

Barracuda Dive :: Stefano Carletti :: Quick Neck :: Edi Frommenwiler :: Rico Besserdich Portfolio



H-Ray Mag

GLOBAL EDITION
January 2022
Number 109

Italy

Climate Change

Tennessee

Gray Quarry

Germany

Maar Lakes

Training

Human Factors

Slovenia

Solo Cave Diving

Contributors' Picks

My Favorite Color Contrasts

TANZANIA

Pemba Island

COVER PHOTO BY RICO BESSERDICH

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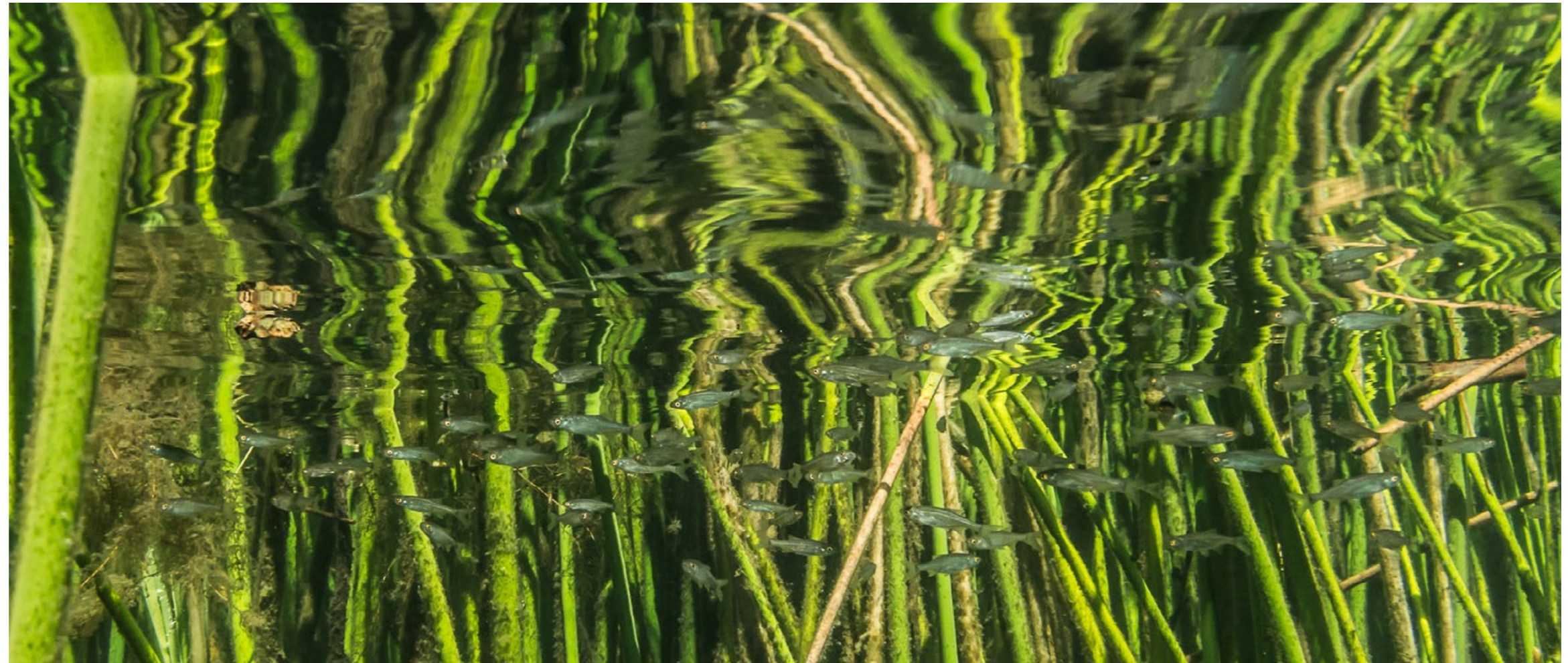
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COVER PHOTO: No. 9. Photo by
Rico Besserdich (maviphoto.com)

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Reflections, Maar Lakes, Volcanic Eifel, Germany. Photo by Claudia Weber-Gebert



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**DIVE
SHOW
RU**

2022

**FEBRUARY 17-20
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**ESSENTIAL
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PEOPLE**

We Carry On...

Over the holidays, as 2021 drew to a close, the media once again began to overflow with retrospections on the year that has gone by, and heads of state, prime ministers and royalty gave reflective New Year's speeches on national radio and television.

As always, I heard or read the usual fair share of speeches, but this time, it made me pensive, and I began to ponder—just as a thought experiment—what I would have said if I had to give such a speech. To whom would my thoughts have gone? Whom would I have thanked and what hopes would I have expressed?

There have always been plenty of humanitarian and environmental crises in the world about which to be concerned and many good causes to champion, but this year, it has been different. Indeed, my thoughts go out to the many good and hardworking members of the dive industry and community who have been terribly affected by the pandemic.

It has been not just one but two years since the onset of the pandemic, which has turned out to be arguably the most destructive event ever to affect the dive industry. In the past, 9/11, SARS, and the global financial crisis in 2008 were bad enough but are mere blips in comparison.

During the past two years, anni horribili, countless dive businesses have ceased operations and dive industry colleagues, many of which we have known for many years as hardworking individuals and entrepreneurs sinking endless hours and effort into building and developing their operations, have been forced to close or mothball their businesses. It has been heart-breaking.

But we have also seen amazing resilience and ingenuity in the face of adversity. In the middle of all the bleakness and devastation, many dive industry members have fought hard to keep the lights on, managing to stay afloat and live to fight another day. Some have had to tem-

porarily step away to do other things for a while in order to be able to pay the bills, while others have managed to restructure and adapt their businesses to the changing circumstances.

My thoughts therefore go out to both those members of the international dive community who have sadly become victims of the impacted economy, as well as all those who have fought and found ways to carry on, sometimes at great cost.

Divers are a hardy bunch, and the dive industry and community will surely bounce back once this devastating pandemic is beyond us.

In the meantime, we carry on, and continue to serve and support the dive community to the best of our abilities.

We wish you all a happy 2022.

— Peter Symes
Publisher & Editor-in-Chief



Shadowfin soldierfish (*Myripristis adusta*). Growl and grunt sounds have been associated with soldierfish.

Edited by
Peter Symes



from the deep

NEWS

The sound of coral reef recovery

Soundscapes are a crucial measure of how well a reef is thriving.

Croaks, moans, purrs, growls, fog-horns, whoops, grunts... these are just some of the many sounds that are heard coming from a healthy and diverse coral reef. Researchers, who wanted to find out just how healthy restored reefs can become, focused on parts of reefs in Indonesia previously destroyed by blast fishing. The areas were restored through the Mars Coral Reef Restoration Project for years preceding the study.

By taking one-hour acoustic recordings of various habitats, the scientists found that the restored habitats had become almost just as vibrant as those that were naturally healthy, while degraded reefs, in comparison, were rather silent.

Noisy is good

On healthy reefs, a wide range of soniferous fishes and invertebrates contribute to a loud and diverse soundscape that plays an important role in ecosystem functioning, and acoustic cues in the soundscape guide the recruitment and settlement behaviours of many juvenile reef organisms that spend their larval stage in the open ocean.

The specific organisms responsible for making the sounds driving

these patterns are unknown. Some of the sound types described in the new study have been previously described. For example, a range of percussive and pulse-train sounds have been associated with triggerfish (family *Balistidae*), damselfish (*Pomacentridae*) and butterflyfish (*Chaetodontidae*); growl and grunt sounds have been associated with soldierfish (*Holocentridae*); scraping sounds have been associated with the feeding of macroherbivores such as parrotfish (*Scaridae*) and triggerfish (*Balistidae*); and whooping sounds have been associated with the Ambon damselfish *Pomacentrus amboinensis*.

Bizarre sounds

However, other sound types are less familiar. For example, the researchers were not aware of any previous descriptions of the "laugh" sound. Each individual sound type does not necessarily correspond to a single sound-producing species; some fishes are capable of multiple phonation types and may be making more than one of

the sounds described in this study. Professor Steve Simpson of the University of Bristol said some of the sounds they heard were "really bizarre, and new to us as scientists."

Importance

The recovery of soundscapes suggests that restored reefs have the potential to regain their attractiveness to settlement-stage organisms. This is encouraging as it means that restored reefs may have the capacity to attract future generations of reef organisms, improving the prospects of long-term ecosystem stability. These results are important because they demonstrate that active restoration of coral cover can have beneficial impacts on the wider reef ecosystem. ■

SOURCES: JOURNAL OF APPLIED ECOLOGY, MARS CORAL REEF RESTORATION PROJECT



Whooping sounds have been associated with the Ambon damselfish (*Pomacentrus amboinensis*).



TRAVEL WITH DAN.

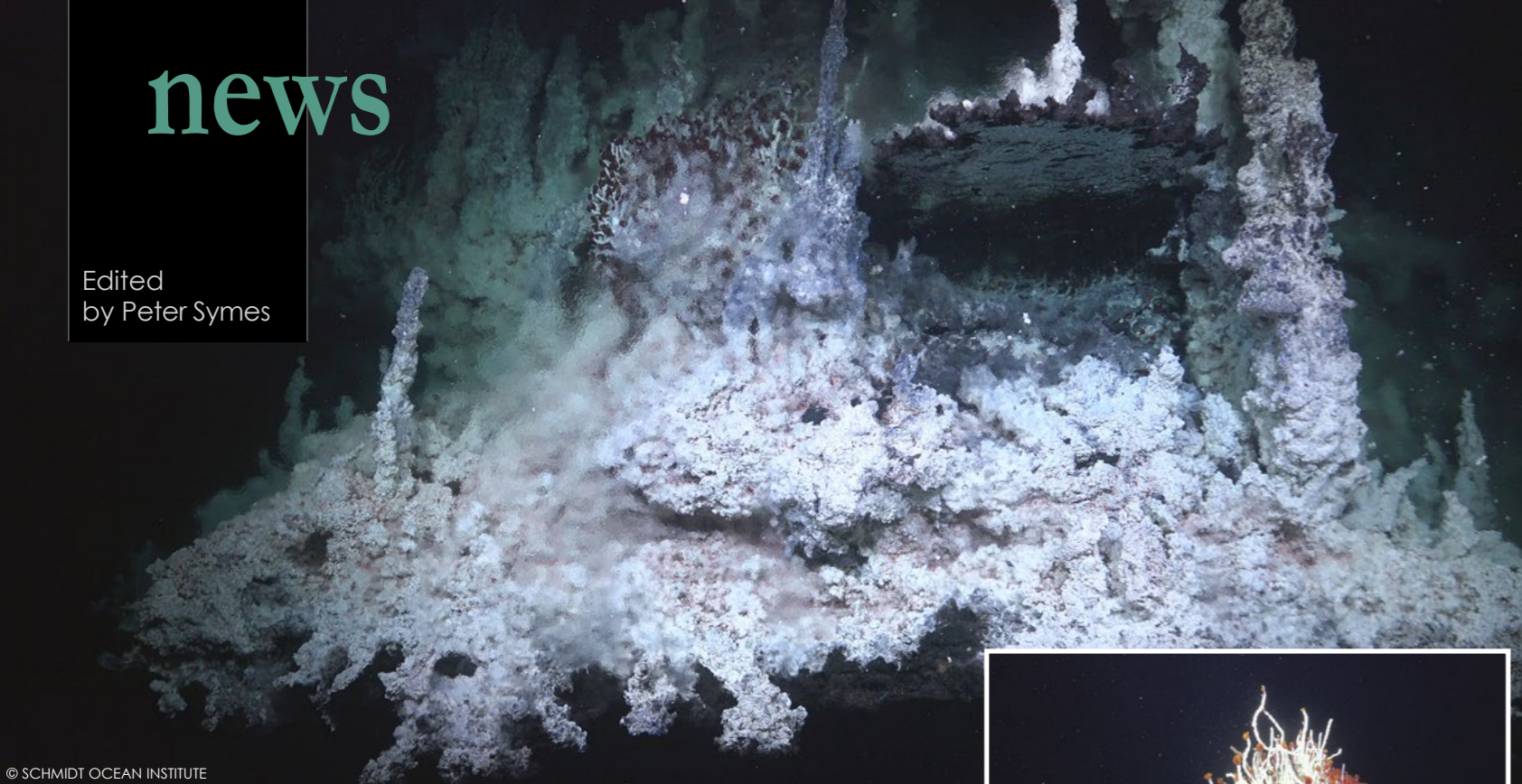
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Edited by Peter Symes



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Hydrothermal vents and possible new species discovered in Gulf of California

A multidisciplinary team of scientists from Mexico and the United States discovered new hydrothermal vents and six possible new animal species during a 33-day expedition off the coast of La Paz on Schmidt Ocean Institute's research vessel *Falkor*.

The hydrothermal vents are located in the Pescadero Basin and are unique both in their chemistry and appearance to other known hydrothermal vents, as they are the only ones currently observed to emit clear fluids as opposed to dark, smokey fluids associated with iconic "black smoker" vents.

The underwater robot ROV SuBastian was used to explore and sample vents emitting fluids at temperatures up to 287°C (549°F) along with the unique animal communities inhabit-

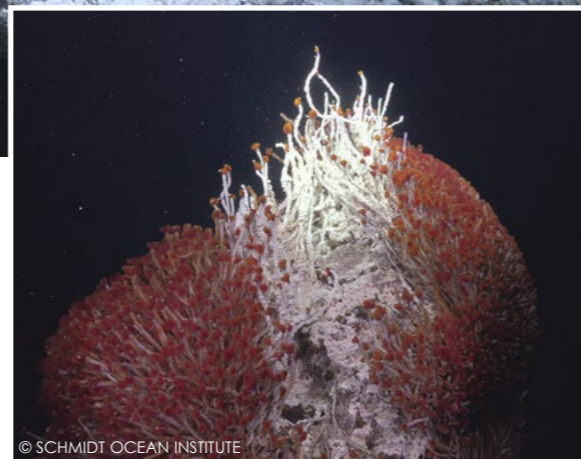
ing this extreme environment. ROV SuBastian additionally captured stunning imagery of the seafloor, including hydrothermal mirror pools, calcite spires, and iridescent blue scale worms.

New species

During this expedition, six or more possible new species, including polychaetes, arrow worms, crustaceans, molluscs and roundworms were found, along with ten known species not previously found in the Pescadero Basin.

Indigenous names

The largest of the new vent mounds, named Maija awi, sits midway between the JaichaMaa 'ja'ag vent field, discovered by the same team during Schmidt Ocean Institute's 2018 R/V *Falkor* expedition, and the Auka vent field, discovered during an expedition by the Monterey Bay Aquarium Research Institute (MBARI) in 2015.



© SCHMIDT OCEAN INSTITUTE

Additional hydrothermal vents were found south of JaichMaa 'ja'ag, and are named 'Melsuu. The names of the vent fields and many of the individual mounds and chimneys derive from the languages of the indigenous Yuman peoples of Baja California.

Schmidt Ocean Institute was established in 2009 by Eric and Wendy Schmidt to advance oceanographic research through the development of innovative technologies, open sharing of information, and broad communication about ocean health. It operates *Falkor*, the only year-round philanthropic research vessel in the world that is made available to the international science community at no cost. For more information, visit: schmidt-ocean.org. See [video](#). ■

SOURCE: SCHMIDT OCEAN INSTITUTE

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

SUPPORT YOUR LOCAL DIVE SHOPS



*Safe Diving,
Team Dive Rite*



Edited by G Symes



THIS PAGE: Scenes from the Malaysia International Dive Expo (MIDE) 2021, which took place at the World Trade Centre in Kuala Lumpur, 3-5 December. Winning images of the Lens Beyond Ocean photo competition in 2020 were displayed at the show (below).



MIDE 2021 proves to be a success for both exhibitors and attendees

After a 20-month hiatus due to Covid-19 pandemic restrictions, the long-awaited Malaysia International Dive Expo (MIDE) returned to the World Trade Centre in Kuala Lumpur on 3-5 December 2021.

Staying true to its theme, "Let's Meet & Dive Locally," the show aimed to kick-start the country's dive industry and welcomed over 7,000 visitors during the three-day event with over 400 exhibitors, resulting in over RM5 (US\$1.2) million in sales.

The bold decision to hold the show drew the attention, endorsement and partnership of several government agencies and lead-

ers, including Prime Minister Ismail Sabri Yaakob, who addressed the event and said that he saw the dive community playing an important role in the recovery of tourism in Malaysia.

Long-standing exhibitors, Tourism Malaysia, the Malaysia Scuba Diving Association (MSDA), partners and the organizers of MIDE worked together to help kick-start the recovery of the dive sector to the delight of water enthusiasts. While strict standard operating procedures were maintained, exhibitors enjoyed more time and space than usual to give one-on-one attention to every visitor in their booths, which proved highly beneficial. While there were only slightly less than the expected 8,000 visitors, exhibitors were very pleased with the quality of the visitors who attended the show.

"Given the pandemic is still

ongoing, we are happy and pleased to have taken the plunge to re-boot the dive sector and inject some confidence into the community," said Ness Puvanes, director and organizer of MIDE. "From what usually takes a year to organize, we pulled MIDE 2021 together in just 45 days and that's not without a multitude of challenges. Moving forward is the key."

Dignitaries & activities

Malaysia Tourism Promotion Board (MTPB) Director General Ybhg Dato' Hj Zainuddin Abdul Wahab officiated the opening ceremony. Other dignitaries in attendance included Al-Wathiqu Billah Sultan Mizan Zainal Abidin ibni Almarhum Sultan Mahmud Al-Muktafi Billah Shah, Sultan of Terengganu, as well as Y.M. Tengku Dato Dr Hishammuddin Zaizi bin Y.A.M Tengku Bendahara Azman

Shah AlHaj, the managing director of Ikkhasas Group; YB Datuk Seri Dr. Santhara, Deputy Minister, Ministry of Tourism, Arts and Culture Malaysia (MOTAC); Her Excellency Ms Visam Ali, High Commissioner of the Republic of Maldives to Malaysia; Dato' Sri Dr. Hj. Irmohizam bin Hj. Ibrahim, Group Executive Director, World Trade Centre, Kuala Lumpur; and YB Tuan Muhammad Bakhtiar Bin Wan Chik, former Deputy Minister, MOTAC.

During the expo, various speakers presented talks about dive education, marine conservation, cave diving, diving for people with disabilities, photography and more. As usual, a big hit with visitors were the bargains and promotions offered in dive wear, equipment, technology, photography/videography equipment, dive holidays, tours, courses, and other dive-related products.

There was keen interest, from dive operators and holiday resorts, in the show's boating section and the water sports exhibits, with numerous sales leads generated, pointing to this area's potential for growth.

In addition, 28 Lucky Draw prizes were handed out to visitors, with a combined value of RM30,000 (US\$7,190), including dive holidays, dive gear, dive courses, and camera equipment, with a grand prize of a seven-day, Sudan and Maldives liveaboard trip valued at RM6,700 (US\$1,600) provided by Maldives & Red Sea Blue Force Fleet.

Supporters & sponsors

MIDE thanks its supporters, including Malaysia External Trade Development Corporation (MATRADE), MOTAC, MTPB, MSDA, University Terengganu Malaysia (UMT); esteemed exhibitors, including dive agencies BSAC, DAN, DDI, Diveheart, IANTD, ITDA, NAUI, NDL, PADI, RAID, SSI, TDI/SDI; media

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For more information, email info@mide.com.my or call 603-79809902. Get updates at: mide.com.my or Facebook @MIDE Expo or Twitter @MIDE Expo.



COURTESY OF SYED ABD RAHMAN / DIVEHEART



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Diveheart Malaysia Ambassador Syed Abd Rahman presented adaptive diving and new ecotourism at the World Expo in Dubai.

Malaysia's adaptive diving and new ecotourism destinations presented at World Expo

Malaysia presented its new ecotourism destinations and Diveheart adaptive diving programs at the World Expo, one of the biggest and oldest events on earth, taking place in Dubai from 1 October 2021 to 31 March 2022 (postponed from 2020 due to the Covid-19 pandemic).

In a collaboration between Malaysia Tourism and adaptive dive training organization Diveheart, Syed Abd Rahman, Diveheart Malaysia ambassador and advisor for the National Dive Council of Malaysia presented the Diveheart adaptive diving programs in Malaysia, which features accessible tourism at Malaysia's beautiful dive destinations.

Diveheart, viewed the exhibition as a good opportunity to reach out to divers in the Middle East and expand the Diveheart adaptive diving community. "We believe that everyone should have the opportunity to experience the life-changing power of scuba diving," said Elliott. "There really are no boundaries to what we can achieve, and we have seen time and time again how educational scuba therapy has built confidence and transformed the lives of people with disabilities all over the world." Elliott conveyed his appreciation for

Tourism Malaysia's outreach to Diveheart for the collaboration. "This collaboration demonstrates Malaysia's commitment to opening doors to every diver, regardless of their abilities, to explore new dive destinations, build international friendships and gain new experiences at the same time."

New connections
Diveheart Malaysia is now collaborating with Heriot Watts University at the Kuala Lumpur and Dubai campuses. Based in Kuala Lumpur, Diveheart Malaysia Ambassador Rahman, who as the founder and director of Kids Scuba Malaysia, presented the Diveheart



COURTESY OF SYED ABD RAHMAN / DIVEHEART

program in Dubai in December 2021. Rahman has trained over a hundred local adaptive divers and volunteers in Malaysia over the past decade. "I am pleased that more and more dive destinations in Malaysia are becoming more disability-friendly in terms of the facilities offered and willingness to accept adaptive divers," said Syed who has been a driving force in connecting government agencies with private tourism businesses in Malaysia in a bid to increase accessibility for people with disabilities.

Beautiful diving for all divers
At the World Expo in Dubai, Rahman, who is a PADI IDC Staff Instructor, also presented the world-class diving that can be found in the waters around Malaysia. "Malaysia is truly blessed with so many beautiful dive destinations, including Tioman Island, Perhentian Islands, Tenggol Island, and of course, the islands



COURTESY OF SYED ABD RAHMAN / DIVEHEART

in Sabah, including Layang Layang and Sipadan Island," he said, adding that Malaysian waters are known for their rich underwater biodiversity, beautiful coral reefs and variety of dive sites that are suitable for divers of all levels. ■

For more information about adaptive diving at Diveheart, visit: diveheart.org.



MSDA FOOD DRIVE

DONATE & HELP - DIVE COMMUNITY

Malaysia Scuba Diving Association (MSDA) has initiated a Food Drive Campaign to provide support to diver friends who have lost work, business or have no source of income. We are hoping to collect much-needed donations to help the struggling dive community.

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Whatever you can spare, will be greatly appreciated

LOCATION OF CAMPAIGN	
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PULAU PERHENTIAN	KOTA KINABALU



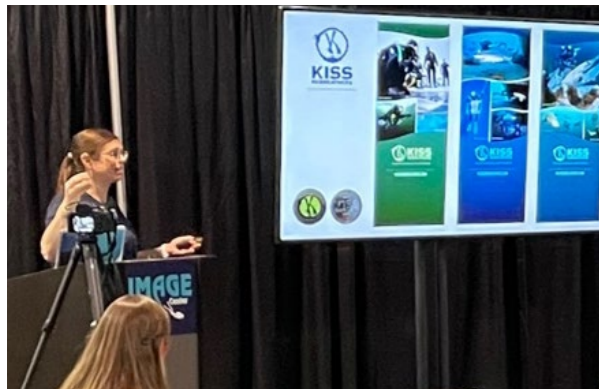
Exhibitors were pleasantly surprised by DEMA 2021

Interviews, photos and videos by Matthew Meier. Text edited by Catherine GS Lim and G. Symes

The DEMA Show 2021, held on November 16-19 in Las Vegas, USA, returned after skipping a year, due to the Covid-19 pandemic. While it was significantly smaller than previous years, exhibitors gave positive feedback on the show and interactions with enthusiastic visitors, dealers and serious buyers—some even said it was their best show in years.

"The show overall was good. Smaller and slower than normal, but it seemed those who came were serious about doing business. It was nice to see familiar faces too."

— Brandi Mueller, Regular Contributor (brandiunderwater.com)



"This year's DEMA Show was full of engaging conversations and quality interactions

with fellow colleagues and friends. I still managed to miss some important people that I would love to connect with, and certainly look forward to the show next year in Orlando."

— Jennifer Idol, Regular Contributor, presenting at DEMA (uwdesigner.com)

In their own words, here is what exhibitors had to say:



"DEMA 2021 has been fantastic. It's probably one of the best DEMAs that we've had in a long time. Of course, coming off the pandemic with everybody eager to travel, it's been extra good because of that. But the seriousness of the dealers, the new dealers that have come into the market, our existing dealers that have hung in there and decided to come to the show, they really made our show. We had an excellent show. And it was as good or better than the 2019 show for us. Hope to see you all next year."

— Sven Harms, SeaLife Cameras (sealife-cameras.com)



"Actually, we were not thinking a lot of DEMA this year, but actually, it turned out pretty good. It was way better than last year, but that's for obvious reasons. Next year, we hope to see you all, including you manufacturers, so we can get our industry back up (and running)."

— Paul Coolen, Buddy Dive Resort Bonaire (buddydive.com)



"We've been pretty pleased with the DEMA Show. It's been pleasantly busy. We were expecting it to be much quieter. We've done some very good business, very serious buyers here. It has been a

pretty good DEMA—actually, very good."

— Mik Jennings, Master Liveaboards (masterliveaboards.com)



"Well, (it's been) two years now (since) the (last) DEMA Show, and we were really happy to be here again. Much better show than we ever expected. Lots of people and good buyers, good people. Before we went, it was like 'How busy would it be?' Well, a really big compliment to the organization, and the results are really good. Focusing forward on 2022, 2023, 2024. Hold on. So, we say the world is moving again. Thank you."

— Arie Hoogendoorn, Magic Resorts (magicresorts.online)



"Well, this year at DEMA, we think it was a success. Many people have been stopping by the booth. People are excited to get back out and start traveling again. And we've seen a lot of old friends that we have been missing over the last year and a half of isolation. So, we're happy to be back and excited to continue doing what we do best—and that's providing diving in amazing destinations."

— Earle Ellis, Solitude Liveaboards & Resorts (solitude.world)



"The 2021 DEMA show for us was excellent. We came here not expecting a huge crowd. But the crowd that was there was fine. And we feel the show was better than the 2019 (show). And for those who missed it, you made a big mistake. DEMA 2021 was excellent. A lot of people looking and interested in travel. And we are going to be super busy next year because of it."

— Tim Webb, Caradonna Dive Adventures (caradonna.com)



"So, we had no idea what to expect, right? We kept hearing, it shrank and shrank, and less booths and less booths. And then we come here, and we find that the players are here, that the ones who survived this big time are here, and it was making a statement about we are here as a travel industry, as a dive resort, as a liveaboard company. We're here and we're meeting our clients. And the people that came out here, came out here with an intention to support the winners who made it through this crazy pandemic! And so, in that sense, we are beyond excited to be here, and it has completely exceeded our expectations. Looking forward to the next one."

— Roni Ben-Aharon, Atlantis Dive Resorts & Liveaboards Philippines (atlantishotel.com)

wreck rap



Edited by
Peter Symes

Marine citizen science on a San Diego artificial reef

Divers visiting the artificial reef HMCS Yukon, which was sunk in 2000, are encouraged to photograph invertebrates that are attached to the vessel (such as anemones and sea fans), as well as any vertebrates (that is, fish) seen on their dives.

A short history

In 2000, the HMCS Yukon, a 366ft-long Canadian warship, was sunk off the coast of San Diego to become an artificial reef, after being cleaned and decontaminated according to Canadian environmental standards. Holes were also cut into the hull at regular intervals to provide divers with daylight by which to navigate while within the wreck. Since then, the ship has transformed into a home for marine life, while becoming an international diving destination. At 100ft, it should only be dived by divers certified to that depth and never penetrated without additional training. There have been several diver fatalities over the years.

Scientific studies

In 2004, a joint study by the San Diego Oceans Foundation (SDOF) and Scripps Institution of Oceanography was undertaken to better understand the effects



COURTESY OF OCEAN SANCTUARIES

the reef was having on the surrounding marine life.

Back then, there were not many sessile (attached) invertebrates, and fish were only just beginning to make the wreck their home. In the intervening years, however, the Yukon has become an ecosystem unto itself, home now to dozens of species of invertebrates and fish, and even the occasional salp chain or mola mola (sunfish) passing through.

Noting that 11 years had passed since the original study was commissioned, which began in 2015, Ocean Sanctuaries began the Yukon Marine Life Survey, intending to update the data on the marine species that have established themselves on the Yukon since 2004, using a citizen science app called iNaturalist.

How it works

Advanced divers who are certified to 100ft dive the Yukon as they normally would and simply photograph either invertebrates that are attached to the vessel (such as anemones and sea fans), as well as any vertebrates (that is, fish) seen on their dive. Fixed transect lines are not used.

