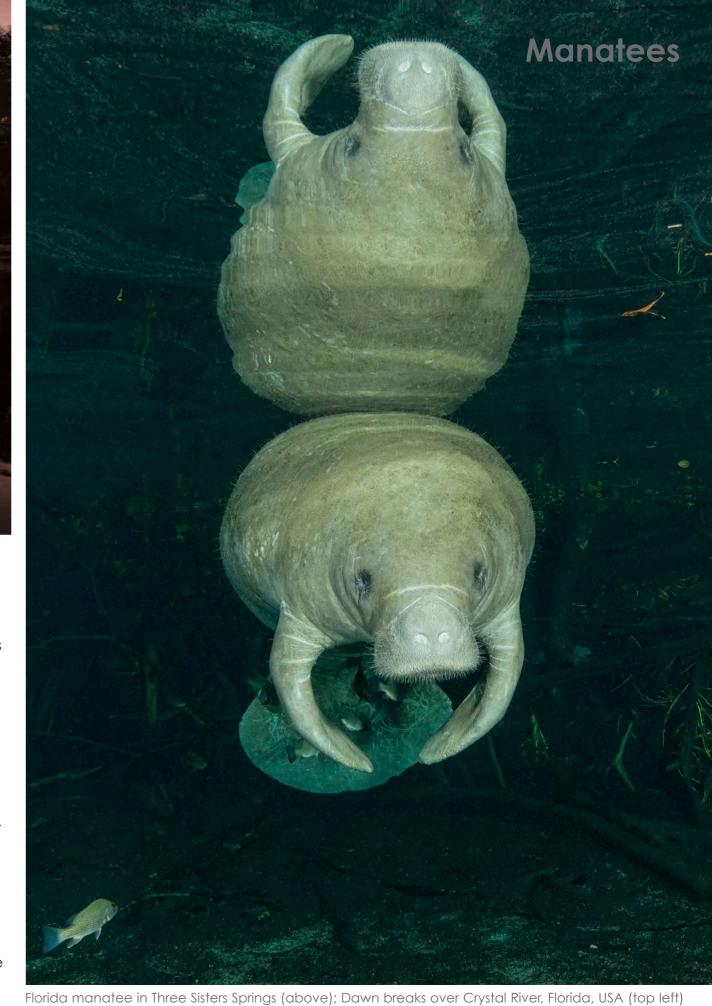
The arrival of the manatees usually coincides with a rising tide and heralds their return from feeding on the sea grass of Kings Bay and Crystal River. Cold and tired, they need the warmth of the spring waters to restore their body temperature as they sleep in the natural and man-made refuges of the area. This area of the Florida peninsula in Citrus County, on the western side of the state that is bordered by the Gulf of Mexico, is without doubt the best place in the world to experience the unique and singularly exceptional Florida manatee.

Warm water

The peninsula that makes up most of the US state of Florida is formed by a large plateau of karst limestone that sits on a massive subterranean platform of bedrock which stretches far out into the Gulf of Mexico. Underneath all of Florida and the southern parts of Alabama, Georgia and South Carolina is one of the world's most productive aquifers—the massive Floridan aquifer, which covers a total area of almost 100,000 square miles.

Instead of running off into river systems, the porous karst limestone allows the state's regular and heavy rainfall to percolate down into the many underground chambers of the plateau and, as new water makes its way into the aquifer system, hydraulic pressure forces previous rainfall out into areas where those chambers are closest to the surface—such as Kings Bay in Citrus County. The water that emerges in those natural springs is extremely clear, having been thoroughly cleaned by the percolation process.

In an area covering about one square mile, Kings Bay has between 70 to 100 natural springs (depending on whose opinion you accept), 15 of which are significant "first magnitude" ones. Combined, they pump out some 300 million gallons a day, all at a con-





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Florida manatee at Crystal River. A species distantly related to elephants, they are often called "sea cows".

stant temperature of 72°F (22°C), filling the bay with warm water and forming the head waters of Crystal River, which flows out into the Gulf of Mexico. This constant flow of warm water is the reason why the manatees come to Crystal River every winter.

The Florida manatee

Said to be the source of the mermaid myth, sirenians are large mammals with stout bodies, which look a bit like small whales. Their considerable size—a fully grown female manatee can reach four meters in length and weigh about 1,500kg—means they have evolved without any natural enemies and have developed a rather slow and passive nature.

They get their name from "sirens", the term used to describe the sea nymphs whose captivating songs are said to have lured sailors to their deaths in treacherous shallow waters. Distantly related to elephants, but usually referred to as "sea cows", there are now only four species of sirenians still alive of the 35 that are known to have once existed—three of which fall into the manatee family, while the fourth is in the dugong family.

The Florida manatee is a sub-species of the West Indian manatee species and is usually found in the shallow coastal waters around the state. In summer, it can be spotted as far west as Louisiana and all the way up to the Carolinas on the eastern coast of the United States. Solitary creatures that can live more than 70 years, manatees are the only aquatic mammals that are also herbivores. They exist on a primary diet of sea grass, the pursuit of which takes up to eight hours a

day, with a fully grown adult consuming up to 10 percent of its body weight every day.

Contrary to what its rotund appearance might suggest, the manatee's diet means that it is actually a really "lean machine", with virtually no fat or blubber to keep it warm when the water temperature drops in winter. At water temperatures below 68°F (20°C), the Florida manatee simply cannot maintain its core body temperature and will die of cold stress unless it can find a source of warmth, which means that Kings Bay and its natural springs provide a perfect natural refuge for them.

Crystal River

— Home of the manatee
There are actually two Crystal Rivers—the river itself, and the town of the same name, which sits on the



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shores of the 400acre lake that is Kings Bay. First impressions are not always what they might appear, and such is the case with the Town of Crystal River where the sian outside of City Hall proudly informs you that you are now in the "home of the manatee".

With a population of just over 3,000, Crystal River gives the first-time visitor

a feeling of small-town America doing okay—thank you very much. There are numerous hotels and restaurants, plus a large shopping mall, and the area around Kings Bay hosts numerous very nice canal-side homes. This prosperity is derived from two very different sources: firstly, the estimated 150,000 people who come to experience the manatees every winter, injecting somewhere between

MANATEE ZONE

JUN 1 - AUG 18
25 MPH
SLOW SPEED NIGHT
NO ANCHORING

REMANDER OF YEAR
NO ANCHORING

REMANDER OF YEAR
NO GRITTED

REMANDER OF YEAR
NO GRITTED

US\$20m and US\$30m into the local economy; and secondly, the "snowbirds"— wealthy residents of the northeastern American states and Canada who migrate south in the winter months to escape their harsh weather for Florida's much warmer southern version.

Peel away the Crystal River onion, however, and you will find a lot of lingering resentment amongst both local resiCLOCKWISE FROM LEFT: No-go zones and boating speed limits are a source of great contention in Crystal River; Canal-side homes in Crystal River; Manatees in Kings Bay; Fish clean propeller scars on a sleeping manatee—a common injury on many of the manatees in Crystal River

dents and snowbirds towards the manatees because of the boating speed and access restrictions in place under both State and Federal laws to protect them. Their basic argument is that manatees have been formally classified as "endan-

gered" under Federal law since 1967, which was probably justified at the time, but the protection mechanisms have worked, so it is time to move the status to "threatened" and relax the restrictions, which impact heavily on the local boating community. Resident groups such as Save Crystal River point to the increasing numbers of manatees in Kings Bay—which are up from 1,267 when aerial sur-

veys first began in 1991, to more than 6,300 in 2015—as the rationale for the change.

Manatee advocacy groups like the Save the Manatee Club have equally strong, but dia-

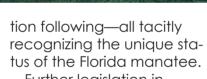
metrically opposed views, arguing for stronger protection and making the main Three Sisters Spring a closed sanctuary. Their basic argument is that there is still a long way to go before any status change can be considered, pointing to the loss of 830 manatees in 2013 because of unusually cold winter weather and pollutioninduced red tides.

Protecting the Florida manatee
The unique nature of the manatee has
long been recognized in Florida, with
the first state protections against killing



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Further legislation in 1978 recognized the entire state of Florida as a "refuge and sanctuary for the manatees" and established enforceable access restrictions and marine craft speed limits in 13 critical aggregation areas where manatees gather each winter. Manatees prefer shallow water, swim slowly, and because they are mammals, they must surface regularly to breathe which puts them right in

or mistreating them enacted in the danger zone where water 1893. Nationally, manatees were craft are involved. For most of the year, that danger is relatively small, as they roam far and wide formally endangered under the in search of the sea grass that sustains them—so the chances other State and Federal protecof being hit are minimal. But in

winter, when they aggregate in places like Kings Bay, they are incredibly vulnerable.

Possibly the single biggest lifestyle attraction in Florida is the "life-aquatic" and boating in general is extremely popular in the state. The no-go access restrictions and speed limits in place in Kings Bay and Crystal River are like red rags to a bull to those who argue that the manatee conservation pendulum has swuna too far. The conservationists counter that such restrictions are essential if the unique manatee is to prosper and survive.

A common statistic doing the rounds is that the most common cause of manatee fatality is water craft collision, with about 45 percent of those fatalities by propeller cuts and 50 percent because of "blunt trauma" from the boat hull. However, fatality statistics on the Florida Fish and

Wildlife Commission's website show that in 2013, "only" four of the 17 reported manatee fatalities in Citrus County were due to water craft. Obviously, the conservationists would araue that this shows the restrictions are working, while the resident aroups and boaters would probably point to the statistical dis-information bandied around is typical of what happens when that pendulum goes too far!

In January this year, the US Fish and Wildlife Service acknowledged the increasing numbers of manatees and proposed down-listing their status from "endangered" to "threatened", but stated that all protection measures currently in place would remain. The conservationists responded strongly to this move by trying to marshal their supporters to use the 90-day public comment period on the



Manatee Watch warden volunteer (above); No-go zone in manatee protection area is carefully marked (top right); Florida manatee ascends for a breath at the surface (top left); Don Silcock, ready to capture images of manatees at Crystal River (left)



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the first species to be listed as

Federal Endangered Species

Preservation Act of 1966, with





proposed change to petition the Fish and Wildlife Service to get it reversed.

Swimming with manatees

While the access restrictions and speed limits are the big issue in town, the "swim with" program is also a major source of contention between the manatee conservationists and tour company operators. Crystal River is the only location in the United States where tourists are allowed to enter the water and have a degree of interaction with the manatees.

An anachronism that dates to before the 1966 Endangered Species Act, swimming with the manatees was always a popular tourist draw in Crystal River and was "grandfathered" through the legislation—something that would never be permitted if it were proposed today. But back then, the numbers of tourists swimming with the manatees were a mere fraction of the estimated 150,000 who did it in 2015 and Crystal River was certainly

not the hot location it is today.

Tourist numbers have more than doubled since 2007 when they hit an all-time record of 60,000, and they look set to climb further as travel magazines and television shows continue to publicize the chance to swim with manatees in Kings Bay. Add to that Crystal River's appearance in the book, 1,000 Places to See Before You Die, by Patricia Schultz (published by Workman), and it is easy to see how tourist numbers could top 200,000 in the next few years!

For the 26 Crystal River companies offering manatee tours, not to mention the 110 licensed boat captains, the "swim with" program is a big attraction with huge emotional pulling power—something you will quickly come to appreciate when you arrive for your first dawn departure onto Kings Bay

and find yourself surrounded by dozens of excited schoolkids and their mothers!

About 60 percent of all tourists who visit Crystal Bay are from Florida and swimming with a manatee is a very popular thing to do. The problem is that while many of those tourists leave Crystal River with a greatly heightened appreciation for the manatee, there are always those who get carried away by the excitement THIS PAGE: With annual Crystal River manatee tourist numbers soon expected to reach 200,000, many would argue that the point of sustainability has been passed! Touching manatees is strictly forbidden, but it happens regardless of the rules (left); Though generally well-organized and regulated, 26 companies offering "swim-with" programs are a source of contention with conservationists (above).

of the moment and do stupid things like trying to ride them. Local manatee activist Tracy Colson started documenting this on video and posting them on YouTube. She even caught local guides taking babies manatees from their mothers to pass around to tourists.

Stricter interaction guidelines have since been introduced, but I know from my personal experience in Kings Bay, a moment of sublime but cautious connectivity as a curious manatee approaches is instantly negated by the arrival of dozens of hyper schoolkids. Quite what impact this all has on the placid manatee can only be guessed at.

Three Sisters Springs

This set of three large springs is probably the most unique and inspiring place you



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Permitted and prohibited activities at Three Sisters Springs (left)

wildlife refuge after having been acquired in 2010 by a consortium led by the Conservation Fund, the Three Sisters is one of Florida's last remaining urban springs.

Unlike the other main springs in Kings Bay, the setting of the Three Sisters means that the crystal clear waters that emerge from the underground aquifers do not merae with the darker waters of the bay until they exit the refuge. Which means that in the right conditions, the visibility is absolutely stunning, creating a magnificent backdrop to those

manatees that enter the Three Sisters through the narrow channel that connects it with the nearby canal system and Kings

Bay itself.

However, it is also open to the public, and what can seem like a unique and tranquil haven if you are there alone, quickly turns into thriving mass of assorted legs and torsos suspended from flotation sausages as the next party of tourists arrive. Very few tourists know how to snorkel and so they end up kicking madly to stay afloat, which rapidly stirs up the sandy bottom and sends the manatees to the deeper parts of the spring in search of some peace and quiet.

Interestingly, of the 400-plus manatees that have been identified (usually from their propeller scars) by the Florida Fish and Wildlife Commission as returning winter visitors, only around 100 of them will enter the Three Sisters. The rest stay

Three Sisters or those that prefer their warm water from as close to the source as possible is not known.

The tidal nature of Kings Bay means that the water level in the Three Sisters also varies with the tides—something that the manatees can sense through their vibrissae, the incredibly sensitive facial and body hair believed to give them a kind of three-dimensional spatial and navigational awareness.

One of the most interesting experiences I had during the 10 days I spent in Crystal River was

early one morning at the entrance of the narrow channel that provides access into the Three Sisters Spring. Entrance to the Three Sisters is not allowed before 7:00 a.m., which that morning coincided with more or less the low tide. As I entered the water and made my way towards the channel, I realized that I was surrounded by several large manatees that were all waiting patiently for the water level to rise.

It was really quite something to be surrounded by three- to four-meter-long animals who seemed either oblivious (hard to believe, given their vibrissae) or accommodating of my

⋆Tallahassee Jacksonville Gainesville§ Crystal River Orlando Gulf of Tampa Mexico West Palm Beach Fort Lauderdale Location of Crystal River on map of US state of Florida; Location of Florida on global map (inset)

in the sanctuaries where tourists are not allowed to enter. Whether it's the more sociable manatees that go into the

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could imagine to see and truly

appreciate the Florida mana-

tee. Set in 58 acres of pristine

vegetation, which is now a

hree Sisters Springs

Do Not Tie to Vegetation, Structures, or Signs

Manatees



A manatee in the Three Sisters Springs (left); Mating manatees, early morning in the Three Sisters Springs (right): Close up with a manatee (below)

stress on the manatees—the Fish and Wildlife Service seems to have good systems in place to monitor the overall situation. The tour operators seem to really know what they are doing and follow the rules (well, certainly mine, Birds Underwater, did) plus the extensive number of Manatee Watch volunteer wardens do a great job.

I felt incredibly fortunate to have had some close personal contact with a few of those manatees that use the Three Sisters. This was always on

presence. Then I realized that in all probability the manatees were simply cold and were enjoying the warmth of the water coming out of the Three Sisters.

Quite how long the Three Sisters will remain open to the public is far from clear as there is a strong belief amongst the conservationists that allowing large number of tourists in greatly stresses those manatees that use it. Conservationists argue that it should be made a true sanctuary with observation only allowed from a boardwalk around the springs.

A personal observation

For me, an opportunity to interact and photograph large marine creatures is as good as it gets—they grace you with their

presence, are in charge of the agenda and I find the actual experience utterly inspiring! Meeting the Sirenians of the Crystal River was just something I had to do. even though it involved traveling two-thirds around the world from Bali, complete with all my dive and camera aear.

I am so glad I did, but I have to say that I left Crystal River with a degree of ambivalence. On the one hand, I loved the manatees— I mean, how could you not? They are big, cute and wonderfully photogenic; plus, if you can get time alone with one in the Three Sisters, the backdrop is just spectacular. But, I was just not comfortable with the way Crystal River has so commercialized them, and if they really are one of the thou-

sand things to see before you die, then it can only get worse.

My overall sense of things was that everything that could be done was being done to minimize their terms though, where they came to me and allowed me to photograph them.

The rules of engagement from the Fish and Wildlife Services for

"professional photographers" is that after you have watched an instructional video on how to behave and paid a fee, you are given a bright vest with a number on it and are allowed to submerge rather than stay on the surface like all the other tourists. You are not allowed to pursue the manatees under any circumstances, so you have to hold your breath and hope they come to you.

But when that happens, it really is a special moment that can only really last until your desire to breathe overcomes your desire to cherish it. What troubled me

about Crystal River was the difference between those incredible moments of intimate interaction and what happens when hordes of tourists arrive eager to spend an hour or so in the water and then go home and tell friends, "I touched a manatee."

Manatees

Don Silcock is a Bali-based underwater photographer and writer whose principal focus is the diving and cultures of the Indo-Pacific region. His images, articles and extensive location guides can be found online on his website at: Indopacificimages.com.





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As our dive boat glided through Papeete Channel off the northern coast of Tahiti, two distinct spouts appeared on the horizon. We were carefully making our way toward them when suddenly two tails emerged out of the water and then majestically disappeared again. Benoit, our guide, carefully got into the water. He quietly swam in the wake of the whales until finally, he lifted his fist into the air to indicate their presence. Excited about the idea of locking eyes with a 40-ton whale, all the divers in the boat donned masks, snorkels and fins and slid into the Polynesian blue for a unique encounter.

After having spent summer in the polar regions of the Antarctic, gorging on tonnes of krill freed from the ice floes in spring, humpback whales embark on an instinct-driven migration that is vital for their survival.

It is the middle of winter in the southern hemisphere and the humpbacks have traveled thousands of kilometers to reach the warm Polynesian waters. Solitary or in small groups, they carve through the waters towards their destination to give birth before heading back towards the South Pole.

The island of Tahiti, and its little sister Moorea, are also visited by large numbers of these *Mysticeti* (baleen whales). Appearing as if by appointment, they patrol the shallow reefs fringing the channels and lagoons all over the islands.

In recent years, marine biologists have observed a strong increase in the number of whales visiting the Tahitian waters. This is definitely thanks to the 1986 moratorium that ended whale hunting, turning French

Polynesia into a true whale sanctuary.

Here, it is possible to observe individual whales at different stages of life, each with their own specific behavior. You can find females, inseparable from the young to which they have just given birth; adolescent solitary individuals that assemble into little groups; males singing their songs to warn off contenders; or fertile females that provoke violent fights between males before giving in to a few moments of tenderness.

French Polynesia is an exceptional destination to observe whales and remains one of the rare places on our planet where it is still legal for a few lucky divers to get in the water with them. To do so, the French Polynesia Ministry of Environment has developed rules that aim to ensure safe and respectful animal encounters. It is crucial for nature enthusiasts visiting these blue Pacific waters between July and October to strictly respect the rules about approaching the animals and when to get in the water.



TOPDIVE Tahiti, which is located at the InterContinental Tahiti Resort and Spa, offers humpback whale experiences for divers; In winter, humpback whales migrate all the way from Antarctica, where they feed on krill during the summer months, to the warm waters of Polynesia (top)



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Diving with whales

Enchanted by the perfume of tiare flowers, crowned with the traditional necklace of multi-colored flowers,

an extensive briefing before a dive with the humpback whales (left) and accompanied by the sound of toere

drums and ukuleles, visiting divers disembarked on the tarmac of Faa'a Airport. We were here and we had dreamed about this moment for a long time. Tahiti and all its treasures were ready to be revealed to us, more specifically, the incredible spectacle of

an underwater ballet performed by graceful giants.

It was early in the morning and we were embarking on the Parata, a

comfortable vessel moored at the ietty of TOPDIVE Tahiti, itself found in the luxurious InterContinental Tahiti Resort and Spa. At the rudder was Teiki, a Polynesian who is passionate and highly experienced when it comes to whale encounters. Conducting the pre-dive briefing was Benoit, a dive instructor who has been living in Tahiti for many years.

Breaching humpback whale off Tahiti (above); Dolphins can also be

observed on the way through Papeete Channel (right); Divers are given

We were given an extensive briefing. To start off, Benoit explained the anatomy, behavior, migration and history of humpback whales. Then he explained the organization of inwater encounters, specifically safety matters and the code of conduct to ensure minimal disturbance to the whales. It was important to keep a

respectful distance, freediving was not allowed, and obviously, touching the animals was strictly forbidden!

He emphasized the fact that these were wild animals and that they alone would decided whether to accept our presence and join us to satisfy their curiosity. The best thing about the game were the baby whales, eager to explore their world and the creatures in it.

Finding the whales

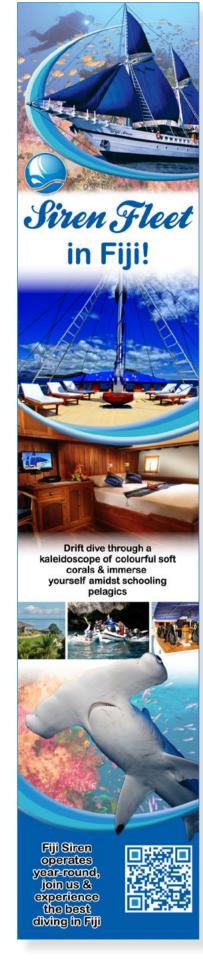
We cast off and headed north towards the Papeete Channel to reach the ocean.

The lagoon unfolded before our eyes. On one side was the reef

showing its colors at low tide, on the other was the lush foliage of Tahiti, with Mont Orohena looming in the background. The surface of the water was mirror-flat and the different shades of blue made the whole scene look like a postcard.

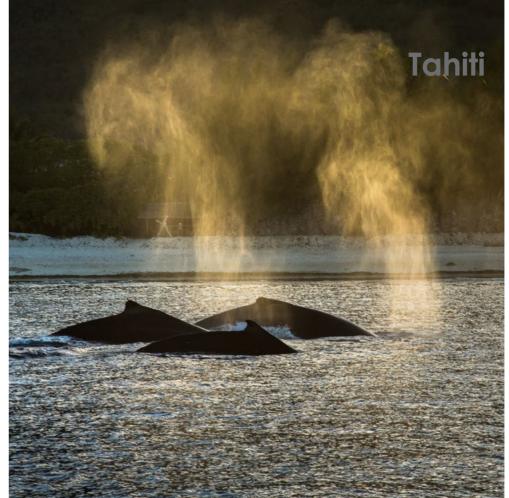
Approaching the channel, we passed a few traditional canoes, and later, a pod of spinner dolphins escorted us to the mouth of the channel. The scene was gorgeous, the sea was calm and the light gradually intensified. In the background was a breath-taking view of the small island of Moorea where surfers enjoyed the waves breaking on the reef.

The ocean gave itself up to us



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as we watched the water's surface in search of any signs of whales. In the distance, we saw a group of small boats—a sign of the presence of one or more whales. But we decided to take the opposite course towards Point Venus instead.

We suddenly saw a huge splash in the distance, followed by several blows—water sprays of whales exhaling. As we reached the area, we cut the engines and waited. After a few minutes, a small calf took a puff of air, a hundred meters away from the boat. It swam in circles, taking several breaths, and then disappeared.

Teiki asked us to stand ready; Benoit had already gone in the water to look for the whales. Fins and masks on, snorkels in our mouths, we were more than ready once he confirmed the presence of a mother and her little one directly below his fins.

Diving with humpbacks

The goal was to be as unobtrusive as possible, so we carefully slid into the water, one by one, and quietly swam in their direction. The clear water revealed a huge female, about 20 meters deep, sleeping with one eye open. Her lighter-colored calf was wrapped under her pectoral fins.

We remained together and floated on the surface. Then the calf separated from its mother and slowly rose to break the surface right before our eyes. We held our breaths as it watched us while performing several rolls and somersaults. It approached us, swimming in a disorderly way, and circled around us, without breaking eye contact, before diving down again to reach its mother. We were amazed by its playful little game, and it seemed the calf was interested in the strange animals that we must have seemed to be.



Encounter with baby humpback; Mist from breaths taken by humpback whales at the surface (top right)





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Protective mother and playful calf at the surface (left); Fluke of humpback whale (top left)

After a few minutes, the calf made another trip to the surface. This time, it looked more determined and less hesitant. Under the careful gaze of its mother, who seemed to accept our presence, it came directly towards us. It came close—too close, forcing us to swim aside and splitting our group in two.

Its curiosity was boundless! It passed between the swimmers and fixed its eyes on all of us. With its full four meters of length, it put up a show that seemed to make fun of us poor swimmers in comparison.

Delicately and agilely, it per-

formed a series of somersaults and pirouettes, as if inviting us to join in. With its innocent and carefree gaze, it transported us to a gentle world full of joy.

Then it was the mother's turn to surface. She rose from the depths and ended the game the calf was playing. She hardly seemed to have moved at all, and yet here she was, already at the surface.

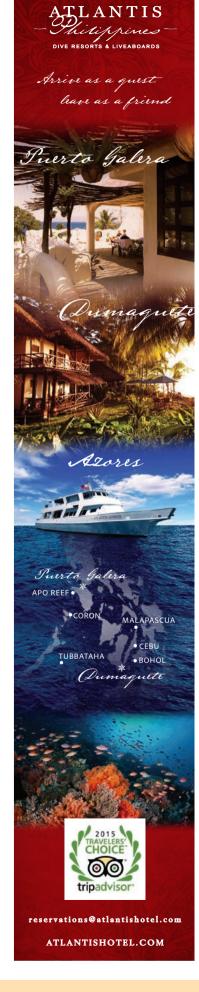
Interposed between the calf and us, she took a breath, and with a single stroke of her tail, she moved her 15m length and thousands of kilos. As she passed in front of us, we felt infinitely

small compared to her size and power. She only needed a few undulations to leave us behind and disappear into the blue, waving goodbye to us with her graceful tail.

