Look After Your People :: Branding Videos :: Spawning Ritual :: Elyse Fournier Portfolio

X-Ray Mag

GLOBAL EDITION
December 2020
Number 102

Thailand
Ming Pottery Wreck

Contributors' Picks
My Favorite Shore Dive

Wrecks
Black Sea

Turkey
Bodrum

UW Photo
Sharpening

Underwater
Model Photography

BRAZIL
Bonito Caves

COVER PHOTO BY KATE JONKER

DIRECTORY

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COVER PHOTO: *Coral nudibranch (Phyllodesmium horridum), Coral Gardens, Rooi Els, Cape Town, South Africa* by Kate Jonker (**katejonker.com**)

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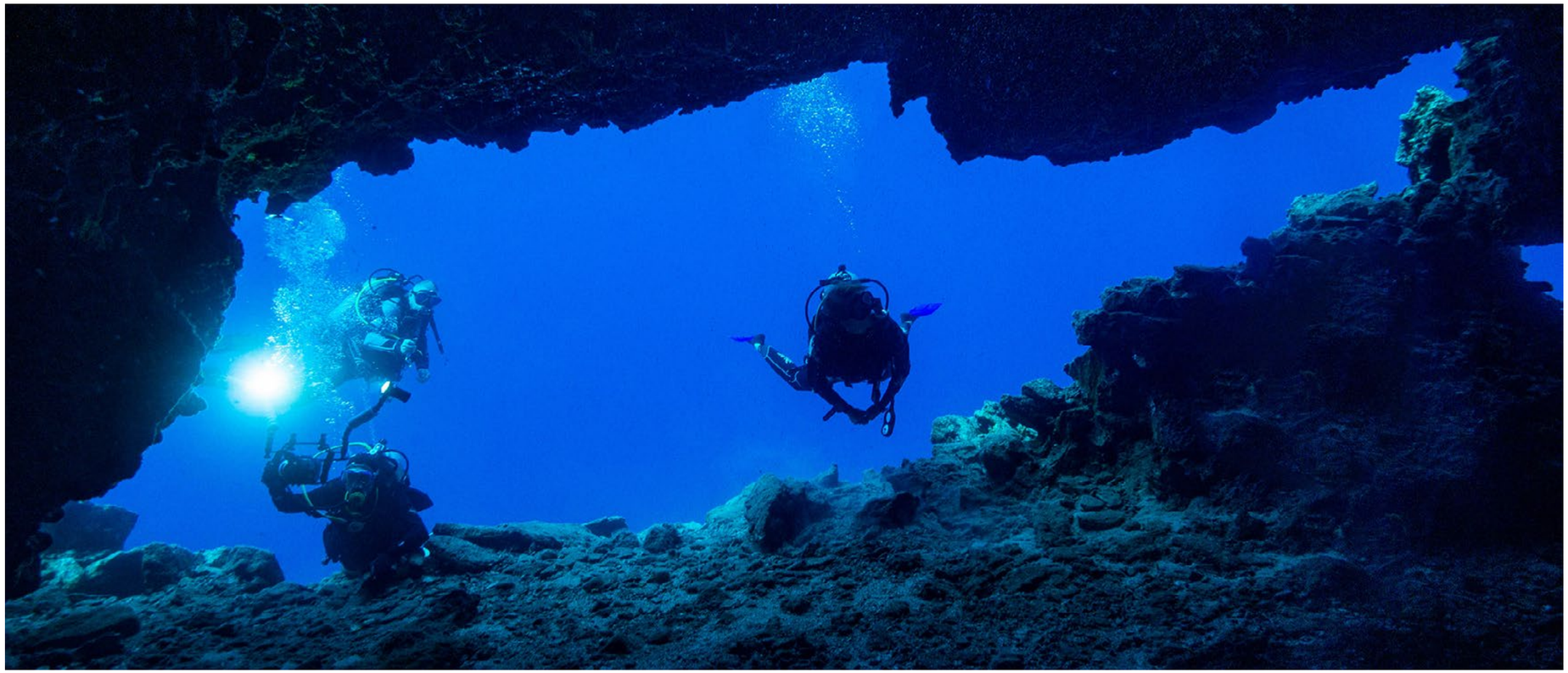
Divers at mouth of Bubble Cave, Bodrum, Turkey. Photo by Farfat Jah



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Reflections at year's end

As 2020 draws to a close, we can both look back at an *annus horribilis* and forward to a new year, with the shimmering hope that the coronavirus pandemic will be quenched as vaccines are rolled out.

That several vaccines have been developed and tested in less than a year is a remarkable achievement. It is a testament to both the efficacy of the scientific method, and to the sheer willpower and focus humans are able to muster in the face of threats to our existence.

And we will have to keep doing it, time and again, working doggedly in this spirit and coming together as societies, as there are many more pressing problems on our doorstep.

I am of course talking about climate change and the rapid degradation of our natural environment. Reading, for instance, about the precarious state of the Great Barrier Reef—a magnificent natural structure and wonder—is almost too depressing to think about.

But we must think about it and not keep sticking our heads in the sand, pretending the issues are not there or "will mysteriously go away."

Science, innovation and bold planning is the only way forward. It is the only approach and mindset that has consistently proven to lead to deeper understanding of the underlying nature of the challenges we face, and ultimately, to solutions and required technological advances. It is because of scientific progress that we no longer treat ailments with bloodletting and chanting at the full moon but are now able to replace heart valves and worn-out joints.

Can we pull the planet back from the brink upon which it is now teetering? I am not sure, but if we do not give it our best concerted effort, we will surely fail. Failure, however, is not an option.

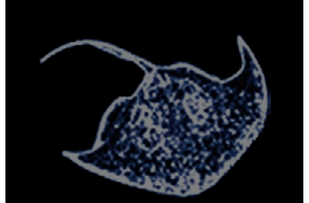
I have sometimes been chided for letting politics into the publication. Diving should be a getaway, a respite from the news, I am told. Sorry, if you only want to tune out and not concern yourself with the bigger picture, then this media is not for you.

Surely, we should all, from time to time, allow ourselves to indulge in some needed escapism, healing and recovering from our busy work schedules when we are on holiday and just enjoy some good diving and the hospitality on offer. When we are surrounded by beauty, we should immerse ourselves in it and take it all in.

But those sacred occasions aside, as divers, we are frequently first-hand witnesses to the degradation of our aquatic natural resources. It is then our simple civic duty as stewards of the environment to raise the alarm and create awareness of the issues at hand—and to tirelessly keep pushing the matter until real and meaningful progress is made.

If any good came out of 2020, I would like to think that the lockdowns and other restrictions gave us cause and time to pause and reflect upon what we treasure most in life. That it came with a silver lining, providing us with a new perspective and clarity, is heartening and hopefully has strengthened humanity's resolve in making the course corrections necessary to save this planet and set it on a better, more sustainable path.

— Peter Symes,
Publisher and Editor-in-Chief

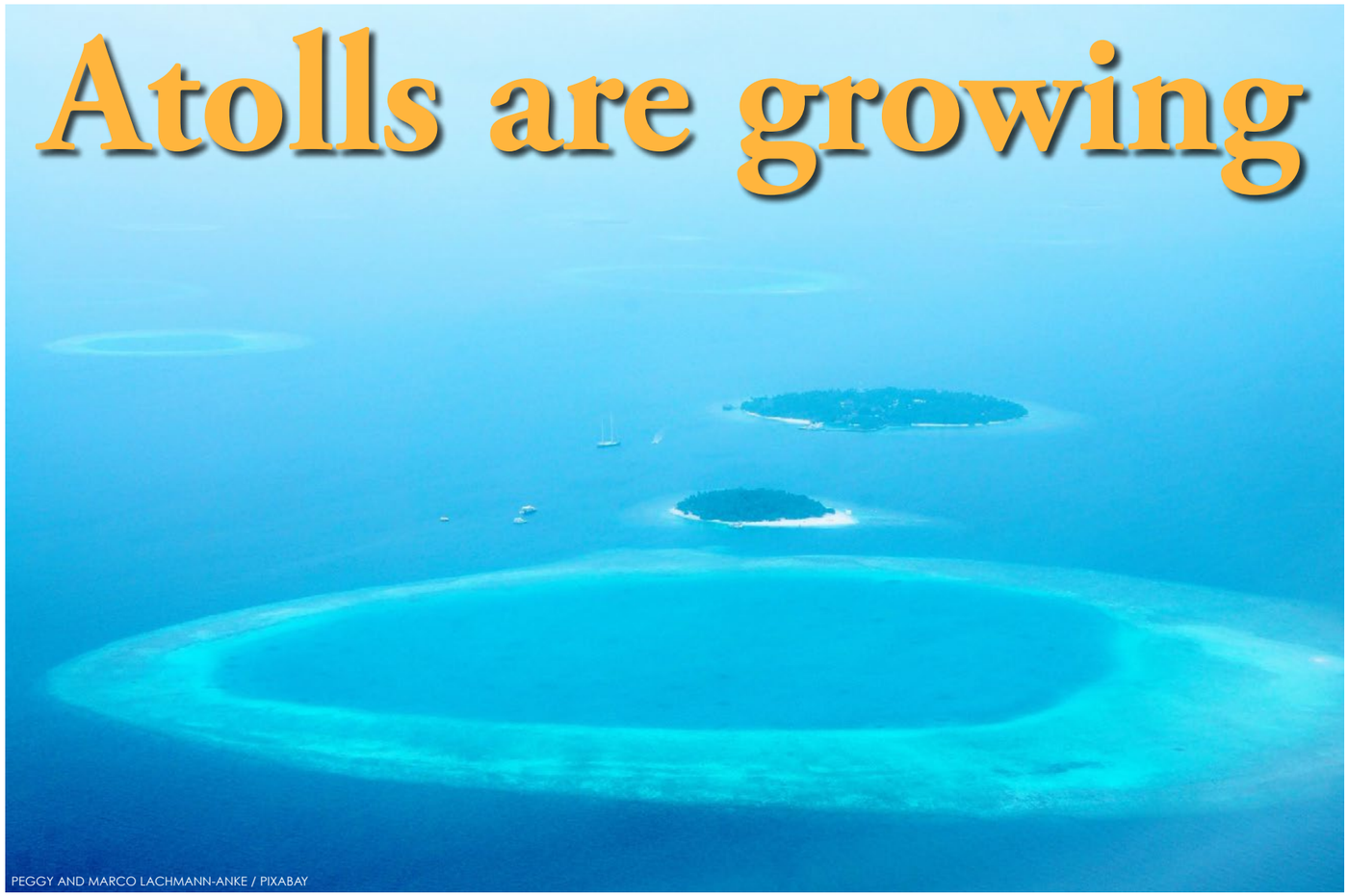


Edited by
Peter Symes

from the deep

NEWS

Atolls are growing



PEGGY AND MARCO LACHMANN-ANKE / PIXABAY

As climate change is causing sea levels to rise and threaten to submerge many low-lying islands, some atolls have actually been growing. Now, scientists have figured out why.

Atolls are often only around two metres (6.6ft) above sea level, but sea levels could rise by more than that by the end of this century, according to prevailing climate models. Four atoll nations—the Marshall Islands, Tuvalu, Kiribati and the Maldives, which are together home to more than half a million people—were the most vulnerable on the planet to climate change but under threat was also those in the Caroline Islands, Cook Islands, Gilbert Islands, Line Islands, Society Islands, Spratly Islands, Seychelles and Northwestern Hawaiian Islands.

In 2009, the government of the Maldives made international headlines by holding a cabinet meeting underwater to highlight the threat of global warming to the low-lying Indian Ocean nation—ministers spent half an hour on the seabed, communicating with whiteboards and hand signals. The Maldivians say they face being wiped out if oceans rise.

Tuvalu already struggles with the rising sea. Tuvaluan Prime Minister Enele Sopoaga has been sounding alarm bells for years about climate change, urging industrialised nations to reduce their greenhouse-gas emissions. He said his country is at risk of disappearing one day, like a modern-day Atlantis. Between January and March, its seasonal "king tides" cause severe flooding and it has been that way for decades. In 2018, a US Geological Survey study found that many low-lying atolls, most of which are in the Pacific and Indian oceans, will be uninhabitable by the middle of this century.

How do atolls form?

An atoll is typically a ring-shaped coral reef that encircles a lagoon. According to prevailing theory and posited by Charles Darwin, atolls were typically formed from coral reefs that grew around shores of volcanic islands and when the volcanos over geological timescales went extinct, eroded and eventually subsided under the surface of the ocean, a circular reef comprising growing coral was left behind. This process may take as long as 30 million years.

However, this orthodoxy has repeatedly been challenged and alternative

AHMED AMIR / FLICKR COMMONS / CC BY 2.0

theories proposed. In the Maldives, for example, cores drilled in the lagoon of North Malé atoll hit volcanic basalt at a depth of 2.2km with an almost 2km thick layer of limestone deposits on top—also known as karst. Limestone is generally formed by coral and foraminifera—single-celled, primarily marine organisms with shells commonly made of calcium carbonate ($CaCO_3$). The discovery of this karst layer suggests atolls forming on its flat carbonate terraces—independent of volcanic subsidence.

Timeline called into question

Based on such findings, André Droxler and Stéphan Jorry, authors of a review paper, which appeared in *Annual Review of Marine Science* in September propose a different model of atoll formation. When volcanic islands sank, as Darwin had proposed, land subsidence allowed space for complex sea floor evolution. Carbonate platforms of corals and foraminifera began to grow on top of the volcanic basalt.

As sea levels rose and fell—a concept Darwin was not aware of, as the theory of quaternary glaciations was not proposed until about 20 years after his theory of atoll formation—atolls formed as a direct interaction between subsidence and karst dissolution that occurred preferentially in the bank interiors rather than on their margins through exposure during glacial lowstands of sea level. Atolls then developed during deglacial reflooding. Coral reoccupied their raised margins and grew vertically, keeping up with the sea-level rise and creating the modern atolls.

Sedimentation works faster

Where active sediment generation from healthy coral reef takes place, islands can continue to expand despite rises on local sea levels. A recent study, published in *Geophysical Research Letters* has documented, after looking at aerial photographs taken between 1943 and 2006, how Jeh Island (a sparsely populated atoll that is part of the Marshall Islands) has grown through the merger of at least two islands and the continued expansion of the island. These findings show that islands are able to grow under present-day conditions by accumulating sediment produced on the surrounding reef.

It is the coral reefs that give these islands their structure and are continuing to produce sediment which may, or may not, keep sea-level rises at bay. ■

Edited by
Peter Symes

Giant kelp (*Macrocystis pyrifera*) is a species of kelp (large brown algae).

Kelp forests help the climate

Kelp may protect coastal ecosystems by helping to alleviate acidification caused by too much atmospheric carbon being absorbed by the seas.

Kelp is an ecologically and economically important foundation species in the US state of California, where forests line nutrient-rich, rocky-bottom coasts. It also might alleviate acidification caused by too much atmospheric carbon being absorbed by the seas.

A new interdisciplinary analysis of giant kelp in Monterey Bay off the coast of California shows that near the ocean's surface, the water was less acidic, suggesting the kelp canopy does reduce acidity.

Kelp is also characterised by its speedy growth—up to five inches per day—during which it undergoes a large amount of photosynthesis that produces oxygen and removes carbon dioxide from the water.

In Monterey Bay, the effects of giant kelp are also influenced by seasonal upwelling, when deep, nutrient-rich, highly acidic water from the Pacific is pulled toward the surface of the bay.

In order to disentangle the various effects, researchers from Stanford's Hopkins Marine Station, fielded an array of sensors which provided new high-resolution, vertical measurements of pH, dissolved oxygen, salinity and temperature. With these instruments, the researchers were able to distinguish patterns in the seawater chemistry around the kelp forest.

At night, when they expected to see more acidic water, the water was actually less acidic relative to daytime measurements—a result they hypothesise was caused by the upwelling of acidic, low oxygen water during the day.

Although the kelp forests' mitigation potential in the canopy did not reach the sensitive organisms on the sea floor, the researchers did find an overall less acidic environment within the kelp forest compared to the outside of it. The organisms that live in the canopy or could move into it are most likely to benefit from the kelp's local acidification relief, according to a press release from Stanford University.

While this project looked at kelp's potential to change the local environment on a short-term basis, it also opens the doors to understanding long-term impacts, like the ability to cultivate "blue carbon," the underwater sequestration of carbon dioxide. ■

SOURCE: STANFORD NEWS

Edited by
Peter Symes

LARRY COHEN

Previous studies of shipwrecks in the United Kingdom and the Red Sea have shown that such artificial reefs often create new and different types of habitat than natural reefs.

Fish thrive on WWII shipwrecks

NOAA exploration of North Carolina wrecks offers detailed glimpse into unexpected "islands of habitat."

In 2016, the National Oceanic and Atmospheric Administration (NOAA) undertook a closer examination of the wrecks of the German U-boat U-*576* and the Nicaraguan freighter SS *Bluefields*, using glass-domed submersibles. The two historically significant and deep (200m) shipwrecks sank in close proximity to one another on the continental shelf of North Carolina, USA, during World War II.

Even though shipwrecks that are the focus of archaeological surveys also form habitat for diverse flora and fauna, shipwrecks are often studied separately by archaeologists and ecologists. This exploration was different in being a joint ecological–archaeological undertaking, the results of which have just been published in *Ecosphere*, the journal of the Ecological Society of America.

The researchers used lasers to acquire 3D snapshots of fish to a millimetre level of precision. For instance, the detailed photos allowed the team to measure the size of a grouper hovering beside the rivet of the U-boat's hull or to document the position of a wreckfish beside the barrel of the deck gun.

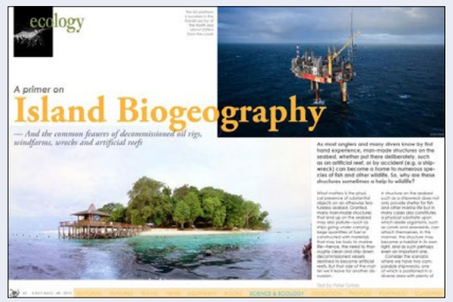
A fundamental goal of ecology is to understand relationships between species and their habitats. For example, researchers seek to understand why fish populations decide to call a shipwreck home rather than a rocky reef—or the significance of wrecks and artificial reefs where there are no other solid structures, say, on sandy or muddy seabeds.

Scientists also want to find out how fish find these remote sites in the first place. "Since the shipwrecks are such small islands of habitat on the sandy seafloor, it was surprising to see so many large-bodied groupers, like snowy and Warsaw grouper, occupying the shipwrecks," said Avery Paxton, a research associate at NOAA.

Shipwrecks can form "islands" in a biogeographical sense. These are isolated habitats spread out over otherwise inhabitable or unfavourable surrounding environment. ■ SOURCE: **Ecosphere**

LARRY COHEN

Amberjack on shipwreck. Many large predators on such a relatively small habitat begs the question of how and whether they are feeding on these sites," said Chris Taylor, Ph.D., a research ecologist at NOAA's National Centers for Coastal Ocean Science (NCCOS) and a co-author of the study.



Island biogeography explained

A wreck can constitute a virtual island in the middle of a barren expanse. And this is where the concept of island biogeography comes in. The focal point of this scientific discipline is the species richness of isolated natural communities. **Link to article**

divebiz

Social media and influencer promotion is becoming a larger part of the digital marketing mix each year.

Branding Videos & Digital Media Marketing

— An Interview with Brent Durand

Text edited by G. Symes
Images courtesy of Brent Durand

Branding videos, sponsored posts, social media marketing... confused? We interviewed digital media marketing consultant and underwater photographer Brent Durand to get the scoop on what these services are and how they can benefit your dive business and increase your sales.

What exactly is digital media marketing? Durand says, digital media marketing encompasses all aspects of a company's online sales and promotions efforts.

> *"Well-planned and targeted digital marketing efforts not only drive sales but engage consumers at all stages of the customer life cycle."*
>
> — Brent Durand,
> digital media marketing consultant

X-RAY MAG: As a digital media marketing consultant, what kinds of things do you advise clients about or what services do you offer?

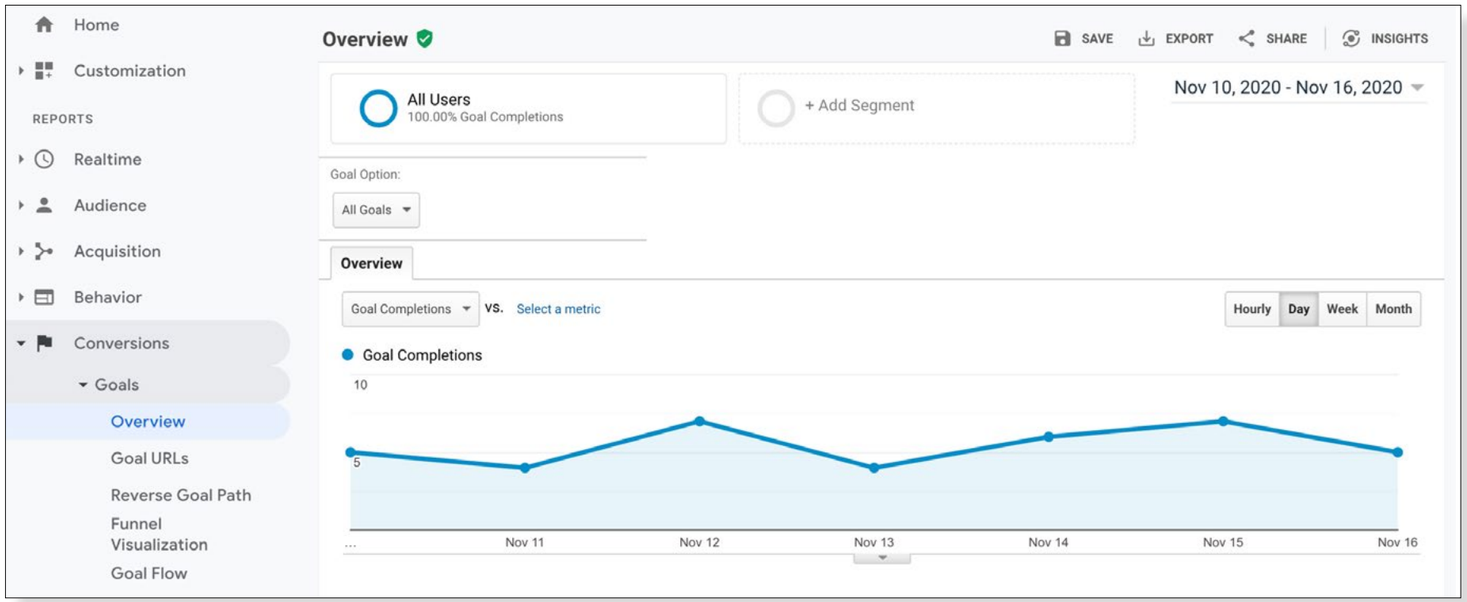
BD: I try to start with the big picture and then work down into the details, ensuring that all of our efforts deliver smart return on investment. Every company has a different online presence and different business goals they hope to achieve through digital. I learn where the company is now and where they want to be, and then fill in a detailed roadmap and action plan that might cover website updates, social media and influencers, paid advertising, building a content library, and newsletter strategy. I also shoot photo and video myself, making my boutique agency, We All Roam, a one-stop shop for digital media.

X-RAY MAG: What are the components of a successful digital media marketing plan and what role does a branding video play in the overall strategy?

BD: A brand video is a great introduction to your company. It is a first impression. Video now comprises over 80 percent of content consumed online, so a short, attention-grabbing video can really tell your story. It can be used on your website or for any of the new digital trade

divebiz

Tracking and optimizing performance is essential for digital marketing.



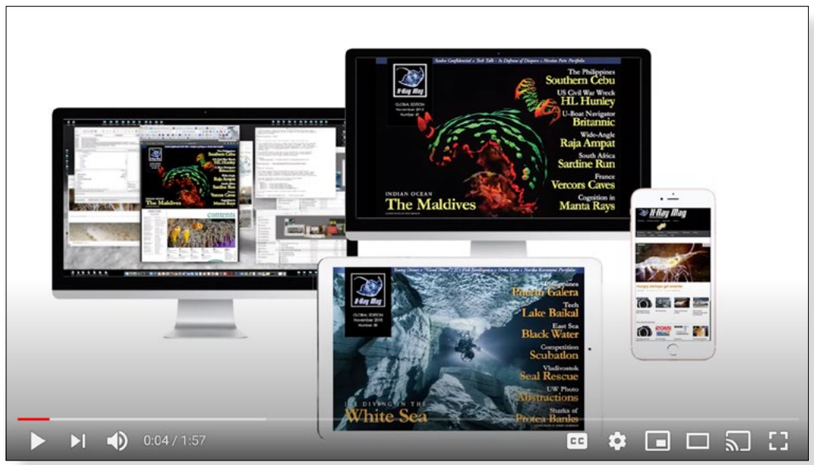
shows. Sometimes, the exercise of creating a brand video or other ad creative helps solidify a brand image and identity that has not been totally clear.

A strong digital marketing plan will vary, depending on the client. For example, a dive center with an online store would look towards a conversion-oriented marketing plan composed of a seamless website shopping experience, paid ads, newsletters, and sale and new product calls to action. This would naturally fit in with the multisensory brand experience at the physical store, personalized instruction, and group dive trips that all turn a one-time shopper into part of the local dive community.

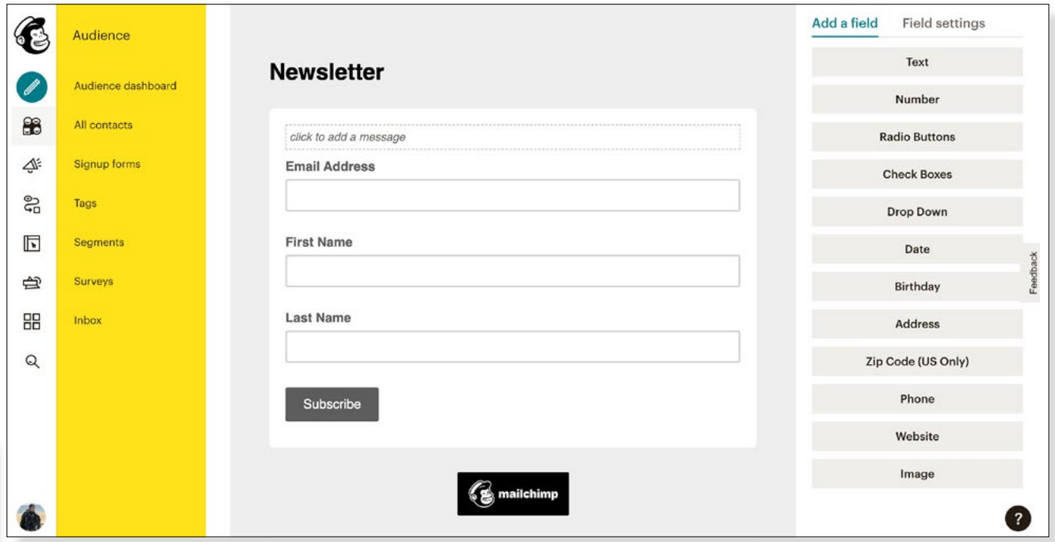
X-RAY MAG: Why is video more important for social media these days?

BD: Video is the future. Social media is rapidly shifting to favor video, so it is only natural for brands to be right where the customer is consuming content. Video also makes it very easy to relay more brand messaging—visual, audio or text—than what you might find in a traditional ad.

X-RAY MAG: How can a dive business make the most of their efforts to create a brand video?



This screen in a brand video clearly demonstrates that the magazine delivers cross-platform content for the reader to view anytime, anywhere. Audio voiceover also relays the same message. **Click image to see video >>>**



BD: This boils down to having a strong content strategy. Preplanning will streamline production efforts and allow you to accomplish several marketing goals at once. For example, if a dive resort would like to film new underwater content for a brand video, I would suggest finding a videographer who can film and produce that project while also creating a library of short clips and spin-off videos for social media, YouTube and other sharing venues. Better yet, hire someone who is also very active on social media, which means they will be creating some buzz and exposure while they are on location filming. They might even be able to line up some magazine articles focusing on the resort and dive destination.

A dive gear manufacturer would do the same thing—shoot for the brand video, plus short-form content about the products and even clips or stills for social media or other advertising creative.

X-RAY MAG: What are the next steps in the process and how do you measure the results?

BD: Once the digital marketing plan is mapped out, it is time to execute. I am a big fan of assigning responsibilities and deadlines, since these things can get hazy in small companies where folks wear many different hats.

Viewing the results is easy; the hard part is knowing what the key metrics will be. How will we measure success in our new marketing plan? Sometimes, this involves several stages within the sales funnel—each of which is important. We might look at newsletter signups or we might look at direct sales. Or we might simply look at engagement rates.

Once we understand our early results, we can take the next step, which is optimizing the strategy from top to bottom. ■

Website updates, newsletters, online ads, and other components of a digital marketing plan can be complicated to set up in a way that maximizes their value.

Brent Durand is a professional underwater photo and video creator, writer, photo instructor and digital content guru. He publishes an active YouTube channel and companion website with over 40 free video tutorials, articles, gear guides and virtual lessons for underwater photographers. Durand also helps dive businesses develop smart digital media strategies. Learn more at ***BrentDurand.com****.*

The Legacy of Ernie Brooks

—*The "Ansel Adams of underwater photography" has died at the age of 85*

Text by Rico Besserdich

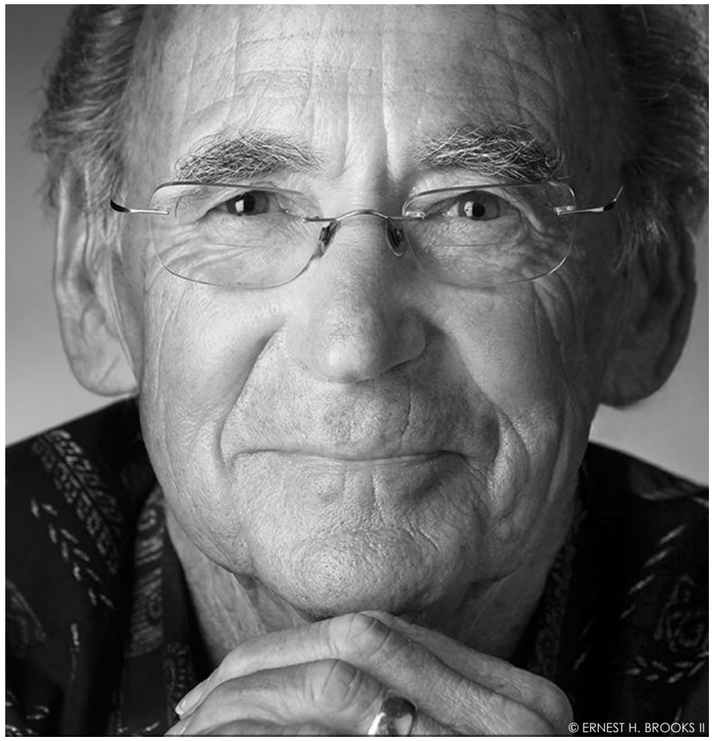
To remember Ernest H. Brooks II means not only to think of the iconic and true fine-art, black-and-white underwater photographer whose creative work influenced people all over the world for 66 years, it also means remembering a true gentleman, and a great and kind soul, loved by so many. If you ever had the luck of meeting him in person, you know what I am talking about.

In the year 1945, Ernie was just 10 years old. His father, Ernest Brooks Senior, founded the Brooks Institute of Photography in Santa Barbara in the US state of California. It was an art college that later offered four majors and two graduate programmes. In 1956, the Brooks Institute established its underwater photography department, which was, as far as I know, the first place ever to offer education in underwater photography on a professional level.

At that time, Ernie had already been an underwater photographer for two years, shooting images with his Leica, stored in an underwater housing he made himself. All his images were in black and white, of course.

At the same time, he was also a pilot, flying a U2 spy plane in the skies of 70 different countries. Ernie recalled, "I was very good at figuring out optics. We were using a lot of infrared cameras, and actually, I designed the film."

Ernie became a graduate of Brooks Institute of Photography in 1962. Today, all institute graduates are still called "Brookies," with some highly respected underwater photographers among them (including *X-Ray Mag* contributors Amanda Cotton and Matthew Meier). The name "Brooks" stands for exceptional quality in photography arts.



Ernest H. Brooks II

With professor Dr Hans Hass as his role model, Ernie used the legendary Rolleimarin underwater camera for a short time, but later switched to the Hasselblad SWC. Ernie never talked much about it himself, but as a matter of fact, this Hasselblad model was gifted to him by Victor Hasselblad, the inventor of Hasselblad cameras. That happened in the year 1961. Ernie never switched models, he never went digital and, of course, he never went colour. He even told me once, "Rico, believe it or not, it's even still the very first O-ring!"

After leaving the US Air Force, Ernie immediately started working with Captain Jacques-Yves Cousteau, training the photographic team aboard Cousteau's ship,

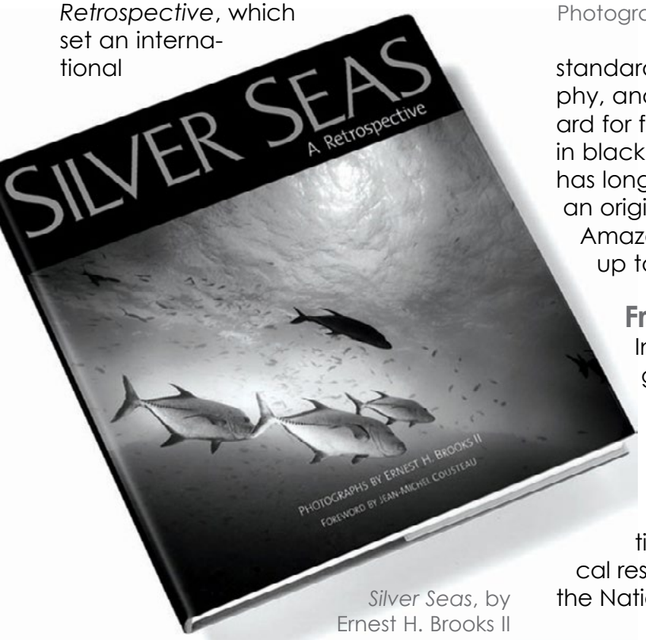
Michael Meets Spot, by Ernest H. Brooks II

Calypso. For 17 years, Ernie worked with the Cousteau team while working in the Brooks Institute at the same time. In 1971, Ernie served as the president of the Brooks Institute, upgrading the institution to a four-year, university-level school. He continued to place focus on the institute's underwater photography department, using his boat, *One Love*, as a floating classroom and darkroom.

And yes, he always kept on shooting images himself. The list of his accolades is a very long one. Everyone knows the work of Ernie Brooks. Therefore, I want to list only two major achievements, which I personally see as outstanding.

Silver Seas

In the year 2002, three years after he sold the Brooks Institute, Ernie published the book, *Silver Seas: A Retrospective*, which set an international standard for black-and-white photography, and can be considered the standard for fine-art underwater photography in black and white. The original print run has long been sold out, but sometimes, an original, signed copy pops up on Amazon. Collectors are willing to pay up to US$1,500 for such a copy.



Silver Seas, by Ernest H. Brooks II

Fragile Waters

In 2013, Ernie's inspirational work got exhibited together with that of Ansel Adams and Dorothy Kerper Monnelly in the travelling exhibition, *Fragile Waters*, curated by Anne Adams Helms—Ansel Adam's daughter. The exhibition called attention to the critical resource of water. It premiered at the National Maritime Museum, and later toured the United States. As Ernie considered Ansel Adams to be one of his mentors, inspiring his work, having his photographs exhibited alongside the work of his master meant a lot to him. He never admitted it, but it also meant a lot to Ernie that people called him the "Ansel Adams of underwater photography."

Photographs by Ernest H. Brooks II: *Maginificent Blue* (above) and *A Lot of Lions* (right)

Sharing his passion

After he sold the Brooks Institute, Ernie had more time to travel the world. During the last 20 years, he was frequently seen at major dive shows such as DEMA, ADEX, Beneath the Sea and BOOT, among others, and at underwater photography-related events such as the legendary World Festival of Underwater Images in Antibes, France.

He always loved to share his passion with others. Moreover, he always had a motivating and friendly word for anyone who loved the sea and photography. Absolutely everyone loved Ernie. Yet it was not easy to reach him in person. He always had his own way of doing things. He showed up when he wanted. Sometimes, he simply disappeared for months. He always kept his private life private.

Ernie and me

Like nearly everyone else, I knew Ernie by name. Of course, I knew his work. When I was helping to curate the *Edition Fifty Fathoms* underwater photography art-book series back in 2012, the publisher said to me, "Black-and-white? There is only one. Ernie, Ernie, Ernie!" And that was so true.

Actually, I do not recall the exact year, but during my journey to morph from a "classical" underwater photographer to one with a more artistic approach, Ernie and I became Facebook friends. To my surprise and pleasure, Ernie sometimes "liked" my images and commented on them. Not often, mind you—Ernie was not much of a social-media writer—but I knew Ernie was out there, watching me.

His legacy of the finest of fine art black-and-white underwater images will continue to inspire photographers for many more decades to come.

A snorkeller above a shallow reef in North Tubbataha, Sulu Sea, Philippines—an interesting side note about this image: The model is a young Lynn Funkhouser. Photograph by Ernest H. Brooks II

Years later, in 2016, I was invited as a speaker and a judge for a photography contest at the ADEX dive show in Singapore. I had a bit of spare time, walked around the hall, and suddenly, I was standing in front of Mr Ernie Brooks himself. Before I was even able to overcome my surprise, he came straight to me, exclaiming, "Rico! It's about time!" Then, he just gave me a big hug, like we had known each other for decades.

For 20 minutes or so, we stood together, chatting about light, life and the universe. I shared some of my points; he shared some of his. We liked each other from the very first moment. Ernie had the gift of making everyone around him feel special and valuable—a gift perhaps even greater than his photography.

When I was working on my book, *Song of Silence—A Book about Water*, in 2017, I contacted Ernie, asking him to contribute a few words about water for my book. "Every living thing on this planet is connected to water," he wrote me. This then was his contribution to my book. When my book finally got published in late 2017, Ernie was one of the first to order two signed copies: one for himself and one for "a very special place in Santa Barbara that deserves to have your book in their library," so he said. He meant the Santa Barbara Middle School, the very same school to which he had donated the former campus of the Brooks Institute.

In 2018, I met Ernie in person for a second time. Again, it was at the ADEX show in Singapore. "Rico, your book is so wonderful. You are a true artist," he said to me. We had several chats, and whenever someone else (some of them quite renowned) came by, Ernie always said, "Do you know Rico? He creates real art!" I was truly over the moon about this comment. Because I knew he did not say such things just to be nice. He said it because he meant it. And his words meant a lot to me, giving me strength and confidence to go on doing the things I do. Later, during a more private talk, he offered to connect me with his own art agent, the same person that was in charge of the *Fragile Waters* exhibition. And so, it happened, thanks to Ernie.

The last time I saw Ernie was after he gave his "Story of My Life" presentation to a huge audience in a packed hall in Singapore, during ADEX 2018. After his presentation, Ernie and I sat quietly and happily together when a young lady from Korea approached us. Dissolving into tears, she thanked Ernie for just being himself, existing on this earth, and for inspiring her and all the people on the planet. Ernie then looked at me with tears in his eyes; he was deeply touched. I took his hand, telling him, "All of it is true." I will never forget the expression in his eyes at that very moment: a deep gratitude for just being alive and witnessing that the love you give always comes back to you.

Ernest "Ernie" H. Brooks II died on 17 November 2020, from heart failure. He was 85. His legacy of the finest of fine-art black-and-white underwater images will continue to inspire photographers for many more decades to come. His kind and warm soul will always be treasured by those who had the honour of knowing him. ■

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

wreck rap

Ming Pottery Wreck

— Exploratory Expedition in the Gulf of Thailand

SIWAT WORACHANANANT

Pottery of the Ming Dynasty was found during exploration of a wreck debris site in the Gulf of Thailand.

Text by Bruce Konefe
Photos by Bruce Konefe
and Siwat Worachananant

There are many benefits to living in Asia. One advantage is that the waters around Asia still have countless numbers of unexplored shipwrecks. As a certified technical diver and an explorer at heart, the Gulf of Thailand has been my playground.

During my stay in Thailand, I have had the opportunity to meet and dive with some of the nicest people. I have fond memories working with members of the Thailand Underwater Archaeology Division, also known as the UAD. The UAD office and museum are located in a small town called Chanthaburi, which is located about a 251km, three-hour drive from Bangkok. At the museum, you can see displays of ancient pottery, which have been surveyed and excavated from some of these wrecks.

Locating wrecks

People are led to believe that it takes costly side-scan sonars, ROVs and other expensive equipment to locate wrecks. But I have discovered that there is a much cheaper and easier way of locating wrecks. In Thailand, the best source of finding a wreck can be found at your nearest fishing village where fishing boats are kept.