Upon returning home, divers go to their previously created account with iNaturalist and upload the photographs taken on their dives to: [inaturalist.org/projects/yukon-marine-life-survey](https://www.inaturalist.org/projects/yukon-marine-life-survey).

iNaturalist is run by the California Acad-

emy of Sciences (CAS) and has both resident marine scientists as well as experienced divers/naturalists who can assist in the identification of species in the uploaded images. This is known as a "community identification process." Final determinations are made by CAS scientists.

Because the Yukon rests on the bottom, at 100ft, only advanced divers are qualified to go to that depth, so the pool of regularly contributing divers is small: nine so far—but it is hoped that this number will be increased moving forward. However, because many of these divers are extremely proficient with a camera underwater, they are able to photograph quite a number of species on a single dive, so a large pool is not always a requirement for this study.

As of August 2021, Ocean Sanctuaries has collected data from 237 observations, successfully identifying 59 individual species on the wreck.

To further our understanding of the marine environment, Ocean Sanctuaries encourages and supports citizen science projects that empower local divers to gather marine data under scientific mentorship. In addition to the Yukon Marine Life Survey, Ocean Sanctuaries has two citizen science projects that are shark-related—"Sharks of California" and the "Sevengill Shark ID Project"—and offers basic courses in marine citizen science. ■

SOURCES: INATURALIST, OCEAN SANCTUARIES

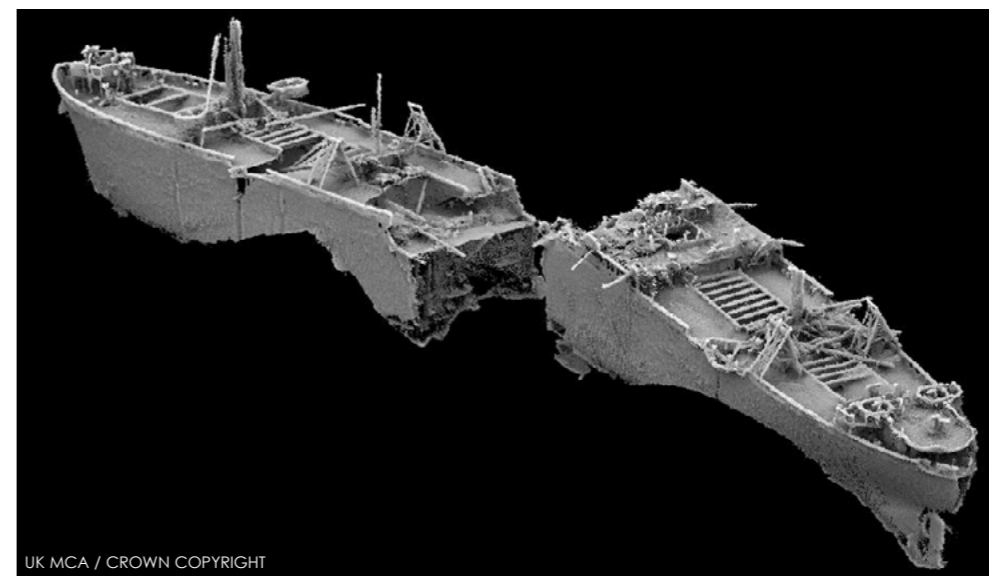
Royal Navy to dismantle WWII shipwreck at risk of enormous explosion

SS Richard Montgomery has been languishing at the bottom of the Thames Estuary in Kent for 77 years, with a cargo of 1,400 tonnes of bombs in the forward holds. A team of bomb disposal experts have now been tasked with making the wreck safe.

or even shifting of the cargo in the tide. At the time, the Maritime and Coastguard Agency (MCA) nevertheless believed that the risk of a major explosion was remote.

Critics of government assurances that the likelihood of a major explosion is remote argue that one of the fuses of the 2,600 fused-fragmentation devices could become partially flooded and undergo

the reaction producing copper azide. A knock, such as caused by the ship breaking up further, or a collision on the busy shipping lane, could cause the copper azide to explode and trigger an explosive



UK MCA / CROWN COPYRIGHT

SS Richard Montgomery, an American Libery cargo ship that sank in 1944

A Ministry of Defence report said an explosion "would throw a 300m-wide column of water and debris nearly 3,000m into the air and generate a wave five metres high."

The warship was part of a US convoy travelling to the United Kingdom in August 1944; but when it arrived in the Thames Estuary, it was instructed to anchor in the Great Nore, off Sheerness, where it sank, with about 1,400 tonnes of explosives remaining on board.

In 1973, she became the first wreck designated as dangerous under Section 2 of the Protection of Wrecks Act 1973. There is an exclusion zone around her monitored visually and by radar.

At risk or not?

An investigation in 2004 concluded that the cargo was still deadly, and could be detonated by a collision, an attack,

chain reaction detonating the bulk of the munitions.

Surveys undertaken in 2008 and 2009 by the MCA found, "Whilst significant structural collapse does not appear to be imminent, surveys suggest that this prospect is getting closer."

In 2020, a Department for Transport survey found the ship's three masts were deteriorating and in a poor state. The Ministry of Defence (MoD) warned that the collapse of a mast could detonate ordnance, and Royal Navy specialists would need to remove them safely.

The MoD is supporting the Department for Transport, which in turn has a contractor that will undertake the mast removal process over a two-month period, starting in June 2022. See video: [youtube.com/watch?v=wP1kq9H7TYg&t=2s](https://www.youtube.com/watch?v=wP1kq9H7TYg&t=2s) ■

SOURCES: MARITIME AND COASTGUARD AGENCY



Stefano Carletti

— *The Man Who Immortalized the Andrea Doria Wreck*

ANDREA MURDOCK ALPINI



Stefano Carletti, Ninni Ravazza and Andrea Murdock Alpini (above); Carletti brushes the silt off the letters in the wreck's name, *Andrea Doria*, in 1968 (right).

Text and archives research by Andrea Murdock Alpini. Photos courtesy of Andrea Murdock Alpini, Al Giddings and Bruno Vailati

Restored images courtesy of Luca Maresca, from the book *Andrea Doria-74* by Stefano Carletti, published in 2021 by Magenes Editoriale

Original images from Ansaldo Archive in Genoa, Italy, courtesy of Antonio Pacucci, chief curator of Archivio e Fototeca Fondazione Ansaldo

Stefano Carletti—adventurer, scuba diver, aviator and fisherman. He is a teller of sea tales and a searcher of hidden treasures on the seabed. He is a man who is a mirror of Europe, the “blue continent”—sometimes tempestuous, other times, crystal-clear and peaceful. Carletti’s life has been an extraordinary tailor-made adventure sewn by a life at sea, narrated by books and articles, which still fascinate audiences even today, as in the past. In this interview, Andrea Murdock Alpini gains more insight into the man behind the myth.

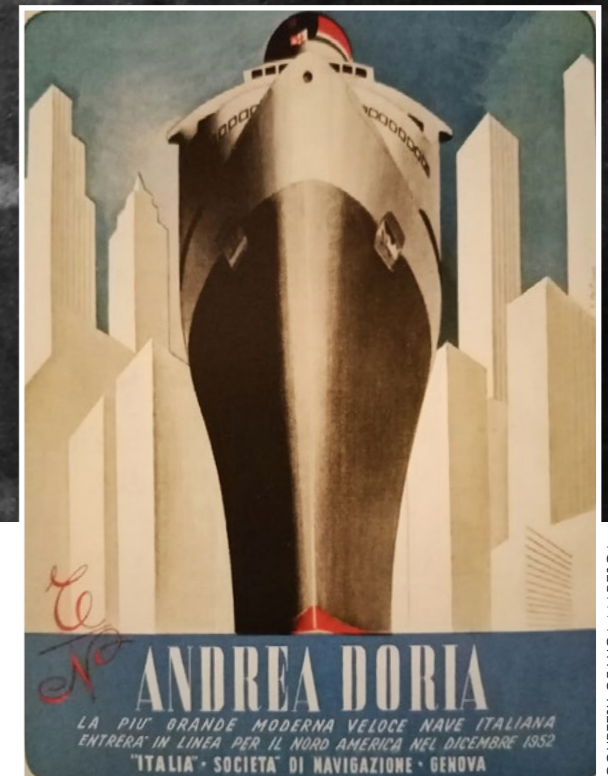
The Italian turboship *Andrea Doria* was a fascinating ocean liner, which connected Italy to New York City. It was a symbol of class, taste and refinement. The ship was launched on 16 June 1951, for its maiden voyage across the Atlantic Ocean from Genoa to New York City on 14 January 1953. *Andrea*

Doria was a symbol of an era—a legend for the centuries.

Andrea Doria was an ocean liner that saw all types of voyagers crossing her decks, from anonymous third-class travelers to famous figures of the last century in first class, including the Italian actress Anna Magnani, American film direc-

tor John Ford, actors Orson Welles, Cary Grant and Spencer Tracy, among others.

One fateful night, on 26 July 1956, this beautiful ship sank off Nantucket in the US state of Massachusetts after a long and agonizing struggle, rocking to and fro in the ocean’s current. The gash in her hull made in a collision with the trans-



Original *Andrea Doria* poster of the Società Navigazione Italia

COURTESY OF LUCA MARESCA





COURTESY OF BRUNO VAILATI

Al Giddings, Stefano Carletti, Bruno Vailati, and Mimi Dies on board *Narragansett*, the side boat for the *Andrea Doria* Expedition in 1968 (above); The recently published re-edition of Stefano Carletti's seminal book, *Andrea Doria -74* (right)

atlantic liner *Stockholm* tore apart the right side of the *Andrea Doria*. Commander Piero Calamai was the last man to get off this ill-fated ship; the accident struck his soul so deeply that, for the rest of his life, he was obsessed by the event.

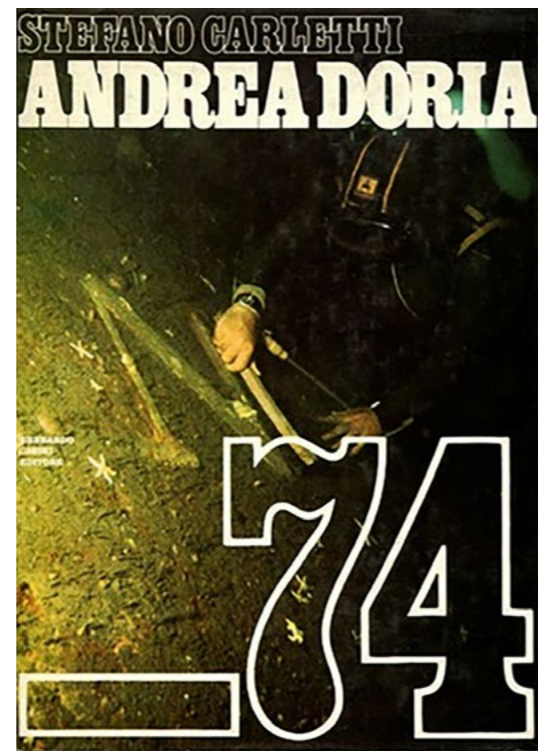
As the Atlantic Ocean engulfed the vessel, with the waters churning and foaming about it, TV channels worldwide broadcast the sinking of the most beautiful ship ever built in the modern era. The dreams of a nation came to an end on the muddy seabed, as the ocean welcomed the *Andrea Doria*, transformed into myth by her demise.

Over a decade later, in the summer of 1968, Italian filmmaker and scuba diver Bruno Vailati gathered a crew of adventurers to go to the United States to film the wreck of the *Andrea Doria* for the first time ever. The crew included Mimi Dies, Arnaldo Mattei, Al Giddings and,

last but not least, Stefano Carletti—the man who made the wreck of the *Andrea Doria* immortal.

Upon his return to Rome after the expedition, Carletti wrote the first-ever book about the wreck, entitled *Andrea Doria -74*. The book was a collection of feelings and rare images captured during scuba dives conducted from the expedition's side ship, *Narragansett*, where Carletti and the crew spent a month.

The first edition of the book has now become treasured memorabilia for collectors worldwide. Now, a new updated edition, with restored images and a new introduction by the author as well as a critical essay that I contributed, has been published in 2021 by Magenes Editoriale. It is a chance for wreck junkies and historians to acquire a stunning re-edition of this legendary book for their private libraries.



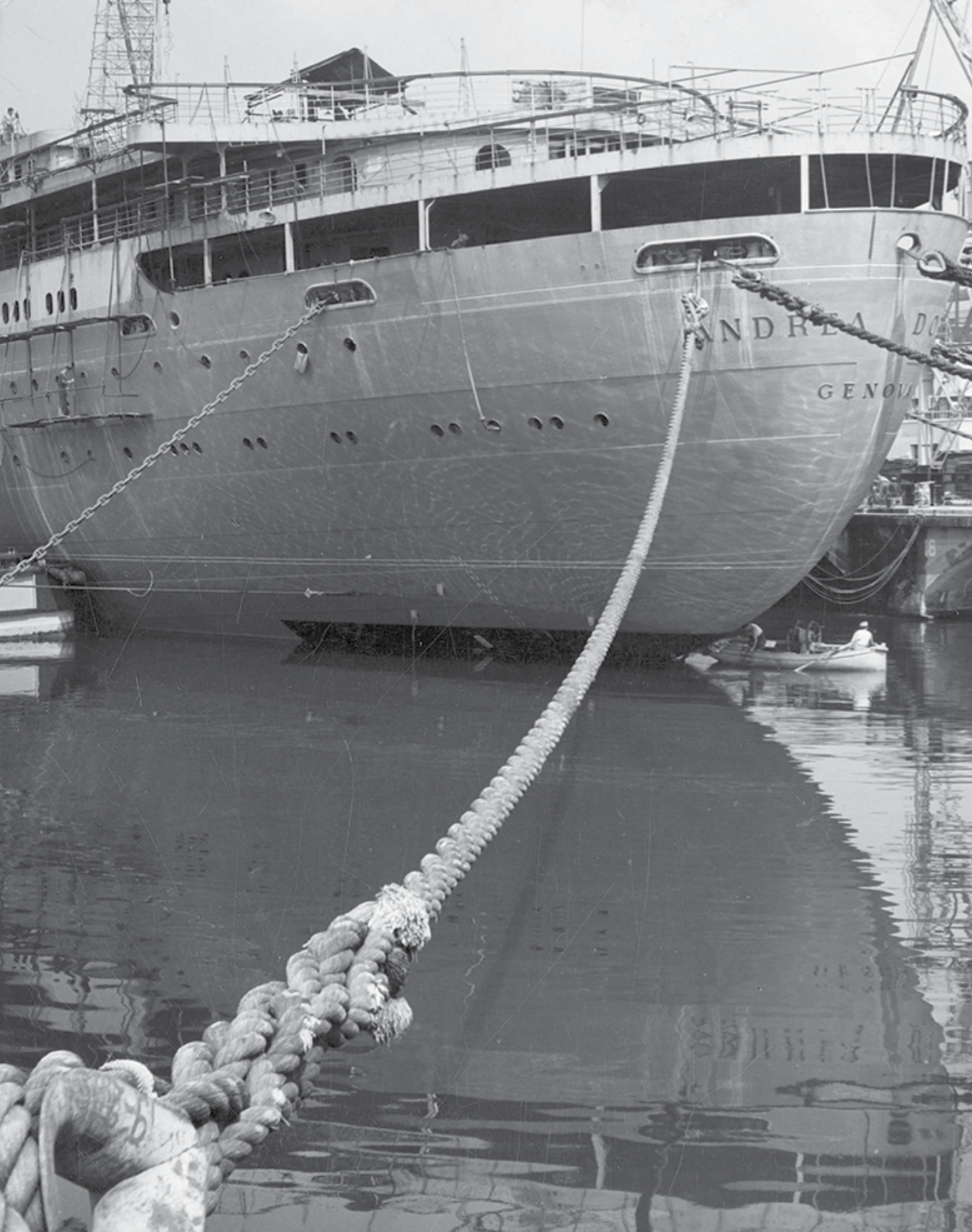
COURTESY OF MAGENES EDITORIALE

Scuba diving tales in the following interview provide a background, an excuse to bring to the surface some fantastic underwater events and anecdotes, which would otherwise be hidden (forever), in time.



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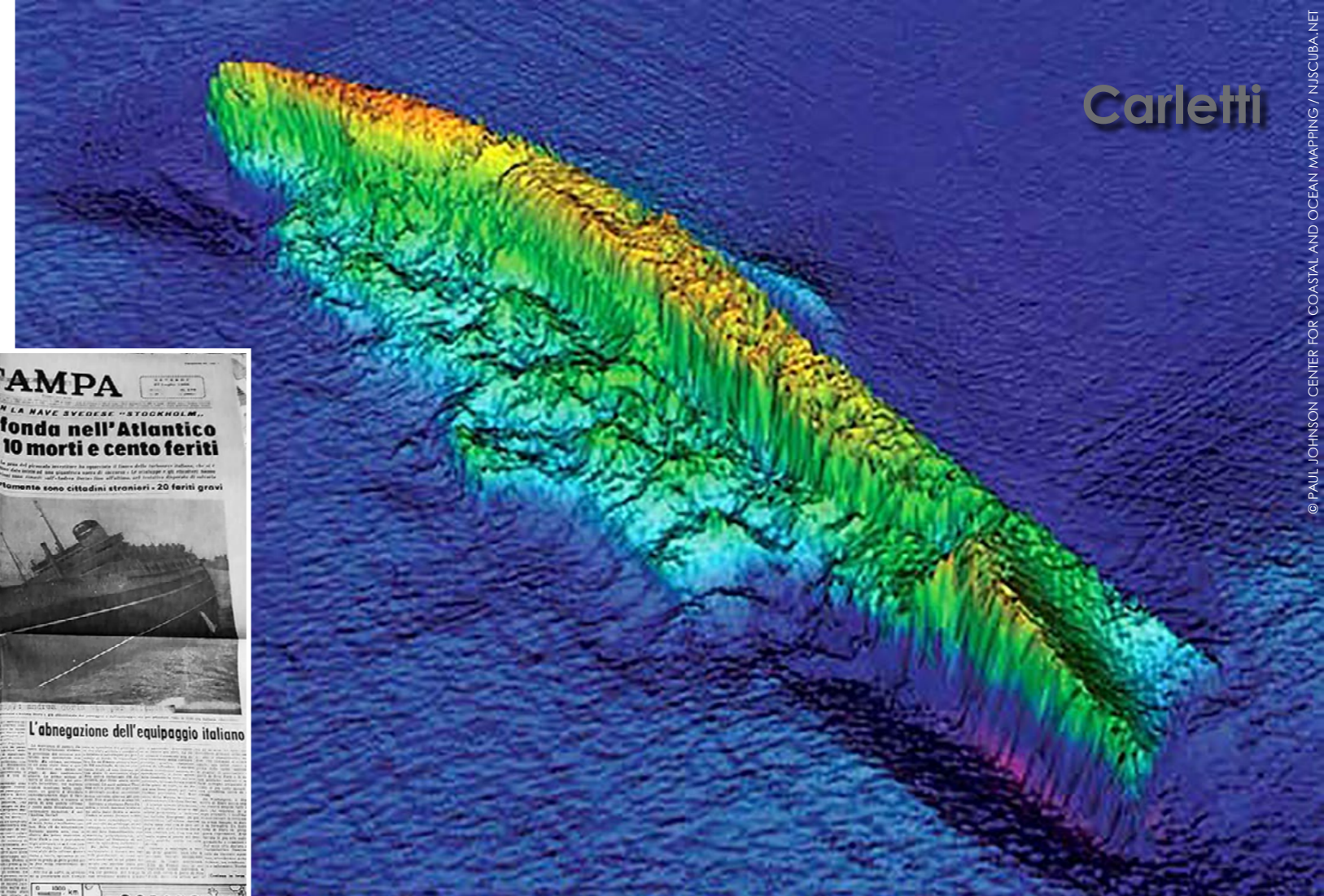


COURTESY OF FONDAZIONE ANSALDO

Andrea Doria in the shipyard. Rare archive image from Fototeca Fondazione Ansaldo (left); Eco-sidescan sonar image of Andrea Doria (right); La Stampa's special newspaper edition on the Andrea Doria sinking (below)



COURTESY OF ANDREA MURDOCK ALPINI



Carletti

© PAUL JOHNSON CENTER FOR COASTAL AND OCEAN MAPPING / NUSCUBA.NE

AMA: Who is Stefano Carletti, today?

SC: Stefano Carletti today is an 80-year-old man, a kind of living anecdote.

AMA: Do you remember the dinner we had one winter evening with Paolo Barone in Rome? He granted us a small ink bottle, which he had salvaged from the wreck of the Laura C., which sank

off Calabria's shore. Our conversation started there with an ink pen and some stories to be recalled and told.

SC: Of course, I remember that great dinner we had together in Rome. One of first ice-breaking questions was about the practice of writing, a world that we both love. Writing is an activity that has been with me throughout my life—one which I

have never given up, by the way, to go to the sea.

At present, I own a small fishing boat that makes me happy during summertime, from early June to September. Usually, I sail the central and southern Mediterranean Sea. Sicily, Sardinia, Tunisia and Libya are my favorite spots where I have gone fishing over the decades.

Fishing is an expression of freedom for me. This activity allows me to return to a special spot I have been visiting for 40 years. Year by year, I go back with a bitter smile, though. Everything has changed, for the worse.

I am still a scuba diver too. I have not abandoned diving. I don't pass up opportunities to dive with good friends. I look at the sea with different eyes though, from the ones I had as a boy.

AMA: Do you see yourself as a scuba diver or a fisher with scuba gear?

SC: The world has changed. Once, a long time ago, the main goal of diving was to hunt fish. Everything was held to the limits that freediving had imposed in those times. Scuba gear changed the scenario: We could go deeper and stay underwater longer. We had, for the first time, the chance to catch huge-sized fish. We felt we were hunters more than scuba divers.

I never polluted the sea, but 56 years later, I am aware that I have taken advantage of it. Mine are not the confessions of an old man. I was aware of it at the time but can admit just trying to survive in life had pushed me to it. I have written a book some decades ago entitled *Naumachos*. In it, there is a chapter that talks about a sort of regret. But it was a different time then, with different rules.

Sponges, red coral, fishes, ancient Roman urns and wrecks... that was what

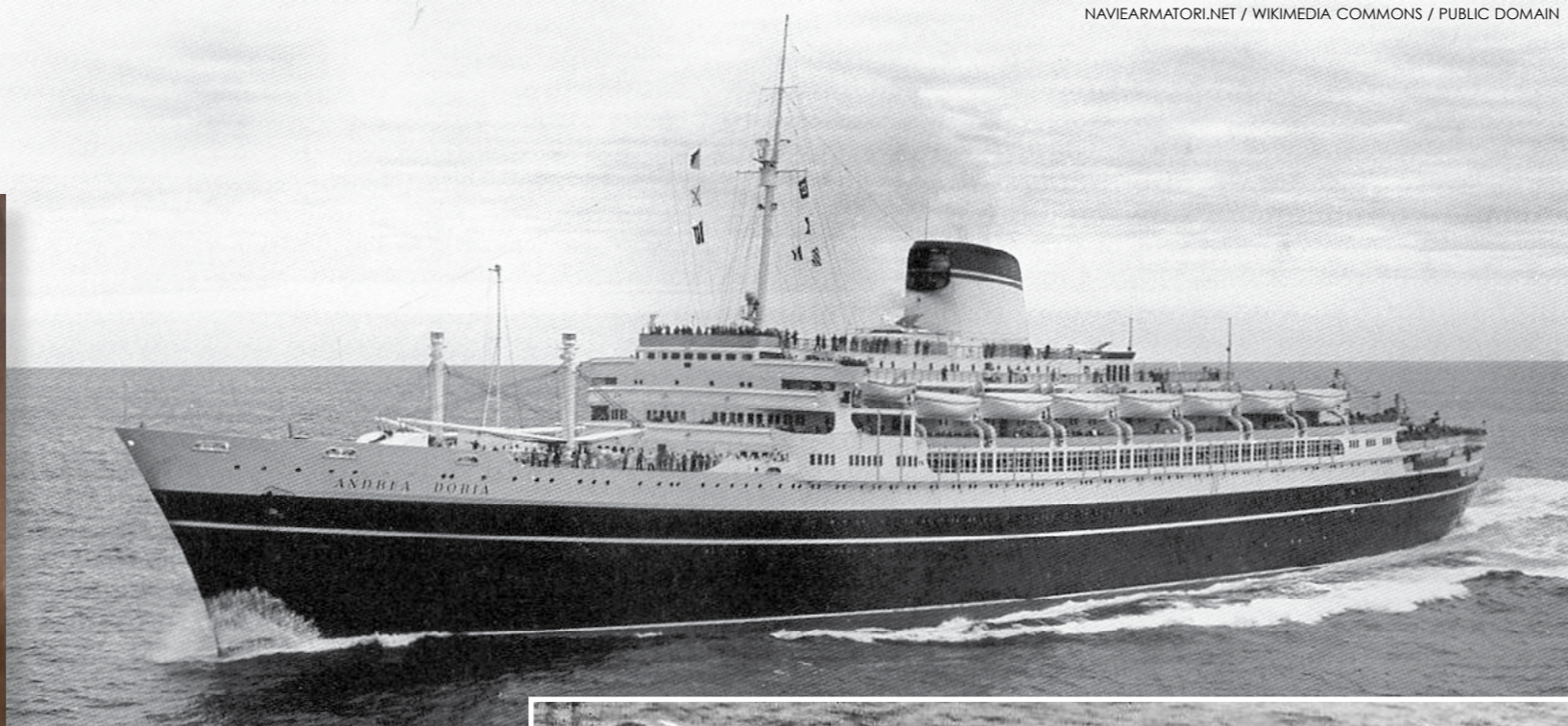
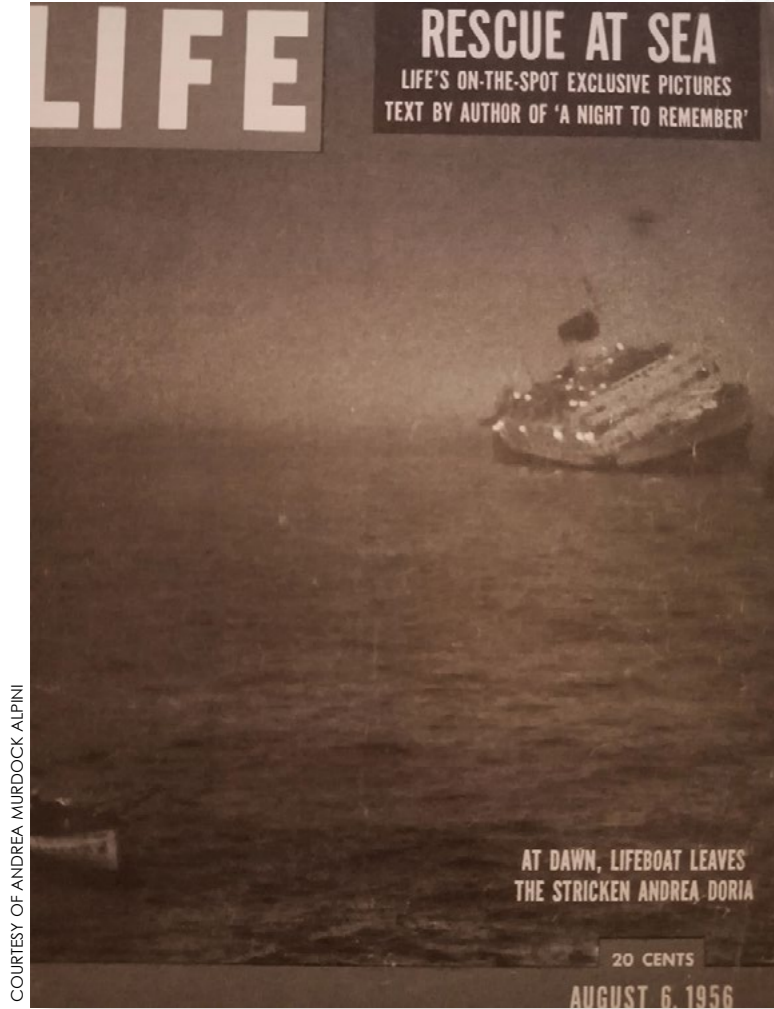
I have hunted in my life to earn my daily bread. We did stuff back then that was nearly illegal. Probably, if you tried to do the same today, you would go to jail. Back then, the sea belonged to all who were crazy and brave enough to explore it.

Wrecks? Those were considered *res nullius* (nobody's thing), as the ancient Romans used to say. Wrecks never belonged to anybody. There were no rules on this matter back then.

AMA: How was the idea to film the wreck of the Andrea Doria born?