We returned to our boat, overwhelmed with emotions. Experiencing such a moment left a lasting memory.

More encounters

For several days, we racked up the boat trips in search for more of these moments. With the TOP-DIVE team, we observed many more whales and got in the water with them multiple times.





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We crossed paths with two males singing. Hanging upright and upside down, they sang for hours. Being in the water with them and listening to their songs was incredible! Their singing was so powerful, it reverberated all through our bodies and everything else around, especially the underwater housings of our cameras.

On another day, we encountered a pod of pilot whales,

mixed with a group of young humpbacks. Visibility was poor that day, so imagine this surprise when getting in the water: While we were hoping to interact with the giants and maybe watch the pilot whales passing by, it was an oceanic whitetip shark that passed by! Inquisitive by nature, the shark circled us a few times before disappearing into the blue.

We also witnessed scenes of



violence—fighting male humpbacks competing to dethrone the leading contender, known as the "escort", on track to win a fertile female. For hours,

the challengers harassed the escort, performing spectacular moves. The escort had to compete, using all of its brutal, physical prowess to display its superior might and impose its dominance.

The activity at the surface was also a treat. Whales performed incredible leaps, lifting their 40-ton bodies completely out of the water, or using their pectoral fins and tails to violently hit the surface of the water. Whether it was a form of communication, socialization, intimidation or de-worming, we did not know why they did it. But one thing was certain, it made for a great show!

Conservation

It is therefore important to preserve this heritage for future generations. These gentle giants deserve the utmost respect, especially as their presence in Polynesian waters is not a coincidence.

Keep in mind that the whales are here to breed and calve away from predators; their

survival depends on it. Just because they accept our presence does not mean we can abuse their trust by disrupting their behavior.

The author wishes to thank Top-Dive (TopDive.com), Tahiti Tourisme (**Tahiti-Tourisme.fr**), e-Tahiti Travel (eTahitiTravel.pf), Air Tahiti Nui (AirTahitiNui.com), Aqua Lung (Aqualung.com) and Nauticam (Nauticam.com).

Gregory Lecoeur is an internationally published underwater photographer and dive writer based in France. For more information, please visit: GregLecoeur.com.



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Juvenile Puget Sound king crabs like to hide under kelp leaves. PREVIOUS PAGE: Cluster of anemones paint terrain of the Skookumchuck Rapids

With over 53 miles (86km) of scenic picturesque coastline along Highway 101 and less than 40 inches (104cm) of rainfall per year, it's no wonder the Sunshine Coast of British Columbia in Canada is a popular getaway for travelers from around the world. Both the upper and the lower sections offer an array of great dive sites and a myriad of other fun activities on a year-round basis.

The lower Sunshine Coast is located between Langdale and Earl's Cove,

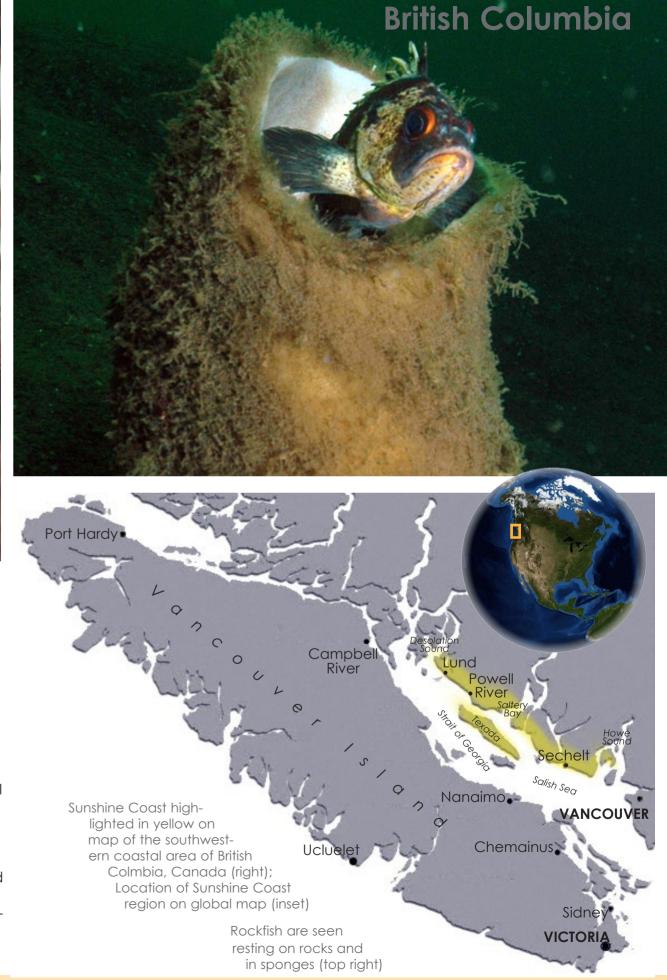
accessed via a car ferry from Horseshoe Bay to Langdale (40 min sailing). The town of Sechelt is a 30-minute drive north where divers can explore Sechelt Inlet. This is actually a peninsula formed between the Strait of Georgia and Sechelt Inlet. Narrows Inlet and Salmon Inlet branch off to the east of Sechelt Inlet opening the possibility to even more boat exploration. Due to the ease of getting here, divers tend to spend one to three days shore diving or join up with a group dive charter.

HMCS Chaudiere. The wreck of the HMCS Chaudiere, a retired 366ft (112m) destroyer escort, scuttled by the Artificial Reef Society of British Columbia (ARSBC) in 1992, is quite an experience. You have the opportunity to see and photograph

a variety of critters, without the worry of currents. Orange and white plumose anemones adorn the ship's railings from bow to stern. The bridge, ladders and stairs are also covered with anemones, feather stars (crinoids) brittle stars and white glass-tunicates.

I am always amazed at the amount of juvenile rockfish on this wreck, as well as thick patches of life thriving on the underside near the stern, which is where I have seen octopus! For divers possessing deep-diving skills, cloud sponges can be found on the forward gun barrels, which point straight down.

"The Chaud is an amazing wreck," said Jon Dewsbury, local PADI Instructor and owner of The Scuba Shack accommodations (TheScubaShack.ca). "It was actually the first of all the wrecks that were





Frosted nudibranchs can be found in both Upper and Lower Sunshine Coast

sunk up here in BC. This destroyer is unique, and over the years, has become home to lingcod, perch, octopus and wolf eels. It's a fun ship to explore."

Several buoy lines are usually attached to the wreck, providing direct access to the ship. The vessel rests on its port side with the bow at 145ft and the stern at 90ft (44-27m). Wreck penetration is only advisable with proper equipment and training.

Tzoonie Narrows. Tzoonie Narrows is not far from the Chaudiere and a great second dive if currents permit. Depth varies from 50 to 60ft (15 to 18m). During my last dive here, a dozen dogfish (small sharks) came to check us out. Alas, they were a bit too fast for my camera, not to mention intimidating as a group!

A gentle drift carried us over

multitudes of white tube-dwelling anemones and ivory-colored giant swimming nudibranchs as they tried to feed on them. Other nudibranchs, rose stars and various invertebrate life can be found covering surrounding rocks and ledges. Aside from the dogfish, macro and close-up lenses worked well.

Tuwanek Point. Tuwanek Point is easily accessible as a shore dive for both day and night dives. This is one of those sites where you never know what you might come across, as Dewsbury recalled:

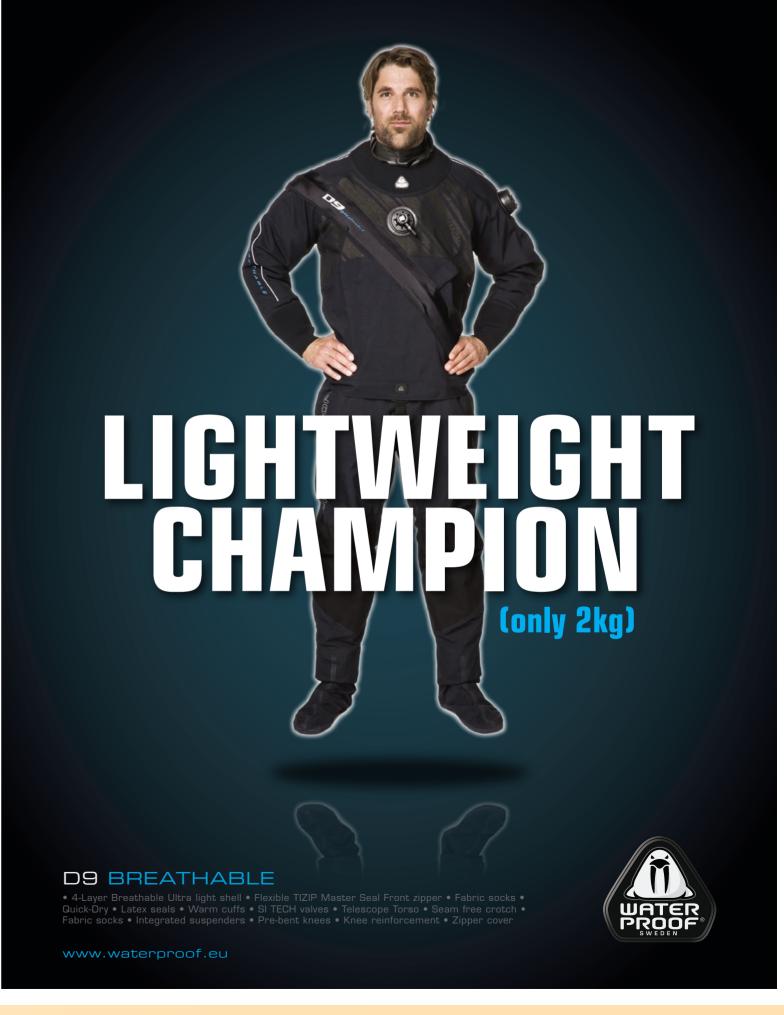
"This beautiful site boasts amazing visibility and often a giant octopus to visit, as well as wolf eels, seals and sea lions. It's pretty cool: Once a sea lion notices you, it usually keeps you company for the duration of your dive!

"Our rental cottage is located

just up the street from Tuwanek. I offer package deals to stay at the cottage and also dive. It's a beautiful cottage with a great hot tub deck. We're not a dive shop but do have over 30 tanks, which I rent out to divers visiting the coast. I also have numerous dive sets to accommodate certified divers wanting to rent all dive gear or just a couple of things."

Degan Walters, a visiting diver residing in Washington State said: "I have dived the Sunshine Coast in several places—
Tuwanek, the *Chaudiere*, Egmont, Skookumchuck, Agamemnon Channel and Saltery Bay near Powell River. My shore diving trips were between one and two days, and the trips with Porpoise Bay Charters were usually four days.

"I love Tuwanek for its excellent visibility," said Degan. "Large and abundant octopuses, wolf-





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eels and relatively easy access Skookumchuck Rapids. Skookumbut Skookumchuk Narrows is also chuck Rapids is quite a sight from spectacular and Porpoise Bay the surface. Viewing this mighty Charters never disappoints. Once force of nature during a full curwe saw orcas in the inlet, and rent flow creates a measurable then also as we were getting into amount of respect for this site. the water (but not under it)! At Diving is only possible from a boat Tuwanek, I see large Puget Sound and during slack current (when king crabs, carpets of anemones the water stops to change direcand sponges." tion). Whether the boat takes you Channel in deep water (right); Sea cucumbers are frequently seen along the Sunshine Coast

along the shore next to the park or in the Glory Hole—a crater-shaped gap in the middle of the rapids—you can expect to see a hodgepodge of colorful anemones, sea stars and multicolored fish.

Try using a wide-angle lens, if visibility permits, to catch your buddy hovering above or next to a large boulder full of marine life. Orange, black and white burrowing sea cucumbers can be seen as they compete for space between sponges, tiny sculpins, anemones and the infrequent octopus. Experience and advanced training is the key for being able to enjoy this fast-paced adrenalin site.



"The SKOOK runs at a rating of 16 knots on the ebb and 16.5 knots on the flood," said Kal Helyar, co-owner and operator of Porpoise Bay Charters (www. porpoisebaycharters.com). "This is BC's fastest! We pick up divers at the government dock in Eamont, providing accommodations, food and boat diving."

Since this is a very popular dive area, advanced reservations are recommended and minimum

group sizes may apply.

When not diving at this site, one of my favorite hikes is along the trail leading to Skookumchuck Rapids. It is a very scenic walk through the forest, totaling about 2.5 miles (4km) from the parking lot. The best viewing times for the rapids can be found posted on a schedule at the start of the trail or in the local newspaper. Usually an hour before and after peak tides will give enough time to watch the rapids, as they go from boiling or standing waves to flat-calm waters, then back to a cauldron of turmoil.

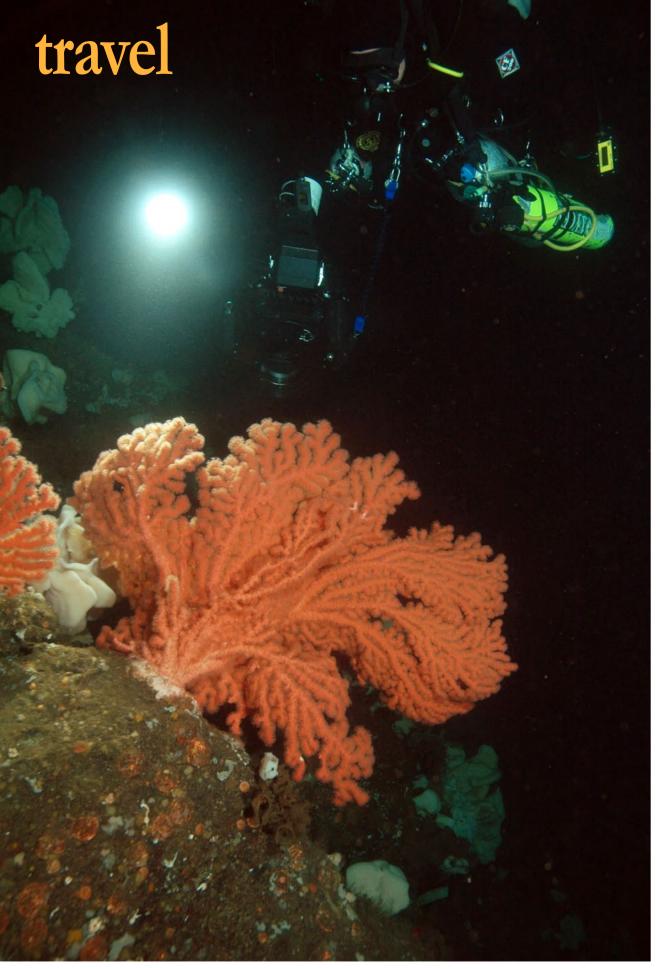
British Columbia

The word "Skookumchuck" comes from the Chinook words meaning "powerful water". If you are lucky, the wave runners will be out challenging the current with their small white-water kayaks.

Crabs often hide in sponges for protection (left); Gorgonian sea fans are found in Agamemnon (below)



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To see gorgonian sea fans, deep diving gear is best to use (above); Gorgonian sea fans are found in Agamemnon Channel in deep water (top right); Diver explores one of the many kelp forests (right)



Captain's Island. Captain's Island on a Huge colonies of cloud sponge start sunny day can be a spectacular dive. I have often cruised along the wall at 60ft (18m), observing juvenile rockfish hiding in the openings of the protruding chimney sponge or giant yellow cloud sponges. Resting cabezon, lingcod and various species of rockfish seem to position themselves equally apart. Large sections of the wall are covered in small blankets of dark red algae and deep purple encrusting hydrocorals. Rose, blood and leather sea stars are always numerous here, creating photogenic possibilities.

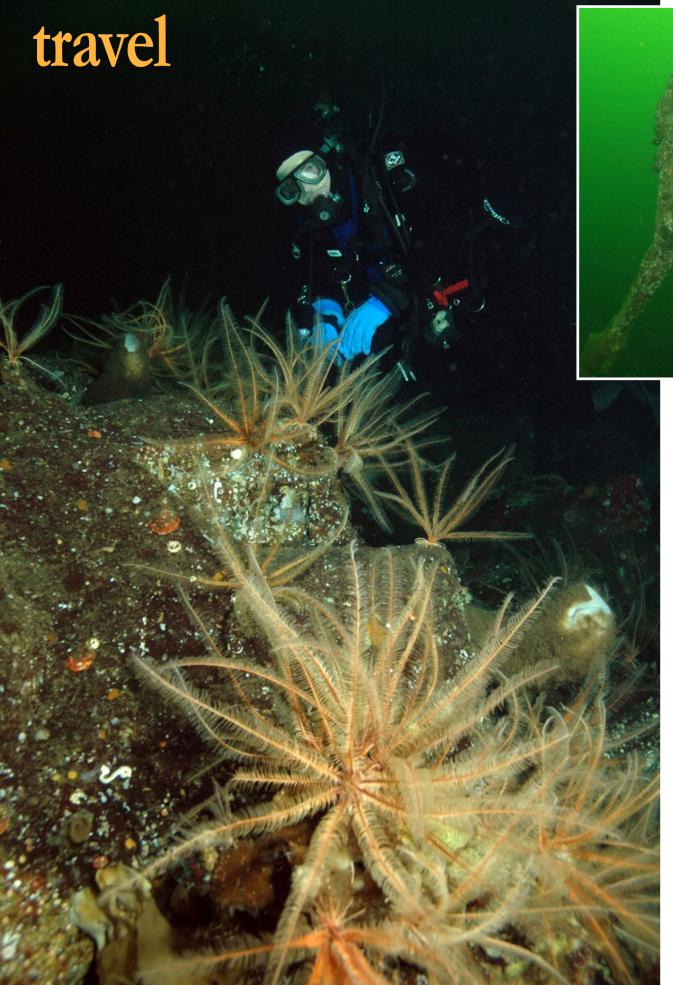
Beneath the Power Lines. Beneath the Power Lines is a wall dive located in Agamemnon Channel. Seeing the unique life at this site convinced me it was time to become a trimix diver.

around 60ft (18m) and seem to head endlessly down. They are brilliant yellow and white in color and highlight silhouetted divers in breath-taking wide-angle shots.

But the best part is even deeper, around 120ft (36.5m) where giant red gorgonian sea fans can be found. Proper buoyancy control is necessary around these delicate fans and sponges, so watch your fins! I have found this to be a great site not only for photographers but marine life enthusiasts as well, yielding clear visibility, abundant marine life and limitless photo opportunities with any size lens. Visitor information can be found at the Sechelt and District Chamber of Commerce (SecheltChamber. bc.ca).



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Boot sponges and feather stars along the wall at Mermaid Cove dive site

Diver with mermaid statue at Mermaid Cove

British Columbia

Plaque on Malhat, Powell River (left): Wreck of the Chaudiere in Sechelt Inlet, with anemones all over it (below)

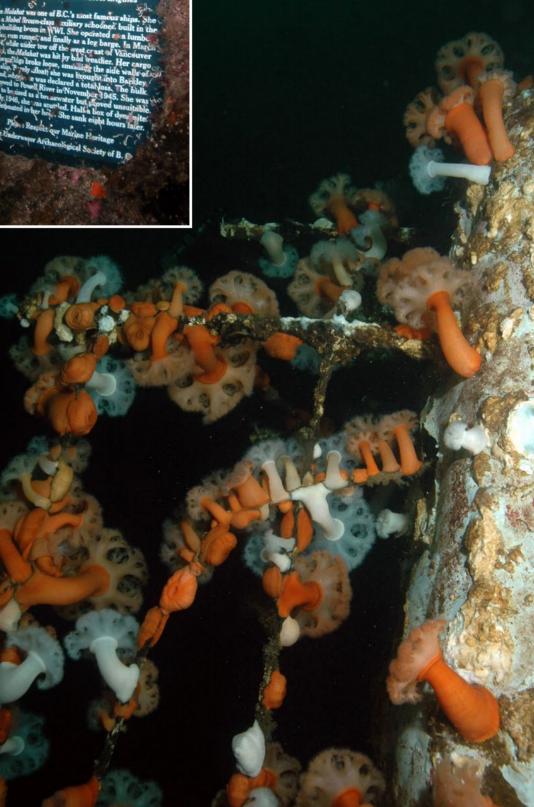


Upper Sunshine Coast Continuing north on Highway 101 from Sechelt, Powell River can be reached by taking another ferry at Earls Cove to Saltery Bay (a 50-minute ride). From the mouth of Jervis Inlet, along the Malaspina Strait coastline to the northern community of Lund, divers can explore a range of exceptional shore diving with little worry of currents. Boat diving is also available. For ferry schedules, consult BC Ferries (BCFerries. bc.ca).

Saltery Bay Provincial Park. A nine-foot bronze mermaid can be found in the protected cove of Saltery Bay Provincial Park, along with a small boat hull and a great wall full of craggy boot sponges. Bright crimson anemones, octopi, swimming nudibranchs and an assortment of sea stars can also be found. The park offers campsites, toilet facilities and a changing area for divers, with a ramp into the water.

Mermaid Cove. Mermaid Cove is where my daughter, Tallen, went on one of her first dives at the young age of around 12. Those of you who have pre-teen divers in the family may relate to the clinging-buddy effect I felt with her at first until she grew confident enough to let go. Although I learned that day what it was like to have a giant remora attached, it was worth it to be able to show her how beautiful and full of life our northern waters can be. Before long, I wished I had brought a bungee cord!

Malahat. Another easy shore dive is the wreck of the Malahat, located next to the log mill's breakwater (old ships), in northern Powell River. The ship's skeletal



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Vivian Island (top right) is known for its huge cloud sponges (above)



remains provide superb habitat for nesting lingcod, cabezon, greenlings and young wolf eels. I received directions from Beach Gardens Resort.

Texada Island. On one of the local boat dives, departing from Powell River, I was treated to a site where the bottom resembled the top of a city filled with chimneys of all sizes and shapes. (Descending, I kind of felt like Santa Claus). They were actually boot sponge with yellow patches of cloud sponge scattered about. Soon, great masses of cloud sponges were everywhere!

This location, near Texada Island, soon became the cover image for Betty Pratt-Johnson's last dive book: 151 Dives. Within her book, Betty lists 13 different dive sites for the Sechelt Peninsula and 10 for the Powell River area, indicating how rich this coast really is for the adventurous dive traveler.

Vivian Island. Another boat dive I really enjoyed was the beautiful wall at Vivian Island, also full of cloud sponges, but with clinging feather stars. Huge orange plumose anemones covered a steep wall down to 125ft (38m). Juvenile yelloweye and tiger rockfish are both common to see here, making it a good location for close-up or wide-angle photography.

Shamrock. A great second dive is the wreck of the *Shamrock*, a 76ft (23m) tug, which met its demise in 1926. It is



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The Sunshine Coast is full of hikes and trails to enjoy in between dives

Porpoise Bay dive charters serves the Egmont area

also located at Vivian Island in shallow water. which I prefer diving during the winter months when visibility is clear. Keep an eye out for nudibranchs, octopi and wolf-eels, since there is plenty of kelp-covered debris.

Dinner Rock. A boat dive technical divers enjoy is at Dinner Rock, south of Lund where the wreckage of the MV Gulf Stream (sunk in 1947) can be found on the south side. The wreck starts around 100ft and stretches down to 165ft (30-50m). The most impressive life, however, is scattered all around Dinner Rock at various depths, making this site great for recreational divers too. I have photographed large lingcod, giant lion's mane jellyfish and abalone here, among other critters. A lot of invertebrate life covers many of the large boulders in 20-60ft (6-18m).

"The wreck is suitable for most levels of divers comfortable with cold-water diving," said Technical Dive Instructor Bill Coltart, operator of Pacific Pro Dive out of Courtenay, British Columbia. "A permanent line is attached to the stern of the wreck at 100 feet with a wall located immediately adjacent. Technical and

TRAVEL

rebreather divers can extend their exploration time on the wreck checking out large 'rusticles' hanging from the bow at 165 feet. This is one of those wreck sites that divers visit, not because of an excess of marine growth, but because it truly looks like a wreck.

"We expanded operations earlier this year with the purchase of a high-speed zodiac and from that operate daily seasonal snorkeling and whale-watching excursions," said Coltart.

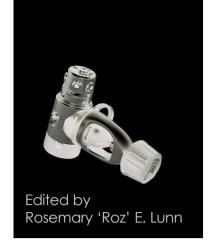
When not diving, it is fun to visit Lund for some sightseeing or lunch, walk along one of Powell River's many beaches or launch the kayaks at Mermaid Cove. Powell River travel information can be found at Tourism Powell River (DiscoverPowellRiver.com).

Although I have only mentioned a few of the many dive sites along the Sunshine Coast, I encourage you to search the Internet, read some guide books and go exploring with a buddy or join a group charter. The possibilities are endless!



