



GLOBAL EDITION
July 2020
Number 99



Papua New Guinea
New Britain

Cuba
American Crocodiles

California
La Jolla

Tech
Sidemount

Wrecks
Florida Panhandle

Contributors' Picks
My Favorite Wide-Angle Dive

HAWAII
Mantas

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COVER PHOTO: *Great white shark and divers in cage dive, Guadalupe Island, Mexico*, by Andrey Bizyukin, which he says was one of his most favorite wide-angle dives

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Reef scene at Mocklon Islands, New Britain, Papua New Guinea. Photo by Don Silcock.



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Heed the Warning

Destruction of wildlife and the climate crisis is hurting humanity, with COVID-19 a “clear warning shot,” scientists with the UN Environment Programme warn.

The costs of the pandemic have been staggering. It is the price we are paying for not thinking about environmental protection and sustainability in our economic planning and policies, globally and locally. The notion that ecology comes at a cost and detriment to the economy, and that we have to choose between the two, has always been a false dichotomy that has too often gotten in the way of sound decision-making.

Hopefully, if anything good is going to come out of the pandemic, this way of thinking is about to change.

As the pandemic spread, some governments reacted relatively decisively and took immediate action,

based on facts and advice from scientific experts, while a number of others chose otherwise, and downplayed the threat, which ended up getting out of control. The outcome of politicising the virus instead of heeding scientific advice is now plain to see, and it is not a pretty sight.

That said, I also see glimmers of hope, and of a new awakening across the board. There seems to be a growing realisation, also among capital interests who hold the keys to new developments, that we are now left with

no other choice but to become much better stewards of our natural resources, if our societies are to survive in the longterm. This week, I even stumbled across a note about a major bank stating it would no longer provide car loans unless the vehicle was electric. I never thought I would see the day when that happened.

In fact, a new discipline—*planetary health*—is emerging, which focuses on the increasingly visible connections between the wellbeing of humans, other living things and entire ecosystems.

While most lockdowns were in place, pollution plummeted in many locations, and during the timeout that was imposed, many people got a chance to mull over their routines and priorities, and started to connect the dots, realising that there is a better way to manage our coexistence with nature and that it is high time that we change course—as individuals and as societies.

Healthy, diverse and productive ecosystems are good for *both* the economy (think fisheries and food production) and leisure and tourism. It should be a no-brainer, really.

— Peter Symes
Publisher & Editor-in-Chief



PIXABAY

Our planet is so overpopulated and so interconnected—in no small part thanks to air travel, which can take us to the other side of the globe in a matter of hours—that the world has become like one big petri-dish in which infections may flourish.

As humanity's destruction of biodiversity is creating the conditions for new viruses and diseases such as COVID-19 to arise, it was just a matter of time before we had a pandemic on our hands, with profound health and economic impacts on the global community.



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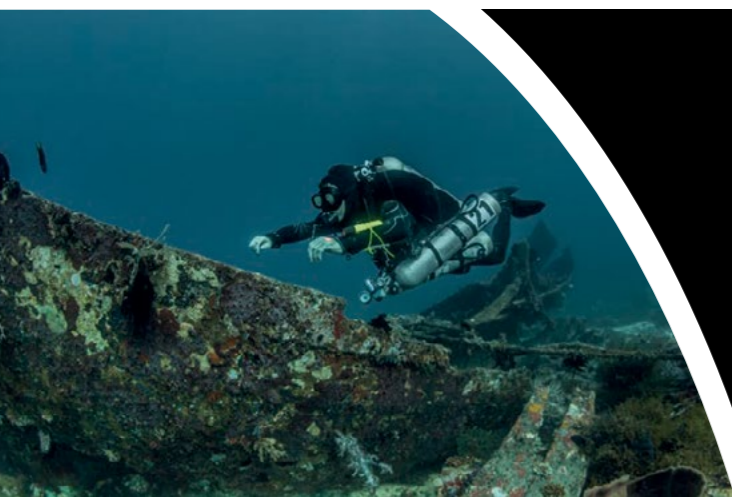
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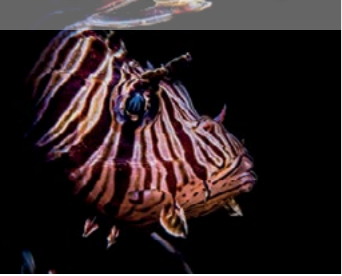
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Edited by
G. Symes

from the deep NEWS

Deep-sea soft coral garden discovered in Greenland

Researchers from University College London, the Zoological Society London and the Greenland Institute of Natural Resources have discovered a soft coral garden habitat in the deep waters off Greenland, using a new, low-cost, deep-sea video sled comprising a GoPro video camera, lights and lasers in special pressure housings, which the team developed and deployed. It is the first habitat of this kind to be identified in west Greenland waters.

The study, published in *Frontiers in Marine Science*, will impact the management of deep-sea trawl fisheries, located near the habitat. It is hoped that

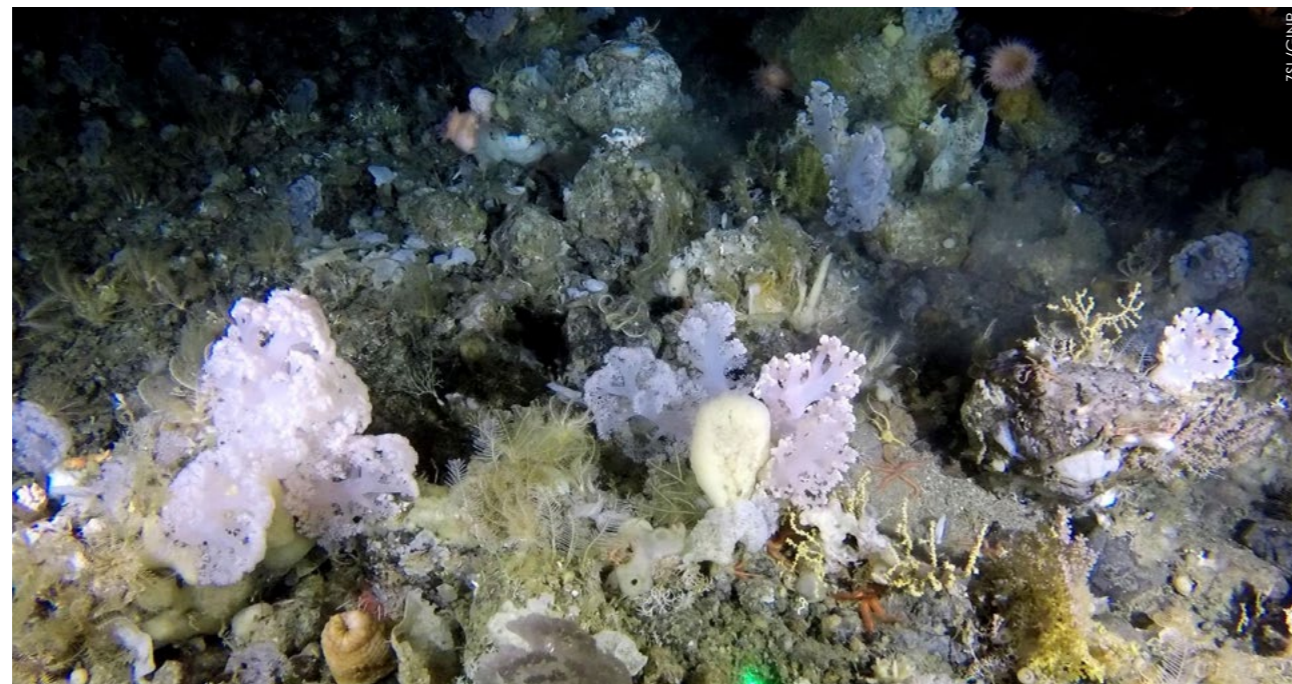
a protected area of 486 sq km will be established as a "Vulnerable Marine Ecosystem" as per UN guidelines.

"The deep sea is often overlooked in terms of exploration," said the first author on the study Stephen Long, a PhD researcher at UCL Geography and ZSL. "In fact, we have better maps of the surface of Mars, than we do of the deep sea.

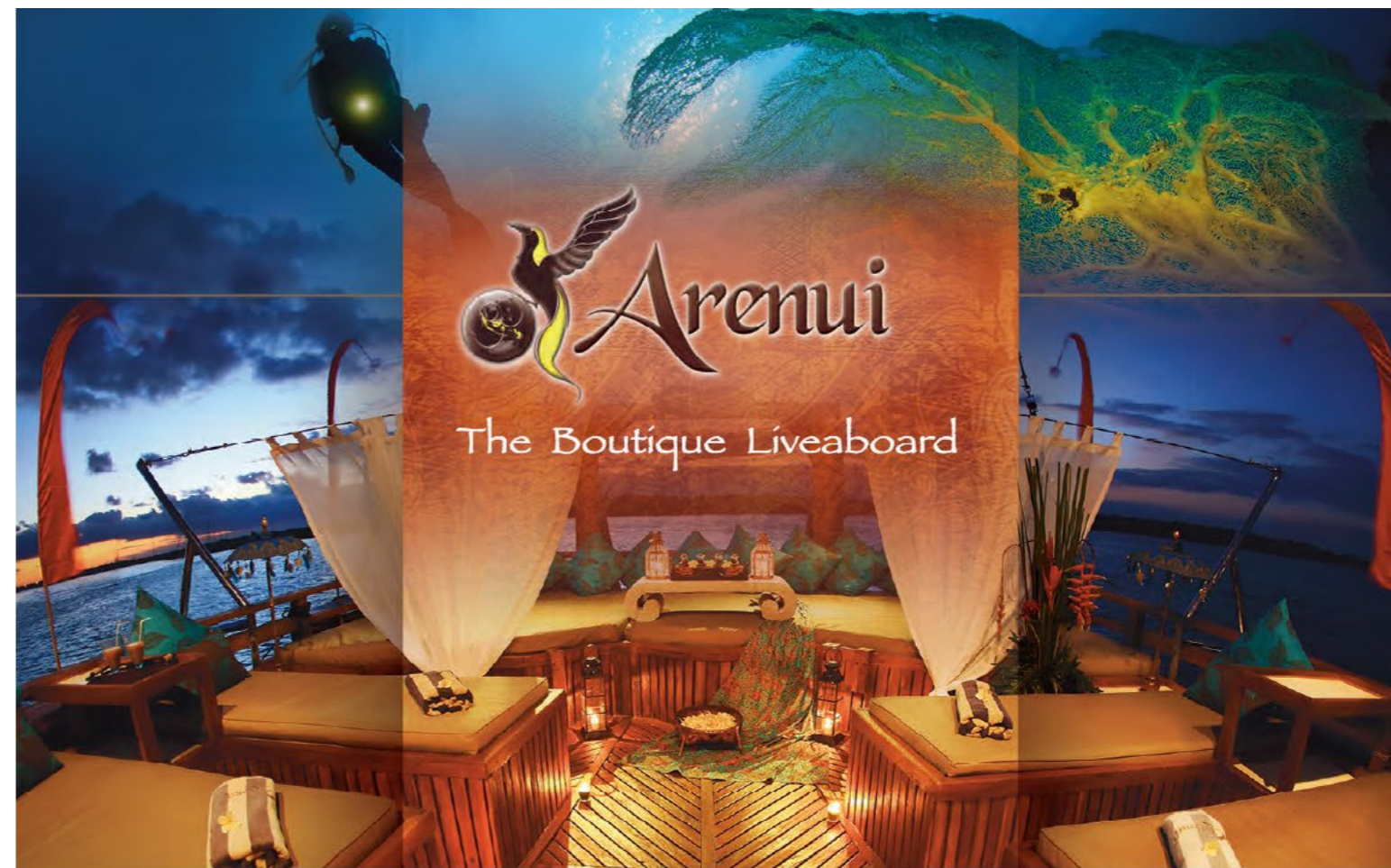
"The development of a low-cost tool that can withstand deep-sea environments opens up new possibilities for our understanding and management of marine ecosystems. We'll be working with the

Greenland government and fishing industry to ensure this fragile, complex and beautiful habitat is protected."

Located at a depth of 500m in almost total darkness, at a pressure 50 times greater than at sea-level, the newly discovered diverse and delicate habitat comprises cauliflower corals, sponges, feather stars, anemones, brittle stars and hydrozoans bryozoans on rock and sand. The discovery is significant as very little is known about the deep sea, even though it is the biggest habitat on earth, covering 65 percent of the planet. ■ SOURCE: UNIVERSITY COLLEGE LONDON



Newly discovered deep-sea soft coral garden in Greenland, found at a depth of 500m



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Sixty years on, son repeats father's historic dive in Mariana Trench

On 20 June 2020, Kelly Walsh, 52, completed a historic dive to ~10,925m in the Challenger Deep, located in the Mariana Trench, 200 miles southwest of Guam. The dive was conducted at the Western Pool, previously visited in 1960 by Kelly's father, Captain Don Walsh, US Navy (retired), PhD, who piloted the bathyscaphe *Trieste* on the first dive there.

This time, his son's 12-hour dive, which was coordinated by EYOS Expeditions, was conducted in *Limiting Factor*, a deep-sea Triton 36000/2 submers-



Historical photo of Don Walsh and Swiss oceanographer Jacques Piccard inside the submersible *Trieste*

ible. Victor Vescovo, a businessman and explorer based in Dallas, Texas, who owns *Limiting Factor*, piloted the vehicle. The Challenger Deep expedition was a joint venture by EYOS Expeditions, Triton Submarines and Caladan Oceanic.

Last year, Vescovo and his team made headlines by completing a circumnavigation of the earth that saw Vescovo become the world's first person to dive to the deepest point of each of the planet's five oceans.

Full circle

The Walsh father-and-son pair has come full circle with their exploratory dives to the Challenger Deep made 60 years apart. Aboard the expedition's mothership, DSSV *Pressure Drop*, Kelly Walsh said:

"It was a hugely emotional journey for me. I have been immersed in the story of Dad's dive since I was born—people find it fascinating. It has taken 60 years, but thanks to EYOS Expeditions and Victor Vescovo, we have now taken this quantum leap forward in our ability to explore the deep ocean.

"The leap in technology from 1960 is immense. Dad spent 20 minutes on the bottom and could see very little. I had the opportunity to spend four hours on the bottom with excellent lighting and a 4k camera running the whole time. We had complete control over our vehicle; great lighting, manoeuvrabil-

Deep-sea explorer Kelly Walsh, upon his return to the surface from a dive to the Challenger Deep

ity and a comfortable cabin, whereas Dad had none of those things. The *Limiting Factor* is an amazing vehicle, a true platform for exploration and a credit to the 'out of the box' innovation at Triton Submarines."

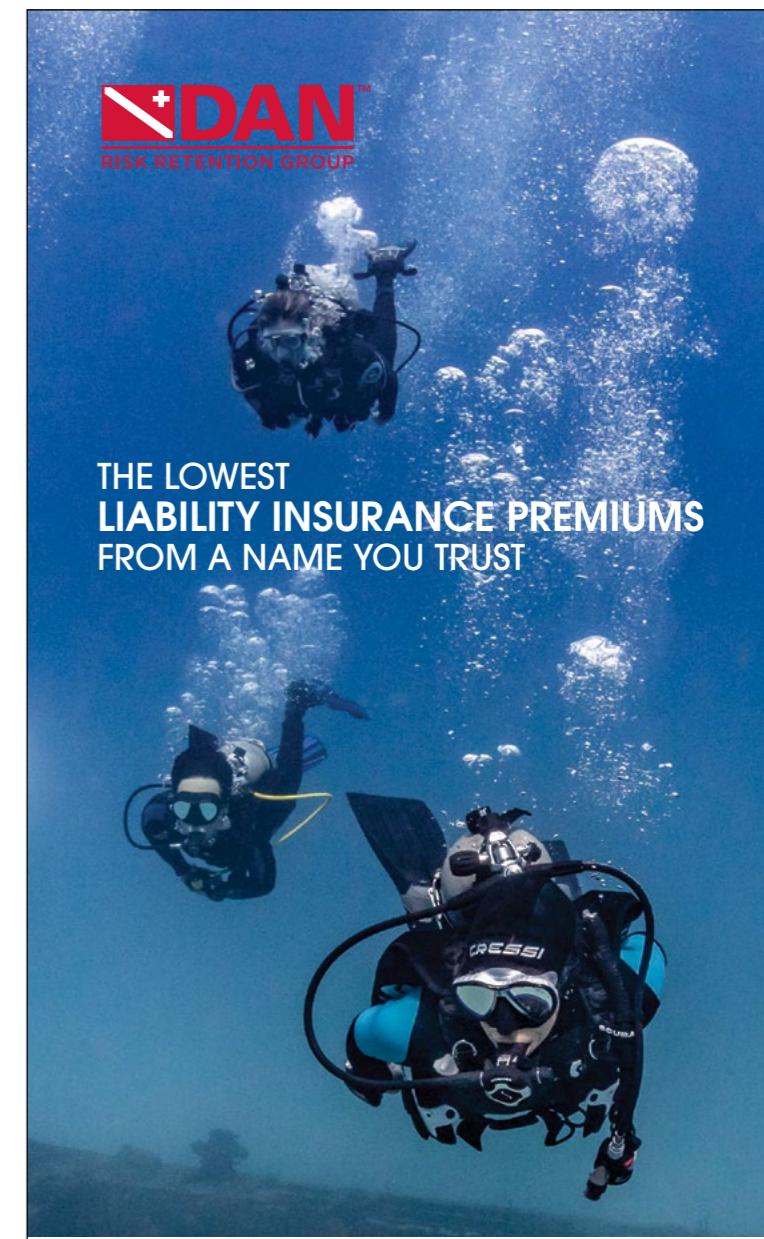
A long-time active member of EYOS' Advisory Board, father Don Walsh helps the company employ the latest developments in modern exploration and science. Last year, when Vescovo made his first record-setting dive, Walsh was on deck, aboard *Pressure Drop*, to congratulate him when he returned to the ship. Walsh said: "Kelly's Mom and I are so pleased and proud that Kelly got to experience the same adventure I had 60 years ago with the Navy's Bathyscaphe *Trieste*. He grew up with the continuing story of my history with deep-ocean exploration, and now he's part of it."

Deep-sea exploration

Specializing in technical expeditions, EYOS Expeditions planned, managed and led all of the expeditions. Its co-founder Rob McCallum is considered a world expert in leading deep-water explorations. "This submersible is the



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wreck rap



Uppermost structure
of the USS *Oriskany*
located off the coast
of Pensacola, Florida,
USA

Text by Melissa R. Price
Photos by Melissa R. Price and
the Florida Department of State

Divers understand there is something eerily attractive about a ship laying upright on the seafloor. Wreck divers often chase that feeling of curiosity and wonder when exploring undersea environments. While Florida's eastern coast certainly offers countless popular wreck dives, the Panhandle is an often-overlooked gem. The Florida Panhandle Shipwreck Trail provides an enjoyable mechanism for divers to experience the history and heritage the Gulf of Mexico has to offer within the realm of wreck diving.

The Trail was launched in 2012 by the Florida Bureau of Archaeological Research (BAR) in response to the 2010 Deepwater Horizon oil spill, which caused a dramatic drop in tourism to the Panhandle. BAR brainstormed creative ways to boost the economy, especially

where diving and tourism were concerned. Local waterfront communities expressed a need for a diving trail similar to the Florida Keys Wreck Trek located on the eastern coast.

A lengthy data collection process resulted in the selection of 12 wreck

candidates, which were accessible to a variety of certification levels, contained abundant marine life and had plenty of superstructure to explore. The wrecks, which were situated offshore of Pensacola, Destin, Panama City and Port St. Joe, were popular within local com-

munities and succeeded in attracting tourists to the region.

Continued management and promotion of the Trail involved the creation of a website and Facebook page, installation of billboards, distribution of printed material and production of high-quality,

promotional video footage. The videos were produced in the summer of 2018 and contained cinematic interviews with archaeologists, who highlighted various exciting aspects of the wrecks. As a result of these widely distributed and extremely popular videos and other

The Florida Panhandle

Shipwreck Trail

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Divers swim through upper decks of the USS *Oriskany* (right); Barracuda and schools of fish on *YDT-14* (below). Both wrecks are located off Pensacola, Florida.

promotional materials, the Trail received an uptick in interest in 2019. In response, local stakeholders expressed a desire to have more wrecks included in the Trail. So, by the summer of 2020, BAR plans to add eight more vessels to the Trail. Here, the 20 vessels are spotlighted.

Pensacola

Three Coal Barges. These barges broke free from their transport in 1974 while on their way to a designated offshore artificial reef location. To prevent them from washing ashore or causing damage to other vessels, the US Navy sent in its demolition experts to plant explosives on the runaway

barges, effectively sinking them in their present location. The barges rest in 50ft (15.3m) of water and offer plenty of opportunities to practice novice dive skills and enjoy local marine life.

San Pablo. Nearby is *San Pablo*, a freighter that originally transported fruit from South America to Boston. The vessel saw action during World War II when it was attacked by a U-boat and sank off Costa Rica. It was refloated and transported to the Gulf of Mexico, where it was eventually blown up in a secret military operation off Pensacola in 1944. Found at a depth of 80ft (24.4m), this freighter invites divers to con-



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sider its intriguing story and history as they explore its boilers, rudder and refrigeration coils.

Pete Tide II. Continuing farther offshore is *Pete Tide II*, an offshore oil rig supply ship that carried laborers and provisions to various rigs in the Panhandle. The 166ft (50.6m) long vessel was sunk upright in 100ft (30.5m) of water in 1993. The pilot house and other two decks offer entertaining swim-throughs, with plenty of schooling fish and other marine life.

YDT-14. *YDT-14* is close enough to *Pete Tide II* that these dives are often paired. *YDT-14* was a US Navy dive tender vessel in service in the Caribbean and South

Atlantic during the 1940s. This workhorse was sunk as an artificial reef in 2000 in 100ft (30.5m) of water. The upright structure is similar to *Pete Tide II*, with an intact pilothouse and intriguing swim-throughs.

USS Oriskany. The final and farthest offshore wreck in this area is USS *Oriskany*, which is quite possibly the most impressive and popular dive site off Pensacola. The largest artificial reef in the world, it served as an aircraft carrier during World War II. The 911ft (277.7m) vessel served in the Pacific Theater, receiving battle stars for its service in the process. It was ultimately repurposed as an artificial reef in 2006 and

rests at a depth of 212ft (64.6m). This immense vessel rises to 80ft (24.4m), offering plenty of structure for divers to explore.

Fort Walton Beach & Destin Tugboats.

The Fort Walton Beach and Destin areas of the Panhandle are a hot spot for purposefully sunk tugboats. *Miss Louise* was an original 2012 Trail inclusion, but five more tugs were added in 2020.

At a depth of 60ft (18.3m), *Miss Louise* is perfect for novice divers. The 95ft (30m) tug maintains a resident sea turtle and schools of bait fish, which swarm and dance around visitors.

Tugboat "Zuess," *Mohawk Chief*, *Chepanoc*, *Belize Queen*/

wreck rap



Resident sea turtle on the wreck of the *Miss Louise*, located off the Fort Walton Beach and Destin areas in Florida (right); Divers in pilot house of the *Pete Tide II* wreck, located off Pensacola (below)



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Bob Reay Reef, and *M/V Janet* complete the tugboat highlight in this area. Many of these tugs are associated with concrete and steel artificial reef structures, which add to the diver's underwater experience.

Thomas Hayward. Another 2020 addition in this area is the Destin Liberty Ship, also known as *Thomas Hayward*. History enthusiasts will appreciate a visit to this

World War II Liberty Ship, which was active until 1949 and transported allied troops from the United States to Europe.

Panama City Beach

Panama City Beach contains a number of wartime vessels that now serve as artificial reefs.

Service tugs. The *USS Chippewa* and *USS Accokeek* were initially service tugs in the 1940s before

being used as navy training vessels. *Chippewa* was sunk in 1990 in 100ft (30.5m) of water. *Accokeek* was also sunk in 100ft (30.5m) of water, in 2000. Both vessels are intact enough for swim-throughs, and *Accokeek* has a resident goliath grouper.

USS Strength. *USS Strength* was a World War II minesweeper that fought in the Pacific Theater, where it found itself in the cross-



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Diver on the bow of the wreck of USS Accokeek, located off the coast of Panama City Beach in Florida





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hairs of a midget submarine and a kamikaze raid. Surviving both, the vessel was eventually sunk off Panama City in 1987. This vessel is not as intact as other wrecks included in the Trail, but it offers an exciting dive for history buffs and marine life enthusiasts alike.

Black Bart. *Black Bart* was another offshore oilfield supply vessel that served the Gulf of Mexico. Originally named *Vulcano de Gulfo*, the vessel was sunk as an artificial reef in 1993 in memory of Navy Supervisor of Salvage Captain Charles "Black Bart" Bartholomew. The vessel's wheelhouse was ripped off completely after Hurricane Michael in October 2018, but the open cargo hold still offers swim-through opportunities.

FAMI Tugs. The FAMI Tugs also illustrate

the power of Mother Nature. Originally, these two deliberately sunk tugs were situated bow to bow, but after a strong storm, one boat was deposited slightly atop the other.

El Dorado. The final vessel in this area, *El Dorado*, is a 2020 addition that provides yet another reminder of Florida's long history with the destructive forces of hurricanes. The unique and quite recently deployed ship was a modern luxury cruise liner that washed ashore in October 2018 after the devastating Hurricane Michael. Its owner donated it as an artificial reef, allowing the community to reap the benefits for years to come, much to the enjoyment of divers and marine life alike, illustrating how an unfortunate situation can lead to opportunity and positive outcomes.

Port St. Joe

History enthusiasts will appreciate the final two wrecks, *Vamar* and *Empire Mica*, which were not deliberately sunk as artificial reefs.

Vamar. Off Port St. Joe lies *Vamar*, an English-built patrol gunboat. The steamer originally served as a support vessel during Admiral Richard Byrd's 1928 Antarctic expedition before it sank in 1942 under mysterious conditions. Resting in only 25ft (7.6m) of water, this shallow dive offers visitors a chance to experience a real shipwreck scattered across the seafloor, a fascinating juxtaposition to those intact and upright vessels described previously.

Empire Mica. *Empire Mica*, a 2020 addition, is accessible via Port St. Joe, Mexico Beach, or Panama City. This British tanker



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Diver at the bow of the wreck of *Black Bart*, located off Panama City Beach, Florida



PLAN YOUR TRIP

BEST TIME TO DIVE

The best time to dive the Gulf is between May and September, when water is clearest (visibility between 18m and 25m) and temperatures average between 24°C and 26°C. During this time, divers will be most comfortable in a 3mm or 5mm wetsuit.

DIVE OPERATORS

Dive charters can be found on the Florida Panhandle Shipwreck Trail Partners webpage: floridapanhandledivetrail.com

These shops offer everything a diver needs to visit these unique wrecks. Most vessels can take at least six divers, with a few in the Pensacola region able to accommodate larger groups and technical divers for visits to USS *Oriskany*.

ACCOMMODATIONS

Many dive shops are close to a suite of hotels on the coast, which offer beautiful beachside vistas and access to lively downtown areas.

GETTING THERE

Visitors can arrive via Pensacola International Airport or Destin-Fort Walton Beach Airport. ■

Diver peers under the USS *Chippewa* structure. The wreck is located off Panama City Beach, Florida.

carried fuel for the Royal Air Force during World War II before it was torpedoed by a German U-boat 21mi (33.8km) south of Cape San Blas. While much of the upright structure has since deteriorated due to time and Coast Guard test bombing, the wreck offers a fascinating story and draws many divers to this area. It also serves as a reminder of how close the war was to America's shores.

Submerged cultural resources

These structures on the Florida Panhandle Shipwreck Trail represent the brilliance of the Panhandle community in creating unique solutions to a challenge. Most of the vessels included in the Trail were sunk intentionally as artificial reefs because the Gulf of Mexico does not contain the natural reef structure

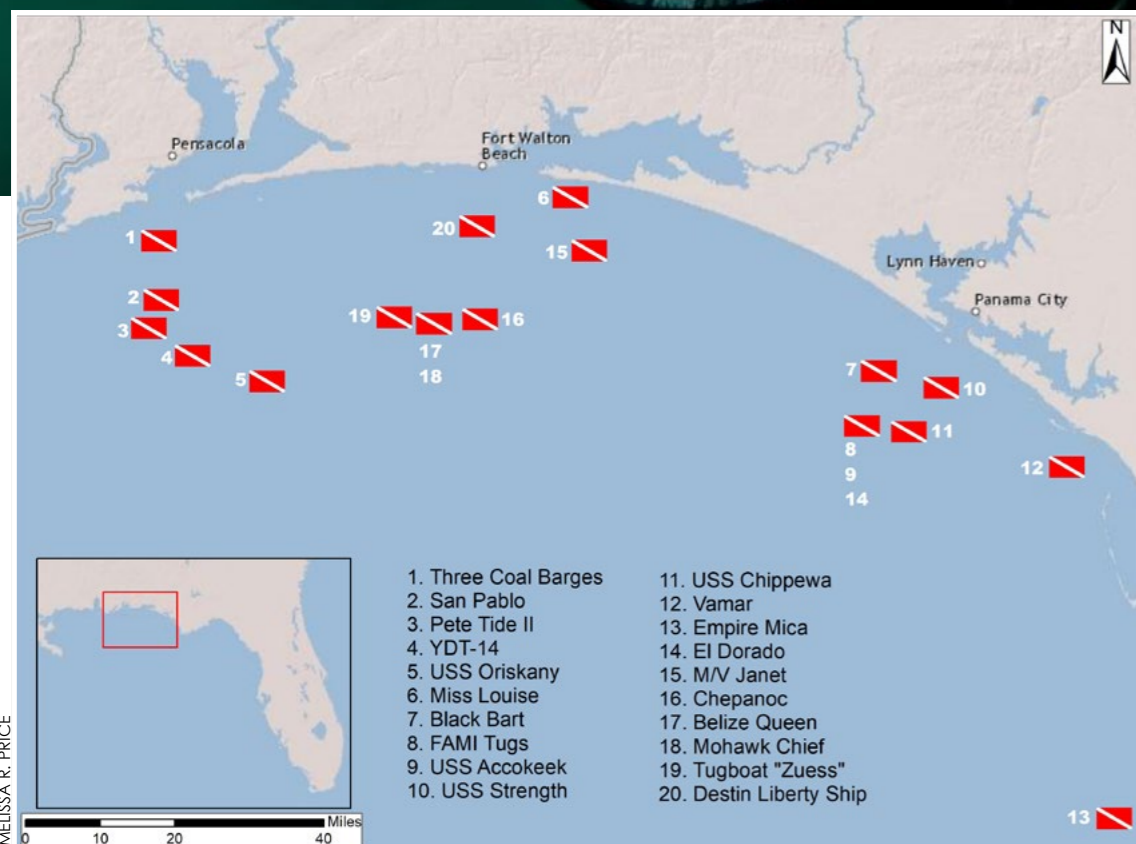
present on Florida's eastern coast. These wrecks-turned-reefs also preserve aspects of Florida's fascinating maritime history, allowing them to continue telling their stories with a renewed life and duty. Because they are pivotal to the marine environment and economy, the vessels illustrate why it is important to preserve and protect submerged cultural resources and underwater environments. Those who observe these vessels in person realize their greater importance and become stewards of their long-term preservation.

Through the Trail, we are reminded to "take only pictures, [and] leave only bubbles." The Florida Panhandle Shipwreck Trail is the synthesis of recreational, ecological and heritage tourism and promotes responsible visita-

tion to and management of artificial reefs and historic wrecks. The Emerald Coast invites you to make your own memories on the Florida Panhandle Shipwreck Trail. ■

For more information, please visit: floridapanhandledivetrail.com. Or follow on Facebook at: [facebook.com/FloridaPanhandleShipwreckTrail](https://www.facebook.com/FloridaPanhandleShipwreckTrail)

Melissa R. Price is an American underwater archaeologist based in Florida. She specializes in Spanish Colonial shipwrecks and submerged archaeological sites of the Archaic period. She is a PADI Open Water Scuba Instructor, Diving Safety Officer and PhD candidate at Leiden University in the Netherlands.



Map of the Florida Panhandle Shipwreck Trail dive sites

MELISSA R. PRICE

FLORIDA DEPARTMENT OF STATE





The newly discovered wreck off Portofino in the province of Genoa, Italy, could turn out to be the Renaissance galleon *Santo Spirito*

500-year-old galleon found in Italy

Two divers have discovered a shipwreck that may turn out to be the famed Renaissance ship *Santo Spirito*, a merchant ship that sank in the Camogli Sea in the late 16th century.

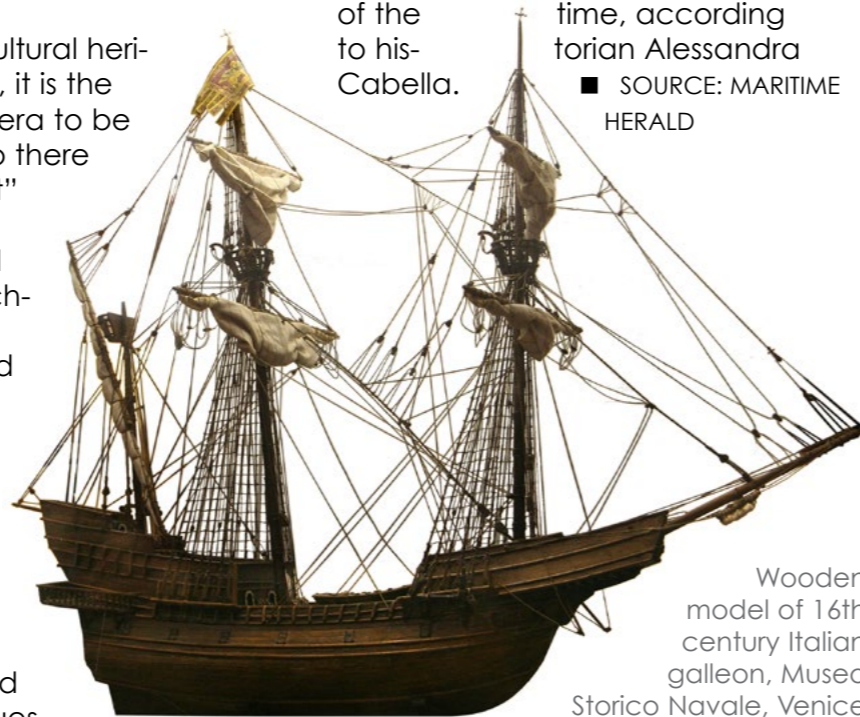
During a dive in late February, the two professional divers—Gabriele Succi and Edoardo Sbaraini, from Rasta Divers submarine works company—noticed wood debris on the seafloor at 50m. What they discovered may actually be the remains of a large Renaissance galleon that shipwrecked in a storm in 1579 off the coast of Portofino in the province of Genoa, Italy, said the Superintendence of Cultural Heritage of Liguria in a release, reported by local media. At the time, the city was being ravaged

by the virulent Black Death, or bubonic plague, which thwarted rescue efforts.

According to cultural heritage authorities, it is the first ship of that era to be found in Italy, so there is "great interest" in salvaging it. An international team of researchers has already been assembled to study the remains and artefacts of the wreck, including an identified helmet, which are of great historical value and may provide clues

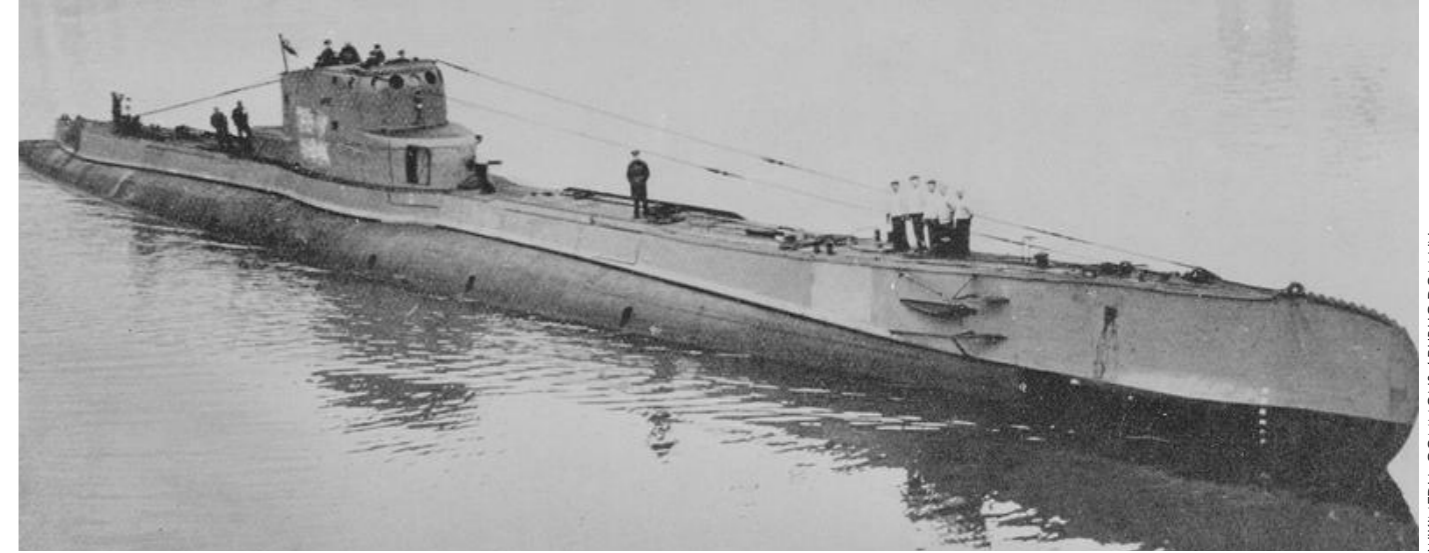
to the little-known early modern era of the Mediterranean as well as details of naval architecture of the time, according to historian Alessandra Cabella.