SC: That is a very funny story. The whole idea was born while Bruno Vailati was on board the minesweeper *Giaggiolo*, a ship that belonged to the Italian Navy. In 1967, Bruno was sailing on board this navy ship, heading to Lampedusa Island (a remote and small Italian island close to Tunisia's coast). At the time, I was making a living on the island as a shark hunter, and you know, *Doria* was famous

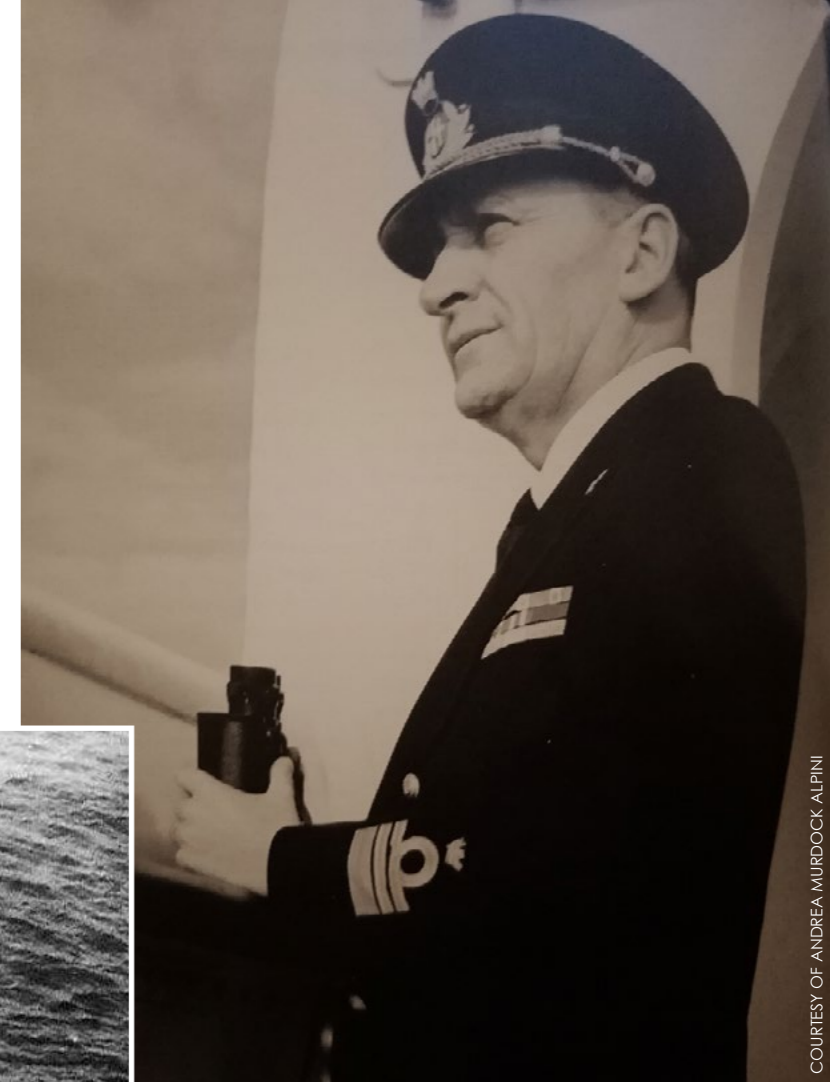




The *Boston Evening Traveller* photographer Harry Trask's 1957 Pulitzer Prize-winning photo of the half-submerged SS *Andrea Doria*, after colliding with the Swedish ship *Stockholm* off the coast of Nantucket Island, Massachusetts, in July 1956 (right); *Life* magazine issue on the *Andrea Doria* sinking (left)



HARRY TRASK / BOSTON EVENING TRAVELLER / WIKIMEDIA COMMONS / PUBLIC DOMAIN



Piero Calamai, Commander of *Andrea Doria*

were here, I could break it down bolt by bolt... have you seen how many wrecks I have dived?"

Some months later, in wintertime, I saw Bruno again to work together on the footage we filmed during the summer. Once again, Bruno caught me by surprise: "Stefano! Prepare yourself for a press conference. We are announcing that we will arrange an expedition to the wreck of the *Doria*!"

I didn't know anything about this beautiful ocean liner except the chronicles of its sinking. I didn't have an exact idea of where it was. The Expedition Board asked us to conduct accurate historical research and write a report after each dive we made on the wreck.

As I began working on this matter, I found an air of mystery about the sinking and the wreck. The LORAN coordinates taken by *Doria*'s commander, Piero Calamai, were kept confidential by the US Coast Guard and US Navy. Most of the information I found was inaccurate;

journals had conflicting reports and a lot of details were wrong.

The whole story needed to be told. Our expedition has been written into history as a large-scale expedition, but honestly, we only sailed there for a great adventure.

AMA: What did the *Doria* represent to you at first glance—a ship or a wreck?

SC: The *Andrea Doria* expedition was born from a sort of afterthought. I was just following the intentions of the filmmaker, Bruno Vailati, to film an Italian wreck,

which sank in difficult conditions. Not only the sea's surface conditions, but also conditions underwater, was something that evoked our interest in the wreck.

Our goal was to capture good quality images of the ocean liner from the seabed to create an episode for the [documentary] series, *I Sette Mari*, an Italian television production. We were not yet fascinated by the *Doria*. We went to the United States to do a job. Emotions, at the time, played a small role in our trip; we were not engaged with the ship or the wreck.

AMA: "Death wreck," a "fatal scuba dive," the "Mount Everest of scuba diving"... These are some of *Doria*'s nicknames. Do you agree with these points of view?

SC: My dives on the wreck had been done with a Technisub wetsuit and a 12-liter twinset filled with air. Our scuba

for sharks. Bruno was preparing a series of marine life documentaries entitled *I Setti Mari* (*The Seven Seas*), and was interested in filming some WWII wrecks that I had discovered on the seabed, whose stories were completely unknown.

One evening, Bruno invited me on board *Giaggiolo* to bug me. He reminded me that the group of French explorers led by Jacques-Yves Cousteau failed in their attempt to document *Doria* off the Nantucket shoal. I decided to play a joke on him, and what I said was partially true... I told Bruno I was linked with a member of Cousteau's crew.

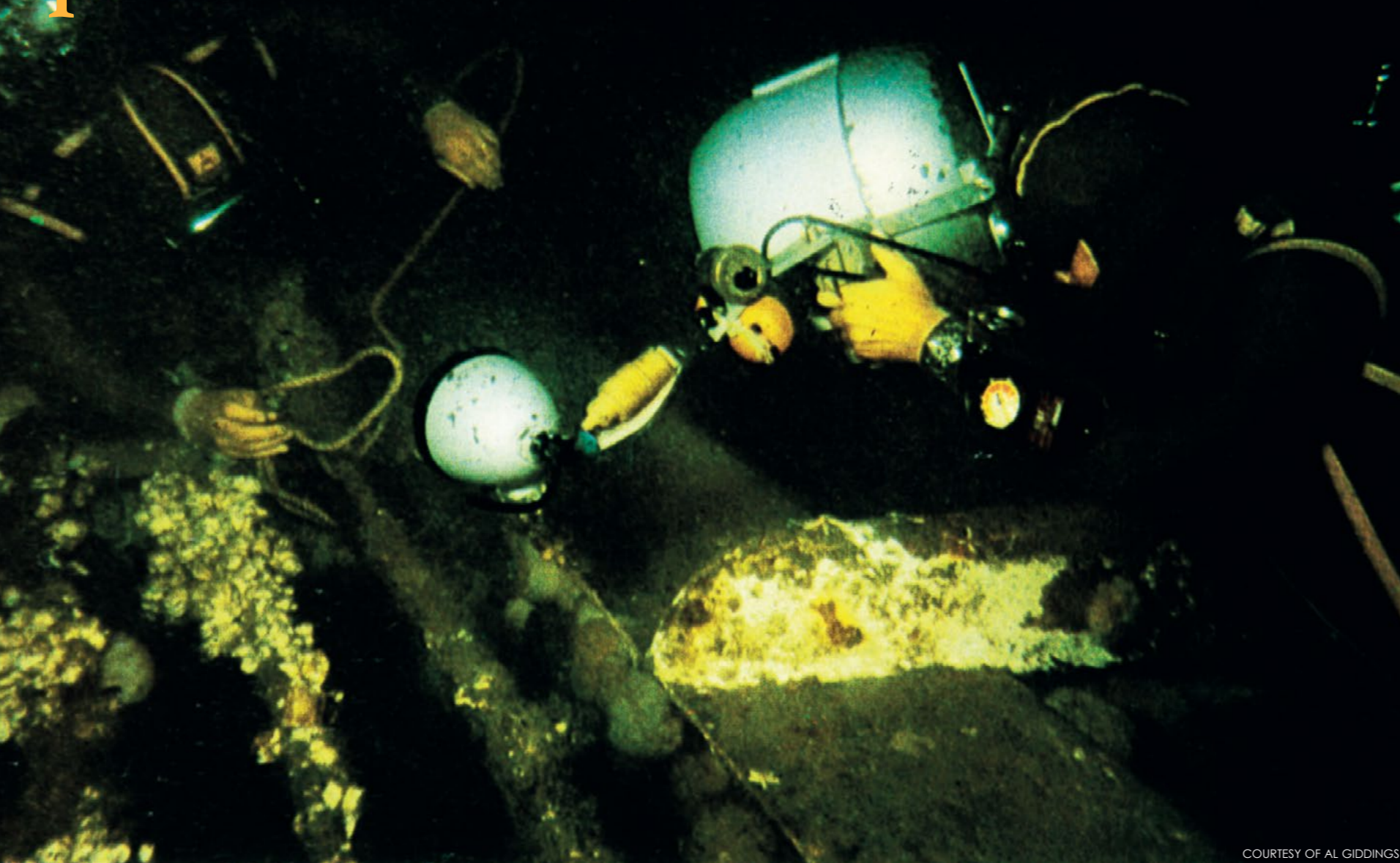
So then Bruno told me all the details of the French expedition to the *Doria*, shoot by shoot, and he also mentioned the remote research vehicle that they had lost during their work on the wreck. I was very intrigued by his report. Finally, I said: "Bruno, look, if the *Andrea Doria*

COURTESY OF ANDREA MURDOCK ALPINI

COURTESY OF ANDREA MURDOCK ALPINI



Bruno Vailati filming Stefano Carletti on *Andrea Doria* wreck (left); Italian *Andrea Doria* expedition boat's deck, 1968 (below)



COURTESY OF AL GIDDINGS



COURTESY OF BRUNO VAILATI

lights [back then] felt like candles compared with modern lights [of today]. I used to bring a hemp rope with me to the bottom for use as a main line in finding the way back to ascend [to the surface].

Today, on YouTube, one can see short videos or images of divers who have recently dived the wreck of the *Doria* in the wrong way. Most of them bring to the bottom of the sea a large quantity of useful stuff. However, the equipment itself makes the *Doria* dive dangerous, not the wreck. I am sure that poor technical diving skills and weak physical preparation put the divers in a place of no return... "a cul-de-sac."

Finally, I can say that the media and scuba reports communicate in the wrong

way how to approach the wreck; they have transformed a moderately difficult dive into a "fatal dive."

The *Andrea Doria* wreck does not deserve to be placed into the black chronicles of scuba diving. I think it is imperative to rethink the current way to approach and dive this amazing wreck—probably more lives could be saved in the future.

A dive becomes "fatal" if the diver makes it so. The wreck has no responsibility at all.

AMA: *Andrea Doria*—from *Dolce Vita* ocean liner to legendary wreck. People say that, nowadays, there are more pieces of her stored inside American

homes than on the seabed off the Nantucket shoal. Year by year, the *Doria* is cannibalized by divers from around the world. Did you collect any memorabilia during your exploration?

SC: Oh, no! I had never removed any relevant memorabilia from the *Doria* wreck. Most of our dives were done in the exterior parts of the ship. Only a few times did we go inside the wreck. I went to the command deck; I remember the helm and the stunning windows. Actually, I have only memories from the job I did on the *Doria*, nothing more.

AMA: In the early words of this interview, you said that the "sea is a kind of amni-

otic liquid." What meaning do you give to sea?

SC: Indeed, the sea has a moral and aesthetic sense for me. The sea has become a primary biological requirement over the years, a mental state of mind. Due to this, it is simple for me to tell sea-based stories in my novels. I feel like the sea loves me.

In 1973, I was sailing on board a regatta in the Lion Gulf (France). During the storm, we sank. I was the only sailor to survive; the other six members of the crew died. I was rescued by a French cargo ship.

AMA: A while ago, you told me about an amazing adventure you had on board your private ultralight airplane—landing in Somalia on the Eastern Horn of Africa....

SC: We landed close to Cape Guardafui. A few months earlier, I had been sailing the Mediterranean on my fishing boat, when I came alongside a group of French adventurers who told me about some amazing places filled with treasures. When I got back to Rome, I decided to search some old aviation charts to find some airstrips. I pinned on the chart some locations for my P-68 fuel refills, and I started loading up cargo.

The city of Cairo in Egypt was the first stop. When we disembarked the aircraft in Somalia, we headed off in a Zodiac Mark II with a marine Evinrude 20CV motor, a Bauer air compressor and three pairs of twinsets. We had a great adventure! Unforgettable.

AMA: Ok, let's come back to our starting point, the *Doria*. At the end of the first



THIS PAGE: Photos from the 1968 *Andrea Doria* expedition. Carletti prepares for a dive on the wreck (left and above); Carletti enters the water for a dive on the *Andrea Doria* wreck (right); Carletti touches the wreck of the *Andrea Doria* (top right).

dive to the wreck, the filmmaker and expedition leader Bruno Vailati said, "We turned back and we looked at her." For the first time, he appears melancholic. At the end of the expedition, the great filmmaker seemed to set aside the practice of placing the job before the ship, and he let feelings come up to the surface.

SC: The last dive we did was done in incredibly flat and calm sea conditions with no current. The visibility, for the first time, was stunning. I can probably say it was the only dive I had on *Doria* with crystal-clear visibility. It seemed that the wreck was showing itself to us.

During the previous 21 dives, we never really saw the *Andrea Doria*—we had only an idea of her. In some ways, the strong current and the cold water with tons of plankton hid the wreck from our gaze. I can say that our dives were more tactile than visual. What was in front of our eyes could have been a common ship. I only knew its name when I brushed silt, letter

by letter, from its beautiful name on the hull. I will never forget when the name "*Andrea Doria*" appeared to me. It's true, when we did the last dive, we said "Arriverderci" to the ship.

AMA: What is a wreck to you?

SC: A wreck, first of all, is a terrible loss—economical, psychological and human. A wreck is a part of humanity that ends up on the seabed.

Afterthoughts

Andrea Doria was launched in Genoa in 1951. Two decades later in 1971, a son of the same city, Fabrizio De André, composed a vinyl record inspired by *The Spoon River Anthology* by the American poet Edgar Lee Masters. The disc's title track, "Non al denaro non all'amore nè al cielo" ("Not to money, nor to love



or to heaven"), describes well the pure spirit of Carletti. He has loved, dived, flown, discovered, written, explored wrecks and bequeathed his stories throughout his lifetime.

The Italian expedition to the *Andrea Doria* was "provocative" and demanding. More than 50 years later, the film by Vailati has found a cult following and the famous book from Carletti, *Andrea Doria -74*, is now a collector's item for wreck enthusiasts. Yes, by the way, we are lucky enough to have a restored edition published in 2021.

Thinking on it, the *Andrea Doria* has hundreds of meanings for

Italian scuba divers. History for us is a base layer upon which we set up our projects. The daughter of Commander Piero Calamai reported that her father, a few minutes before passing away, asked: "Did I rescue all the passengers?"

The *Andrea Doria* wreck belongs to everybody. Divers might steal memorabilia from its skeleton or respect the memory of its glorious past. In the end, it does not matter how one approaches the dives on this amazing ocean liner. Ultimately, the *Andrea Doria* wreck will disappear from the Atlantic seabed, but her story will become immortal. Immortality is a destiny reserved only for the great wonders of the world. ■

Based in Italy, author Andrea Murdock Alpini is a technical diving instructor for TDI, CMAS and PSAI. Diving since 1997, he is a professional diver focused on advanced trimix deep diving, log dives with open circuit, decompression studies, and research on wrecks, mines and caves. Diving uncommon spots and arranging dive expeditions,

he shoots footage of wrecks and writes presentations for conferences and articles for dive publications and websites such as ScubaPortal, Relitti in Liguria, Nautica Report, ScubaZone, Ocean4Future, InDepth and X-Ray Mag. He is also a member of the Historical Diving Society Italy (HDSI), and holds a master's degree in architecture and an MBA in economics of arts. He is the founder of PHY Diving Equipment (phidiving.com), which specializes in undergarments for diving, as well as drysuits, hoods and tools for cave and wreck diving. Among other wrecks, he has dived the Scapa Flow wrecks heritage, Malin Head's wrecks and the HMHS *Britannic* (-118m), *Fw58C* (-110m), *SS Nina* (-115m), *Motonave Viminale* (-108m), *SS Marsala* (-105m), *UJ-2208* (-108m) and the submarine *U-455* (-119m)—always on an open circuit system. His first book (in Italian), *Deep Blue*, about scuba diving exploration, was released in January 2020 (see amazon.it). For more information on courses, expeditions and dived wrecks, please visit: wreckdiving.it.



Mexican customs charge dive travellers sales tax on their equipment

Op-ed text by Scott Bennett, with Peter Symes

Underwater photographers who bring their professional-grade camera equipment and housings into Mexico are at risk of being charged Mexican sales tax (19%) on the value of their personal equipment when passing through customs. The underlying policy is obscure, appears to be arbitrarily applied, and Cabo San Lucas, where the bulk of Mexican liveaboards berth, seems to be the most affected point of entry.

When it comes to must-see dive destinations, Mexico's Socorro Islands tops many a diver's wish list. Boasting up-close encounters with giant Pacific manta rays, dolphins, sharks and immense numbers of fish, the diving presents incredible encounters and surprises galore.

However, if you are an underwater photographer with lots of gear, you may get a surprise of an unwanted variety: paying duty on your own equipment.

My own case story

I had the opportunity to visit Socorro in November 2021, and the diving was everything I had hoped for and more. Just getting there proved to be the challenge. Flying to San Jose de Cabos from my home in Toronto necessitated a brief layover in Calgary.

Too brief as it turned out; I made the connecting flight, but my bags did not.

Fortunately, I had arrived a day before the liveaboard departure, and my bags arrived the following day. I decided to go to the airport to pick them up and then head straight to the marina. My liveaboard, the *Solmar V*, kindly delayed departure so I could do so. So far, so good...

After my flight landed, a WestJet agent took me to the arrival hall where my bags were waiting. We then headed to the customs hall, where she explained my situation to the customs agent. I was then told to put my bags through the X-ray

machine. I was then told to open the bag with my underwater equipment. The agent then explained that I was only allowed to bring in one housing. I was in utter disbelief. He then asked what the value was.

Both housings are Seacam, with one purchased earlier this year and the other being five years old. When I told him the value, he informed me I would need an import broker to bring them into the country. My jaw dropped further. "You can't be serious?" I exclaimed.

"These are my own personal items!"

"These are my own personal items!"

Charged US\$570

With the clock ticking and departure looming, I had no time to argue. They had me, and they knew it. Not wanting to risk further delay, I had no choice but to pay US\$570 in duty. The payment was to be made by credit

card only, no cash. To add insult to injury, the payment did not go through, as the terminal did not work.

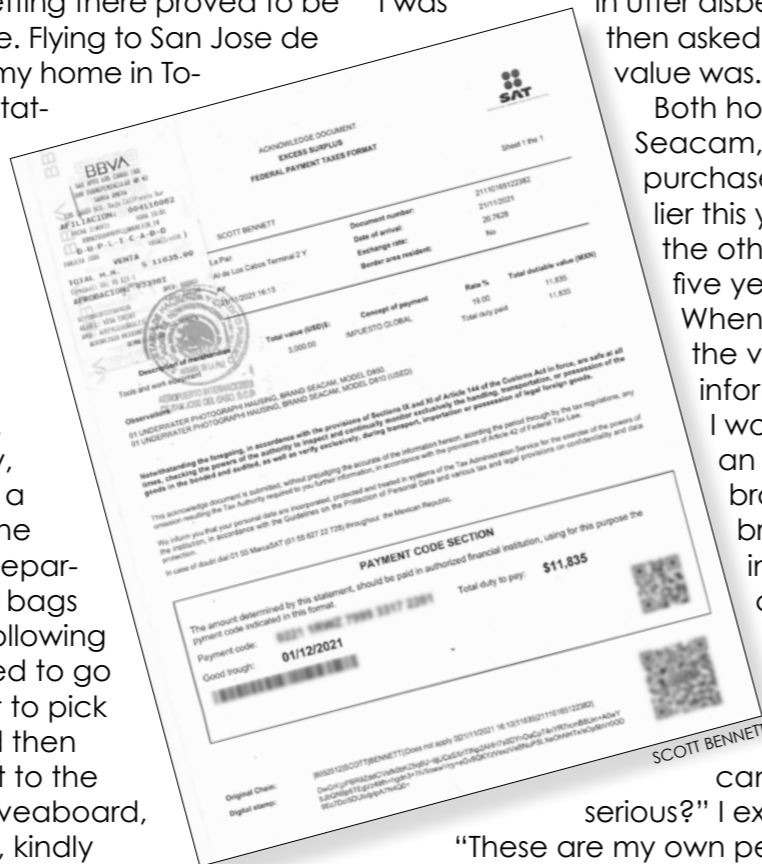
After seven attempts, the agent left to find a unit that worked. I sat there waiting for 20 minutes, frantically sending texts to Pacific Fleet to update my situation. Finally, he came back, and I was able to pay. After stamping the receipt, I was told it would be good for a year. I literally ran out the door, grabbed my bags and headed for the marina.

Once aboard the *Solmar V*, I told the other passengers what happened. Several had heard of similar occurrences happening in Cabo. In the 19 years, I have done underwater photography, I have travelled to 25 countries and territories and have never had anything like this happen before. On a recent trip to Egypt, my bags were X-rayed and opened, but all they cared about was whether I had a drone. (I did not).

Just what is going on here?

It seems the rules are vague or ambiguous. If that is indeed the case, it leaves the door wide open to interpretation and arbitrary handling. Consequently, nobody can be sure of what applies. The entire process is random and unexpected. However, it seems the mere sight of a Pelican case is enough to warrant an X-ray.

Since my return, I have researched



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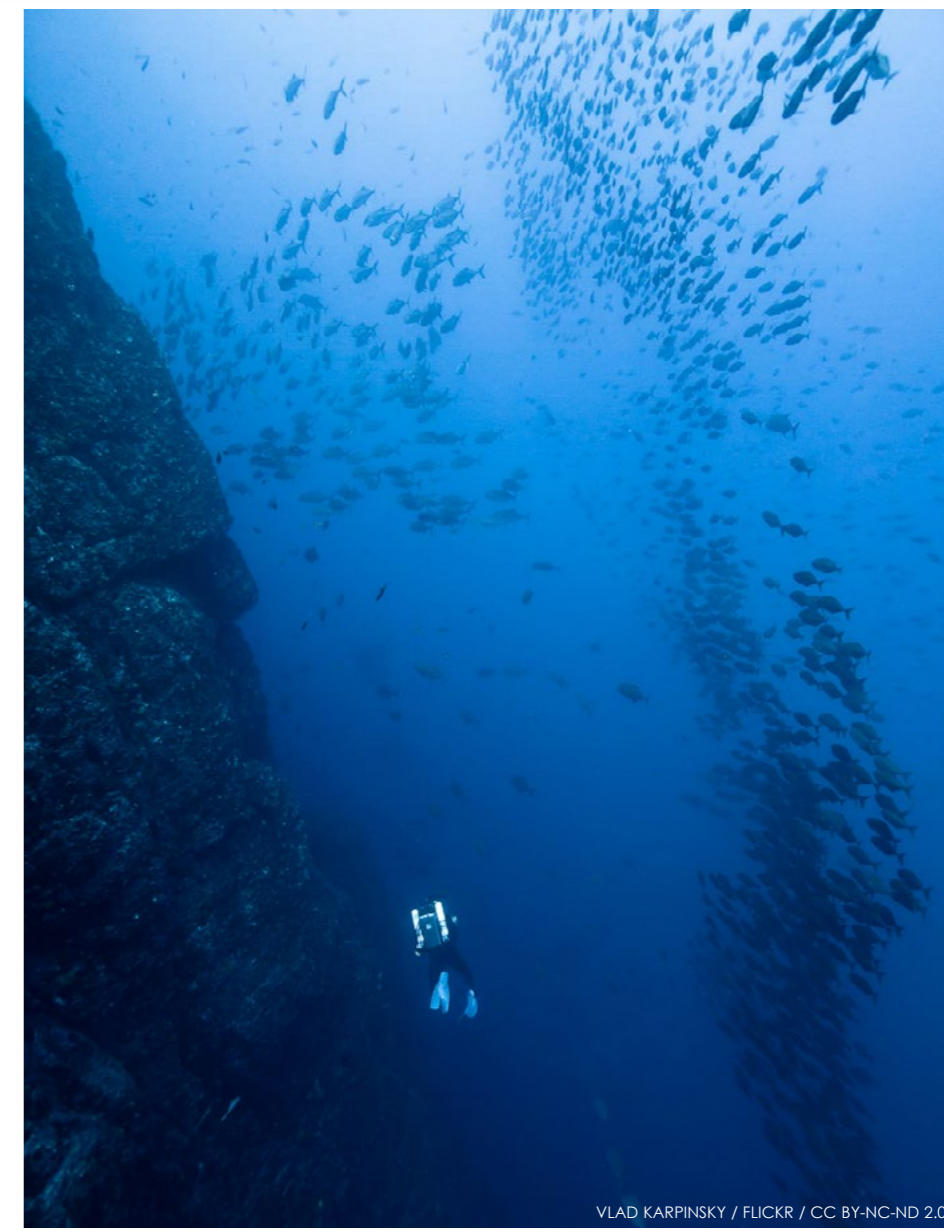
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Diver with wall of fish at Socorro in Mexico





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Socorro's Roca Partida, the smallest of the four Revillagigedo Islands in Mexico

Concerns over imports

Some countries do have concerns about the importation of cameras and equipment. In many cases, however, all that is required is registration of serial numbers beforehand, so border authorities can check that you leave with the gear you brought in.

Preempting the problem

One solution is an ATA Carnet. Established by the World Customs Organization (WCO) in 1961 to facilitate world trade, it is an internationally

would do everything possible to entice visitors, not dissuade them. This so-called "policy" is plainly absurd, as it aggravates tourists and gives them a very bad experience. For some, it is enough to dissuade them from ever returning. Ultimately, what is the point of angering customers and making life difficult for one's tourism industry?

What makes it doubly ludicrous is that many tourists would likely have spent the money on something else within the country. The money for the import duty is coming out of their holiday budget or savings, leaving less to spend on purchases, restaurants or entertainment. In dive circles, it is giving the entire country a bad name, as underwater photographers and divers spend big money on dive trips, especially to remote locations like Socorro.

At the very least, liveboards operating

out of Cabo need to warn customers of this practice at the time of booking. We reached out to *Solmar V* (Pacific Fleet), *Nautilus*, *Rocio del Mar* and *Quino el Guardian* for comment. We did not receive any clarification from the first two before this issue went to press, but we will provide an update if and when we do. Meanwhile, *Rocio del Mar* and *Quino el Guardian* of Mexico Liveboards stated that they were familiar with the issue and even had a post on their website addressing the issue but were not aware of any of their customers ever being affected.

I enjoyed Mexico very much and would love to return. However, if this means paying another US\$570, then sorry, I'll pass. For photographers going through Cabo, be warned: You may get waived through customs, but that random X-ray may lighten your wallet. ■

the matter further and have discovered my experience was not an isolated incident. It did not take many inquiries within the community of established underwater photographers before one story after the other came to light. The emerging case stories came from several personal acquaintances, a couple of big names, a well-known underwater camera store and a travel agent, all of which had quite similar experiences to relate—of being taken completely by surprise and forced to part with a significant amount of money on the spot. These case stories also happened primarily in Cabo.

Apparently, border agents view a certain amount or value of equipment as "professional," which you are not allowed to bring in freely. Or, they are concerned about grey imports—that is, bringing in equipment to sell, or if you act as a courier for somebody else.

By the time this issue went to press, we still had not been able to ascertain the true nature of this fee—whether it was a duty, sales tax or something else. It would

be nice to see some official documents and be able to study their exact wording, i.e. to determine where exactly the limits are, regarding what is permissible to bring into Mexico.

The magazine will continue to search for the relevant documentation and is in the process of seeking comment and clarification from the Mexican authorities. We will share this information if and when it comes to light.

Meanwhile, several secondary sources have referred to the fee as being sales tax (VAT). But if that is the case, the fees should be refunded upon re-export, when you go home, bringing the same equipment with you. But this does not seem to be the case, or at least, it has not been offered. If it is some other sort of duty being charged, why not give a refund upon departure anyway? Whatever the underlying nature of the fee charged, there surely are a couple of better ways to address the mentioned concern—unless the real underlying agenda is to fleece some tourists who may be perceived as wealthy.

recognized customs document for the temporary importation of goods: "The ATA Carnet is an international customs document that allows the holder to temporarily (up to one year) import goods without payment of normally applicable duties and taxes, including value-added taxes. The Carnet eliminates the need to purchase temporary import bonds. So long as the goods are re-exported within the allotted time frame, no duties or taxes are due. Mexico accepts the ATA Carnet in all of its entry points."

Obtaining a Carnet, which you can do from various local or online services, comes with its own fee, but this is much smaller than the duties you risk having to pay and surely will spare you a stressful experience upon arrival.