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British Columbia



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WATER M PROO

THE FACTS AND VIEWPOINTS IN THIS SECTION ARE NOT NECESSARILY THE VIEWS OF X-RAY MAG. EQUIPMENT PRESENTED IN THIS SECTION HAVE NOT BEEN TESTED BY X-RAY MAG. STAFF. NOR ARE THE ITEMS WARRANTEFD. INFORMATION PROVIDED IS CONDENSED FROM MANUFACTURERS' DESCRIPTIONS. TEXTS ARE USUALLY EDITED FOR LENGTH, CLARITY AND STYLE. LINKS ARE ACTIVE AT THE TIME OF PUBLICATION

Equipment

Single lens

Dive Rite's ES155 single lens, low profile frameless mask can be folded flat for stashing in a pocket. The "ultra clear" glass is tempered and secured to the soft matte silicone body. Dive Rite has added a neat touch by designing in a double silicone face skirt. This provides a comfortable fit for almost any size or shape of face. It has a wide field of vision and is an easy mask to clear—the low volume and prominent nose pocket facilitate this and make nose-pinching

for equalization also simple to achieve. It is nice to see that Dive Rite has not taken the path of least resistance and fitted a standard strap. Instead, divers benefit from a lovely double-stranded "dished", soft matte silicone strap. DiveRite.com

TUSA

Waterproof SD4 SD4, the latest model in

Waterproof's long line of semi-drysuits, features a unique anatomical and aender-specific design where arms and leas are pre-bent to provide a perfect anatomical fit while diving. Arms and leas are fitted with zippers and double seals made from smooth skin neoprene. Also new is the gas-proof T-Zip dry zipper with chill guard affixed horizontally across the shoulders, which makes the suit warm and dry. Waterproof states that the suit is dry enough to keep the diver warm in colder water, yet maintains the snug fit of a high-end wetsuit perfect for long rebreather dives in warmer environments and minimal internal water flow, which extends the time before hypothermia becomes an issue. Waterproof.eu



DIVE RITE

TUSA has just launched a solar-powered wristwatch dive computer! The TUSA IQ 1204 has a solar panel integrated into the easy-to-read

> computer display, thus eliminating the need to replace the battery. The recharging time varies from eight hours to 60 hours, depending on the auality of light available. This gauge and freediving or 4-mix gas-switchable computer supports accelerated decompression (21% - 10% oxygen). It also has another sexy function: You are now able to use Bluetooth SMART technology to upload your dive log to

your smartphone and then share it on social media along with suitable photos. So, no more excuses for not logging your dives. Tusa.com

Bubel towel

Bubel states it has evolved the conventional towel by creating a nanofiber product that is four times more absorbent



than a traditional towel, and it

dries in minutes. Apparently, this is an environmentally-friendly towel. "We do not use PVC or solvents in the manufacture of our products," states Bubel, and adds: "Our towels and the packaging they come in are made from recyclable materials." The

rub I have with this statement is that Bubel doesn't actually give any information on the packaging material nor what the towels are made from. While their website and press pack are beautiful, they are also superficial. Sketchy statements like "white, thin, rough cloth with incredible technical properties" and "this revolutionary fabric" doesn't really cut it. Time to

substantiate your green credentials and actually tell your customers what your towels are made from, Bubel! Available in two sizes and 50

designs. Bubelbarcelong.com

Boat coat

Mobby's has a new solution to make miserable surface intervals when "the north wind doth blow". a better experience: the big boat coat. This "Air Shelter" hooded coat is manufactured from a bimaterial 2mm neoprene, lined with fleece for a snua feeling. The arms are long, wide and loose fitting, making it less of an effort to put on when wearing a wet or drysuit. Once donned, you fasten the flappy wrists with a velcro tab. The front, center one-way zip is protected by an external storm flap that is secured in place by strips of velcro. Mobby's Air Shelter comes in four sizes and some remarkably bright color combinations. I would struggle to say that this boat coat is fashionable, but would I wear one? Yes. It looks as though it is utterly practical and I hate getting cold. mobby.co.jp

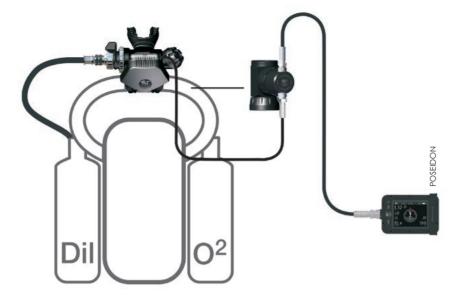




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EQUIPMENT





Poseidon presents a potentially gamechanging solid-state oxygen sensor

New lifetime oxygen sensor offers failsafe diving, Poseidon proclaims. The novel solid-state sensor is said to have unsurpassed operating life, shelf life and calibration stability.

Text by Peter Symes and Michael Menduno

Oxygen sensors are both the heart of rebreathers and their weakest link. The sensors currently used in electronic closed-circuit rebreathers are small electro-galvanic fuel cells, which date

back to the 1960s, have a limited life span and need to be routinely calibrated as they degrade over time. They can also fail in a variety of ways.

Luminescence

Five years in the making, Poseidon's solid-state sensor is based on unique luminescent dyes, which show an oxygen-

dependent
luminescence
when excited
with red light
in the range
of near infrared light (NIR).
The measurements,
Poseidon
writes, are both
accurate and
highly reliable. The
sensor provides digital

and analog output, with a special holder, and comes pre-calibrated from the factory—there's no need for user calibration. According to the fact sheet, the technology is characterized by high precision, high reliability, low power consumption, low cross sensitivity (ed.— with helium or nitrogen) and fast response times.

The solid-state device has a similar size and shape as a standard galvanic cell, however, it is currently designed as a safety addon to Poseidon's existing oxygen sensors. It can also be fitted as an add-on to other rebreather models using Poseidon's CPOD sensor holder, rebreather mouthpiece, heads-up display (HUD) and M28 dive computer. The new sensor does require a separate power supply

Ichthyologist Dr Richard Pyle, who works with Poseidon through Stone Aerospace, said he has been field-testing the sensor for the last six months and calls it a "transformative development". "I've been super excited about it," he said.

Currently, Poseidon has not announced a release date or price for the new sensor but says it will be available by the end of the year.



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Iguana hangs in a tree at Sunset House resort on Grand Cayman in the Cayman Islands. PREVIOUS PAGE: Award-winning photographer Christian Vizl photographs southern stingrays at Sandbar

Panoramic view from shore (above) at Sunset House resort (right) on Grand Cayman

A once-in-a-lifetime chance to learn from the world-renown underwater photographer, David Doubilet, brought US diver Jennifer Idol to the Caribbean island of Grand Cayman where an immersive workshop for underwater photographers offered rare insights into how to capture on camera the beautiful underwater realm of this fabled oasis.

I was introduced to Grand Cayman through a workshop offered by Syracuse University's Newhouse School in the Multimedia Photography and Design Department. Adjunct Professor and photographer Hal Silverman organized an extraordinary opportunity to learn from National Geographic photographer David Doubilet and underwater photographer and marine scientist Jennifer Hayes. This experience changed my outlook on underwater photography.

Doubilet led an unprecedented workshop, his first and a very rare opportunity. Together with Hayes and Silverman, they shared professional insight into how to

create compelling images. I joined eight other accomplished international photographers from countries that included the United Kingdom, Germany, China, Mexico, Spain and Switzerland.

The workshop leaders organized the event in association with a university program, and expected to teach beginning photographers. They were delighted to learn we were an ambitious and experienced group, so they adjusted the workshop to reflect an in-depth look at professional underwater photography. Silverman created an immersive workshop to fill a big gap in educational opportunities for advanced underwater photographers.

Planning the dives

We began planning our dives with photography objectives set each day by classroom lessons at Sunset House Hotel. Hayes and Doubilet revealed their photo techniques for composition, lighting, and story making. Doubilet creates his imagery with the mantra: "Dream. Think. Shoot." I agree with his belief that if you are not creating what you want, dream a better dream.

Never before have I heard such an honest portrayal of professional underwater photography. Doubilet provided



insight that included his opinion on photography. In the workshop, he noted how images have the power to illuminate and open people's eyes to the sea. As underwater image makers, he reiterated our ability as voices to protect the environment and to protect oceans. To build their stories and make the most of limited time, Doubilet and Hayes research every location before they leave for a trip. For this workshop, they shared

their insight into Grand Cayman. We learned what wildlife to expect for each dive and how they would behave. As an aquatic biologist, Hayes shared her insight with us so we would know what marine behavior to expect on each dive.

Doubilet and Hayes have spent a career learning the sites of Grand Cayman. Doubilet's famous image of stingrays at the Sandbar made this an iconic desti-

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Visitors enjoy interaction with southern stingrays at Sandbar; Black arouper (below) at cleaning station at Orange Canyon

Niépce created this image from the window of his studio in either 1826 or 1827. Just a few years later, photography was commercially introduced in 1839.

Image making has come a long way in a short time, much like scuba history. Since we first dreamed

of exploring underwater, we also sought to create reproductions of real life through images. William Thompson took the first underwater pictures using a camera mounted on a pole in 1856. George Eastman revolutionized photography when he invented roll film in 1884. Shortly after this invention, Louis Boutan became an underwater photographer using surface supplied hard hat diving aear in 1893.

Grand Cayman

Developments in scuba technology revolutionized underwater image making. The first record of man descending in a diving bell comes from the 4th century BC. A bathysphere showed a naturalist marine life for the first time in 1930.

Our scuba regulator was first invented in 1864 by Rouguayrol and

nation. Before his image showed both above and below water in one composition, only underwater images of stingrays were shown from this site. By uniting the two worlds, the relationship between the above water and underwater was emphasized. This image captured the imagination of tourists.

For wrecks, we were clued into the best features to capture. Ships often appear indistinct and look

more like texture than structure. The strong lines in the wrecks of Grand Cayman helped create recognizable depictions. We focused on the bow and sterns of the ships, the most distinguishable features. Superior visibility also contributed to being able to photograph a recognizable ship, rather than details protruding from areen water.

We gathered each evening following our dives to review images. discuss the next opportunities, and learn editing techniques from Silverman. This week taught

us not just how to compose our

ages, but also what to do with them afterward. We used professional editing software by Adobe to use subtle changes in contrast, lighting, and color to develop our images. A bad image cannot be made into a great image, but an image can be enhanced to reflect our experience of a subject.

Origins of photography

Doubilet felt our understanding of underwater photography would be helped by a refresher in photo history. Knowing how photography developed contributed to our understanding of modern optics. Moreover, photography is a relatively new and ever developing technology.

I saw the first evidence of a photograph on display in the Harry Ransom Center in Texas. French inventor Joseph

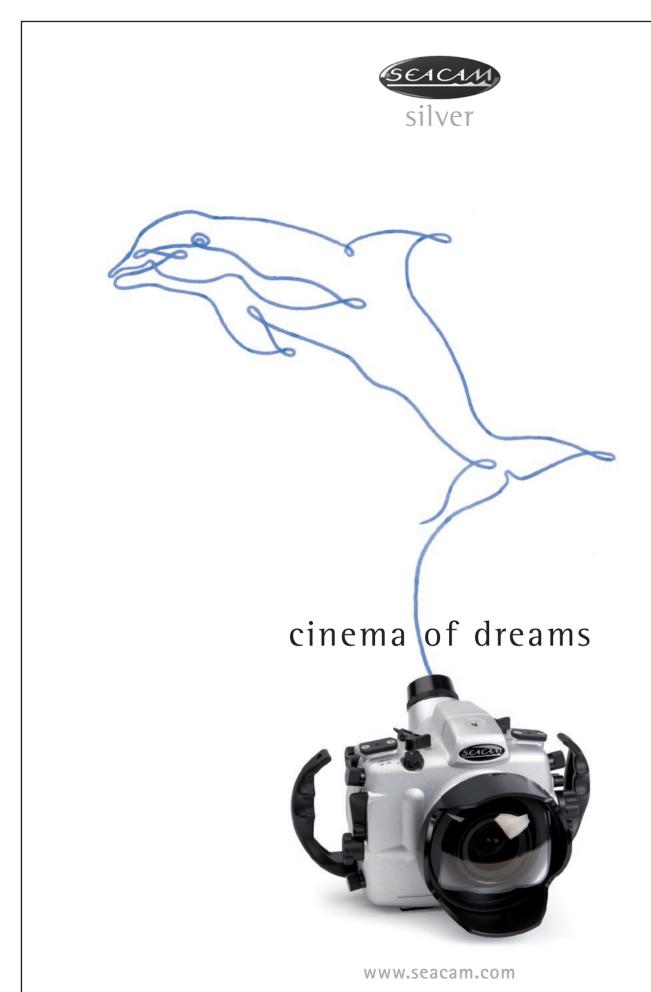


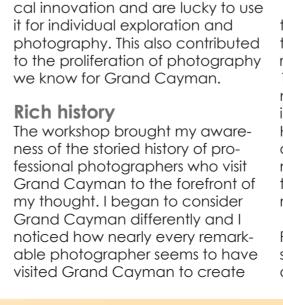
Houndfish with southern stingray at Sandbar (above); Barracuda at Aquarium Reef (left)



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Denayrouze, and refined to much the way it is today by Jacques

Cousteau and Émile Gagnan

world accessible to millions.

in 1942, making the underwater

We benefit from this technologi-

images of the diverse reef system. Not only was I thrilled to learn from the most revered of my role models, but I was equally excited to meet notable photographer Cathy Church.

She moved permanently to the island in 1987 and has been teaching underwater photography in Grand Cayman since 1972. Church is recognized for a number of awards including being inducted into the Women Diver's Hall of Fame in 2000 and receiving a NOGI award in 1987. I hoped to meet her on this trip and was fortunate she was in her studio during my visit.

Cathy Church's Underwater Photo Center and Gallery at Sunset House Hotel is the premier duty-free camera store on the

island. This dedicated photo store provides every need for photographers from amateurs to professionals. As I walked down the stairs at the end of the building to her studio, my anticipation grew. Once inside the gallery, I was immersed in her underwater world. Original prints filled the walls of one room and photo equipment dotted another room.

She shared some of her story with me, including her new artistic pursuits with photo manipulation. She has produced images for numerous publications, but is also creating abstract fine art pieces built from composite images. I admired a black and white barracuda image and was reminded of the diversity in the work we were creating in our workshop. We



Bridled goby at Sunset Reef, Grand Cayman, Cayman Islands

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© J. Haschek

EXPLORE THE UNDERWATER WORLD





Spiny lobster (above) and male yellowhead jawfish incubating eggs (top right) at Aquarium Reef

developed black and white images that were strong because of their composition, contrast, and shape.

Photo ops abound

After I learned about the proliferation of image makers who visit the island, I took this thought a step further and began to address a question of photography in the Caribbean. Why is Grand Cayman so highly revered as a photography destination?

The largest of the Cayman Islands, Grand Cayman is not a volcanic island, but instead the top of the Cayman Ridge, a submarine mountain range formed by colliding tectonic plates. Flora and fauna abound on the island. I observed iguanas and parrots each morning before our dives.

Dubbed a living aquarium, the island features diverse photographic opportunities. Since the island is composed of limestone and lacks sediment runoff, superior visibility defines the waters. With easy accessibility to diving

and photographic support, any photographer is sure to create beautiful images.

This location is like an underwater studio stocked with all the tools necessary for image making. The diversity also supported our ability to create a broad body of work.

Wildlife encounters and behavior

Animal behavior dominates the underwater landscape, from reproductive cycles to feeding activity. The famed Stingray City and Sandbar introduce visitors to guaranteed southern stingray encounters. Visitors from cruise ships snorkel with these island stewards, each bearing high economic worth and hence protection. This experience helps snorkelers connect with sea life.

We spent several wonderful dives observing these animals. I even observed award-winning photographer Christian Vizl surrounded by stingrays. He was used to this subject, having photo-graphed them many times in Mexico and felt at home on the Sandbar.



Filefish at Sunset Reef

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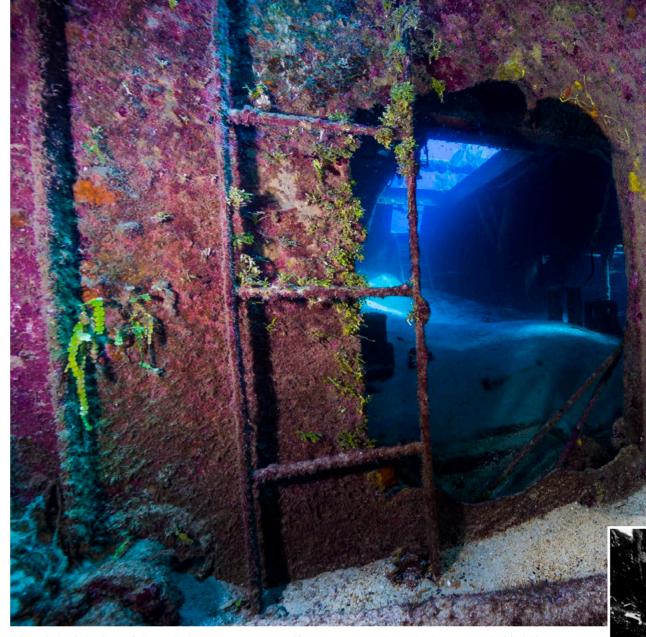
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Diver Jenny Stock explores wreck of *Doc Polson* (above and right)



View into interior of Doc Polson wreck; Jennifer Hayes on Doc Polson wreck (right)

Every marine encounter was stunning. The first time I observed a cleaning station was on this trip. I saw wrasse swim in and around a black grouper's mouth as I approached a pinnacle. Great barracuda hovered beneath our boats for cover and disguise as they waited for an unsuspecting fish to swim below, unable to see him as he strikes like lightning right from the sun overhead. Houndfish hovered near the surface hoping for a meal.

Large subjects

Wide-angle photography opportunities include large animals, reef scenes, and wrecks. I photographed tarpon in Devil's Grotto, a hawksbill sea turtle on Ironshore Gardens and the most beau-

tiful red, orange and yellow sponge scenes at Orange Canyon.

Two wrecks dominate the underwater scene, the *Doc Polson* and ex-USS *Kittiwake*. Both are easy to swim through and serve as artificial reefs. On one of our dives, we saw telecommunications cable that a ship like the *Doc Polson* would have laid. This small ship was relatively shallow in 17m (55ft) of water and was easily explored on one dive.

Grand Cayman

The Doc Polson features more reef growth than the ex-USS Kittiwake because it was sunk in 1981. The larger ex-USS Kittiwake is the most recent artificial reef in Grand Cayman, sunk in 2011. The white paint has since faded, so this wreck appears like a dark shadow on the sand.



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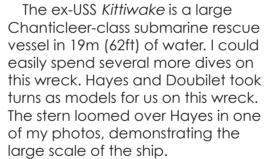
Grand Cayman

View of ex-USS Kittiwake wreck from above

sand and rubble, but to those looking for jawfish, and entire community of fish rising and falling from holes was observed.

Secretary blennies and porcelain crabs also captured our attention. I swam over a rocky barrier and found lobsters hiding in crevices. Before this trip, macro photography was my least favorite endeavor. The shallow water and ease of diving helped me leisurely learn what to observe and how to photograph these subjects. By the end of the trip, I was excited to spot every small fish I could find. I was even lucky enough to find a slender filefish drifting away from its gorgonian cover.

I am careful to exercise good buoyancy,



I dove with published photographer Jenny Stock from the United Kingdom. Together, we spent time swimming through the stack midship. Inside, we found the engine room, a hyperbaric chamber, and seemingly endless rooms.

Tiny animals

In our workshop, we explored some of the abundant macro photography subjects. We saw male yellowhead jawfish incubating eggs and keeping them in their mouths. With a little patience, we were all able to find a jawfish spitting the eggs out of their mouth. They live in holes in the sandy areas. To an untrained eye, the bottom would just look like



Doc Polson wreck (above); Jenny Stock explores interior of ex-USS Kittiwake wreck (right)



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Pair of flamingo tongue snails at Sunset Reef



especially with macro photography so I do not damage reef structure with contact. If you struggle with hovering perfectly, I find sandy areas a good place to find a safe spot that won't damage habitat. There, I was able to focus not only on the jawfish but on translucent fish like the bridled goby.

Diving variety from one dock

While most of our dives were conducted from boats, we also explored the shoreline. No trip to Grand Cayman would feel complete without visiting the mermaid statue, Amphitrite—Siren of Sunset Reef. A small replica stands outside the restaurant at Sunset House Hotel. Recent sculptural gardens in the Caribbean have redefined the underwater scene as an artistic statement and artificial reef environment. Grand Cayman's famous mermaid, created by Canadian artist Simon



I enjoyed spending more time on shallow shore dives to find macro subjects. At the end of our trip, I snorkeled from the coastline at dusk and saw squid dancing with the current. They gleamed with bioluminescent pulses as if waving farewell.

What you need to get started

To appreciate a place like Grand Cayman for its photographic opportunities can be daunting. An abundance of tools makes image making accessible and overwhelming. I strongly recommend small point-and-shoot cameras for beginning underwater photographers. Cameras are extremely distracting and can lead to poor buoyancy, lost buddies, and low air situations.

Manufacturers are all making competent cameras, so the choice in equipment depends largely on your budget and the time you invest to learn the

ductive.

Grand Cayman

Most cameras require a camera-specific housing to make them waterproof and to operate the buttons. Some manufacturers like Canon sell plastic underwater housings for their smaller cameras.

While we primarily used DSLR cameras to create large professional images, mirrorless cameras are becoming more popular. Since they are smaller than DSLRs, they are easier to carry and use underwater. They rival the quality of a DSLR and also feature interchangeable lenses.

On our trip, I saw a multitude of professional cameras in use with a variety of housings. Amusingly, it seemed like we had more equipment than divers on our boats.

Center of Caribbean photos Grand Cayman is not just a beautiful



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Jennifer Hayes at stern of ex-USS Kittiwake (above); Mermaid Amphitrite sculpture at Sunset Reef (top right)



Caribbean destination, but its rich photographic history and its diverse opportunities make it a top photo destination.

Plan your trip to include some of my favorite photo subjects: the ex-USS *Kittiwake*, the 272kg (600lb) bronze *Mermaid Amphitrite*, the silvery tarpon in Devil's Grotto, and the amazing colors of Orange Canyon.

I participated in a once-in-a-lifetime workshop with David Doubilet, Jennifer Hayes and Hal Silverman. Photographers looking to learn techniques in Grand Cayman can learn from Cathy Church in her photo center and gallery at any time.

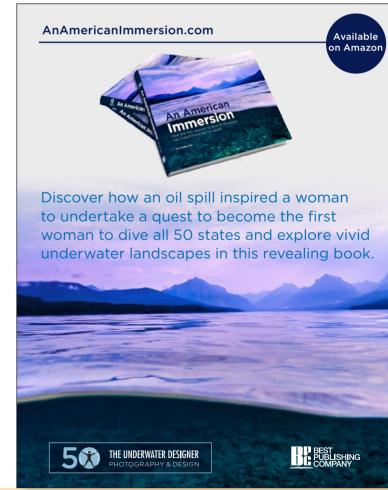
Native Texan, Jennifer Idol is the first woman to dive all 50 US states and author of An American Immersion published in April 2016 by Best Publishing. A widely published underwater photographer and dive writer with 20 years of diving under her belt, she has earned over 26 certifications. She also creates graphic design and photography for her company, The Underwater Designer, at: uwDesigner.com.

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SOURCES: CATHY CHURCH, CIA.GOV WORLD FACTROOK FSO KY

History The Cayman Islands were discovered by Christopher Columbus in 1503, and he named them "Las Tortugas" because of the abundant turtle population. In the late 16th century, Sir Francis Drake named the islands "Caymanas" (derived from the Carib word for marine crocodile) which were also plentiful. Early visitors to the islands included explorers and their crews from England, France, Spain and the Netherlands and, of course, pirates. The Caribbean islands collectively known as the West Indies, became part of the British Empire in 1670, and the Caymans were designated as a dependency of Jamaica for nearly 300 years. Although Jamaica gained independence in 1962, the Cayman Islands chose to remain a British Crown Colony. Presently, tourism and the international offshore financial services sector are the main contributors to the Cayman Islands economy. In 2004, Grand Cayman was hit badly by Hurricane Ivan; Hurricane Paloma did extensive damage to Cayman Brac in 2008. Both islands have recovered nicely, and structures were repaired to even higher building standards to withstand future storms.

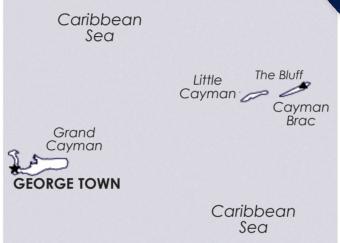
Geography The three islands that make up the country have a total land mass of only 100 square miles (161 square kilometers). The Cayman Islands are located in the Caribbean Sea 149 miles (240km) south of Cuba and 167 miles (269km) northwest of Jamaica. Grand Cayman is approximately 22 miles (35km) long, 8 miles (13km) at its widest, with a maximum elevation of 80 feet (24.4m).

Cayman Brac is 14 miles (22km) long, 2 miles (3.2km) wide with breathtaking bluffs rising up to 152 feet (46.3m). Little Cayman is only 10 miles (16km) long, 1 mile (1.6km) wide with a maximum elevation of 55 feet (16.8m). Primarily limestone, the Caymans are the visible portion of the submarine mountain range known as the Cayman Ridge. Because they are small and comprised of porous limestone, there are no rivers or streams; this lack of fresh water runoff contributes to the amazina underwater visibility (often exceeding 120ft or 36.6m). The Cayman Trough or Trench lies between the Cayman Islands and Jamaica; this is the deepest point in the Caribbean Sea at over 4 miles (6.4km) deep.

Climate The weather is warm and humid year-round; easterly trade winds keep the Caymans from being unbearably hot. Summer temperatures range from 30-34°C, with frequent showers or heavy rain, usually of short duration. December through April is drier with cooler temperatures ranging from 25-30°C. Storms called nor'westers cause high seas from the northwest and occur when strong cold fronts descend from the USA. Hurricane season is from June 1 to November 30.

Getting there Several U.S. airlines offer nonstop flights to Grand Cayman, as do carriers from Canada and the U.K. Cayman Airways offers daily service from

RIGHT: Location of the Cayman islands on global map BELOW: Location of Grand Cayman on map of Cayman Islands



Miami as well as select service from other U.S. cities, Cuba, Honduras and Jamaica. Cayman Airways Express provides multiple flights daily to the sister islands of Cayman Brac and Little Cayman. Grand Cayman is also a popular destination among many of the cruise ship lines.

Entry requirements A passport is always your best travel document. Visitors must also have a round-trip ticket. To see detailed requirements for visas, etc., go to www.immigration.gov.ky

Economy The Cayman Islands has one of the highest standards of living in the world driven by its two primary industries of international finance and tourism, especially divers and other watersports enthusiasts. Due to its tax-free status, tens of thousands of companies are registered as businesses in the Cayman Islands. Agricultural products include

small amounts of vegetables, fruit, livestock, farmed turtles and sea salt. Almost all food and consumer goods must be imported.