The waters of the Gulf of Thailand average between 50 to 70m in depth. At these shallow depths, fishing boats are able to drag nets to scoop up fish. When dragging nets, the nets will sooner or later snag onto wrecks. The boat captain will then log these locations in order to avoid destroying nets in the future. These marks also identify where one will find the most abundance of fish. One of these fishing-boat captains, whom I have known for many years, contacted me one day to let me know that he had a couple of new marks for me to check out.

Expedition

So, over a period of two months, a new wreck exploration trip was planned. I contacted a few of my local technical diving friends: Tim Lawrence, Andrew Moore, Oliver Zaiser, Siwat

SIWAT WORACHANANANT

Worachananant (archaeologist) and Sira Ploymukda (a member of the Thailand UAD). An expedition boat was booked for 25-30 September 2020, allowing us four days of diving. The farthest wreck we would explore was approximately 18 hours from shore.

In the week leading up to the trip, all of the team and dive planning, tank filling (trimix and decompression mixes), and equipment preparation took place. There would be five trimix closed-circuit rebreather divers and one open circuit trimix diver on the trip.

In order to explore the new wreck and cover the most area, we divided divers into three diving teams. Team One would consist of Worachananant and Ploymukda; Team Two, Zaiser and myself; and Team Three, Lawrence and Moore. The teams would stagger their entry times, allowing for one team to help the others in and out of the water. In doing so, we would also leave divers on the expedition boat in case of an emergency. Lastly, the teams decided on 30-minute bottom times for each dive, with total run times of around 100 minutes.

The expedition boat was scheduled to set sail around 8:00 p.m. on 25 September. Team members arrived two hours early, giving us time to load the boat and get settled before departure. Once the boat was loaded and everything was strapped down, the boat finally set off to the first site.

Day One

As the expedition boat arrived at the first wreck site on Saturday morning, the divers were just finishing eating breakfast and cleaning up. The captain placed a dropline and anchor right next to the wreck site and positioned the boat next to the surface marker buoys. Dive team members prepared the equipment and had one last team briefing to make sure everybody knew the plans for the dive.

SIWAT WORACHANANANT

Thailand UAD archaeologist Sira Ploymukda (above) inspects Ming pottery found on a wreck debris site in the Gulf of Thailand (left).

The first team (Worachananant and Ploymukda) entered the water. At the surface, the last equipment and buddy checks were made prior to the descent. Team One then laid a line from the anchor line to the wreck, allowing others to follow. Zaiser and I, in Team Two, would retrieve this line when we were on our way back to the anchor line.

When Zaiser and I entered the water (thanks to the help of three boat staff), we passed Team One as they were just ascending up the line to start their decompression stop. Once we had reached the bottom, we followed the line to survey the wreck. On the bottom, all we could see was a big mound of pottery—mostly vases, jars and plates. Zaiser and I reached our turn time and headed back to the ascent line where we passed Lawrence and Moore in Team Three, just starting their dive. A short while

BRUCE KONEFE

Archaeologist and CCR trimix diver Siwat Worachananant prepares for a dive on the site.


SIWAT WORACHANANANT


COURTESY OF THE THAILAND UNDERWATER ARCHAEOLOGY DIVISION


COURTESY OF THE THAILAND UNDERWATER ARCHAEOLOGY DIVISION

The Thailand Underwater Archaeology Division (UAD) is located in the National Maritime Museum in Chanthaburi, which displays some of the ancient pottery excavated from wreck sites in the area (above and right); Bruce Konefe on the downline at the wreck debris site (left)

later, when Zaiser and I were doing our decompression stop, Lawrence and Moore came up the line to start their decompression stop.

About an hour later, all of us were back on the boat, with a lot of talk and laughter going on. Once the equipment was cleaned and put away, we reviewed the underwater videos and photographs taken at the site and discussed what we had stumbled across. Ploymukda said he believed this wreck dated from the Ming Dynasty, approximately 300 years ago.

Later in the evening, swells and winds started picking up. This is something you do not want to see when you are this far away from shore. The boat captain gave us the latest weather report, which said the weather was going to get worse and not better. So, we held a group meeting and planned what our goals would be for the rest of the trip.

The team decided to cut the trip one day short. In the time remaining, we would dive the new suspected pottery wreck as well as the HTMS *Pangan*, which was a Thai naval transport vessel that sank in a storm in 1961.

Day Two

The second day's dive was on the HTMS *Pangan*, and it went off without a hitch. The wreck was fun and easy to dive. Once everyone was back on board, we headed to the last dive site.

Day Three

On the morning of Day Three, the weather calmed down, giving us a window in which to dive. After everybody finished breakfast, we prepared for the last dive. The first team down would be Worachananant and Ploymukda, followed by Zaiser and myself, and finally, Lawrence and Moore.

Team One entered the water with no issues. As Zaiser and I started to descend, we passed Team One as they were coming up. They signaled to us that we were not sitting directly on the wreck site. I signaled to them that we would continue down and search in another direction.

As we neared the bottom, I noticed that Zaiser was coming down rather slowly, and he was also looking at his computers. I sensed that he was having issues with his rebreather, so I stopped to check on him. I signaled to Zaiser to find out if everything was ok, but he signaled to me that he was having problems. I decided that it was best to call off the dive and come back another time. Better to be safe than sorry.

Once we completed our decompression stop and reached the surface, I signaled to Lawrence that we were not on the right location but very close. When we got back on board, Worachananant told me that his team had seen two large pottery vases, but that was all. Then the weather started to change, and not for the better. So, Lawrence and Moore decided to sit out their dive.

Later, what we came to believe is that we had found two vases that had been dragged off the main wreck site by a fishing net. We believed we were very close to finding the main wreck site but would have to explore farther in another expedition to the area.

Since the weather was getting worse, we decided to call off the trip. Everybody packed up their equipment for the long 12-hour ride back to port. ■

Currently based in Thailand, American pioneer technical cave and deep wreck diver Bruce Konefe is a sidemount and rebreather Instructor Trainer with over 25 years' full-time experience planning and organizing the most ambitious technical diving expeditions throughout most of Asia. In addition to planning and organizing expeditions, Konefe has six years' experience as an Instructor Trainer Director. For more information, please visit: ***deeptecdiver.com***

RUN-TIME TABLE

Dec to	65m		(004)	Diluent 14/36	0.70	SetPoint, 15m/min descent
Level	65m	25:40	(030)	Diluent 14/36	1.30	SetPoint, 36m ead, 39m end
Asc to	36m		(033)	Diluent 14/36	1.30	SetPoint, -9m/min ascent
Stop at	36m	00:47	(034)	Diluent 14/36	1.30	SetPoint, 14m ead, 22m end
Stop at	33m	01:00	(035)	Diluent 14/36	1.30	SetPoint, 12m ead, 20m end
Stop at	30m	01:00	(036)	Diluent 14/36	1.30	SetPoint, 10m ead, 19m end
Stop at	27m	02:00	(038)	Diluent 14/36	1.30	SetPoint, 8m ead, 17m end
Stop at	24m	02:00	(040)	Diluent 14/36	1.30	SetPoint, 5m ead, 15m end
Stop at	21m	03:00	(043)	Diluent 14/36	1.30	SetPoint, 3m ead, 13m end
Stop at	18m	04:00	(047)	Diluent 14/36	1.30	SetPoint, 1m ead, 12m end
Stop at	15m	05:00	(052)	Diluent 14/36	1.30	SetPoint, 0m ead, 10m end
Stop at	12m	07:00	(059)	Diluent 14/36	1.30	SetPoint, 0m ead, 8m end
Stop at	09m	09:00	(068)	Diluent 14/36	1.30	SetPoint, 0m ead, 6m end
Stop at	06m	42:00	(110)	Diluent 14/36	1.30	SetPoint, 0m ead, 5m end
Surface			(111)	Diluent 14/36	-6m/min ascent	

OTU's this dive: 160 CNS Total: 60.5% Gas density: 6.3g/l

QUICK FACTS

DATES
25-30 September 2020 (planned)

DIVE TEAMS
Team #1: Bruce Konefe and Oliver Zaiser (trimix CCR divers)

Team #2: Tim Lawrence and Andrew Moore (trimix OC and CCR divers)

Team #3: Thailand UAD archaeologist Sira Ploymukda and archaeologist Siwat Worachananant (trimix CCR divers)

DEPTH OF THE WRECK SITE
60m (200fsw)

DIVE PLAN
Surface interval = 1 day 0 hr. 0 min.
Elevation = 0m
Conservatism = GF 40/70

MUSEUM
The National Maritime Museum
Open 9:00 a.m. to 4:00 p.m.
(Wednesday – Sunday)
80 moo 8 Bangkaja Muang
Chanthaburi, Thailand 22000
Phone: 039 391 431

GIORGOS RIGOUTSOS

Beaufighter

Off the coast of the Greek Island of Naxos lies the well-preserved wreck of a WWII British warplane—the famous and versatile Bristol Beaufighter, which was used in many roles and saw extensive service in both European and Asian theatres of war.

Approximately half a nautical mile off shore and at a depth of 34m, the wreck of the Beaufighter was found in 2007. Testimonies of fishermen and inhabitants have related that this specific Beaufighter was shot down after destroying a German Arado Ar 196 seaplane during an anti-shipping mission in November 1943.

Parts of the rudder are missing and the side of the aircraft, being riddled with bullet holes from anti-aircraft artillery, provides a pretty strong clue as to what brought down and forced the twin-engine aircraft to ditch at sea. Upon closer look, the aircraft seems to be in a relatively undamaged condition. "It appears to have been landed with care and skill," said acclaimed photographer and scuba diver Giorgos Rigoutsos. The cone at the airplane's nose, made of thin metal, has eroded and now lies beside the aircraft.

"It appears to have been landed with care and skill."

Blunt nose

The characteristic blunt nose, sometimes mounted with four forward-firing 20mm Hispano Mk III cannons, was a result of an upgrade of the engines. The Bristol Beaufighter was originally conceived as a heavy fighter variant of the Bristol Beaufort torpedo bomber from which it was relatively economically adapted. The twin Bristol Taurus engines of the Beaufort, having been deemed insufficiently powerful for a fighter, were replaced by more powerful two-speed supercharger-equipped Bristol Hercules radial engines. This change moved the centre of gravity (CoG) forward, a typically undesirable feature for an aircraft, thus the CoG was moved back to its proper desirable location by shortening the nose, which was possible as the space within the nose had been previously occupied by a bomb aimer, a role that was unnecessary in a fighter aircraft. The majority of the fuselage was positioned aft of the wing and, with the engine cowlings and propellers now farther forward than the tip of the nose, gave the Beaufighter a characteristically stubby appearance.

By fighter standards, the Beaufighter Mk I was rather heavy and slow but it soon showed its merits as a night fighter and went on to perform in other capacities.

In April 1941, the Mk IC variant of the Beaufighter entered squadron service in a detachment from 252 Squadron, operating from Malta. This inaugural deployment with the squadron proved to be highly successful, leading to the type being retained in that theatre throughout the remain-

US AIR FORCE

The British-built Beaufighter even saw service with the United States Army Air Forces (USAAF). In the Mediterranean theatre, the 414th, 415th, 416th and 417th night fighter squadrons received a hundred Beaufighters in the summer of 1943.

IMPERIAL WAR MUSEUMS

Bristol Beaufighters of No. 272 Squadron RAF in flight over Malta. Nearest the camera is a Mark VIC, X8079, "K," which was shot down by German fighters off Maritime Island on 22 May 1943.

SCUBAHELLAS.COM

It is not immediately clear which variant of Beaufighter is now resting off Naxos. One anti-shipping version, the Mk VIC, was equipped with a torpedo.

IMPERIAL WAR MUSEUMS

Cockpit of a Beaufighter Mk IF—the two-seat night fighter variant.

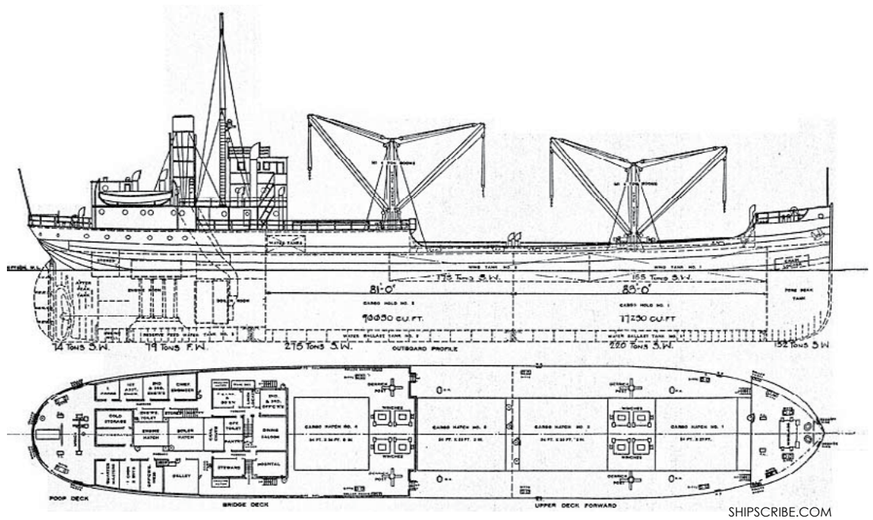
SCUBAHELLAS.COM

A glimpse inside the fuselage indicates how cramped the conditions were for the crew.

der of the war. From mid-1942, the Beaufighter made valuable contributions in other areas such as anti-shipping, ground attack and long-range interdiction, in every major theatre of operations. It also commenced service overseas, where its ruggedness and reliability quickly made the aircraft popular with crews. In the Mediterranean, four United States Army Air Forces (USAAF) night fighter squadrons received a hundred Beaufighters in the summer of 1943, achieving their first victory in July 1943.

The Beaufighter was reputedly very effective in the Mediterranean against Axis shipping, aircraft and ground targets; Coastal Command was, at one point, the primary user of the Beaufighter, replacing its inventory of obsolete Beaufort and Blenheim aircraft. ■

SOURCES: WIKIPEDIA, IMPERIAL WAR MUSEUM, SCUBA HELLAS



Design illustration of the SS *Cotopaxi* and sister ships

Wreck identified 95 years after ship's mysterious disappearance

SS *Cotopaxi* was assumed swallowed by the infamous Bermuda Triangle after the steamship, and all 32 crew members on board, inexplicably vanished in 1925.

The SS *Cotopaxi*—an American merchant steamer—left Charleston, South Carolina, on 29 November 1925, with a cargo of coal, destined for Havana, Cuba; but the vessel did not make it far. The vessel vanished without a trace and the fate of the *Cotopaxi,* and the 32 people on board, has long puzzled experts.

"The *Cotopaxi* was on a routine voyage," marine biologist and underwater explorer Michael Barnette told *Newsweek*. "She was employed in the coal trade and so this was just another trip at the end of November of 1925. We know that on that voyage something happened because she delivered a mayday message early December saying she's in distress," said Barnette. "And then that was it. They never found any wreckage. They never found any lifeboats, bodies or anything. The vessel just disappeared after that point. So, we've been trying to determine what happened."

When Barnette moved to Florida from the mid-Atlantic almost 20 years ago, he sought out shipwrecks he could explore while diving. One wreck in particular, known to locals as "the Bear Wreck" and located about 35 nautical miles (65km) off the eastern coast of St. Augustine, in northern Florida, caught his attention.

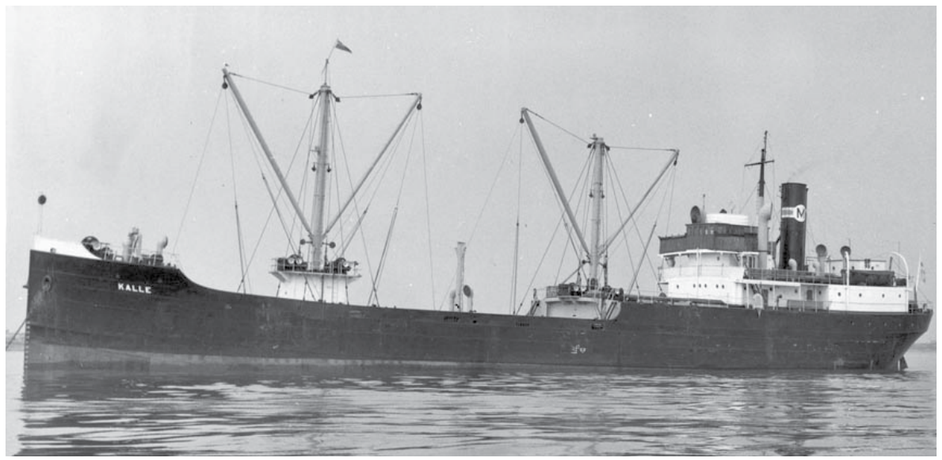
Unlike most shipwrecks in that area, the Bear Wreck was large. Intrigued, Barnette did some research. He took measurements of the shipwreck, looked at historical newspaper articles and insurance records, and examined artefacts found at the wreck.

Barnette also contacted British historian Guy Walters and asked him to dig through the archives of Lloyd's of London, which contains insurance documents related to the ship's fateful voyage. It was Walters who uncovered evidence that the *Cotopaxi* had sent out a distress signal on 1 December 1925—a key piece of information that historians had not previously known about.

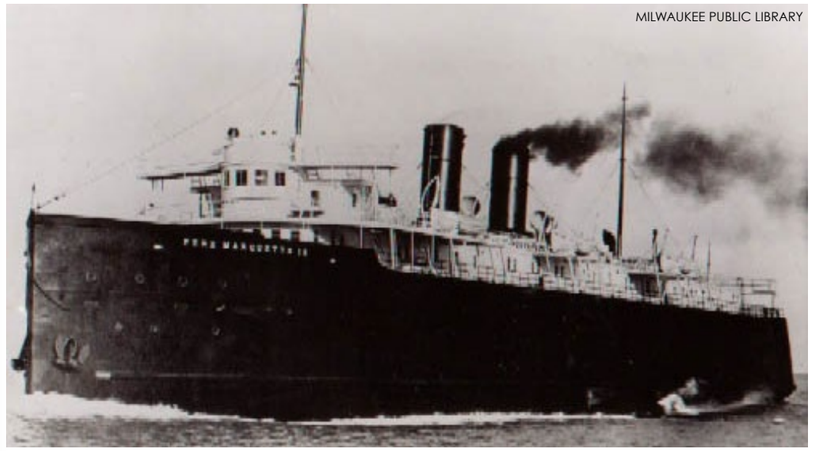
Furthermore, a diver had discovered brass valves from the wreck with the letters SV on them. Barnette concluded that this probably stood for Scott Valve Manufacturing Co., whose Michigan headquarters were not too far from where the *Cotopaxi* was built.

Armed with this new information, Barnette headed to Florida with his dive partner, Joe Citelli, to dive the wreck. Further research was able to corroborate the wreck's location compared to where the distress signals were sent out, leading Barnette to come to no other conclusion: They've uncovered the long-lost SS *Cotopaxi*. ■

SOURCES: NEWSWEEK, DISCOVERY CHANNEL, LIVESCIENCE



SS *Kalle* was a sister ship to SS *Cotopaxi*.



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Archive photo of *Pere Marquette 18*

Minnesota shipwreck hunters locate long-sought after Pere Marquette 18

A ship branded the "Titanic of the Great Lakes" has been found 110 years after it mysteriously sank.

Exactly what caused the *Pere Marquette 18* to founder became a much-debated mystery. And the ship's final resting place was lost to time. It was among the most notable Lake Michigan wrecks to have eluded searchers—until this summer.

On 9 September 1910, the *Pere Marquette* was en route from Ludington to Milwaukee with a cargo of 29 railroad cars and 62 passengers and crew, when it began taking water in the compartment housing the main propeller shafts underneath the crew's quarters. Pumps were unable to keep the stern from settling deeper and course was altered for the west shore of Lake Michigan. Thirteen railroad cars were jettisoned and three lifeboats were launched when the *Pere Marquette 17* arrived on the scene to provide assistance. Just as *17* arrived, *18* sank stern first, taking 27 lives. Thirty-five people were rescued by the *Pere Marquette 17*.

There were multiple witnesses to the sinking—including another ship, the *Pere Marquette 17*, which came to the rescue—but the cause of the calamity remains a mystery. This is mainly because no officer survived the disaster to recount what had happened prior to the sinking to cause all the water to enter the hold. And the vessel itself was never located until shipwreck hunters Ken Merryman and Jerry Eliason found the *Pere Marquette 18*. Using rough location information from some of the many eyewitness and survivor accounts, Merryman had done some initial searching in 2019 without success—but those contemporary reports could often be unreliable.

The two men analysed all the available information, and made their best guess as to the wreck location. It was a remarkably good choice: They located a likely target that first day, and confirmed it was the *Pere Marquette 18* the next. ■

SOURCES: WISCONSIN HISTORICAL SOCIETY, MINNESOTA PUBLIC RADIO

Edited by
Scott Bennett

SCOTT BENNETT

Danum Valley, Sabah, Malaysia

Airline industry clears forest-carbon credits plan

Initiative hoped to benefit airlines and conservation alike

The global civil aviation industry has established a way for airlines to help minimize their climate footprint and protect nature. The International Civil Aviation Organization (ICAO) has approved two forest-carbon programs from which airlines can purchase carbon credits. Under a UN framework known as Reducing Emissions from Deforestation and forest Degradation (REDD+), the "nature-based" credits fund protection for forests that absorb and store carbon from the atmosphere.

"The science is clear—the world cannot meet its climate goals without significantly scaling up the protection of nature," said Maggie Comstock, senior director of climate policy at Conservation International and a technical advice contributor of to the ICAO. "Carbon credits generated through the conservation and restoration of forests can provide high-quality emissions for airlines while protecting wildlife, keeping ecosystems intact and contributing to local livelihoods. This is a win for the industry and a win for nature."

Emissions cap

Even with significant improvements in efficiency, aviation is still one of the world's primary carbon-emitting sectors. Under the ICAO, countries agreed to cap global aviation emissions at 2020 levels, necessitating airlines to utilize more efficient aircraft, improved operational practices and alternative jet fuels.

Despite this, a large emissions gap will remain before the fast-growing sector, which moved four billion passengers annually before COVID-19, can reach desired carbon-neutral goals. To compensate, ICAO has devised a carbon market called CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation). Through this scheme, airlines can purchase carbon credits from approved programs. This allows the inclusion of forest-based carbon credits from specific REDD+ programs, particularly in developing countries.

Offsets demands

Beginning in January 2021, airlines that fly between countries, which are participating in CORSIAs, must decrease emissions from international flights that surpass 2019 emission levels. With 2020 emissions far below those in 2019, demand for offsets will be low in the short term but likely increase as the airline industry recovers.

"ICAO's decision sends an important signal to countries that halting deforestation and restoring degraded ecosystems is an urgent, global priority and that the international aviation industry will be a leader in investing in nature-based solutions to climate change through the purchase of high-quality carbon offsets," said James Roth, who is the senior vice president of global policy and government affairs at Conservation International.

"Nature offers at least 30 percent of the solution to climate change but currently receives less than 3 percent of climate-related funding," added Roth. "That needs to change if we are going to avoid the worst impacts of climate change, and this announcement helps put us on that path." ■

SOURCE: CONSERVATION INTERNATIONAL

IATA calls for systematic COVID-19 testing of all international travellers

IATA Travel Pass will manage and verify the secure flow of necessary testing or vaccine information among governments, airlines, laboratories and travellers, the International Air Transport Association (IATA) writes in a press release.

The first cross-border IATA Travel Pass pilot is scheduled for later this year and the launch slated for Q1 2021.

IATA and International Airlines Group (IAG) have collaborated on this solution and will undertake a trial to demonstrate that this platform, combined with COVID-19 testing, can reopen borders.

IATA Travel Pass incorporates four open-sourced and interoperable modules, which can be combined for an end-to-end solution.

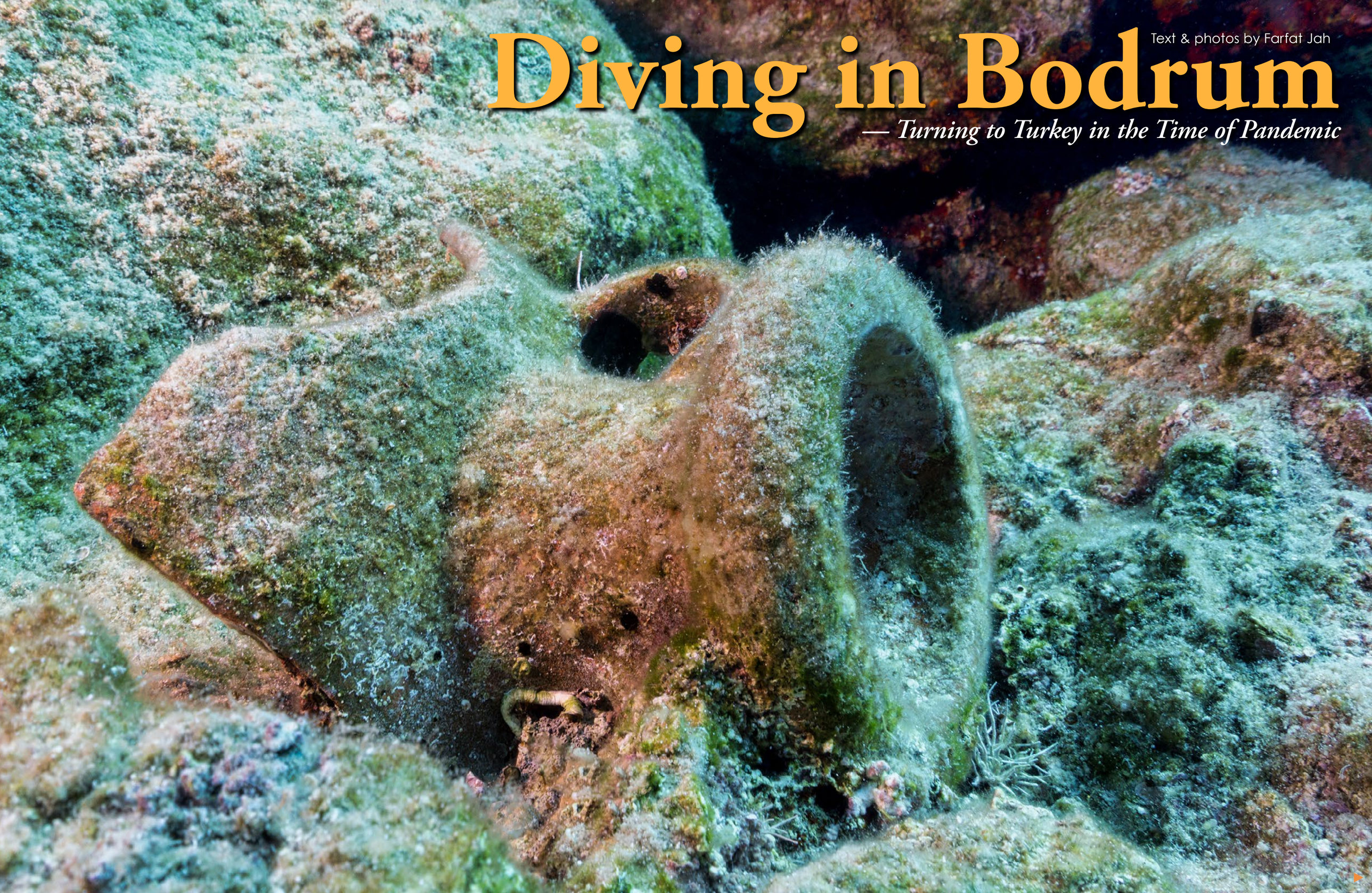
This app can also be used by travellers to manage travel documentation digitally and seamlessly throughout their journeys, improving travel experience. IATA Travel Pass will manage and verify the secure flow of necessary testing or vaccine information among governments, airlines, laboratories and travellers. ■

SOURCE: IATA

Text & photos by Farfat Jah

Diving in Bodrum

— *Turning to Turkey in the Time of Pandemic*



The sleepy town of Bodrum is now nearly a small city by the sea, but it is still quite charming (above); Lionfish, an invasive species, have made it to the Mediterranean Sea in the bilges of ships. Thankfully, grouper eat them (top left). PREVIOUS PAGE: Amphora found on the seafloor is around 2,000 years old.

Bodrum

Diver Francisca Jah on the bow of the TCG *Pinar 1*

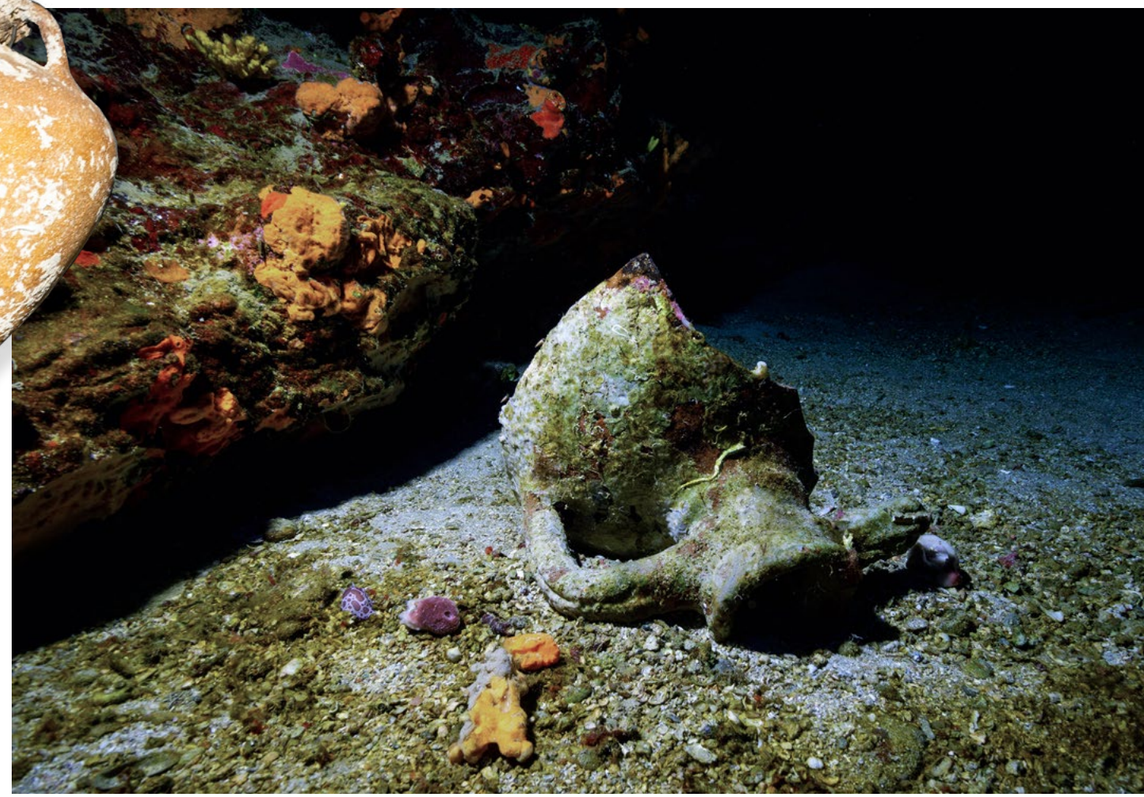
As the novel coronavirus spread around the world, dive operators in all corners of the globe had to adjust to a new normal. One dive operator, Farfat Jah, made unique changes. Here, he takes an honest look at a destination forced upon him by the global pandemic.

The global pandemic affected the travel industry like no other. As it spread across the globe, our world started to implode. One by one, every dive destination that we offered closed to our customers: Micronesia, Asia, Melanesia, the Middle East and finally Africa and the Atlantic island of St Helena shut their borders. We got all of our clients home before the airlines ceased to fly, and then the email and phone went quiet.

"This will be over in a couple of months," we thought. "Europe will beat this like China did, and it will be business as usual." But two months became four, and four became six. We simply sat out the curfews and planned and planned and planned the future—and that was all we could do. We, like so many other dive tour operators, were looking down the wrong end of a financial barrel.

As the pandemic progressed, one shining light seemed to appear. Turkey had been subjected to the worst of the virus and it had ripped through its people of all ages, but through a no-nonsense lockdown, the country had stopped it in its tracks.

As society opened up, a second wave looked imminent. Yet, dependent upon tourism, the government was caught between a rock and a hard place. The Turkish authorities and their scientists then came up with an intelligent way of hosting tourists while protecting them and their own Turkish citizens. I will not go into the details here, but masks, disinfectant, the closing of discos and constant temperature checks were part of the



Bubble Cave, which was discovered by Kenan Dogan, is a stunning swim-through with lots of fish (above)

Bodrum's crusader castle is also home to the Museum of Underwater Archaeoloogy.

employed solution.

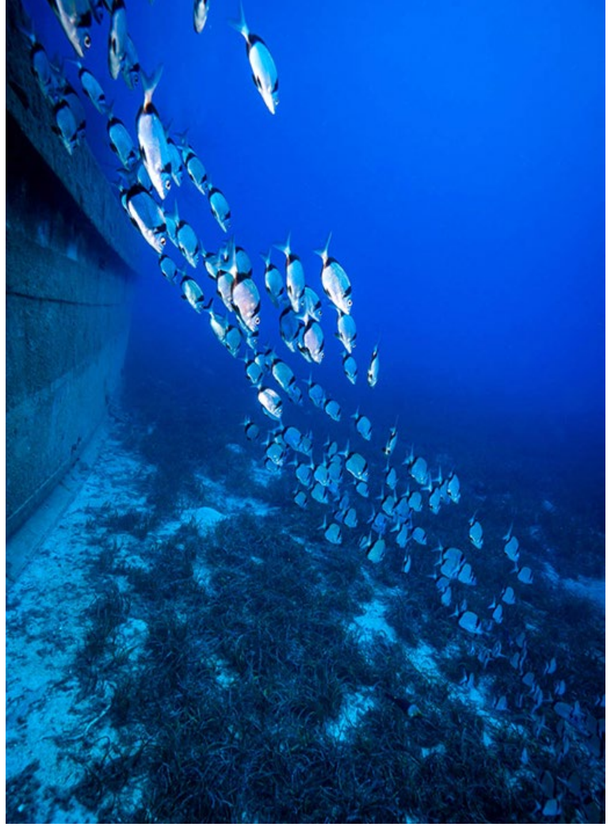
We were over the moon as anyone could (and still can) visit Turkey, but the big question was: could we persuade our "cultural clients" to visit Turkey, and was the diving good enough? This diving was the lump-in-my-throat moment. In 1994, I had completed a very rigorous divemaster course in Fethiye. While I enjoyed it, I remember lots of rocks and seeing just a few groupers. Was the diving interesting enough? It was time to find out.

So, with rather low expectations, my wife and I flew to Istanbul and hired a car. I had been unsure of flying domestically but my worries had been unfounded. Our Turkish Airlines Dreamliner to Istanbul was clean and quiet, and all the middle seats were left empty. Food was served in bags, we all wore masks, and everything was disinfected. We were just so excited to be flying after seven months locked up in a tiny house that we would have stood the whole way if we had to.

Kenan Dogan, Bodrum's diving pioneer

Our next problem was who to dive with. There were plenty of operators in Turkey, but we were completely out of touch. A decade ago, I had met a mad Turk and his wife on a motorbike in Africa. He now ran an adventure tourism company called Ibex Adventure Club. We turned to Deniz and Elif for help. They invited us to stay

Often, 2,000-year-old amphoras litter the bottom of caves (above); Amphora in the Bodrum Museum of Underwater Archaeology (center); View over the city of Bodrum and its marina (top right)



School of two-banded sea bream on the TCG *Pinar 1* (above); The dive boat MV *Vertigo* (right)

The legendary Kenan Dogan (above) still revels in taking his divers underwater—there is little that he does not know about Bodrum; Diver swims over the rocky underwater landscape found around Bodrum (top left)

in their house and pondered over our problem. And between guiding clients on tailor-made tours, they sat with us on their balcony, overlooking Bodrum and found a solution.

"You better dive with my mate Kenan Dogan," said Deniz. This name sounded familiar, but I had met an awful lot of people in the global dive industry, so I put it out of my mind. We called Kenan.

"Can we dive with you?" I asked. "I am a dive tour operator, but I hear you are pretty full."

"Come, come!" he shouted down the phone. "I'll give you a discount, but just come. Bitez Port, 09:30, tomorrow."

And with that, the phone clicked, and he was gone. Kenan sounded like a fairly gruff character, but he was squeezing us onto his dive boat during a global pandemic, so who was I to complain?

MV *Vertigo*

The next morning, we turned up early and looked for the Aquapro dive vessel. We found it moored at a jetty and loaded our kit onto the boat. Unlike most Turkish dive boats, this was not a wooden taka (caique) with a marinized Ford truck engine. Rather, it was a purpose-built metal-hulled dive platform with twin Volvo Penta diesel engines.

The MV *Vertigo* reminded me very much of a slightly small Red Sea liveaboard. The dive deck was run by a steely, blue-eyed man called Can (pronounced "Jzun" in Turkish). A veteran security officer, he was a CMAS instructor and a good organizer. He conducted a few basic checks, we had our temperatures taken, and then we went upstairs to sit down. Soon enough, a tall, wizened man with a thick, black beard and sunglasses appeared.

"Farhat! I remember you!" he shouted at me. We had indeed met at the BOOT Show in Düsseldorf, and his memory had not failed him. Kenan Dogan had arrived. He walked straight up to the helm, turned on the engines and watched them warm up. As soon as he was satisfied with his gauges, he tooted the horn three times as a signal to his crew and any latecomers, and we slowly chugged out of Bitez Bay.

Like every Turkish man, Kenan had been conscripted into the Turkish Armed Forces at the age of 19. He was selected for dive training and spent his two years as a Turkish naval diver. As soon as he was discharged from the navy, he became a commercial diver and then went on to start his own dive centre. At the age of 56, he had been diving in the Bodrum area for the last 30 years, and as he was to prove, there was very little he did not know. Since 2007, Kenan and his friends had been instrumental in sinking three wrecks in the area.

Big Reef

Forty-five minutes after leaving Bitez Marina, Can came upstairs and told us it was time to dive. We pulled on our scuba sets and jumped into the water. I descended on what looked like a pile of rocks. This, I thought, was going to set the tone for the rest of the day. But upon closer inspection, I realised that we had actually landed on an underwater pinnacle. Can was getting the group together, so I looked down and around. This pinnacle was massive; it rose off the floor of the Aegean Sea.

Can signalled that all was well and that we should head off and down. We were diving in two-buddy teams. The

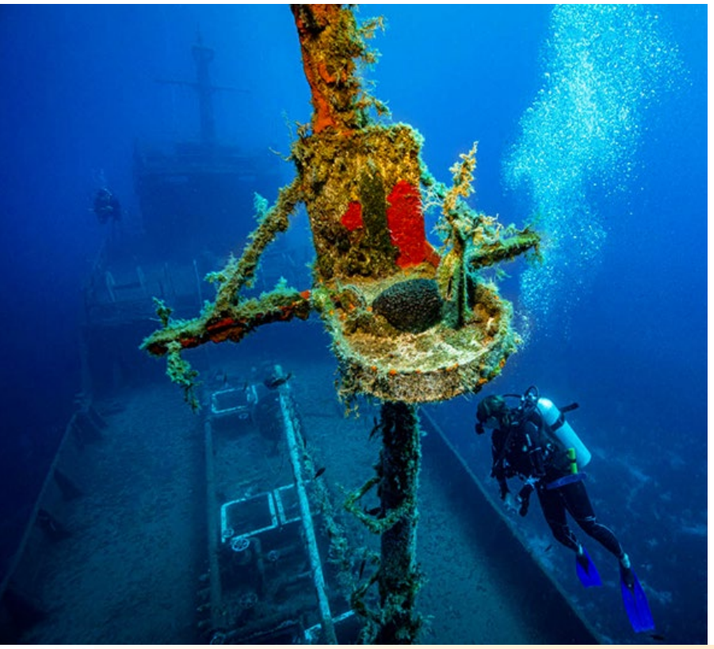
Lionfish and sea bream on rocky reef with colourful sponges (above); Dramatic rock terrain of Baracuda Bay (right)

second was made up of a young lady called Akça, who was doing her CMAS two-star certificate, and a Welshman called Andy. Andy was a former Royal Naval electronics technician and a man of few words. He was also clearly extremely experienced and demonstrated exemplary buoyancy.

Can took us slowly along the reef, descending gently from one cluster of rocks to another. At each cluster, there was a burst of life. My Inon strobe lit up the sponges under every rock. We swam slowly deeper and deeper, and then Can broke off to play with a school of barracuda, swimming lazily underneath them. They were not as large as the barracuda that you find off Papua New Guinea, but they were definitely barracuda, and they were bunched up into a circling mass.

We bottomed out at around 32m. We were now well off the wall on the sandy bottom. Can was poking around some

THIS PAGE: Scenes from the wreck site of TCG *Pinar 1*; School of two-banded sea bream on the TCG *Pinar 1* (left); The stern of the TCG *Pinar 1* (right)



enormous boulders. He called me over. He had found nudibranchs, gobies and anthias. My flash unit fired and lit up the multitude of sponges and a small fish. It never occurred to me that the Mediterranean could be so colourful. In my youth, I had heard about the Turkish sponge divers who had discovered ancient shipwreck after ancient shipwreck, but I did not think there were any sponges left.