■ SOURCE: MARITIME HERALD



Wooden model of 16th century Italian galleon, Museo Storico Navale, Venice

MYRIAM THYES / WIKIMEDIA COMMONS / CC BY-SA 3.0



Historical photo of WWII Polish submarine *Orzel*

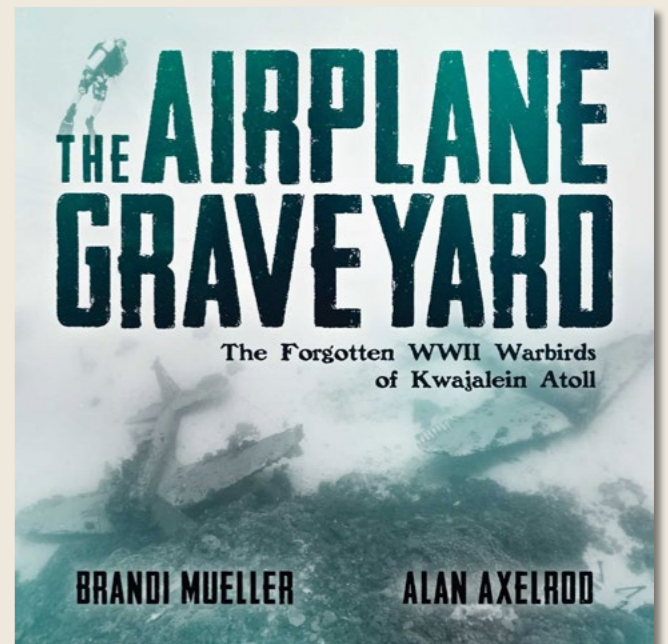
Search for WWII Polish submarine *Orzel*

An international team of explorers and researchers from the Shipwreck Expeditions Association and the Maritime University of Szczecin in Poland are searching for the allied submarine *Orzel* (*Eagle*) that was mysteriously lost 80 years ago.

It is hoped that with the finding of the *Orzel's* final resting place, the nation may commemorate its sailors with dignity, providing their families with closure. But the task will be a major challenge as the area to be searched is large and conditions in the North Sea can be unpredictable. ■ SOURCE: EIN PRESSWIRE

Sponsored by the Chancellery of the Prime Minister of the Republic of Poland and the Ministry of Maritime Economy and Inland Navigation, the project aims to find the final resting place of the *ORP Orzel*, which, as one of the most modern Polish WWII vessels, was the pride of the Polish fleet.

Built in the Netherlands, *Orzel* was mostly financed by donations from Polish society, which was unheard of at the time. Gaining fame for its daring escape in September 1939 from internment in Estonia without the aid of navigational charts, the *Orzel* managed to flee to Great Britain, through the Baltic and Danish Straits, with only the memory of Lieutenant Marian Mokrski to guide it. Under the command of Captain Jan Grudzinski, the vessel also became renowned in 1940 for the sinking of the German freighter *Rio de Janeiro* in early April. But on 23 May 1940, the sub sailed its last combat patrol, never to be heard from again. Its loss is one of the greatest mysteries of WWII.

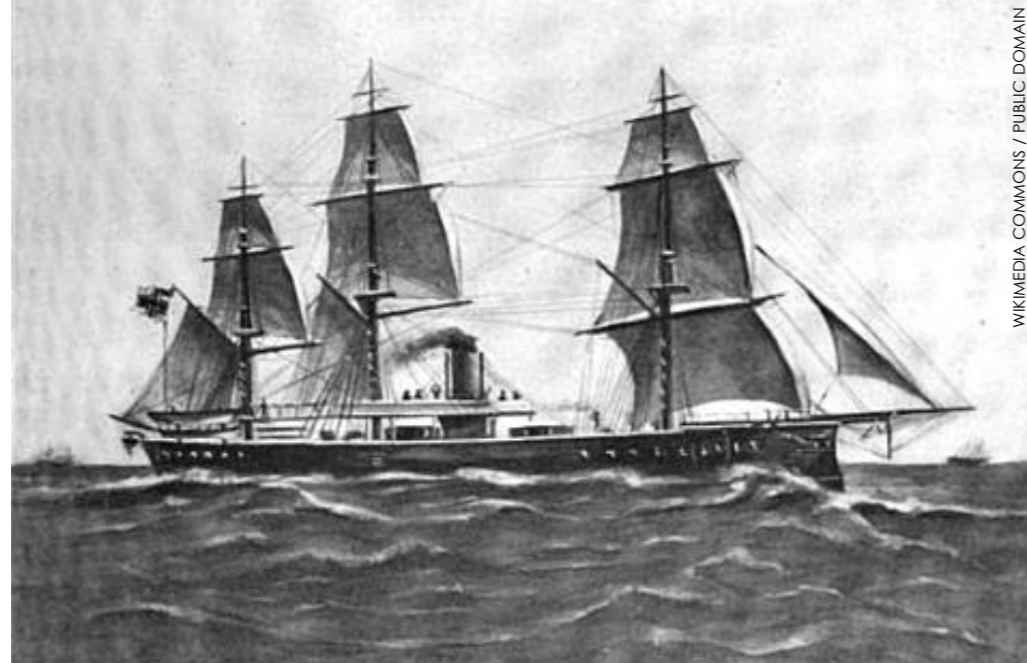


Never before published in book form, see extraordinary images of the forgotten American WWII airplanes resting on the bottom of the Kwajalein Atoll lagoon, from award-winning underwater photographer Brandi Mueller. Available on: **Amazon.com**

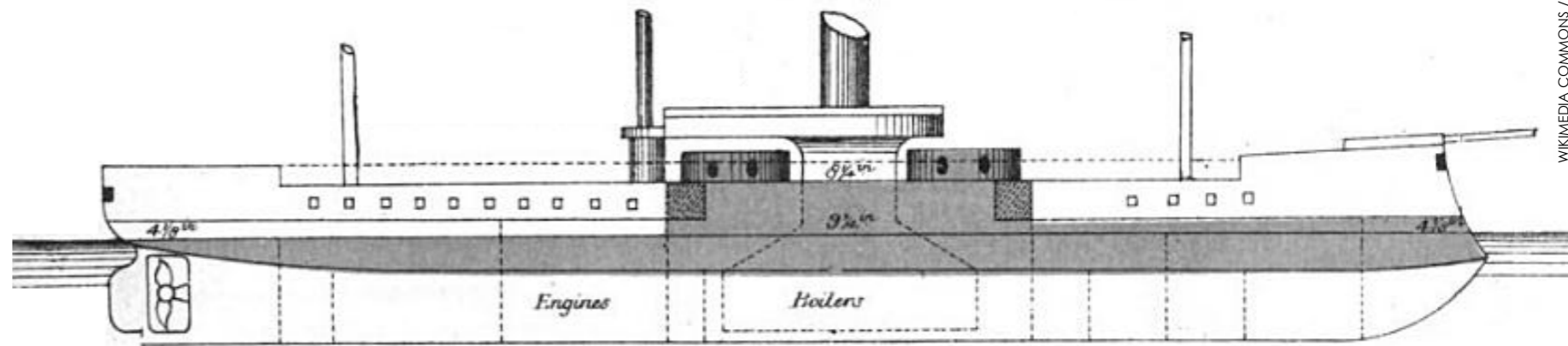
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Historical illustration of SMS *Grosser Kurfürst* underway on her maiden voyage



WIKIMEDIA COMMONS / PUBLIC DOMAIN



Schematic of German Preussen-class ironclad

WIKIMEDIA COMMONS / PUBLIC DOMAIN

Wreck of ironclad SMS *Grosser Kurfürst* now protected

The wreck of the 19th century German battleship SMS *Grosser Kurfürst* which sank off the coast of Folkestone, England, in 1878 after a collision with another German ship during naval exercises, has been granted protection by the UK government.

The wreck of SMS *Grosser Kurfürst* has been given scheduled protection and added to the National Heritage List for England, and the memorial has been given a Grade II listing. Scheduling means that recreational divers would still be allowed to dive the wreck but the new measures would give its contents a level of protection, Historic England said. The SMS *Grosser Kurfürst* is the only non-Royal Naval warship recorded as wrecked in English waters for the period 1860-1913.

SMS *Grosser Kurfürst* was one of only three Preussen-class ironclad warships authorised under the naval programme of 1867, which had been approved by the Reichstag to strengthen the North

German Federal Navy. The design and construction took place during an experimental period in naval warfare when ships moved away from a wooden construction. They also saw the brief return of the ancient ram, used to cause damage to enemy ships. She was laid down at the Imperial Dockyard in Wilhelmshaven in 1870 and only completed in 1878; her long construction time was in part due to a redesign that was completed after

work on the ship had begun. During its construction The SMS *Grosser Kurfürst* was modified to mount a pair of revolving twin-gun turrets amidships.

Sunk on maiden voyage

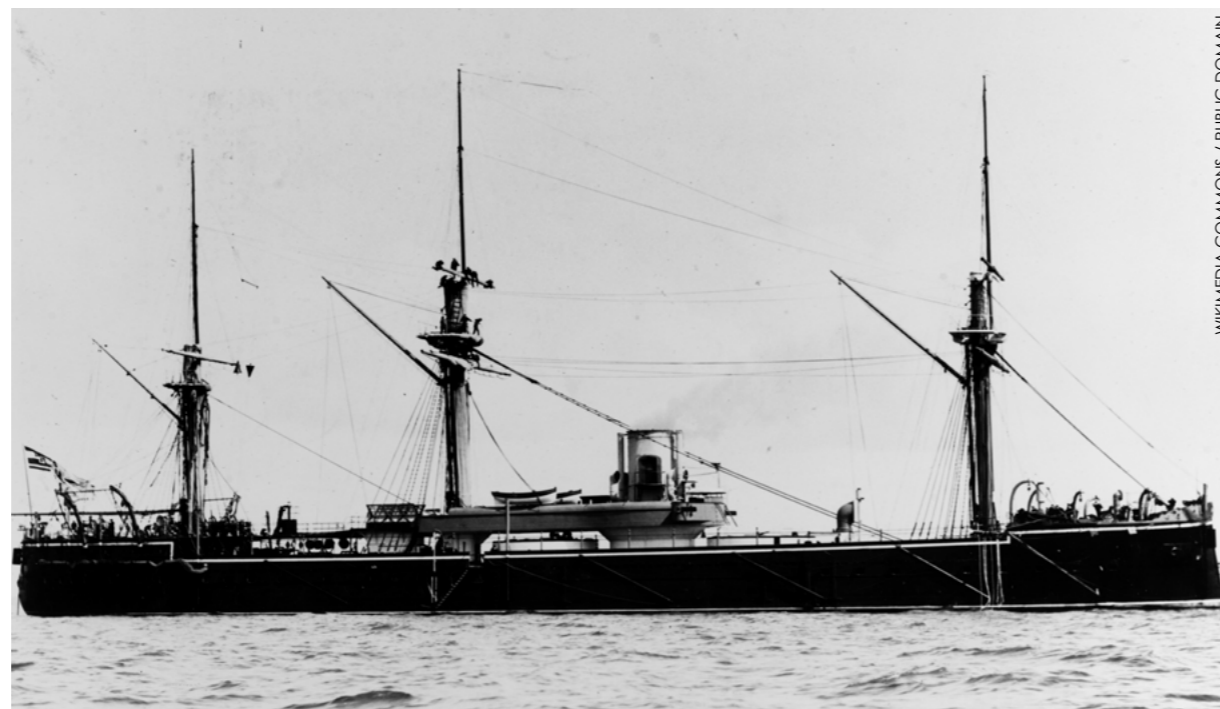
Grosser Kurfürst was sunk on her maiden voyage. The warship was preparing for annual summer training sessions in the English Channel in May 1878 when it was accidentally rammed by another Ger-

man warship, the armoured frigate SMS *König Wilhelm*, which was a sail-equipped, broadside-firing type of ironclad.

The *König Wilhelm* was turning to avoid colliding with a pair of sailing ships when its strengthened ram bow, designed to sink enemy ships, ripped away armour plating and gouged a huge hole in the

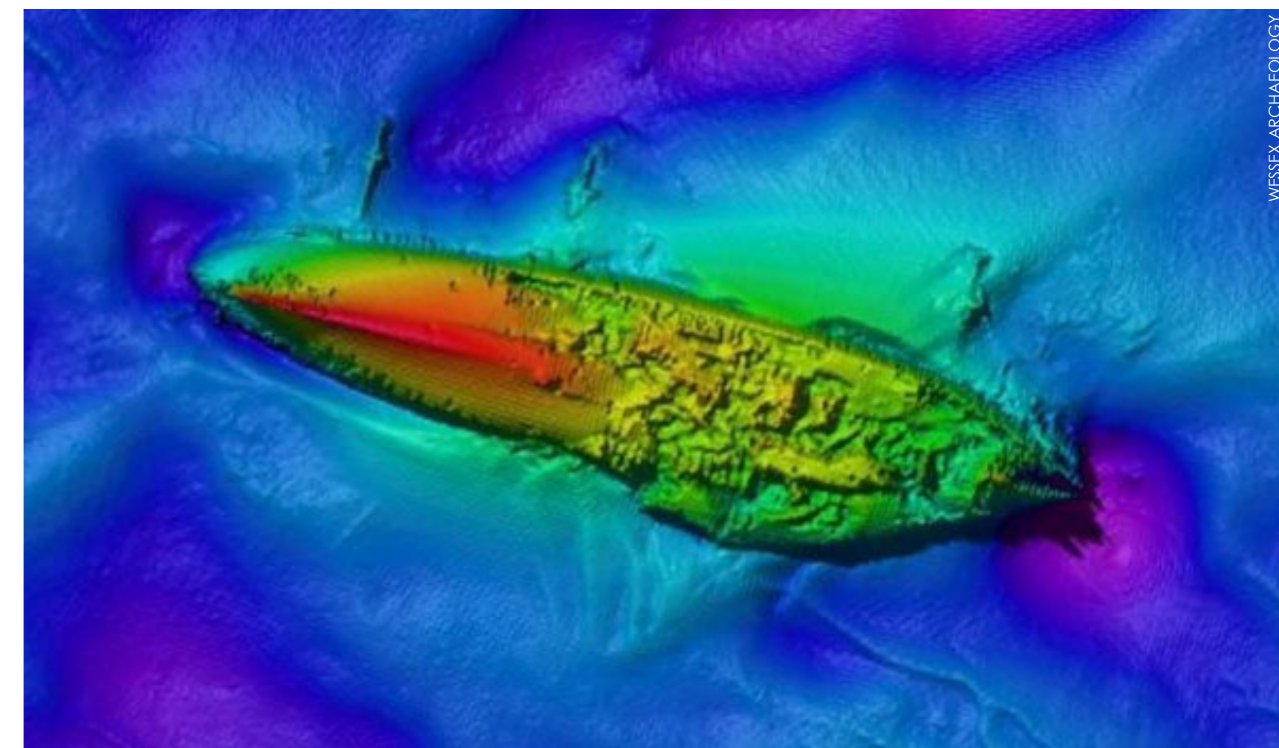
side of *Grosser Kurfürst*, which rapidly sank with the loss of 284 men.

Many of the sailors who lost their lives on 31 May 1878 were recovered and buried in Cheriton Road Cemetery in Folkestone, where a large memorial stands in their honour. ■ SOURCES: HISTORIC ENGLAND, WESSEX ARCHAEOLOGY



Sister ship SMS *Preussen* in 1887

WIKIMEDIA COMMONS / PUBLIC DOMAIN



Multibeam sonar image of the SMS *Grosser Kurfurst*, which sank and now rests upside down off Folkestone at a depth of 30m

WESSEX ARCHAEOLOGY



Edited by
Scott Bennett



FERNANDO ZHIMINACELA / PIXARAY / PUBLIC DOMAIN

IATA proposes quarantine alternatives

The International Air Transport Association (IATA) has urged governments to avoid quarantine measures when re-opening their economies. New measures were proposed to alleviate travel concerns.

During the lockdown period, countries imposing quarantine saw arrivals decrease by more than 90 percent, an outcome similar to countries that banned foreign arrivals. In addition, research has shown 83 percent of travellers would not even consider travelling if quarantine measures were imposed at their destination.

"Safely restarting the economy is a priority. That includes travel and tourism. Quarantine measures may play a role in keeping people safe, but they will also keep many unemployed," said Alexandre de Juniac, IATA's Director General and CEO.

Series of measures

Instead, the IATA is promoting a series of measures to reduce the risk of importing COVID-19 via air travel and to diminish possibility of transmission when people travel while being unknowingly infected. These include health screening using non-intrusive temperature checks, tests undertaken prior to arrival at the departure airport with documentation to prove a negative result, COVID-19 testing for travel-

lers from countries perceived to be "higher-risk," introducing standardised contactless electronic declarations and contact tracing should someone be infected after arrival.

According to the World Travel & Tourism Council (WTTC), travel and tourism is estimated to account for 10.3 percent of global GDP and 300 million jobs globally. "A layered approach to safety has made flying the safest way to travel while still enabling the system to function efficiently. Quarantine is a lop-sided solution that protects one and absolutely fails at the other. We need government leadership to deliver a balanced protection," added de Juniac. ■ SOURCE: FOCUS ON TRAVEL NEWS

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Edited by
Scott Bennett



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Tourism restrictions steadily lifting

A cautious approach is being maintained.

Travel restrictions implemented in response to the COVID-19 pandemic are being eased in a growing number of destinations, allowing tourism to restart. The most recent findings of the World Tourism Organization (UNWTO) indicate 22 percent of all destinations around the world (48 destinations) have started to lift or lessen restrictions.

The latest update, the fifth edition of *Covid-19 Related Travel Restric-*

tions: A Global Review for Tourism, indicates the rebound is significantly more prominent in some regions of the world. Europe leads the way with 37 destinations, including 24 of the 26 Schengen member states. However, 65 percent of all destinations around the globe (141 destinations) continue to maintain completely closed borders to international tourism.

Restart

"The restart of tourism is of vital importance—for livelihoods, for businesses and for national economies," said UNWTO secretary general, Zurab Pololikashvili.

"UNWTO will continue to work with our member states around the world to mitigate the impact of the pandemic and to ensure that, when the time is right, tourism can help drive a responsible and sustainable recovery."

As the specialized agency for tourism at the United Nations, UNWTO has been monitoring responses to the pandemic since the crisis began. Its report also makes it clear that many destinations are employing a cautious approach to the lifting or lessening of restrictions on travel.

■ SOURCES: BREAKING TRAVEL NEWS

IATA interactive map tracks border closures

Frequent daily updates keep pace with the fluid situation.

In order to provide travellers with the latest COVID-19 entry regulations by country, the International Air Transport Association (IATA) has developed an online interactive world map. In a recent IATA-commissioned survey, more than 80 percent of travellers are more concerned about potential quarantine restrictions than actually catching the virus.

Utilising IATA's Timatic database, it encompasses wide-

ranging information on documentation that is required for international travel. To keep pace with the fluid COVID-19 situation, Timatic is updated more than 200 times daily to give accurate travel restrictions based on citizenship and country of residence.

Comprehensive Information

"As the aviation industry prepares to safely restart, travellers will need to know which countries' borders are open and what health restrictions exist," said IATA assistant director Anish Chand. "Travellers can rely on Timatic for comprehensive and accurate information

on travel during the pandemic." "We support the International Civil Aviation Organisation (ICAO) guidelines to harmonise the measures to keep people safe while travelling and provide the confidence to open borders without quarantine measures," added Chand. "And this Timatic offering will be a vital tool for travellers who need easy access to accurate information on entry requirements."

To see the interactive map, go to: <https://www.iatatravelcentre.com/international-travel-document-news/1580226297.htm>

■ SOURCE: BREAKING TRAVEL NEWS



STUX / PIXABAY / PUBLIC DOMAIN

Southern New Britain

— *The Secret Place in Papua New Guinea*

Text and photos by Don Silcock





Large red barrel sponge and sea fans on reef at The East Channel dive site in Linden Harbour



Diver with large sea fan (right) at Waterfall Bay (above) on the southern coast of New Britain in Papua New Guinea. PREVIOUS PAGE: Large pink barrel sponge, sea fan and feather stars at Elsie's Reef

The southern coast of the large island of New Britain in Papua New Guinea is a truly remote location isolated from the northern coast by high, rugged mountain ranges with no real roads through them. There are no commercial airports here—only landing strips and old WWII airfields used for small-scale charter flights. Practically, the only way to get to the southern coast is by boat from Rabaul, on the eastern tip of New Britain.

It involves a long and usually overnight journey, which will take you down through the St George's Channel, in-between New Britain and nearby New Ireland. The channel needs to be navigated with respect, as there are some fierce and complex currents flowing through it. It is a journey that Alan Raabe, the skipper and owner of *MV FeBrina*, has been making regularly for well over 20 years, but only for a few months of each year, during the dry sea-



son in the south when pristine underwater visibility returns.

Alan has been exploring New Britain and many other parts of Papua New Guinea since 1991 and it is a basic fact that nobody knows those areas as well



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Aerial view of Linden Harbour (above); Villagers in canoes at Waterfall Bay greet visiting boats of tourists with fresh produce and goods to sell (right); Diver with leather coral at Waterfall Bay (below)

as he does. Interestingly enough, he considers the southern coast as one of the absolute gems of Papua New Guinea diving.

Waterfall Bay

As we emerged from St George's Channel, the journey to the southern coast became both tangible and



inspiring, as the sheer size of those mountain ranges could really be appreciated for the first time. Dense rainforest seemed to cover everything, and I wondered how it was possible to survive in such a remote place.

We finally arrived in Waterfall Bay—the first port of call on the southern coast. Clearly, they do not get a lot of visitors here; very quickly, the back of the boat was surrounded by canoes from the local villages. Some had women selling fresh vegetables, a few had curious men, but most had kids who were very



Brilliant pink sea fans and sponges (top left), dense patch of cabbage coral on reef (above), yellow sponge and sea fan with feather stars (far left), and diver with crinoid (left) at Mocklon Islands

excited to see us.

There were two main areas to dive in Waterfall Bay: The Mocklon Islands on the western tip, near Cape Kwoi, and around the jetty at the village of Matong. Both offered quite different, but really interesting, experiences.

Mocklon Islands. The location of these two islands (one large and one small) meant they were exposed to the powerful, nutrient-rich currents of the Solomon Sea. Those currents fed and nourished the vibrant fringing reefs around the islands, and there were several sites from which to choose.

Where we actually dived depended on the time of day and the prevailing current. But overall, the diving was really nice, with healthy reefs and interesting sandy slopes that hosted intense patches of cabbage and other hard corals.

Matong Jetty. This small pleasant village was located on the eastern side of Waterfall Bay, not far from the Mocklon Islands. It was well worth taking the time to go for a walk around Matong, as the village was well kept and the people were open and friendly. The villagers were particularly





Local village children pose for the camera at Matong Jetty (above and left)

proud of their school, which had received quite a lot of support from AusAid.

But it was the jetty at Matong that got one's full attention. And you have two choices when diving it. Firstly, you can put on your macro lens and go fossicking for critters in the accumulated flotsam and jetsam; or you can go wide-angle and take advantage of the endless stream of young swimmers, vying for your attention. The jetty seemed to be the place to go after school, with all the kids performing competition acrobatics off it.

So, when divers turned up with underwater cameras, it generated a great deal of excitement and it did not seem to matter that the kids could not see the actual results. Their reflections in the dome port were enough to keep them energised for hours! Signaling them to come closer to fill the frame had them almost bumping into the dome. The sheer exuberance of the



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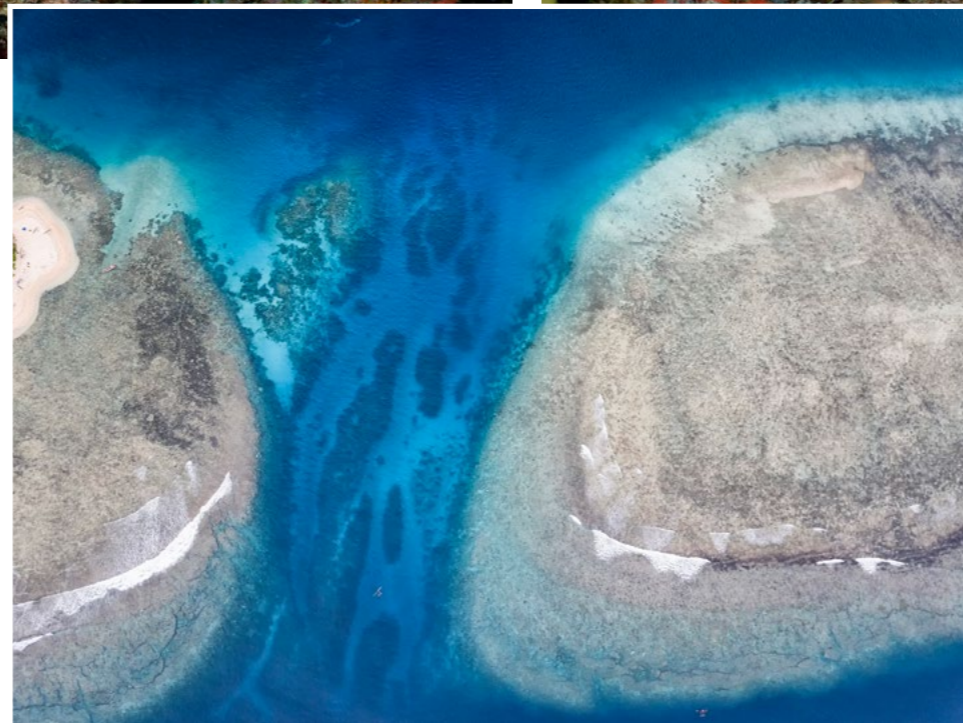
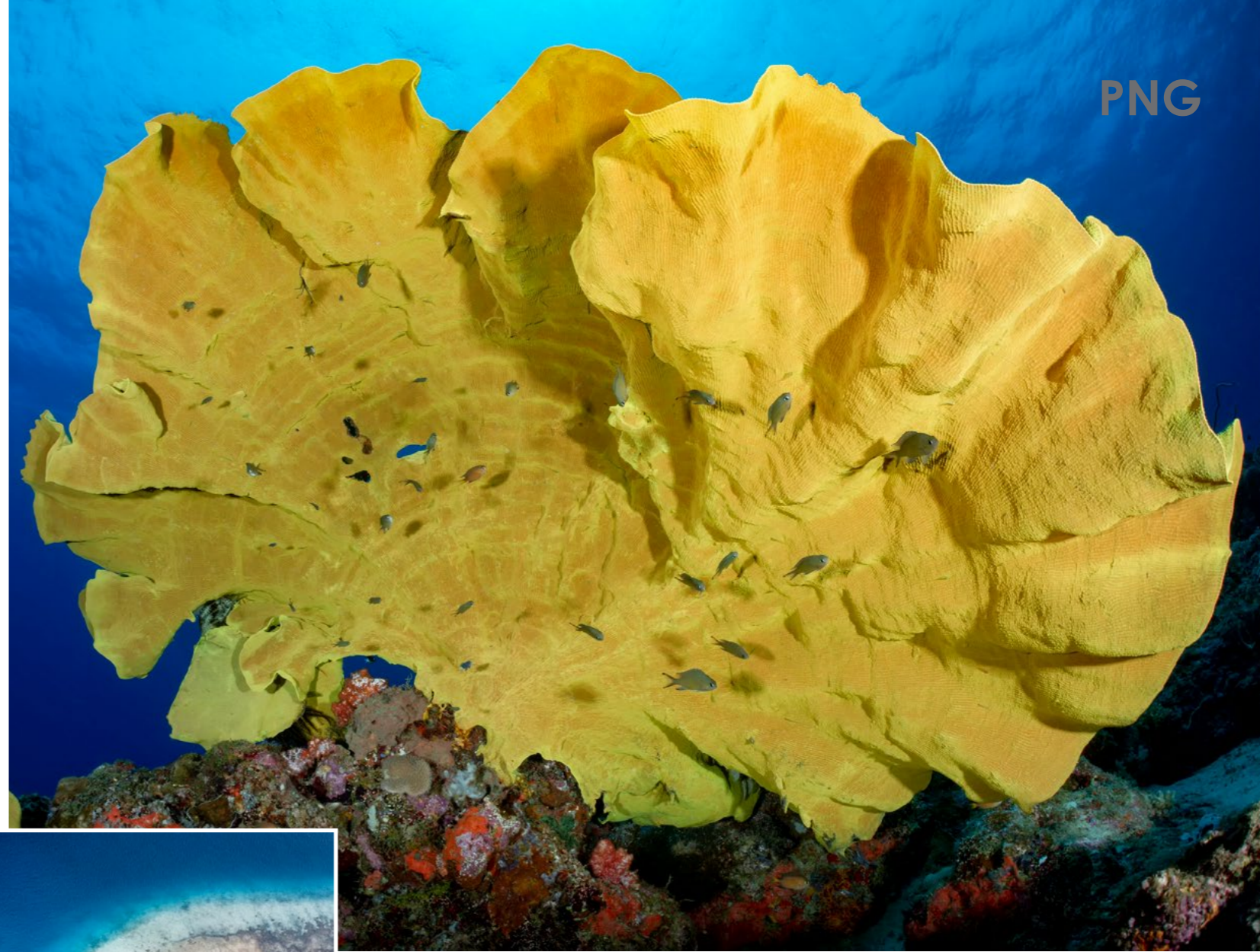
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Large yellow elephant ear sponge (above); Pink elephant ear sponge and soft corals (top left) and large gorgonian sea fan (bottom left) at The East Channel dive site (left) in Linden Harbour

Linden Harbour

Roughly halfway along the southern coast of New Britain was the incredibly photogenic location of Linden Harbour, with its superb lagoon, bounded by a series of outer barrier reefs, which provided an excellent safe anchorage. In-between those barrier reefs were astonishingly

Overall, there was a lot to see and enjoy underwater in Linden Harbour, but without doubt, the number one thing that will stay with you from diving there will be those channels. Much of southern New Britain is swept by the currents of the Solomon Sea, rich with nutrients swept up from the deep basins and trenches to the south. And it is those nutrients that are the life source of the marine life and reefs of the southern coast. But with the channels at Linden Harbour, the daily tides bring in that rich water at considerable velocities, creating the perfect conditions for marine growth to flourish on an all-you-can-eat smorgasbord.

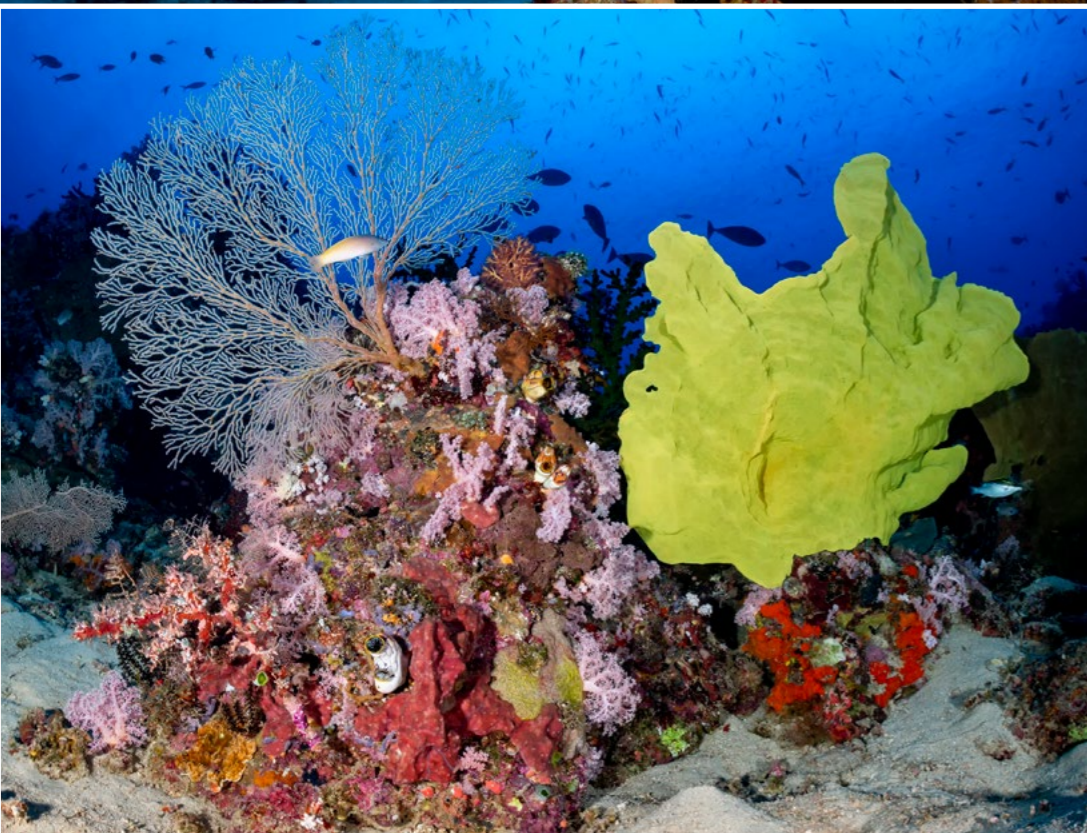
At the other end of the spectrum was the wreck of the Japanese WWII "Jake" seaplane, which rested on its back in the lagoon by

kids at Matong village jetty was what made the place so special. Sure, the photo opportunities were great, but they were not unique; however, rarely will you find such willing and enthusiastic models!

rich channels, which offered some of the very best diving on the southern coast. Add in a few beautiful reefs inside the lagoon and a WWII aircraft wreck, and one could see why Linden Harbour is rated so highly.



Crystal clear blue waters, pink elephant ear sponge with feather stars (above) and diver with coral bommie covered in colorful crinoids (right) on Elsie's Reef



Large pink elephant ear sponge at The East Channel dive site in Linden Harbour

Poronga Island. In just 18m of water and easy to dive, the wreck was a great counterbalance to the vibrant channels and reefs of Linden Harbour.

The East Channel. Diving the eastern channel at Linden Harbour on an incoming tide was simply spectacular. The walls of the channel were covered in a rich marine growth of fans, sponges and soft corals. Scattered across the bottom of the channel were several incredibly beautiful bommies. Although the incoming tide brought clean water from the deep waters to the south, as the channel narrowed, it delivered them at a considerable velocity—so, you can easily find yourself rocketing along. The trick was to duck behind one of the bommies and enjoy the scenery.

Elsie's Reef. Located inside the lagoon at Linden Harbour was this exceptional reef named after one of the former dive guides on *MV FeBrina*. Elsie's Reef was a crescent-shaped reef that started at just 5m and then sloped down gently before dropping off into the depths.

There was much to see on the reef with beautiful elephant ear sponges, gorgonian sea fans and incredibly colorful crinoids. In particular, the shallow area on top of the reef at Elsie's was a great place for wide-angle photography, with excellent light, clear blue water and an abundance of vibrant subject matter to fill the frame.

Jake seaplane. At ground level, there were almost no signs that Linden Harbour was a Japanese seaplane base during WWII. But from the air, it was easy to see why its sheltered lagoon would have





Jake seaplane propeller (far left) and ordnance (left); Huge sea fans with feather stars, soft corals and sponges on reef at Mocklon Islands (above)

made it prime real estate, which, combined with its strategic location on the southern coast, would have made it an excellent place from which to operate.

Not a great deal is on record about those operations, but there are a few aircraft wrecks that have been found in the lagoon, the best of which was a largely intact Aichi E12A1 “Jake” seaplane. The plane rested on its back, with one of its two floats pointing to the

surface, in 18m of water just off from Poronga Island. The plane was relatively intact, apart from the second float, and although it was

not that big, it still made for an excellent dive. Exploring the wreck was really a straightforward and interesting dive, but one should not miss the open bomb bay,

with its open doors and quite large ordnance plainly in sight for all to see.

The name “Jake” comes from how the Allied Forces identified Japanese aircraft

during WWII, as the actual naming convention was both difficult to understand and pronounce. The Japanese gave two names to each aircraft, with one being the manufacturer’s alphanumeric project code and the other being the official military designation. So, code names were used by the Allies instead, with western men’s names given to fighter aircraft, women’s names for bombers and transport planes, bird names for gliders and tree names for trainer aircraft.

Afterthoughts

Papua New Guinea is an amazing country with some incredible diving, but there

are very few places that can match the southern coast of New Britain.

Currently, there is really only one choice if you want to experience the southern coast of New Britain—and you should, if you enjoy great diving with a good slice of adventure! The MV *FeBrina* does nine-day trips to the southern coast every February and March, starting and ending in Rabaul. ■

Asia correspondent Don Silcock is based in Bali, Indonesia. For extensive location guides, articles and images on some of the best diving locations in the Indo-Pacific region and “big animal” encounters globally, please visit his website at: indopacificimages.com.



fact file



Papua New Guinea



SOURCES: US CIA WORLD FACTBOOK, XE.COM, PAPAUNEWGUINEA.TRAVEL/DIVING

History Papua New Guinea is a developing country in the Southwest Pacific, located on the eastern half of New Guinea, which is the second largest island in the world. In 1885, it was divided between the United Kingdom (south) and Germany (north). In 1902, the United Kingdom transferred its half to Australia, which occupied the northern portion during World War I and continued to administer the combined areas until independence in 1975. After claiming some 20,000 lives, a nine-year secessionist revolt on the island of Bougainville ended in 1997. Today, Papua New Guinea relies on the assistance of Australia to keep out illegal cross-border activities from Indo-

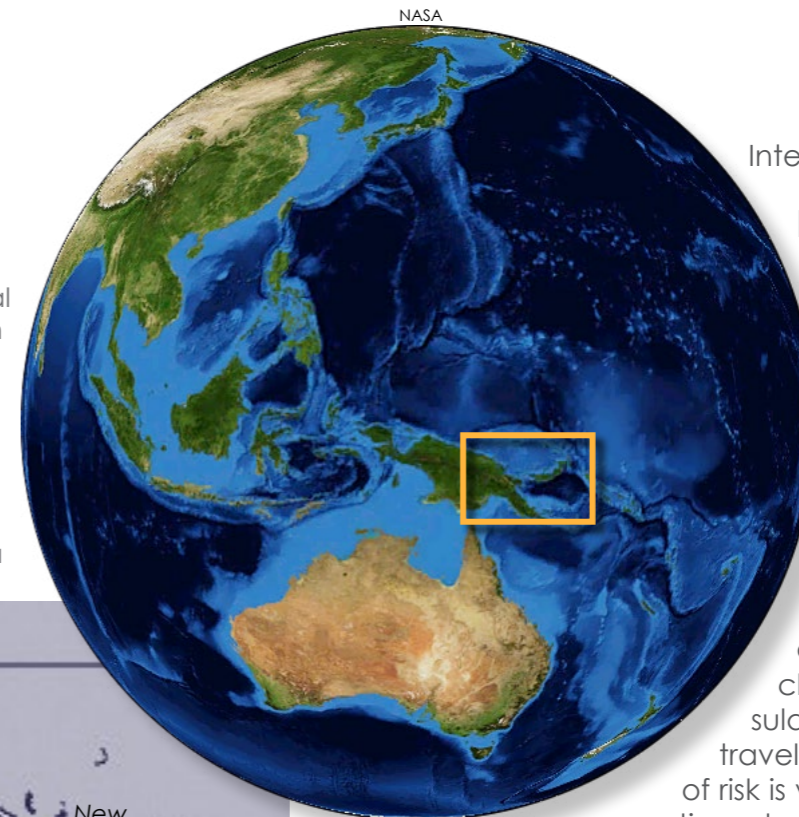
nesia primarily, including illegal narcotics trafficking, goods smuggling, squatters and secessionists. Government: constitutional monarchy with parliamentary democracy. Capital: Port Moresby

Geography Oceania, Papua New Guinea is a group of islands east of Indonesia including the eastern half of the island of New Guinea between the Coral Sea and the South Pacific Ocean; Along its southwestern coasts, it has one of the world's largest swamps. Coastline: 5,152km. Terrain: mostly mountainous with rolling foothills and coastal lowlands. Lowest point: Pacific Ocean 0m; Highest point: Mount Wilhelm 4,509m.