Currency The official currency is the Cayman dollar (CI); US dollar is accepted everywhere, but Cayman dollars are preferred. The Cayman currency is tied to it. Banks will exchange UK Pounds and Euros at current rates. Exchange rate: 1USD=0.82KYD; 1EUR=.92KYD; 1GBP=

Population As of 2014, the estimated population is just over 58,000 with over 95% living on Grand Cayman. In 2014, expatriates made up a majority of the workforce, with about 41% of that number coming from Jamaica, followed by the Philippines, the UK, USA (6.39%), Canada, Honduras and dozens of other nationalities. Religions: Protestant 67.8%, Roman Catholic 14.1%, Jehovah's Witness 1.1%

Language English (official) 90.9%, Spanish 4%, Filipino 3.3%

Time zone Eastern Standard time (-5 GMT) year round—same time zone as New York City, but Cayman does not participate in Daylight Savings Time.

Health There is no need for any type

of immunization to travel to Cayman. The overall quality of medical care in the Cayman Islands is considered to be good—comparable to what is generally available in a small city in the United States. Medical evacuation to the States is often appropriate for certain procedures and critical care cases. Cash payment may often be expected for medical services

Hyperbaric Chamber A hyperbaric chamber is available and well run at the Cayman Hospital on Hospital Road, George Town, Grand Cayman. Email: diveraid@candw.ky

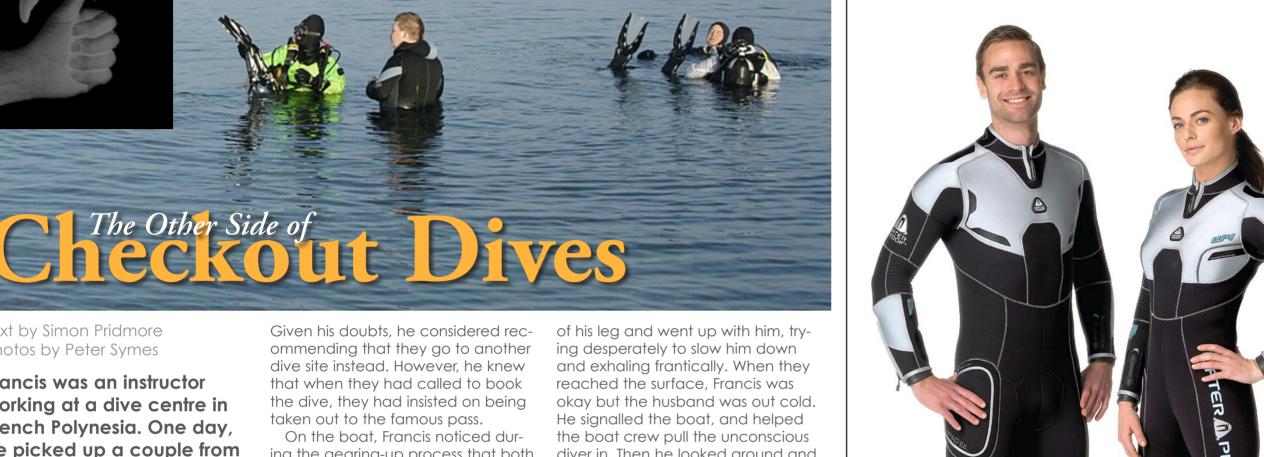
Websites Cayman Islands Tourism www.caymanislands.ky

Underwater photography There are ample tiny subjects for close-up lenses, and good wide-angle opportunities can be found on the walls and wrecks. Telephoto lenses can be used for fish, especially the Rock Beauty (a lovely yellow-faced damselfish that often turns and looks directly at you from a hiding place—but you usually cannot get close enough with a normal lens).

If you need to rent cameras, there are several locations to try but you will find the largest selection at Cathy Church's Photo Centre and Gallery at Sunset House, Grand Cayman. It is just a mile south of Georae Town.

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Text by Simon Pridmore Photos by Peter Symes

Francis was an instructor working at a dive centre in French Polynesia. One day, he picked up a couple from a nearby hotel to go diving. They had asked to do a drift dive through a pass in the reef, a site notorious for fast currents and scores of reef sharks. As always, on the way to the dive centre. Francis asked them about their diving experience and formed the impression that, although they both had a few dozen dives logged, the wife sounded confident and relaxed but the husband did not sound so sure of himself. Francis made a mental note to stay close to the husband and watch him carefully, especially dur-

ing the gearing-up process that both divers were wearing what looked like too much weight in relation to their shape and size. Instead of saying something, he gave them the benefit of the doubt. Sure enough, once they were in the water, drifting along at depth, he saw them inflate their BCDs to compensate for the excess weight, giving them a head-up-feetdown profile in the water. He made a mental note to mention this durina their surface interval, and advise them to wear less weight on the second dive.

Staying close to the husband as planned, Francis was perfectly placed to react when the husband's weight belt, already low on his hips, came loose, slid down his legs, caught briefly on his fins and then plummeted into the depths. As the husband headed quickly for the surface, his inflated BCD expanding as he went up, Francis grabbed hold

diver in. Then he looked around and saw, to his relief, that the wife had now surfaced too. Once she was safely in the boat, he called out on the radio for an ambulance to meet them at the dock and administered whatever first aid he could. The diver was breathing and they had oxygen on board.

No hero

The injured diver was hospitalised, then evacuated off the island. He eventually made a full recovery. His wife departed with him, but before flying out, she was effusive in her praise for what Francis had done and told everyone who would listen that he was a hero.

Francis did not feel like a hero. Ever since the incident, he had been privately kicking himself. He knew how close he had come to having a diver under his care lose his life and that he had risked incurring career-threatSTYLISH SILVER DESIGN LOADED WITH FEATURES.

W4 is the latest back-zip wetsuit from Waterproof. After nearly 30 years of experience of making wetsuits we have put all our knowledge into this high-quality suit with an eye-catching retro-futuristic

and legs with stretch panels and gender specific construction ensures a comfortable fit and a relaxing body position in the water. 3D-moulded real rubber kneepads are perfect for the diving instructor who spends a lot of time on his/her knees in the water while teaching.

The 3D anatomical design, with pre-bent arms

Double smooth-skin seals at arms and legs, adjustable neck and a 10mm spinepad, with an extra seal at the backzipper work together to keep the cold water out. Seals are designed to fit WP boots and gloves.

All zippers in top class Vislon from YKK. The Bronze slider in the back zipper ensures troublefree function for many years.

ToughTex panels at elbows and knees, Bonded HiQ Nylon Thread and 100% CR Neoprene in all panels - quality in every detail

The W4 also features double computer strap anchors with anti slip, comfort front neck zipper. inner plush lining, seat and shoulder antislip reinforcement.



The WPAD™, or the Waterproof Personal Accessory Dock, is a soft artfully constructed docking station located on the right thigh used for attaching our expandable



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ing the drift dive.



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ening, if not life-threatening, injuries himself. He was all too conscious of the fact that it had been his decision to take the divers out to the pass despite spotting that at least one of them might not be ready for such a difficult dive. He had also failed to intervene when he saw them wearing what looked like too much weight.

Now, the police had interviewed both him and the dive centre, their training agency had asked for an incident report, the story was in the newspapers and rival dive operators were making sure that plenty of harmful gossip kept circulating. No, he did not feel very heroic at all.

The diver had suffered no permanent harm and now had a new story to tell at dinner parties. However, the negative impact of the incident for both Francis and his dive centre was much longer lasting. Their reputations locally, internationally and with their training agency—had been damaged. they are no substitute for The story would surface prominently in online searches for diving in French Polynesia, and this would have an adverse effect, not only on their own business but also on scuba tourism in the region as a whole. Divers have the whole world to choose from when they plan their vacations. It does not take much bad publicity to make them look

elsewhere.

How could Francis and his employers protect themselves and try to make sure that nothing similar ever happened again?

A common dilemma

The dilemma that Francis was faced with that morning is one that is all too

common. Every day, dive operators all over the world take people out diving. Most of them are strangers they have never met before.

To judge a diver's competency when they turn up for their dive trip, all the dive operators have to go on are the diver's word, a certification card, a logbook (if they are lucky) and their intuition. These all help a little, but actually seeing someone in the water.

It is normal for sport divers to have long gaps between dives, and during this downtime, their skills get rusty and their instincts fade. Many are aware of this and are

happy to do a checkout dive on their first day back in the water, at an easy site where they can get used to everything again.

Some dive operators ask divers to perform a few skills during the checkout dive to demonstrate their competence. If this reveals important areas where a diver needs further practice.

When divers understand the benefits of a checkout dive, then everything works perfectly. They do the dive, have a nice time and get back into the "swim of things".

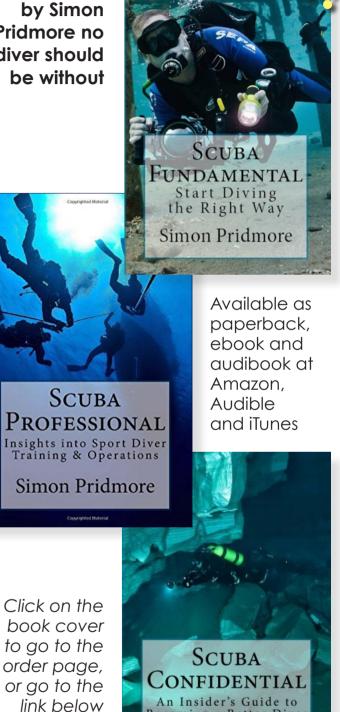
then they will assign an instructor or diversater to work with them in a pool or off the beach before they go out divina again.

When divers understand the benefits of a checkout dive, then everythina works perfectly. They do the dive, have a nice time and aet back into the "swim of things". Meanwhile, the professionals have a chance to see how competent the divers are, correct minor issues and make sure that the dives they do during the remainder of their stay match their abilities. It does not guarantee that a dive accident will never happen, but it reduces the chances considerably.



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Three books Pridmore no diver should



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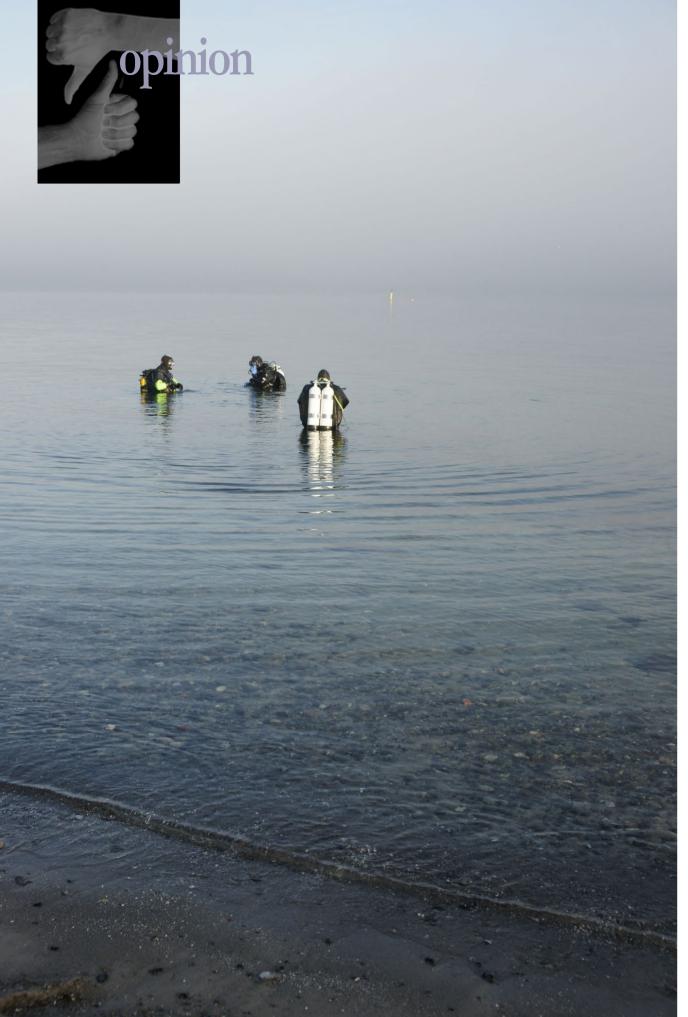
NEWS

SCIENCE & ECOLOGY

EDUCATION

Becoming a Better Diver

Simon Pridmore





Resistance

Some divers, however, are strongly opposed to checkout dives, viewing them as insulting and a waste of time and money. A glance at diver-to-diver forums shows that many will actively choose operations that do not require checkout dives over those that do. Comments include, "I don't need to prove my skills to anyone," and "What a rip-off!"

The insistence that divers demonstrate skills during the dive can even generate full-blown conflict, particularly among those who are concealing skill deficiencies and do not want to get found out. This applies especially to divers who cannot clear their masks without panicking. They will choose operators that do not require checkout dives too, in order to avoid discovery.

Dive operators cannot leave it up to divers who need a checkout dive to volunteer for one. Nor can they believe anyone who tells them they are expert and do not need a checkout dive. This is not necessarily because divers are wilfully dishonest. It may iust be that they do not have the experience to be able to judge their competence dive centre, book an appointment with an objectively.

However, because they know they can lose business by asking customers to do checkout dives, many operators, like Francis' employers, choose not to require them. They know the possible consequences, but they still take the risk. Scuba diving is a tough business to survive in and nobody ever wants to see customers walk out of the door and go off and spend money with the competition.

It is true that there are some divers who stay super-dive-fit or who are so experienced that their scuba diving skills have become as automatic and instinctive as walking. Experience suggests, however, that

there are not many who genuinely qualify to be included in this category. And most of those that do would have absolutely no objection to doing a checkout dive. The idea that it was somehow demeaning would never even cross their minds. They would just enjoy the dive.

My recommendations

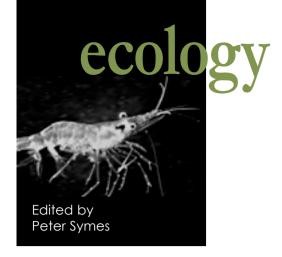
- Do not consider the checkout dive requirement as a factor when you are choosing a dive operator.
- ☐ Whenever you go diving with an operation you have not dived with before, pay them the courtesy of doing a checkout dive or even volunteering to do one.
- ☐ Whenever you have been out of the water for a couple of months, do a checkout dive as the first dive of your next trip.
- ☐ If you have skill deficiencies that make you fear checkout dives because the deficiencies will be revealed, go to your local instructor and master the skills before you go divina again.

Simon Pridmore has been part of the scuba diving scene in Asia, Europe and the United States (well, Guam) for the past 20 years or so. He is the bestselling author of Scuba Confidential: An Insider's Guide to Becoming a Better Diver and Scuba Professional: Insights into Scuba Diver Training and Operations and has just come out with a third book, Scuba Fundamental: Start Diving the Right Way. All are available from Amazon in a variety of formats. For more information, visit: SimonPridmore.com.



EDITORIAL

NEWS



In Search of Seahorses

Text by Marco Daturi and Peter Symes. Photos by Marco Daturi

It was early morning and our dive team was in the process of loading our gear into the car when my friendly neighbor, Walter, greeted me, asking where we were heading so early.

As I tell him what we were up to, he grinned, looking somewhat incredulous and wished me a good day. Yes, indeed, the hopes of finding a seahorse in Italy are very slim since they have become very rare. Seahorses are endangered, and in ten years, there may not be any left in the Mediterranean.

Yet, there is still a place in Liquria at Capo Noli, where it is not unlikely to

cles on the species. The village of Noli is a typical Ligurian town only an hour and a half drive from Milan—that is, when traffic is light. Otherwise, travel time can double or triple. Liguria is the crescent-shaped region in northwest Italy bordering with France. Its Mediterranean coastline is also known as the Italian Riviera and popular with tourists for its beaches, towns and cui-

encounter these "sea stallions"—as

Francesco Turano called them in his arti-

sine. The narrow strip of land is bordered by the sea, the Alps and the Apennines mountains. The continental shelf is very narrow and so steep it descends almost immediately to considerable marine depths along its 350km coastline.

Knowing where to find seahorses is akin to picking mushrooms. The good spots can be hard to find, but once you have discovered a good location, you can come back many times, being fairly certain that you will find what you are looking for.

Diving

Nine o'clock and I was all kitted up, ready for a nice solo dive with the sole purpose of photographing seahorses. Feeling optimistic—definitely a help in these challenging searches—I slipped into the water. Along the sand and the rocks in only a few meters' depth, the water was still warm in the autumn so



Divers lucky enough to find a seahorse in the Mediterranean, now very rarely seen







BOOKS

SCIENCE & ECOLOGY

Long-snouted seahorse on reef, Mediterranean Sea off Capo Noli in Liguria, Italy NEWS



THIS PAGE: Various views of long-snouted seahorse in the Mediterranean Sea at locations off Capo Noli in Liguria, Italy

an hour, I spotted a small shadow dangling in the surf: It was a splendid specimen of a seahorse—just what I was looking for!

With childlike glee, I approached without disturbing it. I know the seahorse will not run away or, at least, not too fast. I rested in the sand in front of it. I watched the seahorse for a couple of minutes and then I began to take some pictures.

It was calm but very shy and slowly turned away, turning its back to me. In pursuit, I moved very carefully to avoid stirring up particles, attempting to get in position in front of the seahorse, but as this dance kept going on, I decided to stop and wait for it to come around and face me.

I snapped some photos, and though the seahorse did not look particularly pleased by the flash, it was the sole reason I was here in the first place. So it would just have to put up with a couple more shots. This may sound like an easy task, but the seahorse kept moving about while my 105mm lens kept giving chase.

It's been almost ten years since I last saw a seahorse in the Mediterranean, and I hope others won't have to wait that long for an encounter. However, this circumstance may not be the case any longer; as I continued my dive, I come across two more—one similar seahorse and a smaller one beside it. They were clinging onto the bottom of some algae with their tails.

In order to get some nice shots not taken from above, I had to make myself as flat as possible against the bottom and stay in that rather uncomfortable position for quite a long time. As my back started to ache and cramps started to set in, I was about to get out of the water soon. I had been under for 111 minutes by now, and that was only the first of three dives that day.

Biology

Out of the 54 known species of seahorse, only three are found in the Mediterranean: the long-snouted seahorse, (*H. guttulatus*), the short-snouted seahorse (*H. hippocampus*), and the sea pony (*H. fuscus*)—the latter being considered an invasive species. Although they are bony fish, they do not have scales, but rather thin skin stretched over a series of bony plates, which are arranged in rings throughout their bodies.

Each species has a distinct number of rings. Unusual among fish, a seahorse has a flexible, well-defined neck. Being quite poor swimmers, they are most likely to be found resting with their prehensile tails

wound around a stationary object. The arched neck holds the head forwards, with a characteristic form that recalls that of a small horse, from which obviously these creatures take their name, and an elongated tubular snout, which they use to suck up food, and their eyes can move independently of each other.

Marco Daturi, who emerged from the warm waters of a nursery in 1972 a restriction prescribed by an inclement, authoritarian doctor—was always very close to the sea and the underwater world, which he continues to explore with a passion whenever he can. Having survived the attack of a Ligurian porter crab, the false attentions of Indonesian nudibranchs, an underwater wedding, and insistent invitations to get into technical divina, Daturi continues to enjoy the passion that is diving, which culminated in 2003 with the creation of ScubaPortal. it. A certified divernaster. Daturi also holds a doctorate in economics, and two masters in marketing and sports management.

For more information, visit www.scubaportal.it or email: info@scubaportal.it.



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trace of seahorses.

staying warm was not an issue

I moved forward slowly, and like a

mushroom hunter, I looked over all the

submerged bushes, fan worms, stones

and whatever else was attached to the

bottom because that is where seahorses

are usually found. I saw octopuses, cut-

and hundreds of other small fish, but no

tlefish, soles, aurnards, nudibranchs, crabs

I was still finning when, after about half

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To get to Pulau Hantu by boat, one passes the vast container ships and oil tankers, large oil refineries and huge container docks of Singapore.

Singapore is not usually the first place that comes to mind when you think about diving in Southeast Asia. And no wonder—we are so spoilt for choice in this part of the world, with Thailand and Malaysia to our north and Indonesia to our south. Well, these places are great if you have some vacation time or a long weekend, but what if you are too busy to get away for so long, or just want a reason to get your gear wet? When I heard about a little island off Singapore's southern shore, I had to check it out.

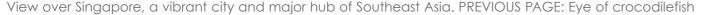
Located about 30 minutes south of Singapore by boat, Pulau Hantu is the go-to place for Singapore's die-hard divers. Comprising two small islands that are connected together at low tide, its name literally translates to "Ghost Island" in Malay.

The names of the two islands—Pulau Hantu Kecil and Pulau Hantu Besar—stem from local legend. Two fierce

warriors, locked in a violent and ceaseless battle, woke up a sleeping jinn (sea spirit). Angered, the jinn cast a spell that pulled the warriors to the depths of the ocean. Undeterred, they continued duelling. The jinn distracted one of them, allowing the warriors to thrust their swords into each other. The gods decreed that the jinn should not have



Pulau Hantu is a haven for macro life and sea slugs, such as this *Flabellina* nudibranch



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View of Pulau Hantu from the bay; Beaked coralfish (left); Cuttlefish in defensive display, grow up to 10cm (4in) (right); Pipefish (below) grow up to 18cm (7in)

have the idyllic Pulau Hantu on one side, but turn around and behind you is one of the many islands converted into oil refineries. It is at this point that you start to wonder what you have got yourself into, and whether there will be

anything down there to see!

The water is a strange green, blue and brown colour, and the only thing visible from the surface are some kelp-like plants reaching the surface. Everything about it is as far from the crystal clear blue waters and white sandy beaches one would imagine in this part of the

world.

Diving

As you descend, the seabed slowly emerges from beneath you. The floor is a thick, silty sediment, which lingers in the water column if disrupted, so good buoyancy is important if you want to avoid lowering the visibility further.

One can imagine what the reef would have once looked like, before the mass industrialisation of Singapore. can make out the old coral reefs, some of which still seem to be thriving. Quite amazing, given its close proximity to the oil refineries, but it wasn't the corals I was here to see.

Nudibranch heaven

At first, I was seeing just a few, then a few more, until all I was seeing were these slua-like creatures: Nudibranchs, and they were everywhere! In every shape, size and colour imaginable. Once you



The journey to Pulau Hantu is one to remember, as you meander your way amongst vast container ships and oil tankers, past large oil refineries and huge container docks. Once at the island, you

interfered in earthly matters. Hence, the

warriors were transformed into islands. It is

believed that their ghosts still wander the

1 en.wikipedia.org/wiki/Pulau_Hantu



islands.1

Getting there

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THIS PAGE: Tiny critters found at Pulau Hantu—various species of colorful nudibranchs, as well as a flatworm (right)

Every time I settled down to photograph one, I would catch a glimpse of another out of the corner of my eye, this time a little

more colourful or interesting, or I would feel a tug at the end of my fin from my dive buddy to tell me that she had found one. There were literally so many, it was a challenge deciding which ones to photograph before my tank ran out!

Macro life

It's not all about nudibranchs, though. There is a variety of fish and other critters to see. Don't expect to look out into blue water and see large pelagic fish swimming by, this dive is all about the small stuff on the sea floor and some of the brightly coloured reef fish you would expect in this region like butterflyfish, angelfish and parrotfish.

Keep an eye out for the smaller critters on the reef as well. During a handful

of dives here, I have seen rare albino pipefish, vibrant blue-spotted stingrays, tiny juvenile cuttlefish and large crocodile fish just beneath the sand exposing only their eyes, lying in wait for their next meal!

Not long into one of my dives, I heard an excited noise coming from my buddy's regulator as she pointed frantically at the yellow outline of a seahorse. It was tucked away happily inside a little crack in the reef, so I moved on, only to find another a few minutes later. This time, it was out in the open, allowing me to snap a few shots before leaving it to go about its day.

Although it might not be for everyone, Pulau



Nembrotha yonowae nudibranch on tunicate



or coral.

in with anything.

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have trained your eyes on how to spot them,

they can be found on almost every piece of rock

I have to admit, I am a little obsessed when it

comes to nudibranchs, as are many underwater

photographers, and this place was really ticking

all the right boxes. From tiny green ones camou-

brightly-coloured ones making no effort to blend

flaged with the algae on the seafloor, to large

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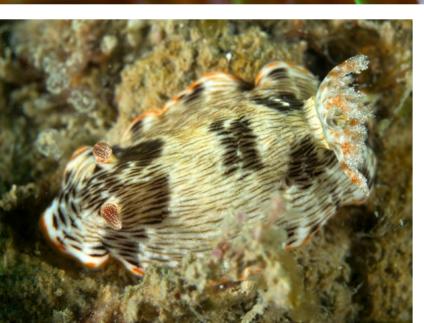
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CLOCKWISE FROM LEFT: Fundia coral; Tigertail seahorse; Hypselodoris and Jorunna rubescens nudbranchs



Hantu does offer some amazing macro diving. For those with cameras and a

love for nudibranchs, you will have some memorable dives here, exploring the silty sea bed for the next little critter to photograph.

Logistics and conditions

The boat I went out to the island on left the Republic of Singapore Yacht Club on the southern coast of the island, as do a few of the others. There are options to suit everyone, from small fiberglass speedboats that can carry up to six divers, to larger vessels like the one I dived from, with the capacity for 24 divers

with toilets and an air-conditioned cabin on board. Prices for two dives can be

anything from SG\$100 to SG\$150 (US\$72-108, EU€65-97); this price usually does not include equipment rental, which can be arranged in advance.

The diving at Pulau Hantu is suitable for divers at all levels, with maximum depths of around 12 to 18m. However, visibility can be very poor—as low as 1m at times, with the best reaching around 10m and an average of 3 to 8m. With this limited visibility, it is not the most popular place to learn to dive; however, it is an option for those who cannot get away long enough to complete courses abroad.