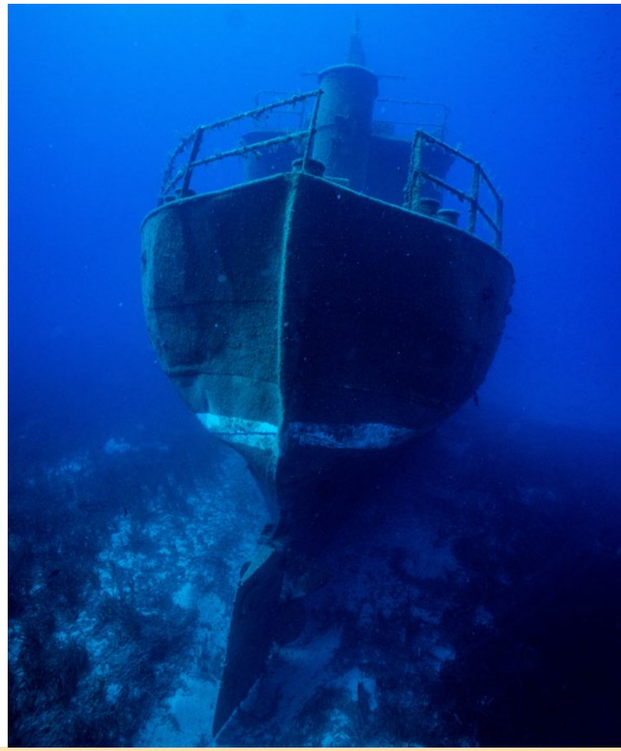
My computer started to beep. I had been down a while. I checked my SPG, which read way too much air. I banged it, and the gauge dropped a few bar. "I must remember to grease that spigot O-ring," I thought, making a mental note.

My computer would not let up, and not wishing to turn my first dive into a decompression dive, I thought I should perhaps wend my way slowly upwards. We regained the wall, and then swam along it at around 18m, meeting the other divers from the boat. They had only been at 18m, but they clearly looked very happy. At this depth, schools of bream were swirling around us and even more smaller fish darted in and out of the rock face. By the time I reached 50 bar, we had circumnavigated the reef. I did my now mandatory safety stop under the *Vertigo* and climbed back aboard. If this dive was representative of what was to come, Turkish diving definitely had something worth visiting.

Surface interval

We motored to a quiet bay for our surface interval. Here, a couple of people tried out scuba diving. They were mentored one-on-one by the highly professional team. We simply sat on the sundeck having Covid-friendly sandwiches and tea. Andy told me a few stories about his naval service in the Falklands War that turned my hair even grayer. He chuckled as he remembered his past. "You try not to think about it really," he smiled benignly, and we chatted about dive training. He wanted to be an instructor.

Kenan pulled out a backgammon board and flagged down a passing boat. The pleasure craft was skippered by his friend, who responded by turning into the



Barracuda Bay has an underwater headland of dramatic rock (above). The caves at its base at 30m were full of fish; Colourful sponges can be found on the rocky reef (right).

bay, mooring up and coming aboard. Three rather fast and very furious games of backgammon ensued. When the try divers had finished, the snorkelers had tired and we had finished our sandwiches, it was time for our second dive.

Barracuda Bay

Barracuda Bay was a steep wall that ended at 33m with a series of caves. Can and Akça wandered off while I took photos. The grooves cutting into the volcanic rock made for some dramatic scenery, and the usual fish suspects were out and about. At the end of the dive, we were so taken by what we had seen that we wanted to do more.

"Can we dive a second day?" I asked Kenan. Kenan could see that we were seriously interested.

"You like it here!" he exclaimed.

"It is certainly interesting," I was non-committal.

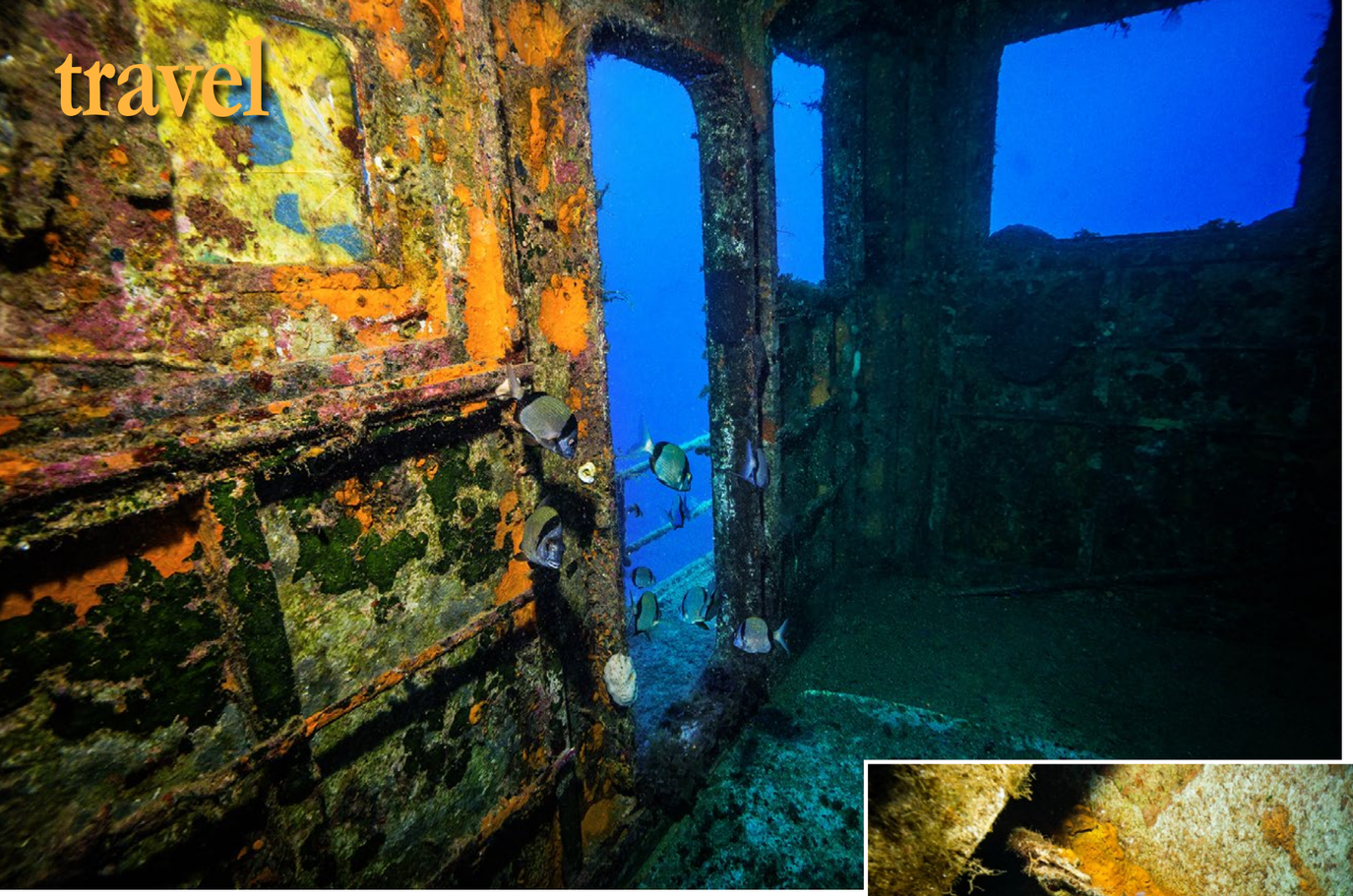
"Tomorrow, we will dive the *Pinar 1*; my friends and I sank it," Kenan said enigmatically. And with that, we disembarked and went back to Deniz and Elif.

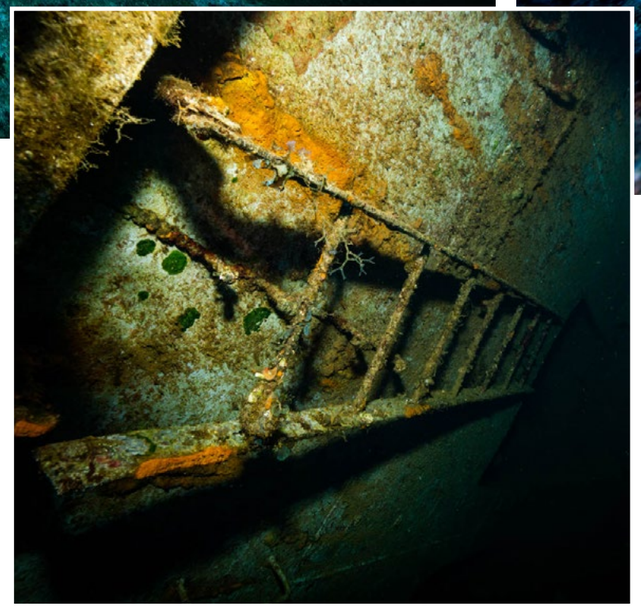
TCG *Pinar 1*

The *Pinar 1* was laid down in Germany in 1938. She

was then sold to the Turkish Naval Forces Command and entered service as a fleet tender. She would supply water to the destroyers and frigates. As the world's navies modernised, Turkey's fleet stayed the same. Her older warships did not have the ability to desalinate, and therefore a fleet water tender was as essential as an ammunition carrier.

It was only in 2007 that the need for a *Pinar 1* diminished. The Turkish Navy agreed to donate her to the Turkish scuba diving community. She





THIS PAGE: Scenes from the TCG *Pinar 1*. The ladder to the engine room on the TCG *Pinar 1* (right)

Lionfish (above) and school of two-banded sea bream (right) on the TCG *Pinar 1*

was stripped of military and recyclable materials, cleaned and handed over to the Bodrum Underwater Association. The Turkish Naval Forces Command towed her, free of charge, to Bodrum. There, the Turkish divers set about making her safe for diving and conducted a final, very deep clean.

In 2007, she was sunk in a spot agreed upon by the Divers Association, the Turkish Coast Guard and local government. The Bodrum Divers sited the vessel and pumped her full of water. As she started to sink, Kenan was the last man off her decks, diving into a waiting dingy—all of which can now be seen on YouTube! This was to be our wreck of the day.

Diving the wreck

Can took us down a slope of rocks, until a shape emerged out of the gloom. This was the stern superstructure of the *Pinar 1*. The vessel was lying bow down but upright on the sand. I circled the stern at 15m, taking a few photos, staying well off the bottom. Can signalled us to follow. I stayed at 15m, trying to take in the whole wreck in the 30m visibility. There was sea grass and sand all around the *Pinar 1*. I looked down and a moray swam freely between the long blades of seagrass. Schools of fish descended down off the deck and went towards the sand.

Can signalled wildly, and I looked into the blue. Some rather large stingrays rose off the bottom and swirled out in front of the bow. I could not take a photo of them, as they were beyond the reach of my lens. By now, we were at the bow, and I could take it no longer. I dropped to the floor in front of the bow. I hovered above the sand at 36m and shot the *Pinar 1*'s bow with my wife, Francisca, swimming beside her.

We closed in on the bow and saw

Divers swim over rocky formations, which are typical of the underwater landscape around Bodrum

rabbitfish hanging around, where the bow met the sand at 32m. The view of the side of the freighter and the sun shining down on us through 30m of blue water was serene. I snapped off a few more shots of the hull, because ships, rivets and holes interest me. They are always covered with life.

The *Pinar 1* was a magnet for fishes. As with most of my Turkish dives, my dive computer started to complain. While Aquapro Dive Centre welcomes technical and rebreather divers, there was a standing request for no-decompression-stop diving, unless pre-arranged. So, with one minute remaining, I ascended to the deck and mast of the *Pinar 1*. Here, my Aladin dive computer relented, and I levelled off to explore the superstructure and railing.

Lionfish had arrived in the Aegean, and I found them around the hatches. While they may be destructive, they make for great photographic subjects. Francisca pointed out loads of nudibranchs on the railing, and after a deck swim-though, it was time for our safety stop and eventual ascent.

"I am blown away by the marine life," I said to Jody Dogan, Kenan's wife and the organiser of all activities on the MV *Vertigo*.

"There are eight different types of nudibranch that we see on a regular basis. This is an excellent area for macro photography," she confirmed.

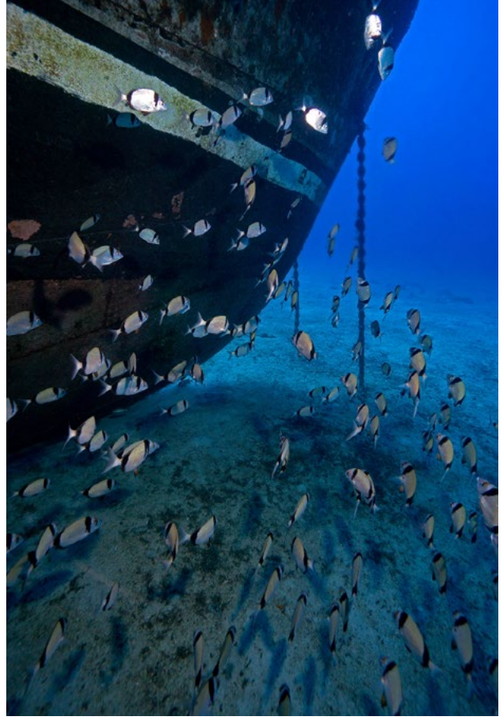
"It's pretty good for wide-angle as well!" I retorted, thinking of the *Pinar 1*.

"Oh, we have more wrecks. Do you want to see the plane next?" she asked. "It is all a bit hard, you see. We have 30 dive sites, which are great, and not everyone wants to wreck dive."

We did more dives in the area, on reefs with schools of grouper and rock faces, and on a dramatic broken-up Dakota DC3 aircraft (another military gift). Andy accompanied us for all of our dive days and served as a solid, reliable buddy for our now three-diver team. Can guided all but one of our dives, forgiving me for my trespasses.

In all our days, we did not manage to dive Barracuda Point, the Coast Guard Cutter wreck or half of Kenan's walls. But on our last dive, Kenan strapped on his twin set, forward-rolled into the

Nudibranchs on TCG *Pinar 1* (above). Eight species of nudibranchs can be found on most dives; At around 33m, the tail (top right) of the DC3 aircraft (bottom left) donated by the Turkish Naval Forces Command



Sea bream school at wreck of *Pinar 1* (above); Can points out stingrays just off the *Pinar 1* (left); Amphora in the Bodrum Museum of Underwater Archaeology (lower left)

Lionfish on wreck of the *Pinar 1*

water and took us down a reef. It was packed with grouper hunting smaller fish, colourful sponges, octopuses and stunning underwater scenery. The visibility was around 50m, and it was a wonderful end to our day. Andy and I squeezed an hour out of my tank, and we ascended to our usual spot on the flying bridge next to Kenan.

"Your mind is like mine," Kenan said. "It's full of projects."

"Well, Turkey is my project now," I replied.

"I have another project," he said quietly. "A new wreck—a big one, maybe," he added, winking at me. "You will have to come back."

I suppose we will just have to. ■

Five days of scuba diving and seven nights' bed-and-breakfast accommodation, including airport transfer fees, at the Marina'da Hotel costs GB£520 (~EU€579/US$679) per person sharing, in shoulder season. Peak season, which is July through August, adds another £95 (~€106/$124). Fascinating tailor-made day trips for two people to 2,000-year-old Leleges tombs costs from £95 (~€106/$124) a head. Entry to Bodrum Castle is £6 (~€7/$9). A guide to show you the underwater museum and to explain the history of Bodrum's underwater heritage starts at £60 (~€67/$78) a day. The African and Oriental Travel Company specialises in tailor-made Turkish Adventure tours, which lets you take in as much as you want, from the Hittites to the Urartians, from the mountains of Van to the Aegean Sea. For more information, go to: ***orientafricatravel.com****.*

Leleges tombs date back 2,000 years (above); Bodrum's crusader castle is also home to the underwater archeoloogy museum (top two photos)

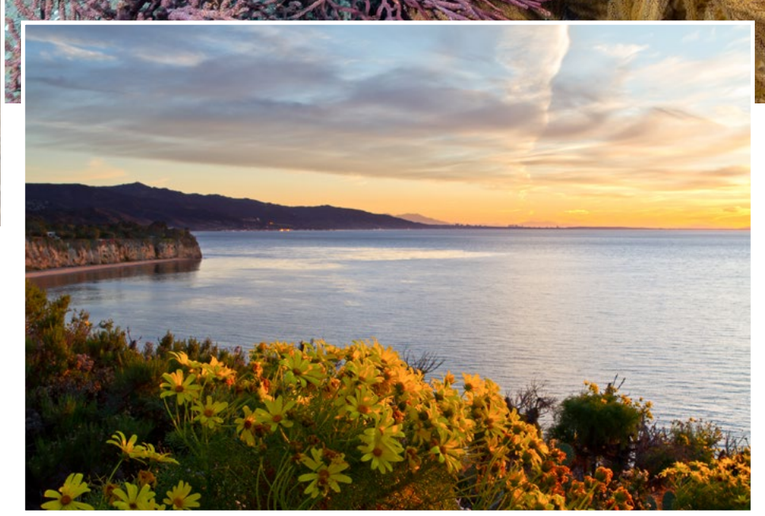
My Favorite Shore Dive

Contributors' Picks from Around the World

Text and photos by Larry Cohen, Brent Durand, Frankie Grant, Jennifer Idol, Kate Jonker, Matthew Meier, Brandi Mueller, Don Silcock, Olga Torrey, Claudia Weber-Gebert

We asked our contributors what their favorite shore or shallow dive was and they came back with stories and images of a diverse range of dives from around the world with easy to not-so-easy access off rocky to sandy shores as well as shallow dives under piers. *X-Ray Mag* contributors reveal intriguing underwater life and landscapes—from a freshwater lake in Yellowstone to the topical waters of Bonaire and Fiji, to the subtropical waters of the Mediterranean, Florida, Southern California and South Australia, to the temperate waters off Cape Town in South Africa—where they captured their favorite images.

BRENT DURAND



Point Dume, Malibu, California, USA

Text and photos by Brent Durand

California is home to some of the best shore diving in the world. As an avid beach diver, virtually all of my dives require walking… or leaping… or jumping… or rolling into the ocean from our beaches.

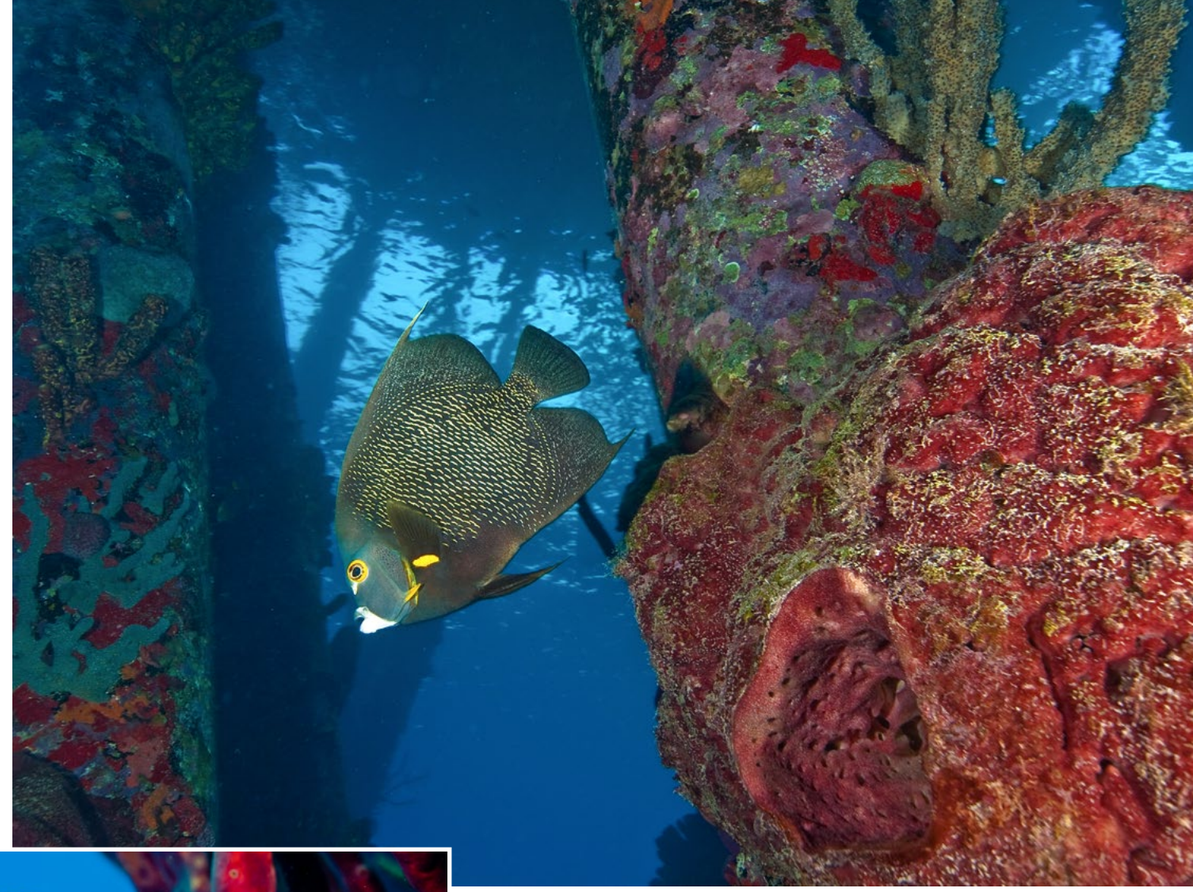
Point Dume State Marine Reserve in Malibu, California is one of my favorite (published) shore dive sites. Designated a marine reserve in 2012, Point Dume has an abundance of fish life compared to neighboring reefs, subject to boat, kayak and other fishing pressure.

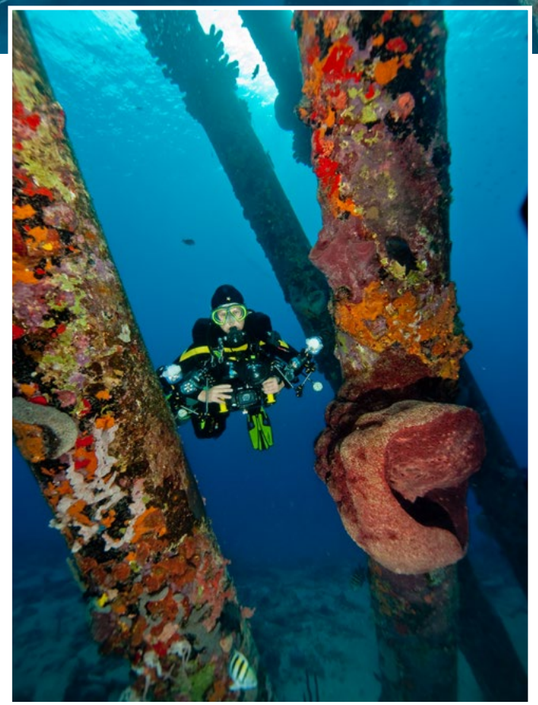
For daylight diving, divers can park in a public parking lot, which has restrooms and showers. After a surf entry and a 150m surface swim, which may involve current, divers descend on a large pinnacle structure, which is visible from the surface at all tide levels. Features include a wall, kelp garden, large boulders and a few secret ones, which are a lot of fun to find! Maximum depth is about 55ft (16.7m).

Marine life includes California sea lions (*Zalophus californianus*), garibaldi (*Hypsypops rubicundus*), California spiny lobster (*Panulirus interruptus*), bat rays (*Myliobatis californica*) and lots of classic California reef fish. You might even see dolphins or gray whales at the surface! Please visit: **tutorials.brentdurand.com**

Various settings and different camera systems were used to shoot these images. Sunflower sea star (above); Classic California reef scene at Point Dume (top left); Bright orange garibaldi fish on reef (top right); Spanish shawl nudibranch laying eggs (center left); The cliff trails above the dive site are a great place to explore, particularly in late winter as the giant coreopsis blooms (center right); PREVIOUS PAGE: A sea lion watches the author explore the dive site.

There is abundant fish life at Point Dume, thanks to its status as a California MPA.





Schoolmaster snapper makes a home in a sponge (above); Dive partner Olga Torrey explores Salt Pier (left); Trumpetfish, photographed with 50mm f/2 macro lens at Salt Pier (right)

Olga Torrey, assessing the dive site before getting ready to dive (above); French angelfish, framed between the pillars (top right)

Salt Pier, Kralendijk, Bonaire

Text and photos by Larry Cohen

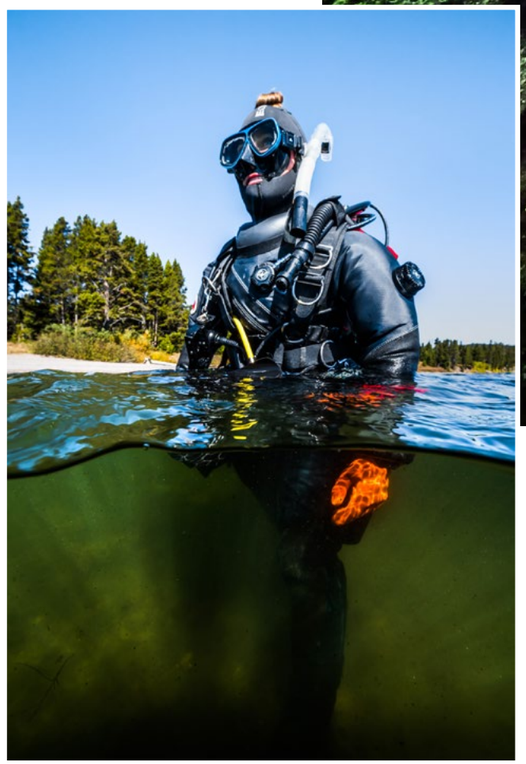
When asked, "What is my favorite shore dive?" my first thought was, "Off a boat!" To quote one of my dive buddies: "When you shore dive, you get sand in places you did not know you had!" Then I recalled my trip to Bonaire. The shore diving in Bonaire is worth dealing with the sand. Since my dive buddy, Olga Torrey, and I wanted to dive doubles and do long dives, we just did shore dives on this trip. We found Salt Pier to be one of the island's most unique locations.

Besides diving and tourism, Bonaire is home to the Solar Salt Works of Bonaire. They produce salt for the entire world. Salt Pier is where ocean-going ships dock to transport the salt (Cargill.com). This practical and industrial location is a place of beauty beneath the crystal-clear blue water.

The shore entry is easy, and diving around the sponge- and coral-encrusted pillars is breathtaking. The site is shallow, ranging from five to 15m (16-50ft). Salt Pier is teeming with marine life, including a variety of angelfish. We observed trumpetfish, frogfish, snapper and barracuda at this location.

On one of our dives, we entered the water in the afternoon and stayed until evening. We ended up doing a day and evening dive without surfacing. As photographers, it was exciting to work with different lighting conditions on one dive.

I photographed all images with the Olympus Evolt E-620 camera in the Olympus PT-E06 housing. Both the Olympus Zuiko 7-14mm f/4.0 lens and the 50mm f/2 macro lenses were used. For lighting, I used dual Sea&Sea strobes. Please visit: **liquidimagesuw.com**



Alex Rose prepares for a dive at the edge of Lake Yellowstone (above). Exposure: ISO 400, 14mm, f/13, 1/200s; A large spire rises from the bottom of the lake (left). Exposure: ISO 1250, 14mm, f/7.1, 1/60s. Camera gear for all images: Nikon D5 camera, Nikkor 14-24mm lens, Nauticam housing, Inon Z240 strobes

Sponges and tunicates grow on the spires (above). Exposure: ISO 1250, 14mm, f/14, 1/100s; The dive entry is beautiful and calm at dawn (top left). Exposure: ISO 400, 24mm, f/10, 1/100s

Lake Yellowstone, Wyoming, USA

Text and photos by Jennifer Idol

Benefits of shore diving include easy entry and simple dives, but my favorite shore dive is neither of these. Lake Yellowstone challenges and excites me both above and below the water's surface.

It is an altitude dive that requires technical expertise and navigational skills in cold water around 4°C (40°F), with limited visibility. However, this lake contains a rich macro world and bizarre hydrothermal features.

Commanding siliceous spires rise up to 7m (23ft) from the sandy bottom of the lake. They captured my imagination so thoroughly that I produced a film with Alex Rose to share this strange world with others. In the film, we illuminate the whole ecosystem down to the amphipods that inhabit the spires. We plan to continue documenting more of this strange world next year.

Few divers visit this remote dive site for which all gear must be brought to the site. Access is limited to approximately three months of the summer because this glacially fed lake freezes most of the year.

Despite these limitations, this is an ecologically significant resource. The Yellowstone Lake trout, which are endemic to the lake, are a keystone species that support wildlife such as bears and bald eagles.

Please visit: **uwDesigner.com**. To see the film about the siliceous spires of Yellowstone Lake, go to: **youtube.com/watch?v=GryugboA9LE**

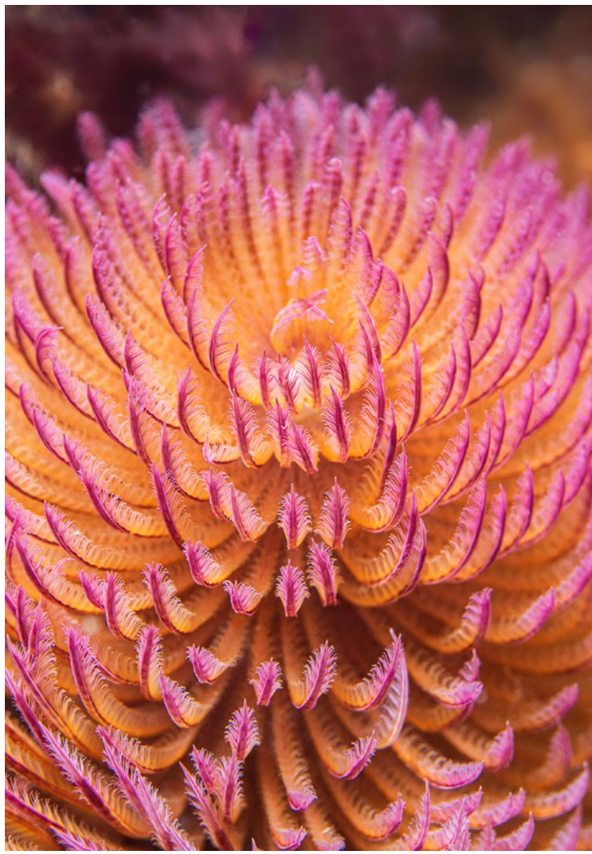
The entry point at Coral Gardens dive site in Rooi Els (above); Super klipfish hiding amongst elegant feather stars (top left). Exposure: ISO 160, f/18, 1/160s; Black nudibranch, *Tambja capensis*, eating its favourite food of bryozoans (bottom left). Exposure: ISO 160, f/18, 1/250s; Camera gear used for all images: Canon EOS 7D Mark II camera, Sea&Sea housing, Canon 60mm macro lens, two Sea&Sea YS-D1 strobes

Coral Gardens, Rooi Els, Cape Town, South Africa

Text and photos by Kate Jonker

Living in Gordon's Bay just outside Cape Town, most of our shore dives require clambering down sheer cliff faces with the dexterity of a mountain goat and undignified exits akin to those of a lumbering seal. Just 25km south of Gordon's Bay is the small holiday village of Rooi Els, where the rugged cliffs flatten out to form a tiny peninsula and shore dives become less challenging. Here, you will find Coral Gardens, one of the most exciting and beautiful dive sites along this stretch of coastline. Exciting because the entry is quite precarious and involves crab-crawling a 45-degree rock face followed by a well-timed giant stride from a small ledge into a steep-sided channel.

Once in the channel, one enters a fairy-tale kelp-forest wonderland of colourful soft corals, sponges, feather stars and swaying sea fans. The lush reef forms a haven for fish as well as West Coast rock lobster, crabs and invertebrates. This dive site is named for the large numbers of vibrant soft and hard corals that can be found here. One can happily spend over an hour scouring the nooks and crannies for spider crabs and a vast variety of nudibranchs, blennies and cheeky klipfish, whilst remembering to keep an eye out for a passing gully shark, pyjama shark or playful seal. After 20 years of diving here, Coral Gardens continues to enthrall me—and not even the sometimes-ungainly exits will deter me from exploring this reef again and again! Visit: **katejonker.com**



Feather duster or fan worm. Exposure: ISO 160, f/8, 1/250s

Pacific seahorse in sea grass (above). Exposure: f/20, 1/125s. Camera gear: Nikon D3 camera, Nikon 105mm macro lens, Subal housing, two Sea&Sea YS-250 strobes; A large school of mating common market squid, *Loligo opalescens* (top left). Exposure: f/9, 1/125s. Camera gear: Nikon D3 camera, Nikon 24-85mm lens, Subal housing, two Sea&Sea YS-250 strobes

A broadnose sevengill shark, *Notorynchus cepedianus*, swimming through a shallow kelp forest (above). Exposure: f/5.6, 1/80s. Camera gear: Nikon D810 camera, Nikon 16-35mm lens, Subal housing, two Sea&Sea YS-250 strobes; Green sea turtle feeding on red algae (right). Exposure: f/6.3, 1/125s. Camera gear: Nikon D810 camera, Nikon 17-35mm lens, Subal housing, two Sea&Sea YS-250 strobes

La Jolla Shores, La Jolla, California, USA

Text and photos by Matthew Meier

The La Jolla Shores dive site has an easy beach entry, transitioning to a gently sloping sandy bottom, which eventually drops off to a deep canyon once you reach about 50ft (15m). At first glance, there is not much to see, but once you slow down and look around, there is a great diversity of life hiding in the sand, tucked into the walls and swimming among the patches of sea grass and kelp. There is a massive sand dollar bed in the shallows, which supports a multitude of crabs, shrimp, snails, octopuses, nudibranchs and other invertebrates.

Turning south, the sand eventually gives way to patches of rocky reef, sea grass and kelp. Here, you can find a handful of resident green sea turtles, various reef fish, spiny lobsters, large sheep crabs, the occasional harbor seal or sea lion, plus leopard sharks, horn sharks, soupfin (tope) sharks, and if you are lucky during the springtime, broadnose sevengill sharks. Hiding in the sand are several species of stingrays, bat rays, skates, halibut and other flatfish, along with the random angel shark. The wall supports a different collection of fish life, various crabs, lobster, octopus and more.

Seasonal visitors can include large schools of mating squid, which lay egg casings in the sand that can resemble snow on a good year. There are also new species (like the Pacific seahorse) showing up from time to time with the warming waters brought about by climate change. There is always something new to experience, waiting just offshore. Visit: **MatthewMeierPhoto.com**

A green sea turtle, *Chelonia mydas*, swims in the shallows of the Matlahuayl State Marine Reserve in La Jolla, California, USA. Exposure: ISO 640, f/20, 1/250s. Camera gear: Canon EOS 7D Mark II camera, Tokina 10-17mm fisheye lens, Sea&Sea housing, dual YS-D2 strobes

Marine Room, La Jolla, California, USA

Text and photo by Frankie Grant

Another site at La Jolla, is one known simply as Marine Room. With its location close to a local La Jolla eatery, it has been one of the most hit-or-miss dive sites in the area. On the days when it is calm and the tide is high, it becomes a shallow sea paradise filled with every local fish imaginable, feeding and swimming as the sun's rays shine down. A short walk down a narrow corridor puts you out onto the beach where you can choose your journey. Right will take you to the sandy flats where leopard sharks are sometimes spotted. Left will lead you through the rocky reef structure where turtles, schooling fish and sometimes even sevengill sharks will stop by to say hey. The path is yours to choose, the only thing left is donning your gear! Visit: **frankiegrant.com**

Tunicates (above). Exposure: ISO 250, f/6.3, 1/250s. Camera gear: Nikon D850 camera, 105mm lens, Ikelite housing, dual DS161 strobes; Juvenile semicircle angelfish (left). Exposure: ISO 250, f/9, 1/125s. Camera gear: Nikon D850 camera, 105mm lens, Ikelite housing, dual DS161 strobes; Pair of Shawn the Sheep nudibranchs, *Costasiella sp.* (bottom left). Exposure: ISO 250, f/25, 1/250s. Camera gear: Nikon D850 camera, 105mm lens, +10 diopter, Ikelite housing, dual DS161 strobes

Rainbow over the house reef at Volivoli Beach Resort in Fiji (above)

House Reef, Volivoli Beach Resort, Fiji

Text and photos by Brandi Mueller

I often turn up my nose to shore dives; it is so much work to gear up and lug all that heavy stuff, walking into the surf, and the sand—it just gets everywhere! But once I convince myself to stop complaining and just go, I always enjoy shallow shore dives. One of my favorites is the house reef at Volivoli Beach Resort. Right out in front of the dive shop is an excellent reef and sea grass bed with all sorts of things to see (and it really is not too much of a walk). Once you get in the water, it starts out as a massive sea grass bed with many juvenile fish, garden eels, and once I even found several Shaun the sheep nudibranchs on algae growing in the sand! Continuing past the sea grass, there is a reef with gobies and blennies, colorful tunicates, anemones with clownfish, and sometimes there are even unique juveniles like the semicircle angelfish. With depths from about three feet to around 40ft, I love being able to spend a long time exploring and going slowly, searching for critters and working on creative photography techniques. It is a great night dive too! Visit: **brandiunderwater.com**

Edithburgh Jetty (above). Exposure ISO 100, f/2.2, 1/500s. Camera gear: Mavic Pro; Edithburgh Jetty pylons (top left). Exposure: ISO500, f/10, 1/60s; Leafy seadragon (top right). Exposure: ISO500, f/11, 1/160s; Octopus under the jetty (bottom right). Exposure: ISO500, f/8, 1/25s. Camera gear for all underwater images: Nikon D500 camera, 8-15mm lens, Nauticam housing, dual OneUW strobes

Edithburgh Jetty, South Australia

Text and photos by Don Silcock

Located on the southeastern tip of the Yorke Peninsula and looking out over the Gulf St Vincent is the small South Australian town of Edithburgh and its incredible jetty. The jetty is generally considered to be one of the best macro photography sites in Australia and is certainly one of my favorite shore dives in South Australia.

First opened in 1873 to facilitate exports of grain (and later salt, lime and gypsum), by the 1920s, Edithburgh was one of the busiest ports on the Yorke Peninsula. In 1973, the port closed, and the jetty has evolved to become a major tourist attraction for both divers and fishers.

The location of the 170m-long jetty means that it is protected from the prevailing southwesterly winds, which has allowed it to bloom and become a veritable kaleidoscope of the incredibly rich and colorful temperate marine life of South Australia!

Its many pylons are densely coated with beautiful sponges, bryozoans and ascidians, which in turn provide both habitat and protection for an intense plethora of sea stars, crabs, feather duster worms, nudibranchs and seahorses. Around the pylons in the midwater are large schools of temperate-water fish like old wives, bullseyes, mullet and yellow tail. While amid the rich sea grass around the jetty are numerous spider crabs, cuttlefish, seahorses and pipefish, plus the incredibly photogenic but very elusive leafy seadragon!