Climate Tropical climate with slight seasonal temperature variation; the northwest monsoon occurs December through March; the southeast monsoon occurs May through October. Natural hazards: active volcanism, as PNG is situated along the Pacific "Ring of Fire". The country experiences frequent and at times severe earthquakes, mudslides and tsunamis.

Economy Natural resources abound in PNG. However, getting to them has been difficult due to the rugged terrain, issues with land tenure as well as expensive infrastructure development. Around 85% of the population live on subsistence farming. Two-thirds of export income comes from mineral deposits such as copper, gold and oil. Estimates of natural gas reserves come to about 227 billion cubic meters. Construction of a liquefied natural gas (LNG) production facility planned by a consortium led by a major

RIGHT: Global map with location of Papua New Guinea
BELOW: Location of Waterfall Bay on map of Papua New Guinea
BOTTOM LEFT: Colorful sponges at Elsie's Reef, southern New Britain, Papua New Guinea



Internet users: 125,000 (2009)

Language Melanesian Pidgin serves as the lingua franca, English is spoken by 1%-2%, Motu is spoken in the Papua region; there are 715 indigenous languages—many unrelated.

Health & Safety

Papua New Guinea has a high crime rate. Please check state advisory consular information before travelling to PNG. The degree of risk is very high for major infectious diseases; food or water-borne diseases include bacterial and protozoal diarrhea, hepatitis A and typhoid fever; vectorborne diseases including dengue fever and malaria are high risks in some locations (2004)

that involve physical security for foreign investors, building investor confidence, increasing the integrity of state institutions, bettering economic efficiency through privatization of state institutions operating under par, and continuing good relations with Australia, which ruled PNG when it was a colony.

Environment

Growing commercial demand for tropical timber is causing deforestation of the Papua New Guinea rainforest. It also suffers pollution from mining projects and severe drought.

Population 6,552,730 (July 2014 est.) Ethnic groups: Melanesian, Papuan, Negrito, Micronesian, Polynesian. Religions: Roman Catholic 27%, Protestant 69.4%, Baha'i 0.3%, indigenous beliefs and other religions 3.3% (2000 census).



Currency

Kina (PGK). Exchange rates: 1USD=3.03PGK; 1EUR=3.32PGK; 1GBP= 4.37PGK; 1AUD=2.15PGK; 1SGD=2.13PGK

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EVACUATION INSURANCE is compulsory for some PNG dive operators, liveaboards and resorts. See DAN for information and travellers insurance: diversalernetnetwork.org

Websites

Papua New Guinea Tourism papaunewguinea.travel



My Favorite

Wide-Angle Dive

— *Contributors' Picks from Around the World*

Text and photos
by Scott Bennett,
Andrey Bizyukin,
Larry Cohen,
Brent Durand,
Jennifer Idol, Kate
Jonker, Matthew
Meier, Brandi Mueller,
Don Silcock, Olga
Torrey and Beth Watson

We asked our contributors what their favorite wide-angle dive was and they came back with stories and photos from some of the most unique and exhilarating dive sites on earth, many of them relaying interactions with large marine life from Steller sea lions in Kamchatka and giant manta rays in Komodo to tiger sharks in the Bahamas and humpback whales in the Dominican Republic. *X-Ray Mag* contributors reveal the beauty of the underwater world—from the topical paradise of Papua New Guinea, Indonesia and the Philippines to the subtropical seas at Mexico's Socorro Islands and the temperate waters off California and South Africa—where they captured their favorite shots and experiences.



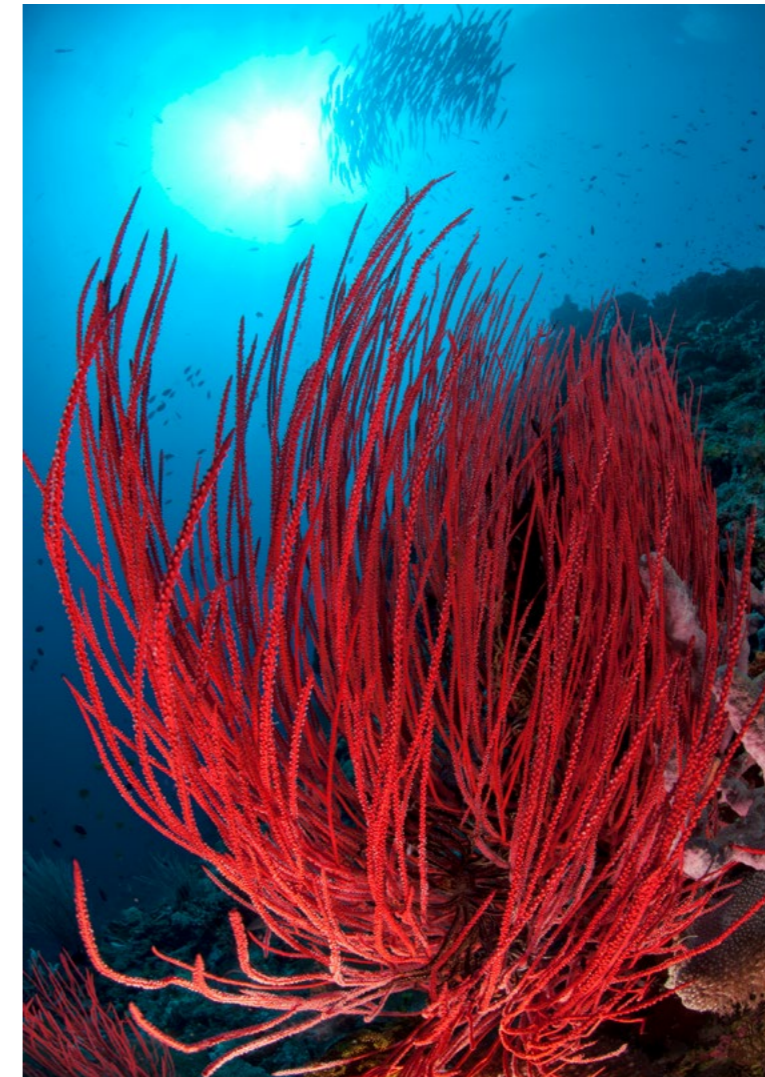
Jayne's Gully, Fathers Reefs, Papua New Guinea

Text and photos by Scott Bennett

When it comes to wide-angle photography, there is no better destination than Papua New Guinea. Its offshore reefs are magnets for marine life and the Fathers Reefs, situated off the coast of New Britain, are no exception. Accessible only by liveaboard, the area features numerous seamounts, with sheer walls



School of big-eye jacks. Exposure: ISO 125, f/8, 1/100s (left); Gorgonian and jacks. Exposure: ISO 125, f/10, 1/100s (far left); Hawksbill sea turtle. Exposure: ISO 125, F11 at 1/100s (bottom); Whip corals and barracudas. Exposure: ISO 125, f/11 1/80s (below). Gear used in all images: Nikon D200 camera, 10.5mm Nikon lens, Hugyfot housing, two Ikelite D160 strobes



jam-packed with colourful sponges, whip and soft corals, and gorgonians. Due to their remote location, visibility is superb and often exceeds 30m. I visited during a 10-day liveaboard on the FeBrina, and one of my favourite sites was Jayne's Gully. We did two dives here, each providing a wealth of wide-angle opportunities. Fish life abounded, with schools of barracuda, big-eye trevally and batfish, mingling with a plethora of reef fish darting amongst the coral. There are wonderful opportunities for close-up wide-angle images, with the barracuda and jacks swimming above the corals. A highlight was a pair of friendly hawksbill sea turtles. Small yet utterly fearless, they allowed a remarkably close approach. As one descended after a gulp of air, I was able to capture a frame-filling image with a sunburst behind. The only thing missing: hordes of other divers. Please visit: xray-mag.com/contributors/ScottBennett

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PREVIOUS PAGE: *Levitation—Divers in the Sky*, by Andrey Bizyukin. "Lake Baikal is a famous pearl of a dive location in Russia," he said, "but it is often hard to find really clear water here, depending on the winds, currents and seasons. So, I had to visit many times before I found the right place and the right season, which took place very briefly in June at the bay of Big Cat. My fellow divers were experienced rebreather divers. With no bubbles disturbing the water's surface, it was much easier to get a clear shot. The water temperature was +4°C and visibility ranged up to 30m. I saw the divers silhouetted against the blue sky above me, and because I used a new TTL-converter by UW Technology, it was easy to get a correct exposure for this funny image with just a push of a button." Exposure: ISO 800, f/11, 1/200s. Gear: Canon 5D Mark 3 camera, Canon 15mm fisheye lens, Subal housing, Inon Z240 strobes, UW Technics TTL-converter.





males kept circling around us at the surface, playfully looking to continue the fun game.

It was one of the most exciting dives of my life, because it was such a rare opportunity to dive with these large and very curious creatures. In the past, I had attempted to photograph Steller sea lions in Alaska too, but the conditions were not as favorable as those I found on the Russian shore.

Another unique dive on the Russian Pacific Coast is found at Rudnaya Bay, 600km north of Vladivostok. It is known to be a favorite habitat of giant Pacific octopuses. Typically, the octopuses hide in holes under stones, shying away from divers. But sometimes, when they grow very large in size, they feel powerful enough to actively defend their hunting grounds. They may display their considerable size, taking menacing poses and releasing ink. It was this rare moment that I was lucky enough to photo-

graph (taken at a depth of around 17m), many thanks to local divers for helping with the dive and sharing their great octopus experience.



Cape Kekurny & Rudnaya Bay, Russia

Text and photos by Andrey Bizyukin

Invited to visit Kamchatka, located at the easternmost tip of Eurasia, by my good friends Anna and Sergey Butkovsky, we headed out on their private boat to the Pacific Ocean from the port of Petropavlovsk Kamchatsky. After a few hours sailing southward, we arrived at Cape Kekurny, located at the entrance to Russian Bay, where a large rookery of Steller sea lions can be found. Here, scientists observe and research these animals, and Anna had come up with a technique for diving and observing their behavior in natural conditions underwater. For this reason, she asked me to take underwater photographs to document the dive. We anchored about 200m from the coast at a place where the depth was about 10m. After entering the water, which was +4°C (39°F), we waited in a tight group on the flat sea floor for the magic to begin.

One huge alpha male and many female sea lions lived at the rookery. Being very curious

creatures, the females were the first to rush in our direction and all together began to study us divers underwater. They looked into our masks, blew bubbles (copying our noisy breathing), and tried to bite our fins. It was like a game to them.

After ten minutes of this playful display, all the females disappeared and one huge male—which dominated the territory of the bay—appeared, like the “Boss of the Sea.” His size and appearance were so impressive that we immediately realized the seriousness of his intentions. If he decided we were a threat to his dominance and harem of females, then we would definitely be in beaten.

According to safety instructions, the dive time was limited to around ten minutes. Apparently, at the start of these dives, sea lions would play carefully around the divers, but later in the dive, if you gave them free rein, they would begin to bite divers and pull regulators out of their mouths. For this reason, we quickly finished our photo session and moved in a tight group up to the surface. The boat crew was already in a hurry to pick us up, but about ten curious fe-

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Divers with Steller sea lions at Cape Kekurny in Kamchatka, Russia (above and top left). Exposure: ISO 800, f/ 9, 1/80s; Diver with giant Pacific octopus in Rudnaya Bay, north of Vladivostok (left). Exposure: ISO 640, f/8, 1/80s. Camera gear for all images: Canon 5D Mark 3 camera, Canon 15mm fish-eye lens, Subal housing, Inon Z-240 strobes. Please visit: xray-mag.com/contributors/AndreyBizyukin

Tips for shooting wide-angle

Text by Larry Cohen

When shooting wide-angle images underwater, it is important to control the ambient and strobe light. Changing the shutter speed will affect the ambient light exposure but will have little effect on the strobe exposure. The aperture will affect both the strobe exposure and the ambient light exposure. For this reason, it is a good idea to rarely change the aperture. One can change the shutter speed to produce a light or dark background. It is best to use strobes with a continuous power dial. This way, one can adjust the strobe power to get the correct exposure on the subject and foreground. In most cases, you do want the strobe light to blend with the ambient light for a more natural look. Nearby objects will look larger than they really are when using wide-angle and fisheye lenses. The objects will also look farther apart from each other. It is important to consider this optical effect when using these lenses. One can use this as part of the design element of the image. ■



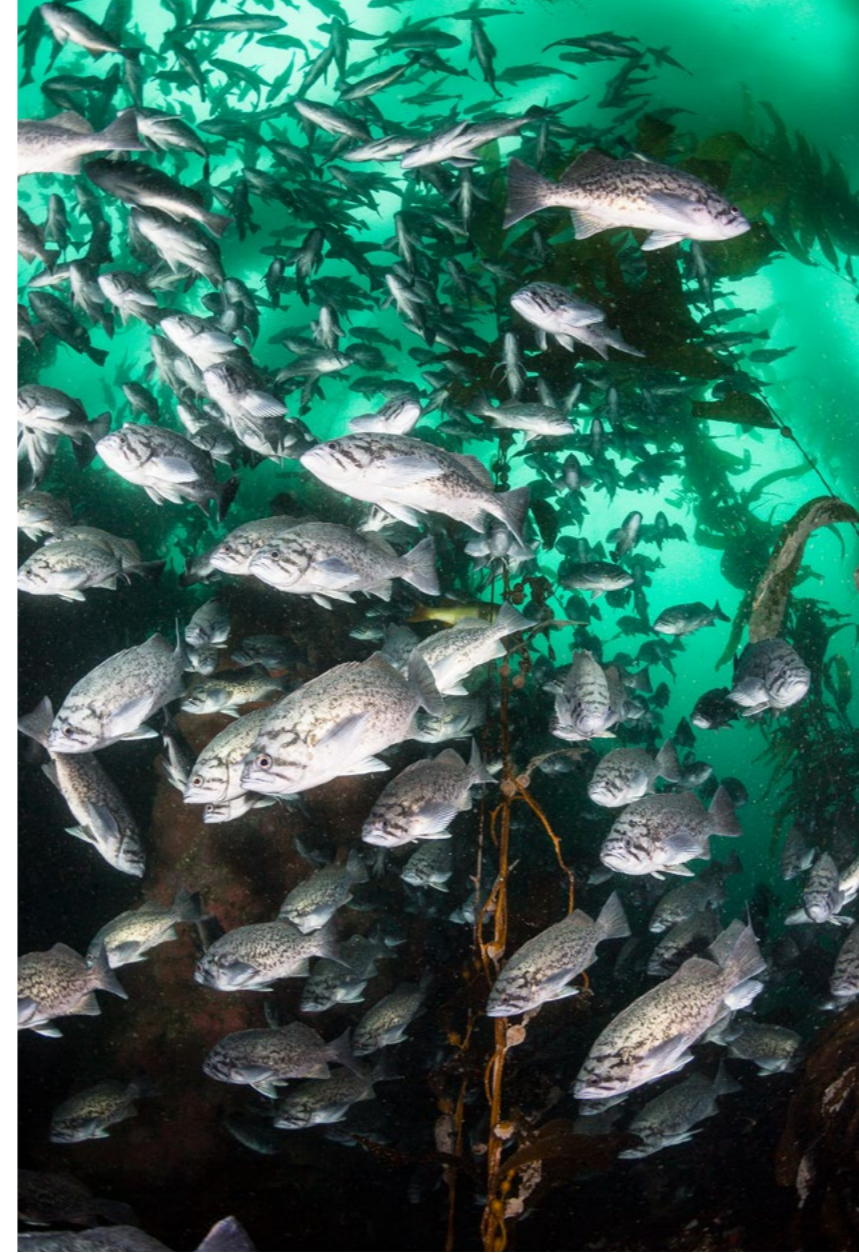
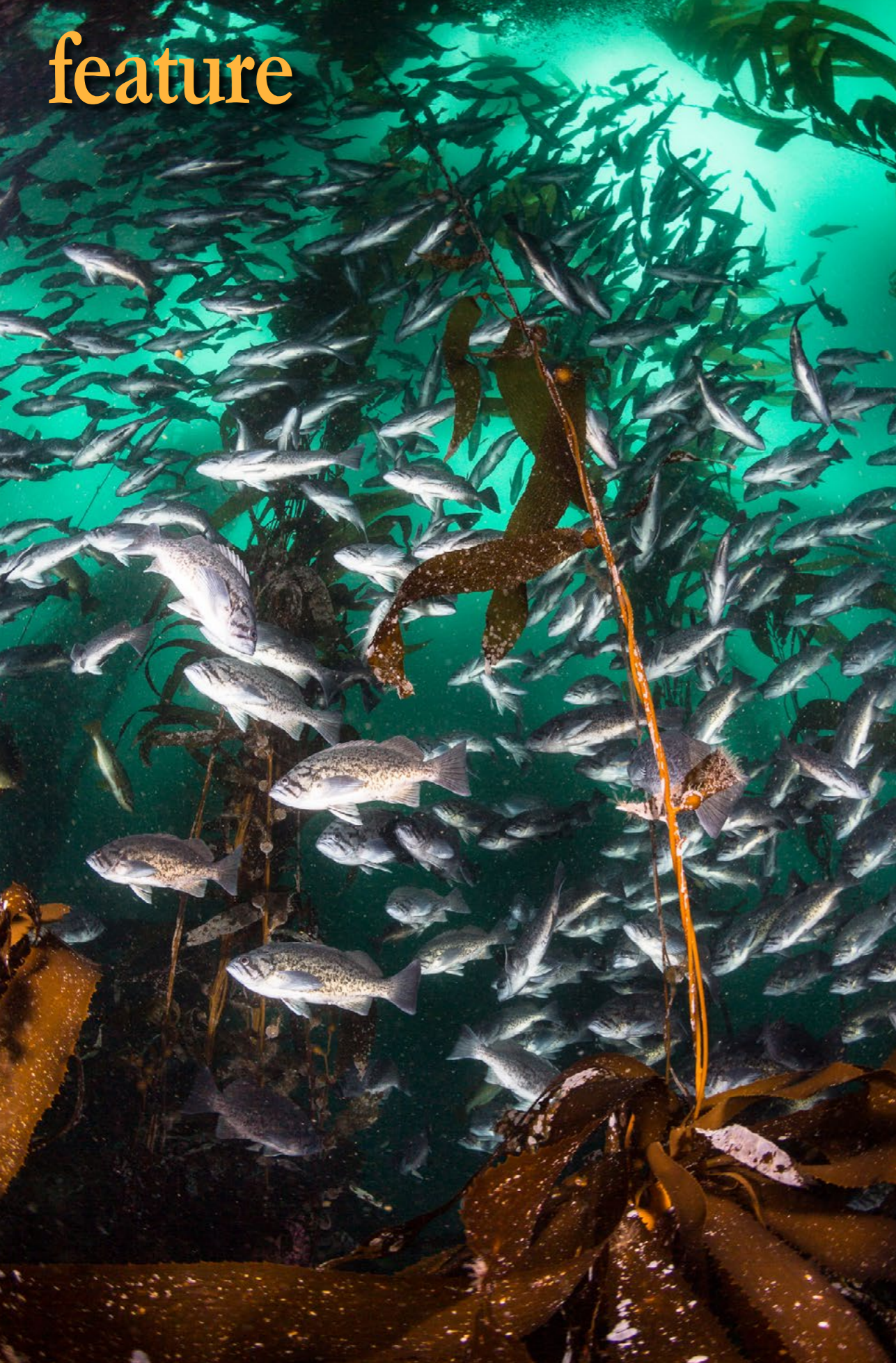
Giant pacific manta. Exposure: ISO 400, f/7.1, 1/200s (above); Juvenile whitetip shark and moray eel. Exposure: ISO 400, f/11.0, 1/200s (left); Yellowtail fusilier. Exposure: ISO 400, f/9.0, 1/250s (right)

Roca Partida, Socorro Islands, Mexico

Text and photos by Larry Cohen

The Revillagigedo Archipelago, known as the Socorro Islands, is a great place for wide-angle photography. They are 390km (240m) off the coast of Cabo San Lucas in Mexico. Wide-angle or fisheye lenses are needed to capture the large marine life in this area. Roca Partida is a very special wall dive, with many ledges, in this area. Facing the wall, one can photograph groups of whitetip reef sharks resting on top of each other. I was lucky to see a juvenile whitetip, using a huge moray eel as a pillow. When you glance into the blue, it is not unusual to see giant pacific manta rays for which the area is famous. You may also spot a light-colored yellowtail fusilier in front of a school of dark-colored fish. All images were captured with an Olympus OM-D E-M1 camera and Olympus M.Zuiko ED 9-18mm f/4-5.6 lens. The camera was in the Aquatica AE-M1 housing with the 8-inch dome port. For lighting, I used two Sea&Sea YS-D1 strobes. Visit: liquidimagesuw.com





It's more fun in the Philippines

MAGIC ISLAND
Moalboal, Cebu

MAGIC OCEANS
Anda, Bohol

Tyler Bight, San Miguel, Channel Islands, California, United States

Text and photos by Brent Durand

My favorite dives tend to be those that cannot be planned and those that require careful planning to line up with favorable conditions. My first dive at San Miguel Island in California's Channel Islands was both. The northernmost island, San Miguel, is subject to open ocean swell and trade winds, making it a tough destination to reach on a charter dive boat. The fog broke that morning in July 2015 and the captain confirmed we would indeed be diving San Miguel. We anchored near Tyler Bight, I patiently helped our guests, and then took a giant stride into the sea. I descended to find rock ledges, an expansive kelp forest, and my favorite—a massive school of blue rockfish. This dive felt just as wild as I always hoped San Miguel would be. Visit: tutorials.brentdurand.com



THIS PAGE: Blue rockfish (*Sebastes mystinus*). Exposure: ISO 500, f/11, 1/100s. Gear: Canon 5D Mk III camera, Tokina 10-17mm fisheye lens, Aquatica housing, dual Sea&Sea YS-D1 strobes.



Lemon sharks (*Negaprion brevirostris*) are curious and respond to the splashing of dive gear at dawn. Exposure: ISO 160, 14mm, f/5.6. Gear used in all images: Nikon D5 camera, Nikkor 14-24mm lens, Nauticam housing, Inon Z240 strobes

Tiger shark (*Galeocerdo cuvier*)—jumping first in the water brought curious tiger sharks close to me. Exposure: ISO 160, f/6.3, 24mm (above); Caribbean reef shark (*Carcharhinus perezii*)—hiding behind the corals allows a view of cruising Caribbean reef sharks. Exposure: ISO 160, f/9, 14mm (right)

Tiger Beach, Bahamas

Text and photos
by Jennifer Idol

Tiger Beach in the Bahamas is a photographer's dream and a must-see destination that is also my favorite wide-angle opportunity, especially as a trip leader. Six shark species frequent these shallow waters: tiger sharks, Caribbean reef sharks, lemon sharks, great hammerheads, nurse sharks and bull sharks. Nothing quite beats the girth of a tiger shark or colorful lemon sharks. The aggregation of sharks un-

afraid of divers is the most thrilling sight above and below water. Depth and warm water allowed for a long dive that began at sunrise. I wanted to photograph free-swimming sharks, not just the feedings that bring tiger sharks here, so I kept to the periphery to

enjoy private encounters. To be first in and last out, I was ready and calm, which was hard to do with these beautiful and exciting animals surrounding our boat. It is a destination I look forward to returning to next year. Please visit: uwDesigner.com

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A school of strepies (*Sarpa salpa*) swirl above a huge orange wall sponge on the deeper edge of the reef (above)—absolutely beautiful contrast between silver, blue and orange. Exposure: ISO 320, f/9, 1/160s. Camera gear: Canon 7D Mkii camera, Tokina 10-17mm fisheye lens, Sea&Sea MDX 7D-Markii housing, two Sea&Sea YS-D1 strobes; Beautiful kelp forest at Percy's Reef (left) with yellow sponges and orange sinuous and palmate sea fans adding a vibrant splash of colour—so typical of the kelp forests of the eastern side of False Bay. Exposure: ISO 160, f/13, 1/80s. Camera gear: Sony A6400 camera, Tokina 10-17mm fisheye lens with Metabones adaptor, Fantasea FA6400 housing, two Sea&Sea YS-D1 strobes.

Percy's Reef, Rooi Els, Gordon's Bay, eastern False Bay, South Africa

Text and photos by Kate Jonker

Craggy, sheer cliffs plunge beneath the water's edge into an enchanted kelp forest. This beautiful dive site starts shallow, with the rays of the sun glittering through the softly swaying kelp. A kaleidoscope of marine life, including anemones, sea urchins, sea fans and sponges, clings to the reef's huge rounded boulders and ridges. Schools of

small fish flit amongst the kelp stipes. Huge orange wall sponges provide shelter for smaller fish, and West Coast rock lobster lurk in crevices as their constantly moving feelers test the surrounding waters for predators. Juvenile Cape fur seals zoom overhead, and, if you are lucky, you might even encounter an inquisitive short-tailed stingray or broadnose sevengill cow shark. It's an absolutely magical reef that I love to explore, as every dive is different and equally exciting. Please visit: katejonker.com





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THIS PAGE: The underwater photos were shot with a Nikon D810 camera in a Subal housing and a Nikon 16-35mm lens, using available light. The lone juvenile in the color photo (below) was shot at 23mm, f/8, 1/500s, ISO 800. The black and white photo of the mother and calf (left) was shot at 16mm, f/8, 1/640s, ISO 800. The topside photo of a juvenile breaching (above) was shot using a Sigma 50-500mm lens at 340mm, f/8, 1/2500s, ISO 800.

Silver Bank, Dominican Republic

Text and photos by Matthew Meier

My most recent favorite wide-angle dive was not a dive at all. It was a snorkeling trip to swim with North Atlantic humpback whales (*Megaptera novaeangliae*) at the Silver Bank off the coast of the Dominican Republic with Conscious Breath Adventures (consciousbreathadventures.com). Fellow snorkelers and I spent a week on the liveaboard M/V *Sea Hunter*, out on the water in search

of whales, photographing both topside and underwater behaviors. The most spectacular experience for me was coming face-to-face with a curious juvenile humpback whale as it came up for a breath of air and lingered to inspect the odd collection of us humans floating on the surface. Words cannot express the feelings that swept over me while gazing into the eye of that whale. It is a moment I will cherish and one I hope to repeat time and again. Visit: MatthewMeierPhoto.com



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Manta ray (left). Exposure: ISO 1250, f/11, 1/160s. Camera gear: Nikon D500 camera, Ikelite housing and dual Ikelite strobes; Manta ray (right). Exposure: ISO 1250, f/9, 1/100s. Camera gear: Nikon D500 camera, Ikelite housing and dual Ikelite strobes; Topside rocky landscape at Manta Alley dive site in Komodo National Park (below). Exposure: ISO 800, f/20, 1/250s. Camera gear: Nikon D500, Ikelite housing, no strobes

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Manta Alley, Komodo, Indonesia

Text and photos by Brandi Mueller

Manta Alley, in Komodo National Park, is a great dive site to see mantas. Above water, the area is surrounded by brown, barren, but strangely beautiful rocks in

contrast to the deep blue water. Underwater, it feels like a manta playground, with different manta activities happening around the dive site. Most dives start at the cleaning station where mantas come close to the reef to have their parasites removed and be cleaned by bannerfish and other butterflyfish. Moving into an area between two rocks, which looks just like an alley,

mantas can be seen hardly moving in the current—just flapping their wings like it is a treadmill and they are getting their morning exercise. (It is hard for divers to keep up in the current though, and we get blown by them with the water movement.) The coral is healthy in this area too, with turtles, bumphead parrotfish and swarms of anthias. Visit: brandiunderwater.com



School of jacks circling at Arborek Jetty. Exposure: ISO 400, f/13 1/250s. Camera gear: Nikon D700 camera, 16mm lens, Subal housing and dual Ikelite DS160 strobes

Arborek Jetty, Dampier Strait, Raja Ampat, Indonesia

Text and photos by Don Silcock

"What's your favourite wide-angle dive?" That is a really tough question, as wide-angle photography is very much my preferred genre and picking a favourite location is hard—there are so many candidates! After a lot of mulling and pondering, I decided on Arborek Jetty at the western end of the Dampier Strait in Indonesia's Raja Ampat. It was at Arborek (aka Airborei) where I first really nailed the "triangulation" of correct foreground and background exposures with a

strong composition. That was back in 2012, and the image is still on the wall of my study. I have dived the jetty many times since, and it is always a great and dynamic dive, courtesy of the rich currents that sweep past it. The 2012 image used the huge school of jacks as the main subject, with the jetty as the background, and it was a special moment when they started circling. Sadly, when I was at Arborek last year, the jacks were nowhere to be seen—but the school of batfish were still in residence. Again, I balanced the foreground and background exposures and triangulated the composition. Please visit: indopacificimages.com

Batfish at Arborek Jetty. Exposure: ISO 400, f/11, 1/320s. Camera gear: Nikon D500 camera, 8-15mm lens, Nauticam housing and dual Ikelite DS160 strobes



Diver with mushroom leather coral on wall. Exposure: ISO 320, f/9, 1/125s (left); School of slender Pinjalo snappers. Exposure: ISO 320, f/8, 1/125s (bottom left). Diver with granular seastar on wall. Exposure: ISO 320, f/10, 1/125s (bottom right); Camera gear used for all three shots: Olympus OMD E-M5 camera, Panasonic fisheye 8mm lens; Nauticam NA-EM5 housing with 4-inch dome, two Sea&Sea YS-D1 strobes.

positioned my dive guide farther back so he would be a silhouette. The interesting shape of the school of slender Pinjalo snappers was enhanced by the fish-eye lens' distortion. Since fisheye lenses produce a curved image, I used a 4-inch dome and still got sharp edges. For lighting, I used two Sea&Sea YS-D1 strobes. Please visit: fitimage.nyc

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Gabriella's Fish Point, Oro, Papua New Guinea

Text and photos by Olga Torrey

Gabriella's Fish Point off Tufi Resort in the Oro Province of Papua New Guinea is a great location to shoot wide-angle images. This reef was named after one of Tufi's previous managers. The majestic wall is covered with growth and is teeming with life. I decided to use the Panasonic fisheye 8mm lens on my Olympus OMD E-M5 camera in a Nauticam NA-EM5 housing. This lens has a 180-degree angle of view and does cause some distortion. I used the distortion to enhance the beauty of the wall and mushroom leather coral. I positioned my model so my strobes would light him and the wall. The same lens was used for the image of the granular seastar. I moved in close to use the forced perspective of the fisheye lens. In this image, I





Pink anemonefish and anemone at The Drop-Off, Verde Island, the Philippines. Exposure: ISO 160, f/10, 1/125s. Camera gear used for all three images: Canon 5D Mk IV, Canon 8-15 mm fisheye lens, Nauticam housing, Ikelite DS 160 strobes

The Drop-Off, Verde Island, Philippines

Text and photos by Beth Watson

The Drop-Off dive site is a rocky pinnacle that rises 200ft to the surface of the water. Below lies a plethora of marine life and rainbow of colors. It is known to be a hot spot and epicenter for marine life biodiversity on the planet. Currents can be strong, which makes for an exhilarating dive. These currents bring in nutrient-rich clear water, creating excellent visibility. Pelagic species can be seen out in the blue. Keep your eyes open—you never know what will pass by. Schooling trevallies, jacks, butterflyfish and surgeonfish can be seen on every dive. The cliff face and the sloping wall are adorned with black coral bushes, beautiful gorgonians, sea whips and large barrel sponges. Thousands of brilliantly colored basslets and anthias cover the reef. It is a wonderful dive with outstanding wide-angle opportunities. It is truly mesmerizing and takes my breath away time after time. Visit: BethWatsonImages.com



The walls are adorned with beautiful soft corals and covered with reef fish (*Anthiadae*). Exposure: ISO 160, f/13, 1/60s



Brightly colored anthias (*Anthiadae*) swarm the reef. Exposure: ISO 160, f/10, 1/160s

Photographing Giant
Manta Rays
at Night
in Kona Hawaii

Text and photos by Larry Cohen
and Olga Torrey





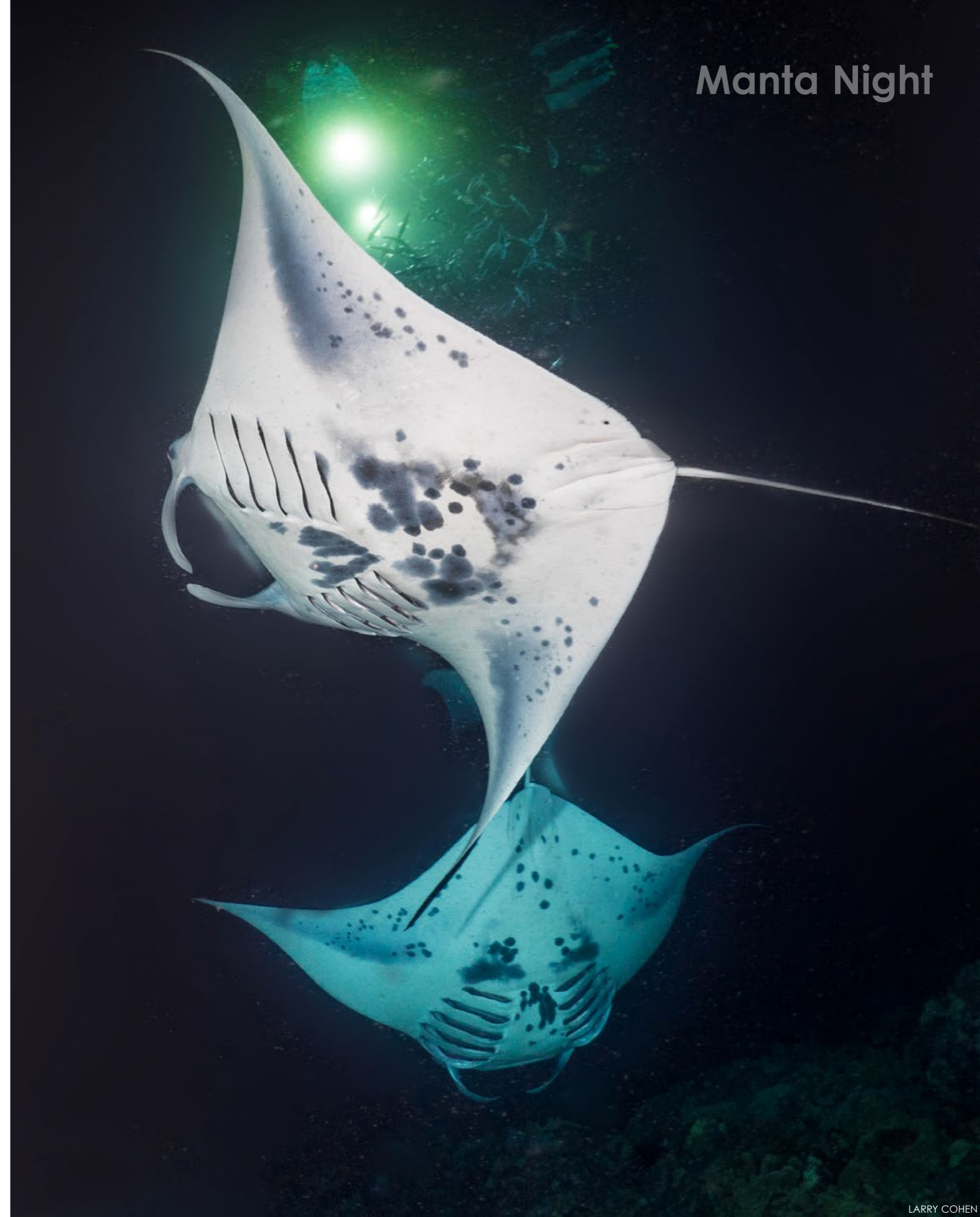
OLGA TORREY

Diving with giant manta rays is always an exhilarating experience. Being in the water with these large intelligent animals is always humbling. They are also spectacular subjects for photography and video. Kona Hawaii in the United States is famous for night diving and snorkeling with the local mantas. This can produce stunning images, but it does take some special techniques.