The island usually attracts experienced divers looking for some local diving on the weekends and is particularly popular with underwater photographers—although I do have one tip, leave your wide-angle lenses at home and only

bring your macro lens!

Depending on the time of day, you may experience a little current, if the tide is on the change, but it does not usually get too strong. Diving here can be done all year round and the water stays at a nice 28 to 29°C for most of the year. Pulau Hantu's close proximity to the city means you can head out for just half a day to escape from Singapore's high-speed city life and still complete two dives.

Nick Shallcross is a British underwater photographer and dive writer based in Singapore. He offers tailor-made work-



shops and courses in underwater photography. For more information, visit: **NickShallcrossPhotography.co.uk**.

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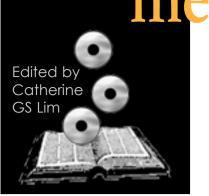
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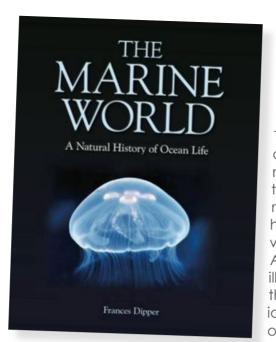
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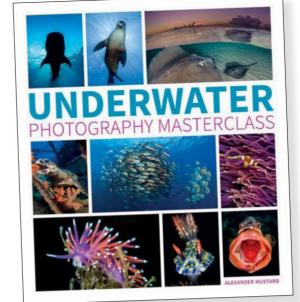


Ocean Life History

The Marine World: A Natural History of Ocean Life, by Dr Frances Dipper.

This book is a comprehensive guide to all types of marine organisms from marine bacteria, plants, fungi and protozoa to marine invertebrates like fish, reptiles, mammals and birds. The main oceanic habitats and ecosystems, both abovewater and underwater, are also covered. Aided by photographs and detailed illustrations, the book is a handy guide to the marine realm, with useful sections on identification, distribution, structure biology, classification and conservation.

Hardcover: 544 pages Publisher: Wild Nature Press Date: 21 April 2016 ISBN-10: 0957394624 ISBN-13: 978-0957394629



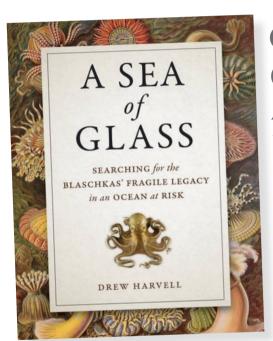
Learn Underwater Photography

Underwater Photography
Masterclass, by Alex Mustard.

This is more than just another how-to book on taking underwater photographs. Written by world-renowned Alexander Mustard, readers are privy to his 30 years' experience in this field, and they learn about diving equipment and cameras, and how to control lighting conditions underwater, be it wide-angle, macro or ambient, etc. The insights contained in this book is complemented by the author's stunning images of the creatures and

landscapes he has encountered while diving within this watery realm.

Paperback: 192 pages Publisher: Ammonite Press Date: 7 April 2016 ISBN-10: 1781452229 ISBN-13: 978-1781452226



Glass Sea Creatures

A Sea of Glass: Searching for the Blaschkas' Fragile Legacy in an Ocean at Risk, by Drew Harvell.

Drawing inspiration from two artists (Leopold and Rudolph Blaschka) who immortalized the marine life of their time by creat-

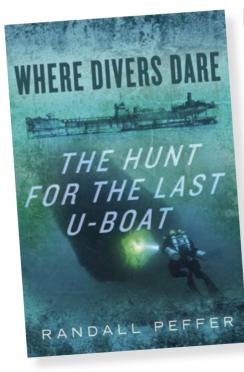
ing representations of them

in glass 150 years ago, author Drew Harvell dove into the oceanic depths to find out for herself the conservation status of the actual living counterparts in today's context. In doing so, she entered a world rarely seen, and brings forward the stories of these ancient animals, highlighting a century of change within our marine ecosystems.

Hardcover: 232 pages

Publisher: University of California Press

Date: 17 May 2016 ISBN-10: 0520285689 ISBN-13: 978-0520285682

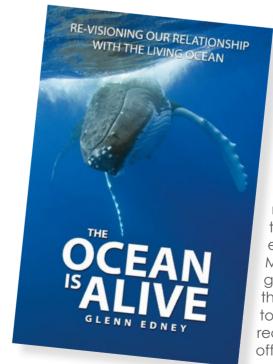


U-Boat

Where Divers Dare: The Hunt for the Last U-Boat, by Randall Peffer.

This is the story of the U-550, a German U-boat that perished at the hands of three destroyers in April 1944 during World War II. It was the last undiscovered U-boat off the eastern coast of the United States—until it was discovered by divers in 2012. Besides recounting the submarine's story, author Randall Peffer also details the 20-year quest to locate the wreck, and to dive it, more than 300ft below the surface.

Hardcover: 320 pages Publisher: Berkley Books Date: 7 April 2016 ISBN-10: 0425276368 ISBN-13: 978-0425276365



Living Ocean

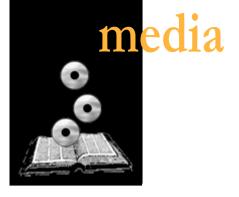
The Ocean Is Alive: Re-visioning Our Relationship with the Living Ocean, by Glenn Edney.

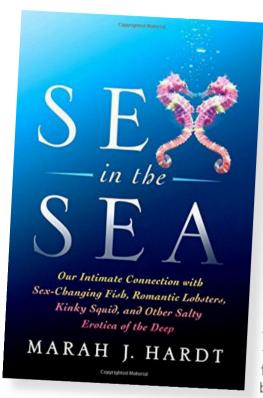
Besides being a celebration of our oceans throughout the eons, this book takes the reader on a journey into Ocean consciousness: through the evolution of the senses, the emergence of sentient behavior and the exploration of what the author terms "Ocean Mind". Drawing on his experience as an ecologist, naturalist and diver, the author weaves a thought-provoking tale about an Ocean alive to itself, presenting a compelling case for the recognition of the Ocean as a living being and offering a new vision for our relationship with it.

Paperback: 246 pages Publisher: Ocean Spirit Ltd Date: 11 April 2016 ISBN-10: 0473352605 ISBN-13: 978-0473352608

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Mating Rituals

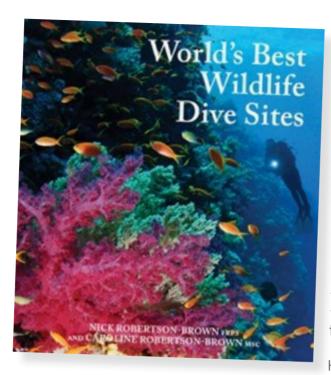
Sex in the Sea, by Marah Hardt J.

The mating rituals of some marine creatures easily rival those found in the Kama Sutra. From right whales engaging in a threesome and the full-moon sex parties of groupers to the daily mating blitzes of bluehead wrasse and the

giant sex loops of hermaphrodite sea slugs, this book presents the myriad of how life begets life beneath the waves. Far beyond just a voyeuristic voyage, the author also explores how overfishing, climate change and pollution are disrupting the procreation processes within the oceanic realm, and discusses how we can shift from a prophylactic to a more propagative force for life in the oceans.

Hardcover: 256 pages Publisher: St. Martin's Press

Date: 1 Mar. 2016 ISBN-10: 1137279974 ISBN-13: 978-1137279972



Marine Life

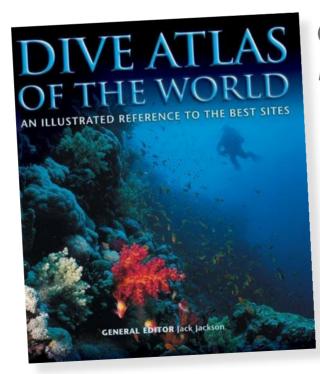
World's Best Wildlife Divesites, by Caroline Robertson-Brown and Nick Robertson-Brown.

Part of the thrill of scuba diving is the ability to observe marine creatures in their natural habitats. This book highlights 50 of the best underwater wildlife experiences in temperate, tropical and arctic waters worldwide, as well as their key wildlife phenomena, be it coral reefs, whales, seals, rays, etc. From crocodiles in Cuba, manta rays in the Maldives, hammerhead sharks in the Bahamas to basking sharks in the United Kingdom—every featured location contains photographs and information outlining key species, tips for divers, equipment to take and the best times to visit.

Hardcover: 288 pages

Publisher: New Holland Publishers

Date: 1 May 2016 ISBN-10: 1921517727 ISBN-13: 978-1921517723

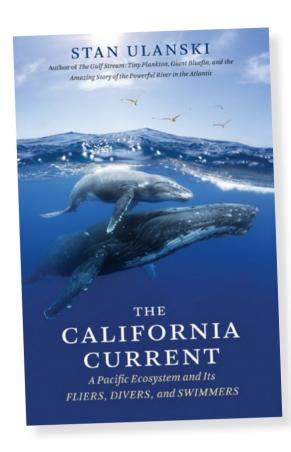


Great Dives

Dive Atlas of the World, by Jack Jackson.

This book serves up a sampling of the diverse range of dive sites worldwide, from muck diving and marco photography to wrecks, walls, reefs, caves, blue holes and drift diving. These cover well-known classics as well as newly discovered sites. Descriptions and photographs of the top sites are included, with contributions from local experts, and established writers and photographers.

Hardcover: 300 pages Publisher: IMM Lifestyle Date: 1 May 2016 ISBN-10: 1504800664 ISBN-13: 978-1504800662



Wild California

The California Current: A Pacific Ecosystem and Its Fliers, Divers, and Swimmers, by Stan Ulanski.

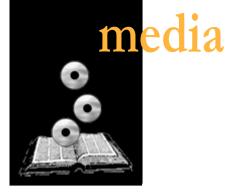
The California Current flows along the western coast of North America, from southern British Columbia to Baja California in Mexico. It yields a complex broth of planktonic organisms that forms the basis of an elaborate food web. Every year, turtles, seals, fish and seabirds travel great distances to feast in the current's biological oases and feeding sites. Similarly, apex predators like certain species of whales and sharks undertake extensive north-south migrations within the current to find food. This book takes us on a journey through this unique ecosystem, illuminating its scientific and biological marvels and the array of flora and fauna within the Current.

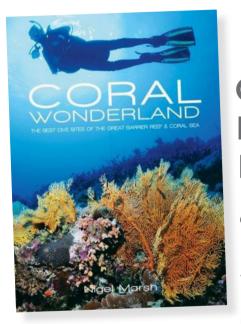
Hardcover: 256 pages

Publisher: The University of North Carolina Press

Date: 30 April 2016 ISBN-10: 1469628244 ISBN-13: 978-1469628240

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Great Barrier Reef

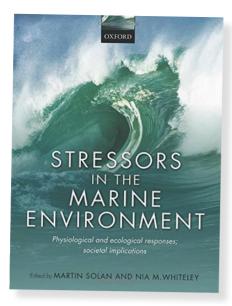
Coral Wonderland: The Best Dive Sites of the Great Barrier Reef, by Nigel Marsh.

The Great Barrier Reef stretches over 2,300 kilometres along Queensland and, despite the singular nature of its name, comprises 3,000 reefs. To aid divers in deciding where to dive, this book highlights over 170 of the best dive sites at the Great Barrier Reef as well as the nearby Coral Sea reefs. Relevant information on marine life, depths, terrain, diving conditions, shipwrecks and the best times to visit is included, alongside photographs and listings of dive operators.

Paperback: 162 pages

Publisher: Reed Natural History /New Holland (AUS) Date: 1 April 2016

Date: 1 April 2016 ISBN-10: 1921517808 ISBN-13: 978-1921517808



Sea Stress

Stressors in the Marine Environment: Physiological and ecological responses; societal implications, edited by Martin Solan and Nia Whiteley.

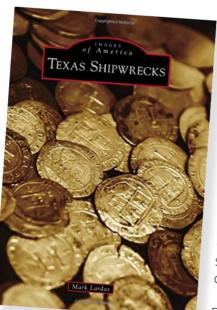
Direct and indirect human influences have significantly altered the environmental conditions, composition and diversity of marine com-

munities. However, understanding and predicting the combined impacts of single and multiple stressors is challenging. This book summarizes the latest research in the physiological and ecological responses of marine species to a range of factors, including chemical and noise pollution, ocean acidification, hypoxia, UV radiation, thermal and salinity stress. It also provides a perspective on future outcomes for some of today's pressing environmental issues.

Paperback: 384 pages

Publisher: Oxford University Press

Date: 10 March 2016 ISBN-10: 0198718837 ISBN-13: 978-0198718833



Shipwrecks

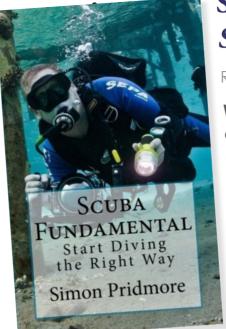
Texas Shipwrecks, by Mark Lardas.

Many shipwrecks from simple working boats to grand Spanish treasure fleets can be found on the sea floor off Texas, as well as within the rivers of the state. Formerly owned by pirates, navies, cotton traders, immigrants, fishermen or oil traders, each downed vessel has a story to tell. Whether they had perished due to extreme weather or warfare, their stories continue to fascinate us, giving us a glimpse into the past.

Paperback: 128 pages Publisher: Arcadia Publishing

Date: 11 April 2016 ISBN-10: 1467116173 ISBN-13: 978-1467116176

REVIEW



Simon Pridmore's Scuba Fundamental: Start Diving the Right Way

Reviewed by Catherine GS Lim and Gunild Symes

Written in down-to-earth language, with frank insights, candid humor, helpful anecdotes and a wealth of tips and insider knowledge, Simon Pridmore's *Scuba Fundamental* is a gem of a book—an invaluable resource for people thinking of taking up diving or new divers wanting a refresher, and certainly a great book for avid divers to give to friends and family curious about the sport.

This book answers some of the burning questions non-divers may have, and even some questions

they didn't know they had. They will get a clearer overall picture of what scuba diving is all about and what it entails. The author explains what the sport is simply, but does not dumb it down. You will never feel as if you are stupid just because you don't understand certain concepts.

Each section flows very smoothly into the next, and readers will not feel like they are slogging through a scientific or technical book. The author makes it easy to absorb the knowledge and years of experience that's contained within the pages. We bet that there are some gems of information that even some certified divers may not know. For those who have never dived before, you will be able to envision what it would be like to actually sign up for an open water dive course.

Common fears and anxieties about diving are addressed as well as health points newbies would not know about. There are extensive snorkeling tips to help you dive better, advice for how to buy gear that fits, how to tell a good dive instructor from a bad one, why cheaper is not better, why you should be taught how to use a dive computer, how best to prepare for a dive course, including your mind-set, and whether or not your child should go diving.

Pridmore does not shy away from the negatives either, how to tell the difference

between a safe dive operation and an unsafe one, what peer pressures divers may place on non-divers, why inferior dive gear is often provided in beginner courses and things that bad instructors say and do that put off people from ever diving again.

He also unveils the unsaid rules of diving etiquette, things your instructor may not have told you, tips on how to breathe, proper finning and buoyancy control, when to abort a dive, and how a dive lamp, a whistle and a safety sausage could save your life. Actual stories illustrate points, helping you visualize real-life situations.

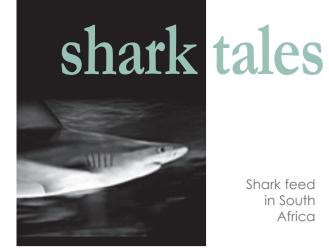
Pridmore gives recommendations for what to do after you finish your beginner's course and points out the important difference between being certified and being truly skilled and experienced, whether a diver, instructor or underwater photographer. Get invaluable tips and tricks from insider knowledge that will save you a multitude of headaches and keep you, your buddy and your gear safe.

No new diver should be without this book, and many instructors and dive operators could benefit from recalling what it is like to be new to diving and how to keep those new to the sport from dropping out.

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Shark feed in South Africa

Text and photos by Brandi Mueller

On one of my recent dive trips, a post-diving dinner conversation turned to capturing epic shark photographs. A magazine photo editor was in our group, and I wanted to know how photographers got those perfectly lit, very close shots of sharks, which is typically an animal that is quite shy around divers. He told me shark feeds, or using bait to lure the sharks, is one of the only ways to get sharks close enough for those types of photos. There are limits of light in underwater photography and strobes and video lights only go so far, so getting them to come close is necessary.

There are few places in the world where one can see sharks quite close naturally (without divers changing the natural environment with food) such as the sardine run in South Africa where huge bait balls attract sharks. Being in the right time and place for large migration events, like the hammerheads that pass through the Galapagos, is another opportunity, and

then there is the super lucky dive where a curious shark comes close. But mostly, sharks do not like us. We are big and loud (all those noisy bubbles), and when they see or hear us, they swim away. Sharks have a sensory organ called a lateral line system that allows them to sense movement and vibration in water. We

must sound like a freight train to sharks, and they know we are there long before we ever see them, so we often do not see them.

Enter the shark dive, where bait is used to lure sharks to a specific spot and divers can enjoy the spectacle.* Sometimes, the sharks are actually fed by a trained

dive guide, sometimes a bucket of bait is opened at the end of the dive, or some are not fed at all with a container of bait used only to keep curious sharks nearby. For photographers and videographers, these dives are amazing opportunities to get close to sharks, and here are some tips to get the best photos.

Before the dive

When you take part in a shark dive, chances are you are doing something that has been done many other times by lots of other people. Get as much information as possible about the dive before you go. What depth is the dive at? How long is the dive? How are divers



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Sometimes we are so focused on the action in front of us that we don't realize we are also capturing distractions, such as the bubbles of a diver in front of you (left); Putting water in front of the sharks can give the viewer a sense of a shark in moving forward (below); Brandi Mueller in the great white shark cage, South Africa (center inset)

> the show. There may be a coral or rock amphitheater at your back, and divers line up so no one is in front of each other. Not swimming around the feeding area (unless permitted) keeps both the sharks from being scared away and other divers from getting in the way.

Shark Dives

Chum. Do not touch the chum. Your dive guide might be hand-feeding the sharks, and yes, they are probably getting closer to the sharks than you. But they have been trained to do this and have years and hundreds of dives practicing this. Most dive guides for shark dives know individual sharks based on their looks and behaviors—they know

arranged (is there a better spot for taking photos?) Consult with the dive operator, tell them what you hope to capture on the dive (sometimes they will place you in the best spot for photos just by letting them know that's your interest.)

Usually, you will want to use the widest angle lens you have, as the action usually takes place over a large area. A quick Google search will usually bring up hundreds of images from popular shark dives, if you want to see other photographers' images. Powerful strobes are recommended—but be ready to turn them off if there is a lot of backscatter or the sharks are too far away for them to be useful. Coming to the dive prepared is the first step.

Once at the dive shop or dive site, listen to your dive guide (they have done this before). Be sure to pay attention to the rules and follow them, as they are meant to keep you safe, and more importantly, keep the sharks safe.

The rules include where "divers should position themselves", which hopefully will keep other divers from being directly in front of you so you do not end up with mostly shots of other divers. Following the guidelines for that particular dive also leads to the sharks coming as close as possible without being scared away. Sometimes all it takes is one diver who swims out into the middle of a shark feed and all the sharks disappear. Don't be that guy, or let your buddy be that guy. Finally, do not be afraid to ask questions. The dive auides want to help you have the best shark dive they can give you so you can get the photographs you hope for.

Following the rules is also important for your own safety. Certain types of sharks exhibit different reactions to divers. When I participated in diving with tiger sharks (without a cage) in South Africa, an extensive pre-dive

briefing was given that directed divers not to wear anything colorful or shinny (no jewelry), "to wear black gloves," not to flail around and to have good buoyancy control.

Sharks are curious and colors, shiny objects, and looking like an injured seal make them want to check you out. Unaloved hands that are flapping around can also appear like little fish in distress, which are a favorite shark snack.

During the dive

Follow the above rules. (Trust me, the dive guide wants you and everyone else on the dive to get amazing photos and have a great dive.) Often shark feeds are set up so that all divers will have a good view of



Showing the shark and the bait can help a viewer understand what was happening during this experience.



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Shark feed, Roatan, Honduras (left); Cropping too tight on a shark at center of photo is not very interesting (above)

bait bucket, or of the dive guide controlling the bait and the opening of the bucket. Usually, you can also aet some shots of individual sharks. Look up and see if any

are going overhead, which can lead to dark shark shadows in sunbursts if it is a sunny day. If you are sitting at the edge of the group, you might be able to get some single sharks to your side as well or sharks that pass directly in front of you.

Backscatter. Backscatter can be a



Cropping the same photo with more negative space in front of the shark implies motion

problem on any dive, and strobe positions can be a key factor. Make sure the strobes are as far away from the camera port as possible and angled to help reduce backscatter. If the shark action is taking place further than your strobe

> light will reach, the strobes are not adding any benefit other than creating backscatter. In this case, you may want to turn them off and take some natural light shots. Try some shots with them on and some with them off.

Negative space.

Don't forget about negative space. Negative space can help balance a photo, especially in the chaotic mess of sharks, divers and fish that occur during shark dives. If you can get the surface in a shot, it can help viewers to feel as if they are underwater with you on the

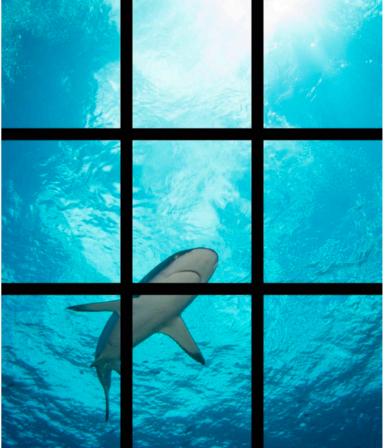
which sharks they can get close to **Test shots.** Snap a few test shots and and which ones not to. They also know look at your camera screen to make behaviors to watch for (you don't have sure you like what you are getting that experience). (I know, it's hard to take your eyes off the action in front of you, but **Scouting the scene.** After the initial rush do try to check the screen during of, "Oh my goodness, there are sharks the dive). Also be aware that small everywhere!" —try to take in the whole bubbles on the lens of your camera scene. Where are the other divers? need to be gently brushed away or Where are their bubbles? Hopefully, not they will appear as dots (similar to backscatter) in your photos. right in front of you, getting in your photos. In which areas are the sharks most concentrated? Think about which of **Angles.** Try different angles—which sometimes can be hard because these things you want to portray in your

usually you are directed to stay in the same place, but you can move your camera to shoot from different anales. In some shots, you will want divers with the sharks, in order to show perspective, such as how close the sharks get to the divers. This can help your viewers to get a feel for the whole set-up of the dive (lots of sharks, lots of divers).

Bait bucket. Get some shots of the



If sharks are swimming overhead, you may be able to single out a shark and get photos with less chaos and at a different angle.



Using the Rule of Thirds by positioning a shark at the intersection of lines in a cropped image can create a more interesting composition.



are in every shot.

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photos. Most of the time, the shark action

lasts the entire dive, so you have the time

to plan and execute the shots you desire.

tractions. There is nothing worse than only

lens, but then after the dive, noticing that

seeing what you want to see on a dive,

such as the sharks right in front of your

there was a diver slightly lower and on

your right and their head and bubbles

Distractions. Be on the lookout for dis-

FEATURES



Feeding at the end of a shark dive—the opening of a bait bucket is when action happens quickly (left); Shark feed at Osprey Reef, Great Barrier Reef, Australia (below)

days that don't do even a little touch-up. Shooting underwater can be hard, especially in the chaos of a shark dive where there are sharks everywhere, people and bubbles everywhere, backscatter, lighting issues, etc. A little editing can help you achieve the same ideas already discussed that weren't exactly executed.

Backscatter. An obvious edit is removing backscatter, as even when shooting without strobes, you are likely to have some spots from sun-lit particles, bubbles on your lens or dust on your sensor. Sometimes, the clone tool may be used to remove a distracting remora, divers' bubbles, or a part of

a shark that did not make it entirely into the frame.

Cropping. Cropping is also a areat tool that can be used to create different effects. The Rule of Thirds suggests that images are more aesthetically pleasing when the subject is not in the center of the photo. This is achieved by drawing three imaginary lines top and bottom, dividing the image into thirds vertically and horizontally, and placing the subject at the intersection of those lines. Usually, it is easier for us to focus and take a shot when the shark is directly in the center of the viewfinder, but that does not always make for very interesting images.

dive. Having water in front of a shark can imply motion or show that the shark is moving somewhere in an image.

If a bait bucket is opened at the end of a dive, there is usually quite a rush of activity that happens very quickly. Usually, the dive guide gives some sort of signal that this is about to happen, so you can have your camera ready.

Shallow dives. You do not always have a choice, but shark dives that take place in shallower waters are better in terms of lighting and color. You can also stay longer on shallow dives, as you go through air more slowly and have more no-decompression time.

Repeat dives. Another way to get great photos is to do the dive twice, if you have the opportunity. There's noth-

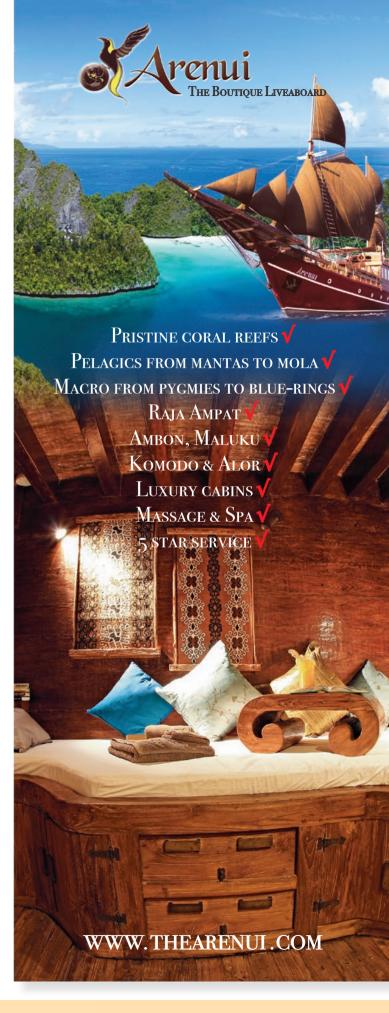
ing like having done a dive to really understanding it. And nothing beats having seen photos you took on one dive, noting what you liked and what you did not like, and then being able to do it again, to improve your shots.