Bad idea to alienate tourists

With tourism hit hard by the pandemic, one would think a country



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Divers with giant manta ray, San Benedictos, Socorro Islands, Mexico





Pemba Island

— *Diving in Tanzania's Zanzibar Archipelago*

Text and photos by Pierre Constant



Beach lined with casuarina trees at Michamvi, Zanzibar Island, Tanzania (above); Threespot dascyllus, or domino damselfish, at Rudy's Wall. North Channel, Njao Island (previous page)

Pemba Island is part of the Zanzibar Archipelago in Tanzania. Pierre Constant shares his adventure there, which took him through lush emerald forests, home to the Zanzibar leopard and rare endemic species of monkeys, a reserve with Seychelles tortoise, as well as diverse dive sites with a delightful variety of corals and marine species, and ample opportunities for underwater photography.

I was in an authentic patch of Zanzibar's original forest in the south-central part of the island. About one hour's drive from Stone Town, the Jozani Chwaka Bay National Park (50 sq km), last refuge of the elusive Zanzibar leopard, has been legally

protected since 2004, being the home of the rare and critically endangered Zanzibar red colobus monkey (*Piliocolobus kirkii*). I was keen, indeed, to meet the creature in its natural environment.

Once I paid the TZS25,000 entry fee (US\$12), Abdul, the naturalist guide in an almond green uniform, took me for a leisurely stroll through the lush emerald forest. Unexpectedly, it was a rather easy feat to approach the monkeys, which were quite tame and used to the visitors, staring at the tourists inquisitively, sitting on a branch like a human. Gifted with a long tail, this endemic species, which is only found in Zanzibar, is grey with red fur on its back, a white chest, a black face and a rosy nose. A tuft of white hairs rose sideways on the top of its head, like a crown.

About 5,862 specimens are left on the island, with a ratio of 3.42 females per each male. They feed primarily on leaves, unripe fruits such as guava, and the Zanzibar apple, seeds and flowers.



The red colobus monkey becomes an adult at the age of five years, when it can mate. The alpha male must, however, reach at least 12 years of age, before it is able to defend a territory and a harem. Pregnant for six months, the female feeds the baby for 17 months. The red colobus does not like sugar and has to eat charcoal or the bark of the guava tree to compensate for the acidity in their stomach. Friendly and non-aggressive, it may live up to 20 years, and their natural predators are the python and the dog.

Abdul led me farther into the dense foliage, to meet another species of the



School of glassfish in a crevice in the reef wall at Snapper Point, Pemba Island (above); Red colobus monkey sitting on a branch, Jozani Chwaka Bay National Park, Zanzibar Island (center inset)



Sinkhole at Kuumbi Cave of Jambiani, where evidence of human habitation dating to 20,000 B.C. was found (above); Blue Sykes monkey, *Cercopithecus mitis*, at Jozani Chwaka Bay National Park, Zanzibar (right)

Jozani Forest: the blue monkey (*Cercopithecus mitis*). It is rather shy, grey-brown in colour, with a black face and shiny orange eyes. Near Jozani is also the Tortoise Reserve where one can see specimens of the Seychelles tortoise, which was introduced centuries ago by Omani Arab rulers.

Geology and climate

Known as "Unguja" in Swahili, Zanzibar is a low-lying island in the Indian Ocean, 5°72' South and 39°30' East, some 36.5km off the coast of east-central Africa. Unlike volcanic oceanic islands, it was not born out of the sea. Once part of the African mainland, Zanzibar broke off during the Pliocene, roughly about 5.3 to 2.6 million years ago.

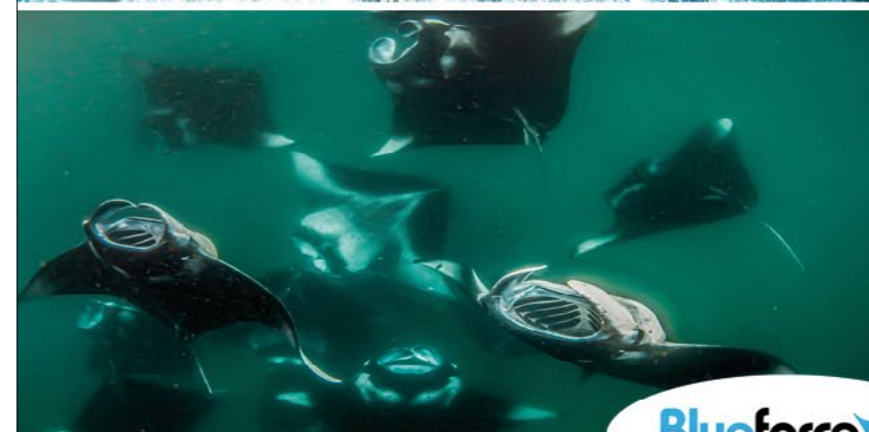
Geologically, it is composed of limestone, uplifted coral limestone, sandstone and sandy clay marl. A rather dry island, some mangroves occur in protected bays of the eastern coast, west and northwest of the island. With a surface of 1,464 sq km, Zanzibar is 85km long and 39km wide, with the highest elevation being a mere 120m above sea level.

Rainfall is influenced by trade winds, which dictate the seasons. Northeastern trade winds blow from December to March and southeastern trade winds from May to October. So-called "long rains" take place between March and May, while "short rains" occur between October and December.



History

At the onset of the first millennium, the earliest migration of Bantu-speaking people brought the Hadimu tribe to the southern and eastern parts of Zanzibar, and the Tumbatu tribe to the northern end. Somehow, the island has been home to humans for at least 20,000 years, since the later Stone Age (as



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MYRIAM DUPUIS



Scenes from Stone Town: Madrasa school on the waterfront (above), Malindi fishermen's beach at Dhows harbour, (top right) colonial house (right), and night market food stall (center)



evidenced by archaeological finds in the Kuumbi Cave of Jambiani).

Swahili merchants acted as traders from the ninth century onwards, followed by Persians, Indians and Arab traders looking for gold, ivory and ambergris. Vasco da Gama's visit in 1498 led to Zanzibar becoming part of the Portuguese empire in 1503 to 1504, when Captain Ruy Lourenço Ravasco Marques demanded tribute from the sultan in exchange for peace. The island would remain a possession of Portugal for two centuries.

If the word Zanzibar comes from the Arabic, it has its origin in the Persian word *Zangbar*, which means the "black coast." Two hundred years after the arrival of the Portuguese, Zanzibar fell under the influence of the Sultanate of Oman in 1698. The Zanzibari elite had invited Oman merchant princes to settle on the island. In 1832 or 1840, the Sultan of Muscat and Oman moved its capital to Stone Town.

Referred to by the locals as the "Spice Islands" for their cloves and other spices, the archipelago became a major trade

route for ivory. With this purpose in mind, Sultan Majid bin Said consolidated its power around the East African slave trade, Malindi in Zanzibar being the Swahili coast's main port for the slave trade with the Middle East. In the mid-19th century, 50,000 slaves transited annually through the port.

Following a revolt of the slaves and the threat of a blockade of Zanzibar by the British, the Anglo-Zanzibar treaty was signed by the sultan. The slave trade was definitively abolished in 1873. In 1890, Germany agreed to recognise the British protectorate over the islands of Zanzibar and Pemba. This came as a consequence of the expansion of the German empire and the imperial partitions of British East Africa with German East Africa in the late 19th century.

Upon termination of the protectorate, Zanzibar became a constitutional



monarchy within the Commonwealth, under the sultan. One month later, in January 1874, the sultan was deposed during the Zanzibar revolution, which led to the creation of the People's Republic of Zanzibar and Pemba. In April 1964, the republic merged with mainland Tanganyika, which in turn became the United Republic of Tanzania, within which Zanzibar remained autonomous.

Stone Town

Stone Town, the historical heart of Zanzibar, is full of croaking Indian or house crows (*Corvus splendens*) and

wandering cats, often in poor condition and abandoned to their fate. It is also a playground to Germans, French, and lately, hordes of Russian or Polish tourists in search of the exotic, the souvenir shops, the spice market and the tropical sun.

Zanzibar also attracts an odd collection of divers, judging by the number of dive centres scattered around the island. My own quest lay farther afield to the island of Pemba, part of the Zanzibar

Inside the hull of Azam Sealink ferry before departure (below)







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Captain Kombo brings the tanks to the boat (above); Pied kingfisher (left)

the first-class lounge. Short-lived was my relief, mind you, as the place filled up with women dressed in black *baibui* (traditional long black robe) with colourful *niqabs* (head scarf) and their assortment of crying babies. The infant concert continued for the whole duration of the five-and-a-half-hour journey, covering the 100km distance to the port of Mkoani.

Fortunately, Eddy the taxi driver of Gecko Lodge was waiting for me upon arrival, giving me a hand with the luggage, and drove me to the very northern tip of the island, on a good tar road for the next two hours. An exception was made for the last stretch of pot-holed dirt road across Ngezi Forest Reserve, farming land for coconut and cassava plantations. After such a long day, I was glad

to arrive at Gecko Nature Lodge, home to Swahili Divers.

Dive operator

Mike, the jolly 65-year-old owner, greeted me with a cheerful, "Bonjour!" This Lebanese-born American—who, incidentally, speaks French perfectly—took over in January 2017, from Raf Jah, the



Crowned hornbill, Ngezi Forest Reserve

row streets of Stone Town early in the morning, I hailed a taxi behind the Omani Arab Fort, and headed off to the Ferry Terminal, where the 800-passenger cargo Azam Sealink ferry was berthed. As anticipated, the port was full of people ready to embark with everything one could possibly think of. Sweating with exertion, I dropped my two heavy bags in a corner of the hold, where they would soon be smothered under a pile of cargo.

Climbing the starboard ladders, with my valuable hand luggage and camera gear, I found the welcome air-conditioned comfort of

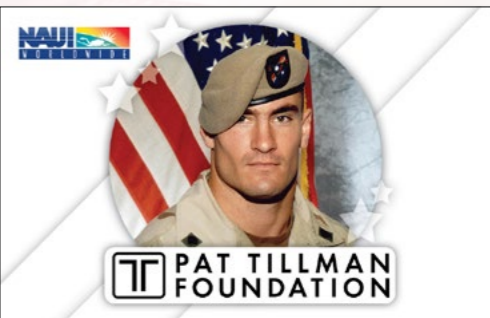
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SCAN FOR MORE INFO!

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On June 1, 2021, the Deputy Assistant Secretary of Defense authorized NAUI to participate in the DoD SkillBridge Program. The SkillBridge Program is an opportunity for Service Members to gain valuable civilian work experience through specific industry training, apprenticeships, or internships during their last 180 days of service.

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SCAN FOR MORE INFO!





CLOCKWISE FROM LEFT: Leafy crater coral at Aquarium; Red sponges at Snapper Point; Black leaf fish at Trigger Wall; Diver with gorgonians and whip coral at Trigger Wall; Large orange sac anemone at Trigger Wall

was African time, you know, so it was delayed a good two hours for, well, logistical reasons! A small 5.5m fiberglass boat anchored off the coral stone beach, was waiting for a 40hp outboard motor to

be fitted first. The Swahili Divers staff included Khalifa, Kassim and Captain Kombo, who had already loaded the dive boat with scuba tanks, gear, cooler and Mike's compulsory fishing rods, in a surf which was rocking the boat sideways like a nutshell.

We had not departed for two minutes when Kassim, squatting at the bow, suddenly yanked his arms up frantically! An iron rod stuck into the reef had punched a hole through the hull. Water was gushing into our embarkation, spasmodically like a geyser. "Well, what a brilliant start!" I thought, with a mischievous smile. We had to jump boats and the 40hp outboard motor was transferred to a new boat in the process.

original British owner (of Turkish and Indian descent) who had launched Swahili Divers in 1999. My wide, square-shaped bungalow was rather spartan but functional, with a central double bed under a mosquito net, on top of an elevated cement platform.

The large cement bench running alongside a wall was convenient for unpacking and spreading out gear. The minimalistic bathroom had a thatched roof of coconut palms. The place felt deserted, for an obvious reason: I was the only guest! After dark, the loud laughter of bush babies resonated in the trees around the natural dining area. This was the end of the world all right; I slept safe and sound with the roar of the surf.

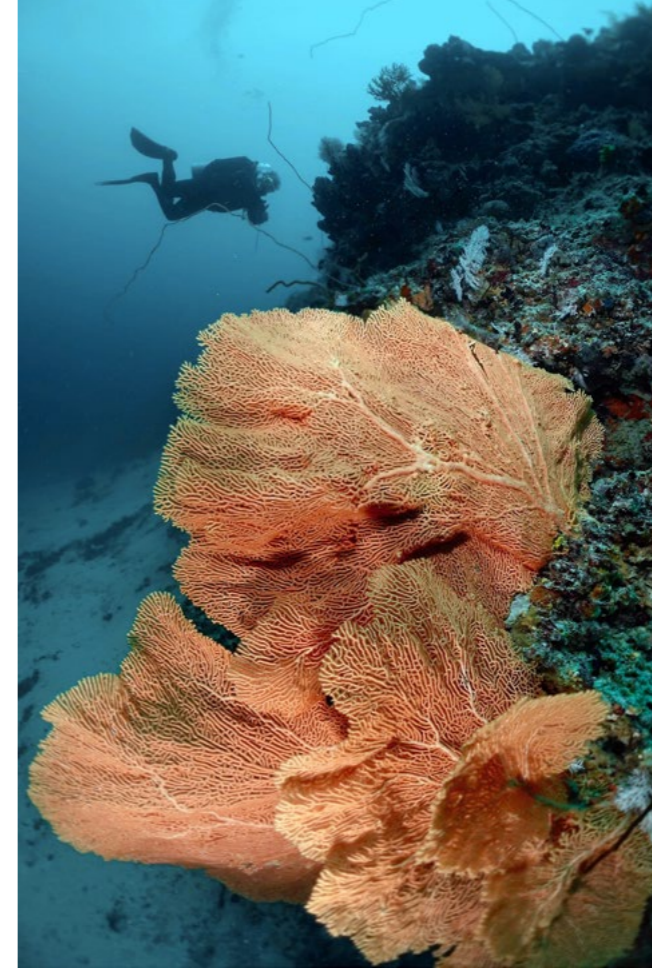
Diving was scheduled for 8 a.m., but this



Diving

The weather was promising, and the sea was a pastel green, with an attractive layer of clouds over the horizon. We headed off for a 30-minute ride on a choppy surface towards the south.

Aquarium. The dive site Aquarium was 200m offshore. We rolled overboard on top of a coral head, full of small fish, fairy basslets and glassfish, but with poor visibility. Upon farther descent, however, to my astonishment, a beautiful garden of leafy crater or disc corals (*Turbinaria mesenterina*) covered the slope in concentric terraces down to the white sandy bottom. Fish life was disturbingly missing, despite streaks of neon fusiliers, a small school of Bengal snappers (*Lutjanus bengalensis*), one spot or slender unicornfish and a lovely leaf fish, which was not in the mood to



pose for a demanding photographer.

We took a break at nearby Njao Island, an uplifted coral reef crested with indigenous forest. The blue and white cooler was brought ashore, with the reef flat at low tide. "Help yourself to chocolate cake and orange slices... Would you like coffee or tea?" offered Mike. The ritual would be repeated daily.

Trigger Wall. The second dive was at Trigger Wall, which was located at the mouth of the channel between the islands of Njao and Pemba. On the surface, visibility was affected by green water. Down below 20m, however, the profusion of gorgonian sea fans in hues of golden orange was a welcome surprise. Here, one could find great opportunities for wide-angle photography.

There were map puffer fish, black leaf fish, blue-lipped and yellow threespot angelfish (*Apolemichthys trimaculatus*), white and orange-coloured lyretail hogfish (*Bodianus anthioides*) and a little school of oneknife unicorns (*Naso thynnoides*). Delightful species of anemonefish in their sac anemones, included the pink skunk clown (*Amphiprion akallopisos*) and Allard's anemonefish (*A. allardi*), which were black with two white bands, a white

DIVE SHEARWATER



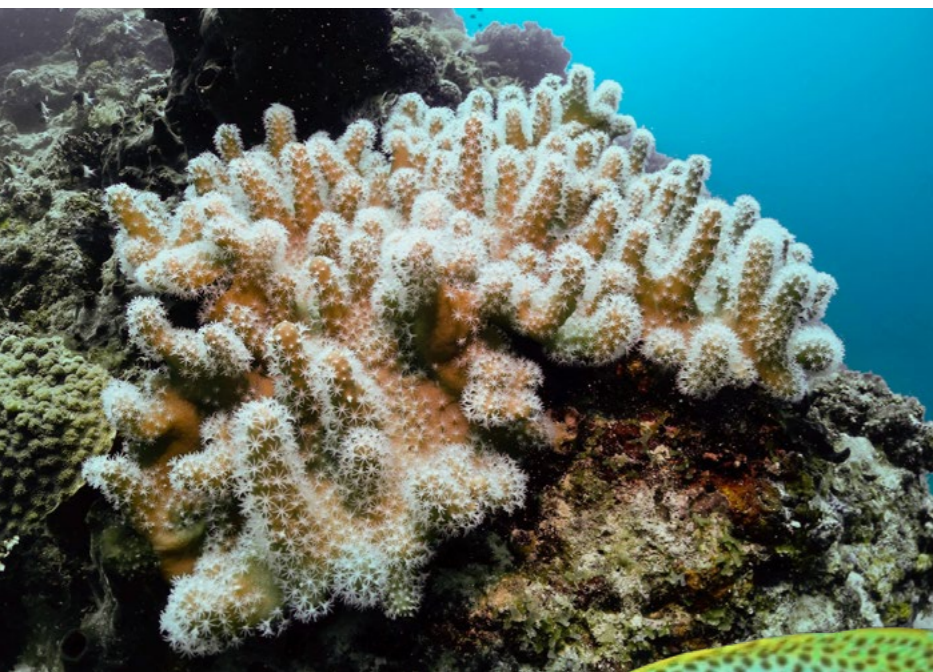
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CLOCKWISE FROM TOP LEFT: Lyretail hogfish at The Crack; Klein's butterflyfish at Fundu; Loading the equipment in the dive boat at Swahili Divers; Allard's anemonefish at Trigger Corner; Bubble coral at Snapper Point; Indonesian sweetlips at Trigger Corner; Soft corals at Fundu

tail and an orange belly—not to be mistaken for the Seychelles anemonefish (*Amphiprion fuscocaudatus*), which is black with two white bands and a black tail. Some of the anemones with red or orange sacs were simply gorgeous.



On our way back to the lodge, Mike threw the lines of his fishing rods into the water. With excitement, he pulled out a beautiful dorado, or common dolphin-fish (*Coryphaena hippurus*) also known as mahi-mahi. It was at least 75cm long,

with a cobalt-blue back and a golden belly. "This will be sashimi for tonight!" he beamed. Addressing Kombo, our skipper, he joked: "I call him Captain Moja (One)," because with him, we always catch one fish. As for Khalifa, I call him Captain *Sifuri* (Zero), because we never get anything when he is the pilot!" He giggled like a naughty kid. Alice, a newcomer, showed up in the

evening. A French woman working in Zanzibar, she would be diving with us for a few days.

The hole in the small boat had been swiftly fixed by Mike, with a powerful resin (sap) applied to the fibreglass. Known as "Kutzi," the southwestern trade winds were blowing. "This is the start of the rainy season," I was told. "*Hakuna matata!*"

Njao Island

The ocean was foaming in the morning,

with white foam cresting the tops of the waves. Needless to say, it led to a bumpy ride for the hour and 15 minutes it took to reach the southern point of Njao Island. Not the best treatment for my underwater camera laying on the bottom of the boat, despite the worn-out, sponge-like cushion Mike provided for it.

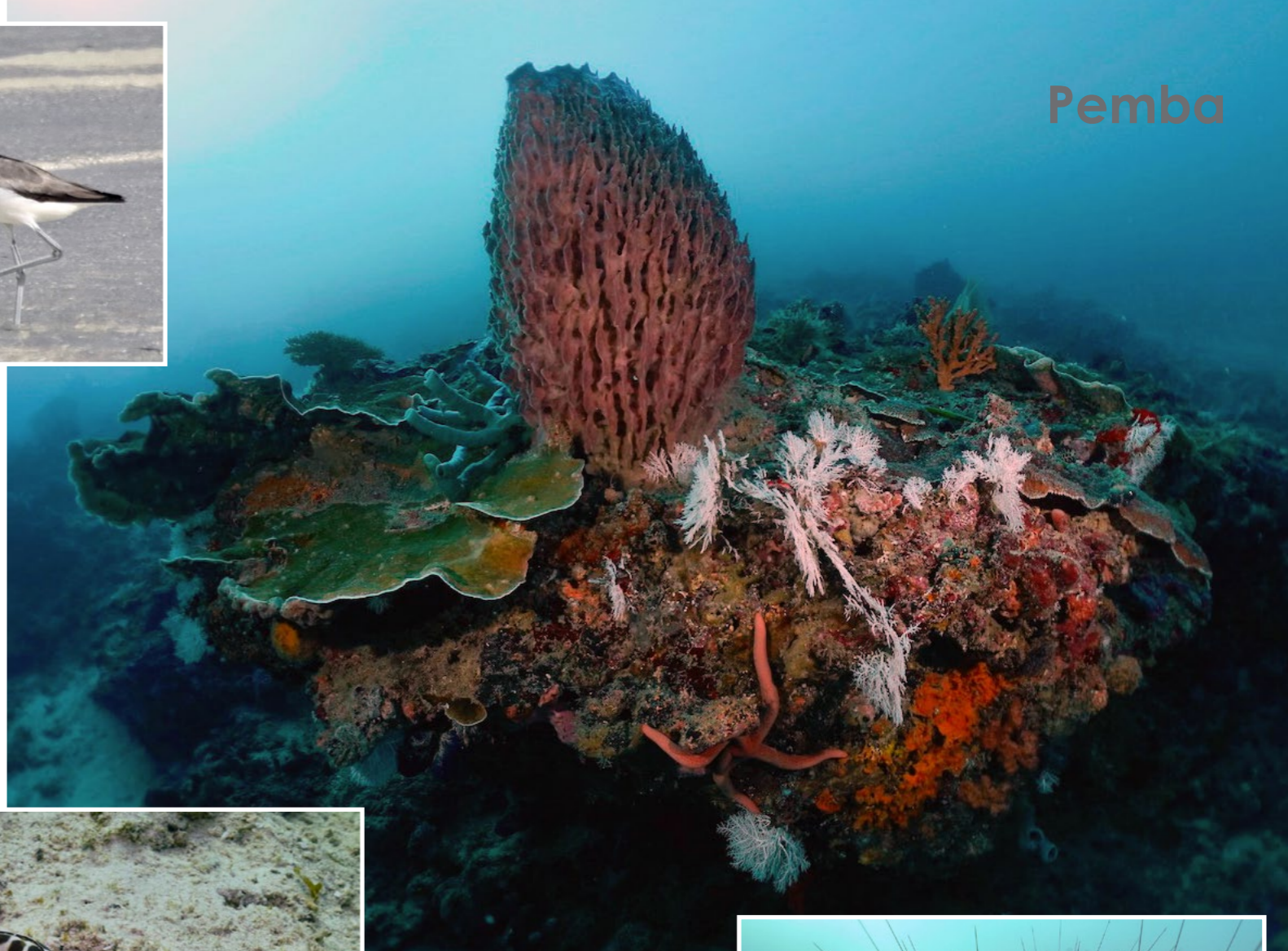
Snapper Point. The dive site of Snapper Point was located at the southern entrance of the channel known as The Gap, located between Njao and Pemba. The visibility would be affected by the outgoing tide. Underwater, lots of leafy crater coral decorated the slope. Clouds of yellowtail fairy basslets (*Pseudanthias evansi*), which were purple in colour with a yellow rear end; guinea-fowl puffer; Madagascar butterflyfish (*Chaetodon madagascariensis*), which had silver sides with a checkerboard design and an orange rear.

At depth, there were black pyramid

butterflyfish (*Hemitaurichthys zoster*), together with a little school of yellow-back fusiliers (*Caesio xanthonota*). Sadly, I saw a number of old fishing lines criss-crossing the sea floor. Despite the 29°C water temperature, I felt slightly cool towards the end of the dive. The sensation did not improve as I came out of the water into the wind.

Captain Kombo steered the dive boat towards the uplifted coral shore of Njao Island, where we soon disembarked, taking shelter under a coralline limestone overhang. Mike slipped away for a stroll. Armed with an old screwdriver and a coral stone, he cracked open oysters embedded in the coralline rock—an instant snack, to the delight of Alice. "Great, but you forgot the lemon!" I joked, with a cheeky note. An enchant-





Dhows, traditional fishing sailboats, at Jambiani (above); Crab plover (top center); Barrel sponge and small white sea fans (top right), diamond sea urchins (far right), and tiger snake eel (right) at Rudy's Wall; Granular sea star at Fundu (left)

"It will still be low tide tomorrow morning," said Mike. "It would make sense to dive in the afternoon, with the incoming tide." I could not agree more. I would make good use of the free time for a stroll on the white sandy beach extend-

ing white layer of clouds hovered over the horizon of the pastel green sea.

The Crack. Our next dive at The Crack dive site was just opposite the first one on the other side of The Gap. Still at low tide, the visibility was disastrous. However, I found a fissure and swim-through in the wall, full of glassfish and plenty of tiny white gorgonian sea fans on hard coral. Mike and Alice vanished ahead of me, and I found myself following a ridge in the middle of the channel. Suddenly, an armada of giant globe-like jellyfish appeared, drifting in open water.

ing beyond the Gecko Nature Lodge towards the lighthouse.

At low tide, women and children were actively collecting *Mwani*, or algae. Seaweed harvest of *Eucheuma spinosum* and *E. striatum* species has been going on in Tanzania since the late 1940s to supply the European and Asian markets.

The greenish-red branching algae is now farmed by locals, then dried up on the trees before export. It is ultimately used as a gelling agent in cosmetics, lotions, toothpaste, medicine and food. In China, it is eaten as a vegetable. Indeed, Pemba contributes to 80 percent



of Zanzibar's exports.

The beach also provides plenty of photo opportunities of shorebirds such as the pied kingfisher (*Ceryle rudis*), the common egret, the blue reef heron, the grey or black-bellied plover (*Pluvialis squatarola*), whimbrel, sanderling, and the exquisite crab plover (*Dromas ardeola*) on tall legs, with a pearly white colour and a thick black bill.

Trigger Corner and Rudy's Wall. In the afternoon, the ocean was like an oil slick. The dives at Trigger Corner and

Rudy's Wall enjoyed optimum light and fabulous cloud formations. At depth, I encountered a school of Indonesian sweetlips (*Diagramma* sp.), one spot or slender unicornfish (*Naso minor*), and a moving cloud of striped catfish. A funny pulsating creature encrusted with algae reminded me of the Papuan jellyfish (*Mastigias papua*). Our second dive into the channel, under the haze of the surface waters, turned excellent below the 22m mark.

Oblivious of us divers, a tiger snake eel (*Myrichthys maculosus*) foraged on the reef. Giant spiny oysters (*Spondylus varius*) hid in the darkness of the wall and snapped shut as soon as they sensed light or water movement. A massive male Napoleon wrasse circled me with inquisitiveness, like a silent Zeppelin, but kept a



respectable distance. Attractive lilac blue tube sponges caught my attention, as did bubble coral and the presence of the charming African butterflyfish (*Chaetodon dolosus*) in the deep. Other species included Meyer's butterflyfish (*Chaetodon meyeri*) and Klein's butterflyfish (*Chaetodon kleinii*). There is such a striking difference when the visibility is top notch that one



Gorgonian at Rudy's Wall (above); Coconut crab (top center) and juvenile coconut crab (center); Cleaner shrimp at Medusa Head (top right); *Chromodoris africana* nudibranch at Swiss Reef (right); Peppered or geometric moray, *Siderea grisea*, at Medusa Head (far right)

finds oneself totally at peace and relaxed within the marine environment, enjoying every breath of the dive.

Another failed attempt to watch the sunset occurred as the sun hid shamelessly behind a layer of clouds on the horizon, so I took a seat in the resort's rustic dinner lounge. Enjoying an ice-cold Kilimanjaro beer for compensation, I waited for a tasty grilled fish with spinach and green papaya salad. Baby coconut crabs in their cute terrestrial snail-like shells roamed about the dining hut floor, curious of our lively presence. "If you are interested, Hamadi the security guard can take you for a night walk to see the big ones," suggested Mike. I shall do so on the following night, I thought.

With an extended range from the Central Pacific into the Indian Ocean, two varieties of coconut crab (*Birgus latro*) are actually found on Pemba Island—the blue one and the red one. "They can reach

over 50cm in length!" assured Mike, dead serious. The coconut crab is legally protected in Zanzibar, but kids still catch them.