The manta rays in Kona waters belong to the *Mobula alfredi* species.¹ These are reef mantas and, unlike other species, these mantas do not migrate. They spend their lives in the coastal waters of Hawaii. This is the second largest species of mantas and can have a fin span of up to 5.5m (18ft).²

Just like all manta rays, they are filter feeders. Mantas swim with their mouth open and take in large

¹ WIKIPEDIA.ORG. [HTTPS://EN.WIKIPEDIA.ORG/WIKI/REEF_MANTA_RAY](https://en.wikipedia.org/wiki/reef_manta_ray)
² MANTARAY-WORLD. [HTTPS://WWW.MANTARAY-WORLD.COM/REEF-MANTA-RAY/](https://www.mantaray-world.com/reef-manta-ray/)



LARRY COHEN

Two dancing mantas—the float with lights is in the background (above); Female reef mantas mature in eight to ten years (top left). PREVIOUS PAGE: Male reef mantas mature in six years





LARRY COHEN



LARRY COHEN

Dive operations deploy a large light on the sea bottom (above); Snorkeler observing a reef manta ray (left); Reef manta rays can do slow somersaults while feeding (right)



OLGA TORREY

amounts of zooplankton.³ At night, light attracts the zooplankton, and the plankton attracts the mantas.

There are many operations that run manta night diving and snorkeling trips. The boats are usually crowded with divers and many go to the same location. This is a follow-the-leader group dive. Even if you normally avoid this kind of diving, it is worth putting up with the crowd to get fascinat-

³ MANTARAY-WORLD. [HTTPS://WWW.MANTARAY-WORLD.COM/REEF-MANTA-RAY/](https://www.mantaray-world.com/reef-manta-ray/)

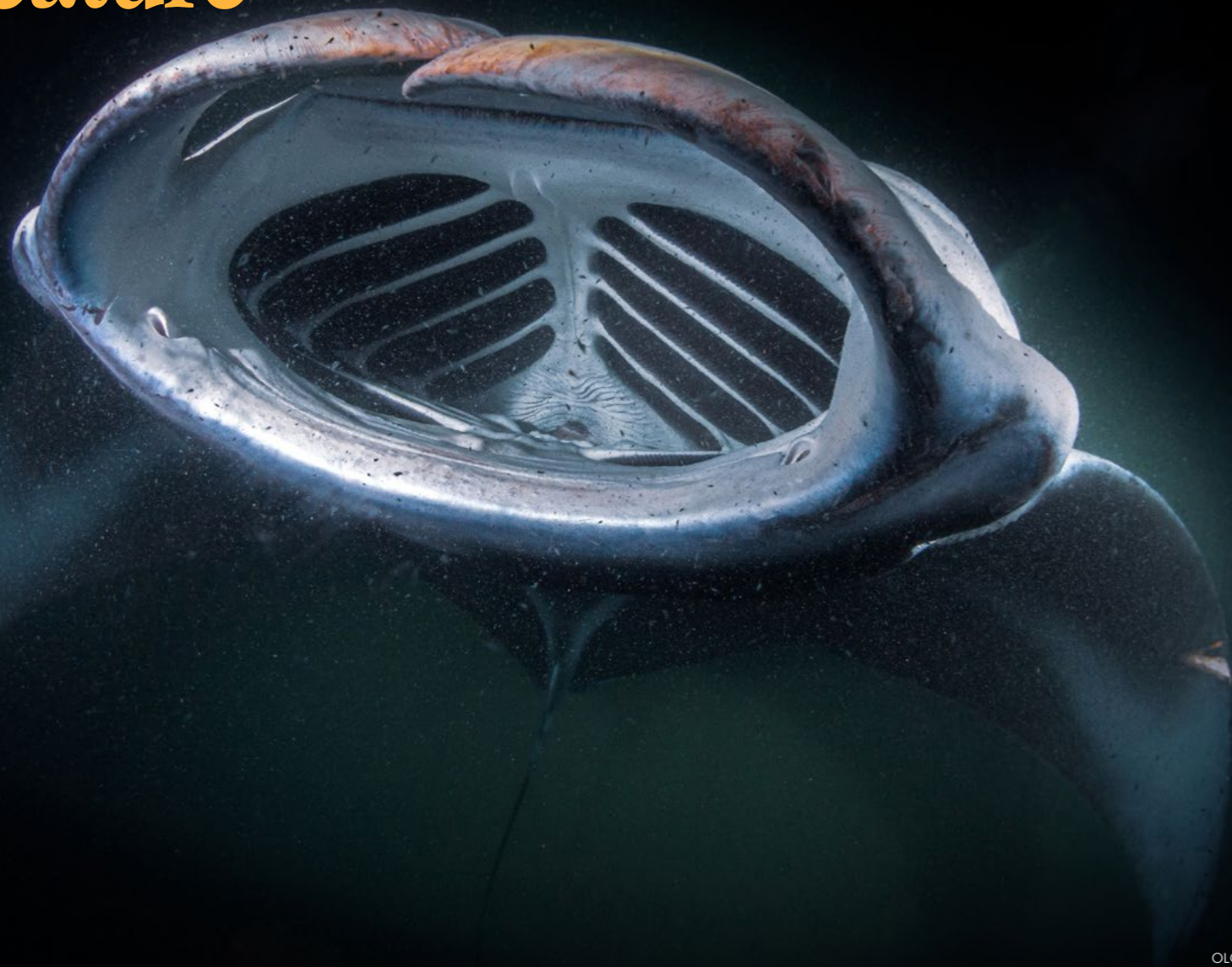
ing images. Both Aquatic Life Divers and Jack's Diving Locker do not overbook, and both have comfortable boats with room for photo gear.

Diving

The dive operator deploys a large light on the sea bottom, pointing up. Usually, there are floats with lights pointing down. Snorkelers hold on to the floats to watch the show from the surface. With all this light and the crowd, it is like doing a night dive

in Times Square in New York City!

The dive guides position the hordes of divers in a circle around the large light on the sandy sea bottom. The guides want all the divers to have negative buoyancy and sit or kneel down on the sand. Sitting on the sea floor with a large group, while watching the mantas dance in front of you, feels like being at a ballet show instead of being on a dive. For imaging, the trick is to get one of the "dancers" to leave the "stage" and come in close to you.



OLGA TORREY

Mantas filter food with plates called gill rakers.

Lighting tips

It is important to get as close to the large light on the sea bottom as possible. Your lighting should consist of a strobe on each side of your housing, with a video light next to each strobe, using triple ball clamps. The video lights should be pointed at the surface. This will attract plankton over your head, so the mantas will leave the stage and come in close enough to be photographed. A focus light just above your port will be helpful. It is best to use a focus light that has a sensor that will turn off when your strobes fire.

The manta movements will be

silting out the bottom, and with all the plankton in the water column, visibility will be limited. It is best to angle your strobe heads outward and use the soft edge to light the subject. Wide-angle lenses are best since it is unlikely you will be close enough to use a fisheye.

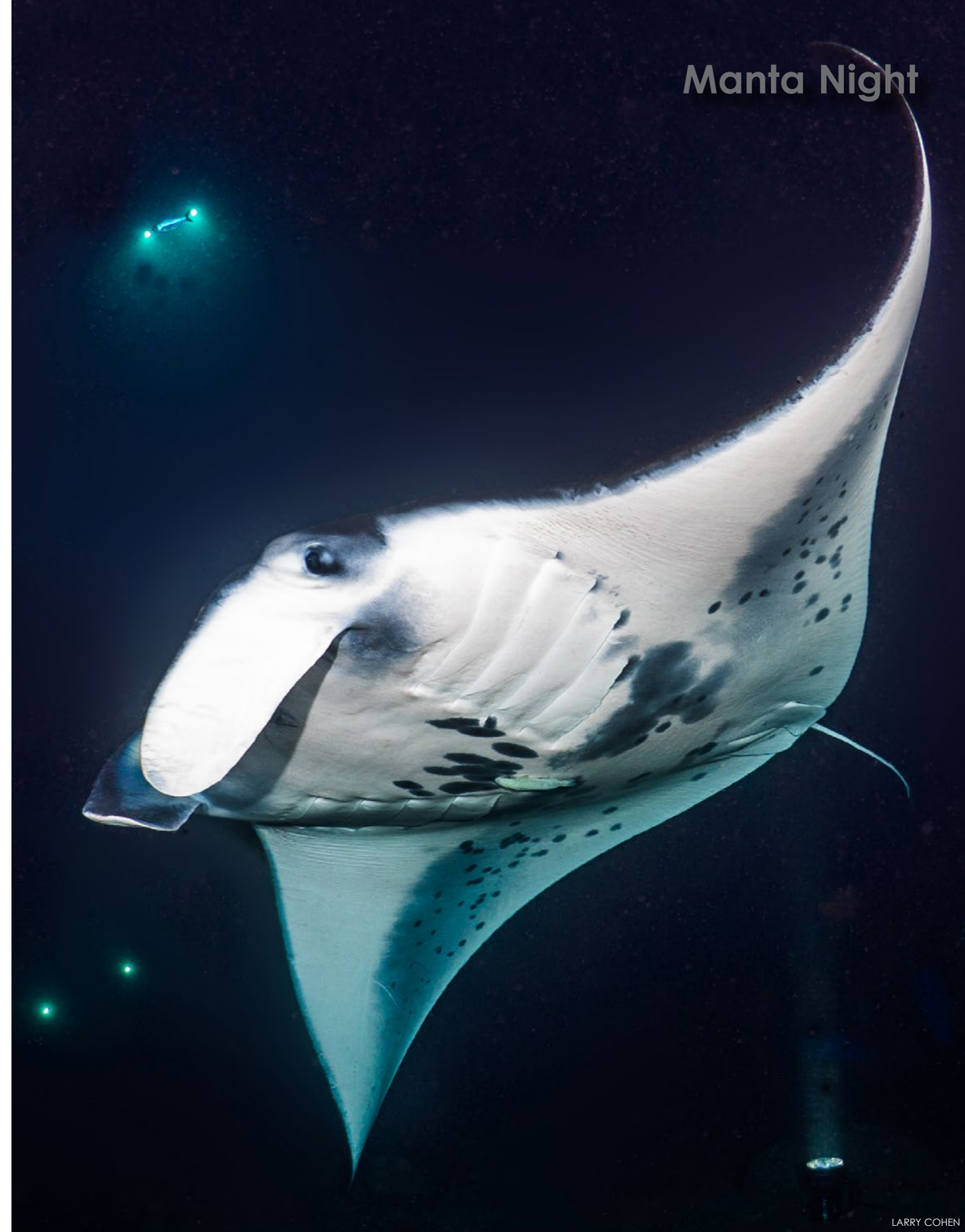
Beach dive

Some Kona locals know sites where you can snorkel with mantas off the beach. This is a very different activity, and these locations are not crowded. Your light setup should be the same as the manta dive. In this case, only your light brings in the plankton, so the mantas will

be much closer. The water column could be milky because of the sand from the beach blowing into the water. For these reasons, using a fisheye lens is best.

Instead of feeling like you are at the ballet, this is like being in the mosh pit at the famous New York City punk music club, CBGB. The only difference is, instead of being body-slammed by a skinny, spiked-haired punk rocker, you are being body-slammed by a 1,400kg (1.4-ton) fish.⁴ This does hurt a little but is a unique experience. Try to protect your soft

⁴ MANTARAY-WORLD. [HTTPS://WWW.MANTARAY-WORLD.COM/REEF-MANTA-RAY/](https://www.mantaray-world.com/reef-manta-ray/)



LARRY COHEN

Reef mantas usually produce one offspring, sometimes two.



LARRY COHEN



Mantas' cephalic lobes extend so water can enter their mouths (above); *Manta alfredi* feed in groups (right).

body parts and your camera gear. Getting slammed this way could cause a housing or light to flood.

If you are visiting Kona, a night manta dive or snorkel is not to be missed, even if you usually avoid "follow-me" group dives. Make sure you bring your camera, and by using a few simple techniques, you will be able to get close to these magnificent creatures and capture stunning images. ■

Special thanks go to Charlie Fasano, the Hawaii regional director of the Shark Research Institute (sharks.org/hawaii-tiger-sharks-expedition), Aquatic Life Divers (aquaticlifedivers.com) and Jack's Diving Locker (jacksdivinglocker.com).

Larry Cohen and Olga Torrey are well-traveled and published underwater photographers based in New York City, USA. They offer underwater photography courses and presentations to dive shops, clubs and events. For more information, please visit: liquidimagesuw.com and fitimage.nyc.

SOURCES: MANTARAY-WORLD.COM

OLGA TORREY



La Jolla

Classic Southern California Diving

Text and photos by Brent Durand





A slow shutter speed helps create a sense of movement in these giant kelp detail photos. PREVIOUS PAGE: California sea lions play in the shallow sea grass of La Jolla Cove.



A classic La Jolla underwater scene, complete with Garibaldi fish (*Hypsypops rubicundus*), sea grass and sunrays

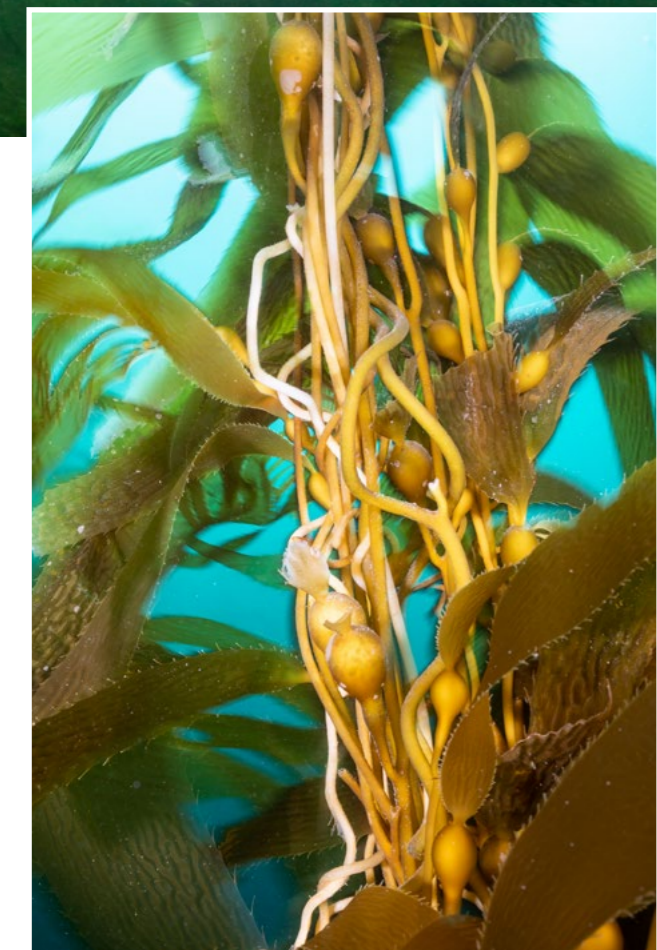
Cool sunlight slowly crept down from the horizon to the kelp beds off La Jolla in southern California. I took another sip of coffee. Sea lions barked on occasion as small groups of pelicans flew up the coast to start their day.

The two-hour drive south had ended with a spectacular sunrise, saturating the coast in a deep pink that one could feel and breathe. I arrived early to ensure I could find a much-coveted parking space. It was clear and calm—the reason I picked today for a dive trip down the coast.

This first dive would be solo, shallow and relaxing. I wandered back to the car to begin laying out my gear: a 7mm wetsuit, 5mm hooded vest, gloves, booties and, of course, my trusty camera, with wide-angle lens and dome port attached.



A California sea lion plays hide-and-seek with the photographer in the sea grass.



THIS PAGE: Playful California sea lions (*Zalophus californianus*) are a highlight of diving La Jolla Cove.

La Jolla Cove

Wading out into the water was peaceful, and I passed a harbor seal (*Phoca vitulina*) plus several California sea lions (*Zalophus californianus*) while kicking out past the point toward the kelp bed. Descending at the edge of the forest, fronds of giant kelp (*Macrocystis pyrifera*) towered up and around like a three-dimensional display of green stained glass, dancing in the twinkling morning sunrays. Sea surface ripples reflected on the sandy bottom littered with spotted reef structure, luring me into an instant meditation.

I swam out to begin navigating a triangle-shaped dive plan, noticing large sand channels between fingers of reef. Small spiny lobsters dotted holes and ledges in the reef. Garibaldi (*Hypsypops rubicundus*), the California state fish, swam around their homes, some more concerned with my approach than others. A female California sheephead fish (*Semicossyphus pulcher*) decided I would be fun to follow.

The rest of the dive was classic California shore div-



ing, and I spent some time shooting close-ups of kelp pneumatocysts. I found my sea lion friends upon swimming back into the cove, and we played hide-and-seek for a solid 30 minutes. As soon as the young sea lions' interest waned, I looked under ledges, tossed kelp into the water and sang, becoming instantly interesting and building up a crowd of pinnipeds once again. I think I loved the experience even more than the sea pups did!

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Detail of giant kelp (*Macrocystis pyrifera*)



A green sea turtle (*Chelonia mydas*) covered in algae is very comfortable with the camera (top left) and swims over the algae-covered bottom with a piece of red algae still stuck to her mouth (left); A leopard shark (*Triakis semifasciata*) found while snorkeling at La Jolla Shores (top right)



La Jolla Cove, walking into the village to order tacos and relax on the patio of a Mexican food restaurant.

La Jolla Shores
Snorkeling La Jolla Shores Park is a must for any beach diver

At the car once again, I learned the mid-day snorkel with friends was pushed back a couple hours and decided I would hop right back in the water with the sea lions, leaving the tank and strobes behind this time. A frisky bunch of adult sea lions were playing in the surf, and I joined right in, holding my breath to roll with them under the waves, surging back and forth with the motion of distant ocean swells.

With the sun now high in the sky, I took advantage of the amenities at

visiting San Diego, and I was fortunate to meet up with a couple of local friends who swim here on a regular basis. We geared up on the side of the road next to our cars and were soon walking into the water on the south side of the beach. Kayak and SUP tours paddled up and down the shore, requiring us to frequently look up from snorkeling to monitor paddler distance.

The snorkeling comprised extensive seagrass beds, undulating with the gentle surge. The shallow depths allow snor-

kellers of all levels to get a close look at the marine life living on the sea floor. It was not long before I heard my name called. We spotted our first green sea turtle (*Chelonia mydas*) of the day! I held my breath, trying hard to film steady video of the turtle as we both rolled gently back and forth, with the turtle grabbing mouthfuls of red algae on each drift. Swimming again, we started to notice leopard sharks (*Triakis semifasciata*) swimming around, shying away as soon as they realized we were floating on the surface. A broadnose sevengill shark (*Notorynchus cepedianus*) swam past us about four meters away, just where visibility faded to a sandy haze.

Eventually, we started swimming towards our exit point, walking out of the ocean to be surprised by friends. We chatted for a few minutes and then changed out of our gear by the cars.

Before long, I was driving north on

the I-5 Highway, heading home, reminiscing about a day well spent. The sun was dropping low in the sky, hinting that it would soon deliver the piercing orange summer sunset so typical in Southern California. ■

An avid diver for over 20 years, Brent Durand is a widely published underwater photographer and dive writer who has served as editor-in-chief of the Underwater Photography Guide and imaging expert at Scuba Diving Magazine and Sport Diver. With a reputation for insightful-yet-simple reviews and tutorial articles, he has written for most of the top dive publications. Helping hundreds of divers "take their photography to the next level," Durand has led underwater photography workshops in California, the Bahamas, Indonesia, Mexico, the Philippines and Sri Lanka. Please visit: tutorials.brentdurand.com.

Your own virtual photo lesson

Want to learn more about underwater photography, camera gear or postproduction techniques? You can now register for a virtual lesson that is customized just for you by Brent Durand, who says: "The lesson will cover exactly what YOU want to learn."

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Still not sure? Get a sneak peak at what virtual lessons are all about and what you can learn in virtual lessons with Durand. See an introductory video clip describing virtual lessons here:

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Photographing
**American
Crocodiles**

in Cuba's Gardens of the Queen

Text and photos by Vladimir Gudzev



The Gardens of the Queen is a popular and iconic dive location in Cuba for those underwater photographers who have creative ideas for documenting or capturing artistic images of sharks, groupers, crocodiles and other fauna of the Caribbean Sea. Here, it is possible to film life in the mangroves, and if one is lucky, meet a crocodile. Vladimir Gudzev reports.

Dear lovers of underwater photography, I'd like to tell you a story about a unique expedition and photo

safari in which fellow participants and I were lucky enough to develop a successful method of taking underwater photographs of marine crocodiles at Cuba's Gardens of the Queen. This site is located far from urban areas and protected from storms and currents, but the accommodations are very comfortable.

Usually, visitors get to Havana by plane, then travel by a comfortable bus across half the country to the southeastern port of Jucaro, where a large ship awaits. This vessel can comfortably accommodate up to 30 divers and guests, and is quite fast. The ship's special dive boats are used to bring divers to specific dive sites.

Diving

The daily diving schedule was as

follows: 6:45 a.m., get up; 7:00 a.m., get to the dive site; 7:30 a.m., first dive; 9:15 a.m., breakfast; 11:30 a.m., second dive; 1:00 p.m., lunch and rest; 3:30 p.m., third dive; 6:30 p.m., dinner; and finally, at 7:45 p.m., a night dive. The water temperature was about 30°C (86°F), which allows you to dive in a thin wetsuit or even just a Lycra dive skin. The visibility of the water varied from 15m to 20m. Diving depths were no more than 30m, with most dives reaching only 20m. Dives lasted no more than 50 minutes.

There were really a lot of sharks here. They were quite bold, getting close to divers and often accompanying them up to the very surface. Gray reef sharks stayed mainly at a depth of at least 10m, and silky sharks stayed in



Crocodiles

the region of one to seven meters.

Sometimes, it seemed quite dangerous—especially when you had to exit the water along the gangway, among swarming sharks, pushing their bodies out of the way with your body. It was scary, and then there was the blood from the fish baits, dripping from the deck. Our Cuban dive guides just chuckled, asking us not to wave our hands. But nothing happened!

How to photograph a sea croc

However, the more important story here is how we photographed a sharp-snouted American crocodile in the mangroves. Photographing a sea crocodile is actually a main objective for many underwater photographers,

and we were no different.

The depths at the site were shallow—from one to two meters. There was little current. Water visibility was five to ten meters, depending on how much silt a diver's finning technique disturbed from the sea bottom. But the current carried away the silt within minutes. As a rule, we arrived at the site at 11:00 a.m., baring gifts for the crocodile—frozen pieces of chicken.

Settling the dive boat in the right channel among the mangroves, our Cuban dive guides began shouting loudly, "Ninyo!" ("Boy!" in Spanish) and splashed the chicken on a rope into the water. The first time, we waited for a crocodile to appear for about 20 minutes and even lost hope. But then,

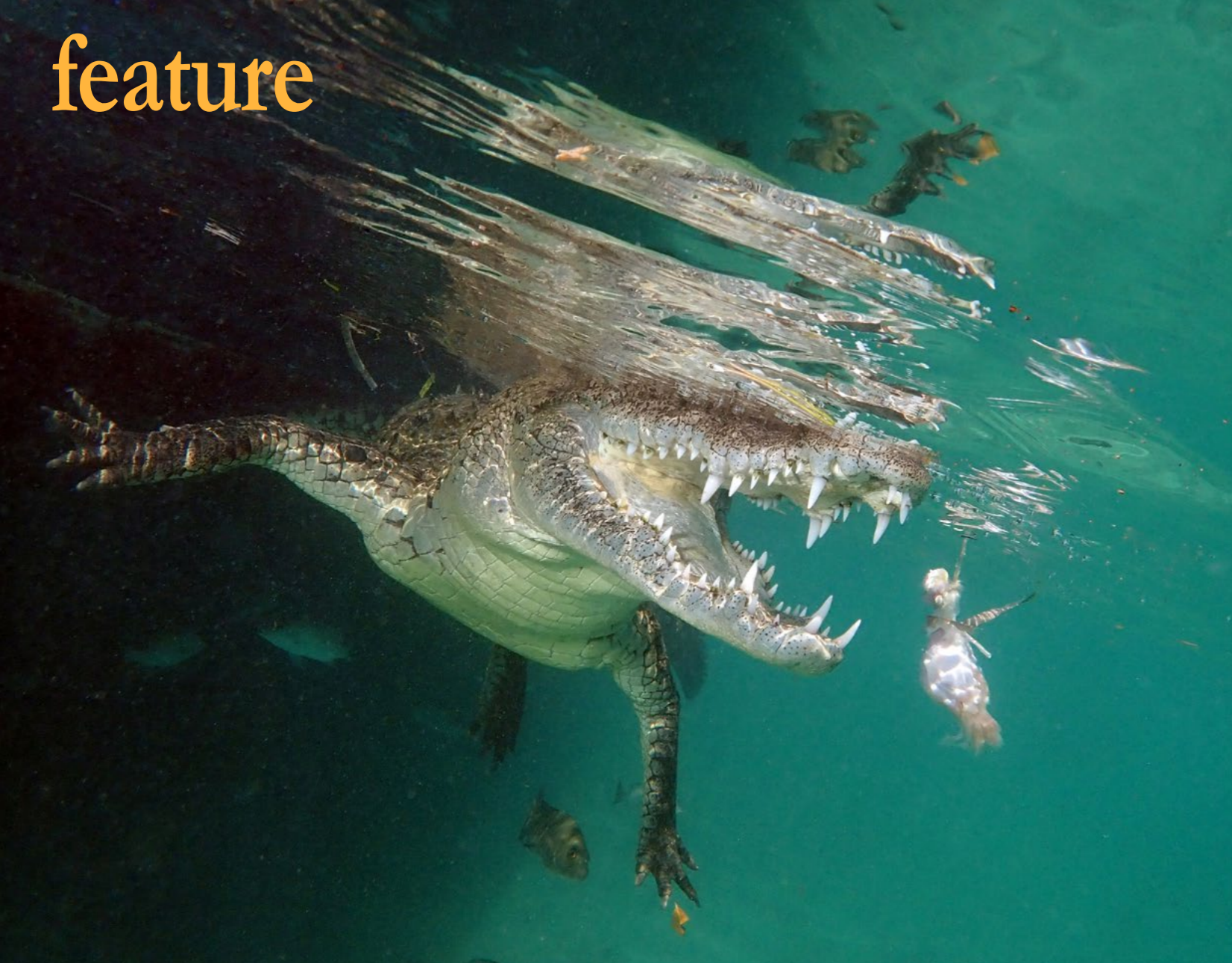
we Russian participants followed the Cubans' lead and started shouting: "Genie, come out! Hey, you! Come out, floating log! Tram-ta-ra-ram!"

And "His Excellency" appeared from the mangroves, leisurely swimming to the boat, where on the side, a piece of chicken splashed seductively. As it swam, the whole group of us divers (having forgotten our initial fears) gleefully jumped into the water, cameras in hand. There was no organization here: crocodile, flippers, arms, chicken and photo equipment were everywhere, flailing and causing the sediment to rise up, clouding the site. In short, it was 39 minutes of chaos. In the end, the cheeky crocodile stole the chicken and escaped into the mangroves! In



Dive boats (above) moored in the mangroves of the Gardens of the Queen where American crocodiles can be found (top left); At the surface, they often look like floating logs with legs (top right)





American crocodile lunges after a bait of chicken used to lure the animal out of its hiding place in the mangroves.

the evening, we each reviewed our shots and got depressed. They were all just a mess.

A new approach

So, we decided to repeat the shoot, but firmly agreed on mutual understanding and coordination. Our Cuban dive guides gave us the go-ahead for another round, or as many as we needed. Dive guides and divers came up with a method devised on a human basis, and everyone agreed to the plan of circular shooting in turn. Each photographer was given two to three minutes to shoot, then the next one would take a turn, and in

this way, we would avoid the crush and turbidity of the first experience. Doing this, we each could do several rounds, until the plan was exhausted. We could also watch our colleagues, and gain new perspectives.

For proper buoyancy in this type of shallow dive, we found that one needs to wear a belt with a couple of weights. One also needs to use a snorkel. Usually, diving here is done without scuba gear, and it is important to choose the right load on one's weight belt.

On full inhalation, you should be able to float slightly, and upon exhalation by one-quarter, your

buoyancy should become zero. This allows you to observe the crocodile from the sea bottom without touching the silty sea floor, but remain in the water column, thus avoiding lifting up sediment into the shot with your fins. In this case, you must very carefully sink to the bottom without raising turbidity, taking into account any water current. It is also a good idea to consider the position of the sun in the sky for the desired lighting effect in your shot. Lastly, one has to adhere to agreements and not interfere with colleagues.

In addition, we followed the directions of our Cuban dive

Local Dive Shops are the backbone of our sport. They are the gateway to training, the place where you meet dive buddies, get your tanks filled, book dive vacations, and of course purchase new dive gear. Being a small family run business ourselves, we understand that dive shops need your support now more than ever. We encourage you to support them any way you can to help keep our beloved sport growing.

SUPPORT YOUR LOCAL DIVE SHOPS



*Safe Diving,
Team Dive Rite*





Snorkeler (left) with American crocodile over sea grass (bottom left); Gaping mouth of crocodile displays a large set of sharp teeth (above)



guides, who ensured the safety of the dives. All the same, the mouth of this crocodile “Ninyo,” and the teeth found therein, were a terrifying sight.

This time, the crocodile was ready. Apparently, it really liked yesterday’s chicken, and it immediately swam toward us. Then, each of us took turns implementing and polishing our individual shooting techniques to get the shots we wanted. We each did at least two rounds, sometimes three. Visibility remained clear, and our Cuban dive guides ensured dive safety from the side of the boat, watching from above. In case a tricky situation arose, the crocodile could be led away with a long pole (resting on the tail) to the side or back. The process

went well, and everyone got the full program.

In short, it was both scary and funny. On one attempt, I tried to get closer to this reptile, by 30cm, and it came to me on its own. At this point, our dive guide pulled it back a little, very carefully, several times with the pole. It was a bit odd, watching the crocodile, poking out its talons, rowing its legs and feeling out of place—it seemed like it was yelling expletives. Then, it gaped as the chicken teased it. The mouth is just creepy, especially when it was opening and drawing closer. For some of my other colleagues, the crocodile simply clung to the acrylic spherical port, or discharge port, of the dive boat.

Afterthoughts

While there were moments that felt on the verge of being a circus, ultimately, everyone got quite decent results from their photo sessions with the crocodile. Well, some footprints were visible in the photographs, but I think that this experience was useful to anyone who wanted to give it a try.

Yes, it was expensive, far away, and difficult to get a good shot, but it was a once-in-a-lifetime experience! The thrill was definitely unique—as were the photos we got in the end. ■

Vladimir Gudzev is an avid diver and underwater photographer based in Moscow, Russia.



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Edited by
Rosemary E. Lunn

Equipment

Scubapro D420

Scubapro's D-Series second stage regulators have always had a unique "Marmite" look. (You either love or hate it). Their D420 is no exception. Never mind the aesthetics, this "high-end second stage with an exceptional breathe" was launched in December 2019. It is now shipping. Apparently, the breath has a lot of torque behind it, with the gas being delivered very naturally, and you know there is more if you need it. Apparently, this is down to the Progressive Flow Control Valve. It delivers abundant air-flow with a natural smoothness. Scubapro has said the D420 has great exhalation, and part of this is down to the precise shape of the exhaust tee. The D420 has a fibreglass-reinforced nylon case with a massive, easy-to-find and use ergonomic purge button. It makes no difference if you are left- or right-handed, diving a thick mitt or bare hand. It is one of the simplest regulators out there to switch from right- to left-hand orientation. A technician can swap or reverse the hose from left to right in a couple of minutes. See the video at: [youtube.com/watch?v=XX6mbUwefno](https://www.youtube.com/watch?v=XX6mbUwefno). Or go to: [scubapro.com](https://www.scubapro.com).



SorbPour CO₂ keg adapter

From the Cayman COVID-19 curfew comes a concept and subsequent culmination of a utensil that will appeal to rebreather divers everywhere. In fact, I foresee that the SorbPour will be a handy gadget on CCR expeditions, and a necessary tool for dive centres that cater for CCR divers. Simply remove the screw-on cap from a 20kg keg of 797 sorb and replace it with the SorbPour. Then place the keg onto a shelf and secure it in such a way that it cannot fall off. To fill your scrubber, just place it beneath the spout and push the lever open. This actuates the iris paddles inside the spout, allowing you to control the flow of the sorb. When your scrubber is full, push the lever home. No more wrangling kegs. No more split sorb. It is worth noting that the SorbPour is not an airtight valve; hence, it is recommended that you do not leave your sorb unsealed. Between dive days, remove the SorbPour valve and replace it with the keg screw-on cap. [techdivinglimited.com](https://www.techdivinglimited.com)



KUBI Icelandic wool thermal inner gloves

It is currently winter in the southern hemisphere—#SnowmanTime—a fact that cave explorer Josh Bratchley recently confirmed in a social media post from the Falklands. Having dived these islands in the summer, I can only imagine just how harsh it is there at present. You will certainly need a decent pair of dry glove liners if you are venturing underwater there. So, it is a good thing then that KUBI has unveiled a new range of inner gloves made of grey Icelandic wool. This wool is unique. It dates back to the 9th century AD when early settlers brought Norwegian sheep to Iceland. The sheep have not mixed with other breeds for centuries; hence, today's offspring are very hardy, and capable of coping with the country's extreme and harsh weather patterns. The secret? Their special wool. When the unique fibres are combined, the resultant garment is warm and possesses water-resistant properties—just what you need in a pair of thermal gloves. With remarkable protection against both the cold and wet, these gloves are available in three sizes: small, large and extra large. [kubistore.com](https://www.kubistore.com)

Ocean-friendly disinfectant

Our entire world has been turned upside down by coronavirus. We now have to run new protocols in several areas of our lives, including when disinfecting our dive equipment. The training agencies have proactively issued guidance to individuals and dive centres to help minimise the risk of COVID-19, and this includes effective equipment sanitisation. There are a number of solutions on the market—the latest is from Fourth Element. The company has partnered up with The Diver Medic and created GoodToDive. This powdered product dissolves, and is effective in both fresh and salt water. The resulting oxidising reagent can be used to disinfect masks, regulators and BCDs. What is even better, it can then be safely discarded without damaging the aquatic environment. (This is not possible with several commonly used disinfectants which can be toxic to aquatic life—hence, these have to be disposed at a recognised waste disposal facility). Once gear has been disinfected with GTD, the user can apply paper-based tape to show that the kit is clean, giving the end user peace of mind. [good2dive.com](https://www.good2dive.com)



Dive Rite O2ptima CM

Dive Rite's design philosophy is simple. The company's O2ptima CM "chest-mounted," fully electronically-controlled "eCCR" had to have a breathing loop that was as "short as possible." It needed to use proven state-of-the-art electronics, and the rugged, durable unit had to be as small as possible. The result enables adventurous divers who are interested in underwater cave exploration. You just use four bolt-snaps to attach this compact unit to almost any harness. Dive Rite states "this simplicity allows for limitless possibilities of use." In other words, it is easy to dive with sidemount, back-mounted twins or doubles, or a single cylinder. This self-contained CCR has been third-party tested, and weighs in (without scrubber or cylinder) at 6.5kg/14.4lbs—making it very attractive to the travelling diver. Dive Rite has chosen Shearwater's respected electronics; hence, it has a redundant DiveCAN, HUD and Petrel 2 controller. It uses onboard oxygen, and you plug in your existing offboard diluent gas. The word on the street is that since this unit was launched, Dive Rite's order book has gone nuts. [diverite.com](https://www.diverite.com)



Text by Matt Jevon, MSc, F.IoD.

For most of us in lockdown during the coronavirus pandemic, being away from diving in itself is enough to cause withdrawal symptoms. Sometimes, factors such as work, weather and lifestyle can mean that we take longish breaks, although I do not think anyone has taken such a long break before—certainly not one that left no choice and one that required significant lifestyle changes and restrictions. It has caused many of us to re-examine our approach.

The first thing to remember and accept is that the sense of frustration and even anger you might be feeling is normal. The situation is unprecedented, and it would not be reasonable to expect calm acceptance. Once you accept that these are OK feelings to have, instead of being caught up in these emotions, you can start to plan how you will cope. If

you are struggling with this, reach out—first to trusted friends and then to a professional, if needed. Online psychological support is very effective—no laying on of hands needed!

Look after your mental and physical health. Do not get caught up in

work, or worse, daytime TV. Get out if you can, exercise, eat well and mostly healthily! Relax and spend time—even if only online—with people you love and respect.

Have a plan for each day. It does not need to be the same routine every day,

unless that suits your psychological make-up (it would drive me mad!); however, the days and weeks will get away from you if you do not bring some focus into your time. I tend to map out the three “must-do’s” for each day and allocate specific times to do these. Then, I plan

a bit of “me” time: relaxation, exercise, guitar practice, etc. I try and limit social media and TV, otherwise, these can become a real time soak.