The jetty is an easy dive and is very popular with local divers from Adelaide, with a night dive there considered to be one of the best underwater experiences in South Australia. Visit: **indopacificimages.com**

According to marine biologist Anita George-Ares, this small fish (left) is a lantern bass, which can reach a maximum length of 2.5 inches; Seaweed blenny (top far left); Bearded fireworm (center inset); Red-lipped batfish (bottom right). Camera gear used for all images: Olympus OM-D E-M5 camera, Olympus 12-50mm f/3.5-6.3 lens, Nauticam housing, dual Sea&Sea strobes

Blue Heron Bridge, Palm Beach County, Florida, USA

Text and photos by Olga Torrey

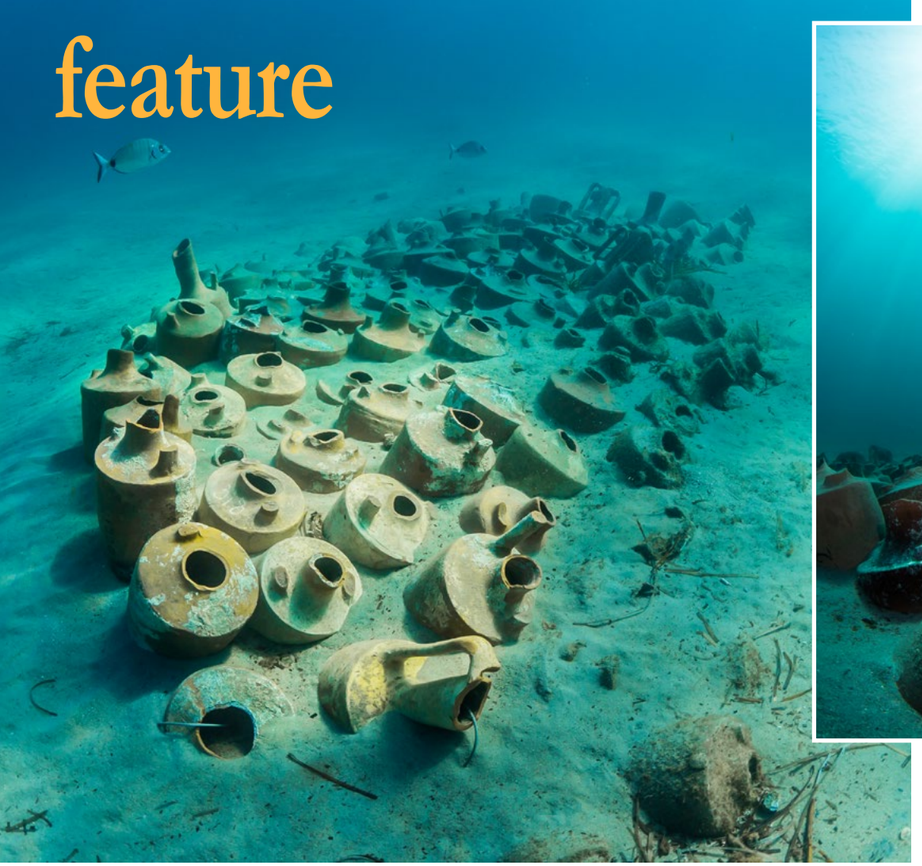
One of the United States' best shore dives is Blue Heron Bridge in Palm Beach County, Florida. This location has an easy-to-access entrance, and there is a wide variety of marine life to be found there because of how close it is to the Gulf Stream.

It is important to dive the bridge at high slack tide because of the currents. You can spend two hours underwater without decompression because this is a shallow dive. You will need a dive flag because of the boat traffic. Visibility at the bridge can be up to 100ft during high slack tide. As a muck dive, this site has a unique habitat and environment where you will find marine life living in the sediment. You will not find these critters on a reef or wreck.

The entrance to Blue Heron Bridge is at Phil Foster Park in Riviera Beach. The park is open from sunrise to sunset, except for boat launches (colemanconcierge.com).

I spent two hours taking photos and exploring this famous underwater location. I did two dives. My first dive was with a dive guide. He showed me the site and the marine life, which calls the bridge home. On the second dive, I found more marine life by myself. The two hours passed fast, and suddenly I felt the pull of a powerful tide. I was overdue to get back to the surface. I had to dig my fingers into the sand to fight the force of the water, pulling myself into the boat channel and trying not to scratch my camera. I learned my lesson on that dive!

I have not been back to the bridge in six years. In that time, my photography skills have improved. I am now ready to go back to my favorite shore dive site, which has so much to offer underwater photographers. Visit: **fitimage.nyc**



Diver explores the site of ancient amphorae at La Tour Fondue in Hyères, France

One hundred and fifty amphorae, which were recovered from a wreck that sank around 70 to 65 BC near La Madrague, have been resubmerged in the bay of La Tour Fondue.

La Tour Fondue, Hyères, France

Text and photos by Claudia Weber-Gebert

This site is part of a project with different archaeological trails on land and underwater in France in the region of Hyères along the Mediterranean Sea. The amphorae in the bay of La Tour Fondue belong to the second underwater trail. The wreck, which carried the amphorae, was discovered in the early '70s in very good condition.

The ship, which was transporting 6,000 amphorae filled with wine, was sailing from Italy and heading to Spain. It sank around 70 to 65 BC near the small village of La Madrague on the Giens Peninsula. The origin of the amphorae is known, however.

After a lot of preparation work, the over-2,000-year-old amphorae were installed in the bay by AREVPAM (Association de Recherche, Etudes et Valorisation du Patrimoine Méditerranéen—an organisation for the research, study and valorisation of Mediterranean heritage) and a lot of volunteers, in a similar fashion as they had been discovered, to give a proper impression of the archaeological find.

Since 2012, experiments with the installations have been made. In 2014, thirty amphorae were fixed to the sandy bottom in the bay, and some years later, 120 more were placed in the bay, making it a total of 150 authentic ancient artifacts.

At a depth of 6 to 7m, the site is easy to reach and open to the public. Visiting the site, divers, snorkellers and swimmers alike will feel as if they have discovered a place of antiquity. If you want to see more, go to: **youtube.com/watch?v=B03r25GAuYU&t=12s**

Bonito Caves

— *Cave Diving in Brazil*

Text and photos by Pierre Constant

Gruta do Mimoso cave entrance (above); Scenery of Serra da Bodoquena on the way to Bodoquena (top right). PREVIOUS PAGE: Dive guide Tuta inspects stalagmite cones in Gruta do Mimoso

Pantanal marsh deer, *Blastocerus dichotomus*, Serra da Bodoquena

— "Moro num país tropical, abençoado por Deus e bonito por natureza …" ("I am born in a tropical country, blessed by God and beautiful by nature…") So goes the famous song by the popular Brazilian musician Jorge Ben Jor.

Did you say, "Bonito"? I had never heard of this place. A Brazilian diver I met in the Galapagos Islands referred to it as the capital of cave diving in Brazil, located south of the Pantanal wetlands in Mato Grosso do Sul—a state bordering Bolivia and Paraguay.

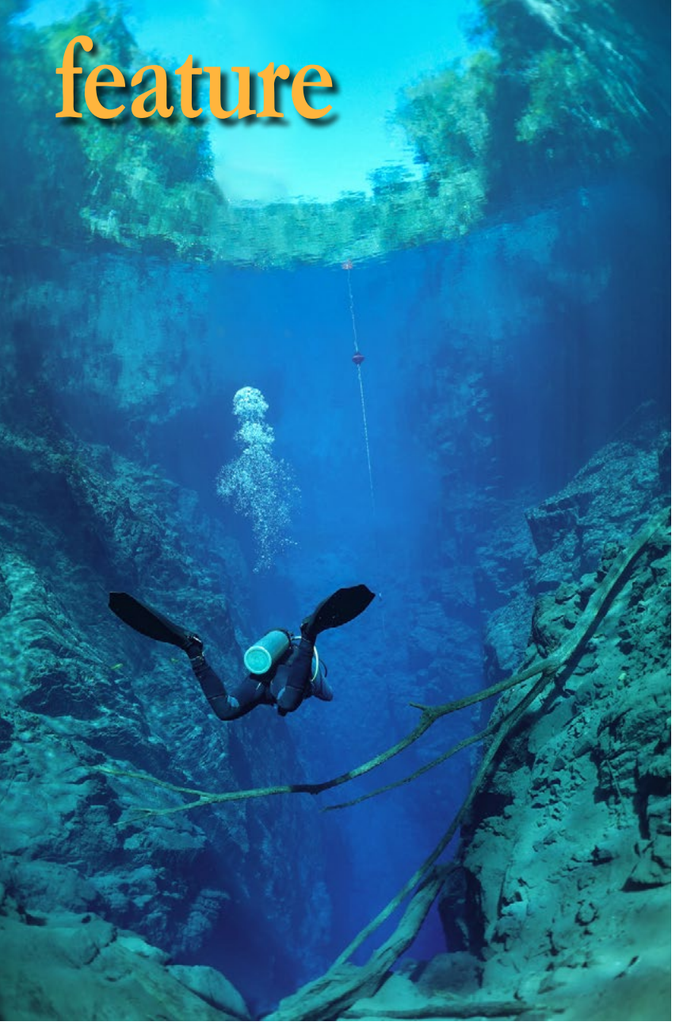
In July 2019, I took a domestic flight from Sao Paulo to Campo Grande, where I hired a car at the airport. On the pleasant 300km drive to Bonito, I passed endless fields of transgenic corn and the green pastures of zebu cattle farms.

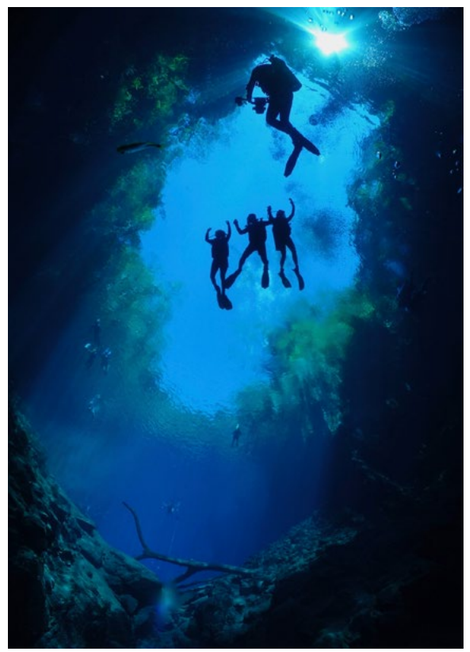
The little town of Bonito is a tourist attraction for Brazilians and a self-proclaimed ecotourism wonderland. Everything is geared to serve the "bona fide" tourist, not the cave diver. Here, local agencies control the game. You cannot access any place without going through an agent, who will eventually hand you a voucher for any activity you can think of. Furthermore, a rental car proved to be a real necessity in Bonito if one wanted to access all the sites.

Located west of Bonito and Bodoquena is Serra da Bodoquena—a weathered limestone plateau of both carbonatic and terrigenous rock in the Corumbá Group (formed 580 million years ago in the Ediacaran Period of the Neoproterozoic Era). The sedimentary deposits followed a period when the planet was subject to intense glaciation. An ocean formed through the separation of the African and South American continental masses, formerly joined in the Rodinia supercontinent.

The second chapter in the geological history of the region took place 60 million years ago (in the Cenozoic Era)

View of Lagoa Misteriosa spring (above); Caracara bird of prey, *Caracara plancus*, in Mato Grosso do Sul (center)





THIS PAGE: Scenes from Lagoa Misteriosa; Dive guide Iago and stumps of wood in Lagoa Misteriosa (top center and top right); Tour photographer takes photos of divers (right)

with the formation of caves. The Bodoquena Plateau slopes eastward, with a 200m escarpment on the western side. A karst area that extends 200km north-south is part of a plateau with an average elevation of 800m, which surrounds the lower plains of the Pantanal Mato Grosso Plain. Dominated by dolomites, the eastern sector of the Bodoquena exhibits a morphology of karst plains with residual hills and features such as dolines, caves, sinks and springs, as well as tufa limestone deposits along the current fluvial drainage system.

Covering an area of 77,022 hectares, the Serra da Bodoquena National Park, which was created on 21 September 2000, is administered by the Chico Mendes Institute for Biodiversity Conservation. It is part of the Pantanal Biosphere Reserve and classified as an IUCN protected area, with the aim of preserving natural ecosystems of great ecological importance, enabling scientific research, environmental education and ecotourism. Protected species in this area include the armored catfish *Ancistrus formoso* (a troglobitic species of the Siluriformes order, adapted to living in caves), jaguar (*Panthera onca*) and cougar (*Puma concolor*), among others. More than 200 caves have been identified in the region, all of them on private farmland or in the park, and are hard to get to.

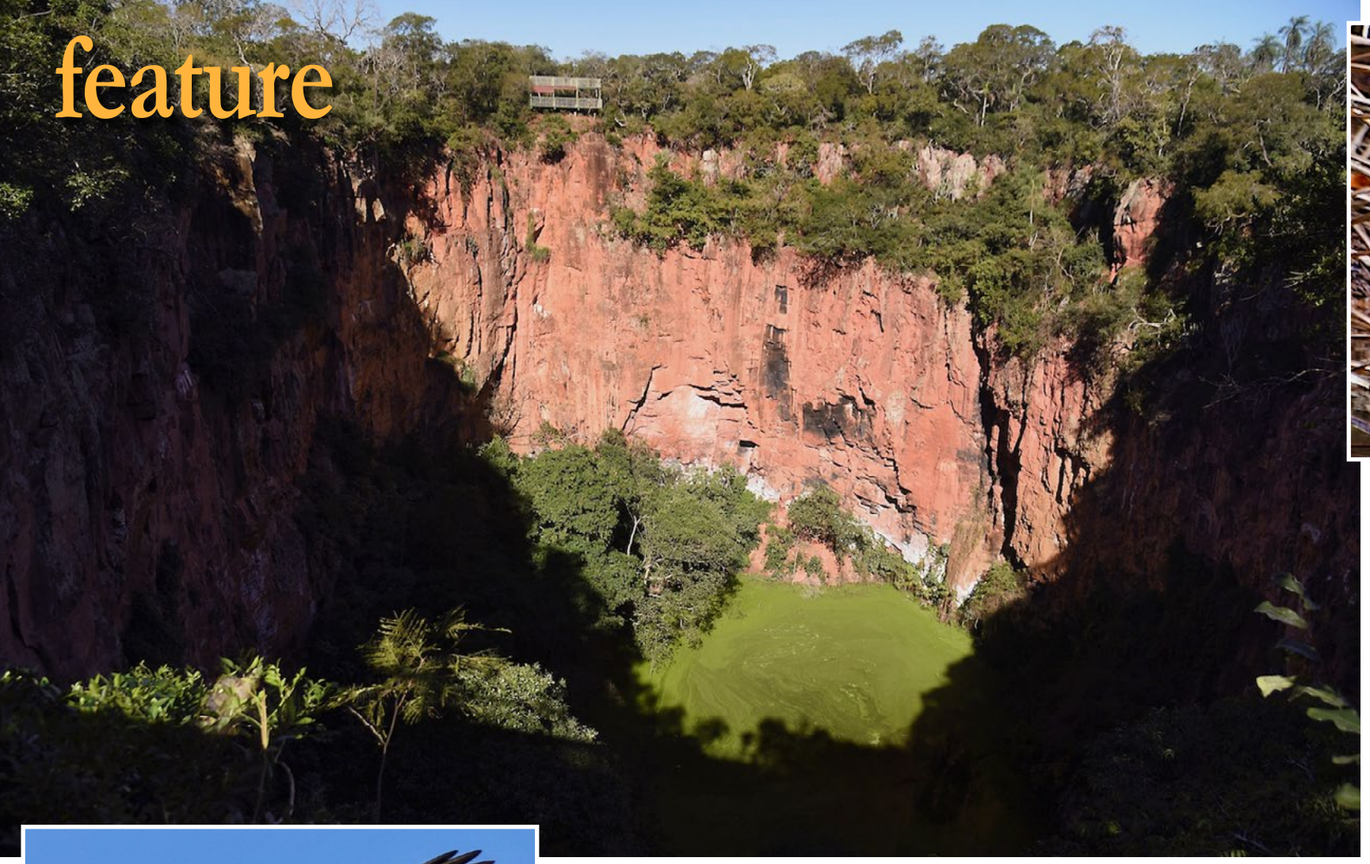
Lagoa Misteriosa

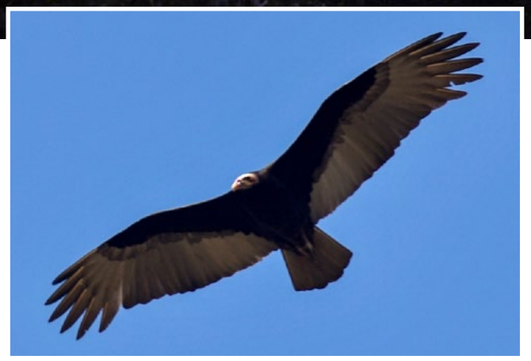
Being the odd unwilling tourist, I booked a R$400 (US$75) tour to dive the sinkhole Lagoa Misteriosa. Transportation was not included in the fee, so I was glad I had the car to drive the 51km south from Bonito to Recanto Ecológico Rio da Prata. It was a bucolic landscape of farmland, with Brahman cows, "gauchos" on their horses, and the ever presence of *urubu*, or turkey vultures, swooping down from above. I handed in my voucher and was allowed to don my shorty for the dive.

As part of a group of snorkelers, I was led along a 400m trail through the forest, then down a wooden stairway to the sinkhole, which was emerald green in color. Iago, our 19-year-old dive guide, spoke some English, although I found that speaking Spanish fluently came in handy when communicating with Brazilians.

Coming from a deep spring in a fracture in the rock, the water was a balmy 25.4°C. The first dive ever made here was done by Augusto

Armored catfish (*Ancistrus sp.*) is a protected species found at Rio da Prata.





Buraco das Araras red sandstone sinkhole (above); *Urubu*, or turkey vulture, *Cathartes aura* (left); *Jacaré*, or caiman, at Rio da Prata (top center)

Plush-crested jay, *Cyanocorax chrysops* at Buraco das Araras (above); Striped owl, *Asio clamator midas*, Buraco das Araras (top right); Red-and-green macaws, *Ara chloroptera*, Rio da Prata (center)

Auler as a member of a French-Brazilian expedition in 1992. The deepest dive down to 220m was undertaken in 1998. However, I was instructed that we would not go deeper than 25m—a shame, since I was promised by the tour agency that I could dive to 40m. "But that is not the same price!" I was abruptly told later. Considering the fame of the site and the number of dive novices doing their "*baptismo*" (baptism) here, this was a well-oiled industry!

The visibility of the water in the sinkhole was excellent; it was a deep blue color underwater. Plenty of small fish, known as *lambari* in Brazil (*Astyanax sp.*), which were yellow in color with a black spot on the tail fin, swam around my mask like pests. There were also *mussums*, which the dive guide Iago confirmed later to be marbled swamp eels (*Synbranchus marmoratus*).

Lagoa Misteriosa was a good place for creative photography. I photographed rays of sunlight filtering through the water, old wooden logs resting underwater and Iago as an underwater model, while the underwater photographer assigned to us took pictures of me in every position! One positive comment about the experience is that you could choose the photographer's best shots of yourself in the end, at no extra cost. Just bring a USB stick.

Buraco das Araras

Only 15 minutes away was Buraco das Araras, which incurred a R$78 entry fee (US$20). This remarkable sinkhole in red sandstone was 160m across and 100m deep, had a green-water lagoon at the bottom and was surrounded by trees and vegetation. Two *jacaré* (caimans) lived here, prisoners of their own fates. There was no way down, but a trail in the forest went around the sinkhole and led to two viewing platforms, one at each end. The main draw here was a population of red-and-green macaws (*Ara chloropterus*), which dwelled in the cliffs and in the trees. They were noisy for sure, but so entertaining and such a beautiful sight in flight. The forest was teeming with birds, and I was surprised by a striped owl resting on a branch in the sunlight.

Seeking authorization

Back in Bonito, I explained my dilemma to another agency. "But I came here to go cave diving!" I said and enquired about the renowned Gruta do Lago Azul. Definitely a place of wonder and enchantment, it was a large cave that had been dived before. "We'll see if we can get an authorization for you," said the agent. It was denied, as expected, since Gruta do Lago Azul was a site of archeological and paleontological research.

"You may look for Edy Edmundo, Secretario do Meio Ambiente (SEMA)," said the agent. "He is an experienced cave diver here. His office is in the Department of Environment."

So, I went there and waited patiently for half an hour before Edmundo came out to meet me. Straightaway, he advised me to contact another cave diver, named Tuta, who could possibly arrange a dive at Gruta do Mimoso, which was actually closed for tourism. But the man was not in town that day. "Come back again tomorrow," said Edmundo.

View into the sinkhole Abismo Anhumas from the outside (left); Rappelling down in tandem into Abismo Anhumas (right)

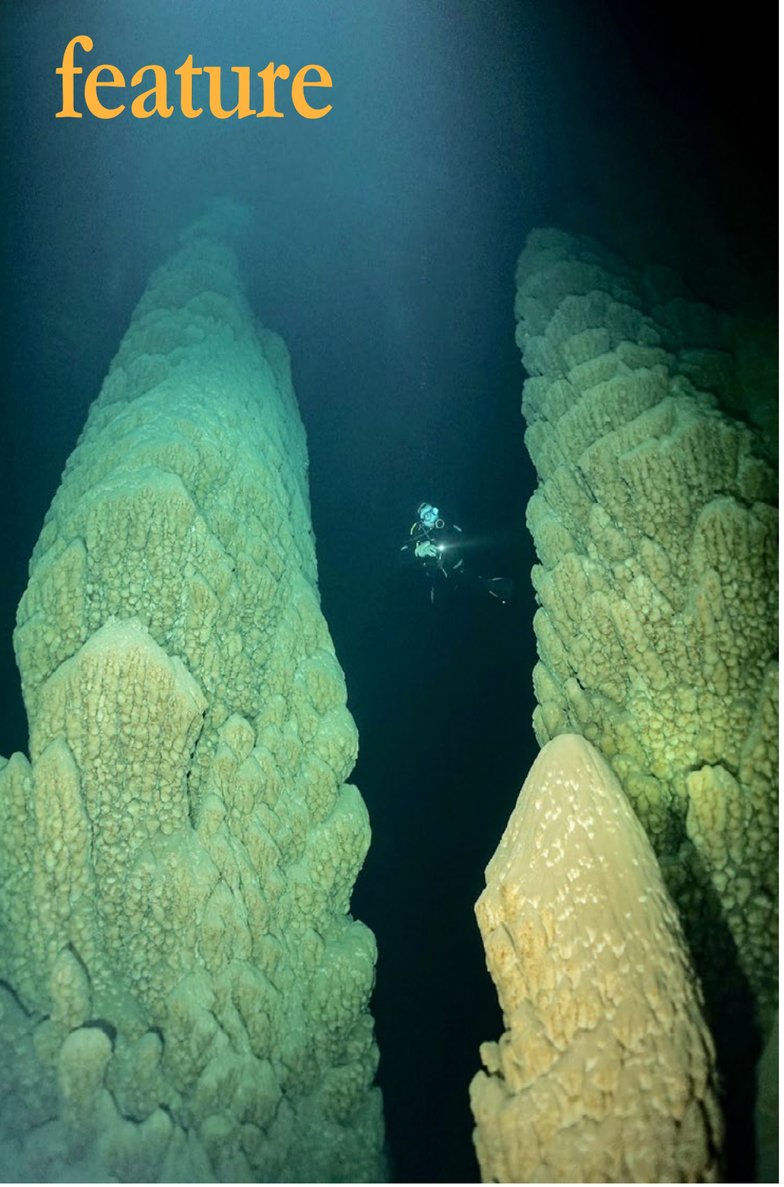
Abismo Anhumas

Meanwhile, I decided to have a look at Abismo Anhumas (Anhumas Shaft), another famous cavern, 23km to the southwest, in the hills of Serra da Bodoquena. To get there, I drove along a red dirt road that climbed into the dry *mato* (forest). The last 100m had to be done on foot. The operation here consisted of rappelling down 72m on a rope, through a narrow cleft that opens into a huge cavern, which had a lake at the bottom. From a viewing platform, you can peek inside the sinkhole. One can get a glimpse of people sliding down or being pulled out, with harness, helmet and the lot. A mere fee of R$1,517 (US$400) is charged for the experience, should you decide to dive in the lake as well!

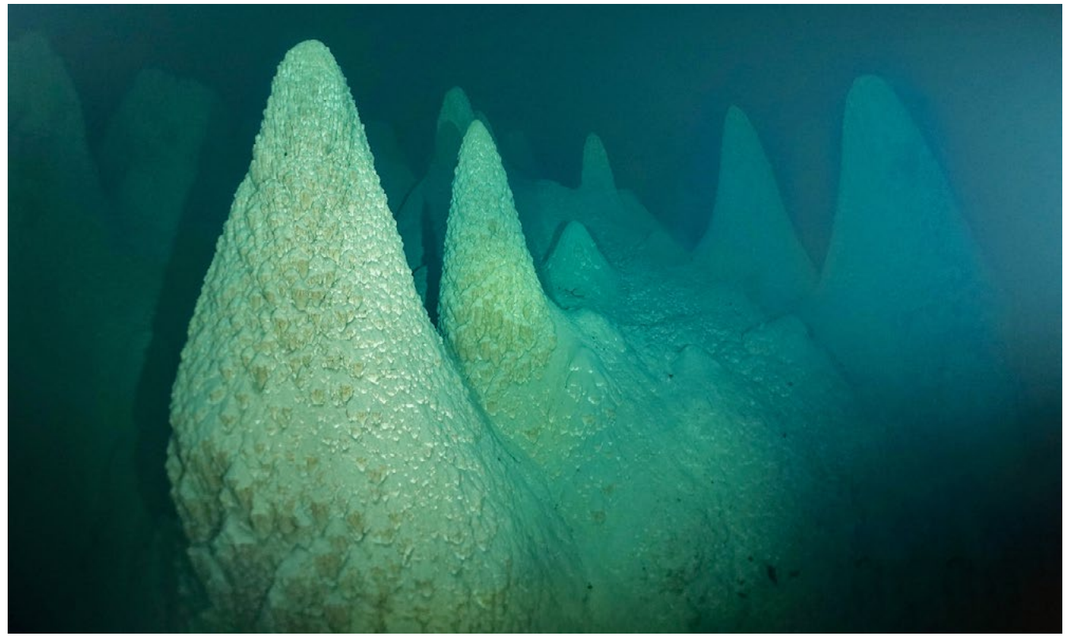
A team of six guys pulled people out on a rope, running a boardwalk 30 to 40m long. The whole ordeal was carried out with enthusiasm and a good sense of humor. A friendly guy named Fernando gave me the name of the operation's owner, Juca, whom I should approach for further information. That same evening, I met Juca by chance on the street. As it turned out, he was the owner of both Ygarape Tours and Bonito Scuba.

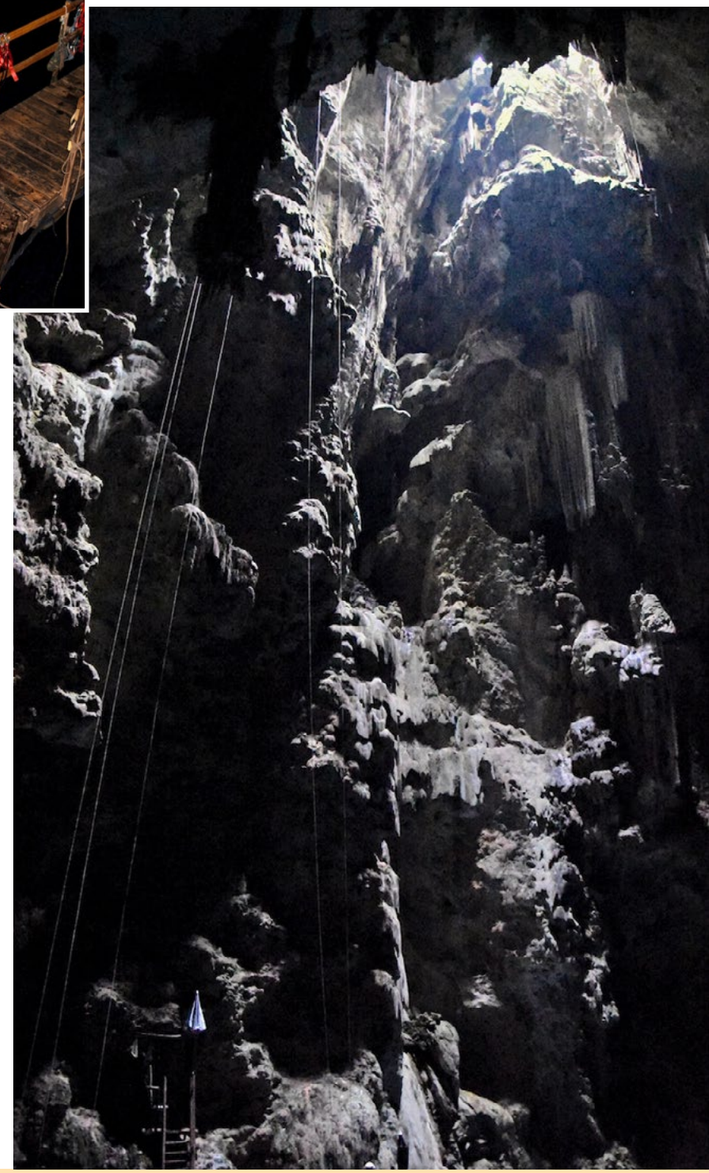
Two days later, I was back with my dive gear. It was compulsory to go through the necessary training at the rappel center the day before, where you are given a basic understanding about how the technique works. Here, you had to pull yourself up nine meters on a rope, with the help of your legs and a rappelling tool.

Back at Abismo Anhumas, early in the morning, my scuba tank and dive gear were brought down separately on the rope, as well as my underwater camera in a bag. The subterranean lake was 120m long by 90m wide, with a maximum depth of 80m in a specific pit hole. I rappelled down together with another guy, to whom I was hooked up with a cable and our legs had to be clutched.



THIS PAGE: Underwater scenes showing the huge stalagmites in Abismo Anhumas; Arriving at the platform after a 72m rappel down into the sinkhole (below); Skeleton of a *tamandua*, or anteater, in Abismo Anhumas (right); View of the daylight hole in the open roof of Abismo Anhumas (bottom right)



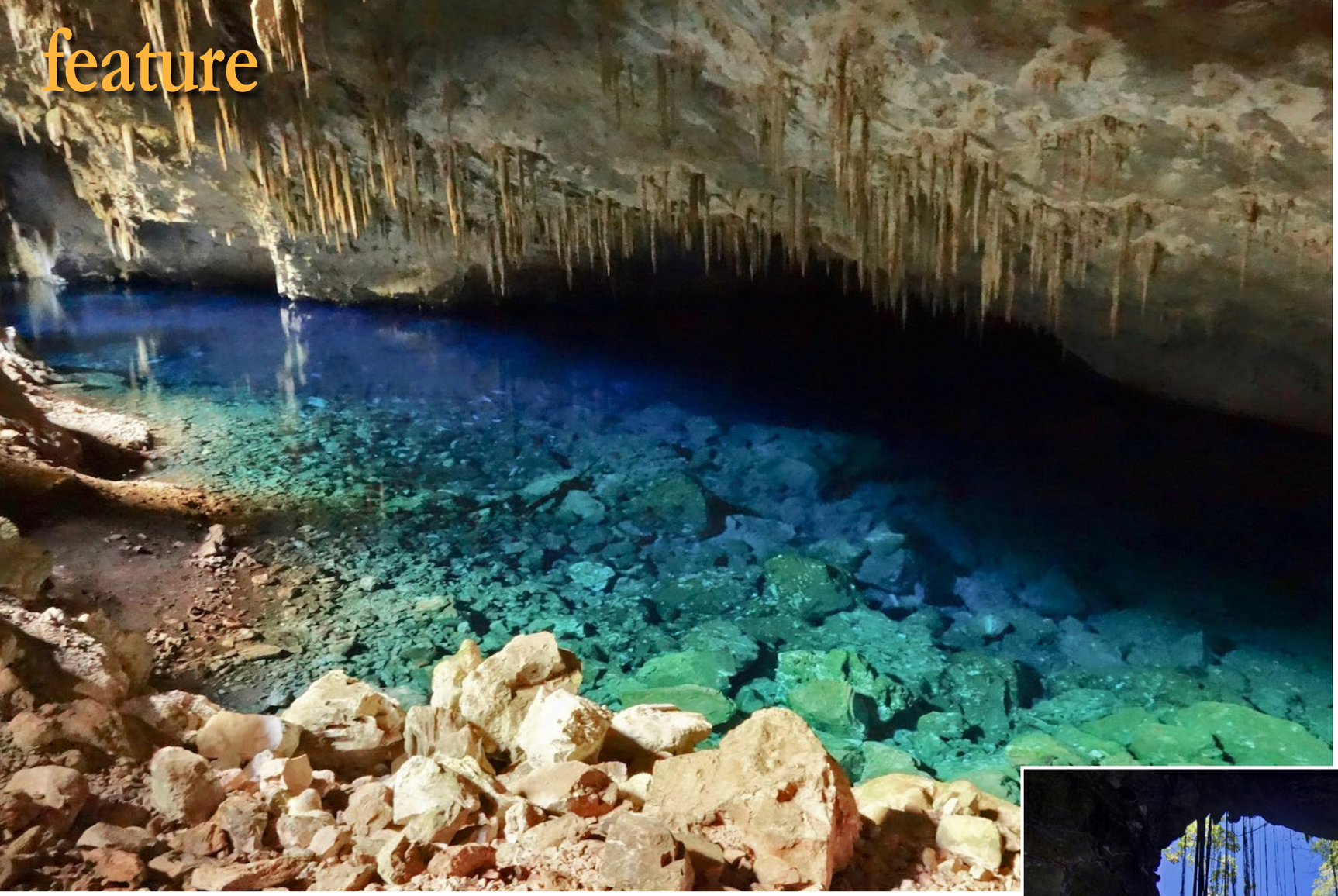


Underwater, the temperature was a frisky 18°C, and the 5mm wetsuit was indeed appreciated. Most of the lake did not exceed a depth of 20m. The water visibility was not clear, which was not helped by the darkness of the surroundings. The only source of light came from the open roof of the sinkhole.

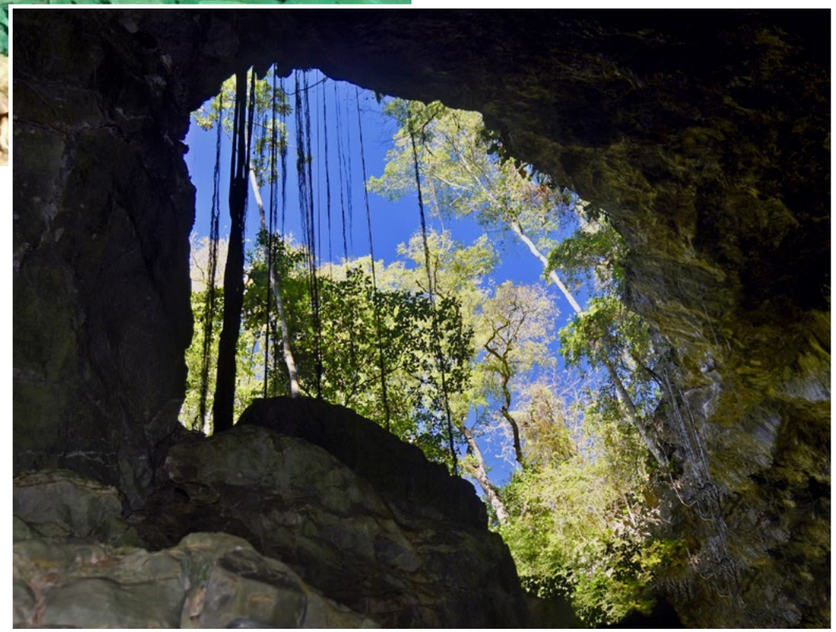
Giant stalagmites rose from the bottom like nuclear warheads. Yellowish-white in color, the tallest was 19m high! According to this scale, it would mean the stalagmite was 19,000 years old, if we consider a deposit growth of 1mm per year. A mind-boggling explanation is that these stalagmites were made underwater, from the accumulation of sediments dripping down from the stalactites above and incidental mineralization. It was hard to believe, but a proven scientific fact. With the shortage of light, photography of the stalagmites was rather challenging.

Eduardo, the dive guide, pointed out the full skeleton of a *tamandua* (giant anteater) laying on the bottom. It was estimated to be at most 100 years old.

The total dive time was 34 minutes, with a maximum depth of 18m, and I still had 100 bar left. The hoisting up was rather quick and took no more than three to four minutes. It was a memorable experience.



Blue Lake, Gruta do Lago Azul (left); View looking up to the entrance of Gruta do Lago Azul (below)



Gruta do Lago Azul

Gruta do Lago Azul would have been a fantastic dive, but the Brazilian bureaucracy is such a headache and the restrictions are so insane that it will take a long time before anything becomes possible. It is simply not enough to be a licensed Full Cave Diver. The environmental laws are overly protective, but promotion of the place by agencies is fully encouraged, as long as it attracts the *lambda*-paying tourist.

The reason behind the interdiction is the occurrence of the bones of Pleistocene animals. The Monumento Natural Gruta do Lago Azul (Blue Lake Cave Natural Monument) was declared a national heritage site in 2001 by the Instituto do Patrimônio Histôrico e Artistico Nacional (IPHAN), not only for its fossils, but also for the occurrence of rare minerals such as nesquehonite, and for the minute endemic crustacean *Potiicoara brasiliensis*, which resembles a weird mantis shrimp, barely a centimeter long. However, tourism activity here was approved in May 2008.

Lago Azul Cave was formed in Neoproterozoic-era dolomitic carbonate rocks of the Corumbá Group, within the geotectonic Paraguay Fold Belt, in relation to the Pan African/Brazilian orogenetic event which extends for 1,500km. The main chamber of Lago Azul extends 224m north-west-southeast and 184m in a northeast-southwest direction, with a maximum depth of 90m. This chamber was probably a former spring in distant times.

During the Franco-Brazilian BONITO/92 Expedition of Jacques-Yves Cousteau, fossils of megafauna mammals from the Pleistocene were discovered at the bottom of the lake. These were from the giant ground sloth *Eremotherium laurillardi* and the sabre tooth tiger *Smilodon populator* (dating from 1.8 million to 11,000 years ago).

A second expedition in March 2015, led by researchers of the Museo da Historia Natural—which included divers, photographers, journalists and filmmakers—went to a depth of 90m, discovering 12,000-year-old fossils at depths of 17m to 50m. Other caves in the region, such as Buraco do Japonês, Nascente do Rio Formoso and Fadas Cave, revealed fossils of Pleistocene carnivores such as jaguar, Pantanal cat (*Leopardus braccatus*) and bear (*Arctotherium sp.*), as well as mastodons (*Stegomastodon sp.*), gomphotheres (*Notiomastodon platensis*), prehistoric armadillo or glyptodont

Piraputanga fish, *Brycon hilarii*, at Nascente Azuil

(*Glyptodontinae*) and tapir.

Nowadays, one can be led by a tour guide along the tourist trail, which takes you down a flight of cement stairs to the bottom of the 60m cliff, into the cavern and to the edge of the Blue Lake. The light being minimal, it is rather difficult to take photos of the lake in natural light, unless you push to 3200 ISO, use the timer and keep the camera perfectly motionless!

More caves

Other dry caves around Bonito (such as Gruta de Sao Miguel and Gruta Sao Mateus) can be visited on a tour, but they hold very limited interest in comparison to the amazing caves found elsewhere.

Back in Bonito to pick up some lights, my aim was now the search for Fazenda Mimoso (Hacienda), where Gruta de Mimoso should be located. Hard to find, I ended up at Estancia Mimosa. A helpful man showed me a road junction on the way to Nascente Azul on a map. Driving to the spot, I discovered a hilltop crested with original forest. A dark 4x4 pick-up was parked in the shade of some trees. "These farmers can help me for sure," I thought. To my astonishment, they were divers—with scuba tanks! Addressing the big one in a drysuit, I reached out my hand and asked: "May I know your name, by any chance?"

"My name is Tuta," he said.

"Oh, what a coincidence! I was just looking for you," I said.

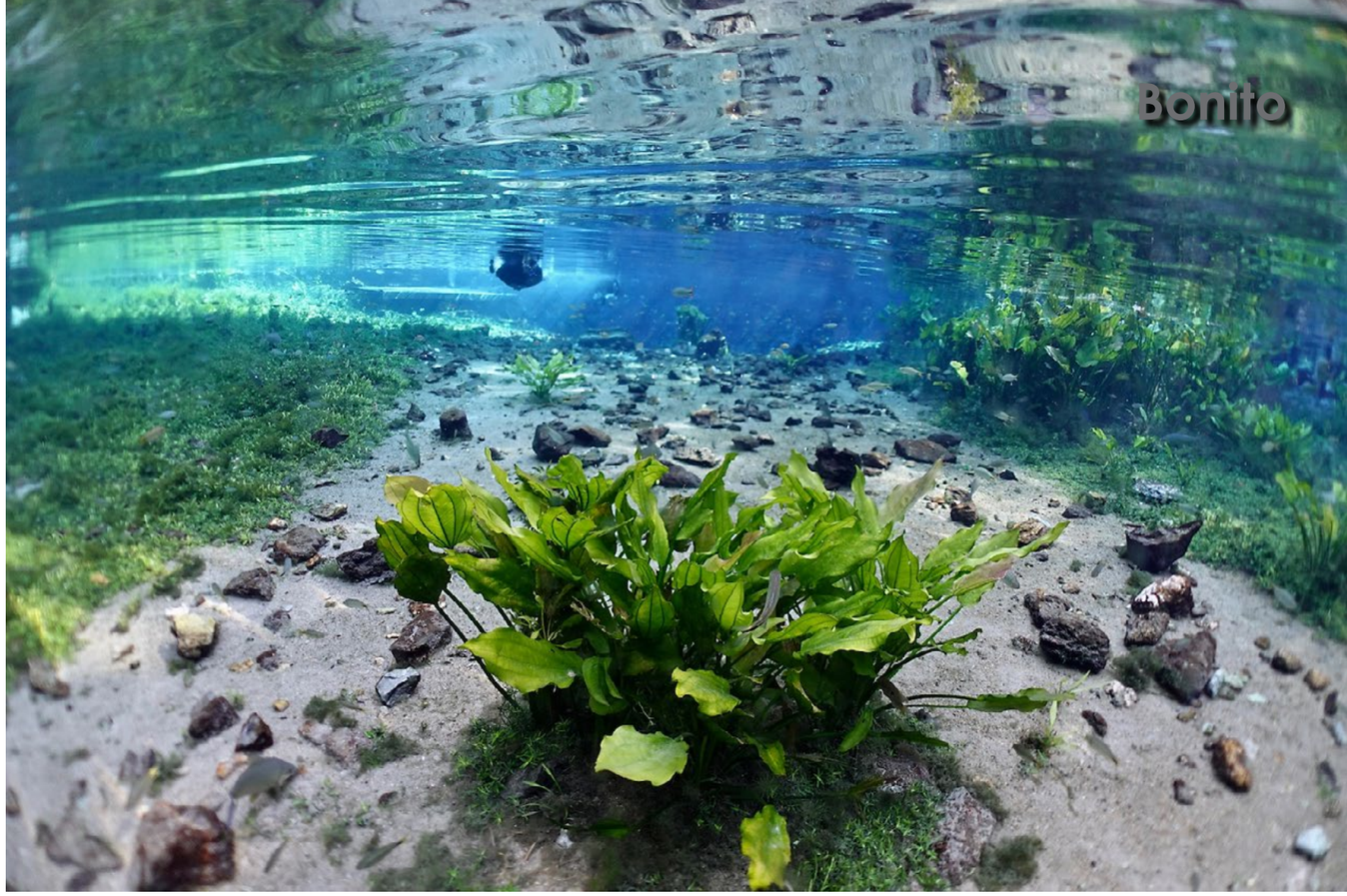
After I explained the reason for my presence, he pointed his finger towards the cave: "Go have a look, then we'll have a chat."