After the dive —Post processing

Now you are home, the postshark dive adrenalin is still rushing, and you can't wait to look at your photos. You download. and wow, you took 1,200 photos...in one dive. Well done! Going through them takes longer than the dive itself did, but after initially deleting the obviously bad shots, you still have plenty to choose from.

Ideally, we always want to shoot a perfect image in camera, but you will be hardpressed to find many underwater photographers these







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Converting a photo to black and white (right) can add contrast, texture and drama, saving a photo that is very blue (below)



Cropping and moving the photo

to follow the rule of thirds is an easy way to add balance and interest to a photo.

Negative space can also be adjusted through cropping to help add balance. By putting negative space in front of a shark or other large or fast moving subject can imply motion or show that the shark help, but can be time consuming, is going somewhere, and this can easily be done by moving the shark to one side of the photo so that blue water in front of it.

White balance. Post-production white balancing can be a savior in bringing some color back into those photos where everything looks blue. Even with strobes, sometimes the sharks are further away than strobe light will reach. Manually white balancing underwater can so if you didn't get around to doing it on the dive, you may be surprised how much color contrast you can get back by using the white bal-

Black and white. Sharks and shark

dives are great for converting to black and white. People are drawn to monotone images for many reasons, including how it makes images look like they have more contrast and texture, and possibly more implied drama in an image. Going black and white can also be a great way to save a photo that appears extensively blue and post-processing white balancing doesn't help. Converting to black and white and increasing contrast, darks and lights can add much

removal or addition of people, animals, and large objects—is some-

ance function in an editing proaram after the dive.

needed contrast to an otherwise blue-on-blue photo. Sometimes, we find that the 1,200 photos we took on a shark dive all appear very similar and a little bit of editing can create different effects and add variety to your photos. What you edit and how much you edit is at your discretion, as the artist behind the image. Extensive editing—especially the



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shark tales

Shark feeds at Roatan, Honduras (right), in Turks and Caicos Islands (far right) and in South Africa (lower right)

a shark or a dive, then extensive

editing may show what wasn't

actually there. But if the object

times frowned upon, as it changof a photo is for artistic purposes es the truthfulness of an image. only, then edit away. Be pre-But it all comes down to what pared describe your edits, espeyou are trying to portray to your cially when entering photos in viewers. If you want to document contests, as many have very spe-

Where to go

cific rules on what can and can-

not be done, post-production.

There are many popular places to shark dive and many difference species of sharks that are possible to see. Some are seasonal, so it is always good to check when the best time and place is to see a certain shark, so you don't get skunked. Below are a few examples.

Great white sharks: South Africa; Baja, Mexico; and

Bull sharks: Bahamas, Mexico and South Africa

Ragged tooth sharks: South Africa: and North Carolina, USA

Blacktip reef sharks: Yap and French Polynesia

Oceanic whitetip sharks: Bahamas

Tiger sharks: South Africa and Bahamas

Blue and make sharks: South Africa: US Atlantic Coast: and California, USA

Grey reef sharks: Turks and Caicos Islands; Roatan, Honduras; and the Great Barrier Reef, Australia

As a final tip, I want to stress that while you are photographing shark dives, remember to try different things on your dive. These dives are one of the rare occasions where you are likely to have lots of time to photograph the same subject. It is easy to get over-excited and just snap, snap, snap the same shot over and over. I like to take the first 15 minutes of the dive to "snap, snap, snap" and be awed at the amazing experience. After that, I stop for a second and think about what I could to differently.

Change your settings, change your strobe angle (or turn it off for a few shots), try video—whatever, really, just do something else. That way when you get home, your photos won't all be the same. You'll thank me later, I promise.



You may have noticed in this article that there was no mention of the heated debate over using bait to entice sharks for these types of dives. It was hard to write about photographing shark dives without discussing the controversy involved in altering a natural habitat, and possibly shark behavior, with bait and the presence of many divers. Clearly, there are two sides to this story and, as always, a right way and a wrong way to do things. The best solution I came up with is to separate the topics and discuss the heated debate on shark dives in a separate subsequent article. So, be



sure to check out the next issue to read: "To Shark Dive or Not to Shark Dive."

Brandi Mueller is a PADI IDC Staff Instructor and boat captain living

in the Marshall Islands. When she's not teaching scuba or driving boats, she's most happy traveling and being underwater with a camera. Visit: Brandiunderwater. com.

Shark Dives

ie to and the second Sunsets and smiles included dive vacations! Roatan, Bay Islands, Honduras Phone: +504 9885-0840, +617 391-8338 email: info@turquoisebayresort.com



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FEATURES

Australia



A natural rock formation known as "Darwin's Arch" protrudes from the water southeast of Darwin Island. The waters around the small, remote islands of Darwin and Wolf contain the largest biomass of sharks on the planet.

Largest shark biomass found in the Galapagos Islands

Northern Galapagos islands of Darwin and Wolf are home to the largest shark biomass reported to date. Despite the large shark biomass, the abundance of reef fishes in this area has been severely reduced because of excessive fishing.

Overfishing has reduced biomass of most sharks and other large predatory fishes worldwide by over 90 percent, and even remote locations have been severely impacted. However, a few localities worldwide still maintain large abundances of top predatory fishes due to either being remote and unfished, or having recovered after full protection from fishing.

Crossroads of currents

The oceanographic setting surrounding Galapagos results in a wide range of marine ecosystems and populations. Galapagos is the only tropical archipelago in the world

at the crossroads of major current systems that bring both warm and cold waters. From the northeast, the Panama Current brings warm water; from the southeast, the Peru current brings cold water; and from the west, the subsurface equatorial undercurrent (SEC) also brings cold water from the deep.

Large sharks benefit from marine reserves

Expansion of protected areas into US federal waters could safeguard core home range areas used by bull, great hammerhead and tiger sharks.

Current research has shown that waters off Florida and the Bahamas are important pupping and feeding grounds for several sharks, providing them with the critical habitat required for the conservation of these slow-to-mature ocean animals.

Researchers at the University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science studied the core home range of 86 bull, great hammerhead and tiger sharks tagged in waters off south Florida and the northern Bahamas. The aim of the study was to find out

whether these highly mobile shark species would benefit from spatial protection, such as marine protected areas (MPAs).

The team examined shark movements in core habitat use areas, or CHUAs, where the sharks were spending the majority of their time, in relation to zones that prohibited fishing or where these sharks were already fully protected within areas of the United States and Bahamas exclusive economic zones (EEZs).

The results show that none of the tracked bull shark's regional CHUAs were in areas

that are fully protected from fishing; and for the great hammerhead and tiaer sharks tracked, only 18 percent and 35 percent, respectively, of their core use areas were currently protected. The study also found that the majority of the CHUAs utilized by all three shark species were within the US EEZ.

The findings suggest the expansion of protected areas into US federal waters would safeguard all of the core home range areas used by these three species of sharks.

■ SOURCE: UNIVERSITY OF MIAMI

Shark hotspot

Within the 138,000 sq km Galapaaos Marine Reserve (GMR), the far northern islands of Darwin and Wolf represent a unique "hotspot" for sharks and other pelagic species. An ecological monitoring proaram has visited the islands over the past 15 years with a strona samplina focus to survey reef fishes and invertebrate communities. However, no study to date has examined extensively the abundance, size and biomass of sharks and other large predatory fishes around Darwin and Wolf.

Enforcement needed

Given how important the Galapagos are to Ecuador's

tourism industry and to the well-being of these top predators, scientists from the Charles Darwin Research Station (CDRS) and the National Geoaraphic Society urae strona enforcement of the new marine sanctuary in a study they just published in the journal PeerJ.

Although Darwin and Wolf are within the GMR, they were not fully protected from fishing until March 2016. Given the ecological value and the economic importance of Darwin and Wolf for the dive tourism industry, the current protection should ensure the long-term conservation of this hotspot of unique global value. ■ SOURCE: NATIONAL GEOGRAPHIC PRISTINE SEAS



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Reef sharks prefer small meals

New study shows that most coral reef sharks eat prey that are smaller than a burger, and typically eat small fishes, mollusks and crustaceans.

Researchers from James Cook University's ARC Center of Excellence for Coral Reef Studies examined stomach contents of reef sharks and conducted chemical analyses of shark body tissue to find out what they had been eating.

Somewhat surprisinally after pumping sharks' stomachs to identify the contents of the last meal, the most common thing to find was, in fact, nothing.

"These results suggest that reef sharks eat small meals infrequently and opportunistically," lead author Dr Ashley Frisch said.

To understand what the sharks were eating over longer periods, the researchers analyzed shark body tissue. They found that the

chemical structure of the sharks' body tissue actually matched closely with that of large reef fishes such as groupers, snappers and emperors.

Not apex predators

In turn, this means that reef sharks do not occupy the apex of coral reef food chains, but instead have functional roles similar to those other large predatory fishes.

Co-author of the study, Dr Justin Rizzari, said the new research changes how scientists think about food webs on coral reefs and acts as a reminder that large, conspicuous predators are not always at the top of the food chain. "We now know that reef sharks are an important link in the food

chain, but they are not the last link in the food chain. In most cases, the top predators are tiger sharks,

hammerhead sharks, or people," Rizzari said.

In the case of reef sharks, the dietary analyses suggest they should be reassigned to an alternative trophic aroup such as high-level mesopredators. This change will facilitate improved understanding of how reef communities function and how removal of predators (e.g., via fishing) might affect ecosystem properties. ■ **SOURCE: CORAL REEFS**

Coastal marine parks not enough to protect large sharks

A study tracking the migratory patterns of tiger sharks across the Southwest Pacific reveals that coastal marine parks provide only brief protection for these important marine predators, while oceanic reefs. vital to their ecology, are overlooked.

Knowledge of the habitat use and migration patterns of large sharks is important for assessing the effectiveness of large predator Marine

Protected Areas (MPAs), vulnerability to fisheries and environmental influences, and management of sharkhuman interactions.

Marine Protected Areas. A four-year study by shark research scientist, Dr Jonathan Werry, in collaboration with the French government. followed the movement of tiaer sharks across the Coral

Sea. The study looked at migratory movements and fidelity to specific reefs for tiger sharks tagged in New Caledonia, the east coast of

Understanding the

habitat-use and

the effectiveness of

Australia (the Great Barrier Reef) and oceanic reefs migration patterns of in the centre of the Coral large sharks is extremely Sea. Thirtyimportant for assessing three tiger sharks (1.54 to 3.9m in total lenath) were tagged with

> passive acoustic transmitters and their localized movements monitored on receiver

From 2009 to 2013, 14

sharks with satellite and acoustic taas undertook wide-ranging movements up to 1,114km across the Coral Sea. One 3.7m female tiger shark was recorded to a previously unknown depth of 1,136m. The Chesterfield Islands appear to be important habitat for sub-adults and adult male tiger sharks.

Tiger sharks are often considered to be a reef-associated "coastal" species that exhibits seasonal and diel visits to coral reef lagoons when traversing between coral shoals and atolls. On coastal reefs, however, all of the monitored tiger sharks were found to be transient. SOURCE: PLOS ONE





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Divers explore the wreck of a Focke-Wulf Fw 58C German WWII aircraft in Lac du Bourget, France

Text by Sabine Kerkau, Photos by Severine Bar and Sabine Kerkau. Translation edited by Gunild Symes

There are places in the world where time seems to stand still. where you will find contemporary witnesses of events that can take your breath away. I visited just such a place more than 100 meters deep in a French lake— Lac du Bourget. Here, for more than 70 years, rests a Focke-Wulf Fw 58C—a German WWII airplane. This particular aircraft is one of the last of its kind that exist in the world.

On the nights of 26 and 27 November 1942, Airport Bruon in France was under German control. The Navigation School Number 4 of the 3rd Air Fleet was housed there. Young students were trained on the Focke-Wulf Fw 58C aircraft to become radio operators of the bomb squadron of the air force. The Focke-Wulf was used in WWII for the connection between the air bases in Bruon on Lac du Bourget and Lyon, and for monitoring the surrounding area.

On 30 March 1943 at 1:15p.m., a Focke-Wulf 58 with four men aboard took off. It was a training flight. They flew over the Alps, and after 40 minutes, passed the city of Chindrieux Châtillon before flying in a north-south path over the lake.

On the last day of training, there was a tradition of flying at low altitude over the lake to celebrate the students' passing of the course. Although this process was actually prohibited, the instructing pilot, Sergeant Ernst Chronz, flew this risky

maneuver. For some reason, the plane hit the water surface and crashed. Two crew members were killed in the crash: the pilot, Sergeant Chronz, and student Corporal Kurt Becker. The second student, Rudolph Schiere, and Radio

Corporal Otto Steinbach were miraculously rescued by fishermen. The water temperature was at this time of year only 3°C (37°F). The shock and hypothermia made the immediate transport of the survivors impossible.

The German airmen were taken in by the villagers of Conjux and given shelter. Later, to thank the villagers for their assistance, the German commander had four prisoners of war, who were citizens of Conjux, freed.



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Philippe Gathiard's small dive boat (above) is quickly filled with gear (left)

Many decades later, the history of the plane crash in the lake was forgotten by the community. So no one knew the exact position of the wreck. In 1988, it was discovered

site made a dive to the downed aircraft impossible at that time. Only in 2004 did three open circuit trimix divers venture a first expedition down to the wreck, resting at 117m. What they found surpassed all expectations.

after intensive research by

ers. However, the depth

a group of French research-

and conditions of the wreck



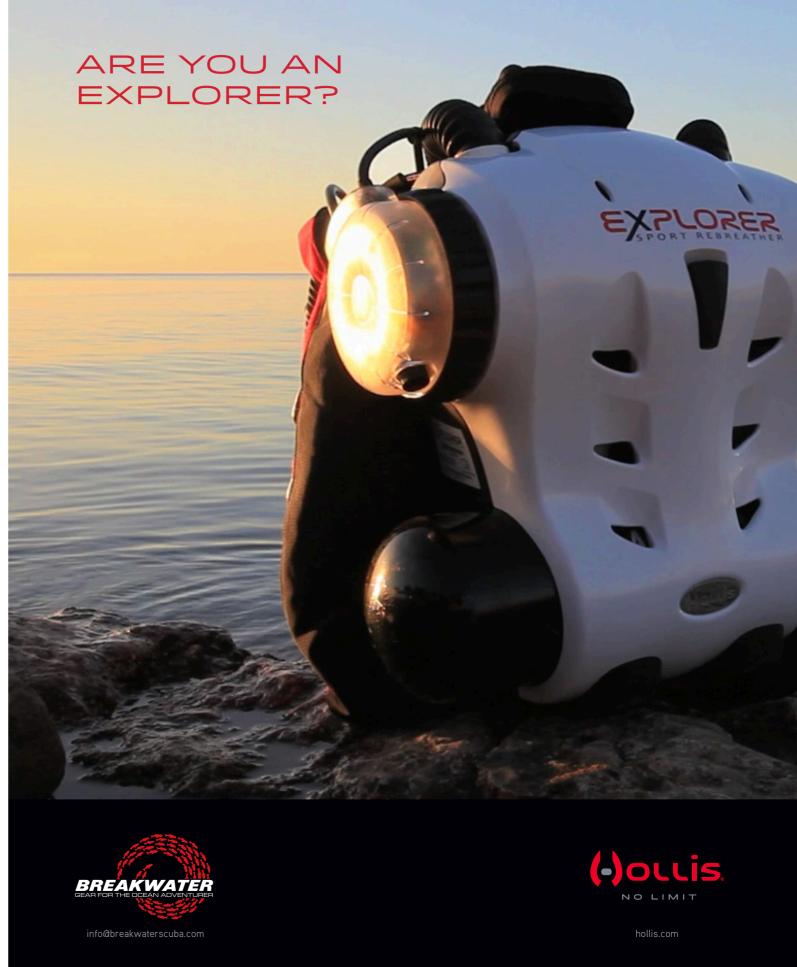
It has been some years since I first heard of the Focke-Wulf 58 wreck in Lac de Bourget. Two friends of mine had received an invitation to dive it and were very enthusiastic about this special experience. At that time, I could not really understand their excitement. It was several years later, that I was able to perform dives to depths of 100m.

In spring 2012, I learned about a deep wreck expedition in southern Sardinia led by Philippe Gathiard. I found out from Philippe that he operates a dive shop in Bourget du Lac, and since 2006, has led selected technical divers on dives to the wreck of Focke-Wulf 58 several times a year.

Typically, he does not take any-



Divers enter the water in the rain





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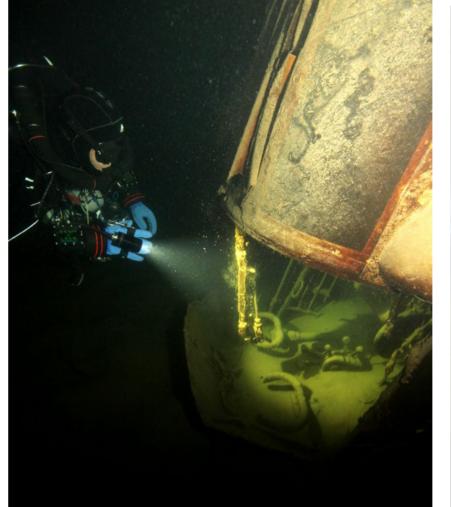
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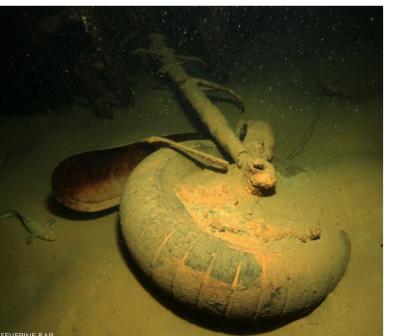
NEWS

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CLOCKWISE FROM ABOVE: Landing gear of Focke-Wulf aircraft; A shiver went down my spine when I first saw the swastika symbol on the wreck, lit by my torch; Diver shines light on the interior of the cockpit; Exposed controls inside the cockpit area

one he does not know, or was not recommended to him by his friends. I received a personal invitation from him and was counted among the few he selected who were allowed to visit the wreck on the bottom of the lake on the last Sunday in October 2012.

On Saturday afternoon, I made the four-hour road-trip from my home in Switzerland to Chambery, France. On the way through Switzerland, winter took me by surprise. There was a severe storm that lasted through Saturday night to Sunday morning. On Sunday morning at 8:00 a.m., my dive colleagues and I met Philippe at the dive center, and he said we would not be able to dive the wreck site. He drove us to the port where we could see with our own eyes that an exit would have

been impossible; the storm had surprised many boat owners. The boats that had not made it back to the safety of the harbor lay partly upside-down on the shore.

Exactly one year would pass before I got another chance. This time, I even had the good luck of knowing all the divers on the trip. There were six of us, including two dive colleagues who had traveled all the way from England to dive the wreck. As Philippe spoke only French, I was very happy that Severine Bar was one of our party, as she greatly facilitated communications with Philippe.

Moreover, Severine and another diver in our party, Frank, had already dived the wreck several times.

The whole group met in Chambery the evening before the dive, so we had time to go through the planning for the next day at our leisure.

Sunday morning at 8:00 a.m., we



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Landina gear of Focke-Wulf aircraft: Instructions on the wreck are still clear (below)

met with Philippe at the dive center. After all the formalities were done, we were given a detailed briefing. During the briefing, Philippe took advantage of some very good posters and pictures of the wreck. He repeatedly pointed out to us the extreme conditions under which we would perform this dive. It would be dark and cold, and quite possibly, we could expect poor visibility.

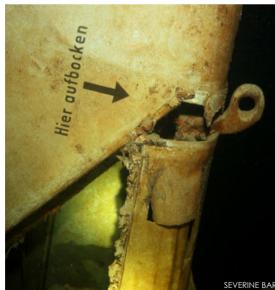
Over 100m down

After a hearty breakfast at the bakery next to the dive center, we made our way to the harbor. It was a cold, cloudy day and it was raining. We stowed the dive equip-



Exposed skeleton of the aircraft





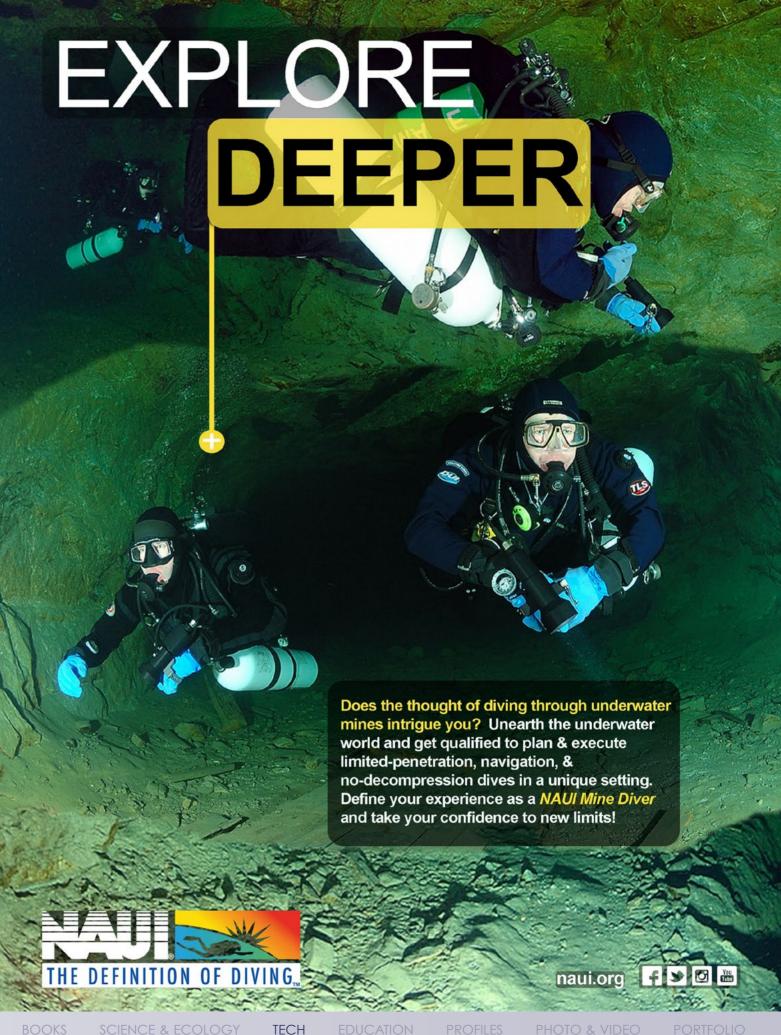
ment on Philippe's small boat. With six rebreathers, 24 stage bottles, a decompression station and some spare bottles, the capacity of the boat was quickly exhausted. In an

hour, we got to the dive site. Once there, Philippe found the buoy with the shotline, which was moored in about 2m (6ft) of water.

Due to the size of the boat, we made three dive teams to do the dive successively. In the first team were our English friends. Oliver Perschke and I formed the second group, and Severine and Frank were the final group to enter the water.

The dive

Oliver and I descended alona the shotline. The visibility was good but it grew dark quickly. At a depth of 95m (312ft), we reached the tail of the aircraft. I got a shiver down my spine when I saw the swastika symbol, which was lit up



EDITORIAL





Focke-Wulf 58

Tail of the Focke-Wulf aircraft (far left); View into the interior of the plane (left and center inset); A crane on board the dive boat is used to hoist dive equipment out of the water (below); Historical photo of Focke-Wulf Fw 58 (far lower left)

by my torch. It looked like it had been painted on the airplane only yesterday.

Next, we saw the tail. We continued along the fuselage to descend toward the cockpit. The two wings were still firmly attached to the airplane and extended from the base at right angles to the surface. The shell of the aircraft was only partially preserved. In some places, it hung down, giving us a view of the aircraft's inner workings and control dials.

It was hard to believe, but even after more than 70 years on the bottom of the lake, we could still clearly read the labels. On the wings, we read, "Do not tread on" and "Do not touch".

The nose and part of the cockpit were stuck in the mud. On the bottom, we could see parts of the landing gear and into the cockpit seat, as well as some other details of the airplane. Unfortunately, the visibility was very poor so close to the bottom, so I could not see



everything clearly.

Slowly, we turned and began the ascent. Swimming along the body of the aircraft, which was only a skeleton, we returned to the impressive, challenging part of the wreck: the rear, with its large swastikas.

After 18 minutes of bottom time, it was time to say goodbye to the Focke-Wulf 58. Philippe had given us a maximum time of 140 minutes. Oliver, Severine, Frank and I adhered precisely to this requirement. Our English friends, how-

ever, dived for nearly three hours before returning to recharge.

On the surface, we were assisted with stowing our equipment. Philippe picked up everything out of the water using a small crane, lifting our equipment back into the boat.

Afterthoughts

The dive to the Focke-Wulf wreck was fantastic, and I would have liked to have repeated it the following year. Unfortunately, Philippe's boat was sold and he

no longer offers diving to the Focke-Wulf 58 anymore. ■

To see a video of the dive by the author, go to: Vimeo. com/80744575. For more information on the dive center, visit: HelioxPlongee.fr.

Sabine Kerkau is a German technical diver, dive writer and underwater photographer based in Switzerland. For more information, please visit: Sabine-Kerkau. com.