For divers, build in something dive-specific into your daily routine. A few ideas follow:



Surviving Lockdown

Tips for Divers

ILLUSTRATION COMPILED WITH PUBLIC DOMAIN IMAGES

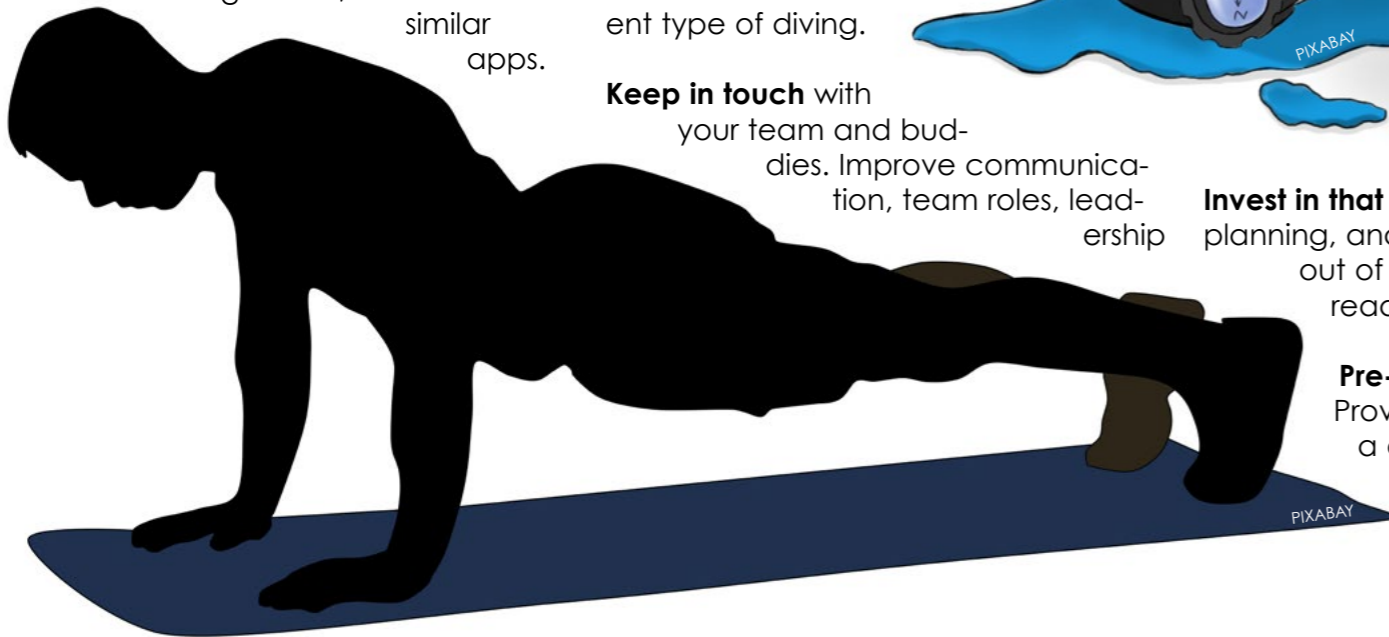
Plan A

Do things that will enhance and improve your diving when you can go back to it. There are a huge number of options from which to choose:

Get fitter. This will make a great improvement to your comfort, skill and safety. Pay attention to strength and movement as well as aerobic fitness. Despite what many would have you believe, strength and power are important elements in diving, as they improve muscle structure and function, and blood composition.

Take some continuing education.

Online courses and webinars are now plentiful. Online learning is available from most dive training agencies. Lots of instructors are offering online instruction, in small groups or one-to-one, using Teams, Zoom or other similar apps.

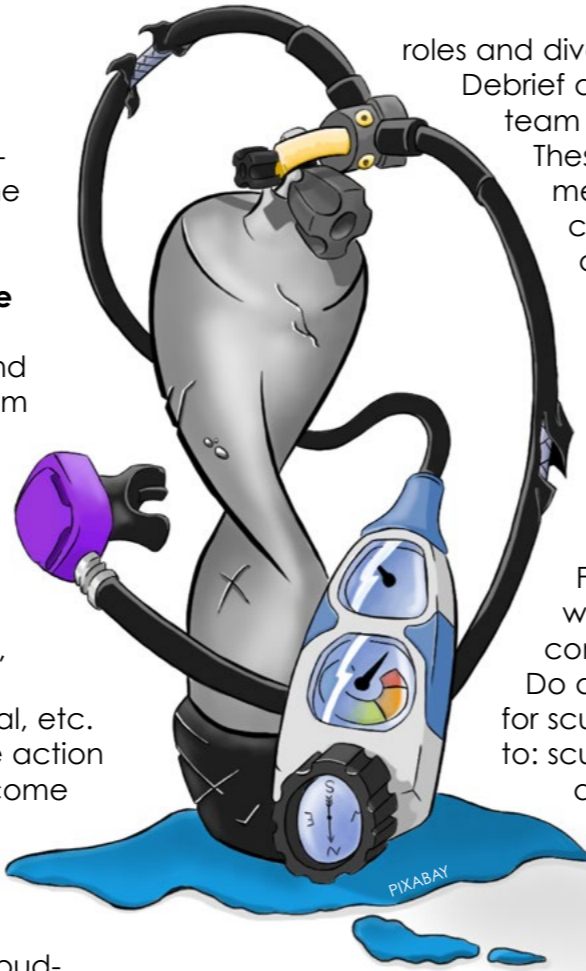


Service, clean and maintain your dive kit, maybe using the online help of authorised technicians or the manufacturer.

Reconfigure your dive kit to be more functional, streamlined and dive-friendly. Help from instructors online will be useful.

Be inspired. Read, watch and research different types of diving: cave, wreck, reef, ecological, ghost net removal, etc. Make plans and take action to experience or become trained in a different type of diving.

Keep in touch with your team and buddies. Improve communication, team roles, leadership



roles and dive protocols. Debrief again with the team your last ten dives. These dives are great memories and a chance to identify and make improvements individually and as a group.

Work on your psychological and mental skills. Look at @PSTforDIVING on Facebook (<https://www.facebook.com/PSTforDIVING/>). Do a Google search for scuba-psyche (or go to: scubapsyche.com) and human factors in diving (or go to: thehumandiver.com).

Invest in that new kit you have been planning, and get used to its operation out of the water—maybe even read the manual!

Pre-book a skills review. Provisionally, book and pay a deposit on a skills review session with your instruc-

tor to bring you back up to your highest qualification. You will be helping an instructor, who probably has no money coming in, by paying a deposit and also have something to look forward to, which will be challenging and rewarding for you.

Plan B

Read back over your logbooks. See, there is a good reason to keep these. Pick out some highlights in your dives and make plans to return when travel restrictions lift. Enjoy the memories and experiences. Look at the pictures and videos if you took any.

Start saving for a bucket-list level trip in 2021 or 2022. You will be more certain of going and very excited if you are planning and working towards the dream. I know many are financially pressured. If so, make it a longer-term savings plan.



IN AN EMERGENCY, YOU MAY HAVE ONLY MOMENTS TO RESPOND.

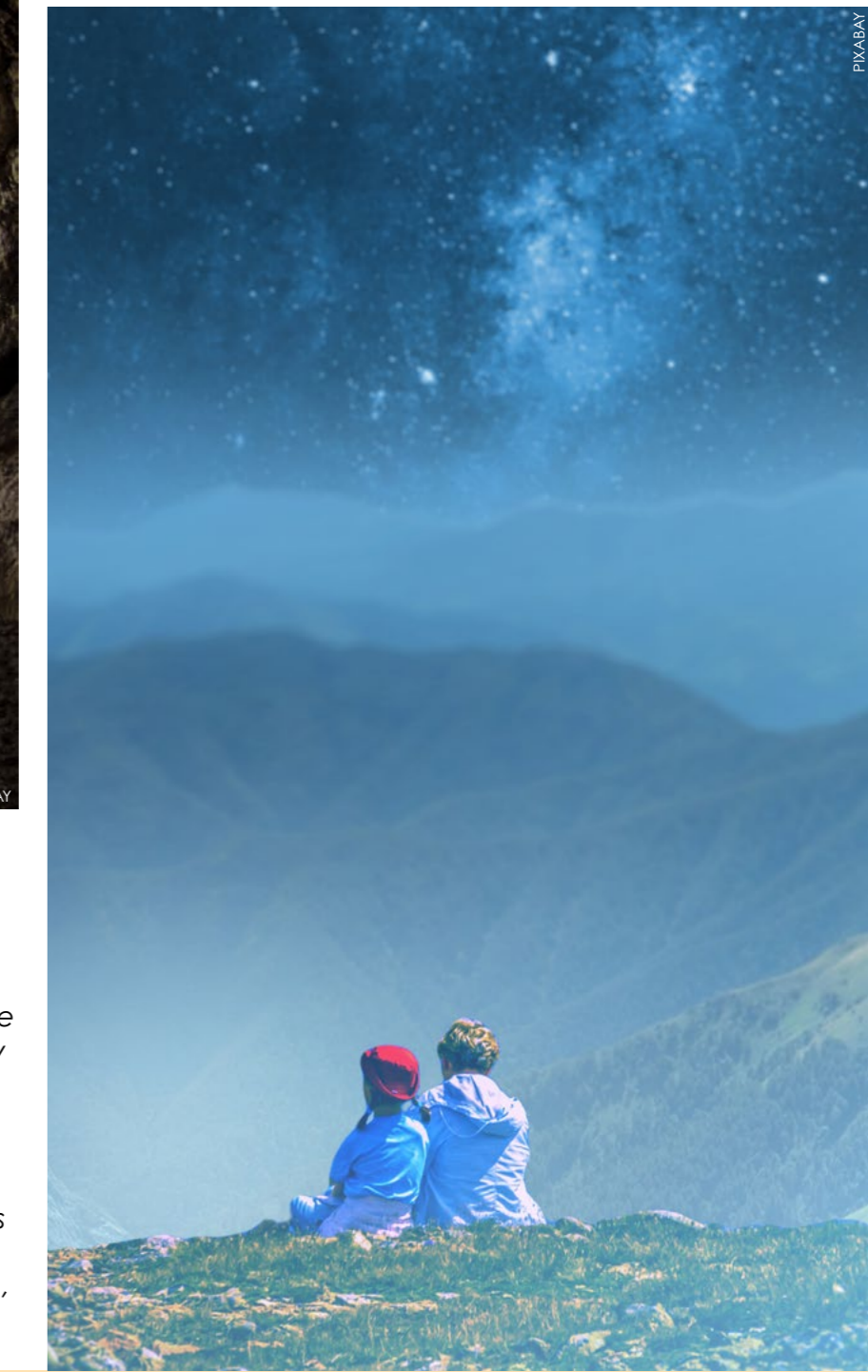
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COVID-19



Make a plan to revive a trip you have had to cancel and were looking forward to. You do not need to be certain of dates at this stage, just confident that, yes, it will happen.

Positive changes

Many people have used the time that the pandemic restrictions have created to review their lifestyle, work practices and more. They have made positive decisions to make changes for the better, to be doing more things they find rewarding, as well as stopping things that were sucking up time,

energy and resources and not adding to their quality of life. Spend quality time with people who matter to you. Get outside more, exercise more—many of these should be part of your forward look as restrictions ease.

Most importantly, avoid the phrase “back to normal.” Not only will we not be back to whatever normal was very soon, but we may never return to it at all. Not returning to normal should be a good thing for a lot of people—especially, if we take time to get a grip now.

Finally, diving is not all of life. Smell

the roses, improve the house, give love, time and attention to those nearest and dearest to you. *Have fun!*

■
Matt Jevon, M.Sc. F.IoD, is a Full Expedition level Trimix and Cave Instructor on open circuit (OC) and closed circuit rebreather (CCR) with TDI and ANDI. He is the JJ-CCR and Divesoft Liberty Sidemount instructor and dealer for Ireland. In the past, he has done cave exploration in the Philippines, wreck projects in Croatia and Ireland, as well as being one of

the inaugural dirty dozen in Truk. He has held accreditations as an interdisciplinary sports scientist, a sports psychologist with BASES, and was a British Olympic Registered Strength and Conditioning Coach and invitee on the Olympic Psychology Advisory Group. He works in high performance business as a board advisor and non-exec in high performance sport and is a partner in South West Technical Diving in Ireland. He writes the Facebook page Psychological Skills for Diving. For more information, go to: swt.ie.



Text by Simon Pridmore
Photos by Andrey Bizyukin

— The Scuba Confidential column in this issue is adapted from a chapter in Simon's book *Scuba Professional: Insights into Sport Diver Training & Operations*.

“Wait, wait,” you may say when you read the title of this column, “What are you talking about? Aren’t those two things the same? Isn’t a dive instructor by definition a scuba professional? And what do you mean by ‘Road’?”

A professional is someone who gets paid for plying a trade. At the point when you become a dive instructor, you may have done a lot of paying, that's for sure, but it is unlikely that you will have seen any cash coming your way yet. What you have achieved when you successfully complete your instructor course is the acquisition of a title that you can use on your business card. You have a few more steps to take before you have a profession—hence, the concept of a road to take.

As a new instructor, you are but one of



Going Pro

Part II: The Road from Dive Instructor to Scuba Professional

a host of fledgling scuba instructors who have just been released into the diving world. Out there, ahead of you in the pecking order, are the countless multitudes of scuba instructors who preceded you.

Actually, that is not the case. Most of

those that passed this way before you are no longer working in diving.

Why is this the case? Here are a few possibilities:

- They only did the course for the card.

- Their drive and enthusiasm fades once they have achieved their goal.

- Their friends did not want to pay them for teaching them to dive.

- It is harder than they thought to find other people to sign up for a course.

- Working in diving is tougher than they thought it would be.





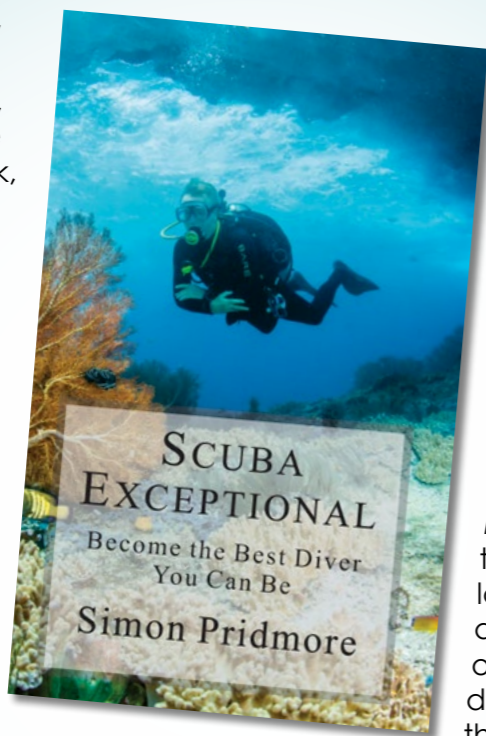
- Working in diving does not pay as well as they thought it would.
- They find out that it is actually diving they like, rather than teaching, and that as an instructor, they do a lot of teaching and not much diving.
- They discover that they do not know as much about diving as they thought they did, and suddenly, as an instructor, they feel they are supposed to know everything, which makes them very uncomfortable.

A New Book for Scuba Divers!

Scuba Exceptional may be the fifth in Simon Pridmore's *Scuba* series, but it is actually the true follow-up to his first book, the best-selling *Scuba Confidential*.

The philosophy of safer diving through the acquisition of knowledge and skills is the same, although this time the themes are different. As before, Pridmore provides us with a whole host of extremely useful advice and techniques, illustrated by real-life experiences and cautionary tales.

The focus this time, though, is more on issues that experienced divers face. There is more technical diving content, and Pridmore covers some relatively complex issues in his usual clear and easy-to-read style. In many cases, the issues that concern technical divers reflect those that affect scuba divers at every level. After all, as Pridmore writes, technical diving is on the same spectrum as conventional sport diving:



It is just a different frequency.

Scuba Exceptional also deals in more detail with the psychological approach to scuba diving, broaching familiar topics from new angles and borrowing techniques and procedures from other areas of human activity.

While most of *Scuba Exceptional* focuses on the diver, it also takes a look at the wider picture and highlights a number of areas where scuba diving professionals and the "industry" as a whole are letting divers down.

As always, Pridmore is realistic in his assessments. He may shine a little light on the dark side of the scuba diving world, but he does this in order to illuminate bad practices and encourage change, while offering solutions.

Scuba Exceptional: Become the Best Diver You Can Be by Simon Pridmore is available on: [Amazon.com](https://www.amazon.com).



One or a combination of these factors is usually what causes new instructors to drop out of the game. Of course, a lot of this has to do with the fact that people often sign up to become an instructor without really understanding what is involved. I wrote about this in my article "Going Pro—Part One," in issue #98 of *X-Ray Mag*.

Anyway, assuming you have become a dive instructor, are happy with your lot and have no intention of giving it up, what can you do to try to ensure that you will be one of those happy few who end up enjoying a long and fruitful career in this wonderful sport? Here are a few top tips.

Keep learning

Practise your personal diving skills constantly. Then, at the point when you think your skills are perfect, practise some more. Everything you do in the water

needs to be absolutely instinctive in order to permit you to devote 100 percent of your attention to your students and/or the divers in your charge. Dive as much as you can, in as many different environments and conditions as possible. Stay within your personal comfort zone but try to push the envelope out little by little. When you pass knowledge on, you are more credible if you speak from a reservoir of personal experience.

When you teach, do not just parrot what the manuals say. Make sure you understand the background to what you are telling people. Read widely, especially books about the psychology, physiology and decompression theory in diving. Do not get fixated on established protocols. Be open to new ideas and ways to do things, but question everything.

Build on the basic underwater management and control skills you were taught on your instructor course. Learn

to observe and interpret behaviour so you can anticipate problems before they occur. Seize upon any chance that comes along to work with and learn from more experienced colleagues. Such opportunities are rare in scuba diving as most instructors work alone—but, if you get lucky, make the most of it.

Undertake more diving courses. Look particularly at technical diving, diving in wrecks, in caves or under ice. Even as an experienced scuba instructor, you may feel like a complete beginner again, but embrace the challenge. When you return to single cylinder no-decompression-stop diving after training like this, you will be astonished at the new levels of competence you have acquired.

Work on your employability

If you do not already have a commercial background, then do some small business courses so you understand at





opinion

least the basics of accounting, marketing, staff management and maintaining cash flow. Dive centres, liveaboards and resorts are primarily businesses after all.

Review the life skills you may have acquired elsewhere over the years. Operators of dive liveaboards and resorts love to take on people with a hospitality background. All

dive operations have a lot of machinery, from regulators and rebreathers to compressors and boat engines, so if you have mechanical or engineering skills, you will be much in demand. The same applies if you can speak multiple languages or have studied marine biology. All these things make you more employable and will help you negotiate better pay and benefits.

Look after the pennies

Many instructors drop out of diving because they have not taken their finances seriously and are forced to leave the work and the life they love and return to the non-diving world simply on economic grounds. This is usually because they have not approached their work and career in a professional way. They have not

taken a long-term view.

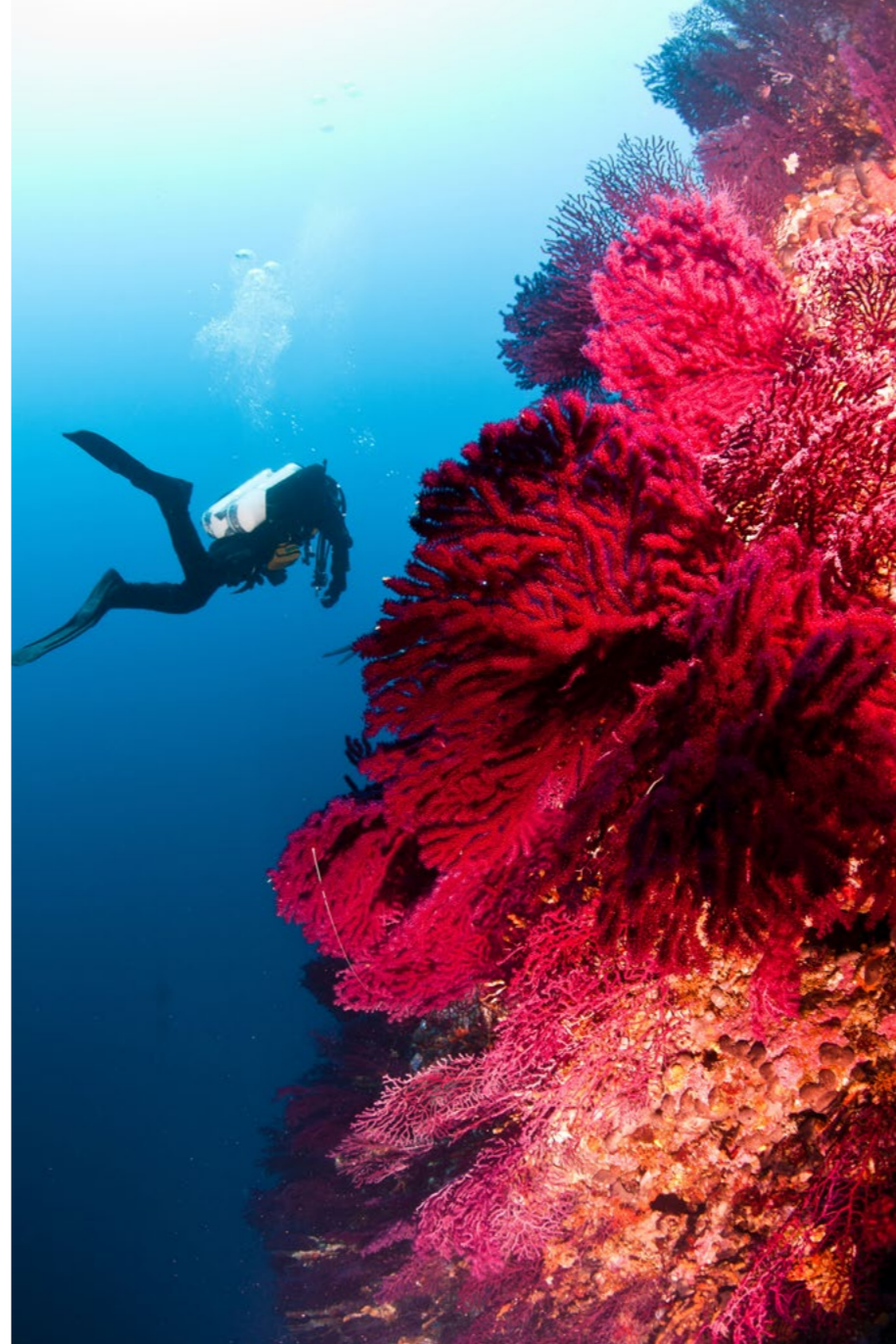
Scuba diving jobs are not well paid. But that does not mean that you need to struggle. Often, your work takes you to remote places where there are few entertainment options and, although your wages may be small, your board and lodging will be provided free of charge, so you will have no expenses. There is a good chance too that your wages will be supplemented by tips.

People react to this lifestyle in one of two ways. Some spend their time in paradise just dreaming of being elsewhere and planning what a great time they are going to have when they get back to "civilisation." They then blow all their money on entertainment and new toys, returning to work a couple of weeks later penniless.

Others take advantage of the opportunity to save their money, start up an investment portfolio or buy a small apartment back home to rent out and make a little extra. Meanwhile, they look ahead in their career and make a plan to perhaps become an industry leader or even one day start their own dive business and become an employer rather than an employee.

Takeaways

Being a dive professional is an exciting career and can bring



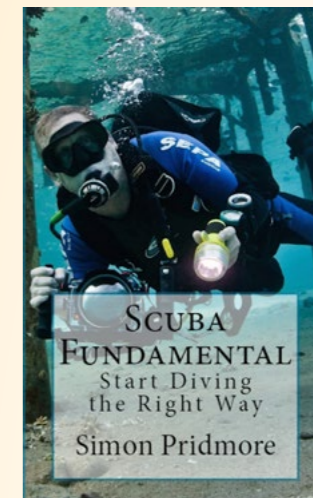
enviable lifestyle rewards. But it takes focus and determination to succeed. You need to work at it, as you would in any other walk of life. Be ready and willing to learn and progress—and always keep an eye on the money. ■

Simon Pridmore is the author of the international bestsellers Scuba Confidential: An Insider's Guide to Becoming a Better Diver, Scuba Professional: Insights into Sport Diver Training & Operations and Scuba

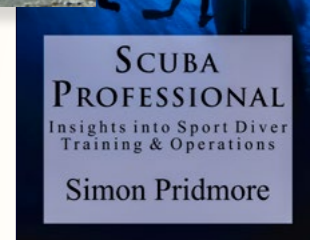
Fundamental: Start Diving the Right Way. He is also the co-author of the Diving & Snorkeling Guide to Bali and the Diving & Snorkeling Guide to Raja Ampat & Northeast Indonesia. His recently published books include Scuba Exceptional: Become the Best Diver You Can Be, Scuba Physiological: Think You Know All About Scuba Medicine? Think Again! and the Dining with Divers series of cookbooks. For more information, see his website at: SimonPridmore.com.

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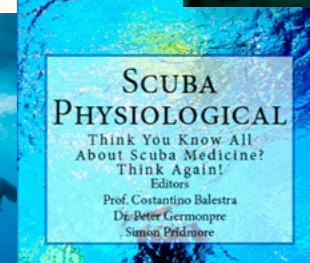
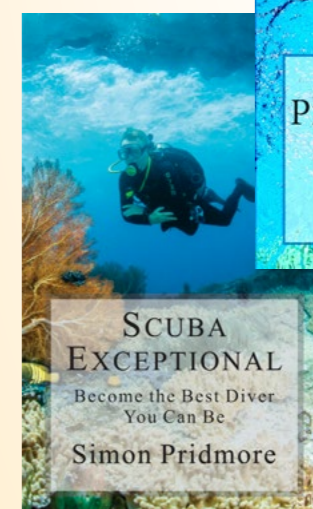
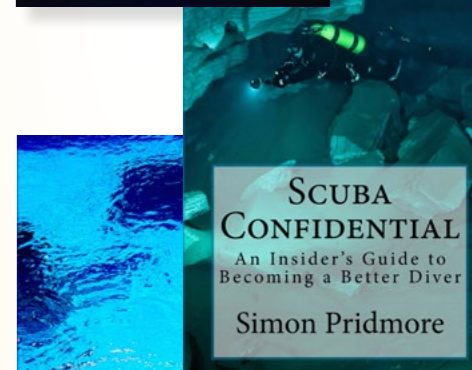
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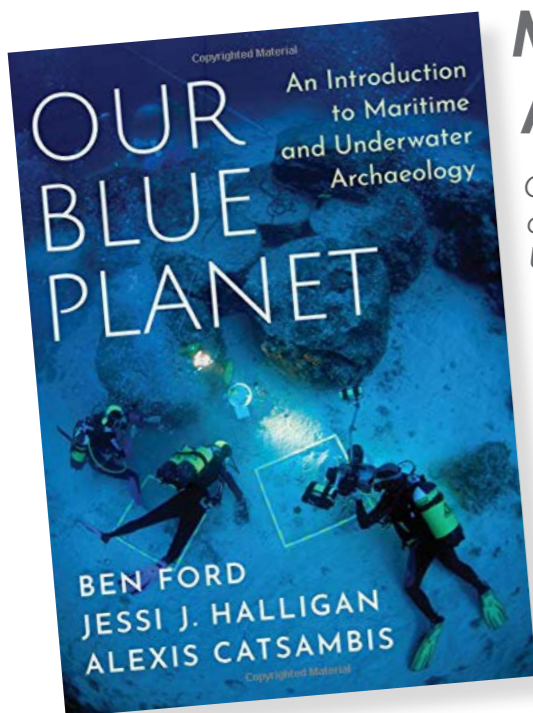
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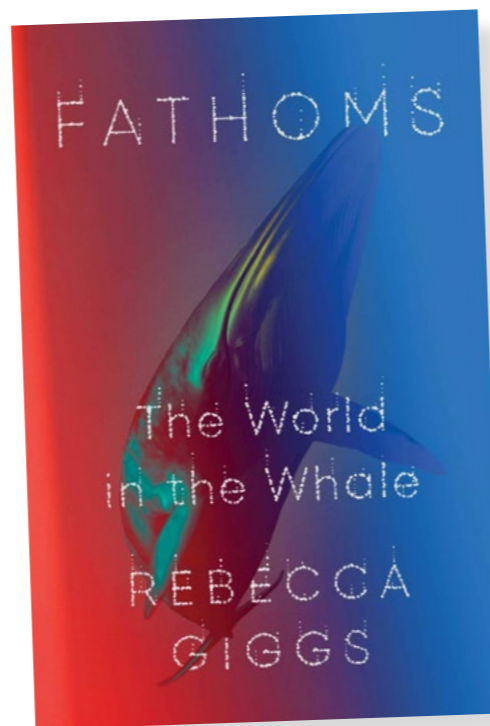
Marine Archaeology

Our Blue Planet: An Introduction to Maritime and Underwater Archaeology, by Ben Ford, Jessi J. Halligan, Alexis Catsambis

Presenting a comprehensive introduction to maritime and underwater archaeology, this book advocates that an understanding of how our ancestors interacted with oceans, lakes and rivers is integral to comprehending the human

past. It covers topics like the methods of finding, recording and interpreting submerged sites, explores human interactions and relationships with the watery world, development and exploration of shipbuilding technology and the lives of sailors, and concludes with how and why the non-renewable submerged archaeological record should be managed, so current and future generations can learn from the past.

Hardcover: 488 pages
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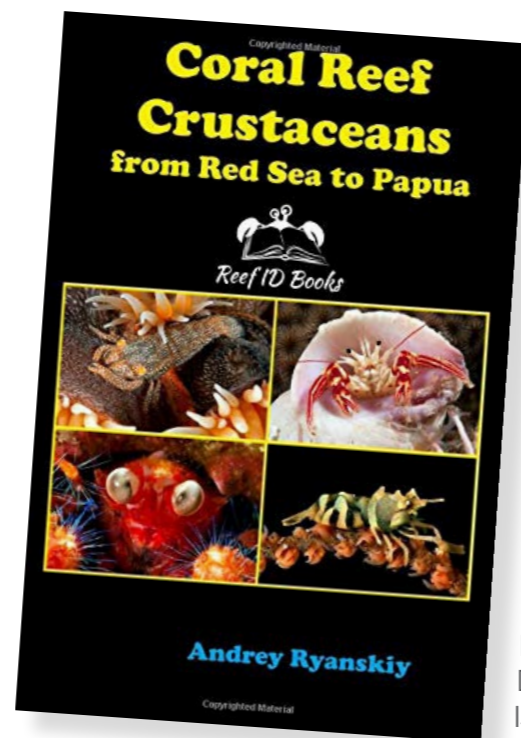


Whales

Fathoms: The World in the Whale, by Rebecca Giggs

Author Rebecca Giggs has written a deep meditation on the lives of whales, revealing what they can teach us about ourselves, our planet and our relationship with other species. This book blends science, natural history and philosophy to explore how whales experience ecological change; how whale culture has been both understood and changed by human technology; and what observing whales can teach us about the complexity, wonder and fragility of life. Read about whales so rare they have yet to be named, whale songs that reach across hemispheres, and whales that have changed the chemical composition of the atmosphere. Learn about Japanese whaling ships and how plastic pollution permeates the oceans. Giggs addresses what it means to write about nature during a time of environmental crisis and outlines the challenges as we try to understand the perspectives of other living beings, and our own place on an ever-evolving planet.

Hardcover: 352 pages
Publisher: Simon & Schuster
Date: 28 July 2020
ISBN-10: 198212069X
ISBN-13: 978-1982120696



Crustaceans

Coral Reef Crustaceans from Red Sea to Papua, by Andrey Ryanskiy

This is an identification guide for more than a thousand species of tropical Indo-Pacific crustaceans, covering the region from the Red Sea to Papua New Guinea. It features over 1,140 species of shrimps, lobsters, crabs and other crustaceans, more than 500 of which have not appeared in field guides or popular books before. Small and compact, this book has an extensive photo index at the beginning to aid in visual identification. Available in paperback and electronic formats.

Paperback: 150 pages
Publisher: Andrey Ryanskiy
Date: 28 April 2020
ISBN-10: 560420496X
ISBN-13: 978-5604204962

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False killer whales were so-named by scientists in the 1800s because their skulls were similar in shape to those of killer whales.

First sighting of false killer whales in Aegean Sea in 25 years

Local fisherman spotted and video recorded eight false killer whales in open sea, six miles off Imbros Island in Turkey. Though this species is primarily found in tropical and temperate waters around the world, it has been decades since they have been seen in the northern Aegean Sea.

The observation was announced in the *Journal of the Black Sea / Mediterranean Environment* by Dr Arda Tonay of Istanbul University and three colleagues, who viewed the recordings. "These endangered whales are rare and completely harmless," said Tonay, "There are 89 different whale and dolphin species. Thirteen of them can be seen in Turkish waters. For the last 30 years, there were less than 20 records of these whales in the Mediterranean." Tonay added, "In the Aegean Sea, this is the first time in 25 years."

According to Tonay, one of the deepest points of the Aegean Sea is found at Imbros, so it would not be unusual if false killer whales and other whale species were spotted around the island. The recent observations are significant in that they help scientists better understand the species' distribution and regional biodiversity as well as how to protect them. False killer whales are threatened by longline fishing and listed as a "Near Threatened" species according to the IUCN Red List. ■ SOURCE: HÜRRİYET DAILY NEWS, J. BLACK SEA/MEDITERRANEAN ENVIRONMENT



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Ornate butterflyfish

Text by Ila France Porcher

For many years, I held a weekly feeding session for the resident reef sharks and their visitors in the study area where I observed their behaviour. If I had enough shark food, I would scatter crumbs into the water for the fish after the sharks had left. The fish knew this, so they had to wait, and while they were waiting, they were excited.

As the session wore on and darkness fell, they gathered. They would creep ever closer as the moment I would feed them approached. The surface glimmered with the continually circling needlefish, who looked at me gravely with their big eyes. Hundreds flashed through the silvery surface lights while some circled solemnly upcurrent. Below them, wrasses, goatfish, butterflyfish, angelfish, pennantfish and many others flitted in an effervescent cloud. Fish hovered in front of me, turning to look first with one eye, then the other,

while upon the ledges and in little nooks in the coral were rock cod and stonefish, looking at me expectantly. To my left was a deep grotto where crimson squirrelfish hung motionless, gazing with huge black eyes, while below them were large

groupers whose purple bodies were covered with stars that shone in that dim light.

They became impatient if I waited too long to start feeding them, and intermittently would swim up to my mask to get my attention, flutter around my

hands, and gesticulate in an agitated cloud in front of my eyes. For a long period, one butterflyfish spent much of its time in front of my mask at each session while I watched the sharks—whenever I looked up, it would be peering in at me.

Self-awareness

That these animals would make an effort to attract my attention suggested that they understood what attention was. They knew that while I was watching the sharks, they did not have my attention. They too must have a

focus of attention that they are aware of using, or they would not have understood this. Such insight is connected with self-awareness.

Those fish knew the routine and the passage of time, and when I swam down to pick up a scrap for them, they surrounded me.



Seeking Eye Contact

— *Fish Gaze Reveals Self-Awareness*

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COURTESY OF ILA FRANCE PORCHER

Sea turtle with school of jack fish (left); Goatfish (below)

Interaction

Months after I had stopped using that site, those fish were still in the vicinity, and remembered. When I passed through at odd times, I would hold my hands out to them, they swam into them, and I stroked them. I had fed birds all my life, but they never flew down around my shoulders when I went outside. Yet, that was what these exquisite birds of the sea would do.

Initially, the occasional large fish came through the shark sessions. I regularly saw blue jack fish (*Caranx melampygus*), titan triggerfish (*Balistoides viridescens*), and there was even a pair of gorgeous spangled emperorfish (*Lethrinus nebulosus*) who waited at the site each session. They were half-metre long, pale fish, with lavish decorations and

solemn faces, moving languidly in midwater. Giant trevally (*Caranx ignobilis*) occasionally whipped into the sessions, and there was an enormous lone barracuda—likely an elderly individual—who often joined me. But as the years passed, no big fish came any more.

Moorea Island was badly overfished, and though there were “fisheries” authorities there, they would not interfere with poachers. Anyone who wished to make a lot of money was free to plunder as they wished.

Intelligent awareness

Another notable example of the intelligent awareness of fish developed while I was rehabilitating a sea turtle. The marine reptile had recovered from illness well enough to return

to the sea, where it lay around in the shallows near the beach on the property my husband and I owned, in a cloud of fish. When I fed it, the fish ate the tidbits scattering around us. I counted about a dozen species of reef fish among them, but the most mobile and alert were small silver jack fish.

When I went to check on the turtle and feed it, the jack fish appeared around me in the lapping waves as I sat down to put on my mask, snorkel and fins. When I glided out, they surrounded me, swimming in formation with the leaders a metre in front. They escorted me to the sea turtle—I never had any trouble finding it as long as it was nearby.

While I fed the sea turtle, the fish formed a cloud around

Needlefish hung, pointing at me at the surface, from my mask all the way across the open circle of the feeding site.

So, I would scatter a handful of the scrap meat to the squirrelfish and cod, pushing larger chunks deeper for the groupers; spray a handful on the surface for the needlefish; several handfuls around for the wrasses, butterflyfish and goatfish; a handful to my right to the fish waiting there; and then, begin all over again, trying to make sure that each patiently waiting creature got some. I alternately fed them and cruised around, whereon they covered my lookout, searching for crumbs that might have dropped, and accompanied me in a giant, glittering cloud, making it problematic to sneak up on any

shy sharks that might be cruising downcurrent.

For a long period, a yellow trumpettfish stayed companionably nearby and even drifted around the site with me, though it never appeared to be moving. Vertical in the water, and about half a metre long, it propelled itself subtly with its tiny rippling fins. I learnt what was truly motivating it when it suddenly shot vertically in front of my eyes and trapped a rainbow wrasse in its elongated mouth. The wrasse's bright markings were visible through the trumpettfish's transparent, yellow skin as it slowly swallowed it, while its companions fluttered near, watching.

Cooperation

A large school of sea perch attended the shark sessions,

spending their time near the sand and feeding on the scraps, among which they favoured the red ones. These were usually too big for one fish alone, so a group of them would pick one up and carry it into the coral where they could all nibble it in private. Here was a demonstration of cooperation among them.

Once, when there were few scraps, I took the piece away from them and put it back on the pile. The perch came back and took that same piece, carrying it between them again, in spite of the presence of three dozen excited reef sharks. From time to time, I noticed groups of perch moving off with the red scraps when the food was first put on the sand, though usually at the beginning, I was too busy with the sharks to watch the fish.



COURTESY OF ILA FRANCE PORCHER

us, and though they took the particles of food drifting away, there was no greedy rush forward in spite of the hundreds of individuals present. In deeper water, the multispecies school filled the volume of a room.