Tuta was indeed the new legal operator, who had free entry and permits to take divers into Gruta do Mimoso. With Bruno, his assistant, he was busy placing lines and markers for future underwater circuits, adapted to all levels of diving and cave diving. The greatest depth reached was 40m+ in the Catacumba. The site was not yet open for visitors but should be in March 2021.

"Send me a copy of your passport, TDI Full Cave certification and DAN insurance, and we could plan it for this weekend," he said. Well, wasn't this providence at last? I thought.

Springs

The regions of Bonito and Jardim are full of *nascentes*, better known as springs in English. These include Nascente Azul, Nascente del Rio Formoso, Nascente da Ceita Corê, Nascente do Rio Sucuri and



School of piraputanga fish at Nascente Azul (above); Aquatic plants at Nascente Azul (right); *Flutuaçao,* loosely translated as snorkeling, at Nascente Azul (left); Clear-water spring at Nascente da Ceita Corê (bottom right)

Nascente do Rio Olho d'Água—all of which come from Serra da Bodoquena and from the artesian waters below. In those areas, the water comes out crystal clear and warm at 24°C on average, whereas river water on the surface is around 18°C. Colorful fish life is plentiful at the *nascentes* and favors an activity known as *flutuaçao*, which Brazilian brochures translate as snorkeling. However, it is not really snorkeling but something rather different.

Nascente Azul. I signed up for the experience, in the hope of taking some nice photos of the fish in fabulous visibility, and I showed up one morning at Nascente Azul, with mask, fins, snorkel and my underwater camera. "Sorry sir, you cannot bring your fins," said the guide.

"May I know why?" I asked.

"Because it will disturb the bottom, and you cannot skin dive," he said.

I frowned with displeasure, but the man added: "And you cannot bring the camera arms with the strobes. It will annoy other people and create delays."

I did not understand but complied for the sake of peace. Then the small group I was with, composed of families with kids, moved on along the trail to the departure point. At the midway point, we were told we had to collect equipment.

"I do not need the neoprene shorty!" I said.

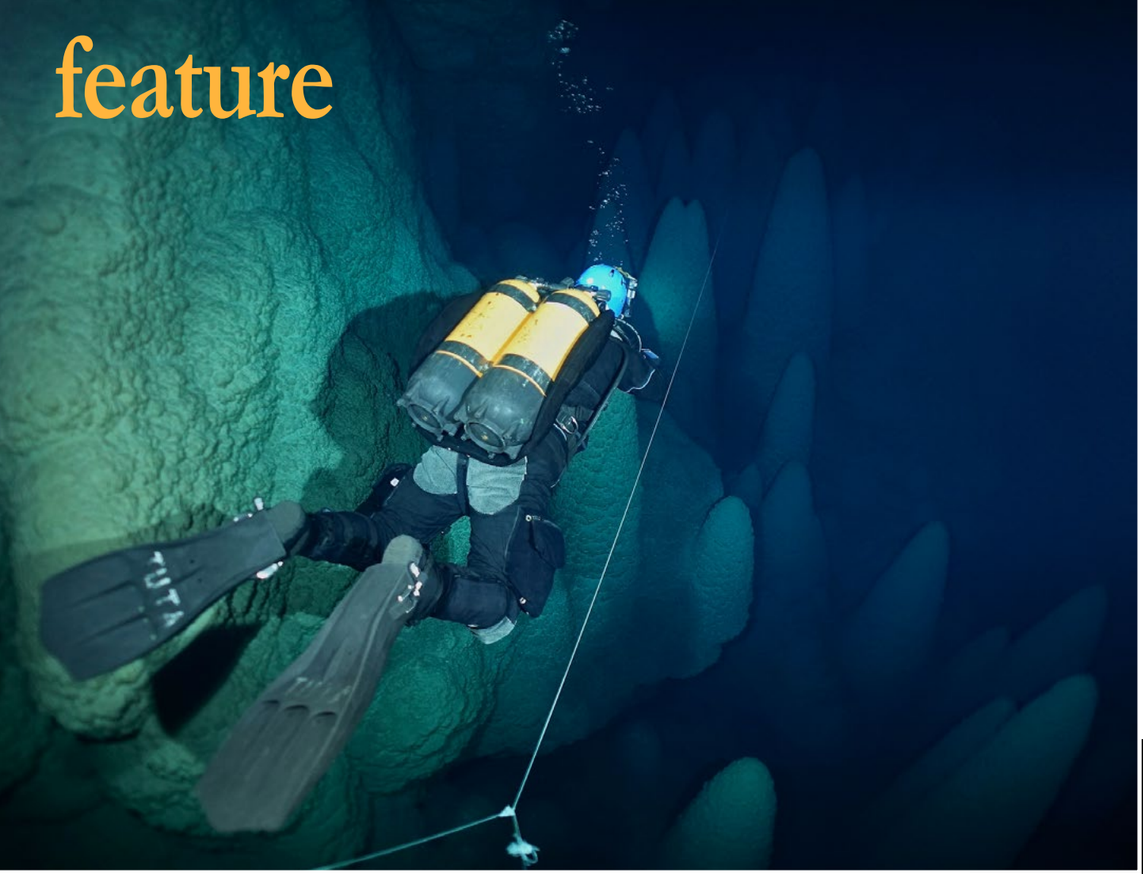
"You have to, sir, as well as the life jacket. This is the rule of the environmental law for conservation!" he said.

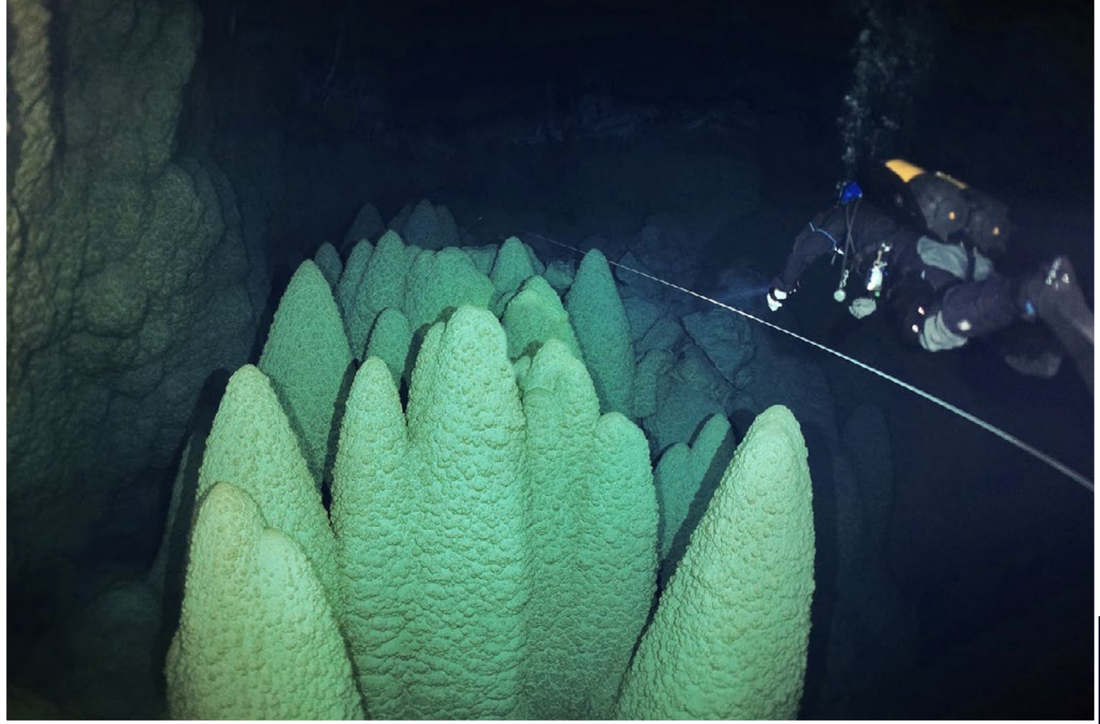
By now, I was pretty upset about the whole circus. Once in the water, I felt like a floating tortoise, with my head down and my back bobbing up like a champagne cork.

"You must move forward with your arms. Do not use your legs!" he said.

For goodness sake, how did they expect me to take decent photos of the fish like this? It was ridiculous. A bad joke. I thought to myself, "Now you understand the principle of floatation."

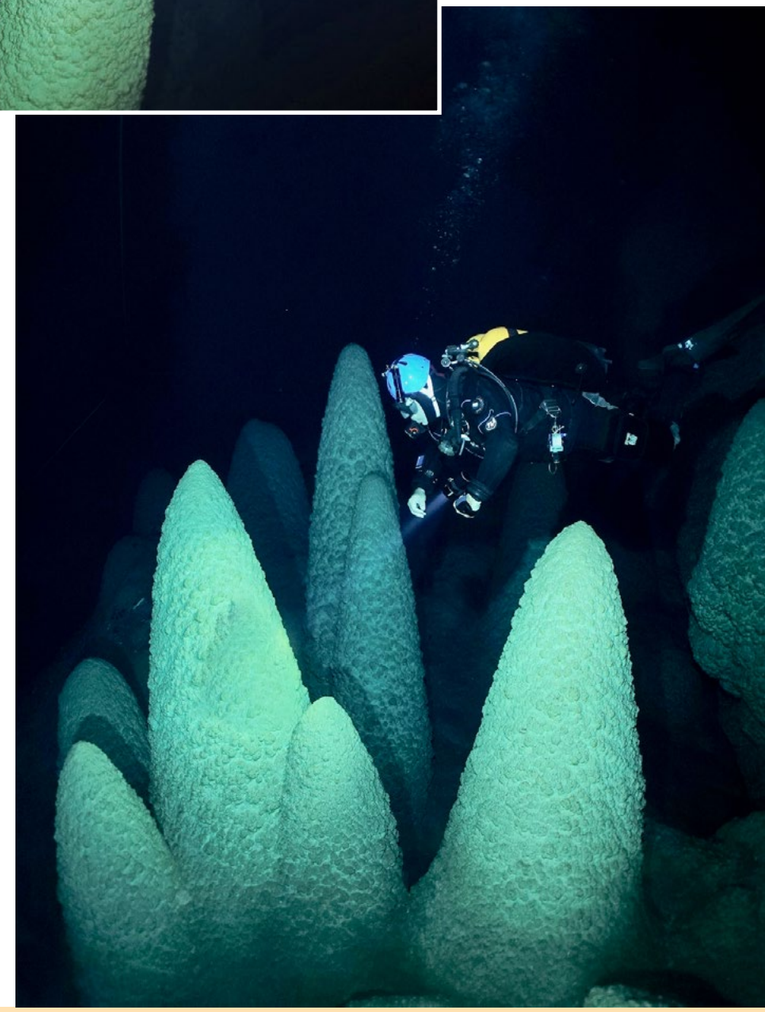
Ceita Corê. Ceita Corê was another attractive spring, located on a farm of the same name. Bubbling with gin-clear water, the hole connected to a subterranean chamber that was six meters deep and to a cave fracture that descended 155m. An enticing cave to dive, this activity was sadly not on offer. "However, you may snorkel and skin dive to 5m, if you wish!" said the guide.

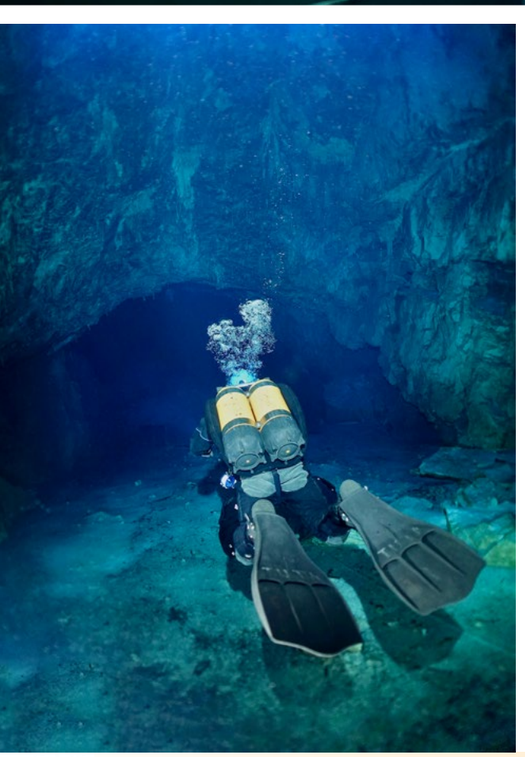




Bonito

THIS PAGE: Underwater scenes of spectacular stalagmites in Gruta do Mimoso; Dive guide Tuta penetrates the tunnel to Gruta do Mimoso (bottom left); Tuta entering the "Salon of the Cones" (top left); Tuta glides over a cluster of cones (left); Tuta hovers over cones that thrust upward like daggers (below); Overhead view of the cones (center)





Gruta do Mimoso

Tuta had confirmed our dive at Gruta do Mimoso for Sunday. "Did you bring your signed Liability Release?" he enquired at once. I nodded in agreement. We would be diving with twin 10-liter steel tanks and a backmount with a manifold system.

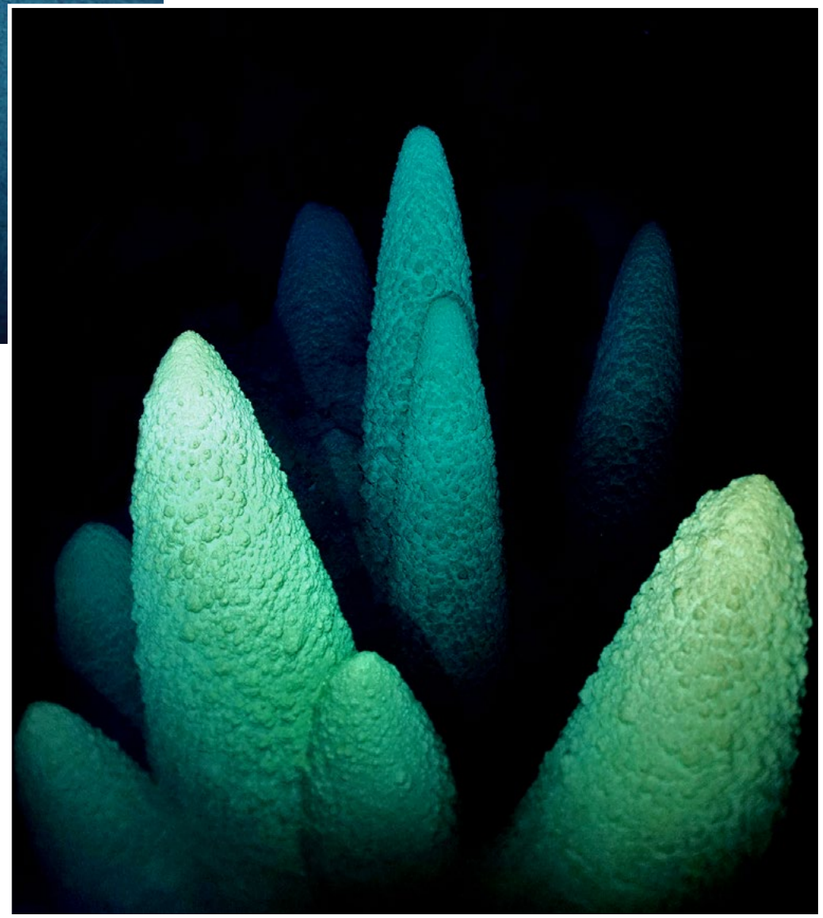
"The first dive will be a loop around the main tunnel, following the U-shape of the yellow line, maximum 18m depth. You'll lead," said Tuta, as if to test me. No camera this time, I was diving only to get used to the cave features of the main chamber. It took me 15 minutes to cover the circuit. Visibility was fabulous. There was hardly any fish life except for small lambari (*Astyanax sp*.).

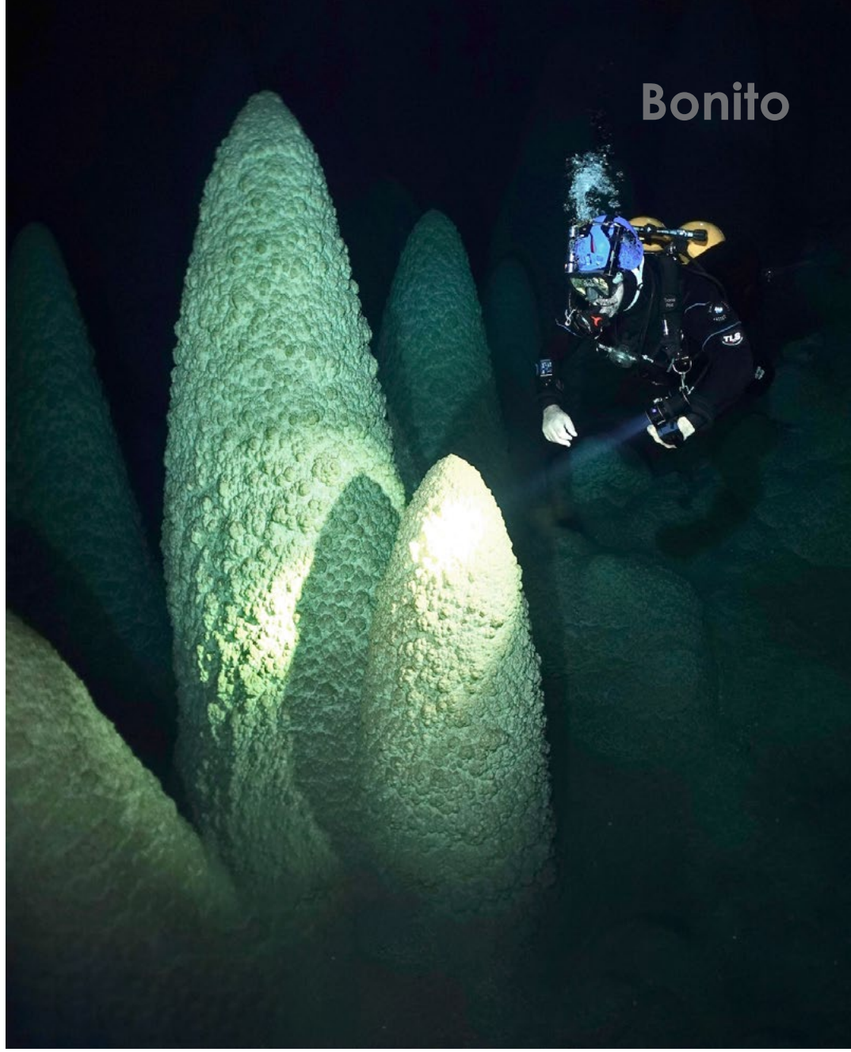
Tuta led the second dive, and I brought the camera along this time. After five minutes, a T-junction took us left into the Salon of the Cones, the highlight of this dive.

"Do not swim below the line, always above the cones," Tuta warned. A vision of a surreal Christmas-tree-like forest in white appeared in the beam of my torch. It was simply breathtaking. The stalagmites were a few meters high and set rather close to one another like a collection of rockets pointed towards the ceiling. Floating above them, I noticed some bulbous ones among the tapered cones.

"When we take a right turn at the end of the alignment, you may come deeper to shoot from below," advised Tuta. The depth gauge now marked 26m, from the

Alignment of cones between the guide lines in Gruta do Mimoso (left); Tuta's progression forward to the next chamber (below); Side view of Tuta inspecting the cones (right); View of cones protruding upward like daggers (bottom center); Tuta at a decompression stop (bottom right)





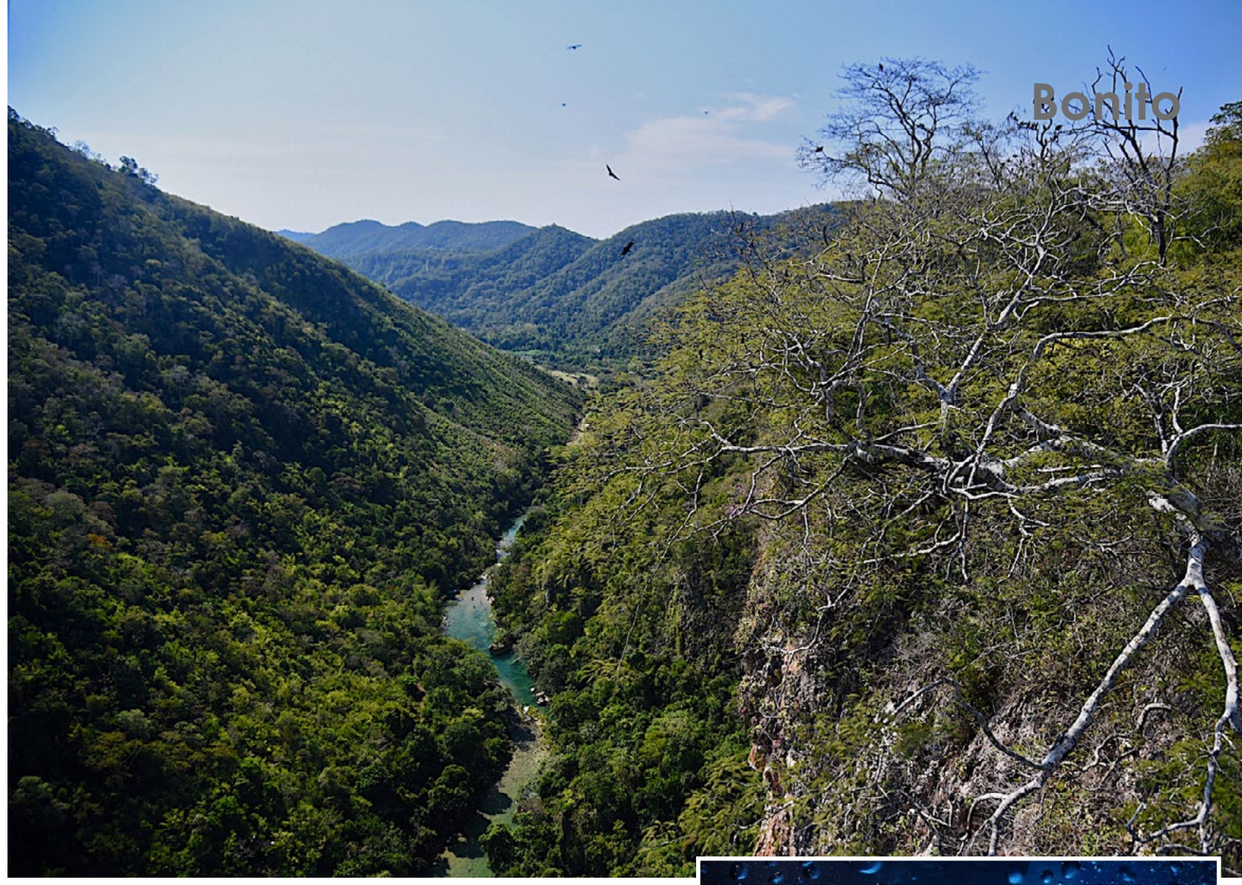
previous 22m. The tallest stalagmite might be close to 10m, reckoned Tuta. Following the side of the chamber a bit farther on the left, we came to a side tunnel that plummeted into the Catacumba, at a depth of over 40m. Not the plan for today. We made it back into the main tunnel and slowly rose to the 10m level. Above us was a dry chamber where we would not surface.

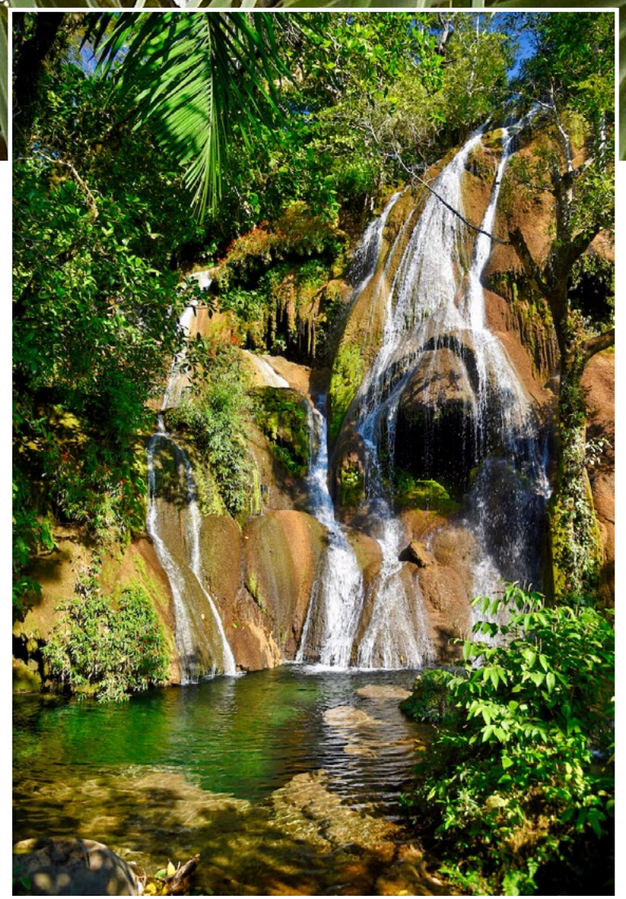
"Back in 2003, a couple of Italian divers explored the cave. One came out of the water there and fainted after a few minutes. The oxygen level is only 10%. Fortunately, his friend brought him back into the water, where he could regain consciousness with his regulator," Tuta informed me later, dead serious.

I emerged from the dive after 44 minutes, truly enchanted and thrilled by the cave. But there was not going to be another opportunity for me to dive it. "We still have a lot of work to do on the cave and we are just behind schedule," explained Tuta, with a nod of the head.

Topside excursions

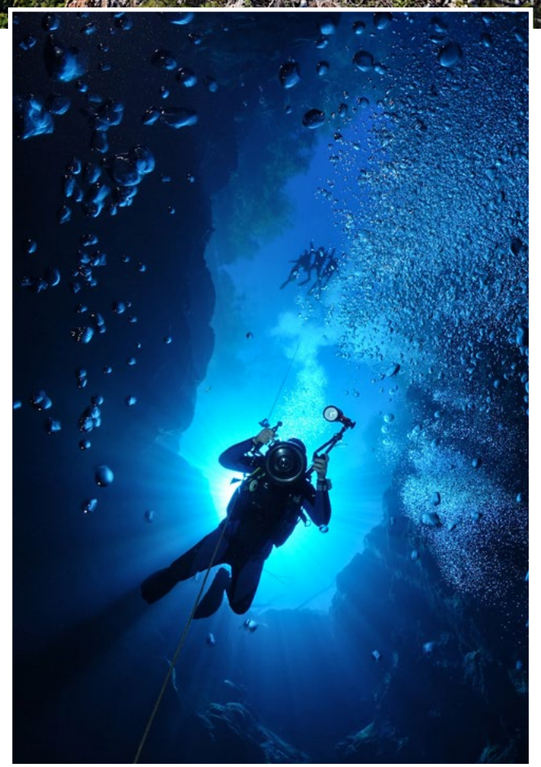
Besides diving in rivers such as Rio Formoso or Rio da Prata for the colorful fish life—with species such as piraputanga or South American trout (*Brycon hilarii*), dorado





The tawny browed owl, *Pulsatrix koeniswaldiana*, is endemic to Mato Grosso do Sul (above); Waterfall at Boca da Onca (left); Underwater photographer at Lagoa Misteriosa, with snorkelers at the surface (bottom right)

Aerial view of Rio Salobra at Boca da Onca (above); Toco toucan, *Ramphastos toco*, in the town of Corumbá (top left)



(*Salminus brasiliensis*) and curimbata or streaked prochilod (*Prochilodus lineatus*)—there are a number of excursions available for those who like *trilhas* (trails) to walk. A well-recommended one is Fazenda Boca da Onça, where a two-hour tour in the forest takes you first to a platform, where you can rappel down 90m to the river bed of the Rio Salobra. The trail then passes through the forest to eight amazing *cachoeiras* (waterfalls) in a very lush natural environment. The tallest waterfall is no less than 156m.

Afterthoughts

Bonito is an experience of a different kind, definitely Brazilian in style. To be perfectly honest, the current restrictions on cave diving left me a bit puzzled and frustrated, knowing that there was so much yet to be discovered underground. But as Tuta rightfully concluded: "Blame it on Brazilian bureaucracy!" ■

With a background in biology and geology, French author, cave diver, naturalist guide and tour operator Pierre Constant is a widely published photojournalist and underwater photographer. For more information, visit: ***calaolifestyle.com****.*

Black Sea Wrecks

— From Ancient Roman to the Modern Era

Text by Pavel Lapshin
Photos by Pavel Lapshin
and Oksana Istratova

PAVEL LAPSHIN

PHOTO BY OKSANA ISTRATOVA / LIGHTING BY PAVEL LAPSHIN

Skeleton of an ancient Roman ship at 85m; Starboard side of *Crown Prince Alexei* (previous page)

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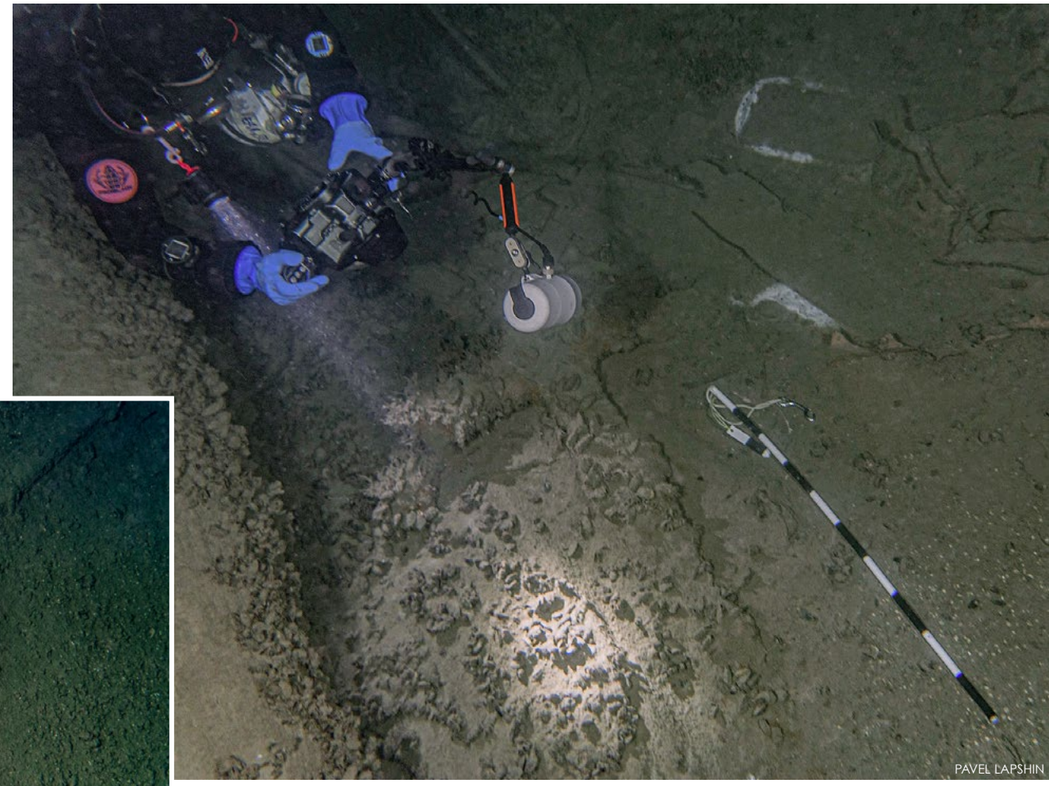

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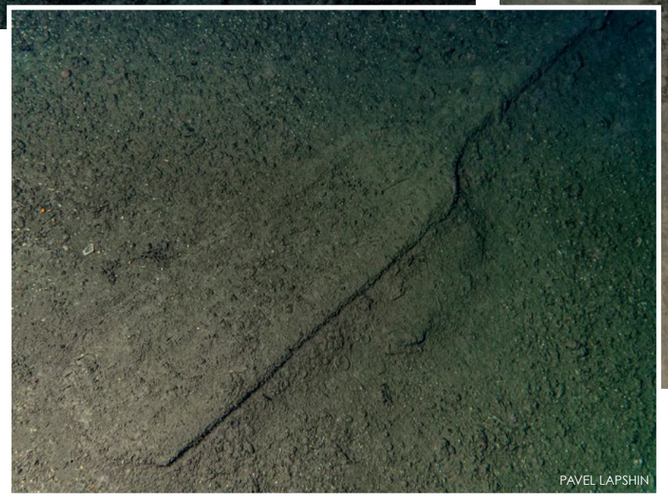

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Wooden frame of an ancient Roman merchant ship discovered in the Black Sea near the bay of ancient Balaklava (top right); Excavation of an ancient anchor at the site (above); A wooden oar in excellent condition (left inset)

The distant Black Sea is a legend for all times. Tender and harsh, calm and violent, lukewarm and ice-cold—much can be said about this marginal sea of the Atlantic Ocean, which has enchanted sailors from all over the world since ancient times.

Throughout its long history, this inland sea has been called by different names. The ancient Georgians called it Spersky, the ancient Greek name was Pont Aksinsky, and even its Scythian name has survived to this day, but when and why the sea became "Black" is not certain. There are different versions that propose the name "Black" as the designation of the northern side of the world, others say that the name was given because of the anchors that turned black after serving in these waters. We will leave it to the historians to figure it out one day.

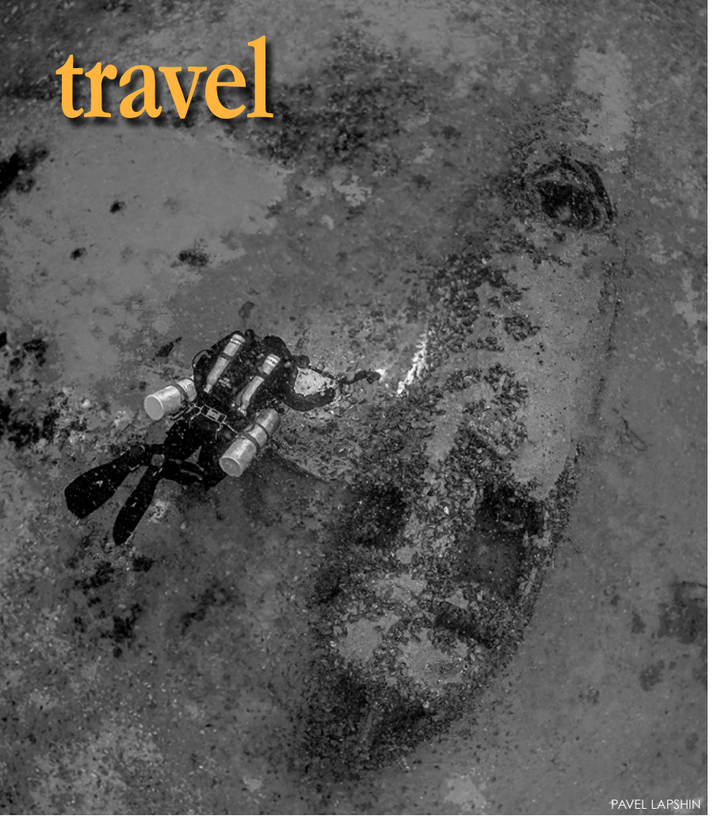
For scuba divers, this part of the world represents a real treasure, a place where you can perform dives of varying difficulty (from open water to mixed gas CCR deep wreck penetrations), touch history with your hands, and sometimes even make real discoveries. What follows are some notes from my expeditions in this region.

Ancient Roman merchant ship

An expedition! What else can be more inspiring than unknown secrets yet to be discovered? A couple of years ago, I was included in a group of researchers discovering a previously unknown shipwreck at a depth of 85m. The wreck is located not far from the bay of ancient Balaklava (on the Crimean Peninsula).

A long time ago, marine trade routes passed through these waters. The Black Sea has always been a wayward place, so many ships ended their voyages at the sea bottom. Various ships and submarines sank here at different times and for different reasons.

The vessel we discovered with the echo-sounder was clearly very old, and our primary objective was to find out what kind of object we were dealing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Diver at fuselage (top left) and cross on wing (left) of the German Heinkel He 111 bomber recently found at 44m; View of dorsel gun turret position on fuselage (above)

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The fuselage and wings of the Heinkel wreck were found in good condition (above). Remote machine gun on the tail of the aircraft (left); Historical photo of Heinkel He 111 bombers (top center)

with. Several dives were made under circumstances comprising strong currents, cold water, variable visibility and a serious depth. Working as a team of experienced divers, we completed the series of dives without any problems.

The framework of the ship was discovered during the first dive. It was 20m long and 6m wide, almost completely immersed in silt, with only its ribs and a well-preserved bowsprit visible on the surface. On the second dive, we were lucky: We found an anchor and a paddle, and took samples of wood for further study. All the planned measurements, photos and video filming were completed successfully. Based on our findings, scientists made a bold assumption that this was an ancient Roman merchant ship from around the second century BC.

Henkel He 111 bomber

During this past summer, I visited several more interesting sunken objects of the Black Sea. One of the recent findings was an aircraft, which was sunk during WWII—a German Henkel He 111 bomber. It rests at a depth of 44m in the area of Cape Tarkhankut.

The plane was shot down by a Soviet fighter in March 1944; one of the crew managed to escape and survive. In the mid-2000s, many years after, he returned to the peninsula with his family to remember his story of a miraculous escape.

The Henkel wreck itself is half-covered in silt, but the fuselage and wings are in good condition. The left engine is still in place, an RC machine gun is visible at the tail of the aircraft and another machine gun was found not far from the crash site but was lost during the salvage attempt. I was also able to find a wheel from the aircraft landing gear at a considerable distance from the hull.

This was another example of good luck for the researchers; during the search for the bomber, an unknown object was discovered at a distance of 150m to 200m from the plane. Checking an unusual magnetic anomaly found there, divers found an unbroken, almost intact ship!