Circles are the most natural geometric shapes and it's nowhere written that a circle always have to be a perfect one. Round, circle-like shapes in a rectangle do often come with interesting image expressions, regardless of the photographed subject

Text and photos by Rico Besserdich Edited by Scott Bennett

Today's underwater photography is pretty much subject-oriented. Let's take it as a fact—and there is nothing bad about this fact. Those who dive without an underwater camera like to describe what they have seen underwater, and those with a camera do exactly the same, but with the added advantage of providing visual proof: an underwater photograph.

However, there is the dilemma. What does one do after everything within reach has already been photographed? That's the point we've reached now. Nowadays, many keen underwater shooters equip themselves with high-end photo gear and invest time and money

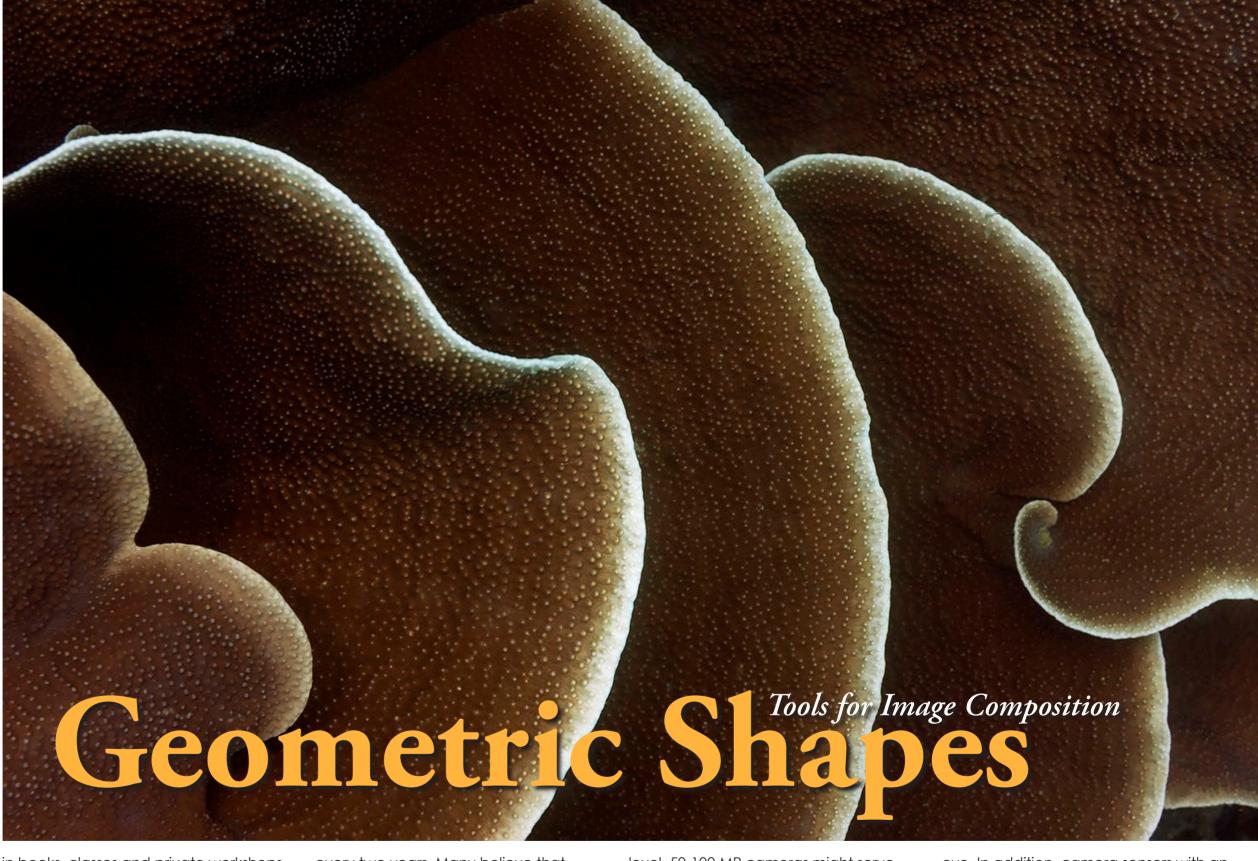
in books, classes and private workshops, not to mention pricey trips to exotic dive locations to shoot that next awesome subject. The average diver will happily use his or her BCD for three to five years, but an underwater photographer does not mind upgrading camera equipment

every two years. Many believe that oft-sung mantra: "The newer camera will be better and so it will take better photographs." Don't stop doing that, as an entire industry now relies upon you!

Sooner than later, 50 MP (megapixel) cameras will be considered standard

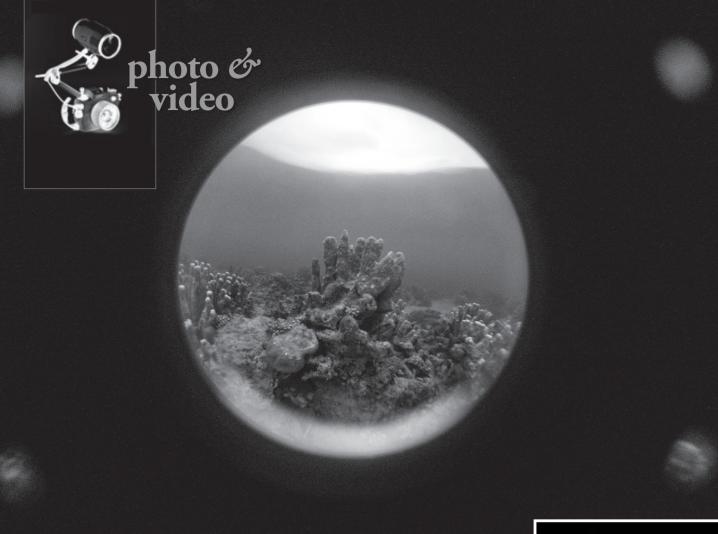
level, 50-100 MP cameras might serve as intermediate models, and high-end models could be 100 MP or more. Add five more years and double the numbers. Add another five years, and there will be contact lenses able to capture high-end images with a blink of the photographer's

eye. In addition, camera sensors with an unlimited dynamic range have already reached the field for testing and may hit the market just after you have sold your house to buy that 100 MP medium-format Hasselblad or the upcoming 120 MP light saber from Canon.



(a)

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Rectangle (the frame itself) and a circle (actually five circles): Whilst the photographed scene itself might be not so fancy, a simple playing with geometric shapes can turn a standard scene into something different. By the way: this image was done with a tiny simple compact camera.

sold for US\$4.3 million. In social media (considering the image would be still unknown by now), this image would barely gather ten likes. In comparison to the capabilities of today's modern cameras, it is not even a technically outstanding image. It has some mistakes and has been manipulated, with several image elements removed during darkroom processing. (Don't think for a second that image manipulation is a

Straight geometric shapes such as rectangles and triangles are often parts of articificial objects such as shipwrecks. It is however always a good move to look out for interesting geometric shapes or pleasing combinations of those.

digital age curse; it has been around as long as photography has existed).

Then again, who needs Likes and pixel analysis if one can make millions of almighty dollars? Incidentally, "Rhein II" uses geometry as its main compositional element, so keep reading as I will come to the point shortly.

Back to basics

In photography, there is no need for "always faster, always better, always fancier." The key to good photography

does not rely on always looking forward, always striving for the best and newest or for special effects realized with special equipment. It might actually rely on looking back. Yes. Looking back means to go back and look at the basics that can make a photograph of any subject look great and impressive. I said "great and impressive", not successful, in terms of profit. If it's money you seek, go and shoot weddings.

Whether or not you can afford

Basic principles

However, that does not automatically guarantee you will shoot better images. If you do not want to sell your house for a better camera but are still keen on improving your underwater photography, I have some good news for you.

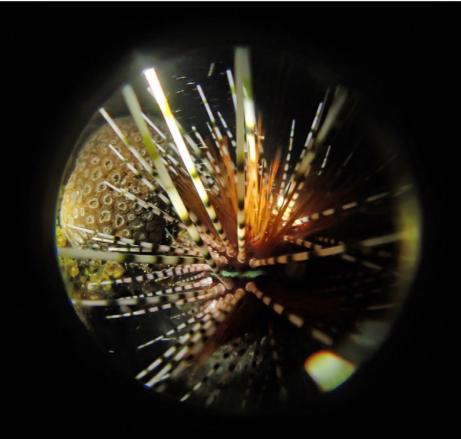
The basic technical principles of photography have not changed in the last 125 years. First is the need for a light-sensitive material (i.e. film—in the past analog age—and nowadays, the digital sensor); second is the need for a device to control how much light hits that light-sensitive material (i.e. the aperture); and third is the need to control how long the light hits the light-sensitive material (i.e. the shutter speed). Add a special feature, the sensitivity of that light-sensitive material (ASA, aka ISO), and that is basically it.

Whether upcoming generations of digital cameras are capable of making

a long distance call to ET's relatives, make you a cappuccino underwater or text your darling that you will be late for dinner while simultaneously combining 25 multiple exposures, every camera works according to the above-listed basic principles. Simple.

Technical quality

It would be a bit singleminded to judge any image by technical quality alone. Let me give you an example: One of the most expensive photographs in the world is "Rhein II" by German photographer Andreas Gursky, which



Rectangle (the frame itself) and a circle. When working on such simple subjects, a circle and a square crop can give such photograph a geometric expression, disconnected from the photographed subject.

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Whilst the jellyfish is actually not a very photogenic subject, this image still works due to its expression of geometry: two circles in one rectangle.

Triangles in a single rectangle. Some fish do come with a sort of triangular shape. Lucky shot this is, as the three fish do form a third triangle.

geometric information which remains when location, scale, orientation and reflection are removed from the description of a geometric object."

Oh dear, it's getting scientific now! Let's get even more basic. There are only three geometric shapes in existence: the rectangle, the circle and the triangle. Any other geometric shapes are just variations or combinations of one or more of the former. See? In the end, it is all very simple. It is even more simple in the art of photography, as we only have to deal with two dimensions. Now let's check out how we can use those three geometric shapes in our underwater photography.

The rectangle

As long as it does not morph into a circle or triangle, the rectangle can be whatever shape it likes. Length of sides, straight or diagonal, it does not matter. A rectangle has four corners. Period. Fancy geometric shapes like octagons or hexagons are a combination of rectangles and triangles.

The most obvious rectangle we have

to deal with in photography is the frame itself. Whether it is a 3:2, 4:3 or 16:9 ratio, the image frame is the most basic geometric element of image composition, defining where our image begins and where it ends. Even the very simple rule of thirds would not work without a rectangular frame.

Seven rectangles are present in the super-expensive "Rhein II" photograph, which I mentioned earlier. The entire image consists of only rectangles, which makes it a masterpiece. If you count them, you will find six, but don't forget the image frame itself is a rectangle, which makes it seven.

Within the pre-given rectangle of the frame, you can position or compose all other elements of your shot just as you like. Following the rule of thirds, or the golden spiral, always works. However, it is always best to see your image frame as part of the composition.

Be it rectangles, triangles or circles, take it as a rule that two in each image are enough. Although there can be exceptions, viewers perceive an image including all three geometrical shapes not as pleasing. Keeping it simple is the



The eye of a pufferfish—a perfect circle



The popular frame-in-a-frame photographic concept (right) does come with geometrical aspects as well. There's a small extra aimmick in this shot: the window reminds one of a triangle; One triangle and plenty of rectangles (left)—indeed a very "geometric" shot.



key. To work with just one or two geometric shapes in a photograph is usually enough.

Rectangles might find their place in wreck shots or shots of anything artificial in the underwater world. In most cases, the good ol' frame-in-a-frame (or window-in-awindow) concept actually works with rectangles. One frame is the image frame itself, the second is a rectangle in the image itself. Note: The second element (or window)

could be the shape of a circle or triangle as well, but you might also want to think of fine art prints that come with a mat board or passepartoot. Whether framed or not, it is the same thing—combination of rectangles—and it always works.

An underwater image solely consisting of rectangles (such as that million dollar baby, "Rhein

II") might not be that easy to realize. But if it was easy, everyone would do it, right? So, the task remains open. Just think about it, especially if you want vour work to be appreciated by not only other

photographers but fine art photography specialists, museum owners and art curators. It isn't enough to shoot something beautiful underwater, as buyers in the art scene are looking for images that step beyond ordinary beauty.

The circle

Round is the world, round is the eye and round is the circle. Eye? Circle?

In the evolution of mankind, the circle is one of the most powerful geometric shapes of all. The sun is round. Even ancient gods were symbolized with circles. The world is round and almost everything in nature appears round. Rectangular and triangular shapes are often artificial, in many cases, created by humans. This makes the circle the





Rectangles and triangles but no circle (left). Wrecks are perfect subjects for photographs working primarily with geometric shapes. Remember: to work with just two geometric shapes (and variations of them) is in most cases more than enough. Adding a third geometric shape can sometimes disturb the overall image.





This image (left) would not be such an interesting scene, if it weren't for all those interesting shapes; Propellers (lower left) of aircraft are usually quite static subjects, but with a swirl (made in camera, not in Photoshop), it serves nicely as a geometrical interlude of rectangle and circle. Geometry!

Geometric Shapes



Using geometric shapes in photography does not always need to result in "static" images. Sometimes, just an intimation of a shape (here, a circle) can create intrigue.

Rico Besserdich is a widely published German photographer, journalist and artist based in Turkey. For more information, visit: Maviphoto.com.



most natural geometric shape we can utilize in our photography.

In underwater photography, the circle is a powerful geometric shape to play with. Sun, eyes, shipwreck's portholes or the effect of a circular fish-eye lens—they all work well. Just keep in mind that you will always have to deal with the rectangle of the mainframe.

The triangle

The geometric shape of the triangle has a deep meaning in human culture. It stands for many things but all of them were made by humans, not nature. But what about fish? Actually, many fish are perfect examples of triangles. Look closer. Many of them are, in one way or another, of triangular shape. Let's remember, it does not have to be a perfect triangle with equal lenaths. Any triangle shape will do as long as it has three corners, which logically

makes it a triangle, correct? You now might want to look closer at the fins of a shark or any other fish. Are there triangles around? Of course, there are!

Be aware of geometric shapes and utilize them in your images. There is no need to travel far for sharks or super-special macro critters; the right subject might be waiting in the pond next door.

Underwater photography still requires learning some basics of photography itself. Geometry is one of the core elements, the subject to shoot is not. So, at your next dive with your camera, think of geometry. Add colors and other basics of image composition, and you will do just fine. In the end, only one question remains: Are you a photographer who loves to dive, or are you just someone who owns a camera? The choice is yours. ■



Circles in a rectangle. Keeping it simple.



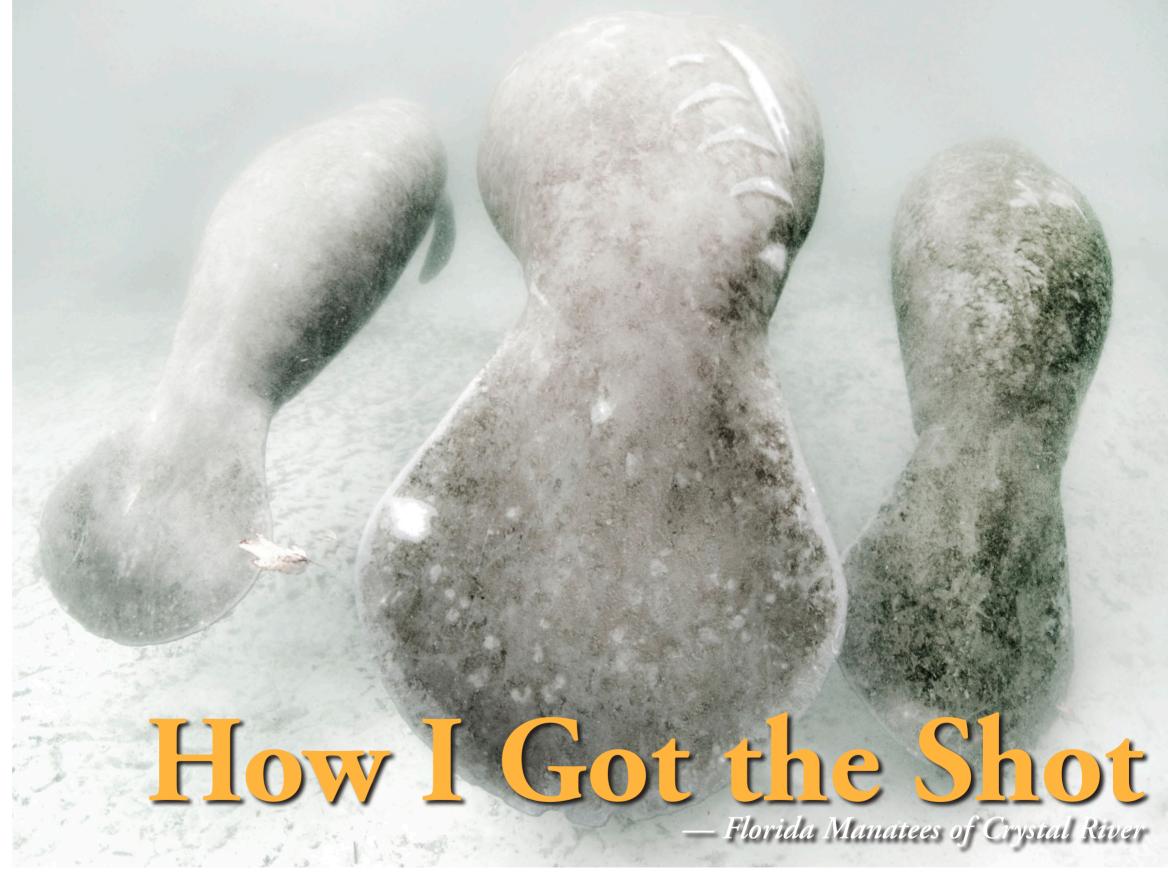


Text and photos by Amanda Cotton

Florida manatees are an endangered species found in the rivers, springs and ocean around the state of Florida in the United States. By far, one of the best places to encounter these gentle giants is at Three Sisters Springs in Crystal River, a state park filled with crystal clear blue water, perfect for capturing imagery of this sometimes curious and playful species.



Florida manatee in this issue's cover shot by Amanda Cotton



Under special permit, underwater photographers are allowed to enter the water with camera in hand to photograph manatees within the state park. Strict regulations are in

place to protect the manatees from harassment and abuse as they move into the spring head area to rest and to keep their young warm, as temperatures fall in the winter months.

Many times, manatees will approach swimmers and photographers alike, as this species can be quite playful. With a friendly and outgoing manatee, the photography

opportunities are endless.

In this particular image (left), a young manatee moved in close to my camera several times, curious over its reflection in my large dome



THIS PAGE: Underwater scenes with the Florida manatees of Crystal River

> published underwater photographer based in Florida. Her work has been featured in science and diving

magazines as well as National Geographic, BBC, Discovery Channel, The Weather Channel, Smithsonian Magazine, Times Publishing, CNN, Natural History Magazine and Earthweek. A member of The Explorers Club and the Ocean Artists Society, Cotton was recently inducted into the Women Divers Hall of Professional Nikon Photographer Fame. For more information: Acottonphoto.com.

with this species. Amanda Cotton is a widely

port. The sun breaking through the trees directly behind us added a nice dramatic backdrop to the scene.

Darkening the exposure on the ambient light helped make the sun rays stand out against the dark sand and roots in the background. The area inside the spring head of Three Sisters Springs is great for photography, with so many different lighting scenarios available to underwater photographers due to the tall trees and light-to-dark changes in sand color.

It never ceases to amaze me how incredible it feels to have a wild animal initiate contact and the interaction. Many times, manatees will attempt physical contact with swimmers.

According to the rules of the park, if a manatee initiates the physical contact, swimmers are allowed to touch the manatee in return. This has been

somewhat controversial over the years because of confusion in determining who initiated the contact and encoun-

At Three Sisters Springs magical encounters happen often. We, as underwater photographers and swimmers in the area, need to stay vigilant in respecting the animals and the surrounding environment of this special place so that generations to come can continue to enjoy it.

Recent changes to the park and its regulations in regards to swimming with manatees have restricted some access to them. These updated rules have been put into place to further protect manatees in the area from harassment. Many of the rules directly impact underwater photographers, both professionals and amateurs. It is recommended for any underwater



photographer interested in pho-

tographing the Florida mana-

Springs to contact the Florida

Fish and Wildlife Conservation

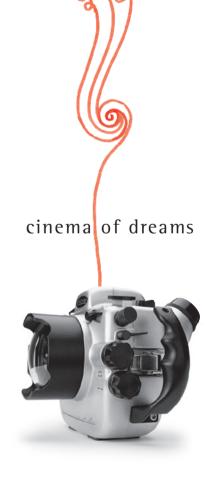
Commission in Crystal River for

safely and respectfully interact

more information on how to

tees in and around Three Sisters





www.seacam.com







Fantasea's FG9X Housing PowerShot G9X is depth rated for the Canon to 60m (200ft) and provides full access to all camera buttons, with clearly labeled controls and access to essential contact points on the camera touch screen. The housing is shock resistant and compatible, with a wide range of underwater photo accessories. It comes with a removable double fiber optic cable

> connection plate, removable flash diffuser and moisture alarm and detector. Double o-rings provide the main seal. Approximate weight submerged in salt water is 74g. The lens port features a 67mm thread. Fantasea.com



Three new lights from Keldan

The Video 8X CRI is a brand new light that features a cutting-edge 8,000-lumen LED lighting module, which generates an extremely high color rendering index (CRI) of 96. The light is color balanced to match sunlight at 5,600K and has a wide and even beam angle of 110 degrees. The battery packs are interchangeable in the field, include an LED battery life indicator, and boast a burn time of 45 minutes at full power. The Video 8X CRI is priced at US\$1,990. The 8X FLUX and 4X FLUX are higher-powered updates to Keldan's existing, similarly-named lights, and both produce a slightly lower CRI of 82. The 8X FLUX has increased its output from 10,000 to 12,000 lumens, while the 4X FLUX has jumped from 6,000 to 7,000 lumens. This increase in power does not affect burn time, which stays at 45 minutes for both lights. The Video 8X FLUX and Video 4X FLUX are priced at \$1,890, and \$1,370, respectively. **Keldanlights.com**





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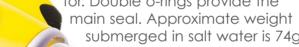
dealer?

program for underwater photographers. Silver Efex Pro is a go-to tool for creating powerful black and white images. Additionally, HDR Efex Pro delivers top-notch high dynamic range photo editing.

Acquisition

Google acquired Nik software back in September 2012 and started selling a discounted version of the entire suite for the low price of US\$150 (originally valued at \$500). If you previously purchased the software in the last year, Google will automatically be refunding all purchases.

The Nik collection can be downloaded free from this URL: Google.com/nikcollection



free underwater drone, according to the inventors—is designed to give divers unprecedented possibilities to capture underwater video while quietly enjoying their dives. Using innovative underwater tracking technology, the drone follows its owner via a connected bracelet for one hour and up to a depth of 60m (200ft). Hands-free, it won't require any other input but the choice of filming angle, iBubble will follow the diver for one hour on one battery. Batteries can be swapped easily for

multiple outings. ibubble.camera

iBubble—the first autonomous and hands-

Hands-free

Nauticam optical TTL converter

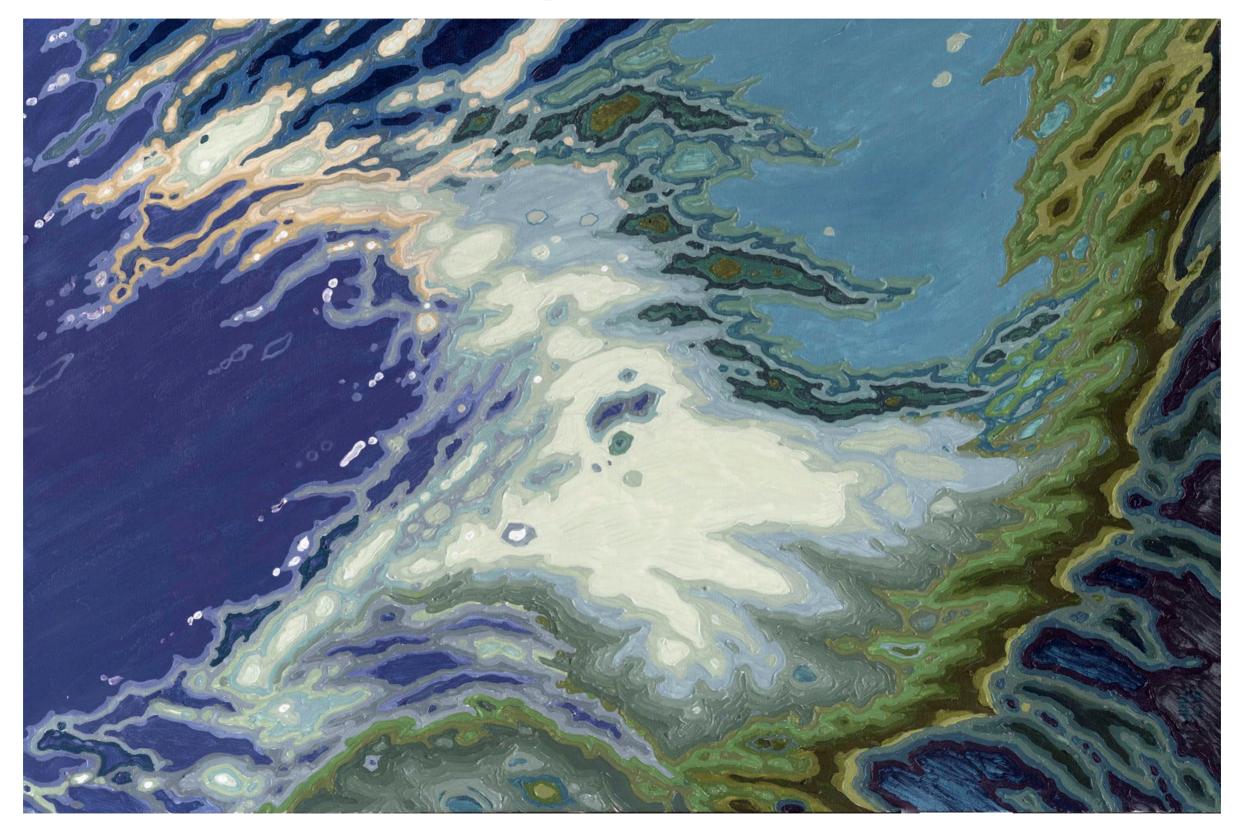
Nauticam has released its first optical TTL converter and LED flash trigger for Nikon cameras and Nauticam housings. The NN-2/IS supports both optical and electrical strobe triggering and is compatible with popular strobes from Inon and Sea & Sea. Whether using in TTL or manual mode, the converter will eliminate the delay of recharging the pop-up flash, while maintaining the efficiency of fiber optic cables. The trigger is easy to install, has an incredibly long battery life and is reported to deliver highly reliable, consistent results. Nauticamusa.com

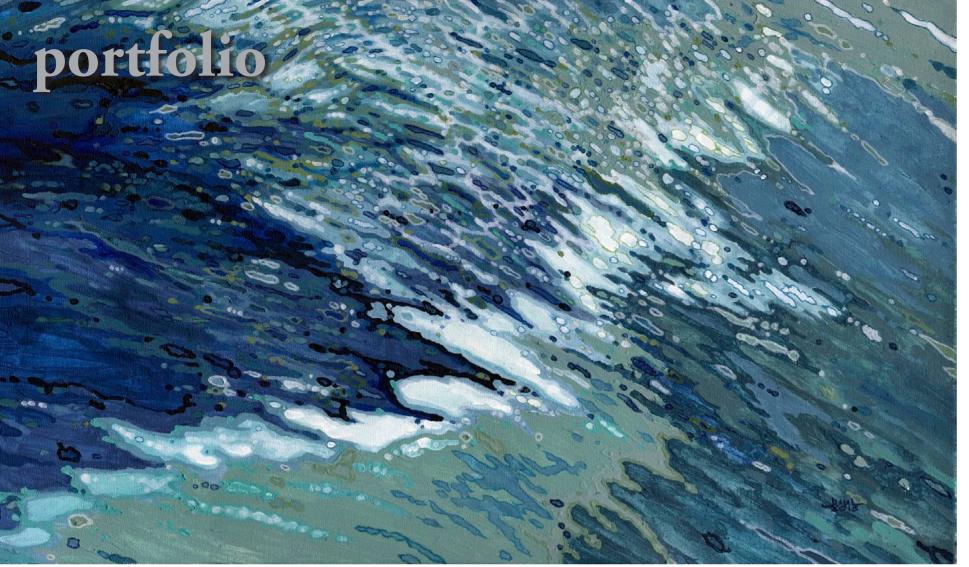




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Margaret Juul





Text edited by Gunild Symes. All artwork and photos by Margaret Juul

American artist Margaret Juul creates vibrant and dynamic paintings inspired by the ever-kinetic, tumultuous states of water, as it may be experienced above and below the waves. X-RAY MAG interviewed the artist to find out more about her artistry and her perspectives on the watery world we inhabit.