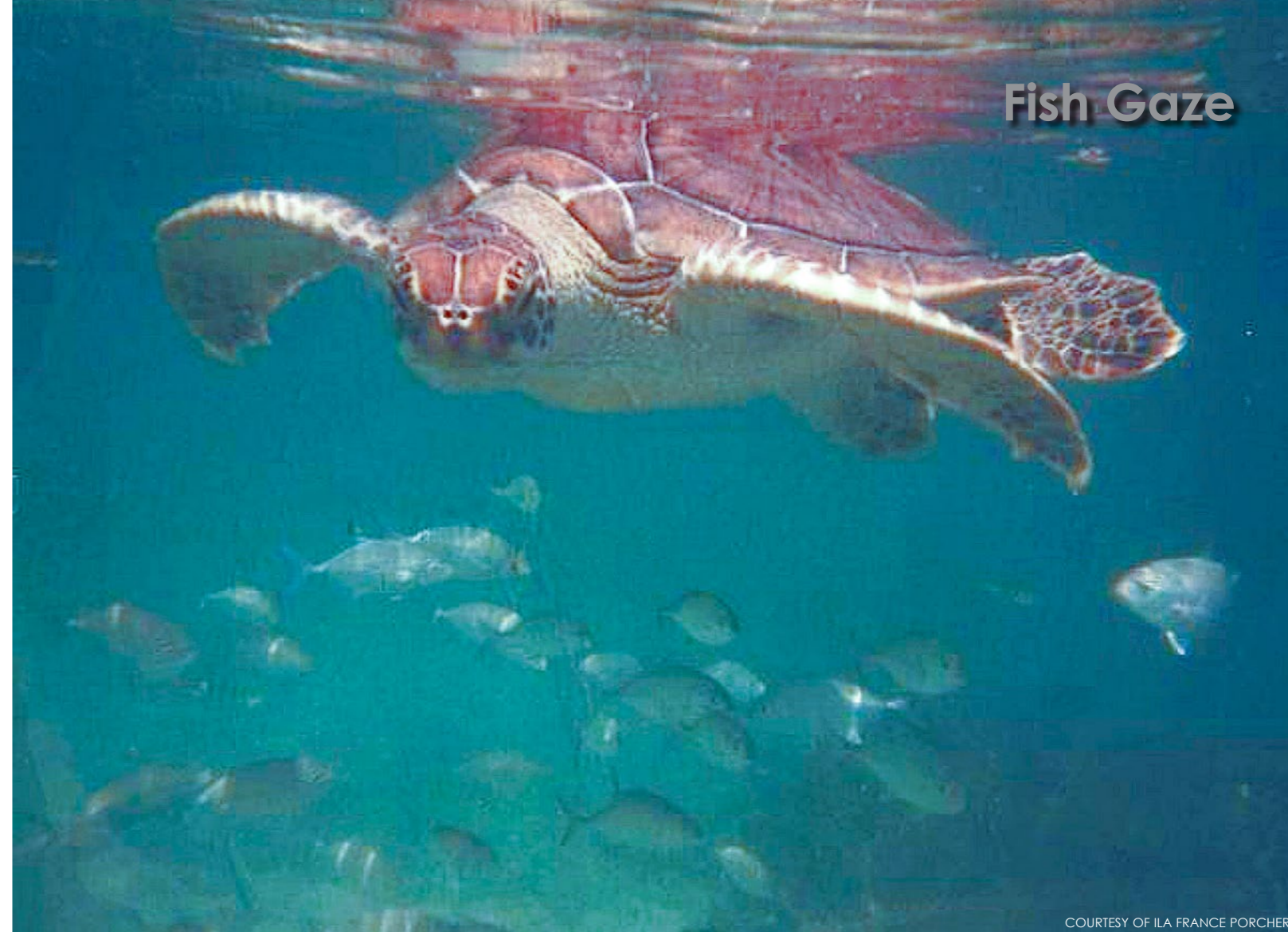
When I returned to the beach, some of the jack fish always came with me, a few taking the lead, while others swam companionably around me. When the turtle and I swam together, they came too, but if the sea turtle roamed too far away, they would not follow. When looking for the sea turtle, scanning the water from the shore, I would often see them coming back, which told me the direction the turtle had taken.

These animals together seemed to form a companionable community, one in which I seemed to be accepted as a participant. Even a stonefish joined us. And a whitetip shark, who hunted the drop-off at the edge of the fringe reef, would perform a circle into the beach as it passed.

There was another beach on our property, about 50 metres away. As the sea turtle extended its range, sometimes it clambered out onto it, and I would go and carry it back. Its fish friends would be at our beach waiting for us by the time I arrived with the turtle on foot. On another occasion, my husband went to fetch the sea turtle in his kayak when it strayed

too far. The fish were swirling around my feet as I waited on the beach, but when the kayak was still 15 metres away, they all went streaming out to meet it!

However, the most striking incident illustrating the faculties of those fish occurred when I was walking along on the large black rocks that lined the shore between the beaches, looking for the sea turtle, one day when it had strayed. The turtle's fish came streaming towards me, and though I was high above the water, they saw me and milled around in the water below. Obviously, they recognized me from beneath the surface, though they had never seen me there before. I



COURTESY OF ILA FRANCE PORCHER



COURTESY OF ILA FRANCE PORCHER

must have looked very different standing on the rocks above, than I did when underwater. Their awareness was surprising.

Debunking myths

Unfortunately, for centuries, fishermen's tales have spread the idea that fish have the sensitivity of wood, and it was not until recreational diving became widespread that we were able to see them pursuing their lives in their own realm. Nevertheless, the idea that fish lack the brains to even feel pain is so widely accepted that it is taking a long time to debunk. So, as a diver, it is important to share your views of fish if you appreciate these enchanting creatures.

Sometimes, circumstances arise that allow us a glimpse into their

inner lives. For example, one day on a dive, my husband and I met an enormous school of yellow striped snappers, each about 30cm long. When they drew near, I became fascinated by the sight of so many hundreds of them so close, blocking my view of anything else, and relaxed in the water, just looking at them. Incredibly, they responded to this by looking back!

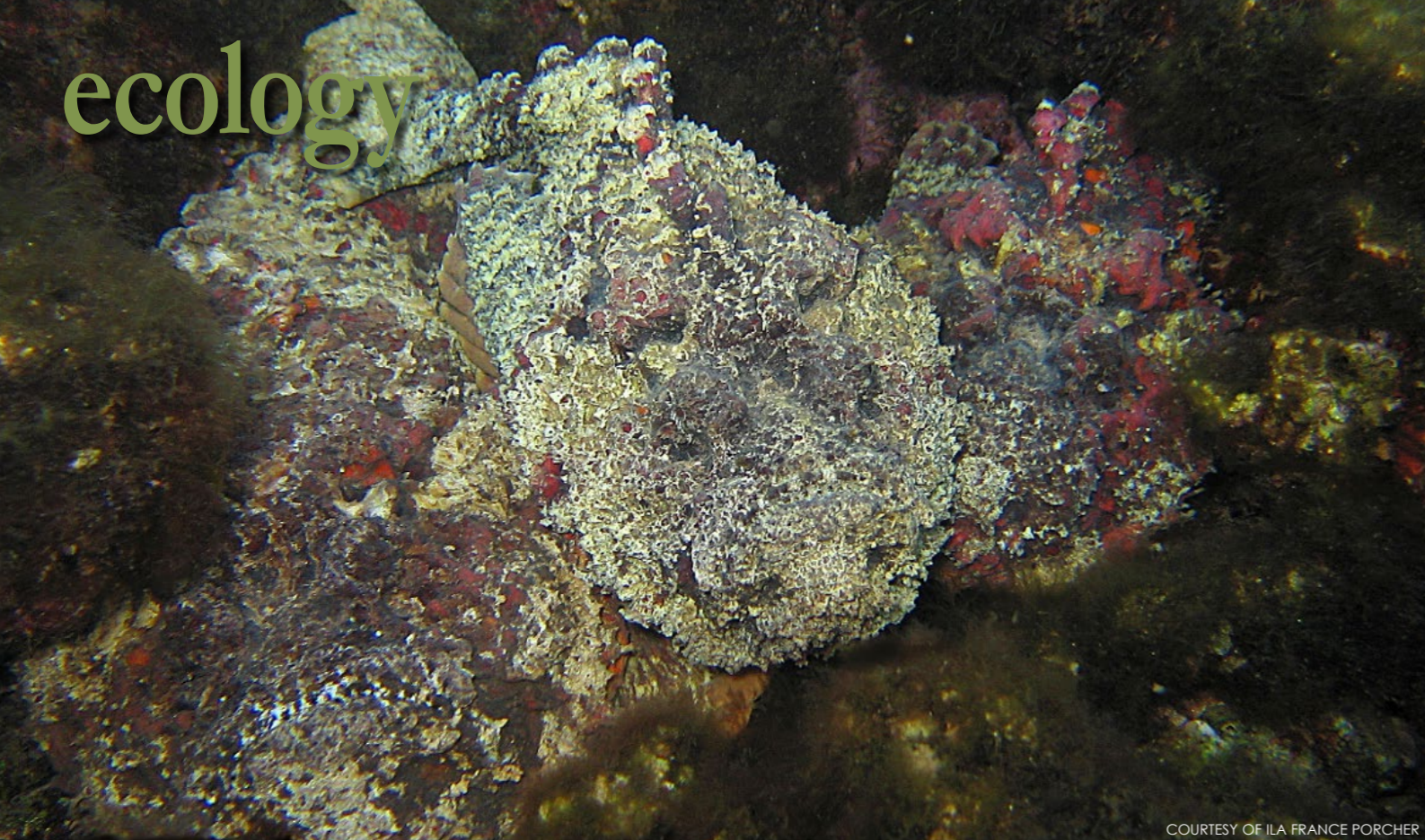
Fish gaze

As I watched, hundreds of fish turned towards me, and one after another, they positioned themselves about 30cm in front of my face, each one taking a deep look into my eyes for a few seconds before moving on. That precise position was then taken by another fish. Their eyes were large

and four centimetres apart, and their look was serious and intent.

Fishes' faces filled my view as they continuously moved towards me to take, one by one, the position directly in front of my eyes and gazed back as I gazed at each one of them. This went on for a very long time and would have continued indefinitely, it seemed, had my husband not come into the cloud of fish to see what we were doing.

This experience with the fish changed my thoughts of them, for it was the first clue they gave me of their inner lives. On other occasions, I found that if I stopped moving and relaxed on the bottom, fish would come over to look at me. Then, on finding me looking so intently at them, they would come close



COURTESY OF ILA FRANCE PORCHER

Three stonefish, well-camouflaged in the coral reef, joined the community of fish that gathered around the author.

and look into my eyes. I never had an opaque school around me again, but every time I tried, some fish came. One small, brown grouper with purple spots was so interested that it kept coming to look into my eyes even after I was swimming away.

Eye contact

Joe Hutto, an ethologist who was accepted into a flock of mule deer, wrote about one of the alpha males he knew:

“Babe became not just the biggest deer you ever saw but, more important, the most powerful creature who ever cared to look behind your eyes in a startling effort to make contact with you . . . Babe would meet you straight on, face-to-face—eye-to-eye—and make an effort to know not what you were, but who you were. By merely wielding those most powerful but gentle eyes, he would knock you and all your preconceived notions about

human superiority and animal consciousness to their knees.”

In their way, the fish too, were seeking eye contact, as if the consciousness that joins us transcends the barriers between species.

Subjective states of fish

The subjective states of fish actually form a whole new dimension of discovery. And especially now that the oceanic ecosystems have been so devastated by overfishing, it is even more important that fish be given the appreciation they deserve, and that fishermen's tales lose their power. Indeed, it is daunting how many people are proud of their efforts to catch a fish. They do not seem to see any irony or contradiction in claiming that fish are too brainless to even feel pain, while being so very proud that they are intelligent enough to outwit one. ■

To learn more, read the author's previous articles in X-Ray Mag: **“The Remarkable Intelligence of Fish”** (issue #88), describing fish intelligence and their surprising capabilities, and **“A Matter of Sentience”** (issue #87), examining the question of why fishermen have denied fish feel pain, and how we know that they do.

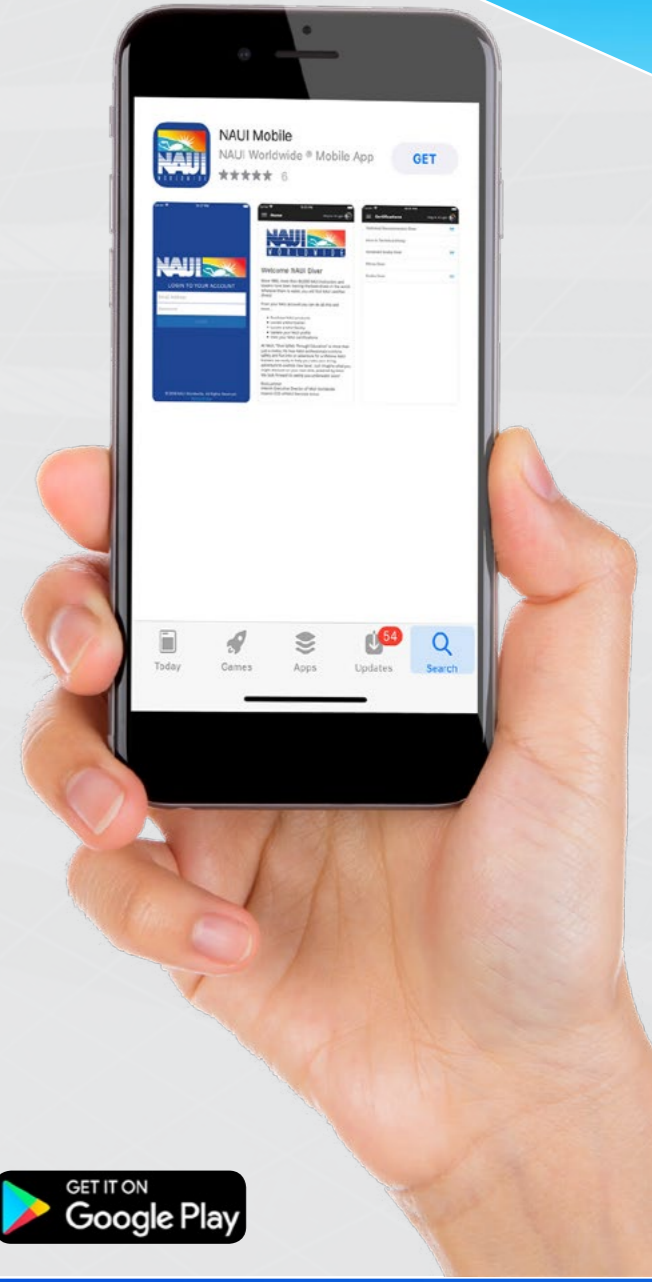
Ethologist Ila France Porcher, author of **The Shark Sessions** and **The True Nature of Sharks**, conducted a seven-year study of a four-species reef shark community in Tahiti and has studied sharks in Florida with shark-encounter pioneer Jim Abernethy. Her observations, which are the first of their kind, have yielded valuable details about sharks' reproductive cycles, social biology, population structure, daily behaviour patterns, roaming tendencies and cognitive abilities. Visit: ilafranceporcher.wixsite.com/author.



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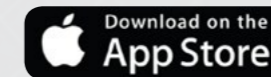
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shark tales



Edited by G. Symes

Great white shark



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What do great white sharks really eat?

In the first-ever detailed study of the diets of great white sharks off the eastern coast of Australia, scientists found that this apex predator spent more time feeding near the seabed than previously thought.

"Within the sharks' stomachs we found remains from a variety of fish species that typically live on the seafloor or buried in the sand," said Richard Grainger, lead author of the study and a PhD candidate at the University of Sydney's Charles Perkins Centre and School of Life and Environmental Sciences. "This indicates the sharks must spend a good portion of their time foraging just above the seabed." He added, "The stereotype of a shark's dorsal fin above the surface as it hunts is probably not a very accurate picture."

The study, which was published in the journal *Frontiers in Marine Science*, furthers our understanding of the feeding and migratory habits of great white sharks. A co-author of the study Dr Vic Peddemors

from the NSW Department of Primary Industries (Fisheries) said: "We discovered that although mid-water fish, especially eastern Australian salmon, were the predominant prey for juvenile white sharks in NSW, stomach contents highlighted that these sharks also feed at or near the seabed."

Grainger stated: "This evidence matches data we have from tagging white sharks that shows them spending a lot of time many meters below the surface."

Juvenile whites

In the study, researchers examined the stomach contents of 40 juvenile white sharks (*Carcharodon carcharias*), which were caught in the NSW Shark Meshing Program. To establish a nutritional framework for the species, the contents were compared to published data from other parts of the world—South Africa, in particular.

The researchers found that the sharks had a varied diet. In addition to Australian salmon, they ate other bony fish such as eels, mullet, whiting and wrasses, according to Grainger. They also ate small electric and bottom-dwelling rays,

as well as eagle rays, which must have been difficult for the sharks to catch, as this species of rays can swim very fast. Other bottom-dwelling fish the sharks ate included sole, flathead and stargazers. They also ate reef fish such as blue groper.

Larger prey, such as other sharks, marine mammals such as dolphins and cuttlefish, were not eaten as frequently. According to Grainger, it was likely that the great white sharks had to reach about 2.2 meters in length before they started hunting these types of larger prey. Larger sharks were also found to have a diet higher in fat, most likely to meet their high energy needs during migration.

Conflict prevention

A co-author of the study Dr Gabriel Machovsky-Capuska, an adjunct Senior Research Fellow at the Charles Perkins Centre, said: "Understanding the nutritional goals of these cryptic predators and how these relate to migration patterns will give insights into what drives human-shark conflict and how we can best protect this species." ■ SOURCE: SCITECHDAILY

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Grey reef sharks (above)

Pack hunting sharks

Researchers studying 900 reef sharks in a reserve at Fakarava Atoll in French Polynesia have documented that sharks hunt in packs. The shark community, which included grey reef sharks as well as whitetip, silvertip and blacktip reef sharks, were observed on night dives, hunting in a nearly pristine ecosystem.

While the sharks did not cooperate with one another nor shared the fish they caught, there was an opportunistic relationship between two of the shark species: the grey reef sharks and

the whitetip reef sharks. The less agile grey reef sharks followed the smaller, slimmer, more agile whitetip reef sharks and seemed to exploit the hunting strategies of the latter in order to catch fish that were chased out of the reef by the whitetip reef sharks.

"Grey reef sharks benefit from hunting with whitetip reef sharks because it increases the number of prey species the grey sharks can access," said behavioral ecologist Johann Mourier, of Marbec (MARine Biodiversity, Exploration, and Conservation) and a co-author of the study published in the journal *Ecology*. "The association with whitetips also increases grey shark predation success by almost 25 percent."

Affects of overfishing

According to Mourier, predation

efficiency in sharks tends to be on the low side, so sharks of different species might hunt in packs to increase their chances of catching prey. Indeed, the collective hunting strategy may not be that uncommon, said Mourier. It is just that we do not observe it so often as overfishing has devastated shark populations.

"Where the density of sharks is low, where they have been overfished or their habitat has been diminished, we might not see this behavior," said Mourier. "But in this pristine place, we have so many sharks that we are able to see this kind of phenomenon. The behavior is new to us because there are not many places like this left in the world." He added, "If we change the density of sharks, it could make changes to this interaction and

Tiger shark trekked 4,000 miles

Fitted with a satellite tracker, a 10-foot tiger shark stunned scientists with its epic 4,000-mile journey across the Indian Ocean, from Africa to a point 800 miles off the Indonesian coast, proving that the species has the capacity to cross entire oceans.

The nonprofit OCEARCH documented the transoceanic trek of the female shark whose

name is Sereia. Researchers from the Oceanographic Research Institute and the Biopixel Oceans Foundation, who made the discovery, are trying to figure out why she made the trip.

"This shark moving across the Indian Ocean puts the question of connectivity into a much larger scale, especially if she does make it all the way to Indonesia or Australia," said Biopixel Oceans Foundation scientist Adam Barnett in a release. "An interesting aspect of this large-scale movement is understanding not just where this shark is moving to, but why."

According to OCEARCH spokesman John Kanaly, Sereia was tagged off Mozambique in November 2018 and tracked crossing the Indian Ocean in April 2020. It is the longest tiger shark migration ever recorded, Kanaly said in a release.

The discovery is "incredibly important," said Ryan Daly of the Oceanographic Research Institute in South Africa in a release, because it "opens up a whole new line of questioning." ■

SOURCE: PHYS.ORG

Tiger shark (below)



ALBERT KOK / WIKIMEDIA COMMONS / CC BY-SA 3.0

have some cascading effects on the food web."

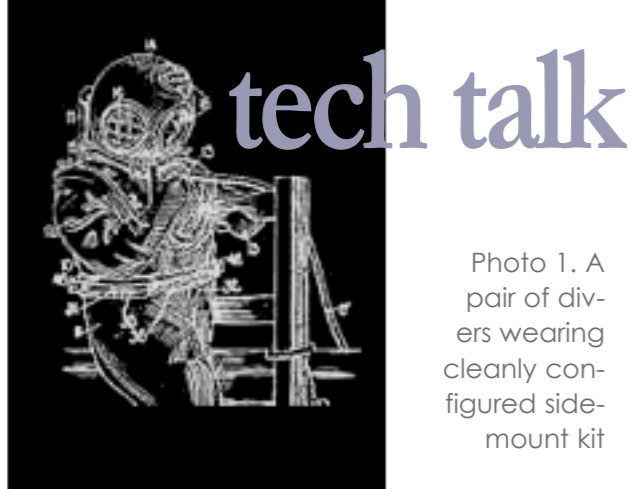
Cognition in sharks

The discovery of pack hunting in sharks is significant as it informs our

understanding of behavior and cognition, according to Mourier. "We show that this type of collective behavior can arise in so-called 'primitive' species, just using simple rules," he said. "There is no strong

social structure, but the sharks can still use collective behavior with simple rules to benefit and increase their fitness." ■ SOURCE: PSYCHOLOGY TODAY





tech talk

Photo 1. A pair of divers wearing cleanly configured side-mount kit

Text by Roger Williams
Photo illustrations by Roger Williams
Cave photo by S.J. Alice Bennet

I like sidemount. I will frequently, jokingly, disparage the configuration, but I do like it. It can be comfortable and streamlined. It can be very flexible. There is an argument to be made for completely isolated redundancy. Mostly, it is good for moving through places no bigger than the space below your coffee table.

What it is not—as has been lamentably sold with such popularity—is it being just as easy as buying a new harness and putting two tanks on your sides.

There are a ton of harnesses on the market, each of which have their benefits and drawbacks. Some are more heavily weighted on the benefits side; some are complete crap. For all of them, it is going to depend pretty heavily on your body type, philosophies, preferred tanks and diving style. Most importantly, contrary to what anyone might tell you, there is no perfect system.

I am not going to write any further on the various systems out there, but there is plenty of information online on the gamut. Obviously, only a small handful



SJ ALICE BENNET

of these systems are seen in great numbers, but it is interesting to see the various trends and ideas.

There is also a great deal of conversation about how valves should sit (i.e. regulators “down,” valve faces pointing

in front of you; or regulators “up,” pointing behind you; there is even a modified version where the valve handles point straight down, with your regulators pointing inward, toward your body). There are pros and cons to each of these as well,

but I am not going to discuss them here any further beyond saying, “Wear your regulators up.”

Proper placement

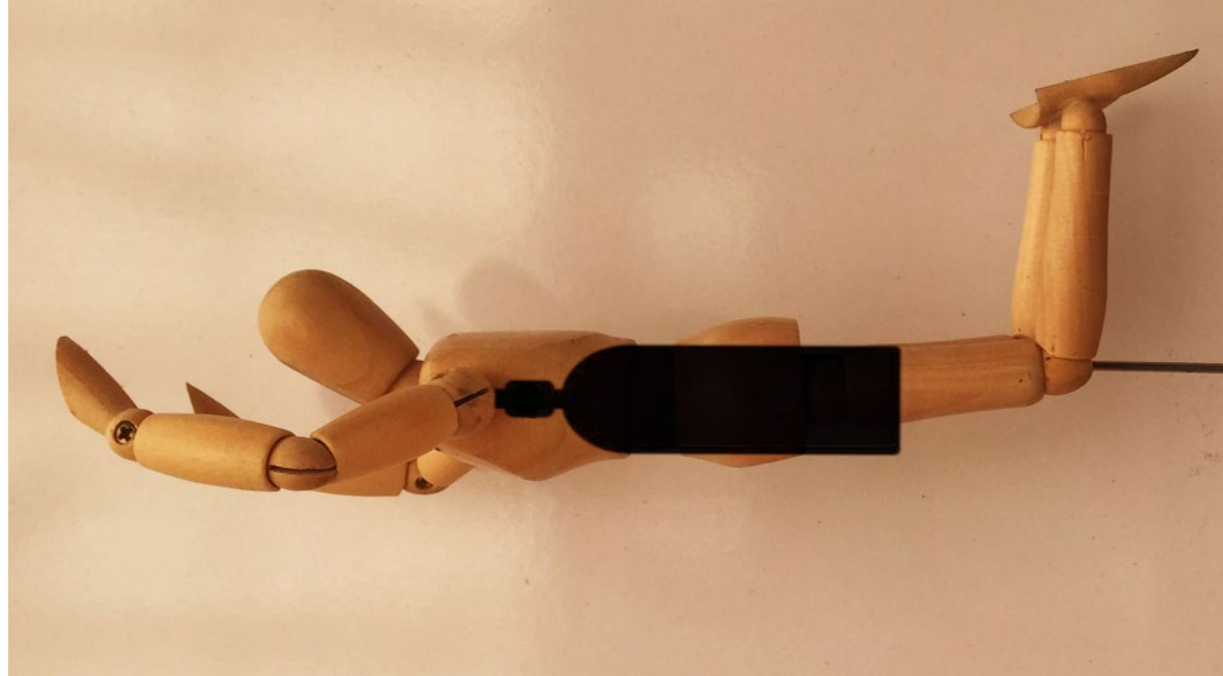
What I wanted to address is something

that I see people struggle with the most: getting your sidemount tanks to actually sit at your sides.

You see how well the tanks lay in this pretty picture by S.J. Alice Bennet (Photo 1)? Valves in the armpits. Tank perfectly



Photo 3. Our goal



parallel to the body along a line from the shoulder to the knee—not breaking above or below the profile of the body. Regulators and valves completely protected by your body, both from damage and from water disturbance, to create a wide, hydrodynamic platform.

That. That is what you are looking for. Not this (Photo 2), which is all-too-commonly seen. Like the profile of the *Lusitania*. As she is now. So, let's not do that.

This is what we are aiming for (Photo 3). How we do this is one of the reasons that sidemount is a giant hassle—because it takes a handful of adjustments, which are all fussy, completely dependent on your personal frame, and for which even single centimeters matter.

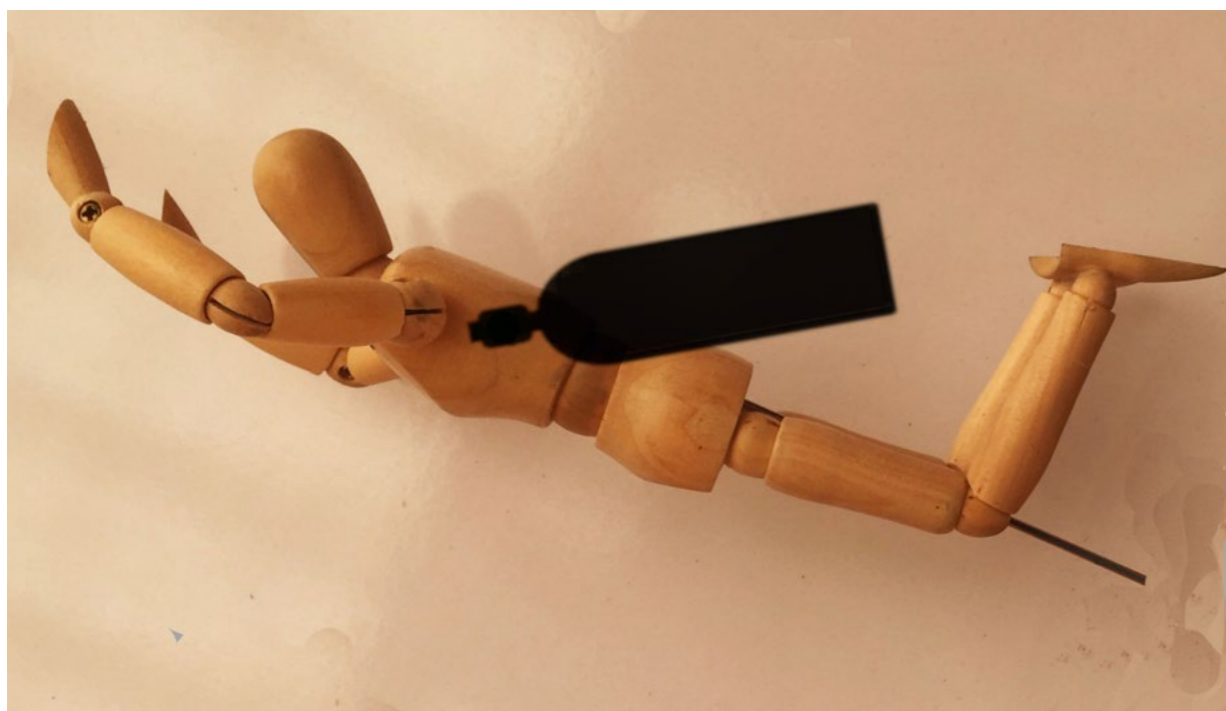


Photo 2. What you want to avoid looking like

In the simplest of terms, there are only two things that need to be adjusted—the bolt-snap and the tank neck bungee—but they each have a few subsections. See below:

Bolt-snap

- Height
- Leash length
- Angle

Tank neck bungee

- Height
- Loop length
- Strength

Seems easy, right? It is. And should not take but a half-dozen dives (at least) under supervision, with some video feedback, followed by fine-tuning with systematic minor adjustments after each dive, to get it just right. But if you were one of those people who decided they were going to figure it out on their own (*stop it, take a proper class*), let's get started.

One more thing I want to say from the get-go: There is no way for me to cover, in these pages, every nuance of how things get perfectly dialed in—there are far too many variables. One of the biggest is steel versus aluminum (AL) tanks. The former just hang there where you clip them, whereas the latter will need to be reclipped to a set of d-rings farther towards your belly, perhaps several times, or need sliding d-rings to compensate for buoyancy shift. Honestly, steel tanks are easier.

Think of this article as more of a troubleshooting guide, using the more troublesome AL-80 tanks as a basis. Steel tanks will only be mentioned in passing.

Bolt-snaps

Height. This is the first place to start and, arguably, the easiest and most obvious thing to adjust (Photo 4). In these pictures, there are a couple of exaggerated band heights. In short, however high the band is on



Photo 5. Leash lengths (note the longer leash usually used for steel tanks and the nearly non-existent length for aluminum tanks)

the tank is going to determine, in large part, how high or low on your body the tank is going to rest. This is going to depend, too, on whether you are using some version of a butt-plate or clipping the tanks to

your waist.

In any case, you can start with a tape measure. Measure the distance from a point comfortably into your armpit down to where you expect to make your attachment point, either waist-belt or butt-plate. Then measure from the very top of the tank valve down and put a sharpie-

mark on the tank at the same distance. There. That is your band height starting point. It may need some fine tuning later, but it's close.

Leash length. The leash is the little dangle of static line that attaches your bolt-snap through the airplane clamp. Here, you see a long one and a short one (Photo 5). Note: Pointing up or down does not matter—just make sure they are the same way around on both tanks; otherwise, your bolt-snaps will be just different heights enough to be really annoying.

This, too, is fairly easy. It is the distance from your attachment point down to where you want the tank to sit.

As I mentioned, most steel tanks tend to stay put, buoyancy-wise. If you are using steel tanks, you are



Photo 4. Greatly exaggerated band heights

probably using a butt-plate, which means you are going to need longer leashes. Start with three inches or so (longer if you have big hips, shorter if you are narrow) and then fine-tune as you see how your tanks sit. Once that is done, you are pretty much done; clip them and dive.

If you are using aluminum tanks, you are probably going to want the leashes as short as possible to keep the tanks under tighter control. That is pretty much it for leash length.

Angle. Where around the tank does the bolt-snap sit (Photo 6)? You have got a little bit of wiggle room, but a great place to start is at about that 45-degree angle between the very back of the valve and the bolted isolator post. This is another thing that is going to vary quite a bit, depending on personal taste, body shape and how hemmed in your tanks.

Closer to the 9 and 3

o'clock positions will give you a little more room if you prefer, or if you are a "hippier" person. Closer to the 12 o'clock position is better if you are narrow-framed or if you like everything really secure-feeling.

One additional thing of note here is that the farther to the 12 o'clock position the snaps are, it may be a little more difficult to argue with the bungee torque when you reclip the tanks as they are breathed down. The big thing to remember is to have them mirrored (Photo 7).

A last, short note about steel tanks (Photo 8): Because you do not need to counteract any bungee forces (you will see what I am talking about below), you can put the attachment point on the valve side of the tank. You can even just loop the bungee over the valve handle (instead of the isolator post) and be done with it. There are also a few harnesses that require this, or even a regulator "down" or "in" configuration. Some people simply prefer them.



Photo 7. Mirrored aluminum bolt-snaps

Photo 6. Various rotation of the bolt-snap placement



Sidemount

Bungee

Height. If you have the bungee pulling from a point right at the base of your neck, that is going to affect where the tanks want to go as the bungees try to relax. Similarly, you do not want your bungee attachment points down in the very middle of your back.

Right between your shoulder blades. There. Done. That is where your bungees should be pulling from, so anchor them there. Some systems are inflexible about where this anchor point is, and some are super adaptable. Then, there are after-market bits you can buy to create your anchor point wherever you want.

Loop length and strength. These go hand-in-hand to dictate where the bungee "relaxes" to when you have got the tank attached. It should go without saying that this is also an adjustment where you want to make sure lengths

are mirrored.

A good starting point is for the bungee loops, without tension or tanks, to hit dead center of your armpit. Very thick or stiffer bungee might need a little more length. With a "boing-ier" (flexible) bungee, you can get away with quite a lot of slop. I strongly recommend the latter, because it makes gearing up that much easier, and it does not take a lot of force to control the near-neutral AL-80 tanks anyway.

There is a point of diminishing returns for each, though. Bungee that is too "boingy" (flexible) and left too long, will allow the tank to wobble around like a shopping cart with a stiff wheel on your side. Stiff bungee that is kept too tight will rotate the handle (and the tank) in such a way that it is difficult to reach or manage.

Length and strength are one of those things you are just going to have to play around with a bit to hit the sweet spot of

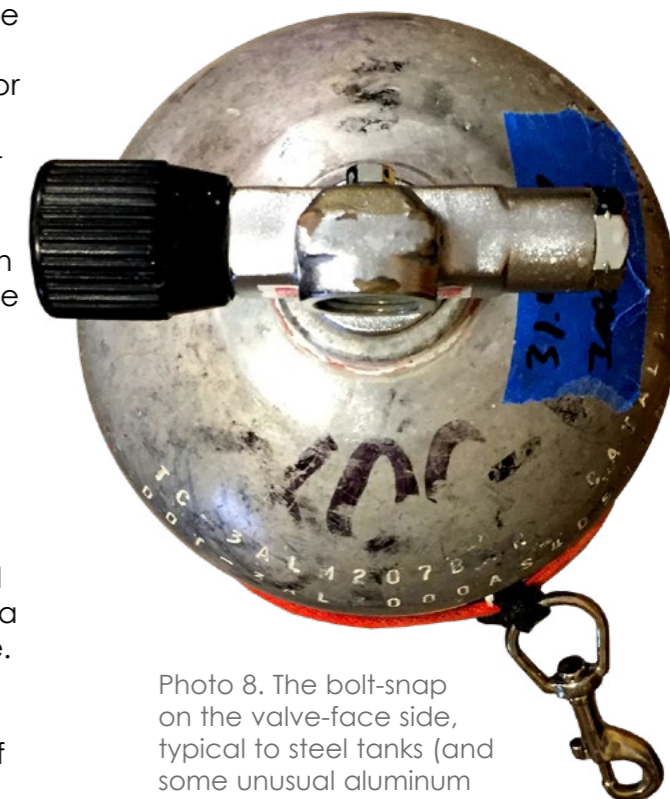
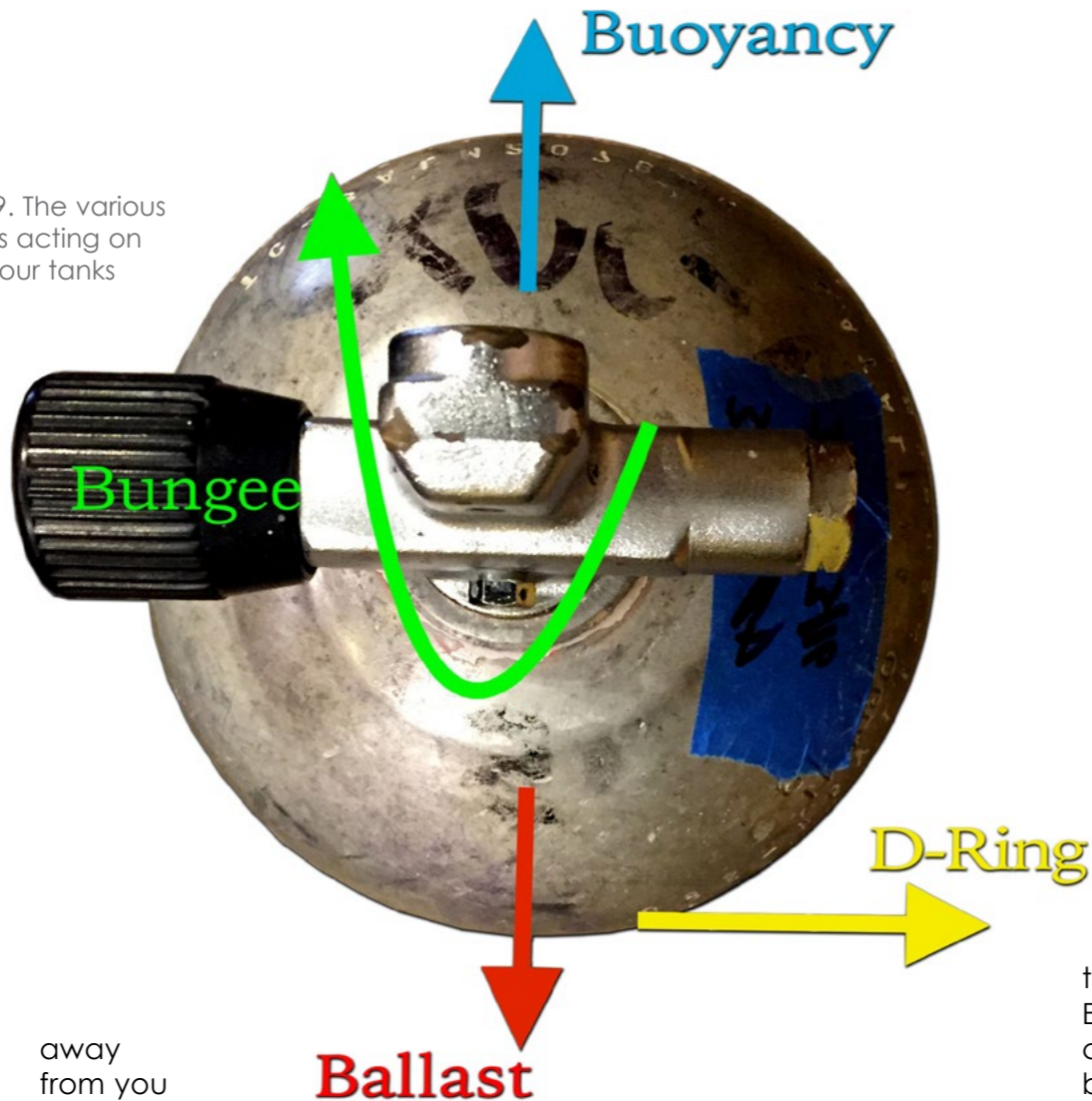


Photo 8. The bolt-snap on the valve-face side, typical to steel tanks (and some unusual aluminum tank configurations)



Photo 9. The various forces acting on your tanks



where you like it.