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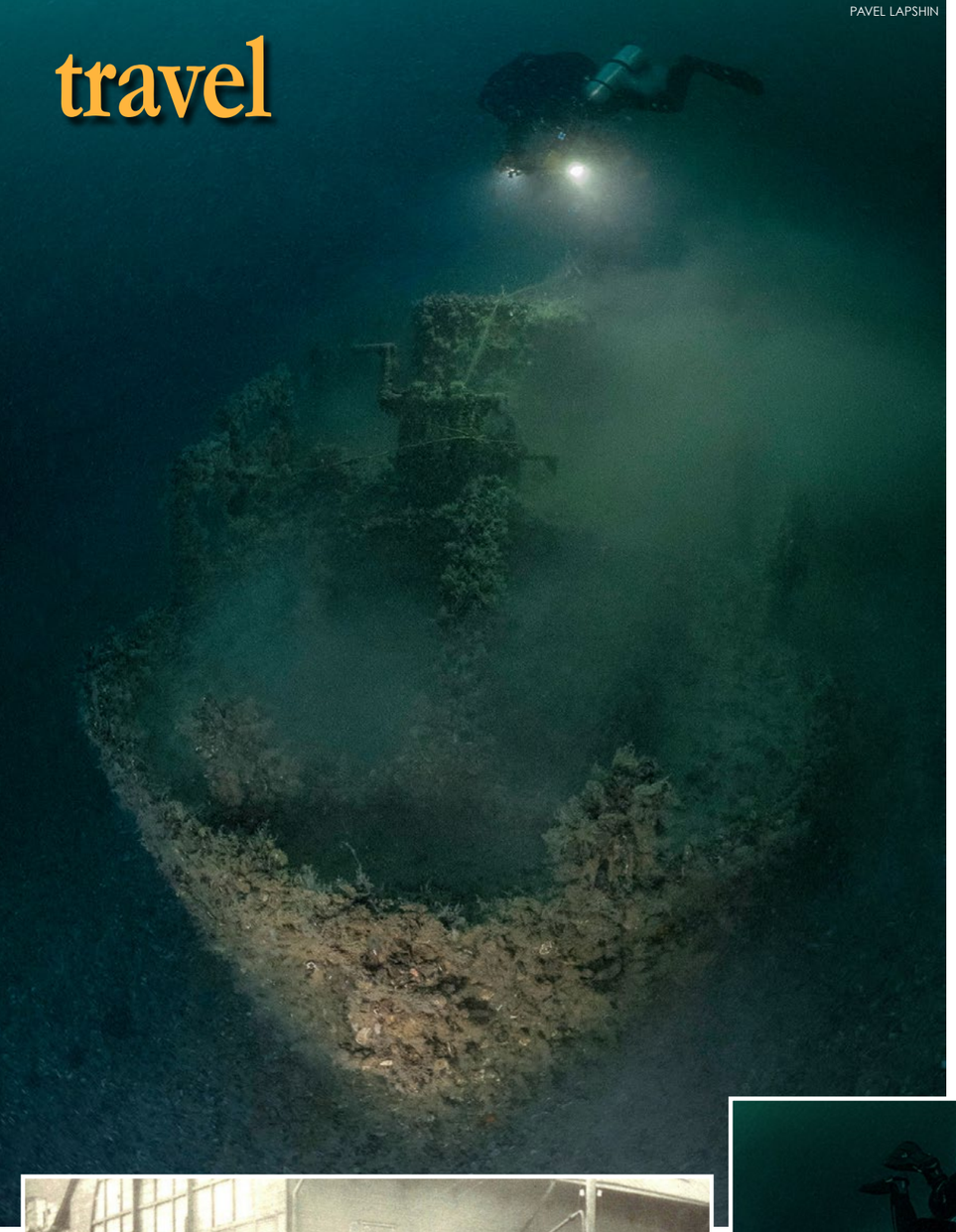

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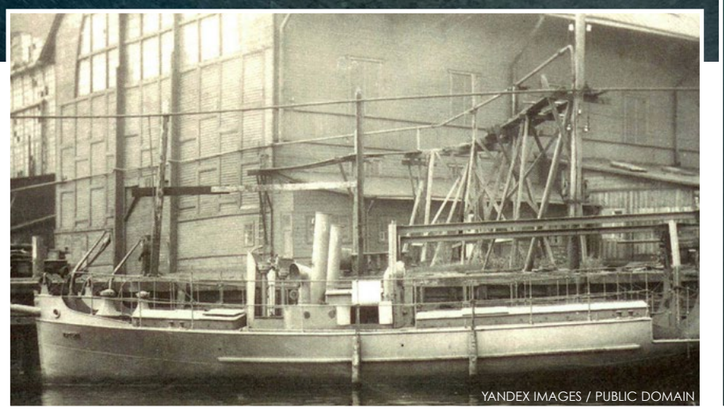
Inscription of the ship's name, "Fourth," on the bow (above); The wreck of the *Fourth* sits upright on its keel (top left); View of the upper deck with captain's cabin (top right)



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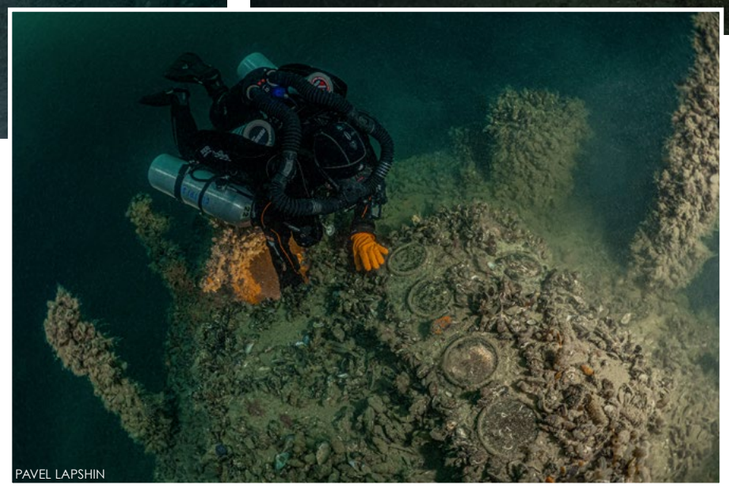
Historical photo of a vessel similar to the *Fourth*



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Diver inspects the ship's engine room.

The *Fourth*

On a board of the wreck, there is the name of the find: the *Fourth*. The ship is dated to the 1920s; no information about its exact functions or its fate could be found. Presumably, it was a minelayer vessel. The *Fourth* wreck is also lying at 44m, on an even keel. The wheelhouse, steering wheel and propeller are in place and the hull is intact, but the history of the *Fourth* still remains a mystery.

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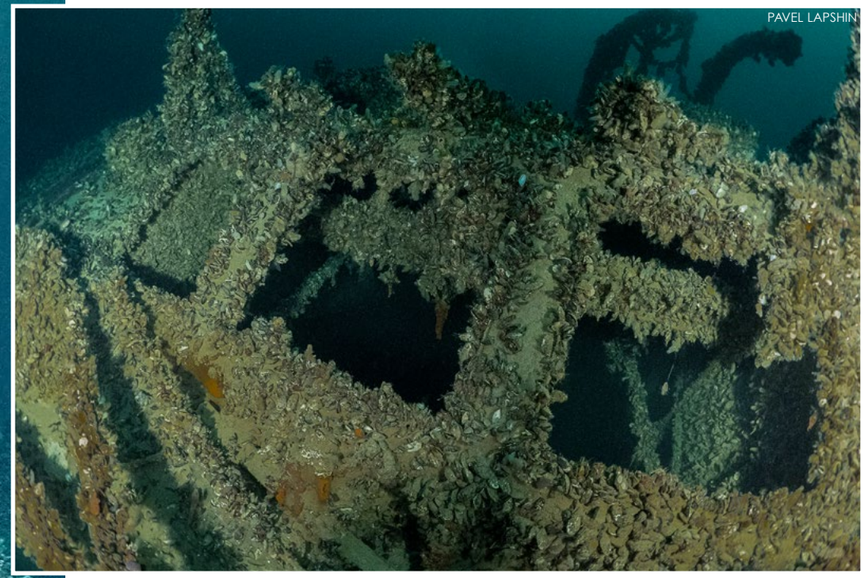

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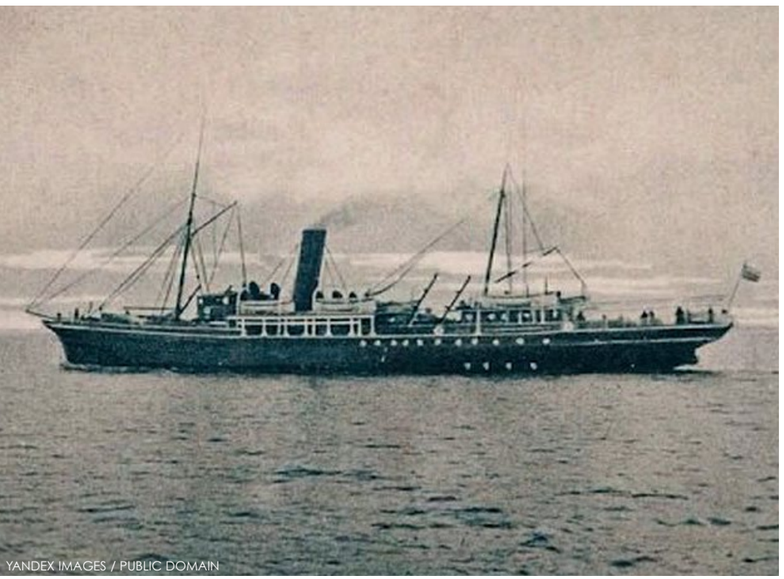
View of the upper deck and masts of the 90m steamer *Tsesarevich Alexei Nikolaevich* (*Crown Prince Alexei*) which sank in 1916 (above); Engine room windows (top right); Spacious halls inside the wreck (right)



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Historical photo of the *Crown Prince Alexei*

The *Crown Prince Alexei*

Surprisingly, the *Fourth* and Henkel wreck sites are located not far from the famous steamer *Tsesarevich Alexei Nikolaevich* (*Crown Prince Alexei*), which lies a bit deeper at 52m, but is much larger, and for me, more interesting than its fellow wrecks.

Six ships of the "Tsesarevich" class were built in Imperial Russia, which were used in different fleets. The steamer *Crown Prince Alexei* was intended for transporting various goods within the Black Sea. However, with the outbreak of WWI, she was mobilized for military needs.

Her service went smoothly until 16 June 1916. On this day, in completely calm weather, an explosion sounded under the stern. The ship suffered a massive leak and tilted heavily. The crew fought to the end for the ship's survival, but the water flooded the engine room quickly. The boilers were shut down in time, preventing another explosion, but the ship's death was inevitable. The 90m steamer sank, and the cause of the tragedy was a mine, laid by an enemy submarine.

Challenging conditions

The conditions for diving in this place are not easy; the weather changes rapidly and there are frequent strong currents near the surface. The highest point of the wreck is at 39m, but it is wiser and safer to visit this wreck with technical gear and a good set of skills, using decompression mixes or a rebreather, as I did.

During one of our dives, the Black Sea showed its true character. Our boat had pulled anchor while we were underwater, and we had to catch up to it, as we faced the threat of being stuck in the open sea for a long, long time. Thank goodness I had taken my personal DPV (diver propulsion vehicle) with me, which diligently pulled two


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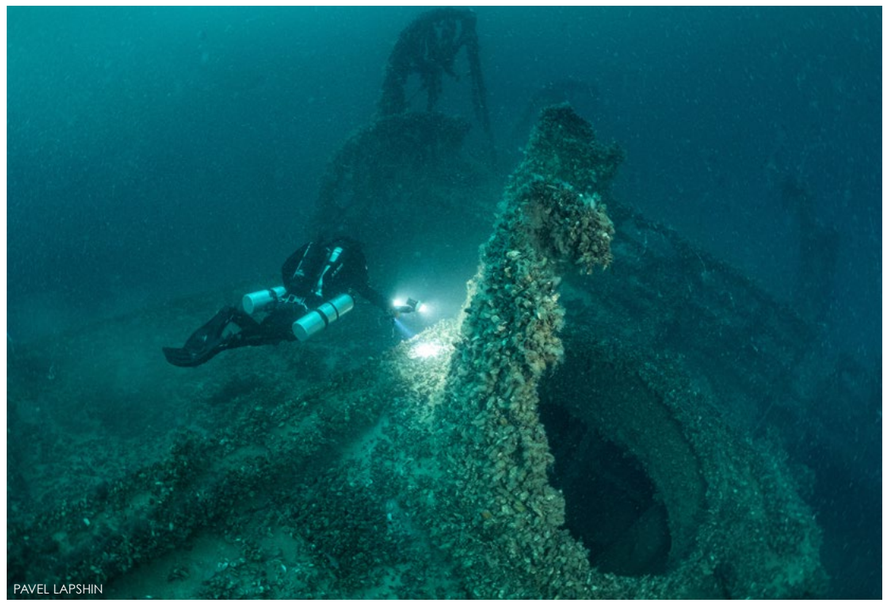
Promenade deck on the wreck of the *Crown Prince Alexei* (above)

divers in full technical equipment towards the drifting boat for a good period of time.

After this incident, we carried out all our dives using special technology. Our entry to a wreck site was carried out according to its coordinates. The moment our boat passed over a target, the captain gave the command to drop the "bullet" off the side of the boat. The bullet was a 50kg full-metal cylinder with a rope tied to a buoy. When deployed, the bullet rapidly sank to the bottom and safely held the dive boat in place, ensuring the dive team could get to the wreck site and come back safely. If the bullet dropped too far from the site, we used a primary reel to get to it.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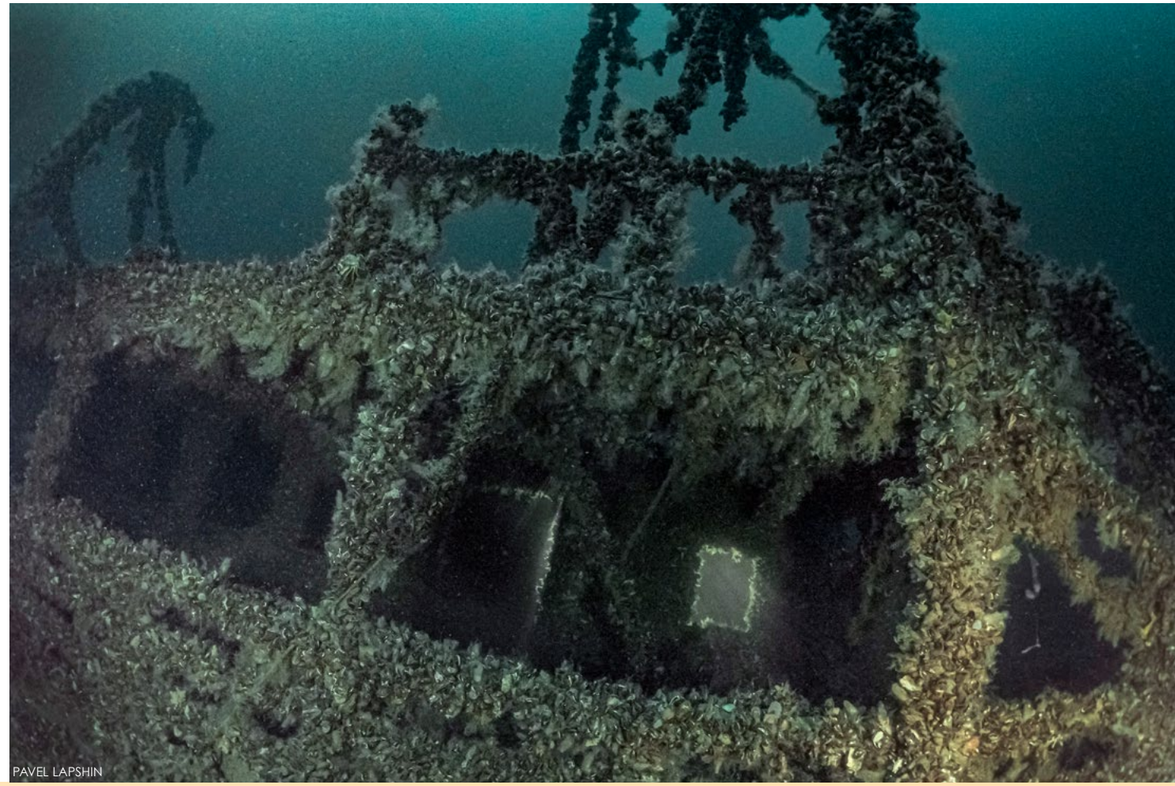
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Diver at the main pipe to the steam boiler on the *Crown Prince Alexei* (above); Top superstructure of the wreck (top right); View of the passenger cabins (right)


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Exploration of the captain's bridge on the wreck of the *Haj Ismail* (above); Upper decks of the ship (top left); View of the port side of the wreck (top center); A curious freediver came down to see how we were doing on our long decompression stop (center).

The *Haj Ismail*

There were also some modern-era wrecks in the Black Sea. We managed to visit the *Haj Ismail*, a bulk-carrier that broke in half as a result of an unprecedented storm in November 2007. She did not have time to hide in the bay of Sevastopol, and huge waves demolished the 110m ship. Only two out of 17 crew members survived. Interestingly, they both quickly disappeared from the hospital where they had been treated for severe hypothermia.

The shipwreck, which carried a cargo of metal beams, lies at 75m. The deck doors are open, and the torn bow of the ship lies at a distance, so it is necessary to plan a separate dive to find it. The stern of the ship is well preserved, but time has taken its toll. Parts of the ship are now covered with life and are slowly being eroded by rust.

Afterthoughts

The Black Sea still holds many secrets and mysteries, and every diver has the opportunity to become a pioneer—you just need to want to, and of course, have good training and a little luck. Go travel and explore! ■

Pavel Lapshin is a technical diver, underwater photographer and traveler based in Yoshkar-Ola, Russia. To learn more, visit: ***facebook.com/lapshinpv***


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Diver on a deep deco-stop, part of the long decompression procedure (above); Diver at the stern of the ship, which was covered in fishing nets (top right)

Underwater Model Photography

— Conducting Sessions for Beginners

Text and photos by
Claudia Weber-Gebert

After the coronavirus lockdown was imposed in my country in March 2020 and all my dive trips were cancelled, I only had one event left on my calendar—an underwater model shoot.

I had offered this kind of event before, and a lot of young aspiring models were really interested, but the expenses for them were much too high, some of them being students or not earning much money. So, rather than hold a shoot for just one model, my idea was to offer three or four young women the opportunity as a group, so they could share the cost of one expensive underwater shoot, just to try it out and discover whether or not underwater modeling was right for them.

After the lockdown, swimming pools were closed as well, and we had to shift our schedule. The young women in the first group were disappointed, but there was no way to get into a public pool. Then, after the restrictions

Lilla Miklós, an experienced model but never underwater, got stunning results.

UW Models

Mother and daughter—a new experience for both models Nathalie Pirard and Charlotte Pesch (left); *Skyfall,* with "Sky Chan" cosplayer Katharine (far left); *Surface Reflection,* with Nathalie Pirard (below). The outdoor pool at Pension Elfi in Maring-Noviand in the Mosel Valley of Germany was a fantastic location during the summer. Hotel Blesius Garten in Trier had a wonderful indoor pool for shoots during the colder months.

were lifted, I suddenly had the opportunity to use the outdoor pool of a small nearby hotel. At first, the owner thought I was kidding when I emailed him my request, but then he became enchanted by the idea of hosting events like this in his pool and he let me rent it for a small fee. The outdoor pool was the perfect place where we could maintain social distancing without the need for face masks, which made working with small groups possible and more enjoyable.

So, I started holding underwater model shoots for groups of three to four beginners each, using just some basic equipment such as two external strobes and some lamps as well as basic decoration in the pool, which meant we were able to keep costs as low as possible. There was also the ulterior motive in mind to keep costs low because during the hard times of the coronavirus pandemic, people would not be earning much money, and as a result, would not be able to pay much for the shoots.

Positive results

Life has not been easy during this

The Little Mermaid, with Charlotte Pesch (left); Monique Nikki Giling in a Roaring Twenties theme (far left); A moment capturing a very nice performance by "Sky Chan" cosplayer Katharine (below); *Sensual*, with Filipa Gomes (lower left)

pandemic, but this concept has been a total success—and all the young women who were keen to give it a go, finally got to experience their first time in an underwater shoot! In these sessions, the models used their own basic outfits and only the colourful long fabrics were provided by me.

After the first session, I made and posted a short video of the event to offer a glimpse into the shoots, and what can I say—every two weeks during the summer, I had enough participants for another underwater model shoot. In every session, the aspiring models were all very happy for the opportunity, and we had a lot of fun!

Challenges and highlights

After a short briefing and introduction to posing underwater, each participant had only half an hour to perform. The time for renting the pool was limited, so we had to hurry up, as hotel guests also wanted to use the

Fairy Tale Fantasy, with Monique Nikki Giling (above); *Falling Out of the Clouds*, with Charlotte Pesch (right); *Spanish Dancer*, with Vaniliam Martins (far right)

pool during the hot summer.

For some of the young women, it was easy; for others, it was a challenge, as they were not used to opening their eyes underwater and had problems with water going up their noses as well as difficulties with posing in the water. I also had participants who were struggling with personal crises and wanted to prove something to themselves. One older woman, with severe health problems, managed to do a wonderful shoot and was so proud of herself when she saw the stunning results in the photos.

In addition, the guests were also amused by the shoots and enjoyed the entertainment, watching the sessions from the terrace near the pool while drinking their coffee or cool drinks. They also cheered for the aspiring models, encouraging them in their performance underwater.

Response

There were, however, some colleagues in underwater model photography who criticised me for the concept of these events. They said the results from these sessions amounted to just "snapshots."

Of course, the resulting photos were not like those of high-end model

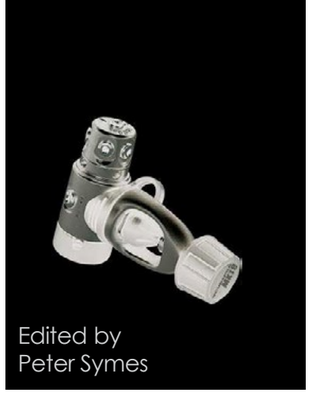
Elegance, with model Lilla Miklós (left); *The Princess*, with Monique Nikki Giling (above); *Summer Dream*, with Filipa Gomes (right); Dramatic reflections captured in an indoor pool session with Diana Hemmers (far right)

shoots—that was never the aim. But we still got really stunning results. The concept also proved to be a really good experience for me, as it also was for the many happy faces of proud and satisfied clients. What else do you need?

Now, as the cold season has set in, I really need to find a hotel with an indoor heated pool. One of my models, with whom I have worked together many times, wanted to make one of her dreams come true, which was to do a special shoot in the theme of the Roaring Twenties—more specifically, *The Great Gatsby*—and plans for a new shoot are already being made. So, the show will go on, even during winter, with the small groups, once a month. Fantastic! ■

To see a video of one of the underwater model shoots, go to: ***facebook.com***

Claudia Weber-Gebert is an advanced diver, underwater photographer and dive writer based in Germany.



Edited by
Peter Symes

POINT & CLICK ON BOLD LINKS

Equipment

Santi

The Santi 303 Thermovalve is a new connector between an external battery and a heated undergarment. This valve replaces the standard inlet valve serving a dual function. The valve has a rotating head, which is able to turn 270 degrees, offering a much higher degree of freedom when routing the cable. **Santidiving.com**

Weezle coat

If you tend to get chilly on a beach or a boat between dives, this "It's a Wrap" coat from Weezle will come in handy. It is a warm, loose-fitting wind and shower proof coat with special wicking lining that will dry both yourself and your wet swim gear. This garment compresses like the Weezle Undersuit, which will allow you to pack it away into a small bag. The coat has a front zipper and two hand warmer pockets. **Weezle.co.uk**

BigBlue "All in One"

The VTL10000P from BigBlue is branded as a "dual-beam video and tech light." The wide beam of 120 degrees is for video and outputs 10,000 Lumen, while the narrow (10-degree) penetrating beam is for technical dives. Burn time at full power is 2.5 hours, and up to 25 hours at the lowest of five settings. Depth-rated to 100m. Comes with a Goodman handle and a yellow and a red filter. **Bigbluedivelights.com**

Fourth Element hoodie

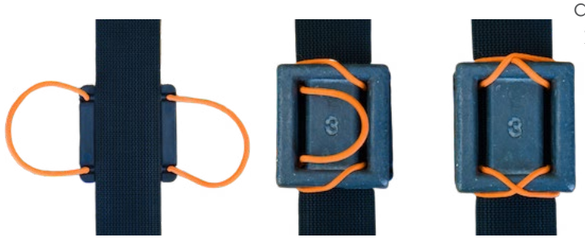
Lined with super-warm, recycled sherpa fleece, this hoodie is a post-dive essential. Printed with water-based inks on 85% organic cotton and 15% recycled polyester. The company does not package its hoodies in order to reduce environmental impact. **FourthElement.com**

Waterproof D3

The D3 Ergo is a further development of the Expedition Drysuit EX2. It has the same characteristics but has a strong tri-lam fabric instead of the EX2 breathable membrane. In addition, the D3 is derived from a military suit, and as such, it is designed for unrestricted mobility, both above and below the surface. Soft, flexible neoprene boots and a plastic zipper keeps the weight down. The whole suit—including valves, boots, seals and suspenders—weighs only 4.1kg. **Waterproof.eu**

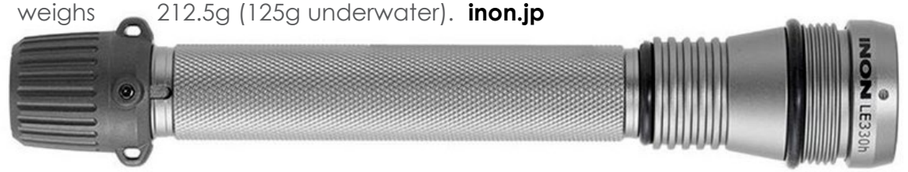
Dripstone weight system

Attach weights directly to the harness without ever re-threading the webbing with this simple system from Dripstone. Weights are held securely by two independent pieces of bungee and a built-in anti-sliding mechanism prevents mounted weights from moving around. Works with any 2-inch webbing, including standard harnesses for sidemount, backmount and rebreathers. Mounts up to 5lb hard lead weights. **DripstoneDiving.com**



Inon LE330h LED flashlight

The Inon LED flashlight LE330h is equipped with one Cree LED module, delivering 90 CRI (Color Rendering Index) and 6500K color temperature. The flashlight has a light output of 330 lumens, a beam angle of 30 degrees (extendable to 60 degrees when using additional filter elements), and an operable duration of approximately 170 minutes. The light is designed for smaller underwater macro subjects, or as a focus assist light, but can be used as a torch at the surface as well. It is powered by three AA size batteries (Eneloop PRO is recommended). The LE330h is depth-rated to 80m. Its dimensions are 33.7 x 197.5mm, and it weighs 212.5g (125g underwater). **inon.jp**



ALL PHOTOS COURTESY OF THE MANUFACTURERS

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ON BOLD LINKS

Exquisite Stocking Stuffers Dive Watches

These days microbrand watches are all the rage. In the age of e-commerce, independent watchmakers that produce limited editions of around 500 to a couple thousand watches per year are able to sell direct to their customers, thereby bypassing the usual overhead and marketing costs. This means that microbrand watch prices may be significantly lower than luxury-tier watches, even though they may be similarly manufactured.[1] Here, we feature five intriguing dive watches from unique microbrands.

[1] WIKIPEDIA.ORG

Marina Dive Watch by The Abingdon Co.

Designed by professional female scuba divers, Marina, with its seven color options, catches plenty of attention on your wrist even when you are not submerged. That said, 20atm water resistance, diver's unidirectional bezel, world timer, buckle wetsuit expander, and plenty of lume make this a highly functional diver watch. Inside the 40mm titanium case is the Miyota 8215 Automatic movement. No batteries necessary. In or out on the water, the Marina is a great option in an American microbrand. **TheAbingdonCo.com**

Momentum M20 DSS with Bahama Yellow Dial option

The M20 DSS dive watch features a 316L stainless steel rounded, polished case reminiscent of their original 1990's Aquamatic model. The case is just under 42mm in diameter but the smooth curves make it feel smaller and more comfortable on the wrist. Don't let its good looks deceive you, the M20 DSS Diver is durable and adventure-ready, with an off-set screw-down crown and 200m-rating. It is also extremely legible day or night, with a double-dome sapphire crystal that features an anti-reflective coating and indices that contain Super-LumiNova lume. **momentumwatch.com**

The Diver by Reverie

The Diver marries the Singapore-based watchmaker Reverie's elegant design language with the utilitarian nature of a dive watch. It offers market-leading features for its price, including an engraved Miyota 9039 automatic movement, sapphire crystal, Super-LumiNova lume, stainless steel bracelet with micro-adjust and an extra rubber strap. All of this packed in a svelte watch capable of withstanding the rigors of underwater exploration. Water resistant to 200m (20atm). **reveriewatches.com**

Seaplane Automatic "Midnight Landing" by Farr + Swit

From office to seaside, the 42mm Seaplane Automatic will become a favorite watch to wear every day. Powered by the Swiss SW200-1 automatic movement and encased in 316L stainless steel, Farr + Swit's Seaplane Automatic is "a wearable work of art," an American-made dive watch fusing the performance of a utility diver and pilot watch. Scratch resistant and water resistant to 330ft, no batteries and no plugs are needed, as your arm movement charges this watch, which keeps a 38-hour power reserve when it is set down. Capable of tracking dive time underwater in dark conditions, this dive watch is engineered to endure rugged use. Dry bag included. **farrandswit.com**

Aquascaphe GMT by Baltic

Inspired by GMT pilot watches of the 60s and 70s, the Aquascaphe GMT combines vintage and contemporary aesthetics. With a double-domed sapphire crystal, this dive watch has an elegant profile, and is ultra-resistant, as sapphire is one of the toughest materials on earth. The case is made of a strong and corrosion-resistant 316L steel alloy. Made with self-winding Swiss movement C125 by Soprod, it has a power reserve of 42 hours as well as date and GMT functions. Water resistant to 100m (10atm), the watch has a black dial with Super-LumiNova-coated indices, ensuring optimal readability in low light environments. **baltic-watches.com**

Look After Your People

Text by Simon Pridmore
Photos by Andrey Bizyukin

In the book *Into Thin Air*, journalist Jon Krakauer tells the story of five people who died near the summit of Mount Everest in 1996. Two were expedition leaders, one was a professional guide and two were their clients.

The clients, like most people who sign up for Everest expeditions, were not mountaineers or hard-core climbers. They were folk with little advanced climbing experience, but plenty of money, plenty of guts and a dream. They died primarily because they placed their lives in the hands of professionals, who then failed to keep them safe. On that day, the professionals broke rules and departed from set procedures, which they themselves had established and which had previously contributed to their exceptional safety record.

What does this have to do with scuba diving?

When people sign up for scuba diving courses, they also put their lives in the hands of an instructor. Non-divers are incapable of saving themselves if they have a problem during a training dive. They rely upon their instructor to ensure as far as possible that nothing goes wrong and, if it does, to make sure they do not come to harm.

The same thing applies in respect of more experienced divers when they embark on technical diving. Until they acquire the skills and knowledge to identify the risks and learn how to deal with them, they are placing responsibility for their survival in the hands of their instructor.

Here is an example of a dive where something did go wrong and the instructor failed the student in that respect.

In the mid-1990s, technical diving was still in its early days and an instructor in Florida had a student named Charlotte, with whom he had been working for some time, as she made her way up the ladder of technical diver training courses. Charlotte's primary ambition was to do a 300ft (90m) dive. The instructor signed her up for a trimix diver course and invited her to join him and a number of already-qualified trimix divers on a dive the following weekend.

The descent was uneventful. The group reached the seabed at just over 300ft (90m) and the instructor shook Charlotte's hand, congratulating her for having achieved her goal. Her big smile was clearly visible behind her mask. Having reached the target depth, the divers began their ascent through blue water. They had no anchor line or shot line to follow. On the way up, as they approached their first required decom-

...until [instructors] see that the students can handle the higher risk points of the dive, such as the latter stages of the ascent, they must be all over them like a rash. They do not leave them to their own devices.

pression stop, the instructor attached his reel to a delayed surface marker buoy (DSMB), which he then inflated and sent up to the surface, to give them all a temporary ascent platform. He held on to the reel and line, while the other divers gathered loosely close by, using the instructor as their depth reference. Charlotte did the same but, after a while, the instructor noticed that she had drifted away from the team and was having difficulty staying neutrally buoyant. He signalled to her that she should ascend a little, but she did not respond and kept sinking.

Aware that something was wrong, one of the other divers swam down to try to catch her but she was now falling faster than he could swim and he eventually gave up the chase, worried about his own dwindling gas supply and increasing decompression burden. The instructor and the rest of the group all watched in horror as Charlotte sank out of sight. All they could see was a thin stream of bubbles rising from the depths. Eventually, the bubbles stopped coming. Her body was recovered a couple of days later.

Like the climbers who died on Everest, Charlotte put her life completely in the hands of someone whom she had every reason to believe would look after her, and died because that person did not follow a number of standard, established safety procedures and completely neglected his duty of care.

Anticipating risk

Going back to the 1996 incident on Everest, extreme climbing guides know that the vast majority of people who pay them to be taken to the top of the mountain and brought down again are not capable of doing this without them. Therefore, they need to babysit them all the way. They have to know where and how problems are likely to occur and anticipate and mitigate the risk at these points.

Instructors—and technical diving instructors in particular—must have the same mindset. If they have students embarking on a new level of training, they have to babysit them through lesser dives before attempting bigger dives and, until they see that the students can handle the higher risk points of the dive, such as the latter stages of the ascent, they must be all over them like a rash. They do not leave them to their own devices.

Liability

Last year, I had the huge pleasure of going to Palau to research the biography I wrote on Francis Toribiong, the scuba diving pioneer who single-handedly changed the face of his country. During a late-night chat reminiscing about the old days, he told me about a salesman who had approached him once, offering liability insurance for his dive guides. He told me he had declined and sent the salesman away. I asked him why.

He told me: "When I trained my guides, I used to tell them: 'Rule number one—look after your people! That's the most important thing you have to do. Look after your people!' I didn't want any of them getting the idea that, if they had insurance, they could relax and be less attentive, believing that their insurance would protect them if any of their customers had an accident."

Now, when I was teaching people to dive, I always had liability insurance and so did my staff. But, I understood the point Francis was making. Of course, having insurance does not mean you can neglect responsibility. Neither does having customers sign a waiver of liability before they dive absolve you of blame if you are negligent. But, there is a danger that some people will think it does.

This is where the instructor in Florida and the guides on Everest went wrong. They did not look after their people. They failed to carry out their number one task.

Checklist and pre-breathe

In my book *Scuba Exceptional*, I wrote about recent developments in rebreather diving and focused on two paths to increased safety: the technological path and the human path. In terms of the human path, for the past few years, the mantra for rebreather divers has been "checklist and pre-breathe."

Now, if you have never dived on a

rebreather, it may be that the word "pre-breathe" and the concept of using checklists in dive preparation are new to you. However, it is absolutely IMPOSSIBLE that anyone involved even peripherally with rebreather diving, is unaware of the fact that every single expert in the world of sport rebreather diving, in both the manufacturing and training worlds, advocates doing a pre-breathe and using a checklist when preparing for a rebreather dive.

Nor is it possible that any rebreather instructor could be unaware of the number of rebreather divers over the last two decades who have died, but who would not be dead if they had just done a pre-breathe and run through a checklist before the dive that killed them. Every one of us in the sport rebreather diving world knows that pre-dive checks and pre-breathes have prevented accidents AND that incomplete or absent pre-dive checks have contributed to fatalities. We have all lost friends in this way.

Yet, in Hawaii, in mid-2018, a young man on a trimix rebreather training dive, with his instructor on board the boat supervising dive preparation, managed to enter the water with the valve on his oxygen cylinder closed. He passed out on the surface and drowned, leaving behind a wife and three children—a terrible waste of a young life.

Every one of us in the sport rebreather diving world knows that pre-dive checks and pre-breathes have prevented accidents AND that incomplete or absent pre-dive checks have contributed to fatalities.

The instructor in this case had failed to verify that the diver had performed his standard checks and a pre-breathe before going into the water and the diver died.

For someone to die like this on a training course is unthinkable and unforgivable. This is not an accident. This is simply a case of an instructor completely failing to look after his people.

All dive professionals claim to offer safe diving. It is a standard selling point. Some clearly lie. Incidents such as those I recount here, make it apparent that there are dive professionals out there who just don't care. They don't care about their people. They don't care about doing a good job. And they don't care enough to make sure that those in their charge do not come to harm.

One of my aims in writing my books is to help divers make the right decisions when employing dive professionals to teach them or guide them—to help them sort the wheat from the chaff in the scuba world.

As a diver, know that no dive professional can be trusted simply because they have an impressive qualification and an attitude. Know that you can only trust yourself and make it your duty to educate yourself as much as you can so that you make the right choices.

And, if you are an instructor or plan to become an instructor someday, I leave you with the words of my friend Francis:

"Rule number one: Look after your people." ■

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* The Diver Who Fell From The Sky, Dive into Taiwan, 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****.*

media

Marine Archaeology

Under the Mediterranean I: Studies in Maritime Archaeology, edited by Stella Demesticha and Lucy Blue

This volume presents 19 articles describing recent research on the archaeology of shipwrecks, harbours and maritime landscapes in the Mediterranean region. The section on shipwrecks examines excavated vessels in the region, as well as a sailing reconstruction of the Ma'agan Mikhael ship. The section on harbours covers areas from the Levant to Seville, looking at harbour defence systems and dockyards from the Hellenistic period to the 12th century AD. The third section on maritime cultural landscapes combines data sets to examine human interactions with the sea.

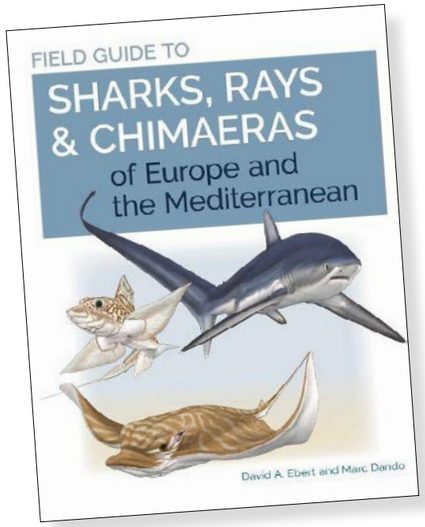
Hardcover: 380 pages
Publisher: Sidestone Press
Date: 14 December 2020
ISBN-10: 9088909466
ISBN-13: 978-9088909467

Deep Sea

Expedition Deep Ocean: The First Descent to the Bottom of All Five of the World's Oceans, by Josh Young

Led by explorer Victor Vescovo, a team of engineers and scientists set out on a mission to dive to the deepest points of all five oceans for the first time in history. Filled with high drama and adventure, this book tells the story of this quest, during which the team designed the most advanced deep-diving submersible ever built, mapped hidden landscapes and discovered previously unknown lifeforms and sea mounts.

Hardcover: 384 pages
Publisher: Pegasus Books
Date: 1 December 2020
ISBN-10: 1643136763
ISBN-13: 978-1643136769



Sharks

Field Guide to Sharks, Rays & Chimaeras of Europe and the Mediterranean, by Dr David A. Ebert and Marc Dando

This handy field guide covers all 146 species of sharks, rays and chimaeras in the Mediterranean, the waters of the European Atlantic and Iceland, along the Scandinavian coasts, in the Black Sea and the Canary Islands. Detailed species accounts present key identification features, habitat, biology and status, together with a colour distribution map, a depth guide, at-a-glance icons and colour illustrations. There are also illustrated key guides that aid species identification, comparison plates of similar species, illustrations of egg cases (where known) and plates of teeth.

Flexibound: 384 pages
Publisher: Princeton University Press
Date: 8 December 2020
ISBN-10: 0691205981
ISBN-13: 978-0691205984

The Mediterranean

Mediterranean Planet, by Laurent Ballesta

From the coral reefs of the Mediterranean to the seascapes beneath the surface, this book showcases photographer Laurent Ballesta's personal endeavours during the Gombessa V expedition in July 2019, while also providing closure to the more comprehensive efforts underway in the Mediterranean. It presents, with minimal textual content, his most spectacular shots from 2010 to the present day, showing (among other things) rare creatures never before illustrated exhibiting unusual behaviour.

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Publisher: Hemeria
Date: 15 October 2020
ISBN-10: 2490952102
ISBN-13: 978-2490952106


PIXABAY

Over 40 incidents of orcas hitting vessels has been reported off the coasts of Spain and Portugal since the summer.

Why are orcas ramming sailboats?

Over the summer of 2020, people started noticing that orcas (also known as killer whales) off the coast of Spain and Portugal were behaving strangely. They were repeatedly ramming boats, and seemed to be specifically targeting sailboats. Since July, there have been at least 40 incidents reported over a six-month period.

While international headlines blared news and images of "rogue killer whales," baffled marine scientists were investigating the incidents to find out what exactly was driving the orcas' odd behavior.

As a marine mammal species, orcas are complex, intelligent and highly social beings that have an acute memory and may be protective in nature. Their favorite prey is bluefin tuna, which they follow as the fish migrate along the coasts of Portugal and Spain and through the Strait of Gibralter, to the tuna's spawning grounds in the warmer Mediterranean Sea.

Harpooning incident

Now an environmentalist Victor J. Hernandez has told the news agency EFE that harpoon attacks on a pod of orcas during an illegal fishing incident in July is most likely responsible for the increasing run-ins between killer whales and vessels off the northern coast of Spain. Hernandez is a naturalist and author of the book *Cetaceos: Introduccion a las especies ibericas, baleares y canarias* (*Cetaceans: Introduction to the Iberian, Balearic and Canarian Species*).

According to Hernandez, it is a particular pod of nine to 13 orcas, led by a male called "Pingu," that have been ramming boats. It is usual for this pod to arrive in Spanish waters as they follow tuna fish that migrate from the Atlantic Ocean.

"Sailors in the area who know Pingu's pod very well due to their markings have claimed that they were attacked with harpoons in July," said Hernandez. "The crew of the illegal fishing boat was probably scared when they saw them approaching so close."