X-RAY MAG: Tell us about yourself, your background and how you became an artist.

MJ: I was born in 1968 in Old Bethpage, New York, USA. I have always had a

passion for art and design, coming from a long line of creative women. From an early age, I aspired to be an artist. You could say it was "in my genes."

My life has always been inspired by the sea. From the shores of my New York birthplace—and later, at Chicago's Lake Michigan, where I studied Fine Art at Columbia College—to the spectacular tropics of Tampa Bay where I currently reside, water has held an unwavering hold on my spirit—fluidity, intuition and reflective volatility.

X-RAY MAG: Why waterscapes? How did you come to these themes and how did you develop your style of painting?

MJ: Interestingly enough, even though I grew up around water and coastal landscapes, my studies in college were figurative. I was fascinated with form and line, and was primarily a figurative realist and still life photorealist. I found the task

of painting in those methods both creative and mentally challenging. Where most other artists I knew were throwing paint at the canvas, creating abstractions, I was meticulously drafting out the lines and perspective before even putting the brush to canvas.

As I traveled more, especially inland and to desert settings, I felt almost a loss when I was not near a large body of water.

The first "ocean-inspired" painting created was an underwater image I recollected from a time I was six years old. My family was on vacation, down from New York on Miami Beach in Florida. I was swimming alone in the ocean, and was pulled down through a riptide. I nearly drowned but managed to be pulled back to shore. I remember the light coming through the waves, which later, began my inspiration.

From that point on, I found that painting water was an emotional release from

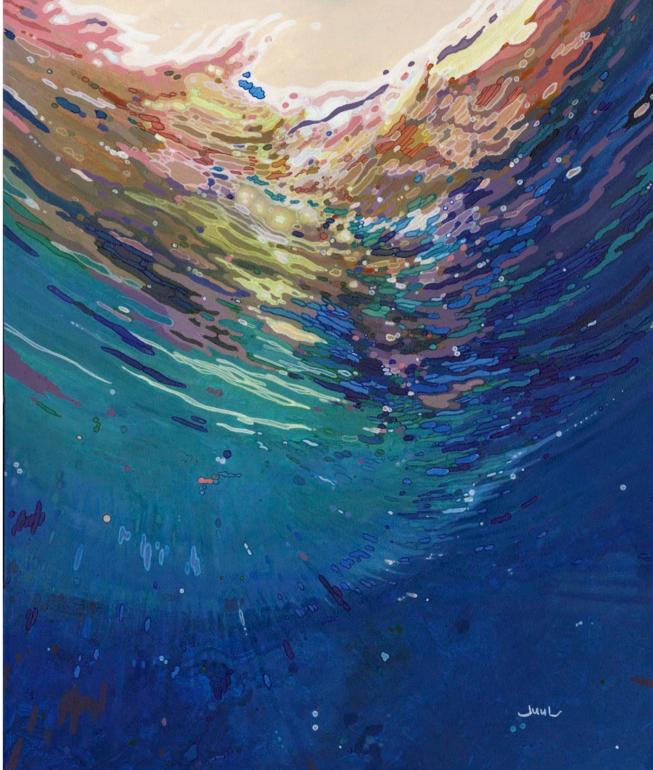
Margaret Juul

PREVIOUS PAGE: Reaching for the Sky II, by Margaret Juul. Acrylic on canvas with ink, 24 x 36 x 1.5 inches

Cold Atlantic Waves, by Margaret Juul. Acrylic

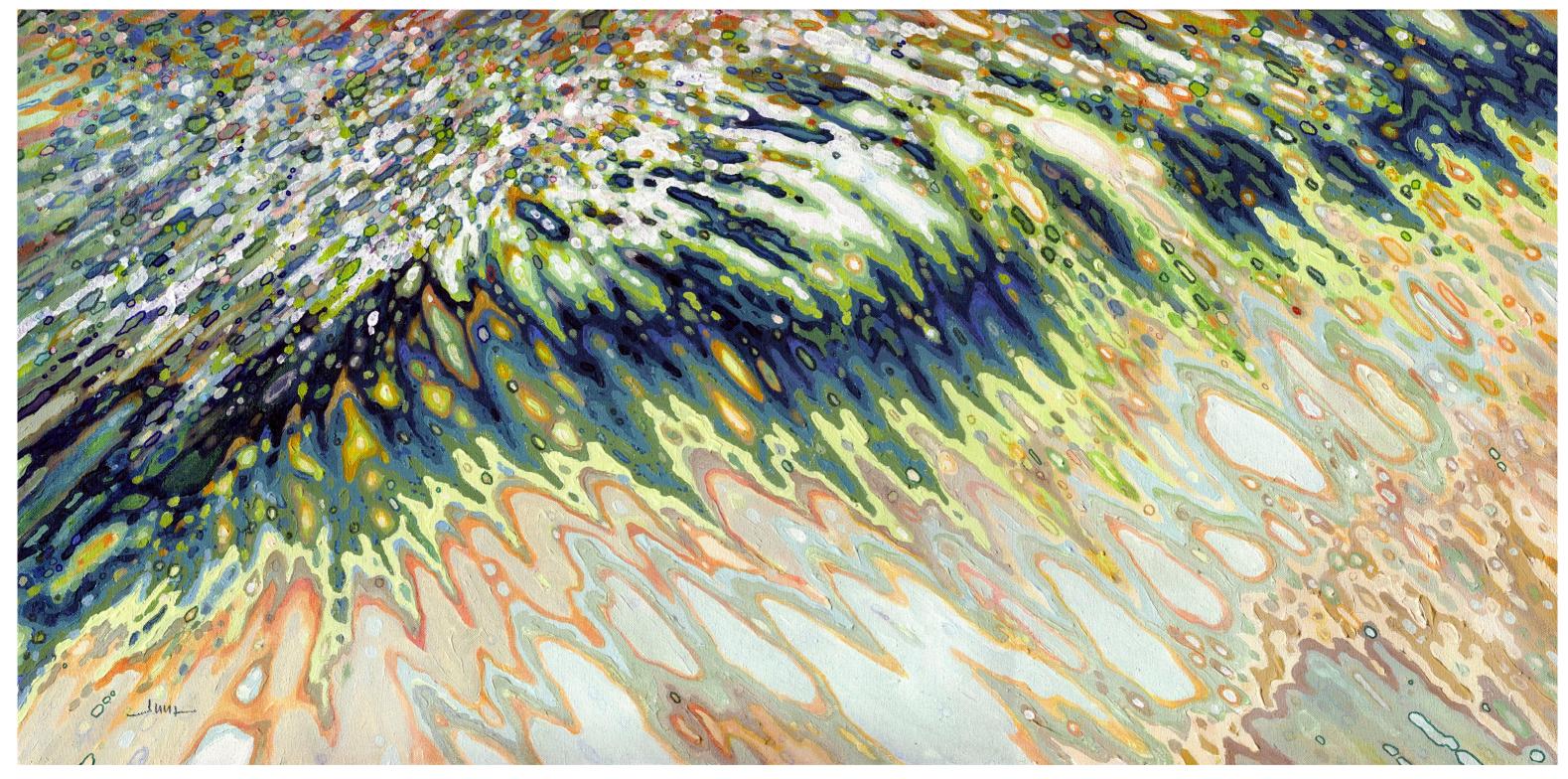
and ink on linen, 21 × 36

× 1.75 inches.



Emerging, by Margaret Juul. Acrylic and ink on linen, 32 x 38 x 1.5 inches





any negativity or pain I was carrying around. It is amazing, the power of art.

At that time, I had already signed with a publisher who loved the work. Soon, the prints began to sell. At about the same time, the Iraq Museum International contacted me to be the American artist

representative for its "International Poster Exhibit." From that point, my works began to take off internationally.

As an environmentalist, I began to wonder how I could use my art to engage others.

Now my goal is to have work creat-

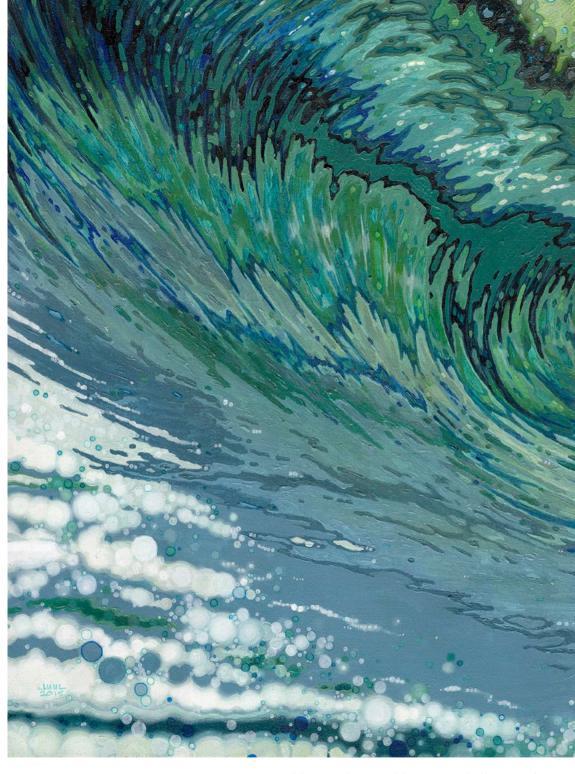
ed to promote an understanding of the challenges we face regarding climate change. Although all aspects are important, I am focusing on fresh water and living oceans.

We are on the verge of a major turning point in human history. In my way, I hope

that someone will look at my abstract water paintings and be moved or inspired. Moved to respect the environment and our precious natural resources. Inspired to think creatively, outside the box. X-RAY MAG: How do you create your paintings? What is your artistic method or creative process?

MJ: Firstly, I have a photographic memory, which in reality is equally a blessing and a curse. Where I live, I am surround-

NEWS



Churning Waters, from the Pacific Coast series, by Margaret Juul Acrylic on canvas, 30 × 40 × 1.75 inches

ed by water and have a plethora of images in my head, which I can pull from at any moment. During my travels, I photograph a lot of water, and I have had clients who are divers who send me images that I can use for inspiration. So that is the

Deep Dive, by Margaret Juul. Acrylic and ink on linen, 24 x 36 x .75 inches

first step.

Ninety-five percent of the time. I choose to build and gesso my own canvases, preferring linen to cotton canvas. I sketch out the image and spend a lengthy amount of time researching color trends, so that not only will my subject matter be of interest, but that my color palette is in sync with trends, so my prints will sell.

Initially, I was an oil paint snob, but the past few years, I have enjoyed using acrylics, oil pastel and ink, some-





Jumping in the Ocean, by Margaret Juul. Acrylic, oil pastel and ink on board, 24 x 36 inches

times in combination. I like the tooth of the canvas and the texture of different mediums.

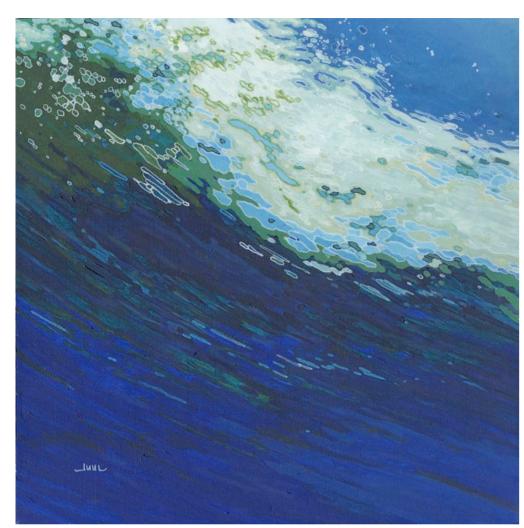
I treat my art as a career and business. I really try to think of what my audience will love and buy.

X-RAY MAG: What is your relationship to the underwater world and marine life? In your relationship with reefs and the sea, where have you had your favorite experiences?

MJ: I am inspired, amazed and in awe of what lives in the oceans, how it affects all other living things on Earth and I am passionate about preserving it. I have been fortunate to have a lifetime of experience with water, mostly in Florida, with one side, the clear calm of the Gulf of Mexico; on the other, the churning Atlantic Ocean.

On the California coast, I have been especially inspired by rocky cliffs, pebble beaches and tall

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waves. It is an all-encompassing imagery.

X-RAY MAG: What are your thoughts on ocean conservation and how does your artwork relate to these issues?

MJ: Really, that is the most important part of my work. I really want to inspire others to love the sea, our coastal lakes and fresh waterways. I want to be a voice for the oceans and the lakes, for the streams and the waterfalls.

I find that only when people are inspired, do they take the time to become aware and listen to what is unfolding.

Our oceans are dying. We are wiping out sea life and poisoning

our freshwater, all while our seas rise. It is a horrible situation, and it might be too late to try and turn it back, but I do have hope. I paint, promote my work, discuss the situation to whomever will listen, and donate what I can to beneficial environmental causes.

X-RAY MAG: What is the message or experience you want viewers of your artwork to have or understand?

MJ: First, they must see the beauty in the work, which always seems to lead to a happy childhood memory of some experience, either a beach vacation or summer spent on a lake. That appears to trigger people to

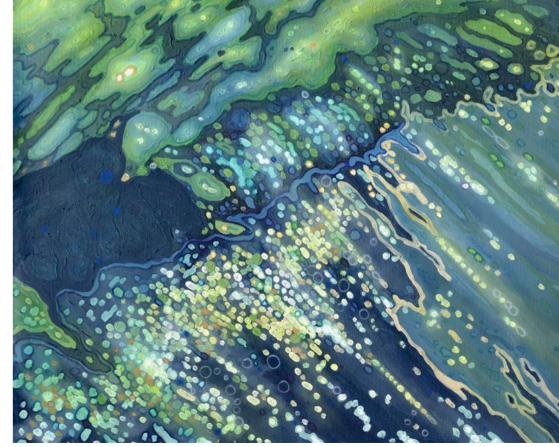


Margaret Juul

Twisting and Twirling Waves from the Atlantic Coast series by Margaret Juul. Acrylic on canvas, 30 x 48 x 1.5 inches (left)

Flexing Ocean Wave, by Margaret Juul. Acrylic and ink on canvas, 32 x 32 x 1.5 inches (far left)





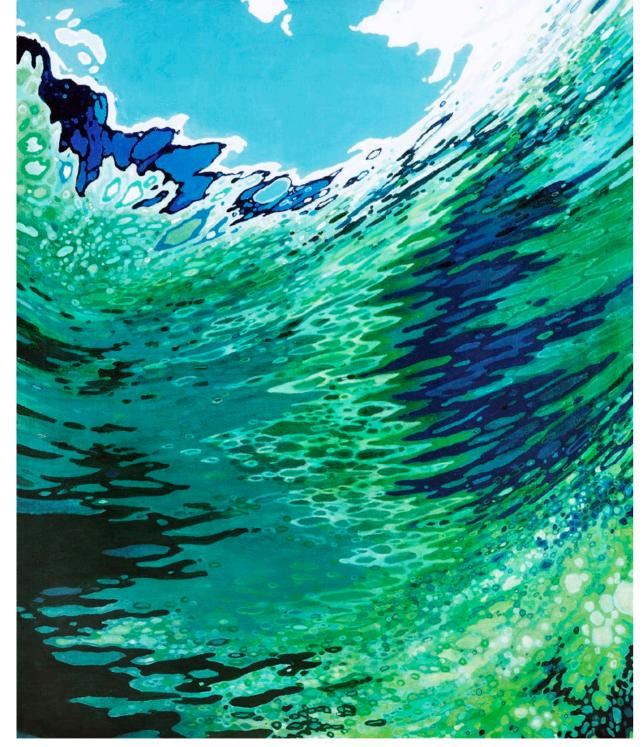
Tide Rolling Out, from the Pacific Coast series by Margaret Juul. Acrylic, ink and oil pastel on canvas, 18 x 24 x .75 inches

Sufacing, by Margaret Juul. Acrylic and ink on linen. 24 x 24 x.75 inches



NEWS

Underwater Reflections, by Margaret Juul. Oil on linen, 30 x 60 x 1.5 inches

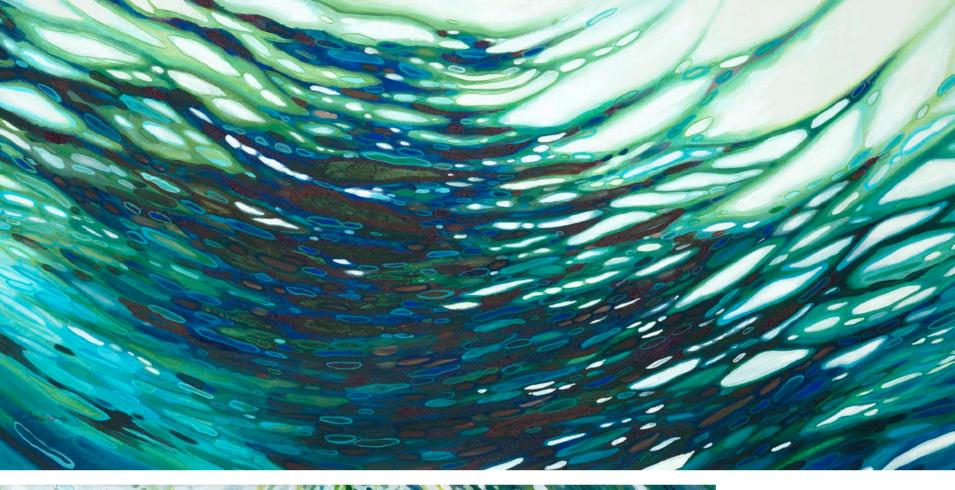


Under a Clear Sky from the Gulf Coast series by Margaret Juul. Oil wash, oil pastel and acrylic on linen, 40 x 47 inches

want to relive some of those good memories, only to find out, in some cases, that that beach or lake is currently polluted. My work seems to bring people a sense of calm and happiness, and it helps bring awareness.

X-RAY MAG: What are the challenges and/or benefits of being an artist in the world today?

MJ: First off, even though we live in the 21st century, being a female artist is the





Underwater Movement, by Margaret Juul Acrylic and ink on canvas, 36 x 48 x 2 inches

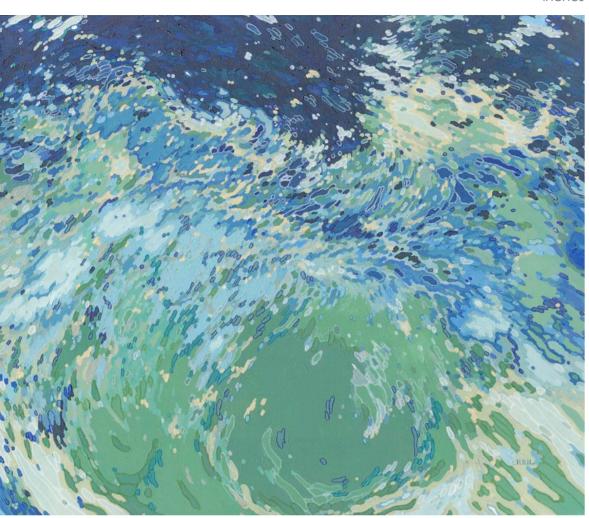
biggest challenge. There is even solid data that shows that if a collector has the choice between selecting a work by a female or a male artist, they are more likely to purchase the male's.

Second, the market is flooded, competition is fierce, and with the world economy is just recovering from a near collapse. People are not investing in "up and coming" artists as frequently.

X-RAY MAG: How do people respond to your works? What feedback or insights have you gained from the process of showing your work to various audiences?

TRAVEL

Rising Indigo Sea, by Margaret Juul. Acrylic and ink on linen, 54 x 54 x 2 inches



Heart of the Ocean, by Margaret Juul. Acrylic and ink on canvas, 32 x 38 x 1.5 inches

MJ: I am very grateful that people of all races, religions and age groups respond very well to my work; I have cultivated fans all over the world. It inspires me, as an artist, to keep at it.

X-RAY MAG: What are your upcoming projects, art courses or events?

MJ: In addition to working with galleries in the United States and London while promoting and selling my prints internationally, I am now expanding my work onto textiles.

My next project is a state-of-theart hospital in Jacksonville, Florida. That project will utilize custom-designed fabric and wallpaper. Canvas prints will also be on display.

My water imagery is being promoted not only for environmental purposes, but in healing spaces, such as hospitals, wellness centers and nursing homes. I am also looking to connect with additional galleries abroad. There is always something to do!

X-RAY MAG: Any final thoughts or insights you would like to share with our readers?

MJ: First, and most importantly, I would like to thank everyone for supporting me in my career. To the ocean enthusiast, please enjoy and



Margaret Juul

do all you can to preserve it. To aspiring young artists out there, my advice is: practice, think, set goals, and develop a body of work that speaks to you.

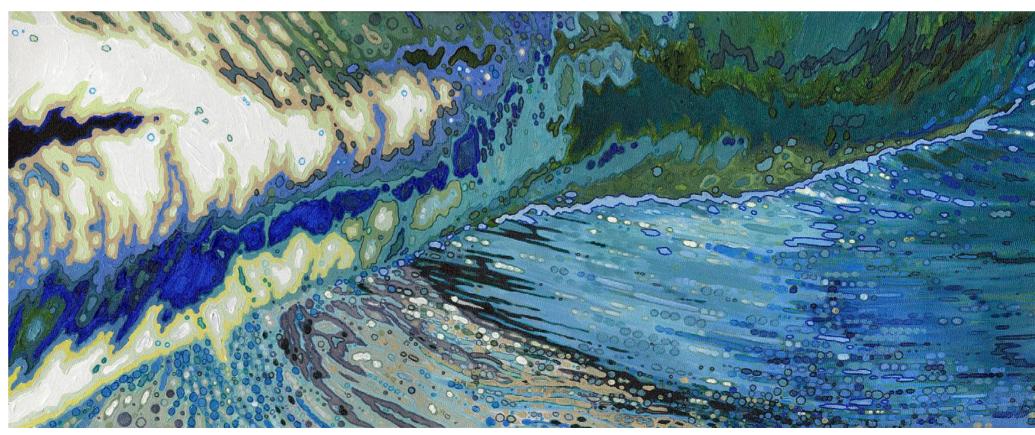
Initially, I believed the primary purpose of an artist was to exhibit. In some respect, art schools train you to think success will come from gallery exhibitions. I now believe that is a 19th- or 20th-century frame of thought, one that no longer applies to today's art world.

If an artist really wants to learn how to make a living, I suggest attending events such as Artexpo or the Art and Frame Expo. Forget Art Basel. When at Artexpo, meet agents, printers,

designers, architects and put your work out there. Design a clean, tailored website. Have a professional—not a friend or family member—honestly review your portfolio. Professionally "can" your work to create quality images for reproduction.

Treat your art as a business. Most importantly, keep at it. Create, create, create. The life of an artist is challenging, sometimes difficult, but when you find your voice, it will make your life extremely rewarding.

For more information and to purchase original art and prints, visit the artist's website at: www.margaretjuul.com.



Merging Ocean Waves, by Margaret Juul. Acrylic and ink on canvas, 16 × 40 × 1.5 inches



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