Strength, unfortunately, might be limited to what is available at shops near you. Length, however, is much easier to play around with; it is even easy enough to get your buddy to adjust, even in the water. Just leave a little extra length and do not tie tight stopper knots until after a good handful of dives.

Balancing forces

With all of this in mind, what you are looking to balance out are these forces (Photo 9). The attachment point towards your body and the bungee torque

away from you are in direct contradiction. As are, obviously, positive and negative buoyancy.

Let's look at some of the ways an imbalance of these forces may manifest.

Troubleshooting

Tank bottom too high. This is one of the simplest and most common problems (Photo 10). The tank base is riding too high. It could be that you have configured your harness with the initial clip point way too far back. Just as likely, you are just a little way into the dive and need to reclip. The buoyancy has started to shift positive as the tank has been breathed down, and you can use either a sliding d-ring or another attachment point on your waist to pull the whole base down. Easy-peasy.

Bungee too loose. Looks kind of the same, but it's

not (Photo 11). Your bungees are too long. Or may not be "boingy" (flexible) enough. Valves are probably pointing straight down because the tanks are hanging limply in that wet noodle of a bungee. Either way, if you get the valves controlled by tightening up that bungee a bit, you will be in great shape.

This is one of those things you probably wanted to remember to do after your last dive, so ask your buddy to come back with you to the surface to correct it before you start your new dive in earnest. With a really good team and a little flailing, maybe you can get it adjusted without surfacing.

Tank bottom too low. This is the opposite of our first picture (Photo 12). You have got your initial clip point configured too far forward. Or, maybe you have reclipped too soon.

There is a tricky, in-between period, if you are only using two sets of attachment points to change forward during a dive. Between about 2600-2300 psi (180-150 bar) where the tank base

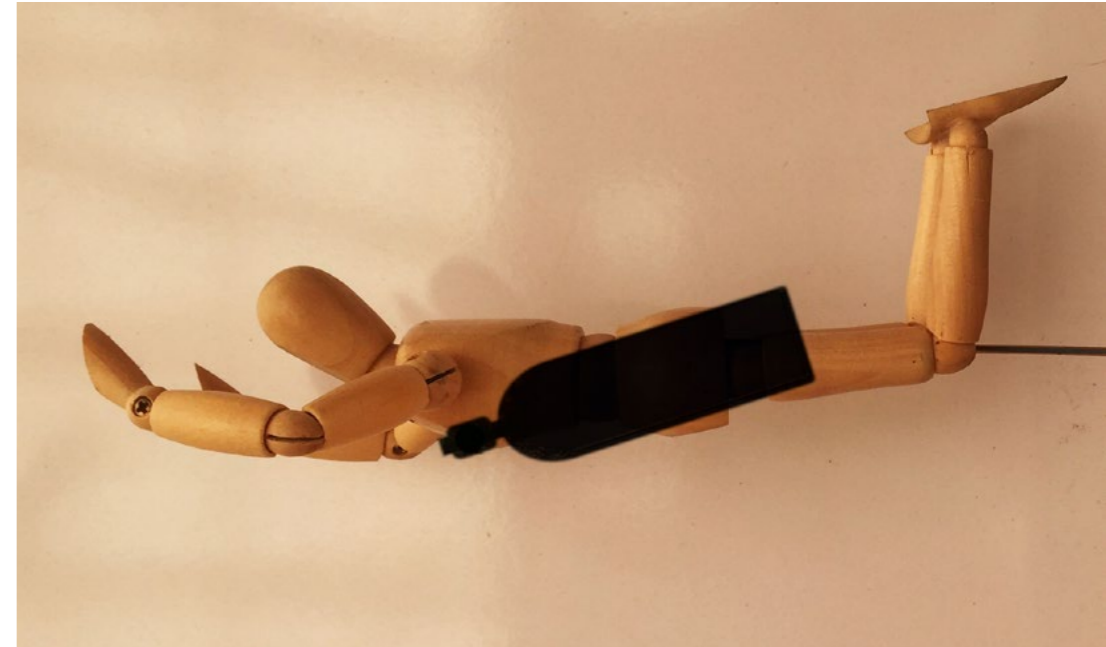


Photo 11. Bungee too loose

floats up at the initial point and down at the front attachment point. If you hate this as much as I do, it is time to get a third set of d-rings or sliding d-rings.

Getting those d-rings in just the right places along the waist strap can be a confusing exercise. You will look at two of them and say, "There's barely space to fit a third in the middle! Why should it make such a difference from one to the other?" But it really does. Because it's sidemount.

Honestly, I tend to favor sliding d-rings because I do not even like the in-between periods with three fixed. Worth noting: It is less likely,

but possibly in part, because your bungee anchor point is too high up your back, and it is trying to pull your regulators up to the back of your head.

Tank bands are way too low and push the whole tank up past your armpit (Photo 13, next page). You will not be able to use your arms. Your hoses will be all over the place. There is not a chance in the world you will be able to reclip because you are going to have to play tug-of-war with the bungee while you both unclip and try to reclip the bolt-snap. This is no fun.

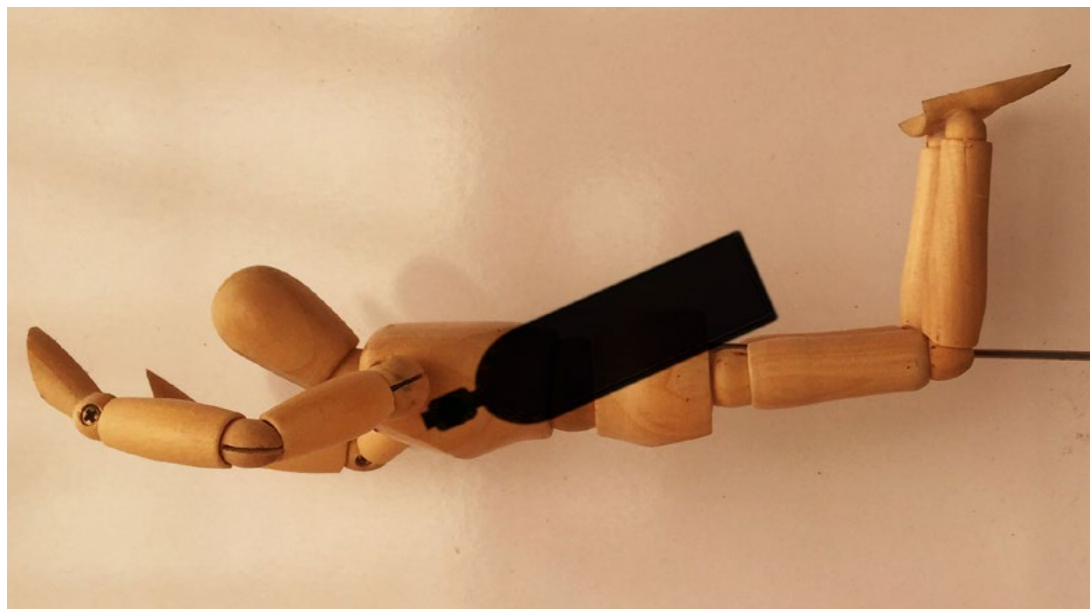


Photo 10. Tank bottom too high

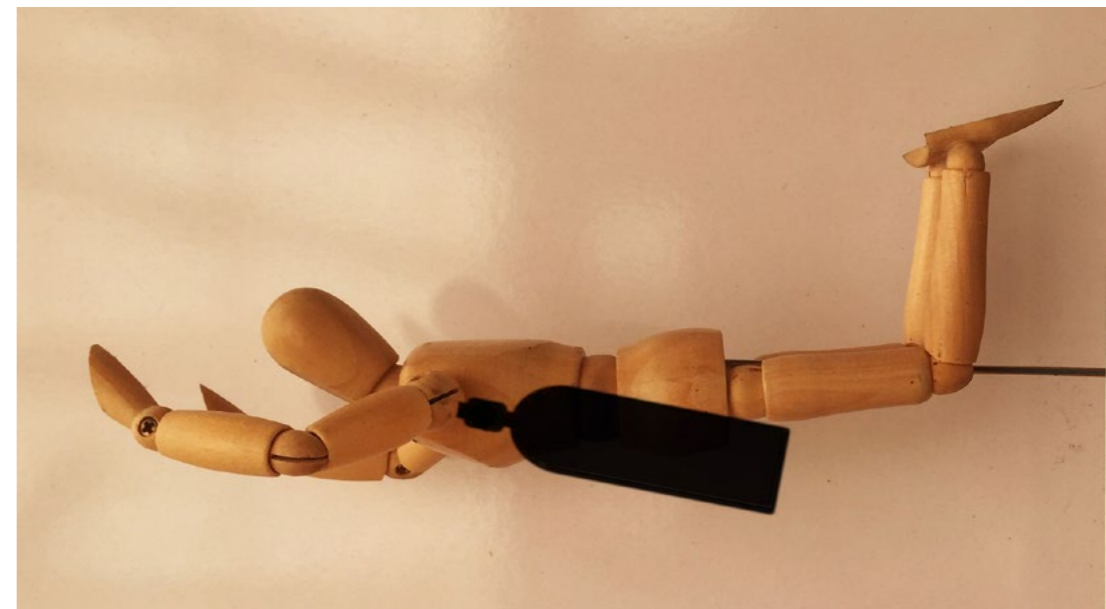


Photo 12. Tank bottom too low



Photo 13. Tank band too low

Tank band can be too high up the tank, too (Photo 14). The tell-tale sign of this is that every time you kick, it feels like both tanks are wagging behind you like an unbalanced trailer on your car. Also, to reach your tank valves, it will feel like you are trying to fish something out of the back pocket of a pair of jeans that are too big.

This can often happen in conjunction with or simply because the tank bungee anchor is too low down your back. Remember: between the shoulder blades. Tighten it up.

OK, too tight! You have gotten really ambitious about having everything on lockdown (Photo 15). Stop trying to persuade your sidemount tanks to spontaneously become back-mounted doubles.

If you cannot reach your tank valves, it is because the force of the bungee is overriding the anchor of the clip and pulling the tank valve knob to point straight behind you. You probably cannot reclip either—because trying to manipulate the clip is going to be a losing war against mega-bungee. It probably feels like you cannot kick because your tanks are holding your legs together.

Calm down. Loosen up. Listen to some

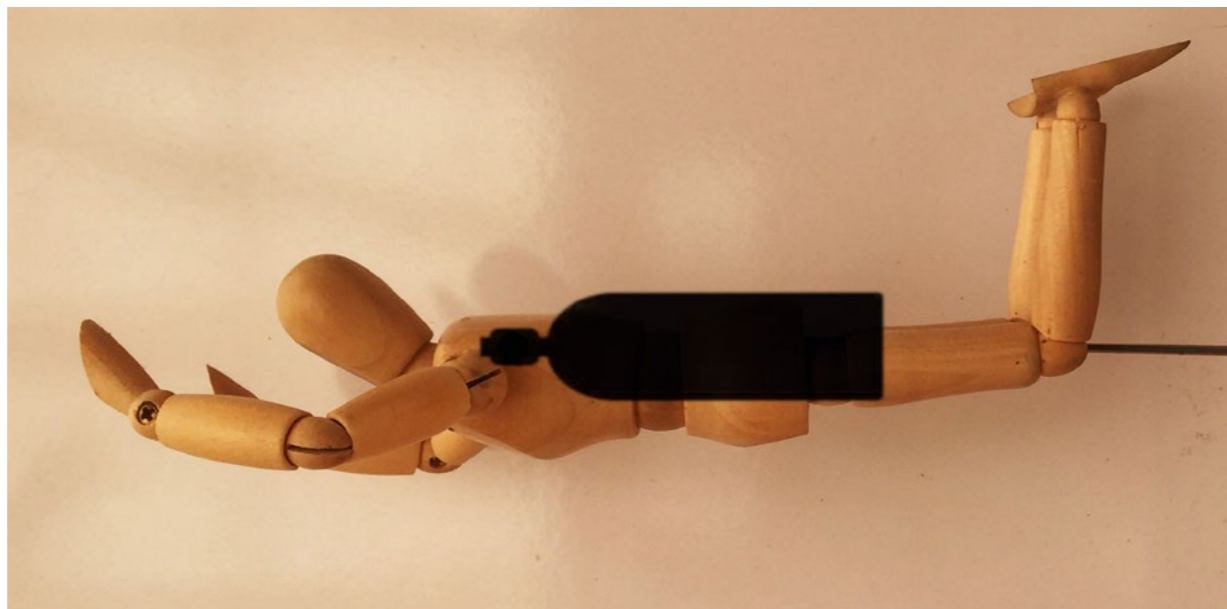


Photo 15. Whole configuration far too tight

Grateful Dead or something.

Raise the bands a little. Loosen the bungees. (I do actually wear my CCR bailout this way because it is super out of the way. But I also have orangutan arms and can still manipulate my valves perfectly easily. I do not recommend it for everyone.) This is also a “maybe-the-bungee-anchor-is-a-little-too-high” moment.

A bit too loose. So, this one is not actually a disaster (Photo 16). There are some harnesses designed specifically so that the tanks will ride like this. Which

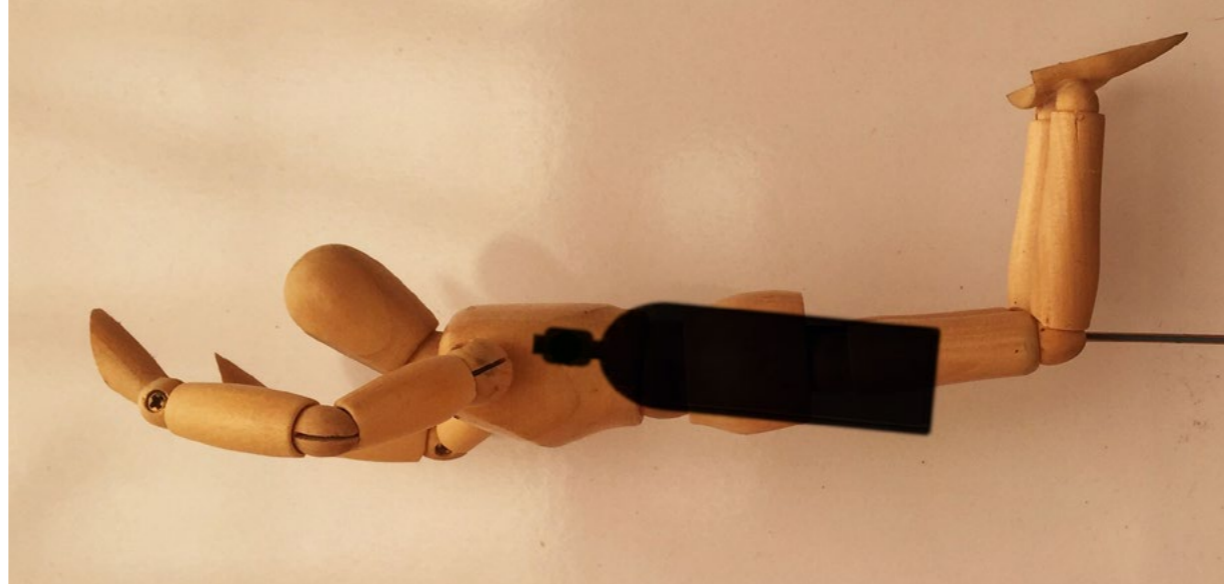


Photo 14. Tank band too high

New York/New Jersey wrecks. He even used to tell people that it was the best place in the world to dive for years while working as full-time instructor in Hawaii. But that was a long time ago—before he found his heart in the caves. For some years, he was the Dive Safety Officer for the Wildlife Conservation Society's (WCS)

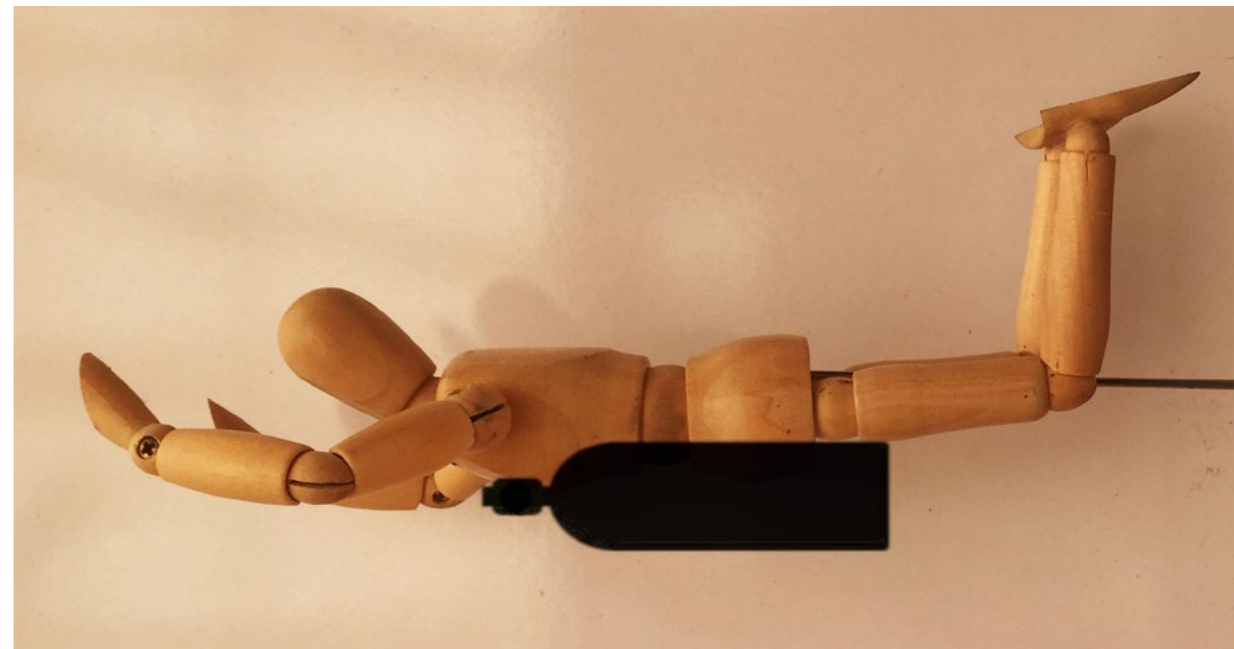


Photo 16. OK-ish. A little too loose all-around for my taste.

about diving but you talk at them about it anyway. If there is any definitive conclusion, let it be this: As you are dialing in a sidemount system, make only one adjustment per dive. Seriously, just a centimeter at a time—a full inch can frequently knock you too far in another direction. Have a friend shoot a bit of video of you so you can see how the tanks look and match that up with how they feel.

Dive safe, dive often. ■

American technical diver and instructor Roger Williams first discovered technical diving while living in his native New Jersey and used to be an ardent diver of the

New York Aquarium in Brooklyn. Currently (and for the foreseeable future), he and his wife, Nelly, own and operate XOC-Ha, a divers' bed-and-breakfast near Akumal, in the heart of Mexico's cave country. He teaches cave, technical and CCR diving, while Nelly creates sorcery in the kitchen for their guests. If you see him staring off into space and ask, “What are you thinking?” He will probably say, “Safety, balance, stability and team problem solving.” And you would be perfectly within your right to say, “About dinner! I meant, what are you thinking about ordering for dinner?” For more information, see: **XOC-Ha.com**. Or Facebook and Instagram @xochabnb.



photo & video

The original underwater image taken in Bodrum, Turkey, which will be used in this tutorial on fixing color casts

Text and photos
by Rico Besserdich

A color cast is a tint of a particular color, usually unwanted, which affects the whole photographic image evenly.

Even though white balance settings or adjustments are still "golden key no. 1" in fighting color casts, in some cases, a finer adjustment is necessary in postproduction. This is especially true when the scene and subject in our image is lit by two different light sources, such as strobe light and sunlight, as they have different Kelvin values. But even underwater images, taken in very shallow water (one to five meters) and lit by ambient light, do still always need color correction.

This tutorial refers to Adobe Photoshop CC but works with older versions of Photoshop as well. Let's start with a shot I took in August 2016 while working with underwater model Chris Mo in the waters of Bodrum in Turkey. I have adjusted the white balance and done a few very slight exposure corrections in the Adobe Camera



Fixing Color Casts

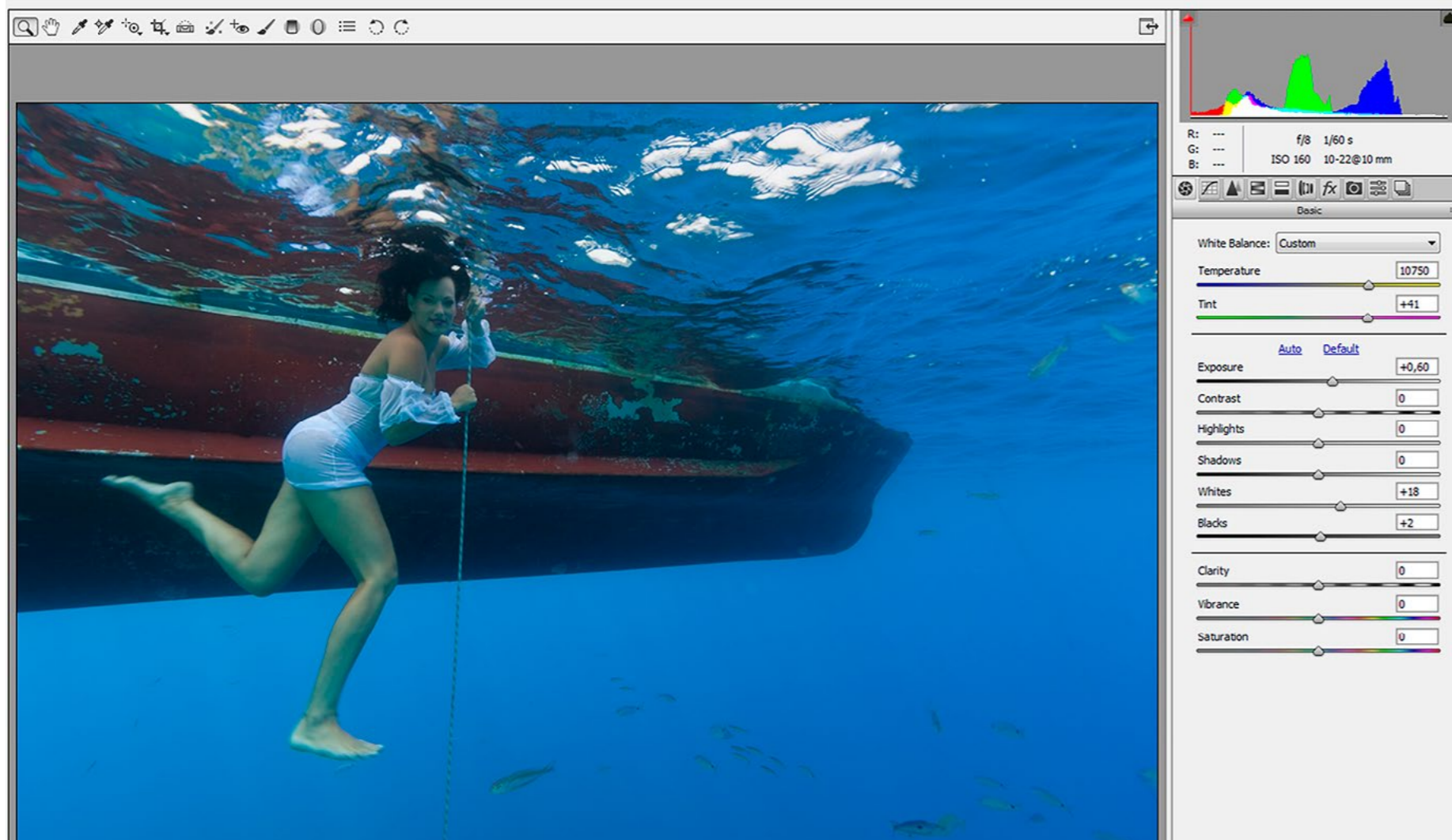
in Postproduction of Underwater Images





Photos 3 to 6. Examples of Photoshop's auto functions (right)

Photo 1. The original image after slight exposure corrections were made in Adobe Camera Raw filter (below)



Raw filter, and this is how the image looks now in the Adobe Camera Raw window (see Photo 1).

Even after adjusting the white balance in Adobe Camera Raw, I still sense a few problems caused by color casts. We cannot judge an image without examining it, and when it comes to postproduction,

we should take a very close look at each image. I divided the image into a few "zones," just so one can visualize where to look (see Photo 2).

Zone 1: The red of the boat looks pretty much washed out, and it has a serious cyan color cast.

Zone 2: The model's dress is white, but it does not appear as white. We spot a cyan color cast in the whites of her dress.

Zone 3: The lower hull of the boat looks washed out.

Zone 4: Way too much cyan makes her skin not so nice-looking.

color temperatures: the sunlight and the light from the strobe.

Why did this happen?

- **Distance to the subject.** The longer the distance, the higher the risk of color casts.
- **Insufficient strobe lighting.** The strobes were not powerful enough to light the main subject nicely. Whilst my right strobe fired, the left one malfunctioned and did not fire at all.
- **Two different light sources** with different

So, what can we do?

Photoshop offers a few "auto" functions such as "Auto Color," "Auto Tone," "Auto Contrast" and "Auto Curves." First of all, such automatic corrections are surely worth a try but rarely end in pleasing results when it comes to editing underwater images (see some "negative examples" in Photos 3 to 6).

None of these auto functions really helped but, regarding colors, hope lies in the use of curves. Let's see how to

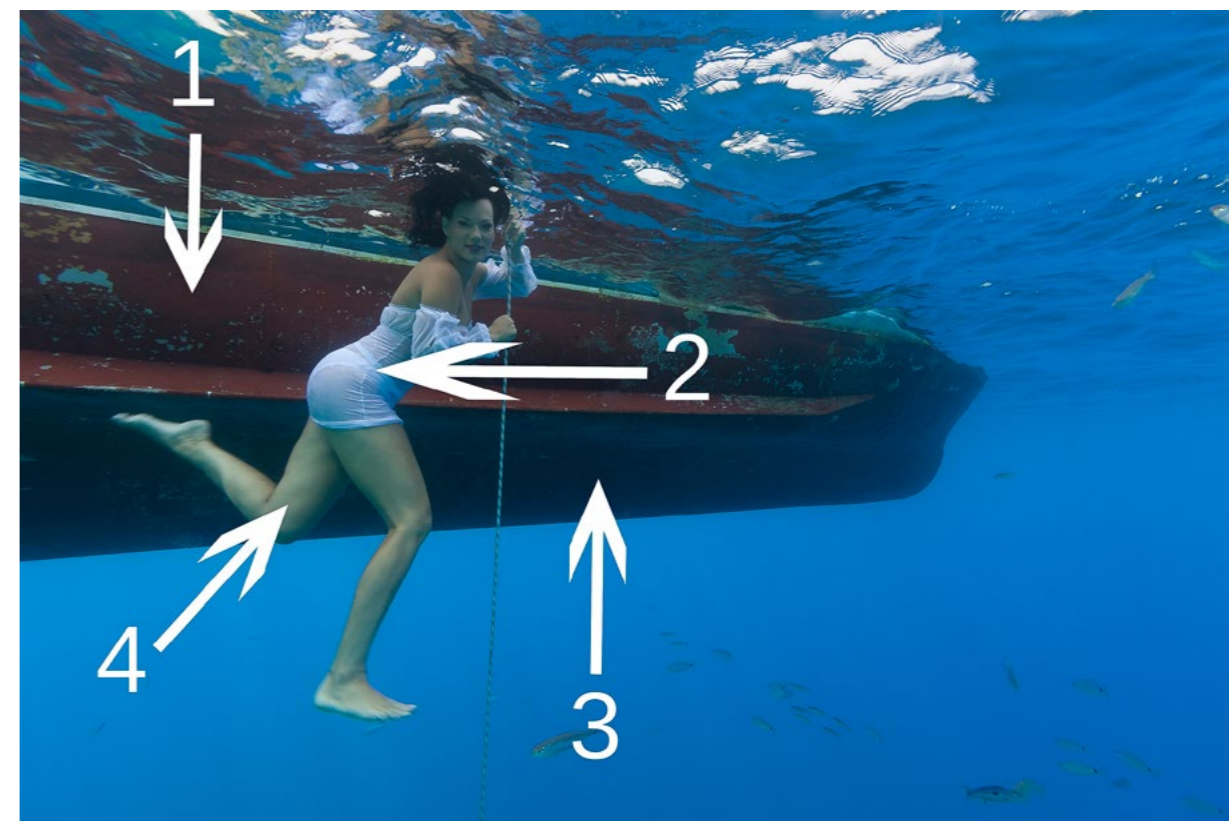


Photo 2. Zones to inspect for color casts

Photo 7. The tutorial image opened in Adobe Photoshop (below)



Photo 10. Find the black area in the Threshold layer by moving the slider in the layer's Properties tab to the left (below).

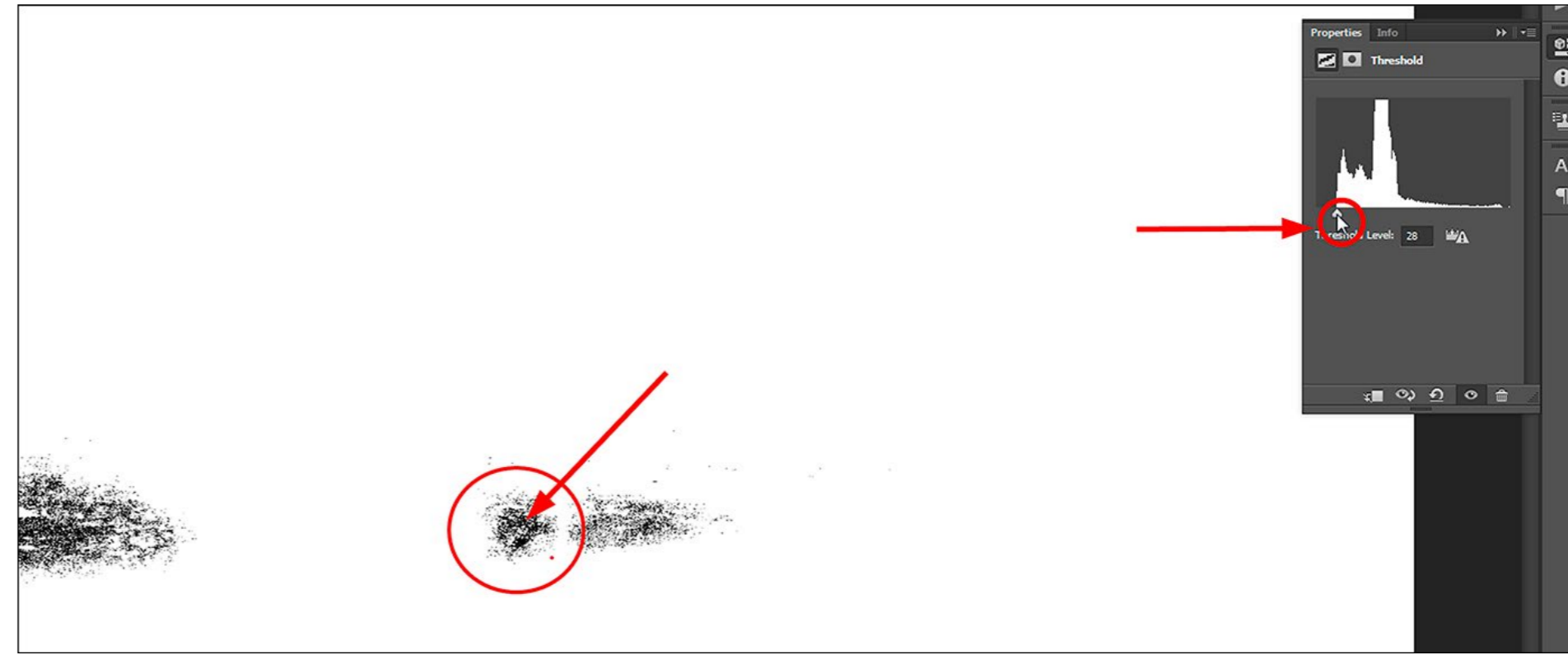


Photo 8. The Threshold icon in the Adjustments panel in Photoshop (above)

improve this image by editing these curves manually.

1. Open your image in Adobe Photoshop (see Photo 7).
2. Create a "Threshold" adjustment layer by clicking on its icon in the Adjustments panel on the right (see Photo 8). Do not be afraid if your image looks weird for a short while; it's for its own good.
3. Select the Color Sampler tool in Photoshop's Tools panel on the left (see Photo 9).

4. Move the small slider in the threshold adjustment layer's Properties tab (located in the Adjustments panel) completely to the left and then to the right, until a black area appears in the image (see Photo 10).



Photo 9. The Color Sampler tool in Photoshop's Tools panel on the left (right)

Photo 11. Zoom in and make your first color sample in the black area (below).