Medusa Head and Swiss Reef. On my last day, the wind dropped substantially. The ocean was as smooth as a lake. "We'll try the northern point of Pemba, near the lighthouse," reckoned Mike. The dive site of Medusa Head was known as a cleaning station for various fish species. This was the place to see the lovely peppered moray (*Siderea grisea*), which has a whitish speckled body, with a grey head, spotted with lines of pin-like dots. Sporting a white eye with a black pinpoint in it, this moray was tame and inquisitive. Two specimens shared a den in a tiny hole. I managed to get a few macro shots

of *Phyllidia* and *Phyllidiella* sp. nudibranchs. A short distance away, a red and orange Pacific cleaner shrimp (*Lysmata amboinensis*) played hide-and-seek in between the knobs of some *Pavona* or cactus coral. At nearby Swiss Reef, I was fortunate enough to bump into a black-and-white banded nudibranch (*Chromodoris africana*), which had orange gills and rhinophores, and was munching on a red sponge.

After dark, over a couple of gin and tonics (his drink of choice), Mike surprised me with his amazing collection of nudibranch photos, including one of a Spanish dancer. It was enough to convince me of the abundance of critters in these waters. "Providing, of course, that you visit Pemba in the right season," he

FACT FILE

GETTING THERE
From Europe, there are direct flights from Amsterdam (KLM) and Saint Petersburg.

From Western Asia, there are direct flights from Dubai, Muscat (Oman Air) and Doha (Qatar Airways).

You can fly from Zanzibar to Pemba, or alternatively take the Azam Sealink ferry from Stone Town to Mkoani.

VISA: Visa on arrival costs US\$50.

HEALTH: No PCR test is required upon arrival; however, one is required out of western Europe.

CURRENCY: Tanzanian shilling (TZS)

EXCHANGE RATE: 1 USD = 2,300 TZS; 1 EUR = 2,600 TZS

LANGUAGES: Swahili, Arabic and English is widely spoken.

DIVE OPERATOR AND RESORT: Swahili Divers & Gecko Nature Lodge (swahiligecko.com)

confessed, "you will have a stunning visibility of 40m to 60m." That, indeed, was the final nail in my coffin! "Karibu sana (You are welcome)," he smiled. ■

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, please visit: calaolifestyle.com.

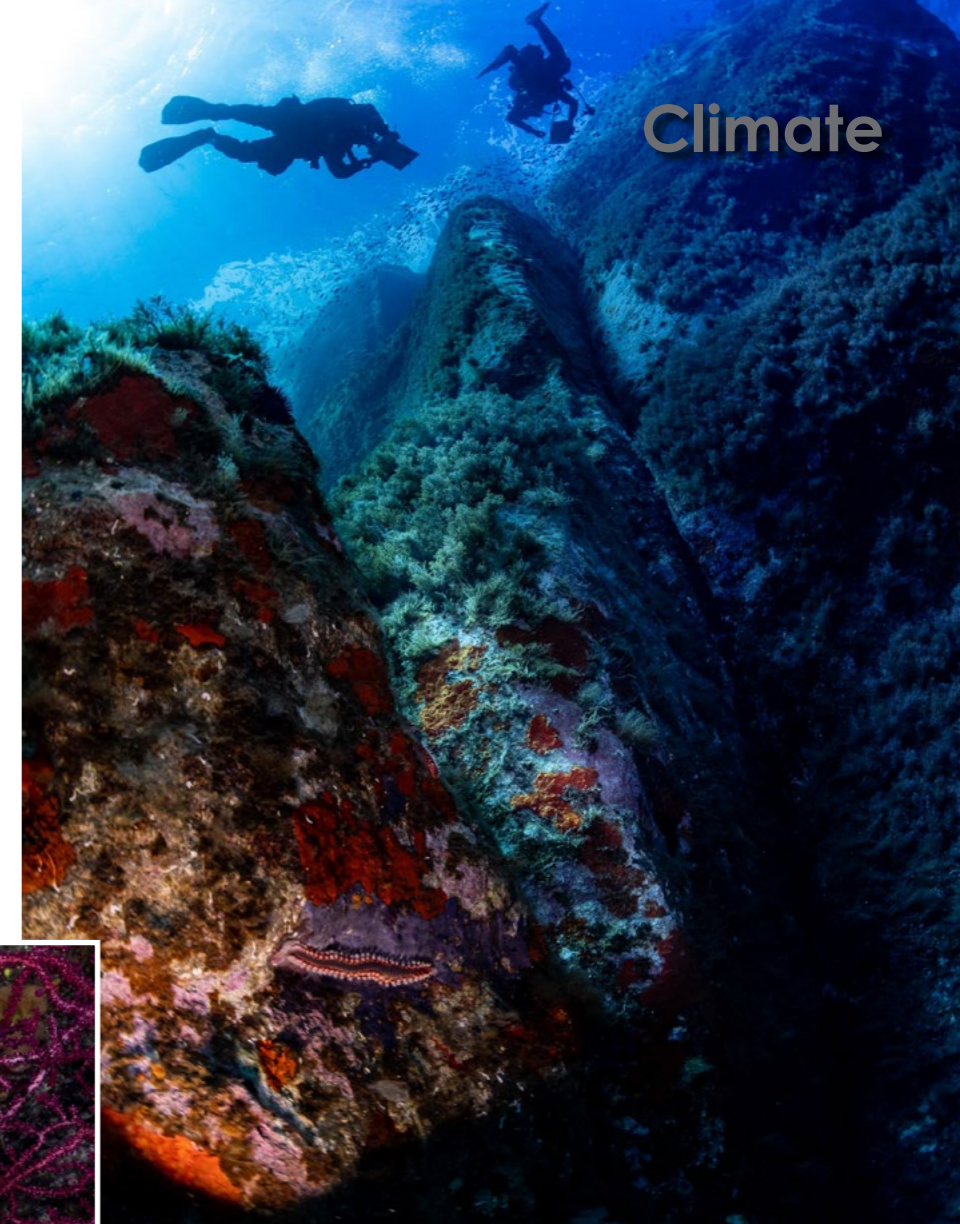
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Climate Change

Text by Lorenzo Moscia & Giorgia Monti
Photos by Lorenzo Moscia

& the Growing Crisis of Our Oceans



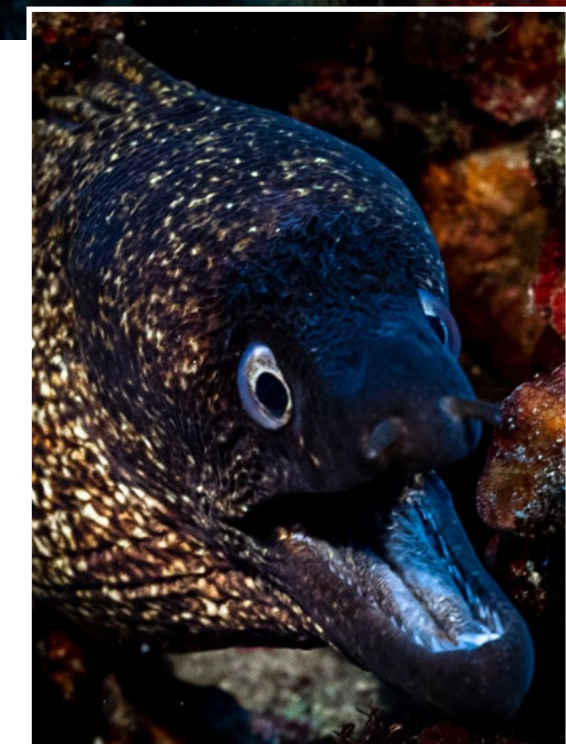
Partially bleached colony of the madreporarian *Cladocora caespitosa*, one of the most important hard corals in the Mediterranean, at Cape Carbonara, Sardinia (above). University of Genoa researchers monitor the health of marine benthic communities in Elba Island's shallow waters, using white slates to annotate data underwater (previous page).

Climate change is increasing the crisis of our seas, already under pressure due to several human activities. Rising temperatures are affecting and changing the underwater environment all over the world. The Mediterranean Sea, unfortunately, is no different from other seas. A group of specialists, coordinated by Greenpeace Italy, are monitoring the situation in the waters around Italy. Lorenzo Moscia reports.

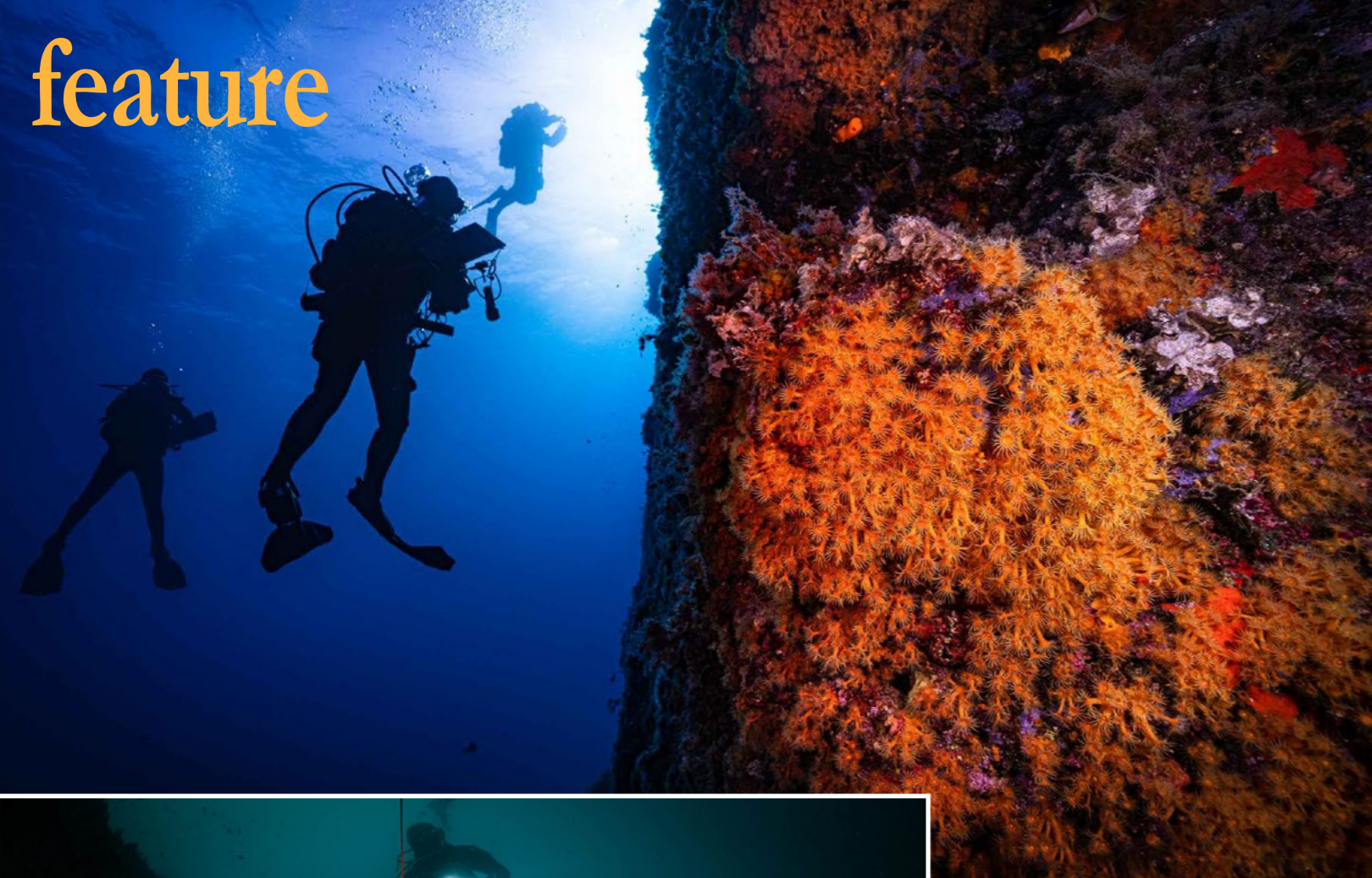
The meeting took place at 6:00 a.m. on the little pier of Sant'Andrea on the northwestern coast of Elba Island, located five miles off the Italian coast of Tuscany. It was late November and recreational dive centres were already closed, as the dive season had finished; however, despite the cold and the grey sky, a group of divers prepared to embark on a zodiac, which would take them to several spots around Sant'Andrea to set underwater thermometers for the Greenpeace Italy's "Progetto Mare Caldo," or "Hot Sea Water Project." My task was to document the job with video and photography. By boat, our destination was just

a few minutes away from the pier. Weather conditions were worsening; we could see several little cyclones forming above the island of Capraia only 18 nautical miles (33km) away from our dive site. "If the wind changes and the cyclones head towards us while we are underwater, let's get off the moorings and go along the coast with the dinghy!" These were the last few words Andrea Romoli, who led the mission, shouted before showing me his thumb-down sign to signal the

ABOVE: On boat (left to right): Marco Sartore, Andrea Romoli and Nicola Rozzi, with sign: "Operation Hot Sea Water." In the water: Giorgia Monti, project manager for Greenpeace Italy. Increased abundance of thermophilus and alien species was found in MPAs monitored during the Hot Sea Water Project, such as the native fireworm, *Hermodice carunculata*, which is increasing in number and observed in latitudes farther and farther north (top right).



Mediterranean moray, *Murena helena* (above), and gorgon star, *Astrospartus mediterraneus* (center), at Elba Island



Researchers from the University of Genoa at work at a wall colonized by *Parazoanthus axinellae* (above); Marco Sartore removes a sensor, after months of marine anchorage, to analyze the collected data (left).

one of the partners in the project; and Giorgia Monti, project leader of the Hot Sea Water Project for Greenpeace Italy.

We reached a depth of 40m, where the first thermometer had to be positioned, and we started working. Everything went smoothly, and an hour later, we returned safely to the surface with the job done. The first pilot station of the Greenpeace Hot Sea Water Project had been placed.

Project expansion

Since that time, at the end of 2019, the project has grown significantly, and now there are nine stations all around Italy, which, every hour and every day, measure variations

start of the descent. His words resonated in my head like a broken record, as the pressure built up.

After the first few moments of anxiety, I quelled any lurking breaths of hyperventilation, pushing away an onset of hypercapnia, and thought that even if the cyclones sailed over our heads, we would somehow be protected

underwater.

We had two 15-litre cylinders each, below the buoy at a depth of five metres. Moreover, I was surrounded by experts. With me was not only Romoli, an incredible dive instructor; but also Dr Marco Sartori, an experienced diver and marine biologist from Elba who headed the ElbaTech lab and was



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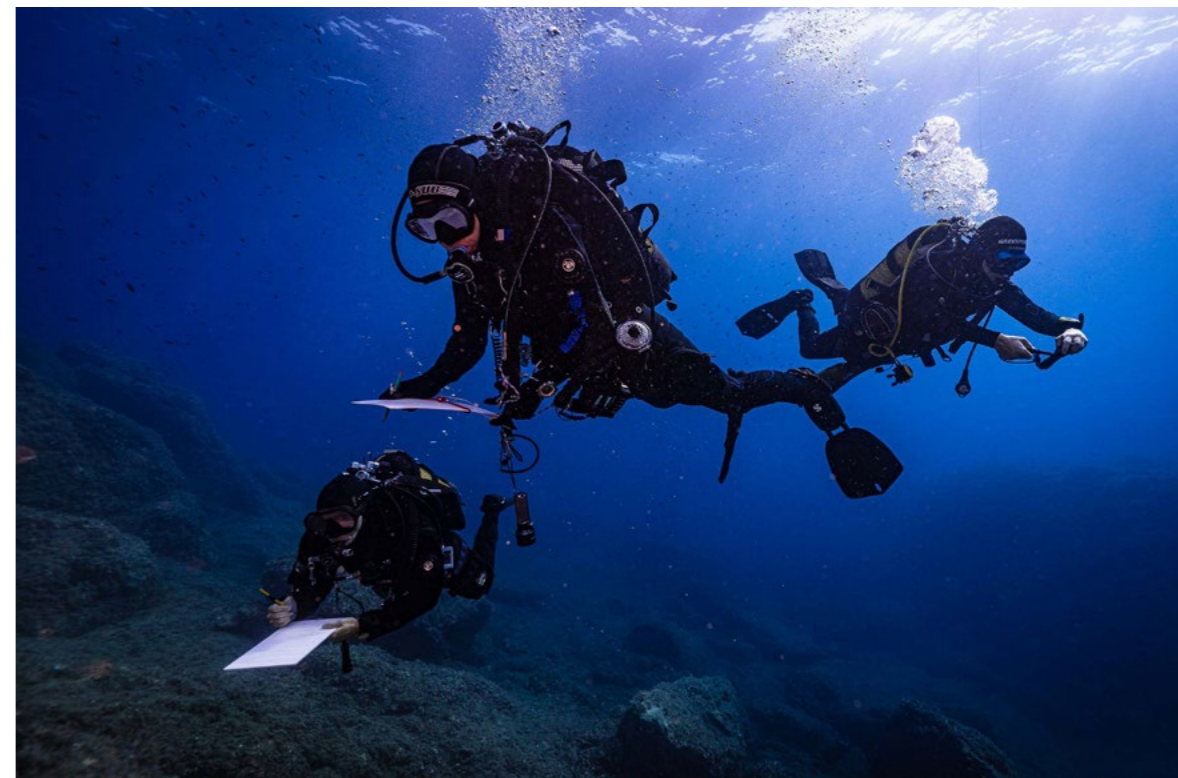
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A common octopus, *Octopus vulgaris*, rests placidly on a rock on the seabed at the Tremiti Islands (left); Aerial view of the island of Serpentara in the marine protected area of Cape Carbonara, Sardinia (above); University of Genoa researchers Monica Montefalcone and Annalisa Azzola collect data on their marine slates, together with project manager Giorgia Monti (right)



Giorgia Monti, who was in charge of the Hot Sea Water Project, points to a sensor positioned in a garden of native green algae *Caulerpa prolifera* on the Sicilian seabed.

in temperature in the water column to see how the rising of atmospheric temperature due to global warming affects the marine environment. After setting up the Elba station, other measuring stations have been placed in eight Italian Marine Protected Areas (MPAs), including Portofino in Liguria; Plemmirio in Sicily; Cape Carbonara, Tavolara-Punta Coda Cavallo and the island of Asinara in Sardinia; Torre Guaceto in Puglia; Miramare in Friuli-Venezia-Giulia; and the islands of Ventotene and Santo Stefano in Lazio.

I have been so lucky to follow the project in some of these areas, documenting some of the most amazing underwater spots around the Italian coast as well as the beautiful wildlife found here, which few may think the

Mediterranean still has.

Together with Monti and two researchers from the marine ecology lab of the University of Genova, the scientific partner of the project, we dived the MPAs of Plemmirio in Sicily, Cape Carbonara in Sardinia and Torre Guaceto in Puglia, where thermometers are now in place and where we monitored the impact of rising temperatures on rocky-reef biodiversity.

Tremiti Islands

In addition, we visited the waters of the Tremiti Islands, where we had been called because the local MPA wanted to join the project. But even if our seas looked amazing through my camera, I was also able to document how fragile they were and

how fast they were changing due to the impact of human activity. After seeing how marine life in the Tremiti Islands had been slowly but terribly impacted, I looked to Monti following one of the last of our dives there and asked: "What can we do?"

"Climate change is impacting marine ecosystems that are already under pressure all around the world," she said. "While we are calling for coordinated and global actions to cut greenhouse gas emissions, it is becoming clear that investments are

needed to strengthen and expand the global network of marine protected areas in order to protect marine biodiversity and give it a chance to adapt to a change that is already underway," Monti said, with the determination of a campaigner in her eyes.

Data analysis

After almost two years, the project has collected a huge amount of data, and the analysis of the first-year data shows that water



Red scorpionfish, *Scorpaena scrofa*, Tremiti Islands (above); *Felimare picta* nudibranch, one of the many colourful Mediterranean species of nudibranchs (top right); An explosion of colours (right)—variable gorgonians, *Paramuricea clavata*, in the depths around the Tremiti Islands

temperatures are raising throughout the water column and throughout the Italian seas, with two heatwaves already registered in the summer of 2020. Researchers are now analysing the most recent data to see if one of the hottest summers registered in the Mediterranean might have also affected water temperatures.

Even data collected during monitoring activities of our group's dives have shown how climate warming is causing radical changes in marine biodiversity, including the loss of iconic Mediterranean species within the coral-igenous habitat, such as the red gorgonian (*Paramuricea clavata*); and the phenomenon of "tropicalisation," with many thermophilus (heat-loving) species moving to the northernmost regions. The data also indicated how organisms in areas protected from local human activities have been more resilient to the ongoing changes.

"The Mediterranean Sea, due to

its nature as a semi-enclosed basin, is particularly susceptible to water warming, so that it has been placed among the regions in the world where warming rates are the highest," said Dr Monica Montefalcone, scientific coordinator of the project for the University of Genova. "Mass mortality events, increased pathogen outbreaks, settlement of alien species with tropical affinity are causing marine biodiversity erosion, with the consequent loss of key species that play fundamental roles in the functioning of marine ecosystems. The scientific community must continue to monitor the state of our seas in order to understand the evolutionary trends of marine ecosystems over time," said Montefalcone, when we worked together in Sardinia.

Looking forward

Today, the "Hot Sea Water Project" network in Italy has become a strong reality. The project will run until 2022. Its objective? To provide key data to develop proper mitigation and protection measures, and to save for future generations the amazing underwater beauty that I was lucky to document. ■

Widely published photojournalist Lorenzo Moscia has been a photog-

rapher for over 20 years and has just recently decided to follow the little inner voice that has urged him since childhood to get serious about going underwater. In the last two decades, he has worked with Greenpeace as a staff photographer in Chile and Italy. It was during this time that he decided to dive underwater and cover some of the campaigns Greenpeace does, which are related to the sea. For more information, visit: lorenzomoscia.com.

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Maar Lakes

of Germany's Volcanic Eifel Region

Text and photos by Claudia Weber-Gebert



Maar Lakes



European perch (above); Waterlily bloom in the maar lake (previous page)

School of fish and submerged vegetation mirrored under the lake surface

What is the origin of the unique lakes in the Volcanic Eifel region of Germany? In short, they were created from an explosion of water vapour when lava from a hot spot under the region met with groundwater thousands of years ago. The explosion created a round funnel, or crater, with earthen walls, which was later filled with rain-water. That is why the water is really clear and has rather good visibility. Author and underwater photographer Claudia Weber-Gebert gives us a glimpse into this beautiful underwater world and her new book about these special lakes.



Juvenile northern pike (above); Aerial view of the maar lakes in Volcanic Eifel (top)



Sun rays pierce through underwater vegetation (left); Pike patrolling amid fronds of watermilfoil (above); Waterlily pads reach up toward the surface (right); School of small fish shelters amongst the lake's vegetation (bottom left).



Maare, Quellen, Wasserfälle: Die faszinierende Unterwasserwelt der Vulkaneifel (Maars, Springs, Waterfalls: The Fascinating Underwater World of the Volcanic Eifel)—this is the title of my book, which was published in September 2021.

The underwater world of this region has nearly been forgotten since diving was forbidden in the 1970s. The Maar lakes are very deep and cold, and many diving accidents happened here in those early days. As a result, the authorities decided to close the lakes to diving.

I have known these lakes since my childhood when our family spent many Sundays during the summer, swimming and boating here. So, I already knew that the water was pretty clear. And until now, no one else had ever published a book about the underwater world of these lakes. But, as already mentioned, diving was not permitted, and the

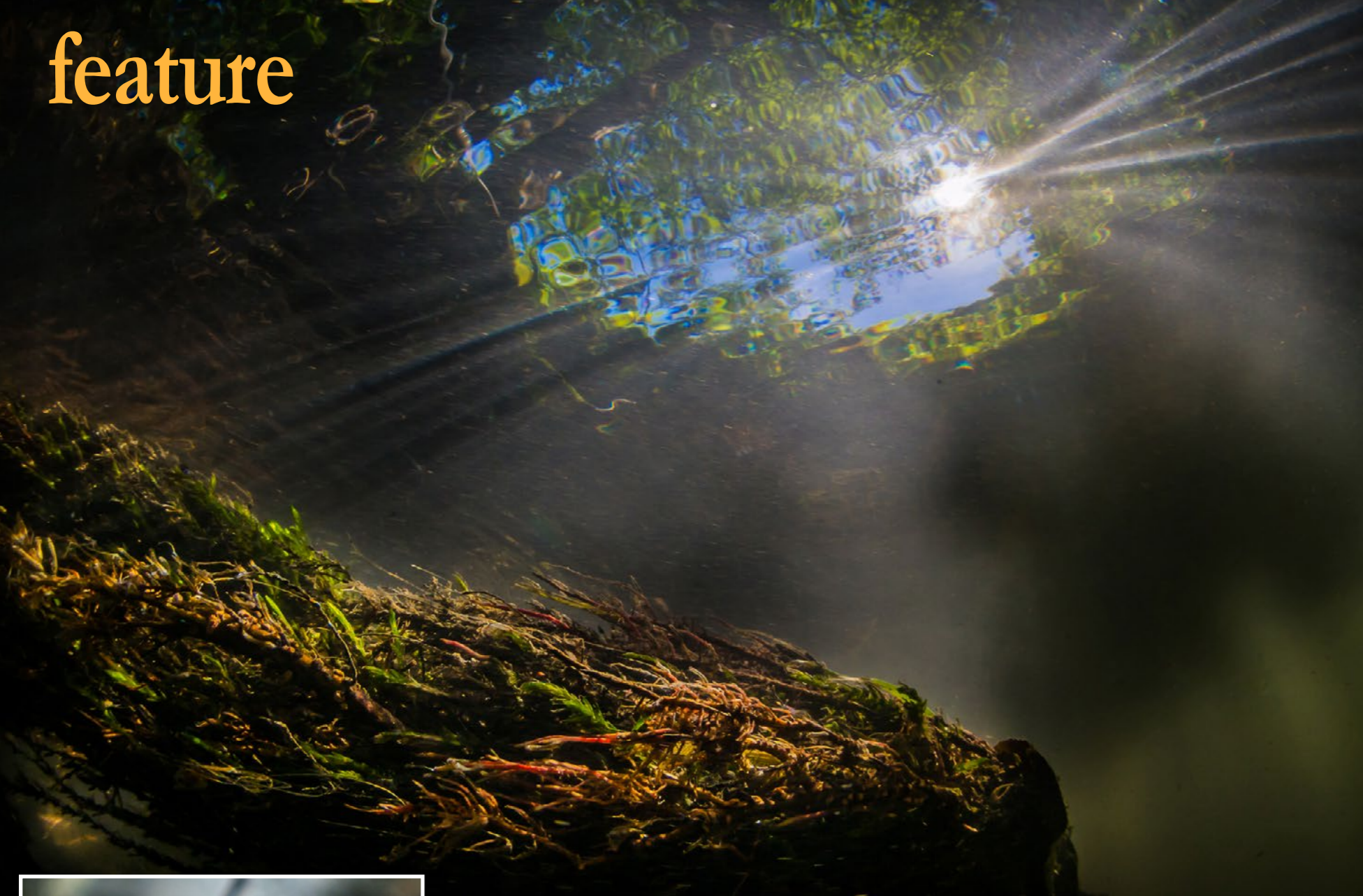
authorities did not give me special permits to do so for my book project. So, I decided to do it simply by freediving.

Freediving challenges

This was not an easy task when one is used to doing underwater photography with scuba gear and strobes. To be more comfortable underwater while freediving, I decided not to use my strobes, but just to capture my images using only ambient light.

The Maars are called the “blue pearls of the Eifel region.” An aerial view of the Maar lakes, however, shows them as blue circles, which are just beautiful and invite one to jump in. And so, I did. I have been freediving the lakes since 2014 for my special book project, which presents the fascinating underwater world of this wonderful region to all those who could not dip their heads under the lakes’ surface.





Dragonfly laying its eggs underwater (left); Snell's window effect under the surface of the lake (above); Eelgrass and reflections (top right); School of European perch (right)

Each summer, I took every chance I had to drive to one of the maar lakes or some small adjoining river to take underwater photos or split shots. I found marvellous scenes underwater with a variety of species, including fishes, frogs, toads, insects and even turtles. I found myself swimming in a fairy-like world with underwater forests of water-lilies, observing the magical play of light under the water's surface, and enjoying every single day I was in the water. I was blessed with delightful encounters of underwater life,

such as a dragonfly laying its eggs underwater or a swarm of perches coming towards me and surrounding me. So many wonderful moments with fishes and freshwater life filled each day I spent in the waters of the Volcanic Eifel region.

Unfortunately, I also found destruction and plenty of litter, even a motorcycle... But hey, I was writing a book, so I could make the best out of the situation by including a chapter about environmental protection to educate and inform readers. Furthermore, I could even include

a comparison of my own photos and observations taken in 2015 and later in 2018 of the same site, to show the changes over time and the necessity to do something for the environment.