While no humans have been injured in the incidents, it has mostly been smaller sailboats that have been affected, particularly in the area of Galicia, within two to eight miles from the coast. In September, there was a temporary ban of sailboats in the area to prevent more incidents.

Good memory

Hernandez said that like dolphins, orcas have good memories. "Two of the youngest orcas have been hitting sailboats because they are traumatized by these kinds of vessels. They hit and bite the rudders because it reminds them of the harpoon incident."

But he believes as the orcas move on into new waters, their memory of the alleged harpoon attack will fade. "It is only a question of time," said Hernandez. "I don't know when, but when tuna migrate from the Atlantic, orcas follow them and will end up forgetting about the abuse they suffered." ■

SOURCES: BBC, MADRID METROPOLITAN

Pink dolphins linger longer in Hong Kong waters

Due to reduced sea traffic and lower pollution levels during the Covid-19 pandemic, pink dolphins are hanging around longer in the waters around Hong Kong, and possibly in bigger numbers, according to experts.

After the suspension of cross-border ferries in February, the marine mammals spent more time in one of their primary habitats, located off Lantau Island, according to recent data collected by conservation group WWF-Hong Kong. Experts say that the findings through acoustic monitoring suggest that either the dolphins are staying longer or there are more of them, or both.

Listed as a vulnerable species, pink dolphins are native to the Pearl River Estuary. According to WWF-Hong Kong, their numbers in the area have been decreasing from around 2,500 in 2013 to around 2,000 last year. More specifically, in the Lantau Island area, their numbers dropped from 188 in 2003 to just 32 in 2018, then rose slightly to 52 in 2019 (due to lower tourist numbers during anti-government protests and reduced ferry traffic after the opening of the Hong Kong Zhuhai Macau Bridge), according to the Hong Kong Dolphin Conservation Society (HKDCS).

"The pandemic has provided us with an unexpected chance to reflect on ways to protect the species," said Doris Woo Ka-yi, WWF-Hong Kong's conservation officer. She added that reduced noise levels and injuries from sea traffic as well as better water quality during the pandemic, have been a benefit to the rare pink dolphins.

While their rebound in numbers is a positive change, the pink dolphin population still remains very low said HKDCS chairman Taison Chang. However, better water quality may lead to better reproduction rates not just for the pink dolphin, but all marine life in the area, according to Dr David Baker, coral reef researcher and an associate professor with the Swire Institute of Marine Science of the University of Hong Kong. Baker warned that additional policy changes were needed to reduce ferry speed and cross-border traffic, improve waste-water management and limit tourism's environmental impact. ■

SOURCE: SOUTH CHINA MORNING POST


PHOTO: HANDOUT

Pink dolphins have benefited from lower sea traffic and better water quality during the pandemic.

FREE PHOTOS FROM PIXABAY

The so-called "dive response" is not merely a reflex in dolphins, but an active response.

Why aren't dolphins getting bent?

It appears that by reducing their heart rates, dolphins avoid the typical decompression sickness that afflicts human divers.

Marine mammals are not above the physical principles and processes that lead to bubble formation in tissues following decompression. Scientists once thought that diving marine mammals were immune from decompression sickness, but beached whales have been found to have gas bubbles in their tissues—a sign of the bends. In any case, how some marine mammals and turtles can repeatedly dive as deep and as long as they do has perplexed scientists for a very long time.

Then, in 2018, researchers at the Woods Hole Oceanographic Institution (WHOI), found that a key difference that sets marine mammals apart from other mammals, including humans, is the unusual lung architecture of whales, dolphins and porpoises (and possibly other breath-holding diving vertebrates), which creates two different pulmonary regions under deep-sea pressure.

When air-breathing mammals dive to high-pressure depths, their chest structure allows their lungs to compress. Cartilaginous reinforcements also help to maintain airway permeability (no gas trapping) during compression and provide an air storage site in a non-gas-exchange compartment when lung parenchyma collapses at depth. Scientists have assumed that this passive compression was marine mammals' main adaptation to avoid taking up excessive nitrogen at depth and getting the bends. However, the extent of compression of the tracheobronchial tree on different species is still debated.

By studying CT images taken in a hyperbaric chamber the researchers discovered that marine mammals' lung architecture creates two pulmonary regions—one air-filled and the other collapsed—and that blood flows mainly through the collapsed region of the lungs. This mechanism allows some oxygen and carbon dioxide to be absorbed by the animal's bloodstream, while minimizing or preventing the exchange of nitrogen, thus minimizing the risk of the bends. The actual degree of pulmonary shunt has been determined for some pinniped species but not in cetaceans.

Moreover, a new study published in November 2020 indicates that dolphins can further reduce the risk of decompression sickness by reducing their heart rates. The mammals seem to be able to adjust their heart rates to the kind of dive they are about to do. The so-called "dive response" is supposed to be a reflex; however, in dolphins, it is not merely a reflex, but an active response. The animals can decide to what extent they change the heart rate during a dive. What is not clear is whether dolphins are conscious of responding in this way on a cognitive level. ■ SOURCES: FRONTIERS IN PHYSIOLOGY, WOODS HOLE OCEANOGRAPHIC INSTITUTION, PROCEEDINGS OF THE ROYAL SOCIETY B

US Navy exercises to continue being a threat to endangered killer whales

Naval activities include torpedo fire, underwater sonar and bomb detonation. These can kill, disturb, injure or strand marine mammals, including killer whales, which are very sensitive to noise.

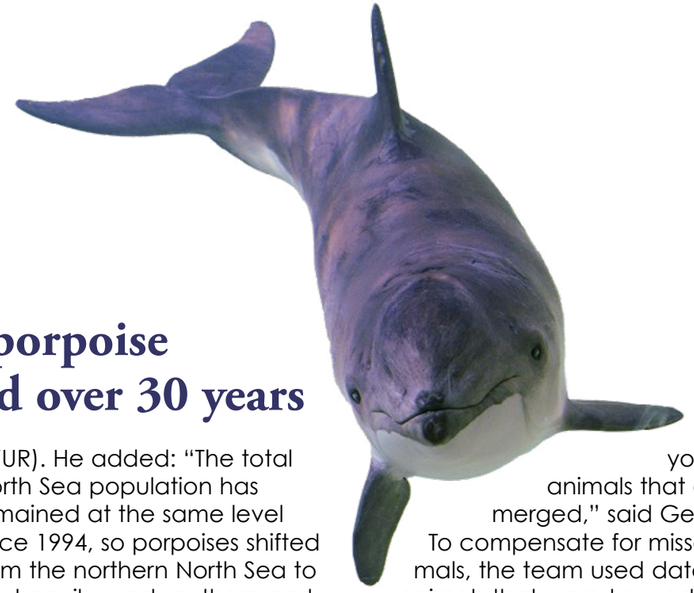
A US federal agency has renewed the US Navy permit to use sonar and detonate bombs weighing over 450kg at sea. The testing and training activities have been conducted on the coast for decades, according to the navy.

The US Marine Mammal Protection Act says behaviours that could be affected by what it terms Level B harassment, such as the navy's incidental "takes," include migrating, breathing, nursing, breeding and feeding "to a point where such behavioural patterns are abandoned or significantly altered."

The new rule says the US Navy expects to cause up to 51 incidental takes per year among the southern killer whale residents alone, and up to 243 incidental takes over the seven-year period. Researchers estimate there are only 74 southern resident killer whales that remain.

The seven-year military program is expected to begin in November. It would take place across a vast region stretching from California to Alaska, including Puget Sound and the outer coast of Washington state. ■

SOURCE: **NOAA Fisheries**



Population of Dutch porpoise increased by seven-fold over 30 years

According to research by national statistics agency CBS and Wageningen University, the numbers of porpoise in the Dutch part of the North Sea has climbed seven-fold since 1991. Researches said that one reason for the increase was the movement, in general, of porpoises from the northern to the southern parts of the North Sea.

"Porpoises were abundant in the Netherlands till they disappeared in the mid-20th century but returned in the late 1980s and early 1990s," said Steven Geelhoed of Wageningen Marine Research (WUR). He added: "The total North Sea population has remained at the same level since 1994, so porpoises shifted from the northern North Sea to the heavily used southern part of the North Sea. The reasons are unclear, but a link with food availability seems logical, although we can't quantify this."

The research team used a plane to count porpoise, which flew along predesignated transect lines so they could cover the entire Dutch North Sea. "We only fly with good weather but of course you miss animals that are submerged," said Geelhoed.

To compensate for missed animals, the team used data from animals that were tagged.

While the porpoise has been taken off the list of most threatened Dutch species in November 2020, the number of strandings has increased significantly as the porpoise population has risen in the Dutch part of the North Sea. In 2012, 980 strandings were recorded, but this number decreased to 320 last year. ■ SOURCE: DUTCH NEWS

UK gray seal colony "baby boom" prompts new research techniques


ANDREAS TREPTE / CC BY-SA 2.5

Around 4,000 new pups are expected to arrive this season (starting in October 2020), according to rangers of the National Trust Blakeney National Nature Reserve in Norfolk, United Kingdom—home to England's largest gray seal colony.

Since 1988, the birth of gray seal pups has steadily been increasing, from just 25 pups in 2001 to over 3,000 pups in 2019. Reasons for the increase include lower levels of disturbance and mortality rates during the critical first few weeks of life as well as no natural predators.

There are an estimated 300,000 gray seals in the world, with 40 percent in British and Irish waters. With so many new pups, improved methods of monitoring the colony have been implemented. Rather than individually counting pups, just one specific area will be monitored year to year. Observations of gray seal behavior and offspring data gathered from this specific area will indicate changes across the whole colony.

"Counting the colony only provides a fairly basic overview of the seal colony," said Chris Bielby, who is Countryside Manager for the National Trust on the North Norfolk Coast, "so we are going to work with the SMRU (Sea Mammal Research Unit at St Andrew's University) to do more in-depth research to better-understand why Blakeney has become such an important habitat, and to look at their behavior to get a greater understanding of these curious creatures." ■

SOURCE: OCEANOGRAPHIC

SCOTT BENNETT

Between 2011 and 2020, 41 different blue whales have been photo-identified from South Georgia. None of these individuals match the 517 whales in the current Antarctic blue whale photographic catalogue.

Blue whale numbers rebound off South Georgia

When whaling all but exterminated the Antarctic blue whale 50 years ago, the waters around South Georgia became quiet. Between 1998 and 2018, dedicated whale surveys off the sub-Antarctic island yielded a sole blue whale sighting. However, this year, 58 blue whales were spotted by an international research team on a whale expedition. These sightings, as well as numerous acoustic detections by the team, point to a trend of recovery for the critically endangered mammal, five decades since whaling was banned.

"We don't quite know why it has taken the blue whales so long to come back," said Susannah Calderan of the Scottish Association for Marine Science and lead author of a study published in the journal Endangered Species Research. "It may be that so many of them were killed at South Georgia that there was a loss of cultural memory in the population that the area was a foraging ground, and that it is only now being rediscovered."

Blue whales were once abundant off South Georgia before industrial whaling was established on the island in 1904. An estimated 42,698 whales were killed there, with most slaughtered before the mid-1930s. Despite the establishment of legal protection in the 1960s, illegal hunting carried on until the early 1970s.

Gathering data

Sightings and acoustic data was collected off South Georgia on expeditions led by the British Antarctic Survey, the Swiss Polar Institute Antarctic Circumnavigation Expedition and the South Georgia government, with financial backing from groups such as the Friends of South Georgia Island.

In addition to searching for whales, scientists employed listening devices to detect the whales' loud, low-frequency calls over significant distances. Whale sightings by sailors and passengers on tourist ships reported to the South Georgia Museum were also compiled by the research team, including photos that enabled identification of individual animals.

Between 2011 and 2020, 41 different blue whales have been photo-identified from South Georgia. None of these individuals match the 517 whales in the current photographic catalogue of Antarctic blue whale. Additional research has revealed that humpback whales are also coming back to the region.

"This is an exciting discovery and a really positive step forward for the conservation of the Antarctic blue whale," said Dr Jennifer Jackson of the British Antarctic Survey and leader of the 2020 whale expedition. "With South Georgia waters designated as a marine protected area by the government of South Georgia and the South Sandwich Islands, we hope that these increased numbers of blue whales are a sign of things to come and that our research can continue to contribute to effective management of the area," she added. ■

SOURCES: BRITISH ANTARCTIC SURVEY, ENDANGERED SPECIES RESEARCH, SCOTTISH ASSOCIATION FOR MARINE SCIENCE, THE GUARDIAN

SIMON AGER / SEA SHEPHERD

Could this be a new species of beaked whale?

Sea Shepherd possibly discovers a new whale species

The animal captured on photographs and video recordings by scientists and Sea Shepherd crew is a beaked whale, but it is not a known species, the organisation writes. The recordings of the animals were made by a specialised underwater microphone to record the acoustic signals emitted by the whales.

Beaked whale experts, who according to Sea Shepherd Conservation Society are leading figures in their field, are "highly confident" that the evidence reveals the presence of an entirely new whale species. Environmental genetic sampling, performed at the time of the sighting, is undergoing analysis and is expected to prove the existence of this new species definitively.

Beaked whales, like all cetaceans, emit distinct acoustic echolocation signals under the water. These sounds are unique to each species and can reliably identify the types of beaked whales present in the area.

The sightings of the three beaked whales occurred 100 miles north of Mexico's San Benito Islands, a group of three remote islands located approximately 300 miles from the US border. ■ SOURCE: SEA SHEPHERD

SIMON AGER / SEA SHEPHERD

CLAUDINE LAMOTHE / FLICKR / CC BY-NC 2.0

Striated surgeonfish, *Ctenochaetus striatus*

The Fabulous Spawning Ritual *of Striated Surgeonfish*

Text by Ila France Porcher

During a seven-year study of reef sharks in Tahiti, ethologist Ila France Porcher also observed the behaviours of various fish species. Here, she offers a detailed description and insights into the dynamic and mesmerising spawning events of the striated surgeonfish, which take place every year in the South Pacific.

One evening in late December, fish were splashing in the glowing surface at the western edge of the fringe lagoon. I drifted to where they were leaping in scattered places, and the streaming water beneath my kayak became opaque with striated surgeonfish (*Ctenochaetus striatus*) while the dorsal fins of reef sharks sliced through them. Sometimes, they lunged ahead.

I anchored some distance from the leaping fish, slid underwater, and swam towards a darkness that filled the waters from sand to surface. Surgeonfish streamed in a dense cloud to the limits of visibility, while here and there, a few bunched together and flashed to the surface to release tiny clouds into the water. They were spawning, and those striated fish had turned a pale, pearly-rose colour.

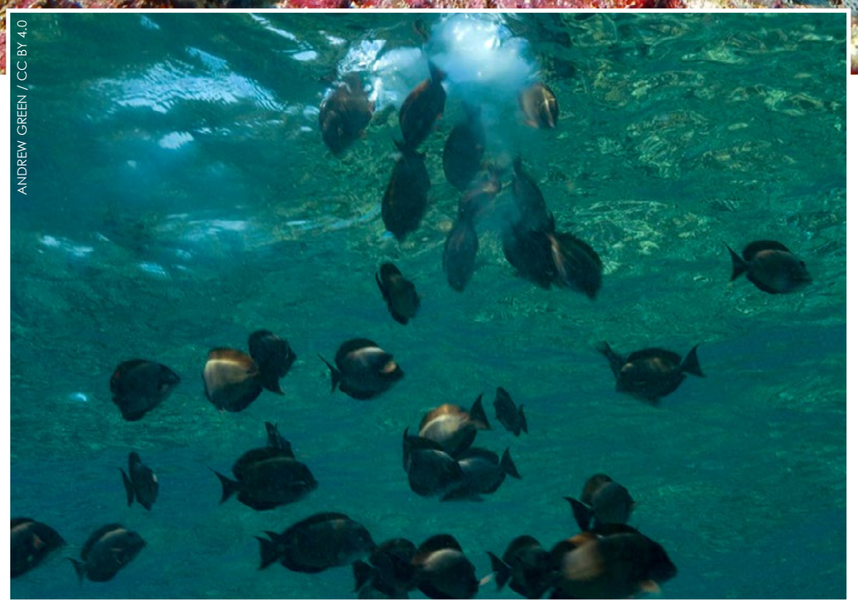
A close-up look

I returned the next night to investigate more closely and found them at 5:45 p.m. in their usual places in the coral bordering the lagoon. But they seemed restless. After looking around, I held onto a dead coral formation to watch the progression of events, and they gathered around me. Approximately two hundred fish hovered beneath me and in the coral beside me, yet there were none anywhere else in sight. They were so skittish that if I moved, they all jumped 15cm, while an assortment of blackfin and whitetip reef sharks patrolled through the area.

Striated surgeonfish filed continuously out of the lagoon to gather in the open, sandy area on the border where they had spawned the previous evening. It was a natural cavity on the

ecology

BERNARD DUPONT / WIKIMEDIA COMMONS / CC BY-SA 2.0



ANDREW GREEN / CC BY 4.0

border of the bay, approximately circular, about 30m in diameter, and three to four metres deep. A long string of big coral formations crossed it and ended where the sandy floor fell into the gloomy depths of the bay.

A staggering concentration of fish gathered, and still they came in single file from between the corals of the lagoon. Sometimes, they streamed away from the shadows of the deep water beyond, but it was not possible to see what had spooked them. Other times, a shark passing downcurrent caused them to pour inward. They congregated most thickly around the string of coral formations—where it ended, so did their dark cloud.

Waves of the solemn little creatures streamed rhythmically out over the sand and back again, fluid as running water. And strangely, wherever I went, they surged towards me. Yet, in spite of their continuous motion, they remained within the designated area, of which the centre was the string of coral structures. They were very specific about the place where they wanted to be.

Changing colours

Their colours slowly turned to rose-grey as their excitement mounted during the half hour in which they accumulated, and soon they formed an opaque cloud that obscured the surroundings. Their faces looked intent as they flitted by, and all the while a sense of tension grew among them. Their colours brightened to an opaline violet, and by 6:10 p.m., they began to rise slowly towards the surface very gradually, and then descend again in rhythmic waves.

NPS / PUBLIC DOMAIN

As the sun approached the horizon, the tension among them became a palpable force. They grew increasingly energetic, rushing upwards in twos and in larger groups, only to calm again and sink in a swirling mass.

Once, as they collected densely below to begin their expansion upwards, a large, pregnant blackfin sailed above them, and the flowing fish descended, presenting a dramatic sight in the mysterious light. Behind her they rose again in an enormous wave and, as if at an invisible signal, the dance began. In every direction, they shot upwards in small groups. At the moment they flicked the surface, they released tiny pale clouds of eggs and sperm. They were shining a pale, pearly rose colour with black accents.

Spawning

The mating ritual of the striated surgeonfish began at 6:30 p.m.

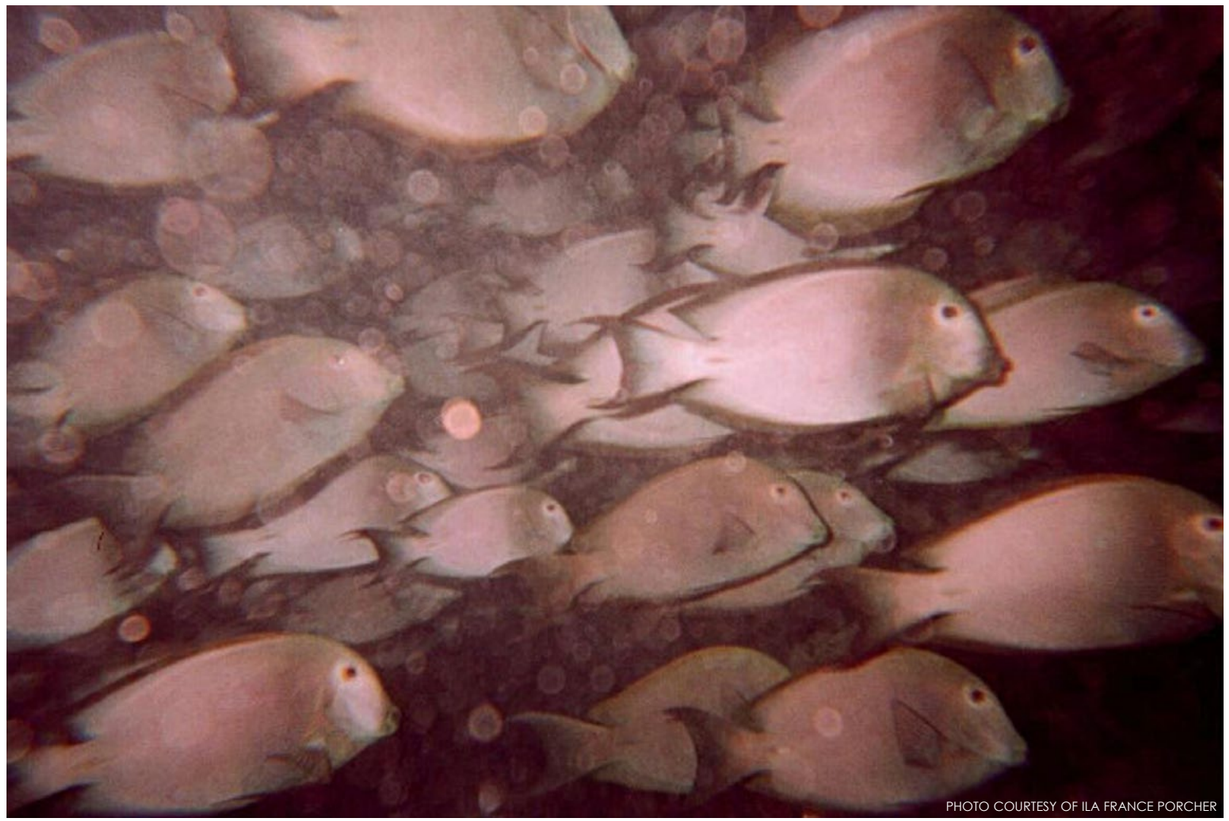
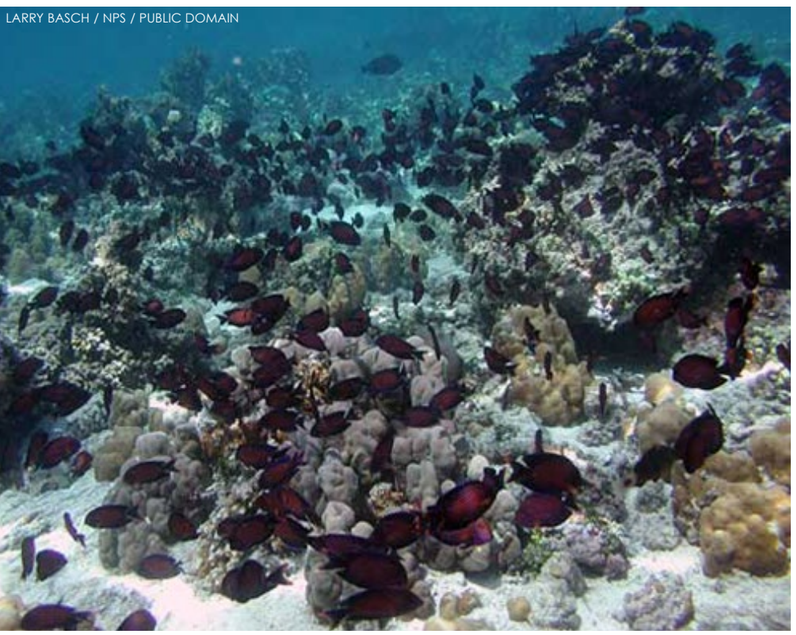


PHOTO COURTESY OF ILA FRANCE PORCHER

Striated surgeonfish (top left) turn a rose pink as they gather for the spawning event (above); Then their colours brighten to an opaline violet (top right); Surgeonfish shoot upwards in small groups to release pale clouds of eggs and sperm (left)

CHRIS HOARE / FLICKR / CC BY 2.0



LARRY BASCH / NPS / PUBLIC DOMAIN

Striated surgeonfish turn a bright violet colour during spawning events (above and top right); Schooling surgeonfish (top left and centre)

and, within ten minutes, began to wane in excitement. At 6:38 p.m., the sun sank beneath the horizon and, as darkness gathered, they began to disperse. By 6:48 p.m., only scattered groups were still half-heartedly rushing together to flash to the surface, without their former zeal. The rest streamed away into the lagoon and disappeared among the corals. Finally, bang on 6:50 p.m., the event was over, and the last of them, now brown-black again with purple tinges, hurried away into the lagoon in a loose line.

The surgeonfish left an enormous cloud of thick spawn, which I circumnavigated night after night during my observations of this remarkable natural phenomenon. The cloud tended to stay in place, instead of dispersing with the current.

A remarkable location

The event took place, year after year, in the middle of the wet season, when heavy oceanic waves pouring into the lagoon always produced high turbulence, but the conditions at the spawning site were unique. It appeared that

LARRY BASCH / NPS / PUBLIC DOMAIN

Spawning

Colour change in spawning striated surgeonfish may be mediated by the pineal hormone, melatonin, in concert with a complex arrangement of light-reflecting cells (M. Goda and R. Fujii).

RICHARD FIELD / CC BY-NC 3.0

the fish had chosen the one location on the border where not only was the water fairly deep, slowing the current, but the surge from the bay counteracted the outflow from the lagoon, holding the spawn right there in position, caught by the opposing forces of the sea!

Along the border in the direction of the ocean, strong current poured over shallow reef flats, and beyond that were breaking waves on a coral wall, which extended to the place where the barrier reef began at the mouth of the bay. In the direction of the shore, a high patch reef formed a wall between the shallow lagoon and the bay's depths. Nowhere else did the striated surgeonfish congregate.

During the period in which they were spawning, the striated surgeonfish passed my shark study site inside the lagoon for more than half an hour, for as far as I could see through the coral formations, heading towards their spawning site. And as night gathered, they returned, always in single file in their many lines, following fairly straight paths back through the mazes of coral.

The extent of the event

Year after year, I went to see the spawning event when I was not with the sharks. My husband, a mathematician, accompanied me one time and calculated that between 10,000 to 15,000 fish had assembled. Each time, they began to cluster at the site just before 6:00 p.m. The spawning took place between 6:30 and 6:50 p.m., and sunset came at 6:40 p.m.

The event began in the last days of December and continued into January. After about a week, the fish seemed to start to lose interest. Many of them gathered into lines and moved towards the spawning site, then clustered, turned colour, spawned briefly over a coral, and returned the way they had come. For several days, there were no fish filing through the lagoon, and only a very few in the spawning area turning rose, clustering, twirling together, and occasionally darting to the surface to emit a spurt of eggs and sperm. But no cloud formed, so the main event had ended with a few individuals still spawning, while the majority had lost interest.

However, there were times in the following weeks when again large numbers of the solemn striated surgeonfish were filing to the border and returning after sunset, so apparently in some years, the event continued after a break of a few days. But it was over by 20 January.

DEREK KEATS / WIKIMEDIA COMMONS / CC BY 2.0

Adult striated surgeonfish (left) in brown livery; Juvenile striated surgeonfish (centre). Each young surgeonfish must learn the entire spawning ritual from its elders.

A terrible mishap

One night, the current was exceptionally strong. A disturbed ocean poured over the reef and through the lagoon, picking up particles that spoiled the water's clarity. Even in the deeper pocket of the spawning site, I had to fin continuously to keep from drifting away as I watched the fervent dance of the pearl-coloured fish. It filled my view with sinuous movement in all three dimensions, without a gap to see through, and I did not notice the moment when, thrilled and almost hypnotised, I stopped finning.

A long time seemed to pass before I saw that we were all moving very fast over reef flats in shallow water. But the fish continued their dance, and I continued to watch them, despite concern that this was not in the plan. Then my visibility was suddenly zero. I could not see my hand in front of my face and looked above the surface to find that my kayak was far away. I started swimming across the current and up it, trying to find clear water. Downstream from the spawning, the water was opaque, and I had to continue blind, checking my direction by glancing above the surface.

When I reached clear patches in which I could see, I found that the fish were swimming in a panicked column at my side, shooting ahead, pausing to normal speed, and then shooting ahead again in unison, as regular as a heartbeat. The column was about a metre wide, perfectly straight, and vanished into the murk ahead and behind. A pregnant whitetip shark shot through, and a large blue jack fish was criss-crossing the column. I swam beside the fish, most concerned about the distance we had drifted from the spawning site.

When we got there, the event was over—only scattered groups were still flowing together and flashing to the surface, while the rest filed hurriedly into the lagoon.

It was only 6:40 p.m., and by 6:45 p.m., there were no striated surgeonfish visible at all. So, it appeared that our mishap in the current had badly disrupted the spawning. Due to the way they seemed to consider me a provider of protection, so that I was always surrounded by the thickest gathering of the fish when I watched them, my carelessness seemed to have had a dire effect on the entire event.

The fish had been using me, instead of the coral formations, as a reference point. When I stopped finning and began drifting, all the fish spawning around me (and those around them) stayed with me. To us, all sailing along together and seeing only each other, we seemed to be in the same place, but the current in the neighbouring shallow region was very fast, so once we started, we were all swiftly displaced. This hypothesis was reinforced by the way their geometrically perfect column, shooting in panicked pulses back to the safety of the lagoon, had formed at my side.

The incident demonstrated the reason why the row of large coral structures crossing the region was so important to them. It provided them with the reference point they needed to stay in place while spawning.

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Social learning

One day in late December, after a series of storms had brought a month of turbulent conditions, I found a few tiny striated surgeonfish, which I assumed were immature juveniles, appearing to spawn in the place used by the adults, with the sun shining straight down on them. In the following days, the adults began again to spawn in the evenings.

This observation suggests a possible period of preparation for immature fish. Other researchers have found that the spawning ritual of the striated surgeonfish is a case of social learning—each individual has to learn the spawning site and the routine from the other fish. It is not instinctive. This fact raises the point that the choice of the remarkable spawning site was a deliberate decision by some fish at some time, a strong indication of consciousness.

Arthur A. Myrberg wrote a scientific paper on the spawning of a closely related species, the lavender tang (*Acanthurus nigrofuscus*), in Eilat, Israel. The geography of the region that those fish had to cover was unlike my South Pacific lagoon, so that the area from which they came was smaller, and the place that they spawned was different. Otherwise, the event he described was very similar.

There is clearly a great deal to learn about this mysterious phenomenon. ■

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. Please visit: ***ilafranceporcher.wixsite.com/author****.*

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GODA M, FUJII R. "THE BLUE COLORATION OF THE COMMON SURGEONFISH, PARACANTHURUS HEPATUS-II. COLOR REVELATION AND COLOR CHANGES." *ZOOLOG SCI.* 1998 JUN 1;15(3):323-33. DOI: 10.2108/ZSJ.15.323. PMID: 18465994.

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Adult striated surgeonfish displaying colour change

Edited by Peter Symes

PATRICK DOLL / CC BY-SA 3.0

The shortfin mako shark (*Isurus oxyrinchus*) is classified as "endangered" by the IUCN.

Plans to protect shortfin mako blocked by the European Union and United States

Last year, international governments voted to regulate trade in the endangered species, under the Convention on International Trade in Endangered Species, after the EU co-sponsored a proposal. The EU and the US, however, refused to back the ban, saying it would not in itself stop mako mortality as bycatch.

The majority of mako caught in the North Atlantic in 2019 were landed by EU vessels, mainly from Spain and Portugal followed by Morocco. Most mako sharks are bycatch—accidentally caught by boats hunting different species.

Scientists have said a ban on bycatch is needed to rebuild the species. Shortfin mako sharks are slow to mature, and the majority of those caught within ICCAT fisheries are juveniles that will never have the chance to reproduce, leaving makos even more vulnerable to overfishing. Scientists warned last year that the important predator was declining faster than previously thought.

Last year, the International Commission for the Conservations of Atlantic Tunas (ICCAT)—responsible for the management of tuna and tuna-like species and bycatch including sharks and rays—set new catch limits for bigeye tuna at a meeting in Palma, Mallorca.

Conservationists then welcomed "long overdue" catch limits set for bigeye tuna and other Atlantic species, but criticised weak measures to rebuild endangered mako shark populations. There was no outright ban and the United Kingdom said it was extremely disappointed that no agreement had been reached in 2019. Given the lack of consensus, the ICCAT committee chairman said he had no choice but to postpone any decision on mako catches until 2021. ■

SOURCES: THE GUARDIAN, PEW TRUST

Glimmer of hope for silky sharks in the Atlantic Ocean

Conservation efforts in the Atlantic Ocean may be working for silky sharks (*Carcharhinus falciformis*)—the second most common species found in the global shark fin trade.

Testing has revealed 99.8 percent of the fins sampled from retail markets in Hong Kong and China originated from the Indo-Pacific Ocean. Virtually none came from the Atlantic Ocean, which provides the first evidence that conservation efforts could be making an impact.

Researchers from Florida International University and Hong Kong used DNA analysis to track where fins in the global shark fin trade originate. The long-term goal of this research is to provide information to better direct more concentrated shark conservation efforts and fisheries management.

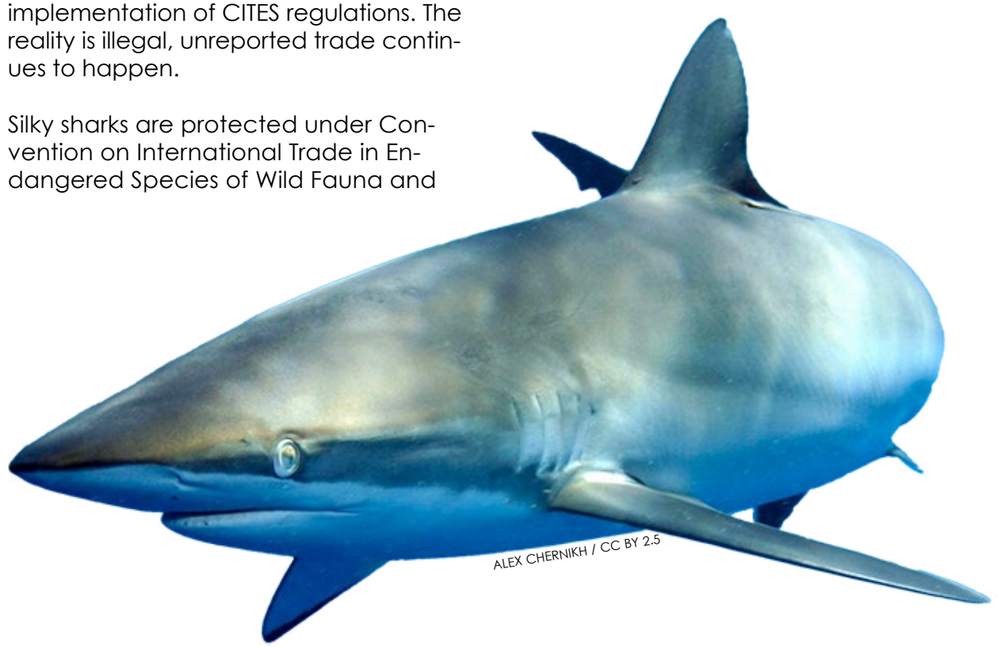
This study emphasizes the need for increased monitoring, as well as better implementation of CITES regulations. The reality is illegal, unreported trade continues to happen.

Silky sharks are protected under Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)—an international agreement protecting animals and plants from overexploitation in international trade.

Listed in Appendix II, all trade of these sharks requires permits certifying they were legally caught, and catch is sustainable and traceable through the supply chain.

Open ocean sharks, like silky sharks, face a considerable risk of overexploitation because they get caught in nets and longlines set by fishing fleets targeting tuna. High demand for shark fins in Asia means that although they are considered accidental by-catch, they are by-catch worth keeping. ■

SOURCE: CONSERVATION LETTERS



ALEX CHERNIKH / CC BY 2.5

Image 1. The final image after capture and output sharpening in postproduction

Sharpening

Underwater Images in Postproduction

Text and photos by Rico Besserdich

The sharpness of a photograph depends on the camera in use, the lens and the camera settings. Every lens has an optimal range in respect to its sharpness performance.

As a basic rule, most lenses provide their optimal sharpness with an aperture setting that is two full stops higher than the widest possible aperture of the lens. If you use a lens that comes with an aperture range of f/4 to f/22, it will most likely perform its optimum sharpness at f/8 (which is two full stops over f/4). Cheaper lenses that start with a maximum aperture of f/5.6 will perform well at around f/11.

Another important factor is the focal length of the lens and the shutter speed used. The general rule here is that the minimum (slowest) shutter speed, when shooting without a tripod, should be at least equal to or above the focal length of the lens. If you are using a 60mm lens, the shutter speed should be set to 1/60s (at least) or higher (faster).

As RAW (or DNG) should be the format of choice, we can say that every digital photograph needs to be sharpened during postproduction—some more, some less.

Referring to postproduction of RAW images, the workflow of sharpening comes with two steps: capture sharpening and output sharpening.

Capture sharpening fixes the softness characteristic in digital images and is done in Adobe Camera Raw (ACR) or in Lightroom.

Output sharpening is done at the very end, when finalising an image for digital presentation or print. Adobe Photoshop is a good tool for proper output sharpening.

Note: Whatever tricks or techniques are available in sharpening during postproduction, they will never turn a blurry image into a sharp crisp one. See an example in Screenshot 1 on the next page.

Whatever I try, this surgeonfish will never become sharp, as my shutter speed of 1/60s was too slow for its fast movements in this shot taken with ambient light.

Unless you intend to work with blurriness as a creative element, it is better not to waste your time with attempts in postproduction to make blurry images into sharp, crisp ones.

Capture sharpening

Now, let's look for an image that comes already with an acceptable level of sharpness but would benefit—as they all would—from a little extra capture and output sharpening (see Screenshot 2).

This image is opened in ACR. Access the Capture Sharpening Tool via the third icon in the Editor panel (see icon circled in blue).

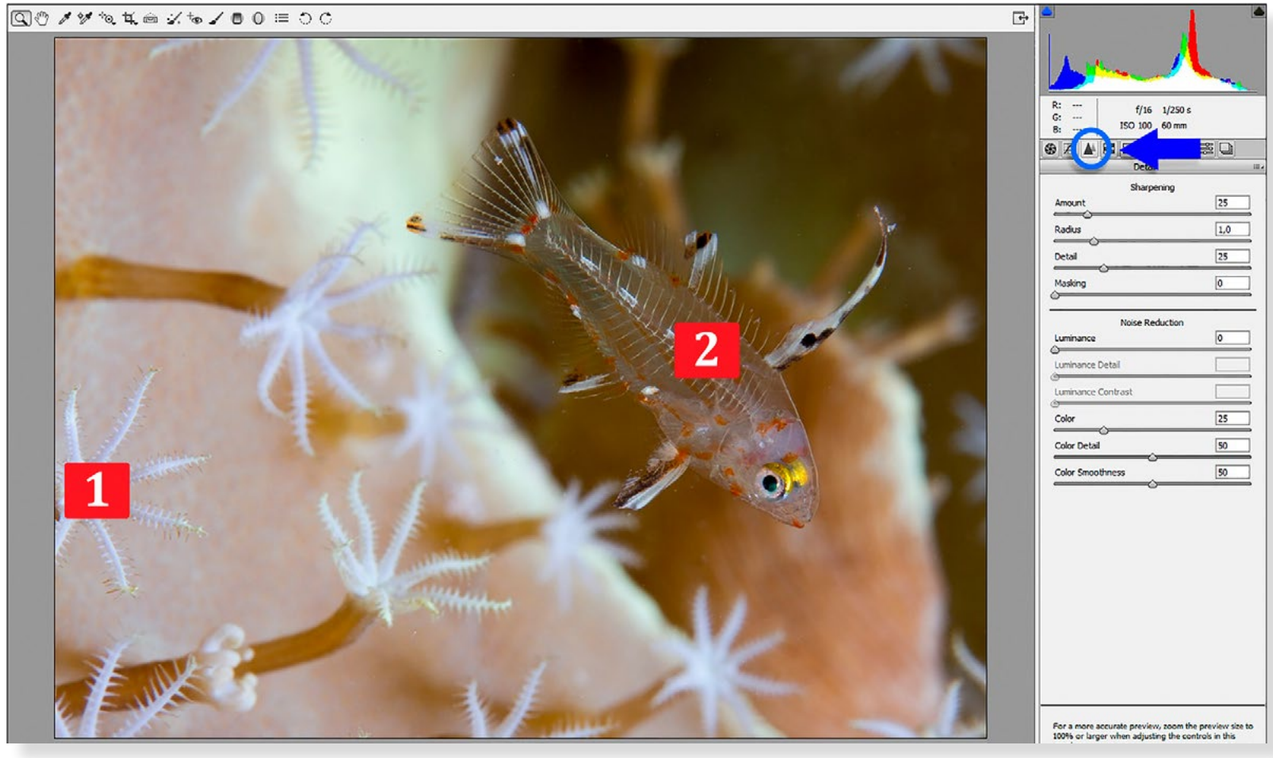
Before sliding the sliders, here is a quick checklist of things to look for:

- Does the image appear sharp in general?
- Are there areas that are in focus, and if so, are these sharp areas where you want them to be?