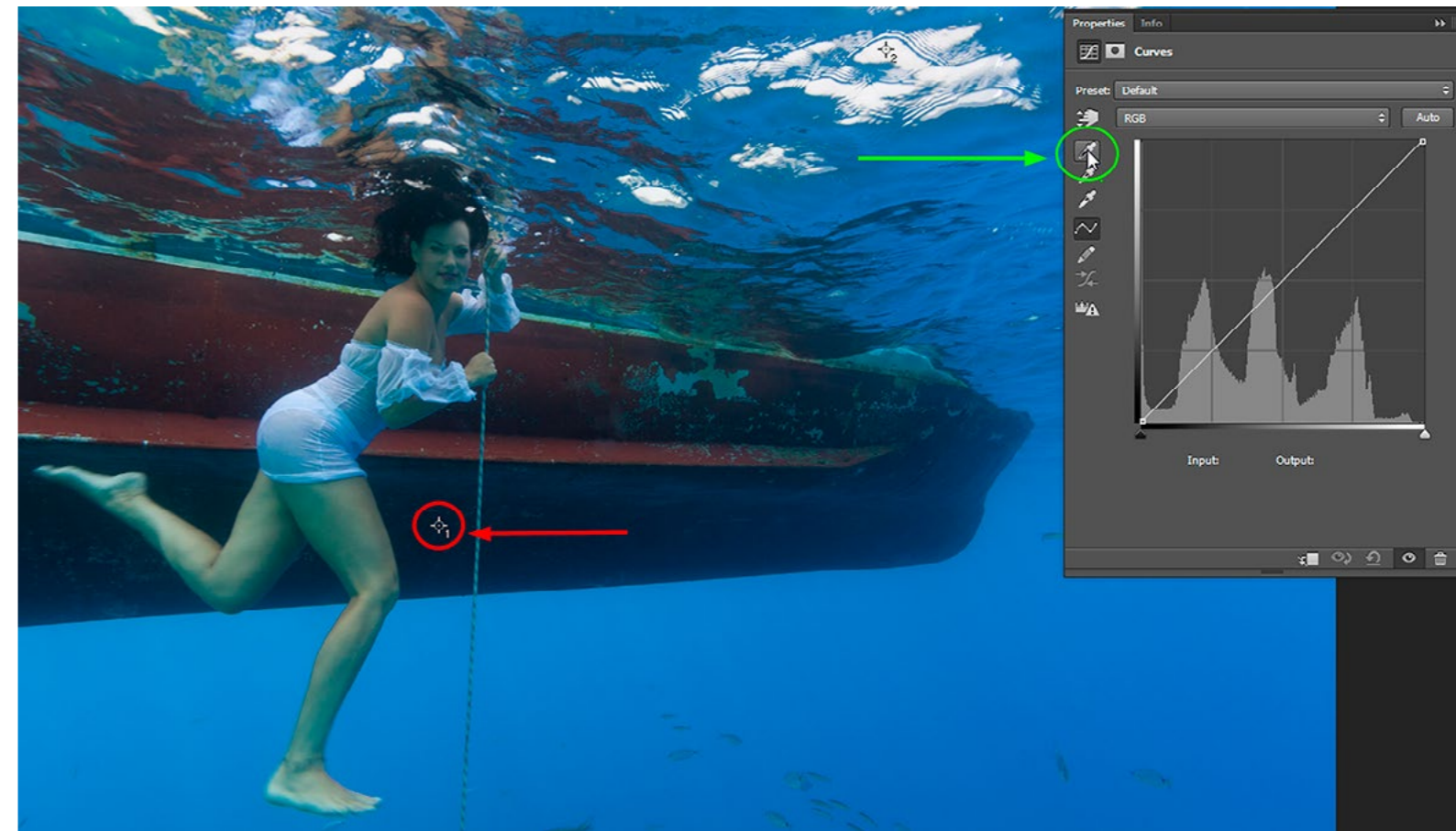
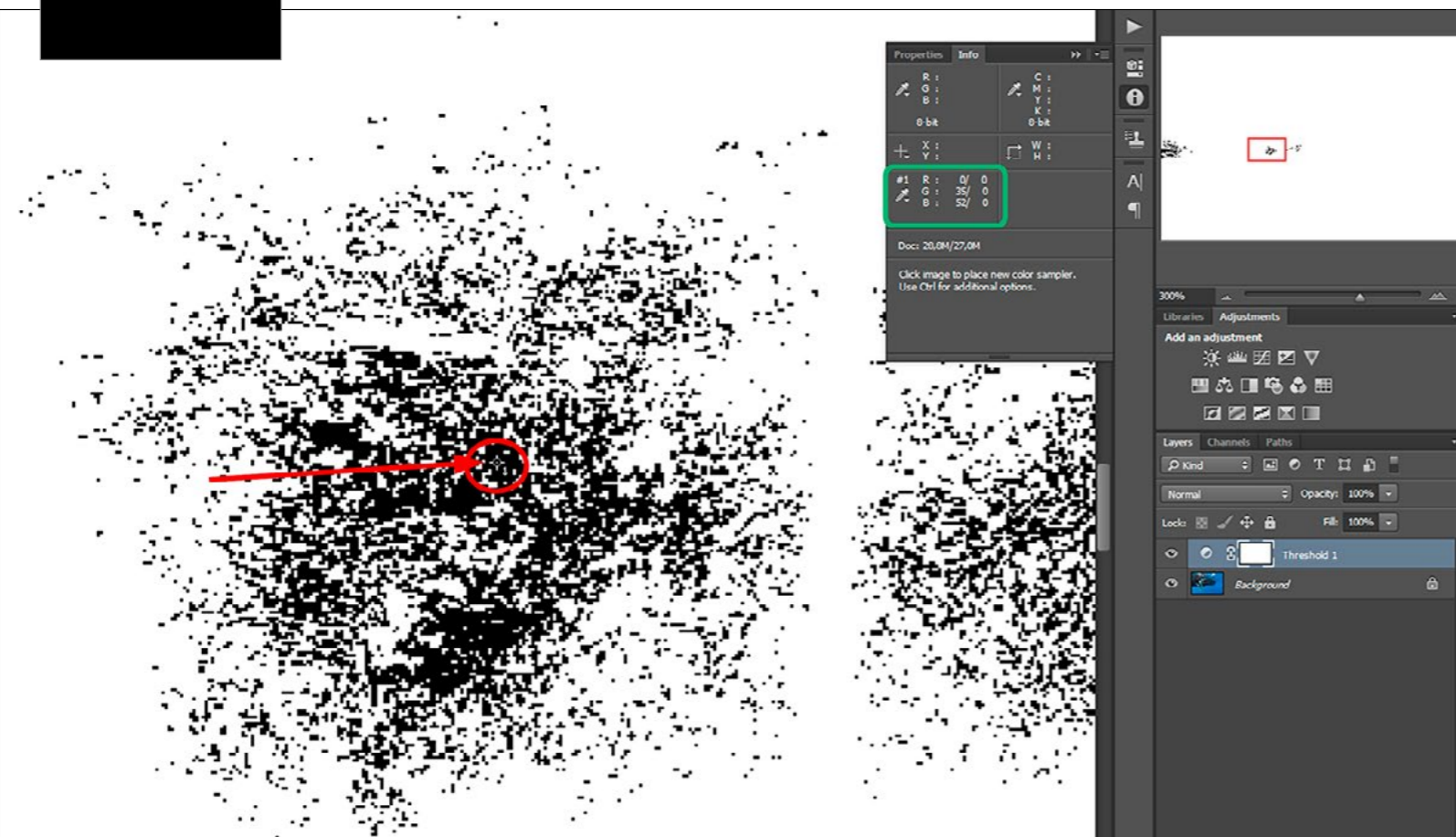


Photo 13. The Info tab shows the values of the two color samples picked (right); Photo 14. The first Eyedropper Tool sampler in the Properties tab of the Curves layer (above)

5. Zoom into the image and place a color sample by clicking in that black area (see Photo 11). You now have a small color pick with a “1” beside it. Check the Info tab to the right. As we just picked the black point, it is supposed to be 0 (= black), but it is not. A green (35) and blue (52) color cast is in the blacks. Good to know—the mix of green and blue turns out to be our old enemy, cyan.

area to pick a second sample (see Photo 12).

The Info tab now shows you the values of our two color samples (see Photo 13). Color picker sample no. 1 shows a green and blue color cast (all values are supposed to be “0”) in the blacks, while picker no. 2 (which marks the white point) shows multiple color casts in the whites. The ideal value would be 255 (= pure white), but that is not the case here.

7. Delete the threshold adjustment layer; we do not need it anymore.

8. Create a Curves layer (in the Adjustments panel). Grab the first Eyedropper Tool sampler in the layer's Info tab, locate your previously placed “color pick no. 1,” and click in it. Be precise; you will need to zoom in to make a correct pick (see Photo 14).

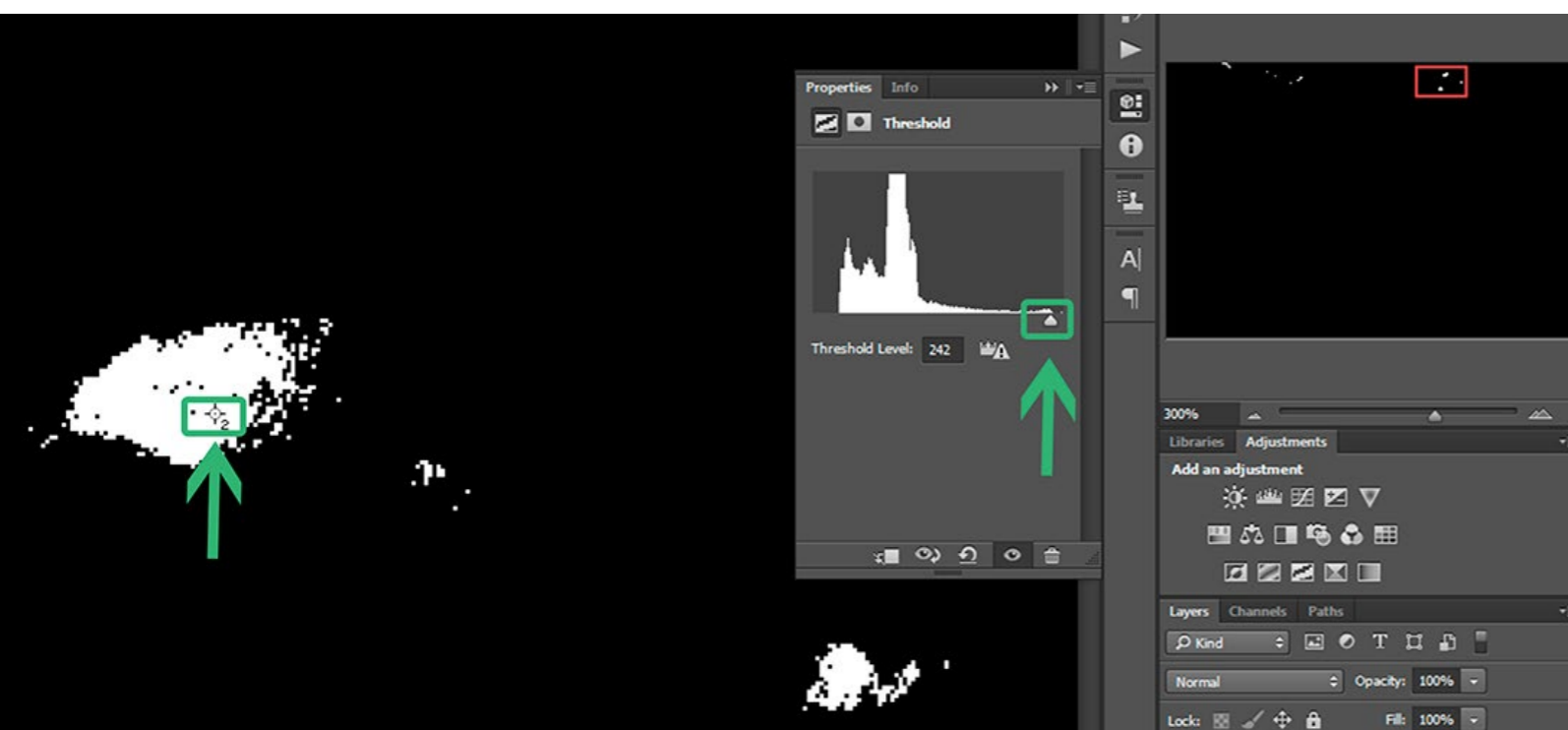
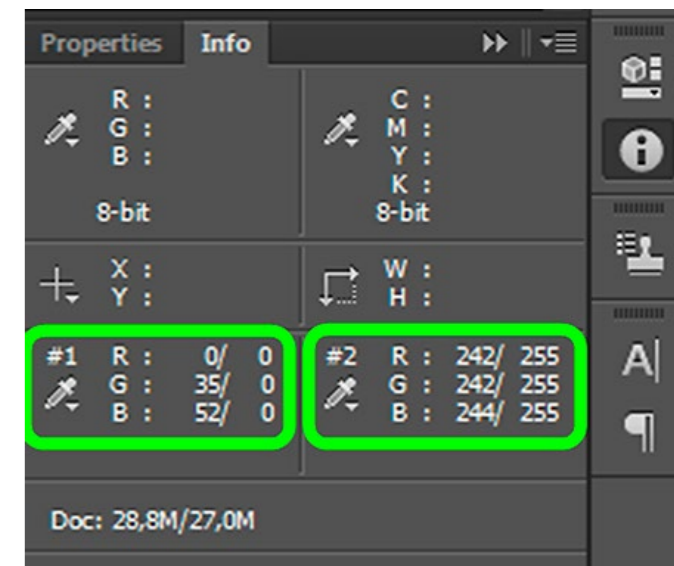


Photo 12. After moving the slider in the Properties tab to the right, make your second color sample in the white area.



Photo 15. The final result after color cast correction

Then, grab the third (not second) Eyedropper Tool sampler in the layer's Info tab, locate your "color pick no. 2," and click in there. See Photo 15 for the result.

This is the most precise technique to get rid of subtle to intermediate color casts in underwater images with mixed light. What we actually did was to correct the colors by defining the black and white points and utilizing the Curves tool to adjust the range. Properly set black and white points are, by the way, the preferred method of color correction in magazines and other print media, up to and including the mighty *National Geographic* magazine itself.

Final tips

Even though "technically correct," you may sometimes find the result of this adjustment slightly too strong. Reduce the opacity of the "Curves correction layer" in such cases. Remember, if the result of this correction appears to be "too strong," the image might lack some basic elements such as proper camera settings.

This editing technique works best with RAW images, as these contain much more data than JPG photos, and therefore, provide more space for later adjustments. It is worth the little extra work, so if you can, always shoot RAW.

There is no "special trick" in

Photoshop (or any other image editing software) that is able to turn a "bad" photo into a good one. Postproduction should be thought of as a final finishing touch to make an already good

photograph an awesome one.

As software, Photoshop has no notion of your intentions as a photographer, in terms of how you want your final image to look. It is just a tool, and the final decision

is always yours, as it is your very own image. There are several very nice underwater images out there, which are praised by audiences, despite the fact that they have serious color casts. Just think of all

those whale and shark images.

Please note that in postproduction, "many roads lead to Rome," which means there are plenty of different workflows and ways to fix specific problems in an image. ■

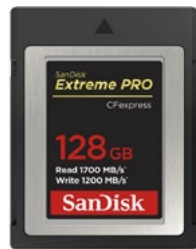
Rico Besserlich is a widely published German photographer, journalist and artist based in Turkey. For more information, visit: Maviphot.com. See his latest book at: Songofsilence.com.





ALL PHOTOS COURTESY OF THE MANUFACTURERS

SanDisk Extreme Pro CFexpress



The new Extreme Pro CFexpress cards by SanDisk and Western Digital offer transfer speeds of up to 1700MB/s to read and up to 1400 MB/s to write. The new CFexpress card format is rapidly being adopted by high-end cameras, such as the Canon EOS-1D X Mk III, Nikon D6, Nikon Z6 and Z7, as well as the Panasonic Lumix S1 and Lumix S1R. The Cfxpress Card Type B is backwards-compatible with select XQD cameras that adopt firmware enabling Cfxpress. Available memory capacities are 64, 128, 256 and 512 GB. westerndigital.com



Nauticam NA-1DXIII

The new NA-1DXIII underwater housing by Nauticam is designed for the Canon 1DX Mark III SLR camera, which is considered the flagship of the CANON EOS series. The housing offers HDMI 2.0 compatibility via an M28 bulkhead and uses Nauticam's N120 port system. Strobe triggering is supported with optional manual or TTL flash triggers, via fiber optics, or with the supplied Nikonos 5 pin bulkheads and internal electrical board. Its dimensions are 360mm x 235mm x 145mm. Its topside weight is 3.59kg, and its underwater weight is -0.2kg (with camera and battery). The NA-1DXIII is depth-rated to 100m. nauticam.com

Eizo ColorEdge CG319X Monitor



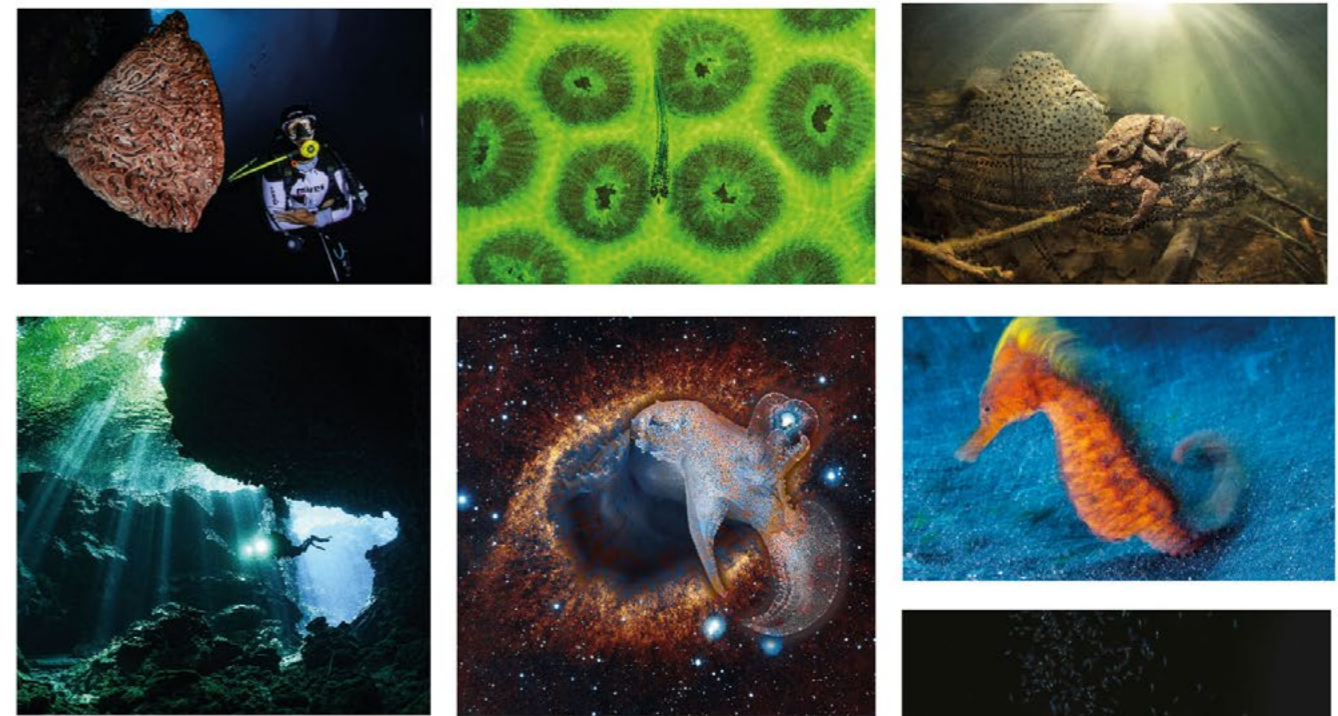
Designed for PRO level image, video and 3D editing, the ColorEdge CG319X 31.1-inch (79cm) monitor from Eizo supports 99 percent of the Adobe RGB and 98 percent of the DCI-P3 color spaces. It features a Cinema 4K resolution

of 4096 x 2160 pixels, 10-bit support for 1.07 billion colors, a static contrast ratio of 1500:1, 350 cd/m2 brightness, 149 pixels per inch, and a 9 ms (GtG) response time. For optimal color workflow, the Eizo has a built-in sensor that can be set to automatically calibrate the monitor at designated times. For assisting the calibration, Eizo offers the free software program ColorNavigator 6 for download. The wide color gamut also ensures correct reproduction of almost all ISO and WEB CMYK color spaces used in professional printing. Furthermore, the ColorEdge CG319X is equipped with HLG (Hybrid Log-Gamma) and the PQ (Perceptual Quantization) curve for displaying and editing HDR (High Dynamic Range) video content. Its integrated 3D LUT for accurate color display allows the simulation of various displays in order to design or edit content for specific devices and audiences. Other features include an integrated luminance warning, aspect marker, anti-glare panel, out-of-gamut warning, light-shielding hood, a viewing angle of 178 degrees, two display ports and two HDMI input ports. eizo.com



Retra Supercharger

The Supercharger is an add-on for the Prime and PRO series of underwater flashguns made by the Slovenian manufacturer Retra. The Supercharger doubles the battery life and reduces the recycle time by more than 50 percent. It is powered by four AA-sized rechargeable batteries, making the complete set (strobe and add-on) running on eight batteries in total. In addition, it acts as a helpful grip for strobe positioning underwater. With this add-on attached, the technical specifications of the Retra strobes include a recycle time at 40% power output of ~0.7s and the number of flashes at 50 percent power output of 700+. The combined (strobe and Supercharger) assembly weight is 1150g. retra-uwf.com



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After 84 years of developing and manufacturing camera equipment, Olympus announced on 24 June 2020 it is in the process of selling their camera division.

Betrayed Again

— Ode to Olympus

Text by Larry Cohen
Photos by Larry Cohen
and Olga Torrey

On 24 June 2020, I woke up to the news that after 84 years, Olympus was selling off its camera division.¹ As a long-time user of Olympus camera gear, my feelings were that of betrayal, again. Here is some history on my experience with Olympus, and my thoughts about the future.

My first Olympus camera was the Pen FT half-frame 35mm film camera. At the time, I had a photo studio and worked mostly with large and medium format cameras. When I did have to shoot 35mm film, I usually used Nikon cameras. For some volume projects, this camera, which gave me 72 images on a 36-exposure roll of film, was useful. I was surprised by the quality of the images taken with a tiny frame of film.

In 2003, Olympus announced the Four Thirds cameras and lenses E system.² At this time, APS-C size sensor cameras were more popular than full-frame cameras due to the expense. The optical design of most lenses was based on

1 <https://www.digitalcameraworld.com/features/what-does-the-olympus-sale-mean-for-users-and-the-wider-camera-industry>

2 <https://www.dpreview.com/articles/1505521452/olympusesys>

35mm film photography.

Olympus' reasoning for the smaller sensor was that the aspect ratio was the same as an 8 x 10-inch print. To make an 8 x 10-inch print from an APS-C size sensor, you had to crop, so a small section of the sensor would be used. The Four Thirds size sensor did not require cropping to produce an 8 x 10-inch print. Olympus



OLGA TORREY

Author Larry Cohen, with his underwater rig, which houses his Olympus camera (above), and shooting topside (right)



OLGA TORREY

reasoned that its sensor had a larger useable area because of the aspect ratio.

Olympus began designing lenses specifically for digital

Underwater photography

As an underwater and travel photographer in the digital age, the small size of this system appealed to me. Olympus supported underwater photographers.

sensors of this size. The lenses provided better image quality, with better edge sharpness and were more compact in size. I remember listening to a sales representative from Olympus, talking about this new system; it made sense to me.

The company manufactured housings for its cameras and speed lights. My first Olympus digital camera was the E-330 EVOLT. To shoot underwater, I used the Olympus brand PT-EO2 housing. My go-to lens for underwater photography was the ZUIKO 7-14MM F/4 ED. Through the years, I upgraded my Olympus DSLR cameras and housings. Using these cameras on the surface and underwater, I got very good quality images, as long as I did not push the ISO up too high.

Olympus came out with their first mirrorless camera in 2009.³ The sensor size was the same; unlike DSLR cameras, there was no mirror or prism. For this reason, the camera bodies were substantially smaller. The lens mount was different; the rear lens element could be moved closer to the sensor. This provided sharper images and smaller lenses. The two systems coexisted until

3 <https://expertphotography.com/mirrorless-camera-history>



LARRY COHEN

Underwater photo of dive partner and fellow underwater photographer, Olga Torrey, taken by the author, using an Olympus camera in an Aquatica housing



LARRY COHEN

Fellow photographer, Olga Torrey, also uses an Olympus camera topside

wide-to-telephoto zoom range, this lens is very sharp. When working from a small inflatable boat, having a lens with this zoom range is a very useful tool.

The future

Now that Olympus will be out of the camera business, what does this mean for me and other devoted Olympus camera users? I am trying to be optimistic. Olympus is selling its imaging business to Japan Industrial Partners (JIP).⁴ This is a private equity fund that specializes in the restructure, revitalization and resale of loss-making businesses. The firm did purchase the computer division of Sony. These computers still exist under a new company name.

I can only hope that Olympus imaging equipment will be restructured and sold to a company that will keep developing inventive, useful tools. Olympus has always been accessible for technical information. When gear needed repair, Olympus had been straightforward to deal with and did the repairs in a reasonable amount of time. I can only hope this will continue. ■

Larry Cohen and Olga Torrey are well-traveled and published underwater photographers based in New York City, USA. They offer underwater photography courses and presentations to dive shops, clubs and events. For more information, please visit: liquidimagesuw.com and fitimage.nyc.

2017, when Olympus decided to stop supporting the DSLR Four Thirds system. As a long-time user, I felt betrayed. I continued to use my cameras for many years. I knew at some point I would need new gear and would have to change systems.

When that day came, I tried different systems including the Sony full frame a7 camera. At that time, there were very few lens choices. The lenses I needed to shoot underwater did not exist then. Trying the professional quality Olympus OM-S E-M1, I was impressed with the camera. The Micro Four Thirds lenses were small and of high quality. Besides the Olympus brand housing, Aquatica was producing a housing for this camera.

I decided to put my feelings aside and move into this system. I purchased a number of bodies, lenses from 7mm to 300mm, and other accessories. I decided to use the Aquatica housing. I was very happy with the image quality and handling of this gear, and the compact size allowed for easier traveling. So, I forgave Olympus for abandoning my beloved DSLR Four Thirds system. I found the new mirrorless Micro Four Thirds system to be even better.

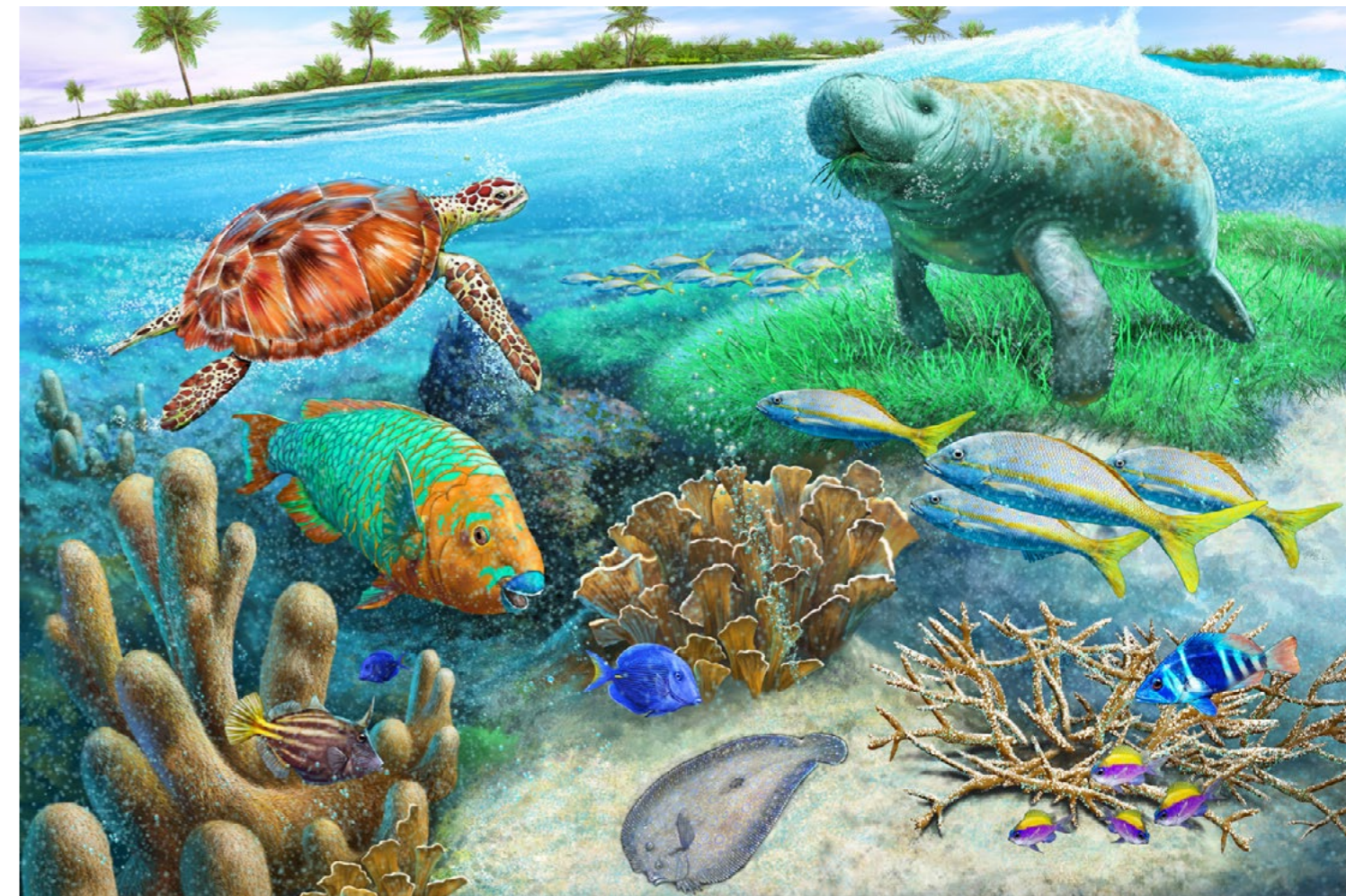
Recently, I upgraded to the Olympus OMD E-M1 Mark II. I purchased a new Aquatica housing and got the Olympus M.Zuiko Digital ED 12-200mm f/3.5-6.3 lens for working on the surface. Considering the large

⁴ [HTTPS://WWW.DIGITALCAMERAWORLD.COM/FEATURES/WHAT-DOES-THE-OLYMPUS-SALE-MEAN-FOR-USERS-AND-THE-WIDER-CAMERA-INDUSTRY](https://www.digitalcameraworld.com/features/what-does-the-olympus-sale-mean-for-users-and-the-wider-camera-industry)

Rudolf Farkas



P O R T F O L I O



Text edited by G. Symes
All artwork by and images
courtesy of Rudolf Farkas

Hungarian artist Rudolf Farkas, who lives in Budapest, creates dynamic and intricately composed illustrations of a wide variety of marine life as well as the unique marine ecosystems in which they live. X-Ray Mag interviewed the artist to learn more about his artwork and his creative process.

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

RF: I live in Budapest, Hungary. While I am a person who lives in a city, I have a passion for creating illustrations of animals and nature. During my 40-year career, I have developed a distinctive style through my artworks.

I graduated from college in 1978, majoring in fine arts. Then, I served two years in the army, after which I joined Wessely Tibor's fine art society. In this group, I mostly focused on realism in my paintings. I gained

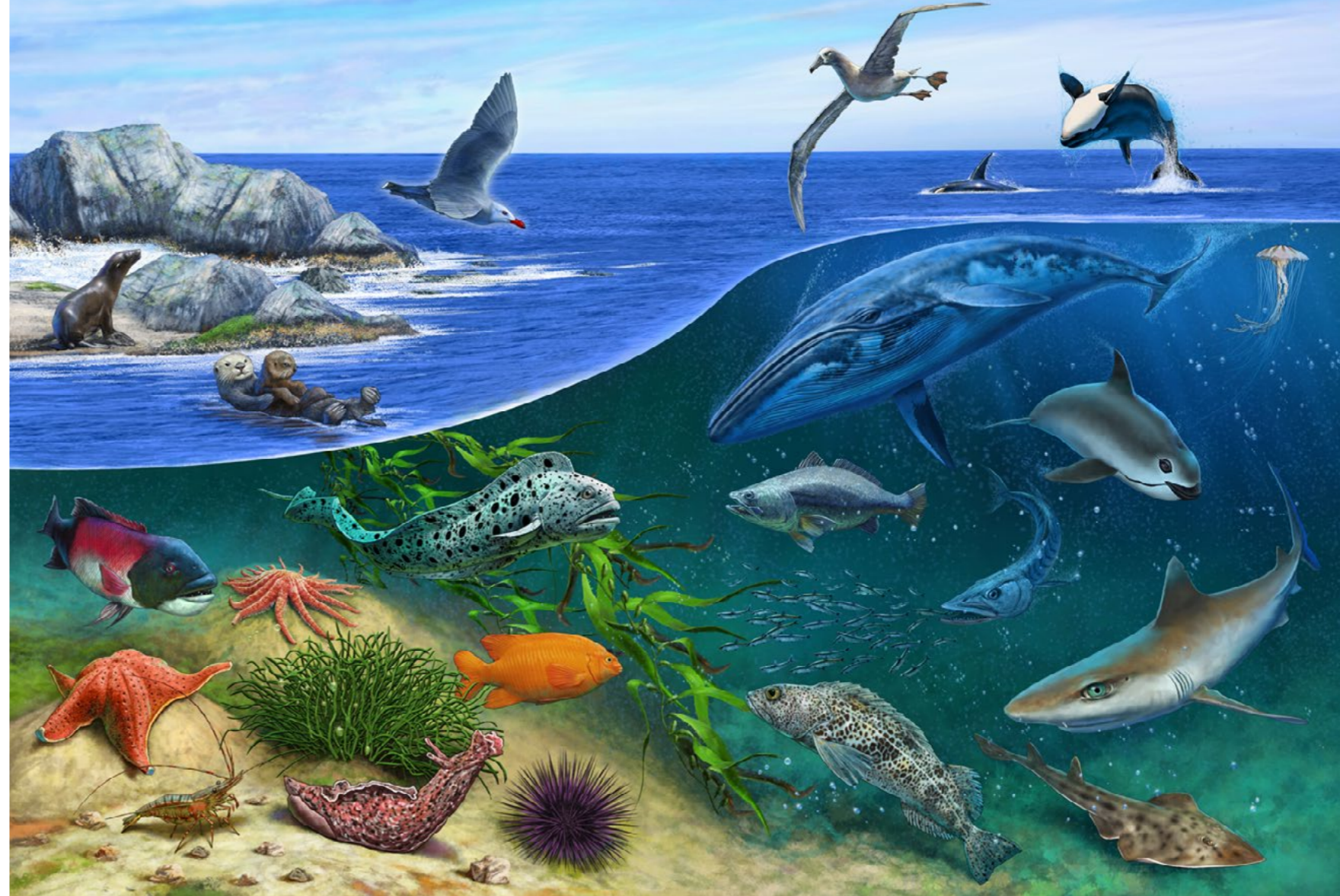
greater insight into the representation of the flora and fauna of the world. My artworks were featured in several group and individual exhibitions.

In 2005, one of the leading book publishers in Hungary asked me to create illustrations for their upcoming editions. It was in this year that I started producing digital illustrations for children's books. Over the past 15 years, my illustrations have been published in more than 100 different books and magazines as well. Nowadays, I have gone back to my roots by creating hyper-realistic oil paintings.

Ecosystem of the Coral Atoll, by Rudolf Farkas. Digital illustration, 210 x 297mm, 300dpi



Ecosystem of the Sargasso Sea, by Rudolf Farkas. Digital illustration, 210 x 297mm, 300dpi



Ecosystem of the Monterey Bay, by Rudolf Farkas. Digital illustration, 210 x 297mm, 300dpi (above); *Hunting at Night*, by Rudolf Farkas. Digital illustration, 148 x 210mm, 300dpi (top left)

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

RF: I have been an avid angler since I was a kid, and I have always been amazed by sea life and underwater creatures. I spent many hours at the waterfront. In various art projects, I had to specialize in marine life, even though I had always lived in a continental country.

X-RAY MAG: *Who or what has inspired you and your artwork and why?*

RF: I have always been attracted

to realistic representation. At the beginning of my career, I took Tibor Wessely's fine art courses. As part of my studies, I produced several copies of well-known paintings by artists such as Vermeer, Leonardo, Caravaggio, etc., but mostly, I focused on creating my own oil paintings.

X-RAY MAG: *What is your artistic method or creative process?*

RF: First of all, accuracy is essential in my artwork. Therefore, I thoroughly study the anatomy and habitat of the selected animal for the piece. Usually, the next step is to create an

exact drawing and then create the graphic rendering.

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

RF: I have seen a lot of footage of coral reefs in nature films, but unfortunately, I have not had the chance to study them in person yet. During holidays, I have spent a lot of time on the Adriatic Sea where I had the opportunity to examine the underwater world.

portfolio

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

RF: Generally speaking, people need air to breathe, water to drink, food to eat, a climate they can live in, beauty, inspiration and recreation. In my opinion, we have to remind people that they belong to something bigger than themselves. I would like a better future

for those I care about, and future generations as well. To live and prosper, we need healthy oceans.

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

RF: By creating extremely detailed artworks, I would like to raise awareness of the importance of environmental and ocean conservation. I am concerned

that oceans are becoming more and more polluted nowadays. I hope that my illustrations can draw the world's attention to the imminent danger.

X-RAY MAG: How do people—adults and children—respond to your works?

RF: Most people appreciate that my pictures have a realistic style. I receive a lot of positive comments and letters from readers.

Portrait of a Greenland Shark,
by Rudolf Farkas. Digital illustration,
148 x 210mm, 300dpi

Rudolf Farkas



Ecosystem of the Deep Sea, by Rudolf Farkas. Digital illustration, 210 x 297mm, 300dpi (above);
Humpback Whales Hunting, by Rudolf Farkas. Digital illustration, 210 x 297mm, 300dpi (right)



portfolio



Under the Sea, by Rudolf Farkas. Digital illustration, 660 x 480mm, 300 dpi

X-RAY MAG: What are the challenges or benefits of being an artist in the world today? Any thoughts or advice for aspiring artists in ocean arts?

RF: I think it is very difficult to pursue a career as an artist today. I would advise young people to follow my lead as one who lives very far from the ocean and yet does his best in representing and illustrating sea life.

X-RAY MAG: Regarding your work, *Devonian Marine Life*, please tell us how you visualize and render extinct

species as well as envision the ecosystem in which they may have lived millions of years ago.

RF: I received this specific commission from a publisher who needed an illustration of Devonian marine life. After we agreed on our future collaboration, the editor sent me a brief about the animals, plants and properties of the image that would be placed in the book. I was completely free to create the illustration within the given limits. In paleoart illustration, fantasy plays a big role, as knowledge about

these ages is incomplete (or partial).

I started with a rough sketch first and sent it to the publisher for approval. The next step was to develop the digital rendering. I created the work with a well-known drawing software program. The workflow was very similar to developing analog images (e.g., oil paintings). I used brushes but in a digital form. In my opinion, digital painting is a much easier way of implementation, compared to acrylic or oil painting.

X-RAY MAG: Would you call this type



Devonian Marine Life, by Rudolf Farkas. Digital illustration, 210 x 297mm, 300dpi —the initial rough sketch (above) for the finished work (top right)





Ecosystem of the Rocky Shore, by Rudolf Farkas. Digital illustration, 210 x 297mm, 300dpi (above); *Life in the Coral Reef*, by Rudolf Farkas. Digital illustration, 210 x 297mm, 300dpi (bottom right)

of illustration "paleoart" or "paleontologically-inspired art"? And what is the difference between the two?

RF: Yes, I think there are two branches of representation. In one branch, fantasy dominates, at the expense of science. In the other branch, the artist depicts a specific animal and era on a purely scientific basis. The scientific representation of extinct species and eras is the one closer to my goals in illustration. I aim to spread knowledge.

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

RF: I am currently working on two projects in parallel. The first one presents the development and breeds of frogs. This book will be published later this year. The second one is a series of pop-up books. These editions focus on dinosaurs in a playful manner.

X-RAY MAG: Lastly, is there anything else you would like to tell our readers about yourself and your artwork?

RF: Authenticity and accuracy are essential to me. In creating illustrations and imagery, I would like to draw readers' attention to the fact that they can

find beauty in the smallest details of animal life, and moreover, that they should conserve wild species and protect their habitats. As a professional artist, I always welcome new challenges, and I really enjoy coming up with creative ideas. If you would like to get further detailed information regarding a particular image, I will be happy to respond in a private message through my agent (Kevin@KJA-artists.com). ■

For more information, or to order commissions or prints, please visit the artist's webpage at: kja-artists.com/portfolio/269.

Life Cycle of the Red Mangrove, by Rudolf Farkas. Digital illustration, 148 x 210mm, 300dpi (below)

Rudolf Farkas