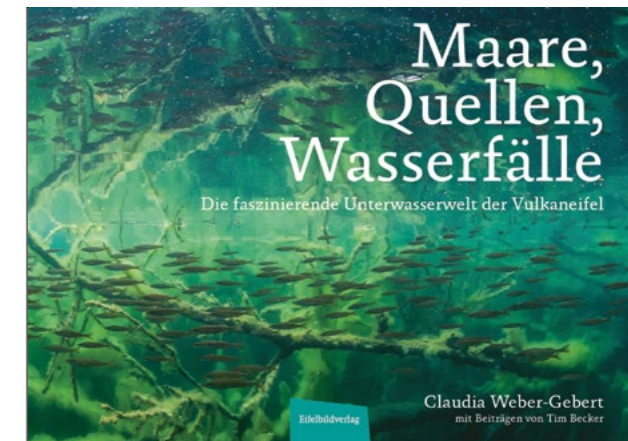
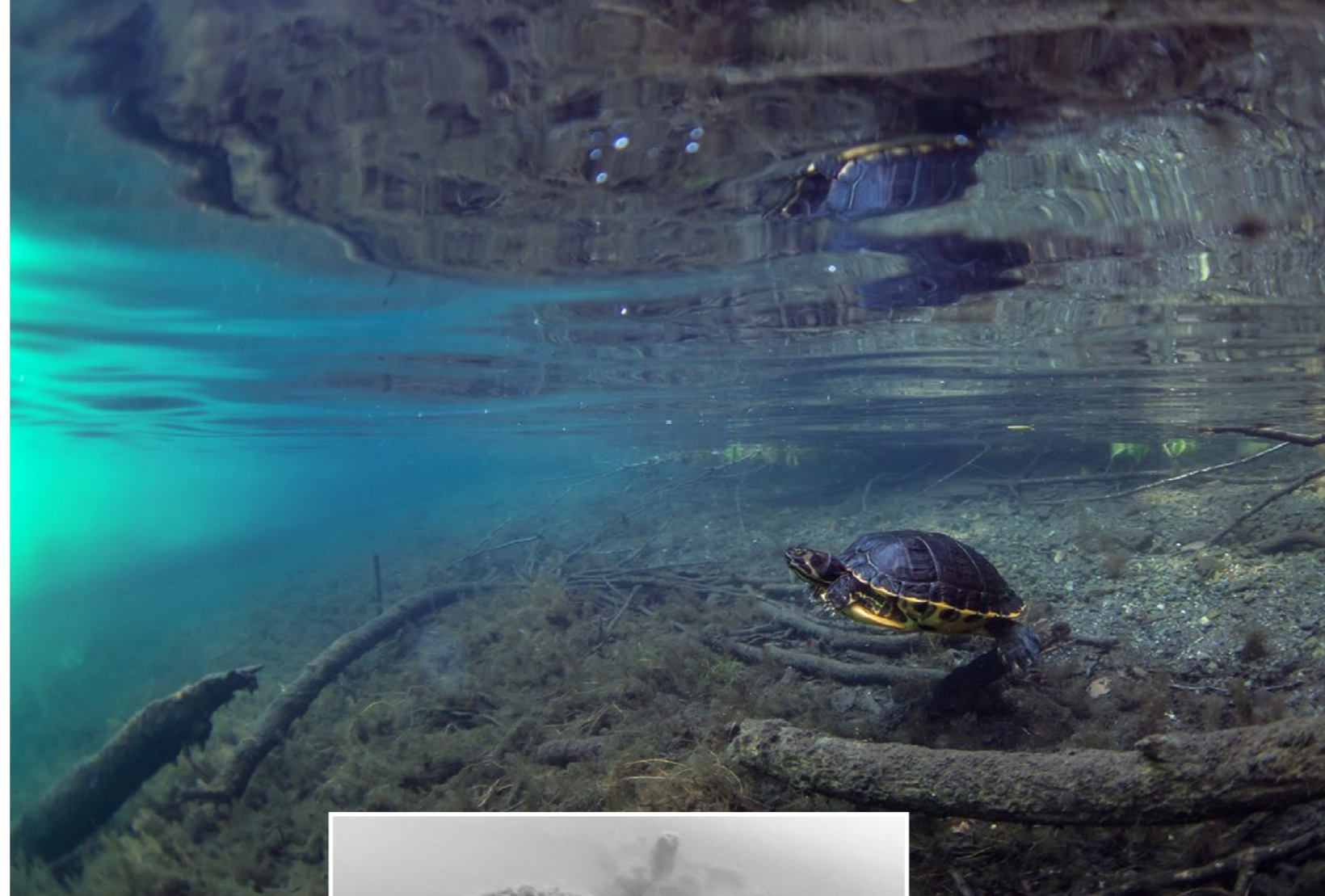
New fascination

But mostly, I could find wonderful nature to photograph. Hikers passing by often asked me what I was doing—so did local residents, who asked if there was anything

to see down there in the water, as they smiled, incomprehensibly. And they were astonished when I described the rich, colourful underwater world that I found down there. They had never seen their region in that way before and

from that point of view. Even my editor did not know about the fascinating underwater landscapes, despite having grown up here.

Of course, it is not comparable to the tropical reefs found in exotic seas around the world,



Maare, Quellen, Wasserfälle: Die faszinierende Unterwasserwelt der Vulkaneifel, by Claudia Weber Gebert

They lie like blue pearls in the green Eifel landscape: the world-famous maars. A world is hidden under the glittering surface of the water that we normally do not see. Underwater photographer Claudia Weber-Gebert has repeatedly plunged into this cosmos and brought breathtaking images to the surface. The clear water of the Vulkaneifel or Volcanic Eifel region in Germany allows a clear view of the living underwater world, which is inhabited by almost 400 species of fish and a large number of waterfowl, insects, reptiles and amphibians. This spectacular illustrated book lets us take part in it for the first time. Available at **Eifelbildverlag, Amazon.**

Publisher: Eifelbildverlag
Date: 15 September 2021
Language: German
Hardcover: 176 pages
ISBN-10: 3946328768
ISBN-13: 978-3946328766

Terrapin turtle (above); Watermilfoil aquatic plants reaching towards the sun (top left); Discarded motorcycle litters the lake bottom (left); Split image of the green growth both under and over the water's surface (far left)

but it has its own innate beauty. The dominant colours are blue and green, and they come in a multitude of shades from deep hues to a Caribbean turquoise, with plenty of fish cruising through the branches of fallen trees. As there are nature reserves around the lakes, those trees just stay where they have fallen and serve as hiding places. While there is no Loch Ness Monster, or Nessie, in these lakes, there are 400 species of fishes, which are prevalent throughout Germany and Europe. So, my book is filled with underwater pho-

tos and split shots, inviting the audience to make a journey through the Volcanic Eifel region, and includes geographic coordinates as well as a description of the various sites and some nice stories about the maar "monsters."

In the end, I really have to admit that it was a blessing to do this project by just freediving, as there was so much satisfaction in being minimal in gear and silent in this special environment, being one with nature, accepted by the animals, and being at peace with myself at the end of the day.

The region is well known for its hiking trails, and many tourists visit during summertime to explore the nature around

the lakes and the valleys with crystal-clear streams. If you are in the Volcanic Eifel region, don't hesitate to bring your mask and fins to have a look at the hidden beauty under the water's surface—but always use the entry at the public access points, never the natural banks of the lakes! ■

Claudia Weber-Gebert is an advanced diver, underwater photographer and dive writer based in Germany. Please visit: design-buero.org/Unterwasser-Fotografie



Text by Phil Pfeiffer
Photos by Brian Ekey, Gordon
Hutchinson and Carter Warden

Lake of Dreams

— *The Remaking of Tennessee's Gray Quarry*

GORDON HUTCHINSON

Aerial view of Gray Quarry in Johnson City, Tennessee, which was an abandoned quarry bought and developed by avid diver Wayne Bartley who was inspired to create a diveable site, especially for new divers, after a dive trip to the Caribbean.

Avid diver and professor of computing Dr. Phil Pfeiffer gives an account of how the love of diving, persistence, US\$100,000, and a homebrew aerator turned an abandoned quarry in the US state of Tennessee into a thriving dive site for a region that lacked one—and had lost prospective divers for want of a site.

Gray Quarry is located in Gray, Tennessee, midway between Kingsport and Johnson City. The quarry, which was on farmland owned by the Gray brothers, was leased to a gravel company, which mined it until the mid-1970s. Mining was stopped after digging cut into the local water table, temporarily drying up local springs

as the pit filled to a depth of 70ft, creating a "swimming hole" that soon became an attractive nuisance. This prompted the brothers to sell the site to the person who later sold it to Debi and Wayne Bartley.

Wayne Bartley, the guy behind Gray Quarry, grew up as a "water rat" along nearby Boone

Lake. After earning his open water certification in 1995 and traveling to the Caribbean, Bartley felt "called," as he put it in reference to his Christian faith, to share with others the beauty that he and future wife Debi had experienced as divers. This calling took the form of a search for a place in northeastern Tennessee where





GORDON HUTCHINSON

Aerator assembly, showing hose (above); Further improvements to Gray quarry included a staging area for divers with picnic tables, tank stands, changing area and floating platform with submerged stairs (left).

which the most powerful commercial systems, designed for use in farm ponds and fish farms, could operate. More discouraging news came from a biologist, who said that the system would probably not provide enough oxygen for fish to survive at depth.

Unknown territory

Eventually, Bartley abandoned his search for known solutions and struck out into the unknown. Over the next two years, he contracted with local utilities to get power to the quarry. Bartley obtained a 7.5-hp compressor, capable of pumping 40 pounds of air per minute, installing it in a pod on the quarry's southeastern plateau. He obtained a heavy duty, 300ft hose that could withstand the compressor's flow of heated, compressed air, then ran the hose over the cliffs and into the water. Bartley contracted with an awning company for a 24ft long aluminum platform, on which he installed a network of PVC pipes and diffusers, with valving to adjust for irregularities in air flow created by the quarry's uneven bottom.

people—particularly young people—could learn to dive.

At the time when Bartley began his search, north-eastern Tennessee had no good sites where novices could train. Driving the 150+ miles to the closest training sites—former quarries south of Knoxville, Tennessee—was an inconvenience that prospective divers either would not or could not manage. One long-time area instructor, Barry Burton of Smoky Mountain Divers, estimated that fewer than a sixth of his students at the time, most of whom were students at nearby East Tennessee State University (ETSU), never obtained C-cards, due to

this lack of a local site for practice and checkout dives.

Bartley's search eventually led to Gray Quarry. With the help of area shopkeepers, Bartley befriended the quarry's owner, who was using it as a private dive site.

In 2014, Bartley acquired ownership of the property's 450ft by 250ft lakelet and its surrounding property. For the next three years, Bartley worked to render the quarry diveable and accessible.

Gray Quarry is a rocky basin whose walls range in height from a low of 50ft, where an access road drops down a hill to the water, to 130ft, where the quarry's "sign"—a high-wing aircraft that hangs from the top of the cliff—is visible from I-26. This bowl-like depression reduced the lakelet's exposure to wind, creating a persistent thermocline at 20ft. Below this thermocline, Bartley's quarry was an anoxic, lifeless body of 50°F water, with

two feet of visibility and a bottom that was coated with a black, oily sludge of partially decayed organic matter.

Bartley's first idea for improving the basin was to break up the sludge, using "large hockey-puck-like" pellets that a Kentucky firm had used to purify water in third world countries. Experiments with the pellets subsequently failed, due to their need for heat and oxygen, both of which were lacking at depth.

Bartley then tried to buy a commercial aeration system that would—in effect—turn the site into a giant fish tank. The idea was to sink the aerator to the quarry's deepest point, where it would generate bubbles that would expand and burst as they surfaced. This would cycle the water in the basin and provide oxygen for fish. The system, however, would have to deliver air at depths of 70 to 75ft—more than twice the depth at



CARTER WARDEN

Aerator assembly dive crew with Wayne Bartley (far right)





CARTER WARDEN



CARTER WARDEN



CARTER WARDEN

The sinking of the school bus in Gray Quarry (left) and divers on the sunken school bus at depth (above); Diver with Gibson houseboat in Gray Quarry (top right)

Currently, the area holds:

- a long, wooden gear table, which separates the access road from the staging area proper;
- two partially submerged metal staircases, which act as entrances into the basin;
- a floating dive platform, connected to the staging area by a floating walkway;
- an aluminum canopy, which shelters five of the 12 picnic tables in this area;
- two tank stands, one on each of the canopy's supporting posts; and
- a school bus, which anchors the canopy, serves as a changing area, and hosts a lighting system for nighttime use.

ary; two diamond-shaped swim-throughs; and two fish attractor balls. Prominent surface features include a small, centrally moored sailboat; an out-of-the-way "goose platform", tucked into the quarry's southern corner; and in the parking lot, a couple of picnic tables, a changing room, a pair of pit toilets, and an artificial waterfall.

Aquatic life and diving conditions

In addition to the usual bluegills and zebra mussels, Gray Quarry hosts a small school of paddlefish. Paddlefish are prehistoric-looking, sturgeon-like filter feeders that have distinctive, long snouts. In the 1990s, after the collapse of Russian sturgeon fisheries, paddlefish, which are fished for their roe, were identified as a species of concern. This led to Tennessee's restriction on the transport of paddlefish across its state line. After repeated, unsuccessful attempts to obtain permits to secure paddlefish from out of state, Bartley and some friends caught some fish from a site below the Cherokee Dam, then drove them 80 miles to Gray, where they were released into the quarry.

In its four years of operation,

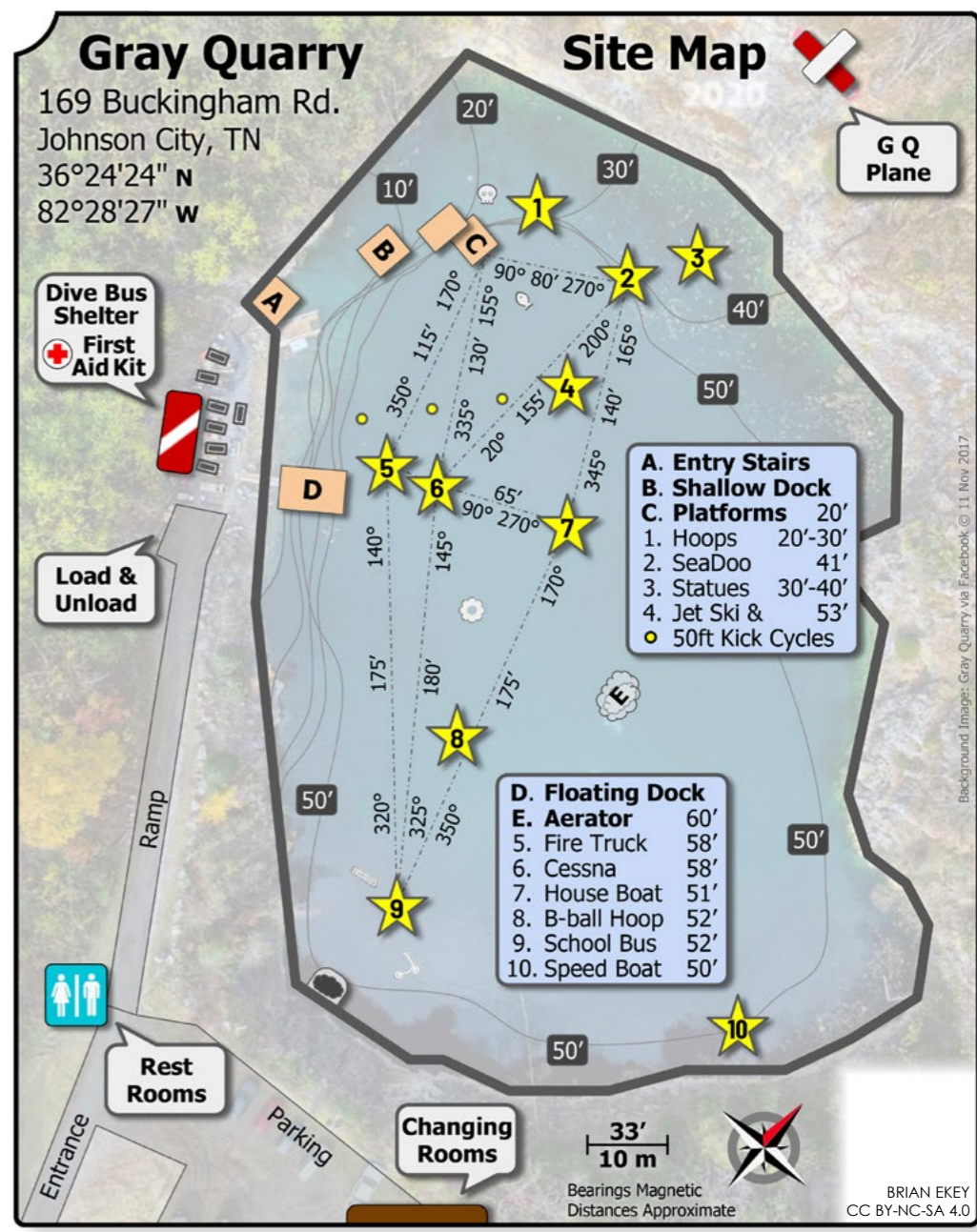
Bartley correctly surmised that this assembly could withstand the heat from the compressed air; the water in the quarry proved cold enough to cool the PVC pipes, preventing them from melting. In the spring of 2017, with a 750-lb lift bag and help from four volunteers, Bartley sank the aerator. Thereafter, the five divers emerged from the quarry's darkest depths, geared down, returned to the parking lot, started the compressor, and waited. After some minutes, bubbles broke the surface, directly above the aerator. The crew then departed, leaving the compressor running. After two weeks of continuous aeration, the thermocline started to dissipate. Visibility improved.

Within four weeks, fish had moved down into the quarry's lower reaches. Some weeks later, in the summer of 2017, Gray Quarry opened to the public for diving.

Further development

Over time, multiple volunteers have contributed to making Gray Quarry a more welcoming and interesting site. One early improvement, a 30ft by 70ft staging area at the base of the access road, was created from 500 tons of shale, piled behind a partially submerged concrete retaining wall and topped with gravel. The road from the parking lot to the staging area, which was originally gravel, was covered in concrete in 2020.

Apart from the aerator, the quarry's deepest attraction, a school bus, was lowered into the quarry in November 2015. It rests at 65ft, a little to the southwest of the aerator. Other submerged artifacts include five platforms, at depths of 5ft, 10ft, 15ft and 20ft; a six-seat, twin-engine Cessna 310; a 1967 US Navy fire truck; a cabin cruiser; a four-person Sea-Doo; a 35ft Gibson houseboat; various statu-



Gray Quarry site map



GORDON HUTCHINSON



CARTER WARDEN

Waterfall feature at Gray Quarry (left); Gray Quarry airplane (above); Diver with school of bluegills on platform (top right) and divers on Cessna airplane in Gray Quarry (right)



CARTER WARDEN

Gray Quarry has been dived by locals and visitors from throughout the Southeast and Midwest, and from as far away as California and New York State. It has been dived in wetsuits and drysuits, in single tanks, in backmount and sidemount twinsets, and in backmount and sidemount rebreathers. It has hosted multiple classes, ranging from basic open water to instructor certification. Utilization runs anywhere from a few divers on weekdays to 50 to 70 vehicles in high summer; due to the latter, a reservation system for controlling access at peak times is currently being planned.

Visibility ranges from 20 to 80ft, depending on weather, time of year and runoff. Water temperatures vary from the 40s °F (~7 °C) during winter to the mid-80s °F (~29 °C) in summer. Due to the aerator, temperatures and visibility tend to be nearly uniform throughout.

In 2019, Bartley reorganized Gray Quarry as a 501(c)(3) nonprofit with a seven-member board of directors. All board members serve for free; none owns an interest in any dive store. Gray's current operating costs are roughly US\$7,000 per year, including insurance, materials, groundskeeping and maintenance. Costs have been kept low, in part, by ample help from merchants who have donated materials at cost and volunteers who have helped with carpentry, painting and cleanup. All profits—the quarry now operates in the black—have gone towards improvements.

Overall, Bartley estimates that it cost US\$100,000 to turn Gray Quarry into a viable dive site. As Bartley sees it, the good that the site has done has justified the cost. As one indicator of this, Burton estimates that 90 percent of his ETSU scuba students now complete their certifications, up from 15 percent in pre-Gray

days. Again, in 2020, an estimated 450 students completed open water certifications at Gray, including 15 twelve-year-olds and 10 ten-year-olds.

"It's pretty cool," Bartley said, "to have this facility in the mountains of east Tennessee. It was all about the kids." Or, to quote one of his favorite movies, *Field of Dreams*: "If you build it, they will come." For more information, visit: grayquarry.com ■

Phil Pfeiffer, Ph.D., is an avid diver and a professor in the Department of Computing at the College of Business and Technology at East Tennessee State University in Johnson City, Tennessee, USA.

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CARTER WARDEN

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STOCK-ASSESSMENTS-DRIVE-REGULATION-CHANGES-TENNESSEE (LAST ACCESSED 8 JUNE 2021)

My Favorite

Color Contrast Pix

Contributors' Picks from Around the World

Text and photos by John A. Ares, Scott Bennett, Larry Cohen, Anita George-Ares, Jennifer Idol, Matthew Meier, Brandi Mueller, Gary Rose, Mike Rothschild and Olga Torrey

We asked our contributors what their favorite images of color contrasts were, and they sent back photos and stories revealing the diversity of color contrasts found under the waves. From brilliant sponges and corals against deep blue waters in Raja Ampat, Papua New Guinea, Bonaire and the Red Sea to contrasting primary colors of marine life in Socorro, Fiji and Cuba, from vivid hues of macro life in Indonesia, the Maldives and the Philippines to contrasting pinks and greens on wrecks in San Diego and New Jersey, *X-Ray Mag* contributors share their favorite images from near and far.





A bright orange grouper in Raja Ampat hides behind some coral to wait for prey. Exposure: ISO 800, 14mm, f/14, 1/100s



Gear used for all images: Nikon D5 camera, Nikkor 105mm lens, Nauticam housing. Blue and orange define this Anna's Chromodoris from Raja Ampat, Indonesia (above). Exposure: ISO 500, 105mm, f/22, 1/200s; An orange elephant ear sponge such as this one (see previous page) on a wall in Bonaire are vivid filter feeders on coral reefs. Exposure: ISO 400, 14mm, f/11, 1/250s

Naturally Complementary

Text and photos by Jennifer Idol

I am addicted to contrast and find no better match than in blue and orange, a surprisingly rare combination underwater. These complementary colors pop underwater.

I create photos in a number of aquatic environments, most of which are variations of green to teal waters. When they appear, blue and orange seem to collide in coral reef systems in sponges, on wildlife, and against blue water backdrops.

The biggest challenge with shooting such a vibrant combination is to avoid overexposing the oranges. Orange often exceeds the color bandwidth of camera sensors. When editing, the oranges may need to be lowered in saturation to reveal full details of their subject.

These colors are often seen independently underwater, perhaps on an orange shrimp or as an abundance of blue in our oceans. Finding them together and in a way that creates an interesting composition is a challenge I enjoy meeting.

Sponges are the most common form of orange I see on our reefs and vary

from the deep orange that I seek to other warmer tones including fuchsia and purple. Bright colors often indicate dangerous wildlife, but many orange species are not venomous. Perhaps some of these innocuous creatures use orange to pretend to appear dangerous so predators will avoid them.

Although I shoot orange in other non-natural settings such as in a historical diving suit or at a pumpkin carving contest, it is the naturally occurring combination I find the most compelling. Looking at shooting through color combinations is an intriguing perspective. Visit: uwDesigner.com



Broadclub cuttlefish, Bunaken, North Sulawesi, Indonesia (above). Exposure: ISO 100, f/8, 1/125s. Gear: Canon 10D camera, Sigma 50mm f/2.5 macro lens, Ikelite housing

Underwater Color

Text and photos by John A. Ares

Cuttlefish are translucent and change color frequently. This broadclub cuttlefish was intrigued by my presence, and our encounter lasted maybe five to ten minutes. I took my strobes and pointed them toward the middle of the cuttlefish. With the strobes facing each other, it allowed a “glow” to pervade the subject in the image. This increased the contrast and darkened the background.

Fire urchins are so named for their painful sting. However, their purple and blue irides-

cence is truly revealed by bouncing the strobes off their test (body) by placing them above the urchin and at a 45-degree angle. Fire urchins are tricky due to their reflectance. Bracketing exposures in manual mode resulted in this image having the right degree of saturation.

The flatworm (*Pseudoceros ferrugineus*) stood out from its sandy background. Purple and orange are near complementary colors on the color wheel. This image was shot with one backlit strobe. The other strobe had stopped working due to a dual connecting cord failure. Having a backup plan is important.

For most people, Cassiopea (upside-



Fire urchin, Bunaken, Indonesia (left). Exposure: ISO 400, f/13, 1/200s. Gear: Canon 10D camera, Canon 100mm f/2.8 macro lens, Ikelite housing, twin Ikelite 125 strobes

Flatworm, Apo Island, Philippines (center). Exposure: ISO 400, f/16, 1/160s. Gear: Canon Rebel T1i camera, Canon 100mm f/2.8 macro lens, Ikelite housing, twin Ikelite DS-161 strobes, only one fired. Manual exposure mode.



down) jellyfish have a mild sting, so can be safely photographed in close quarters. This one was about a foot in diameter. Cassiopea have very short tentacles. I shot the jellyfish looking straight up to get the blue background. I aimed one strobe through the top of the jellyfish, and another aimed at the bottom, so the orange color could be seen in contrast to the blue. Please visit: johnares.com

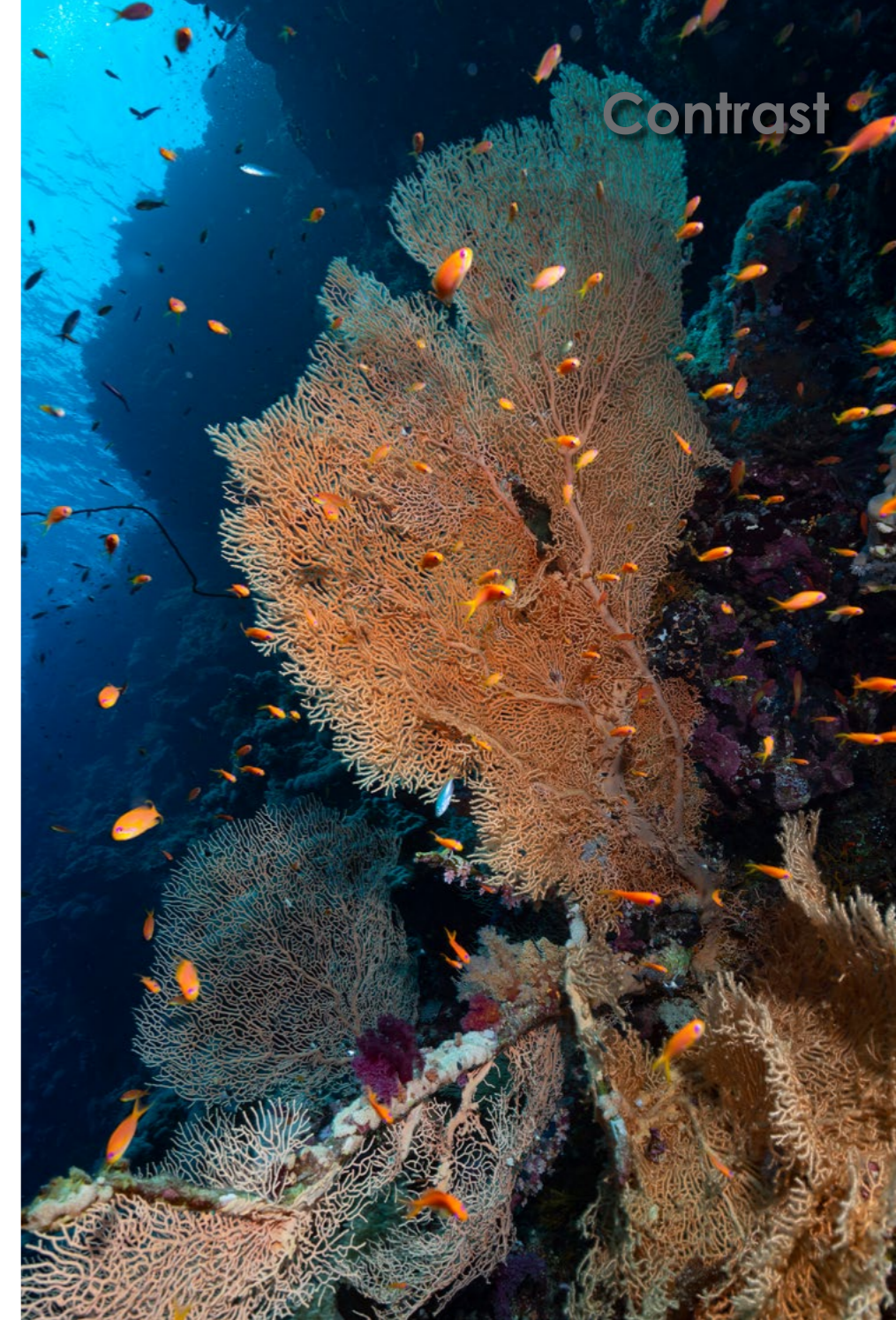
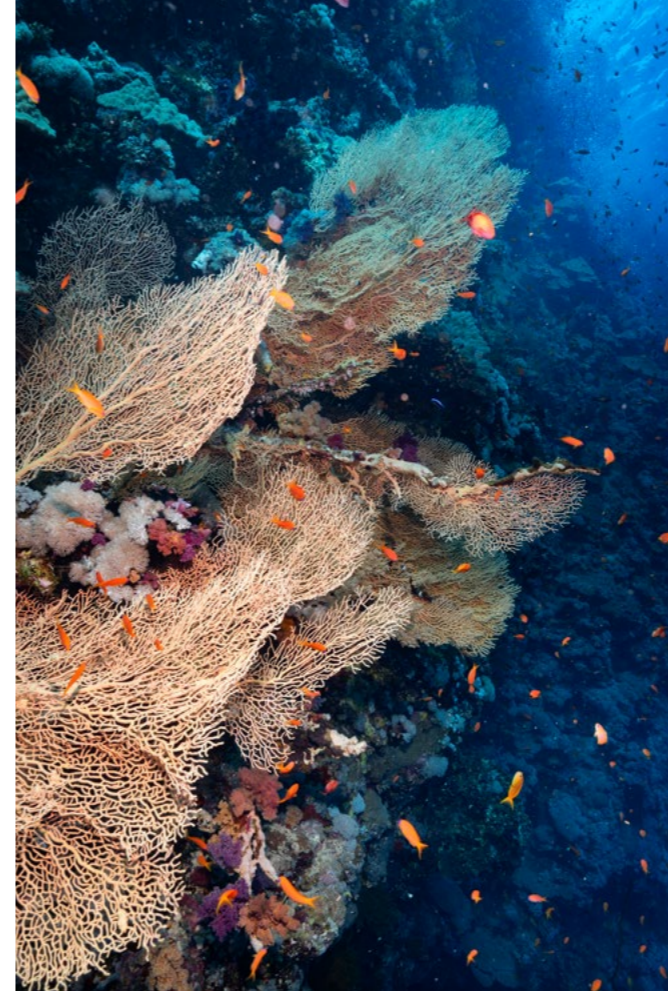


Cassiopea (upside-down) jellyfish, Dumaguete, Philippines. Exposure: ISO 400, f/16, 1/160s. Gear: Canon EOS Rebel SL1 camera, Canon EF-S 18-55mm f/3.5-5.6 IS STM lens set at 18mm, Ikelite housing, twin Ikelite 161 strobes

Contrast

feature

Elphinstone Reef, Southern Red Sea. Exposure: ISO 200, f/13, 1/60s (far right) and ISO 200, f/13, 1/60s (top centre). Sponge at Rocky Island (bottom centre). Exposure: ISO 320, f/11, 1/125s. Gear used for above images: Nikon D850 camera, Nikon 16-35mm lens, Seacam housing, two Inon Z-330 strobes; Rocky Island wall (right). Exposure: f/16, 1/125s, ISO 160. Gear: Nikon D850 camera, Sigma 15mm lens, Seacam housing, two Inon Z-330 strobes



Contrast

Red Sea Contrasts

Text & photos by Scott Bennett

Despite years of diving, I had never been to the Red Sea and a week-long liveaboard trip quickly showed what I had been missing. Elphinstone's far offshore location in Egypt's south guaranteed spectacular visibility, which was easily in the range of 50m. The lack of sediment virtually ensured non-existent backscatter, making wide-angle photography an absolute joy! Elphinstone is also home to some gigantic fan corals. Thrusting outwards from the precipitous walls, their warm tones and graceful patterns provided a sharp contrast to the intense blue of the adjacent sea. I liked composing the shot with the bottom of the image anchored by partial and smaller corals and the main subject echoing the shape of the reef wall behind it. Swarming anthias numbers add dynamic splashes of contrast and colour.