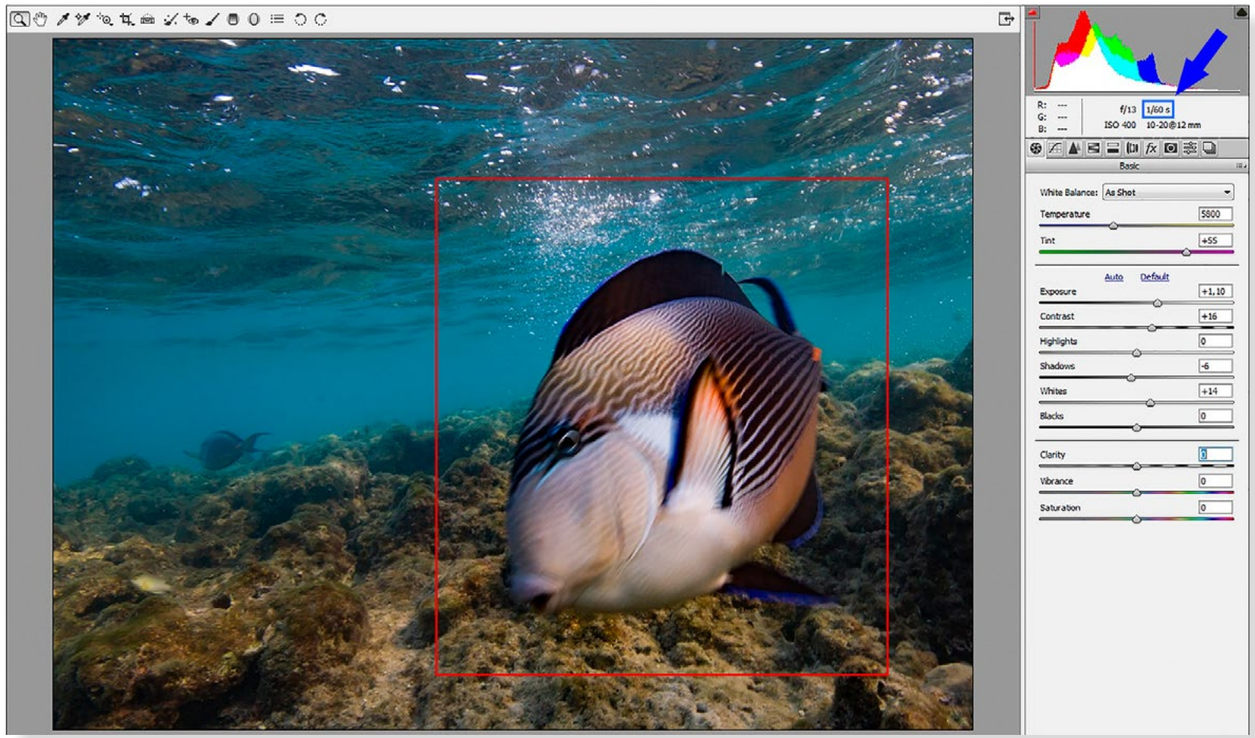
If yes, proceed.

In the example shown in Screenshot 2, the best focus is in areas "1" and "2."

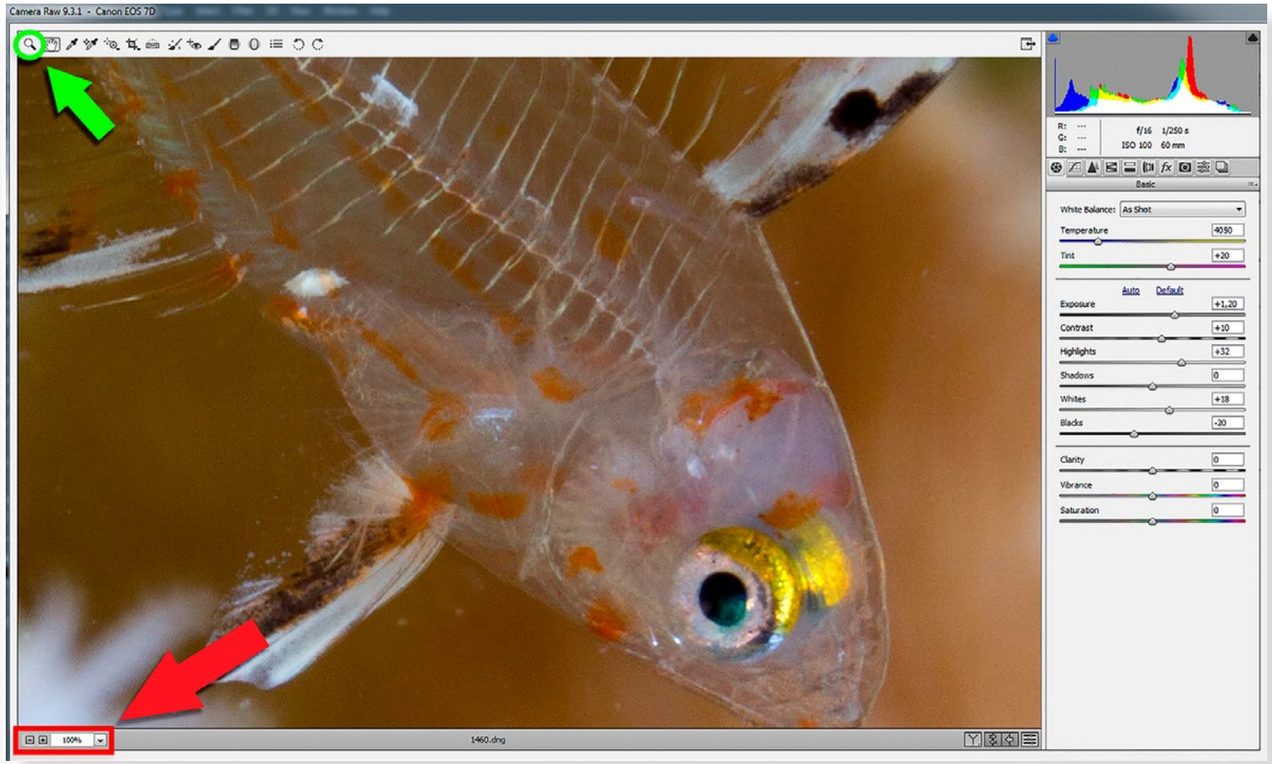
Every time we look at an image to check its details and see what can be done in postproduction, we need to zoom in to 100% (by using the magnifying Zoom Tool) and then move around the image with our mouse (using the Hand Tool) to determine fine but important details (see Screenshot 3).



Screenshot 2. Areas "1" and "2" have the best focus. The blue arrow points to the Sharpening icon circled in blue.

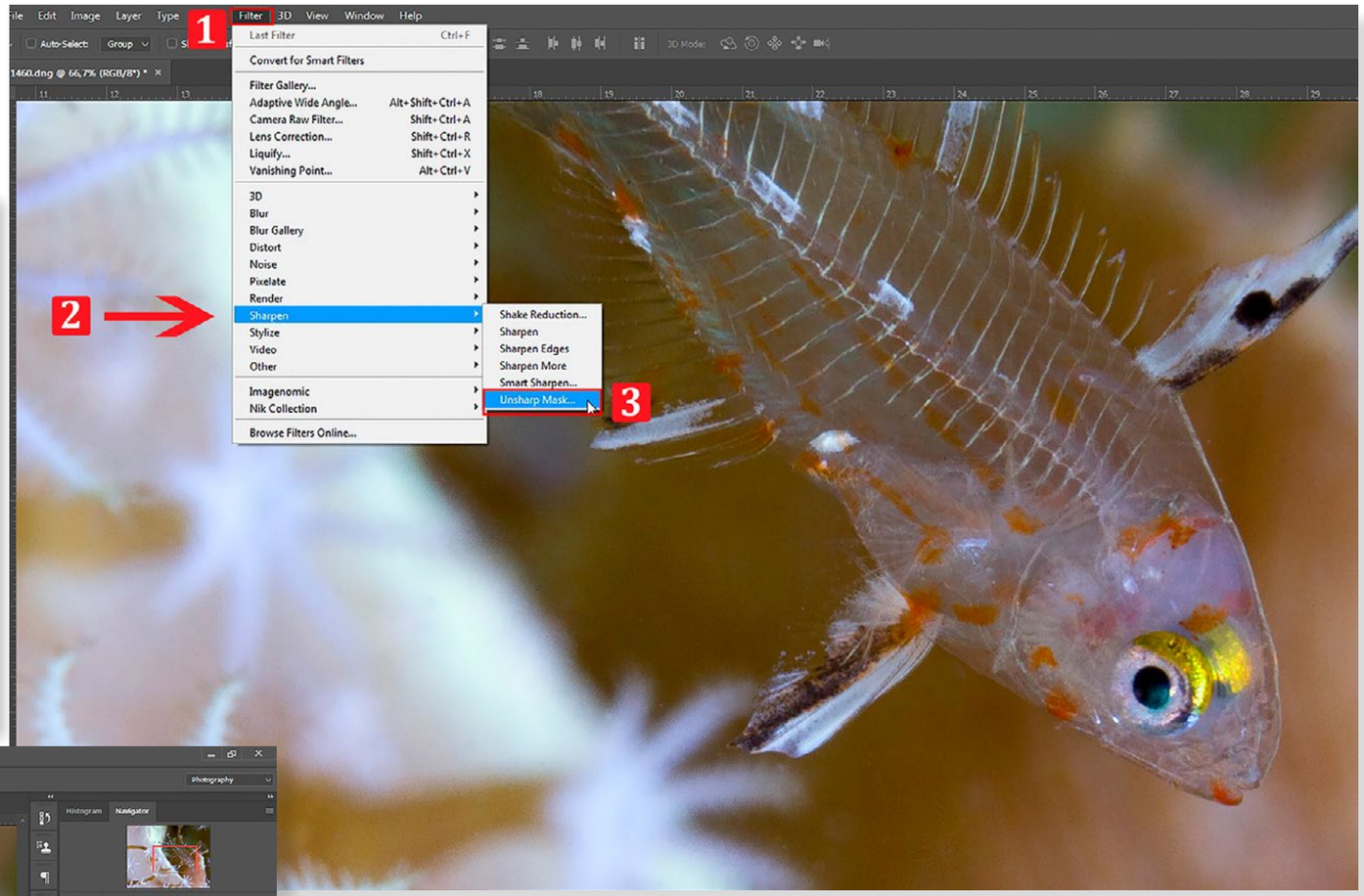


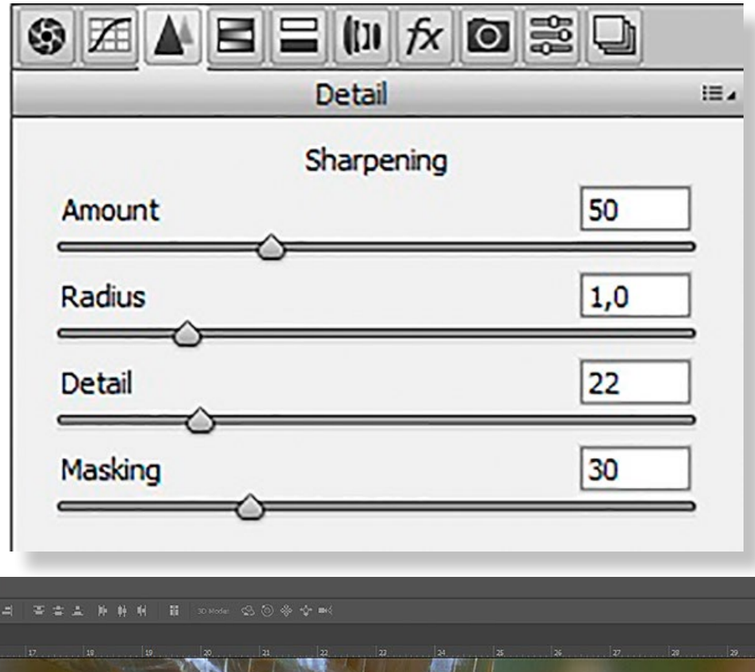
Screenshot 1. Surgeonfish image in Adobe Camera Raw (ACR). The blue arrow points to the shutter speed of 1/60s.



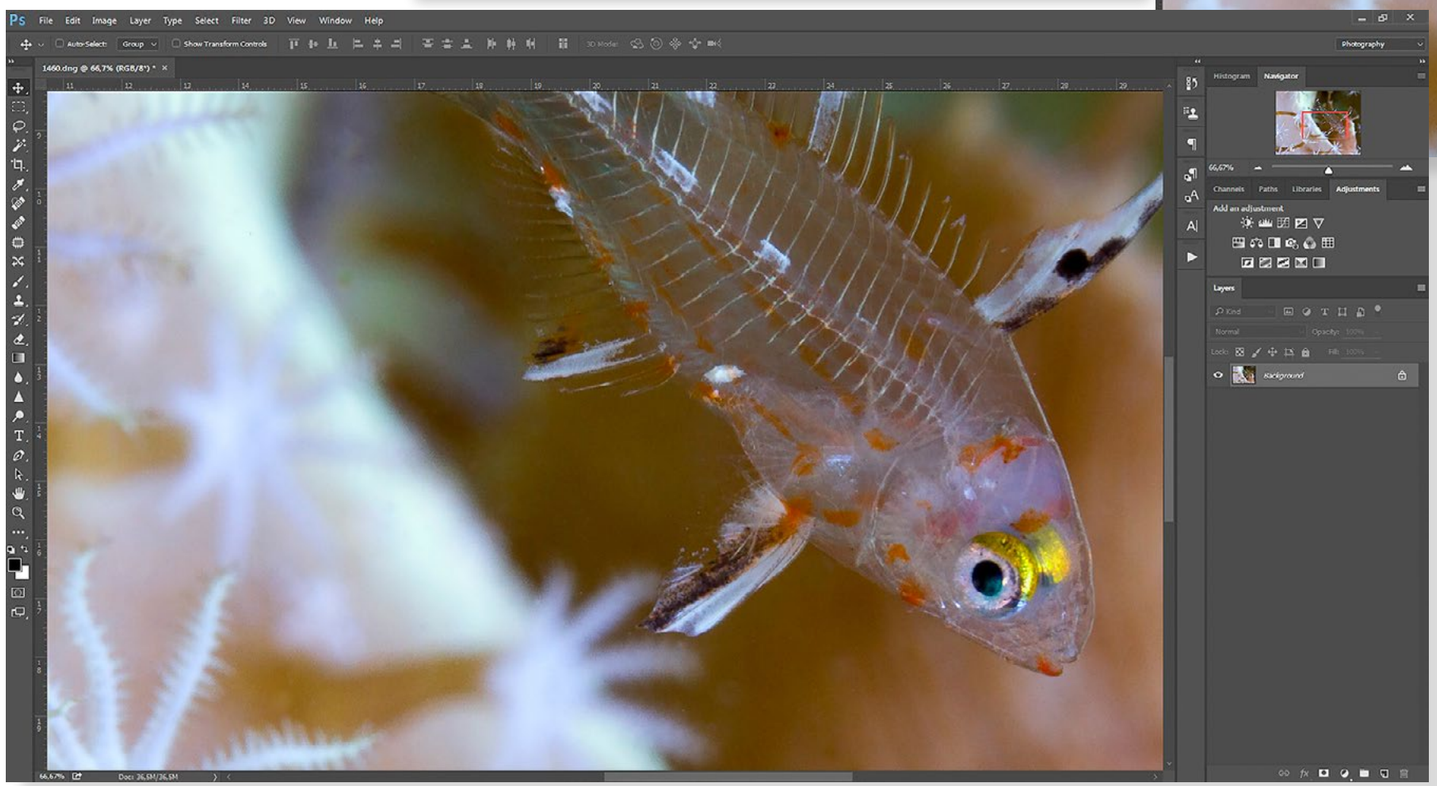
Screenshot 3. The green arrow points to the Zoom Tool icon. The red arrow points to a magnification level of 100%.

Screenshot 6. To find the Unsharp Mask panel, first click on Filters in the top navigation bar (1). Then, scroll down to Sharpen in the dropdown menu (2). Then, click on Unsharp Mask (3).





Screenshot 4. The preset Amount, Radius, Detail and Masking settings in the Sharpening panel



Screenshot 5. A zoomed-in view shows that details of the fish look better now, while the background is still smooth, due to the masking option in ACR.

The RAW sharpening tool in ACR offers us four different sliders for sharpening options. Let's see what they can do:

Amount: Controls the strength of the sharpening effect. ACR preapplies an amount of 25% to all RAW and DNG images (but not to JPGs or TIFFs). A range of 25 to 45% is just fine.

Radius: Determines the number of pixels around the edge in which the sharpening effect is applied. ACR's preset here is 1.0, and a range of 0.7 to 1.3 usually works well.

Detail: The higher the value, the more the enhancement of finer details and texture are applied. How much detail depends on the photograph.

Masking: Restricts sharpening in less detailed areas of the image. Hold down the "Alt" key on your keyboard while dragging the slider to see the masked areas in black. We rarely need to sharpen the water or backgrounds, so an amount of 25 to 35 does a fine job here.

In the image example, I have applied the presharpening settings shown in Screenshot 4.

Output sharpening

Now, it is time for the output sharpening—the final step! I opened the image in Photoshop, quickly erased a few spots of backscatter, and applied a curves adjustment layer for final colour adjustments.

A zoomed-in view shows me that the details of the fish now look better, while the background still appears smooth, thanks to the masking option in ACR (see Screenshot 5).

1. Go to Filters > Sharpen > Unsharp Mask (see Screenshot 6).

Screenshot 7. Set the Amount, Radius and Threshold in the Unsharp Mask panel. Check the Preview box to see changes.

2. Set the sliders for "Amount" to somewhere between 50 to 90, the "Radius" to 0.7 to 1.5, and the "Threshold" to 3. You have a small preview screen that shows you areas of the image in 100% magnification (which you can select with your mouse). Move around your entire image and check that there are no unwanted halos in bright areas or nasty outlines. If you spot those problems, decrease the values of the "Amount" and "Radius" until the problems disappear. You will see all modifications in real-time (see Screenshot 7).

Note: You can check or uncheck "Preview" to see the changes before and after.

3. Confirm by clicking on "OK," save the image, and enjoy your awesomely sharp photograph. Congratulations! (See the final image in Image 1 on the first page of this article). ■

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

photo & video

Edited by
Rico Besserdich

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OF THE MANUFACTURERS

Nauticam NA-EM10IV underwater housing

The NA-EM10IV is a new underwater housing designed for the Olympus OM-D E-M10 Mark IV mirrorless camera. It includes Nauticam's ergonomic layout of controls, dual fiber-optic ports for optical TTL strobe triggering from the camera's pop-up flash, and vacuum check and leak detection system installed as standard features. Tray and handles are available as optional accessories. The housing is compatible with Nauticam's range of underwater optics, including the WWL-1 and new WWL-C wide-angle attachments, and the CMC series macro wet lenses. Its dimensions are 184 x 138 x 100mm, and it weighs 1.08kg topside and 0.1kg underwater (including the camera and battery). It is depth-rated to 100m and has a Nauticam N85 port mount. **nauticam.com**

Keldan remote flash control

The RC1 remote control unit from Swiss manufacturer Keldan uses ultrasonic technology to control flash units up to 50m away. It has two channels controlling brightness, each of which can connect with an infinite number of lights simultaneously. The remote control unit works with Keldans XR Series of video lights. The RC1 remote control has eight transmitting power settings. At the highest level the range is about 50m. By using a triple clamp, the unit can be easily attached on the top or on the side of a camera housing. The ball adapter can be attached on either the top or the bottom.
Keldanlights.com

Haweel underwater case for iPhone

Chinese manufacturer Haweel has extended its range of underwater housings for Apple iPhones with a new model that supports iPhone 11, XR, XS, X, 8 and 7 (including 8+ and 7+). The housing is made of transparent polycarbonate, allowing one to easily view the iPhone's LCD screen. It is depth-rated to 40m. The case converts the iPhone into an action camera. Underwater use is limited to photo and video functionalities only. Its dimensions are 19 x 10 x 3.5cm and it weighs 369g. O-ring, lanyard and cleaning cloth are included. **haweel.com**

Pixelmator PRO 2

The image-editing software Pixelmator Pro 2.0 (code name: "Junipero") is designed as a universal app that supports the new Apple M1 processor. Intel CPU systems are supported as well. It is integrated with Metal, Apple's hardware-accelerated 3D graphics and compute framework, standard library and GPU shading language, thus providing increased speed in various image-editing processing steps, by a factor of 15x. The user interface has been completely overhauled, and now matches the macOS 11 (Big Sur) design. A new Effects Browser, interface customization, and workspaces for photography, design, painting and illustration are included. In addition, the Pixelmator PRO also has a new presets browser, including seven new color adjustment preset collections and eight new effect preset collections. For users of former Pixelmator versions, the update to the PRO 2 version is cost-free. **pixelmator.com**

Insta360 ONE X2

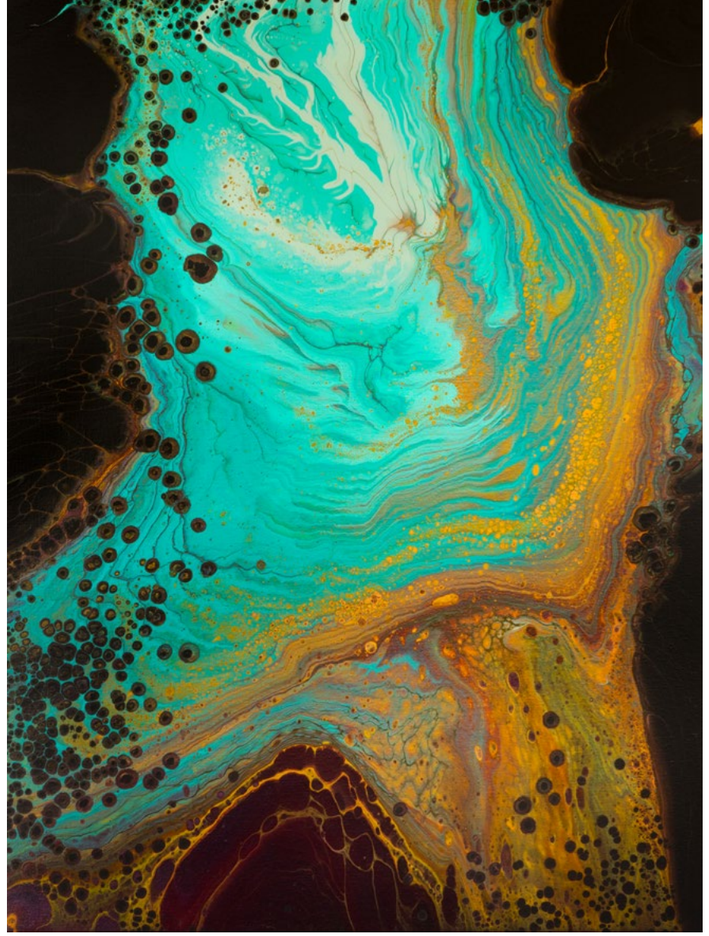
The ONE X2 action camera by Insta360 is a major update to its previous model, the One X, and includes a new (circular) full-color OLED touchscreen display. While the ONE X2 is waterproof to 10m, a dive depth of 45m can be reached by using an optional dive case. It features stabilized 5.7K 360-degree video recording, updated FlowState image stabilization technology, and a special underwater shooting mode called "AquaVision," which automatically balances color. The camera supports both HDR photo and video. It is able to capture and merge multiple images to increase dynamic range, as well as reduce noise and maintain detail when shooting in low-light situations. Further features include SteadyCam mode, voice control, AI editing, dual-lens capture, 4-mic 360-degree audio, GPS and TimeShift. The ONE X2 supports shooting stills (6080 x 3040px) in JPG and RAW/DNG formats. The (fixed) aperture is f/2.0, the focal length (35mm equivalent) is 7.2mm. It supports one MicroSD as a storage device and is powered by a rechargeable 1630mAh battery (via USB connector), permitting a runtime of approximately 80 minutes. It weighs 149g, with dimensions of 4.62 x 11.30 x 2.98cm.
insta360.com

Elyse Fournier

P O R T F O L I O

PREVIOUS PAGE: *Coastal Coral,* by Elyse Fournier. Acrylic on canvas, 18 x 24in

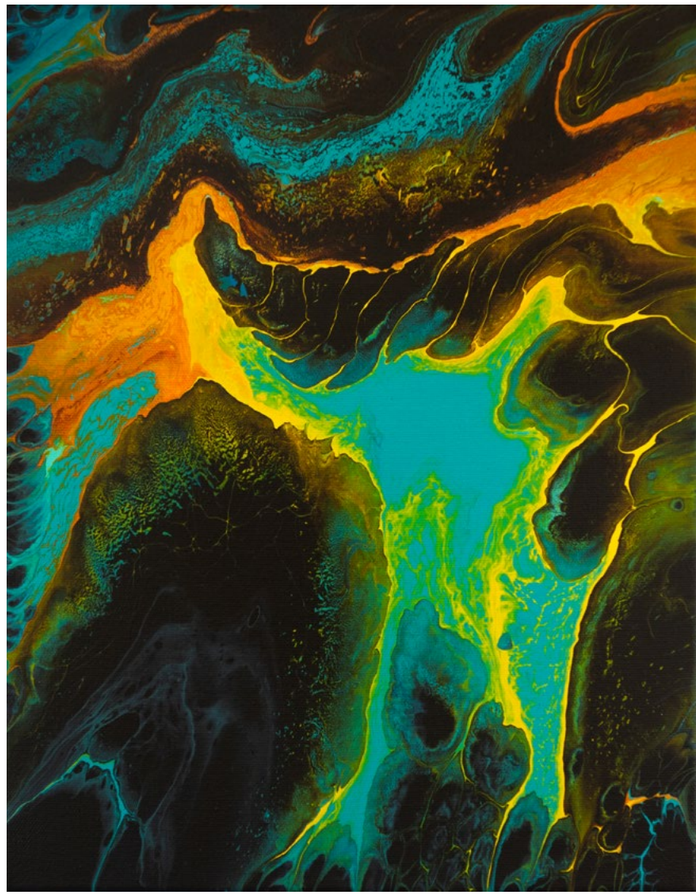
Deep Sea Coral Reef, by Elyse Fournier. Acrylic on canvas, 20 x 16in



Elyse Fournier

Deep Sea Exploration, from the *Into the Abyss* series by Elyse Fournier. Acrylic on canvas, 24 x 18in (left). The series is inspired by the mysterious and unknown areas of the planet. In this painting, writes the artist, "you can imagine to finally be able to see the light during the ascent to the surface after a voyage of discovery in the dark depths."

Bioluminescense 2, from the *Into the Abyss* series by Elyse Fournier. Acrylic on canvas, 14 x 11in (below). The artist writes, in this painting, "one can imagine the incredible colors of a bioluminescent microorganism of the depths, from a macro point of view."



Text edited by G. Symes
All artwork by and photos courtesy of Elyse Fournier

Originally from Quebec, Canadian self-taught multidisciplinary artist and horticulturist Elyse Fournier creates fantastic worlds within worlds, using a combination of techniques from painting by brush to fluid acrylic pouring on canvas, bringing to life surreal and abstract underwater scenes mixing vivid color and wandering imagination. *X-Ray Mag* interviewed the artist to learn more about her creative process and perspectives on art and nature.

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

EF: I am an independent, relatively solitary, self-taught artist from Quebec, Canada. I felt the need to create early in my life as my mind has always been wondering with imagination. Whatever the medium available, my hands needed to get to work to release that creative pressure building inside of me.

My second passion being the world of plants, I studied three years to get a horticulturist technician diploma that would eventually lead me to work for Mosaïcultures Internationales

Life, by Elyse Fournier. Acrylic on black gallery wrapped canvas, 36 x 24in

in Montreal in 2003 for the entire exhibition. I then began sharing my artistic side with the world by designing 3D mosaïcultures for the city of Dorval, using plants, moss, bark, driftwood and metal. After working ten years as a horticulturist for the city, I came to the decision to follow my own artistic path. This eventually led to creating a successful YouTube channel (with more than 38,000 subscribers) in which I demonstrate my methodology and creative process.

Forgotten Depths, by Elyse Fournier. Acrylic on canvas, 14 x 12in

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

EF: I have this attraction to underwater worlds, without really knowing where it comes from. I have always been intrigued by the complex forms of life living within our oceans. I like to imagine parallel worlds where nature cannot be disturbed or damaged by humans. Having had these thoughts for many years, I decided to put my ideas on paper to create intricate and detailed abstract drawings by using inks and watercolors as a medium. Needing more intense colors, I then started experimenting with acrylics.

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

EF: I have always been captivated by the beauty of our planet. Since I am mostly inspired by nature, David Attenborough's *Planet Earth* and *Blue Planet* documentaries hold a special place of inspiration in my art. But I want to stay true to myself and would rather not be influenced by any specific artist or artistic movement. This is important to me,

Sea Dragon, by Elyse Fournier. Acrylic on canvas, 16 x 16in

Elyse Fournier

at a time, adding details and new ideas as I paint.

For my fluid acrylic paintings [ed.– abstract liquid art created through acrylic pouring], I begin by choosing a specific color palette, depending on the ambience I want to create. Next, I play with paint densities and brands to produce reactions that lead to a variety of different textures and patterns. When I am satisfied with the dried results, I leave the painting as it is, but most of the time, I use it as an inspiring background for a more complex hand-painted artwork. (See Elyse's video of acrylic pouring

because otherwise I would feel like I am following someone else's path and not my own. Improving my acrylic painting techniques is also not the most important thing to me. Rather, my goal is to better and more clearly create a vision or snapshot of my world and share it with the world.

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

EF: For my hand-painted artworks [ed.– painting by brush], the inspiration comes first. It can come from anywhere: a color, a texture, a pattern, a mood… Then, I begin instinctively painting on a canvas. There is no preparation, plan or sketch, because this can create an unnecessary pressure that restricts me. I then let my mind guide me to spawn a new world, one element

Lost in My Own World, by Elyse Fournier. Acrylic on canvas, 36 x 24in

The Goddess of the Ocean, by Elyse Fournier. Acrylic on canvas, 18 x 24in

Blue Mind, by Elyse Fournier. Acrylic on canvas, 14 x 18in

Elyse Fournier

in her artwork *Seaweed* on thist page at: **youtube.com/watch?v=FWtsssNceE4**)

X-RAY MAG: What is your relationship to the underwater world and coral reefs? Are you a scuba diver or a snorkeler and how have your experiences underwater influenced your art? In your relationship with reefs and the sea, where have you had your favorite experiences?

EF: One of my dreams is actually to dive in a kelp forest. There is something so magical about it. I experienced snorkeling only once, in a beautiful lake in Quebec when I was younger. While I was fishing there, I could not see any fish around the boat, so I got curious of their whereabouts and decided to take a closer look. I had by chance brought my mom's old snorkeling kit at the time. I used a fishing rod that I modified to be able to attract the fish while snorkeling.

The moment I dived in, I was filled by this amazing feeling of freedom. This hidden world was offering its beauty to me for free because I dared to look. I was soon surrounded by many curious fish and completely lost any intentions I had of fishing. I could not get out of the water for a whole hour after that.

Contemplating the waves from the shore is impressive, but actually taking the time and effort to look below the water's surface changes you forever. That is a big reason why most of my work has an underwater theme. I was marked by this experience.

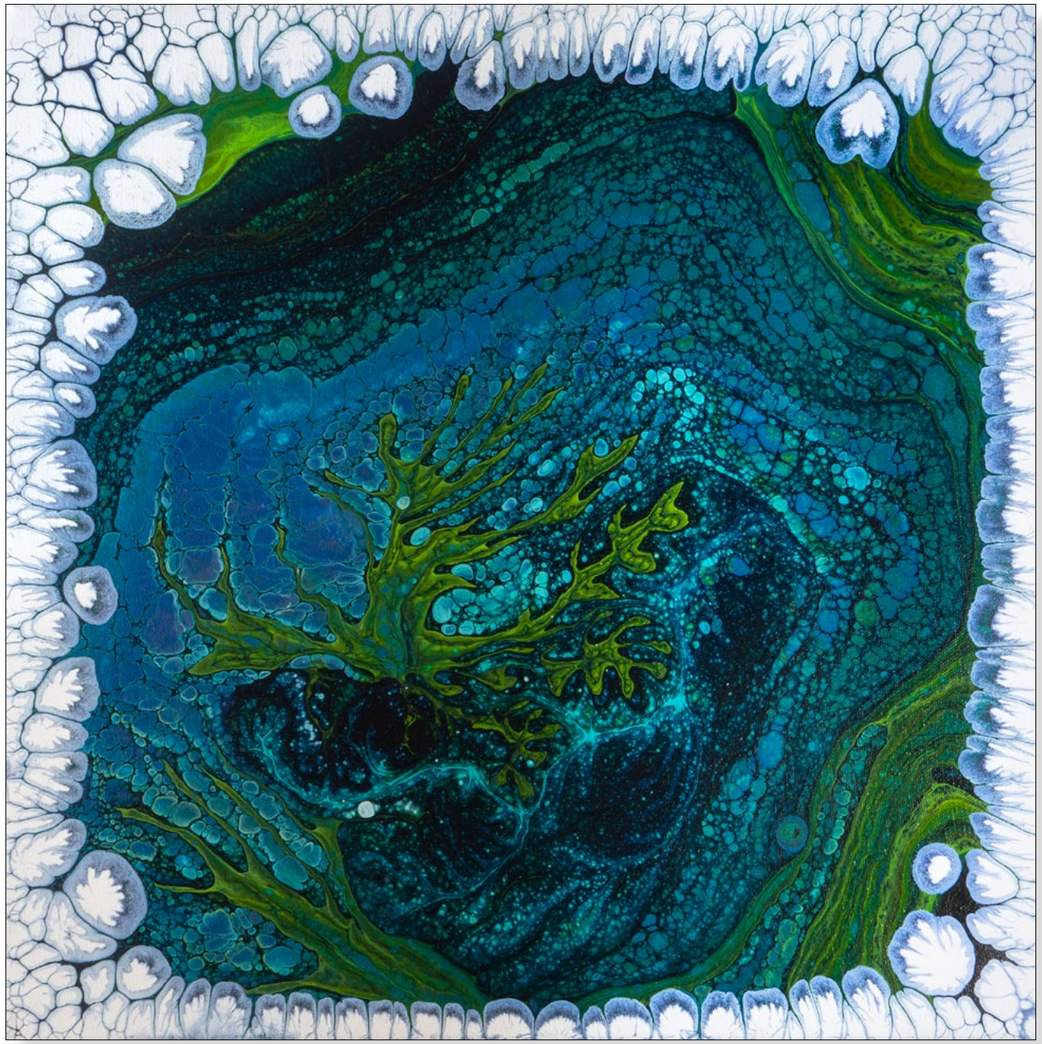
X-RAY MAG: What are your thoughts on ocean conservation and coral reef management and how does your artwork relate to these issues?

EF: I am not alone in believing in the importance of ocean conservation. It is imperative that we do our utmost to resolve so many of these issues that have resulted in massive losses of life underwater. I am bringing my passion for the ocean into each and every underwater painting in the hopes of raising awareness of coral reef fragility.

Sourcing materials is often a contradictory action. I am fully aware acrylic paint is not ecologically friendly; however, I have yet to find suitable alternatives that are sustainable. In the meantime, I use best practices to handle and dispose of acrylic paints to minimize environmental impact.

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

EF: I want viewers to dream and travel



Seaweed, by Elyse Fournier. Acrylic on canvas, 16 x 16in

with me to these parallel worlds, untouched by the madness of humans and show them nature's reciprocity to help them realize all the damage we are inflicting on our own planet.

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?

EF: It has never been easier to share your art and message all around the world, by way of the Internet. This, however, can be a double-edged sword, as you really have to stand out from the crowd and get noticed. The very best advice I can give is to stay true to yourself. The key is to be original and to let your passion guide you. I believe it is important to use your art as a medium of communication and to free yourself internally.

X-RAY MAG: How do people respond to your works?

EF: People are usually amazed by how viewing my paintings takes them on a journey through my dreamlands. They imagine a whole personal story about each painting. I once got a comment on one of my YouTube videos from a woman telling me that watching my creative process actually made her cry because she could feel how this new world grew and evolved to be what it was in the final painting. I was really touched by this comment and it made me want to create even more.

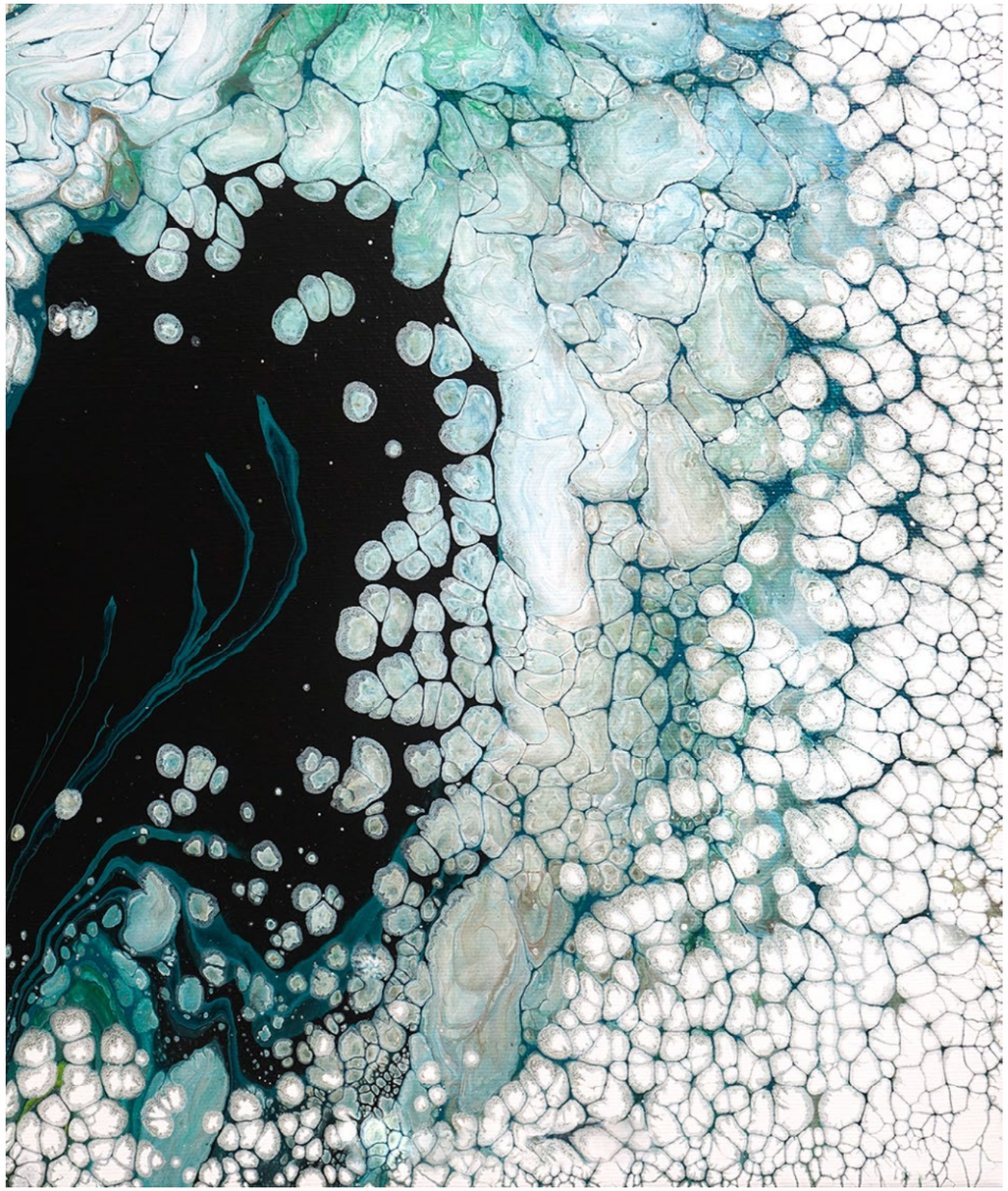
X-RAY MAG: What are your upcoming projects, art courses or events?

EF: One of my goals is to have a solo exhibition incorporating my acrylic paintings, sculptures and mixed media artworks within the next five years. In the meantime, I will continue with my acrylic paintings but would like to incorporate 3D sculptures into them. I have so many unique projects in mind…

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

EF: I would like to invite anyone who is interested in knowing more about my artworld and creative process to take a look at my YouTube channel where I take the viewer on a journey to discover how many of my underwater fantasy worlds are brought to life. Please visit: **youtube.com/c/ElyseFournier**. ■

For more information and to purchase original artworks, please visit the artist's website at: ***elysefournier.net***



Ice Cave, by Elyse Fournier. Two 12 x 10in acrylic paintings on canvas. See Elyse's video of acrylic pouring in the creation of this artwork at: **youtube.com/watch?v=xEB_kKINMn8**