Large fan corals combined with steep walls are especially well suited to a vertical format. As the corals are light in tone, care

must be taken not to blow out the highlights with the strobes. To avoid this, I positioned one strobe set at one-half power aimed toward the foreground corals with the other strobe set at full power aimed towards the most distant fan corals. The intense blue of the water provides contrast, while ever-present schools of anthias add additional splashes of colour. Although the strobes cannot light up the distant wall, the exceptional visibility reveals detail all the way to the rear of the image.

With the Red Sea renowned for its reefs and visibility, I purchased a full-frame 15mm fisheye lens before leaving for my trip. This

proved to be a very good decision, as both were spectacular!

Rocky Island

Situated at the southern end of the Egyptian Red Sea, Rocky Island features a stunning wall that is home to a dazzling assembly of corals and fish. The soft corals were especially prolific, providing a visual bombardment of colours, forms and textures. For the image, I set the strobe arms as far out as possible and set both strobe's power



output at half. Doing so ensured even lighting and not blowing out the foreground elements, providing a complementary colour contrast of the red-orange foreground to the blue/blue-green background. Although the background recedes darker, the water is so clear it allows distant fish to be illuminated by the strobes.

During a dive at Rocky Island in Egypt's Southern Red Sea, my eyes discerned a vibrant jolt of pink on the wall ahead. Moving closer revealed a magnificent elephant ear sponge. I had seen a few specimens during the trip, but none as colourful as this. As well as being photogenic, there were several elements of contrast at play. I wanted the sponge to be the dominant feature of the image but allow enough space to

show its surroundings. The intense uniform hue juxtaposed alongside the surrounding sponge-clad rocks and hard corals created a striking tonal contrast that made the subject pop. To further the impact, the smooth organic folds and curves provided additional contrast to the irregular patterns of the surrounding wall. To complete the picture, a tiny fish added a minute sliver of blue. Visit: xray-mag.com/Contributors/Scott-Bennett





Contrast



Papua New Guinea Blues

Text and photos by Larry Cohen

The blue waters of Papua New Guinea are the perfect background to contrast with the brilliant colors of the marine life and the transportation of the locals. When diving with Walindi Plantation Resort, I looked up and noticed how magnificent an outrigger canoe looked silhouetted against the blue water. The problem was I had a macro lens on my camera! So, the following week, we were diving at Tufi Resort, and I asked if we could stage the scene. The manager arranged for us to tow an outrigger canoe offshore so we could get clear blue water. Then, using my Olympus 9-18mm wide-angle lens, I used ambient light to capture the canoe.

Since blue is a cold color, it is good to have a warm color for contrast. Diving the site Lana Shoal, the small yellow coral damselfish on the exquisite reef, added color contrast with the blue water. Likewise, the

red color of the sabre squirrelfish in the crevice at Gabriella's Fish Point stands out against the blue water background.

In the case of the yellowtail fusilier photographed on Veale Reef, different shades of blue could add contrast. I used a fast 1/250th shutter speed to darken the blue background to contrast with the light blue color of the fish. The yellow tail adds a color accent.

Using a neutral color could also be effective. When diving off the liveaboard, the *Febrina*, we expected to get close to silvertip sharks at Norman's Knob. So, I decided to use my Panasonic 8mm fisheye lens. When the shark came over my head and turned, the distortion of using a fisheye lens added to the image's composition. The dark blue background allowed the gray shark to stand out. Visit: liquidimagesuw.com



Sabre squirrelfish at Gabriella's Fish Point (above). Exposure: ISO 200, f/5.6, 1/15s. Gear: Olympus OM-D E-M1 Mark II camera, Olympus 9-18mm lens, Aquatica housing, Sea&Sea YS-D1 strobes; Yellowtail fusilier photographed on Veale Reef (top left). Exposure: ISO 200, f/5.6, 1/200s. Gear: Olympus OM-D E-M1 Mark II camera, Olympus 9-18mm lens, Aquatica housing, Sea&Sea YS-D1 strobes

Reef at Lana Shoal (above). Exposure: ISO 200, f/8, 1/180s. Gear: Olympus OM-D E-M1 Mark II camera, Olympus 9-18mm lens, Aquatica housing, Sea&Sea YS-D1 strobes; Silhouette of an outrigger canoe (top right). Exposure: ISO 200, f/11, 1/250s. Gear: Olympus OM-D E-M1 Mark II camera, Olympus 9-18mm lens, Aquatica housing; Silvertip shark at Norman's Knob (top center). Exposure: ISO 200, f/5.6, 1/250s. Gear: Olympus OM-D E-M1 Mark II camera, Panasonic 8mm lens, Aquatica housing, Sea&Sea YS-D1 strobes





ANITA GEORGE-ARES



ANITA GEORGE-ARES

Tomato anemonefish, Masaplod North dive site, Negros Island, Philippines (left). Exposure: ISO 200, f/11, 1/200s. Gear: Canon EOS Digital Rebel XTi camera, Canon EF50mm f/2.5 compact macro lens, Ikelite housing, two Ikelite DS161 strobes

Blueface angelfish, Five Rocks dive site, Maldives (right). Exposure: ISO 200, f/11, 1/160s. Gear: Canon EOS Rebel SL1 camera, Canon EF-S 10-18mm f4.5-5.6 IS STM lens, Ikelite housing, two Ikelite DS161 strobes

Janolus nudibranch, Lembah Strait, North Sulawesi, Indonesia (bottom right). Exposure: ISO 200, f/8, 1/200s. Gear: Canon EOS Rebel SL1 camera, Canon EF-S 60mm f/2.8 macro USM lens, Ikelite housing, two Ikelite DS161 strobes

Ring-tailed cardinalfish, Sahara dive site, Negros Island, Philippines (bottom left). Exposure: ISO 200, f/11, 1/200s. Gear: Canon EOS Digital Rebel XTi camera, Canon EF50mm f/2.5 compact macro lens, Ikelite housing, two Ikelite DS161 strobes

Water Colors

Text and photos by Anita George-Ares

Why are reef species so beautifully colored? Colors may aid both in crypsis (ability to avoid detection) and communication (Marshall et al., 2018).

With their constant motion, anemonefish make you work to get the image that you want. Yet, I never get tired of photographing anemonefish. I like the warm colors of the anemonefish nestled among the tentacles. The fish and the anemone both appear to glow.

The ring-tailed cardinalfish (left) were hovering above a small wooden boat, which was part of an artificial reef. The striking blue lines through the cardinalfish eyes draw one's eyes to theirs. The complementary colors of blue and orange (in the RYB color model) provide a nice contrast.

Lembah Strait never disappoints with the color and biodiversity of its marine life. The Janolus nudibranch (right) sports contrasting warm and cool colors. The orange background highlights the purple tips of the respiratory structures (cerata) and the purple lines on the rhinophores (sensory tentacles on the head).

In the image taken in the Maldives (top right), contrasting complementary blue and yellow colors (in the RGB color



ANITA GEORGE-ARES

model) are exhibited by the bluestreak cleaner wrasse and the blueface angelfish. Blue and yellow color patterns are a common occurrence in reef organisms. These colors transmit well in marine waters and may serve as advertising or warning coloration (Marshall et al., 2018). Please visit my Facebook page at: [facebook.com/profile.php?id=100016947967639](https://www.facebook.com/profile.php?id=100016947967639)

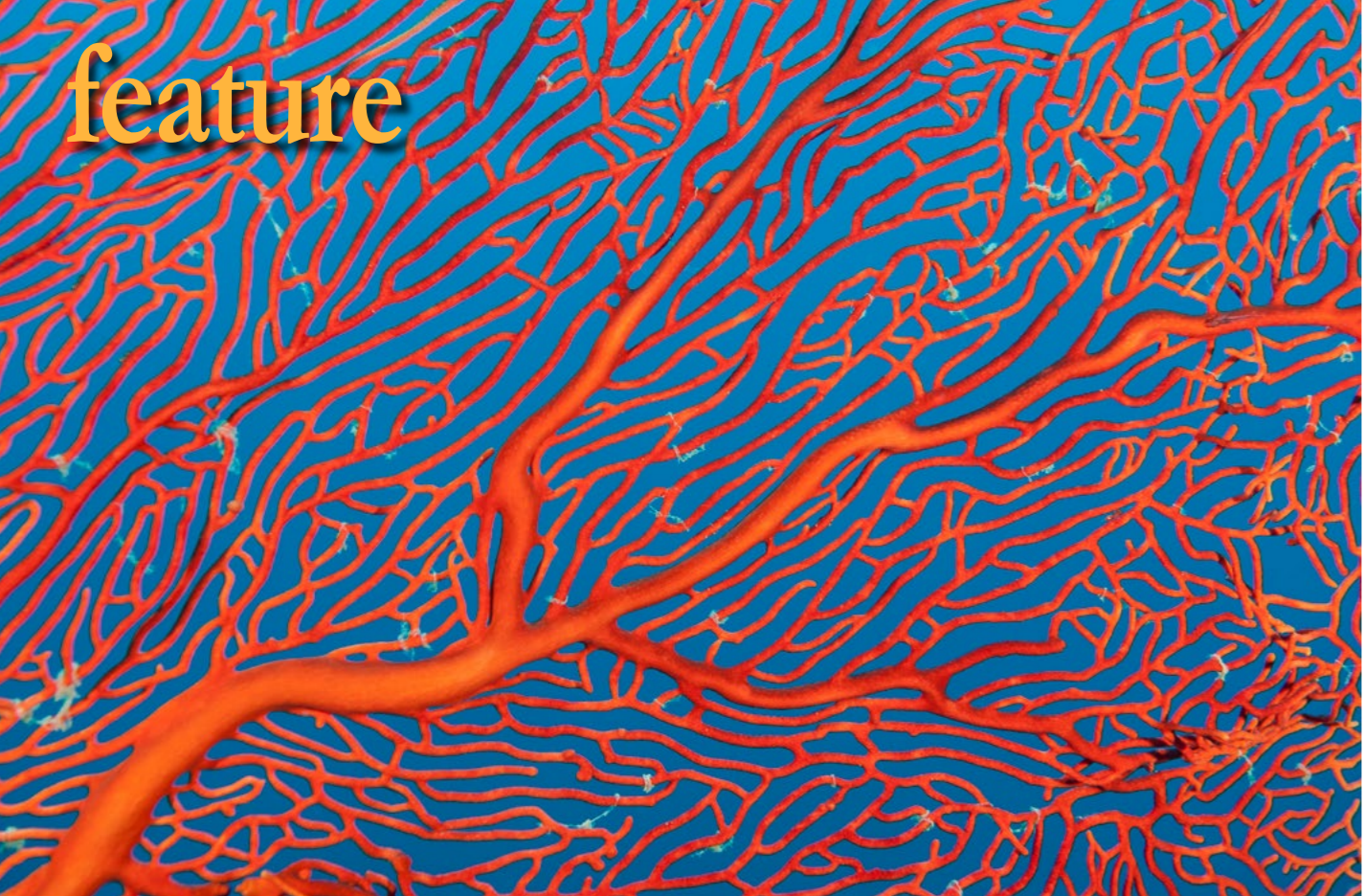
REFERENCE:

MARSHALL, N.J., CORTESI, F., DE BUSSEROLLES, F., SIEBECK, U.E., CHENEY, K.L. (2018). COLOURS AND COLOUR VISION IN REEF FISHES: PAST, PRESENT

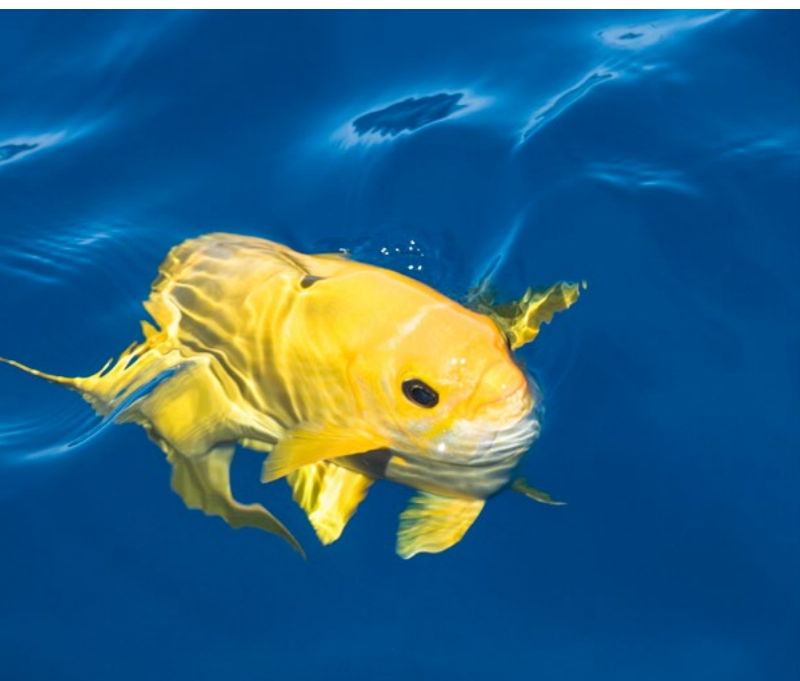


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AND FUTURE RESEARCH DIRECTIONS. *J FISH BIOL.* 95:5-38. [HTTPS://ONLINELIBRARY.WILEY.COM/DOI/FULL/10.1111/JFB.13849](https://onlinelibrary.wiley.com/doi/full/10.1111/JFB.13849)



Pattern detail of a red sea fan against a blue water background, Bligh Waters, Vatu-i-Ra Passage, Fiji. Exposure: ISO 400, f/5.6, 1/125s. Gear: Nikon D3 camera, Nikon 24-70mm lens, Subal housing, Sea&Sea YS-250 strobes



Topside photo of a yellow Socorro chub (*Kyphosus lutescens*) just below the surface, San Benedicto Island, Revillagigedo Islands, Mexico (above). Exposure: ISO 400, f/5.6, 1/1000s. Gear: Nikon D2x camera, Nikon 70-200mm lens, 2x Teleconverter

An aggregation of golden damselfish swimming among large colonies of dark-green black sun corals and colorful sea fans, Bligh Waters, Vatu-i-Ra Passage, Fiji (top right). Exposure: ISO 400, f/6.3, 1/250s. Gear: Nikon D3 camera, Nikon 16mm fisheye lens, Subal housing, Sea&Sea YS-250 strobes

Primary Contrasts

Text and photos by Matthew Meier

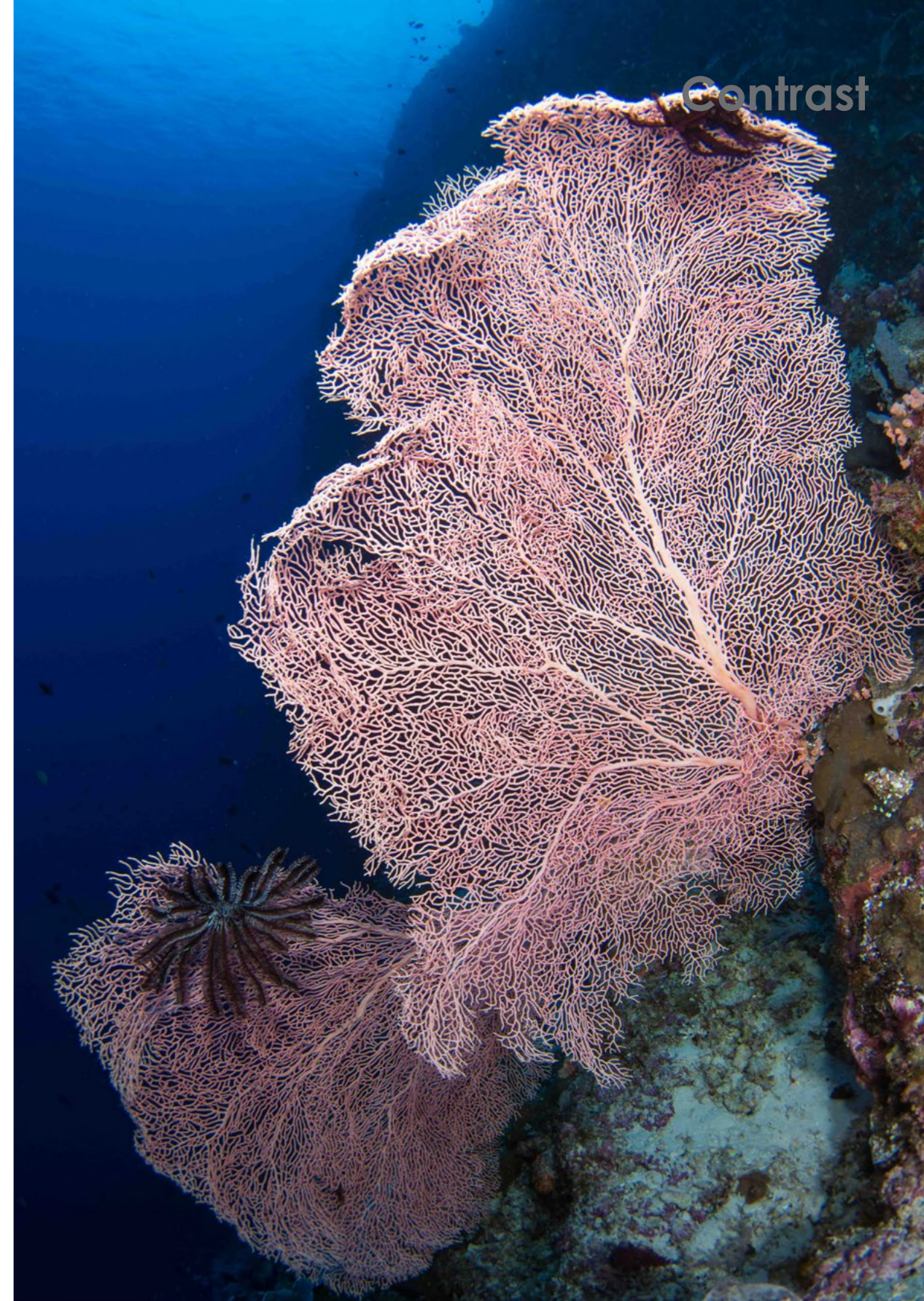
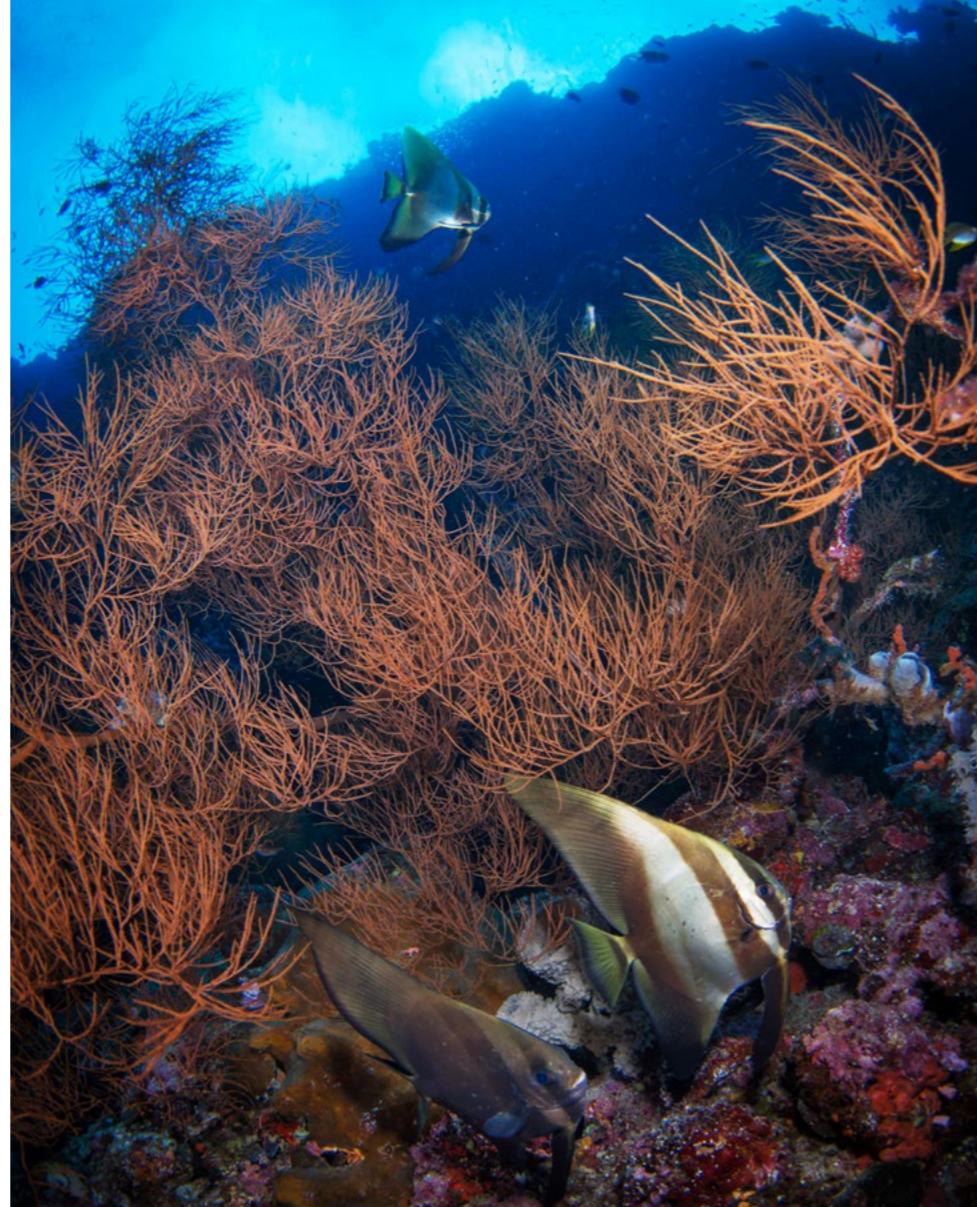
My favorite color contrast photos are composed of a simple design with a bold use of primary and secondary colors. When possible, I prefer to limit the composition to just two or three principal colors but will include other hues as long as they do not distract and tend to fade into the background. The turquoise blue of tropical waters is an easy primary color to juxtapose with the other primary colors of red and yellow or secondary colors such as green and orange. I especially like



the interplay of patterns to help accentuate color differences. The close-up detail of the red gorgonian sea fan is a perfect example of strong primary colors arranged into a striking configuration. As a graduate of the University of Michigan, the primary color combination of maize (yellow) and blue has special meaning for me, and I will often gravitate to scenes where I can include this grouping, as evidenced by the other images I have included for this series. Visit: MatthewMeierPhoto.com

A scuba diver swimming over an aggregation of French grunts, bluestriped grunts and porkfish, Gardens of the Queen, Cuba (right). Exposure: ISO 200, f/7.1, 1/100s. Gear: Nikon D3 camera, Nikon 17-35mm lens, Subal housing, Sea&Sea YS-250 strobes





Corals and Sponges

Text and photos by Brandi Mueller

I love the way some corals and sponges reveal bright, vibrant colors that contrast with the blue of the water when lit up with strobes or video lights. In places like Bunaken National Park in Indonesia, huge barrel sponges are deep purple and black coral bushes are bright orange (it does not turn black unless it is taken out of the water). Powder-puff pink gorgonian sea fans extend out away from the reef, usually in deeper water (and sometimes are the home to equally colorful and tiny pygmy seahorses).

Anemones of all colors can be found in the park, including those with brilliant purple sacs and yellowish green tentacles or bright orange anemones with clownfish residents. These colorful corals and sponges contrast with the dark blue water that becomes darker as the depth increases. As a diver goes deeper without light, the human eye will see them as drab blues and greens, blending in with their backgrounds, but with a little light, a whole new scene is exposed. Please visit: brandiunderwater.com

Powder-puff pink gorgonian sea fan in Bunaken National Park, Indonesia (above). Exposure: ISO 200, f/10, 1/125s; Black coral bush that is bright orange, with batfish in Bunaken National Park, Indonesia (top center). Exposure: ISO 200, f/9, 1/125s; Deep purple barrel sponge with a yellow damselfish in Bunaken National Park, Indonesia (top left). Exposure: ISO 200, f/7.1, 1/125s; A brilliant purple, balled-up anemone in Bunaken National Park, Indonesia (bottom left). Exposure: ISO 200, f/13, 1/200s. Gear used for all images: Nikon D850 camera, 8-15mm fisheye lens, Ikelite housing, dual DS161 strobes



Experimental Interpretation of Color and Contrast

Text and photos by Gary Rose, MD

When asked, “What are your favorite color contrast underwater photos?” my initial thought (as I would assume any underwater photographer would have), was to think of the vivid contrasts and enriched colors of shooting in deep blue water with strobes. We have all seen spectacular photos of walls resplendent with colorful and scintillating gorgonians, sponges and impossibly colorful schools of fish. It is for this reason that I chose not to repeat the same art that we have all become accustomed to.

I have chosen to share with you a few of my fun color, contrast and interpretation experiments. Playing with my camera and strobe settings has borne luscious fruit. From time to time, we all need to step out of our underwater photography comfort zone—and PLAY. It is during these creative and imaginative times that some of our most unusual

and fabulous art is created.

By combining strobes and natural light, painting light near and far, upwards, downwards and sideways, I was able to produce these photos that I am sharing with you. Light is the source of all visual information. It stimulates the retina, creates electrical stimulation that is transmitted along neuronal pathways, and then these impulses are sent on to the brain where interpretation takes place. Sometimes, it takes a little while for the brain to process what one is actually looking at. On other occasions, the infinite combinations of color and contrast are more obvious.

The next time you go out for an underwater photoshoot, experiment and give your brain the freedom to interpret the magnificence of what it is witnessing. Then, remember to depress the shutter release. My goal with this group of photos was to create color, contrast, and experimental interpretations. Visit: garyrosephotos.com



Lemon sharks approaching the surface (above). Exposure: ISO 200, f/11, 1/125s; Lemon shark emerging into the light (top center). Exposure: ISO 200, f/11, 1/125s; Great white shark under the rainbow (top left). Exposure: ISO 320, f/8, 1/125s; Lemon shark with a following (left). Exposure: ISO 200, f/11, 1/125s. All photos were taken with Nikon D500 camera, Tokina 10-17 lens, Nauticam housing, Inon Z330 strobes





Dive buddy on the anchor line over a local shipwreck in New Jersey, USA (above). Exposure: ISO 250, f/9, 1/160s. Gear: Canon EOS 7D camera, Tokina 10-17mm fisheye (11mm) lens, Nauticam housing, dual Inon Z-240 strobes; Black sea bass on the wreck of the *Pinta*, night dive (top left). Exposure: ISO 320, f/14, 1/100s. Gear: Canon EOS 7D Mark II camera, Tamron 60mm macro lens, Nauticam housing, dual Inon Z-240 strobes

Contrasts in New Jersey, USA

Text and photos by Michael Rothschild, MD

The waters along the New Jersey shore provide striking contrasts—the inky black of a night dive, the emerald green over historic shipwrecks—and the vibrant marine ecosystem means that the stars of the show are dressed to impress in their colorful outfits.

The image (top right) is one of my favorite diver portraits. Not only is the contrast between the diver's red drysuit and the green background striking, the angular element of the anchor line drives the image, while the graceful curves of the hoses soften the composition. And of course, a great model really grabs the view-

er's attention!

The image of the black sea bass (top left) is a favorite because the intricate scales and facial markings of the fish work with the brown and orange rust of the wreck behind it. The image (bottom left) shows the detail and beauty of hydroids—it is hard to take a bad photo of these creatures. I love how the pink and green work together.

Finally, the business end of the little crab's arm (center) looks great against the dark riverbed. The blue topped by the red and white reminds me of a gas flame. Visit: dive.rothschilddesign.com



Blue crab arm in the Manasquan River (above). Exposure: ISO 125, f/22, 1/200s. Gear: Canon EOS 7D Mark II camera, Tamron 60mm macro lens, Nauticam housing, dual Inon Z-330 strobes

Hydroids on the wreck of the McGurr Tugboat (left). Exposure: ISO 100, f/22, 1/250s. Gear: Canon EOS 7D Mark II camera, Tamron 60mm macro lens, Nauticam housing, dual Inon Z-330 strobes





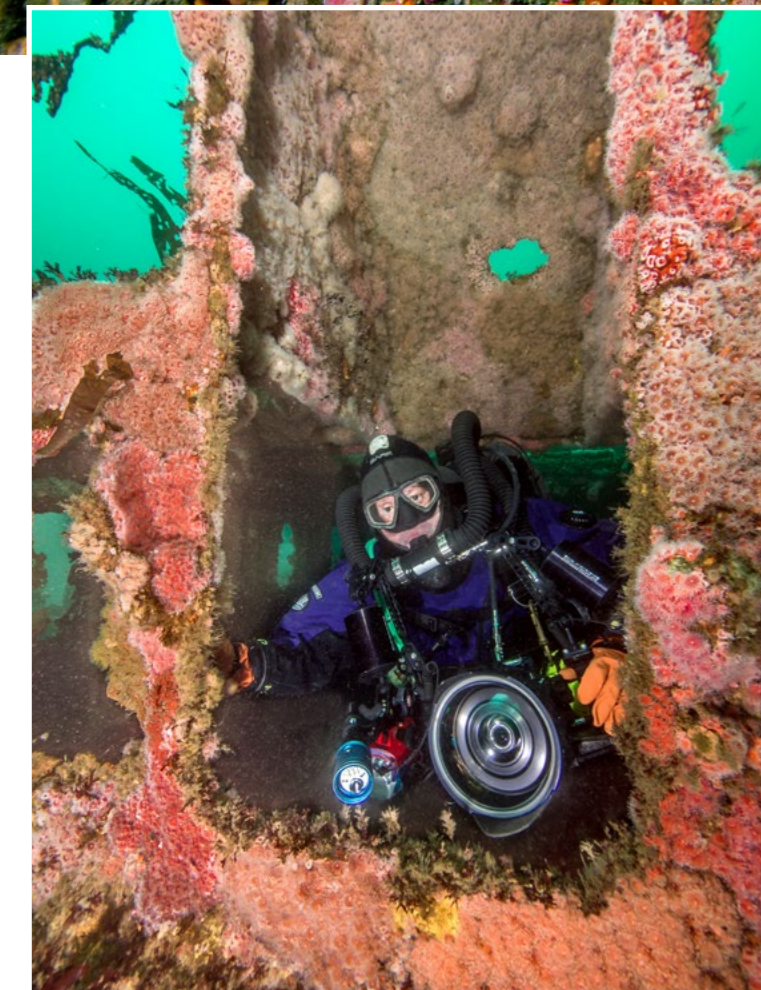
California sheephead inside the HMCS Yukon (left). Exposure: ISO 800, f/7.1, 1/100s

Rebreather diver Larry Cohen framed between the guns on the HMCS Yukon (right). Exposure: ISO 640, f/5.6, 1/80s

California sheephead at the Ingraham Street Bridge dive site (bottom right). Exposure: ISO 400, f/8.0, 1/100s

Rebreather diver Larry Cohen is inside a doorway on the HMCS Yukon (bottom left). Exposure: ISO 400, f/7.1, 1/60s

Gear used for all images: Olympus OM-D E-M5 camera, Panasonic 7-14mm lens, Nauticam housing, Sea&Sea YS-D1 strobes



Pink and Green in San Diego

Text and photos by Olga Torrey

Color contrast is a great tool to use as a design element in any photograph, especially one captured underwater. The waters off San Diego in the US state of California are green and make an exquisite background for the vibrant and colorful marine life.

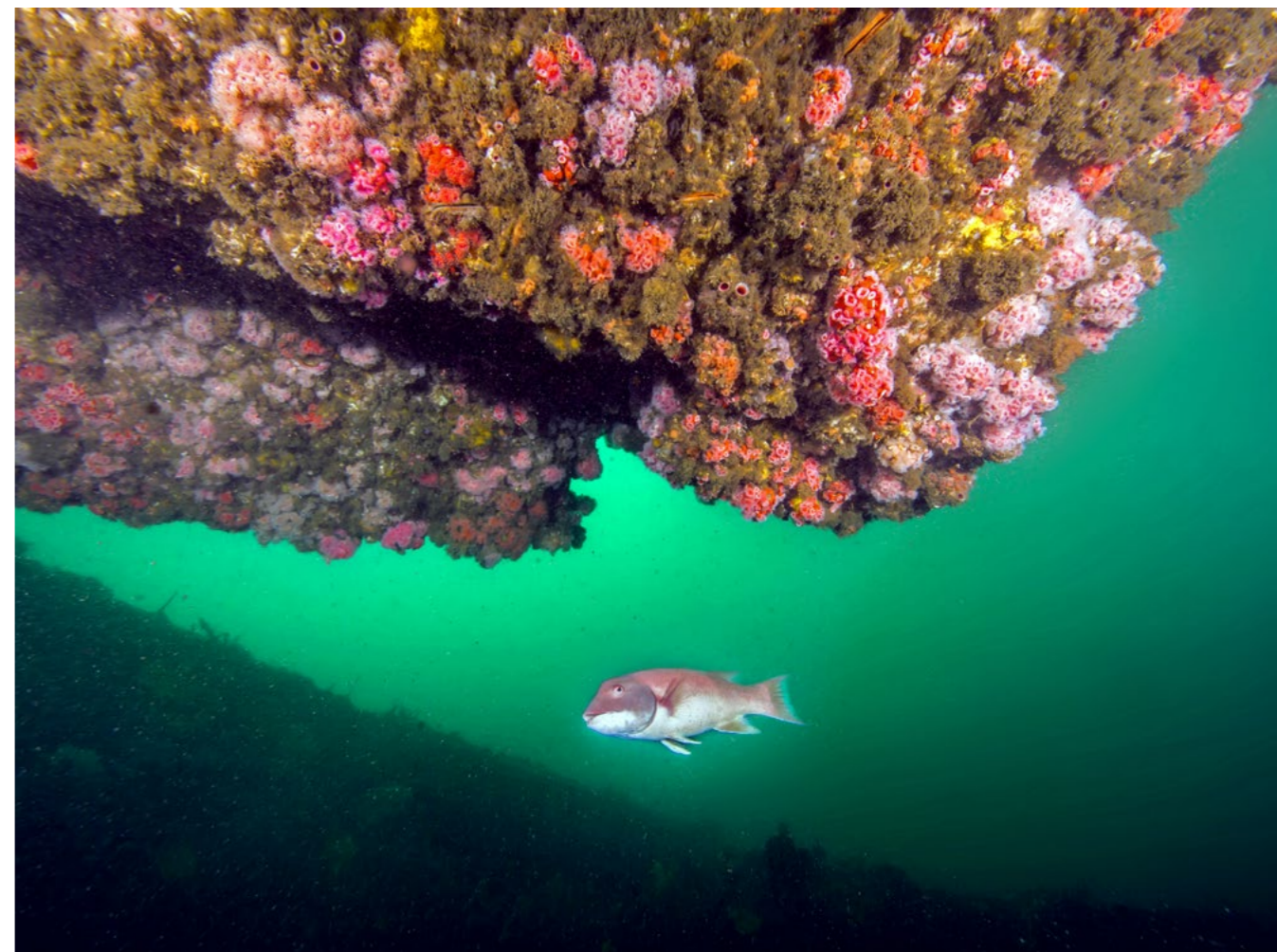
To adjust the density of the green background, I used my shutter speed. A fast shutter speed produced a dark background, and a slow shutter speed created a light background. I used strobes to bring out the color in the foreground and subject. I adjusted the aperture on my lens and the strobe's power to get the correct exposure.

Diving with Marissa Charters, I visited several wrecks, including the HMCS Yukon. The wreck structures were covered with beautiful marine

growth, including strawberry anemones. I used the guns blanketed with vivid hues of pink on the Yukon to frame my dive buddy, Larry Cohen. His purple drysuit added a color accent to the photograph. I used the same technique with a larger frame when I photographed him inside a doorway on the wreck.

The photo of the California sheephead was also captured on the Yukon. The colorful fish stands out, framed by the Yukon's wreckage. Most of the negative space is black and allows the color of the fish to stand out. The green water on the right side of the image adds interest.

The California sheephead photographed under the overhang was at the Ingraham Street Bridge dive site. The colors of the fish stand out against the green background. The composition is enhanced with the colors on the overhang. Please visit: fitimage.nyc



Edi Frommenwiler

A True Adventurer in Raja Ampat



COURTESY OF EDI FROMMENWILER

Edi Frommenwiler (above); The *Pindito* (right)

Text by Don Silcock. Photos courtesy of Edi Frommenwiler and Don Silcock

Back in 1992, very little was known about Raja Ampat in the Indonesian province of what was then known as Irian Jaya. Edi Frommenwiler had heard rumours about how scenic it was, so he studied the area charts and suspected that with so many islands, there must be some great places to explore underwater. He decided to go there in September that year—a trip which would foster his appreciation for this amazing jewel of an area and build a liveaboard dive boat to explore it. Don Silcock interviewed the adventurer to learn more about his pioneering endeavours.

I have a theory... Completely unproven of course, but very logical (well, to me at least) and it is that true adventurers have seven genotypes, rather than six like the rest of us. Let's just call it the AA++

genotype, and those individuals with one have inherited an intense desire to explore the world and can never accept a nine-to-five existence.

They tend to embark upon their first big adventures in any way they can, as soon as they can. And, in the case of Edi Frommenwiler, his chance came by driv-

ing trucks in his native Switzerland. But we are not talking about delivering stuff to supermarkets or longer hauls across Europe. None of that for Edi; rather, he was delivering heavy machinery and specialist building materials to places like Iraq and Saudi Arabia.

In total, he did 18 of those trips, over

a two-year period in the mid-1970s, all while still in his early twenties, enabling him to save enough money for the next stage—two years of almost exclusively overland backpacking. That journey took him to places like Nepal, Burma (before it was Myanmar), Southeast Asia, Australia and New Zealand. Along the way, in

1980, he made his first visit to Indonesia—the country that would become his home and where he would have his biggest and longest adventure!

But in-between the backpacking trip and his biggest adventure, Edi spent 10 years as a tour guide in places like Brazil, Venezuela and Nepal. And occasion-



COURTESY OF EDI FROMMENWILER





Building the hull and the wheelhouse of the *Pindito* (right column)

COURTESY OF EDI FROMMENWILER

COURTESY OF EDI FROMMENWILER

COURTESY OF EDI FROMMENWILER

DON SILCOCK

Arborek Island in Raja Ampat, Indonesia (above); Map of Indonesia showing location of Pulau Laut (left)



SATELLITE IMAGE FROM GOOGLE EARTH

ally, he returned to Indonesia to take guests to Lamalera, the remote village in Nusa Tenggara where traditional, subsistence whaling was practised.

Indonesia beckons

Edi first heard about Indonesia when he was quite young, from his father who owned a

motorcycle repair shop, and had agreed to sponsor a missionary with a bike and spare parts to take to Maumere where he was going to work with the poor. Both the bike and the missionary made it to Maumere where they both became quite well-known—so much so that the locals christened him “Brother Tuk-Tuk.”

It was during those trips to Lamalera that Edi got the idea of building a real boat. Aside from places like Bali, the tourism infrastructure in Indonesia back in the 1980s was almost non-existent. To get his guests to Lamalera, Edi

had no other option but to hire local boats, many of which he considered decidedly “dodgy.” A custom-built boat with guest cabins, ensembles and serving good food, which was able to take adventurous tourists to some of the amazing off-the-beaten-track places in Indonesia seemed like a wonderful way to earn a living!

Getting it together...

As most people know, it is one thing to have a good idea but quite another to make it all happen. Having a good idea in Indonesia, and actually making it happen are on completely different scales. Even today, with a pro-business government in Jakarta, achieving success is really tough.

In 1990, it bordered on the almost impossible. But Edi Frommenwiler does not do “impossible” and believes that there is always a way through. So, in May of that year, he went



COURTESY OF EDI FROMMENWILER



COURTESY OF EDI FROMMENWILER



COURTESY OF EDI FROMMENWILER



COURTESY OF EDI FROMMENWILER

THIS PAGE: Scenes of the construction, with Edi Frommenwiler and this team building the *Pindito*

back to Indonesia to work out how and where he could build his boat and how much it would all cost.

Back in Switzerland at the end of June, he embarked on what we would now call crowdfunding. Starting with his family and friends, then following leads which came out of that process, he slowly but surely raised the capital needed to build the boat.

Then in September, he set off for Jakarta, where he spent what he now considers to be possibly the worst three months of his life, living in a small,

cheap hotel while he found a way through the labyrinth-like bureaucracy in the nation's capital—something that was once described to me as akin to swimming in glue.

But succeed he did, and by December, he was in possession of a PMA—the formal permission to conduct business in Indonesia at that time. So highly prized were those PMAs that Edi's was one of just 20 that were approved and signed by Indonesian President Suharto at the end of 1990!

Building *Pindito*

In early 1991, Edi moved to Pulau Laut, the large island on the southeastern tip of South Kalimantan in Indonesian Borneo, where he had found the people and materials he needed to build his boat. But first, there were a couple of really important things to get his head around: AutoCAD and the Indonesian Classification Bureau (BKI). Edi had decided to design the boat himself, and to do that, he had to learn the industry-standard AutoCAD software.

For the uninitiated, AutoCAD is fantas-

tic but very complex, and learning it to build your first boat is a bold move—particularly so when you are also learning how to work with the German Lloyds-approved Indonesian BKI marine standards. But fortune favours the bold, and by the end of March 1991, a huge 12m by 30m hole had been dug—by hand—in the clay near the beach to create a dry-dock, and the boat's keel had been laid.

Construction continued through 1991, and the boat was safely floated for the first time by breaking through the dry dock wall. By early 1992, Edi had

named the boat *MV Pindito*. And his youngest brother, who was in the travel business in Switzerland, was actively promoting the initial trips on the very first liveaboard in Indonesia.

Raja Ampat

In September of 1992, Edi decided to go and explore Raja Ampat further. It was a trip that led to a shift in the whole rationale for *Pindito*, changing from a liveaboard island hopper to a liveaboard dive boat.

Obviously, that change came at a cost. But it seemed worth it, as the under-



COURTESY OF EDI FROMMENWILER

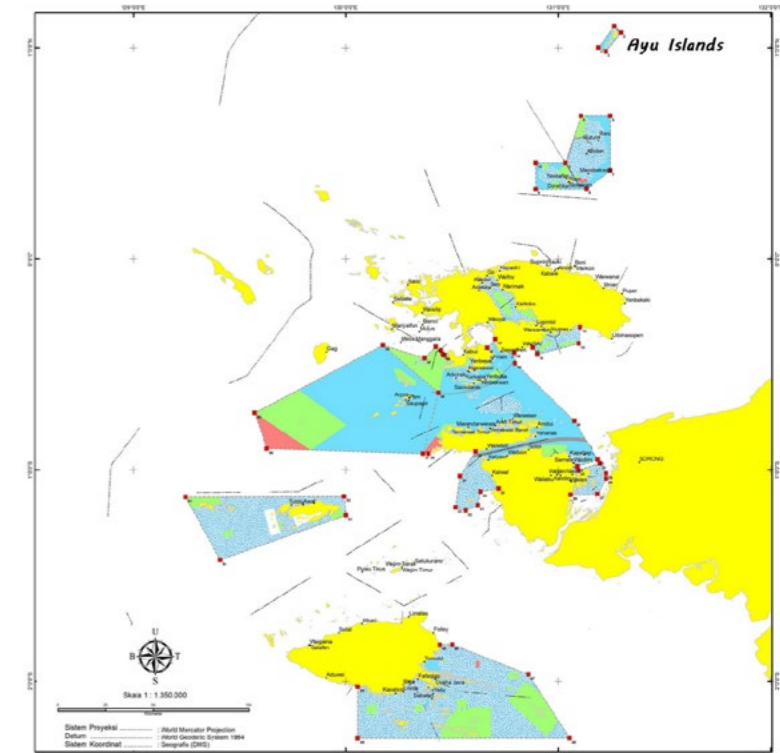


COURTESY OF EDI FROMMENWILER



SATELLITE IMAGE FROM GOOGLE EARTH

Pindito approaches completion during construction (top left and right); Raja Ampat MPA Network showing Ayu MPA (right); West Papua map showing Raja Ampat and the Ayu Islands (left)



COURTESY OF CONSERVATION INTERNATIONAL

water potential of Raja Ampat appeared to be immense. However, nobody, including Edi, had any idea just how immense it actually was.

Bear in mind that 1992 was before the words “coral” and “triangle” had been associated with each other, and the Indonesian Throughflow was just being quantified and understood. In many ways, Edi’s first trip was like discovering an Indonesian Galapagos hidden in plain

years were truly experiencing something very unique.

But...

As wonderful as that story is, it was not all kumbaya around the campfire. The very isolation of Raja Ampat meant that its incredible biodiversity and intense marine life was wide open to be pillaged without any recourse.

sight.

Quite amazingly, for 10 years, Edi had the greater Raja Ampat area to himself, as *Pindito* was the only boat operating there. The guests who came on the boat during those

Edi tells the story about first visiting the remote Ayu Islands in the far north of Raja Ampat around 1993. After dropping the anchor, out from one of the villages, the locals quickly got in their boats and headed for *Pindito* with their spears and machetes!

Clearly, they were very angry at something, and Edi did not understand what, but sensed the danger around the highly unusual reception. Luckily, Edi’s Indonesian wife Ella was on board and was able to establish a dialogue with the villagers. She learnt that their reefs had been effectively decimated from cyanide fishing carried out by a small fleet of rogue boats.

To put that into perspective, for the villagers on those remote islands, their reefs were their primary source of nutrition, and it was how the fishermen fed their families. The health of those reefs was of paramount importance. And like many fishing communities in Indonesia, the people of the Ayu Islands used Adat traditional practices to manage them and the fish stocks.

To have those rogue fishing boats come in like they did, using cyanide to harvest en masse almost all their fish and damage the reefs in the process was simply life-threatening. So, that was why they were so angry—they thought *Pindito* was there to do more cyanide fishing!

Conservation —The first shoots

Running the first liveaboard dive boat in Raja Ampat—and for 10 years, the only boat—meant that Edi was able to establish a strong reputation and good relationships with key people. In 1996, the Bupati (regional leader) of the Raja Ampat regency reached out to him, wanting to know what could be done locally to attract more investors and tourism operators to the area. Sensing a unique opportunity, Edi explained the paradox of underwater Raja Ampat, in that its incredibly rich biodiversity was also its biggest threat, as it would be ruthlessly

exploited unless it was protected.

It took quite a bit more work, but ultimately, the Bupati asked which parts of Raja Ampat should be protected, so Edi drew some circles on a map of the area. It turned out that the Indonesian government were drawing up a manage-

Underwater Raja Ampat at its best! (right); The *Pindito* today (below); Pair of anemonefish in anemone, Raja Ampat, Indonesia (bottom right)

ment and development plan for Raja Ampat and had asked the Bupati for his input.

It took a few more years to come together, but in 2004, the first Marine Protected Area (MPA) was established. And over the years since then, another eight MPAs have been put in place, with some two million hectares, or 44 percent of the total 4.6-million-hectare marine area of Raja Ampat, now protected.

It is a source of considerable pride to Edi that those circles he drew on the map for the Bupati form the core areas of that MPA network—

particularly so, the one around the Ayu Islands!

More adventure to come

I like to think that I have an adventurous streak and have done a lot of stuff—but whenever I talk to people like Edi Frommenwiler, I start to think that in reality, I have led a sheltered life. The scope and magnitude of what Edi has accomplished is simply tremendous, but what is amazing to me is the passion that still burns deeply within him to discover more of the underwater wonders of the vast Indonesian archipelago. I hope to

return to my home in Bali in the coming year and join Edi on one of his exploration trips as he seeks to unlock more secret places, just like he did all those years ago with Raja Ampat! ■

In more normal times, Don Silcock is based in Bali, Indonesia, but is currently hunkered down in Sydney. To see extensive location guides, articles and images on some of the best diving locations in the Indo-Pacific region and “big animal” experiences globally, please visit his website at: indopacificimages.com.



DON SILCOCK



COURTESY OF EDI FROMMENWILER



OLGA VYATKINA / FLICKR / CC BY 2.0

equipment



SI TECH has developed several replaceable neck cuffs over the years. The Quick Neck is common on several drysuit models. The grooves in the neck ring make it flexible in one direction and rigid in the other, so that the ring feels comfortable, and at the same time, the cuff is securely fastened.

Text by Lelle Malmström
Photo and video by Tomas Forssander

The Swedish company SI TECH has further developed its Neck Tite system, which enables the diver to change the neck seal on a drysuit easily, without the need to glue a silicone neck seal in place. The new system is called Quick Neck and is, just like its predecessor, made up of a soft ring that is glued to the suit and another ring that is clamped together with the neck seal in the glued ring.



The SI TECH Quick Neck seal for drysuits is both stiff and flexible for a better fit.

SI TECH Quick Neck Test

— *Braving a Jump From a High Dive Platform*

A colleague of mine and I tested Neck Tite a few years ago, and at the time, we experienced that the neck ring was a bit stiff on land, but underwater, it did not feel stiff at all. The new Quick Neck is much softer and designed so that it will shape to

the shoulders in a much better way—so it will not feel like a stiff neck ring. The secret to the new soft Quick Neck is the patent-pending construction with “grooves” that make the ring stiff in one direction and flexible in the other. (The ring must not

be so soft that the neck seal risks coming loose at the wrong time.)

My colleague and I were the first people outside of SI TECH’s development department to have the opportunity to test the Quick Neck. The first thing that

struck us when we saw our test specimen was that it seemed like the Quick Neck was smaller than the Neck Tite; however, upon checking the measurements of the Quick Neck, it turned out that both models had the same circumference. This





SI TECH's Quick Neck seal system consists of a flexible neck ring glued to the drysuit, and a yellow ring that locks the neck cuff. (below). To see how the Quick Neck withstood rough handling, we were not kind when donning our drysuits (right).



COURTESY OF SI TECH



Test



The yellow locking ring is visible above. This holds the neck cuff and is mounted at the edges, or with the included "pizza wheel" (top left).

Sure, one could just pull a bit on the Quick Neck seal (right) to test its metal, but we went further...

meant that all neck seals, both latex and silicone, that fit the old Neck Tite will also fit the Quick Neck. The yellow locking ring and the installation tool are also the same for the Neck Tite and Quick Neck.

Quick Neck and its predecessor Neck Tite can both be used on drysuits with and without a hood as well as on drysuits with a so-called "warm neck" collar. The soft ring can be glued to the drysuit either from the inside or from the outside. The size of the ring is basically the same as most standard latex neck seals and this makes Quick Neck (and Neck Tite) compatible with most drysuits—even on suits with a front zipper.

Testing Quick Neck

Testing a clamped neck seal is not that difficult—but how should we do it? Sure, you can pull a little on it and see if it stays in place and does not leak when diving. But we were

not content with this. The questions we asked were:

- Does it work in the cold?
- Can it come loose when getting dressed?
- What happens if I jump from a high quay or boat?

Because the test dives took place during December and January, when it was only 3°C in the water and around -8°C on land, we soon got the answer that the Quick Neck worked in the cold. However, I thought that the Quick Neck was a little stiffer in the cold than at room temperature—but then again, my whole drysuit was also much stiffer. I was also extra rough on the neck seal while donning the suit, both out in the cold and inside the swimming pool. But I did not manage to get the seal to come loose or leak.



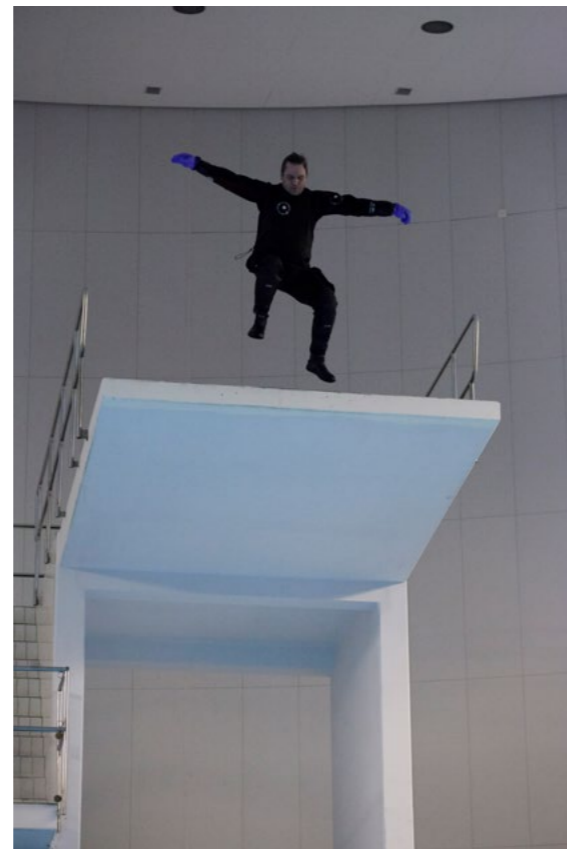
High dive

Would the Quick Neck remain in place if I jumped from a high altitude? We had already jumped off a bridge, so now we would test to see if the Quick Neck held in place for jumps from even higher altitudes. I contacted Alpin & Dyksport (Alpin & Diving Sports) in Stockholm, which had pool time in Eriksdalsbadet's high dive swimming pool.

equipment



The Quick Neck was tested in jumps from a great height (up to 10m) to see if the neck cuff withstood the strain.



Even after repeated jumps, everything sat as it should and the cuff was still tight—there was no sign that anything had come loose.



An installation tool used for mounting and changing seals comes with the SI TECH Quick Neck system.



Test

And, of course, they wanted to see a maniac jumping from a height of 10m in a drysuit!

I can actually admit now that I did not feel so tough when I started climbing the stairs of the high diving tower—especially when I passed the 5m platform and Alpin & Diving Sports instructor Josefin

shouted: “Be calm, we have both oxygen and first aid—so we will probably be able to bring you back to life if something happens.” Right. It felt very safe...

So, all that was left to do was just to take the step out and jump from 10m. It felt like an eternity

before I hit the water's surface... Once I got under the water, I started to feel as if something was leaking somewhere, but I ascended to the surface with incredible speed due to all the air in the suit. Nothing had come loose or had started to leak.

I had to jump four more times before the photographer was satisfied, and I experienced no injuries or any sensation that the Quick Neck was about to loosen.

Summation

Having the Quick Neck mounted on one's drysuit provides security in the event of an accident and the neck seal breaks just before a dive. You never risk missing a dive—if you have an extra neck seal with you in your dive bag. With the installation tool that you get with the Quick Neck, it is easy to change the neck seal at the dive site. After a little practice, I fixed it in a few minutes.

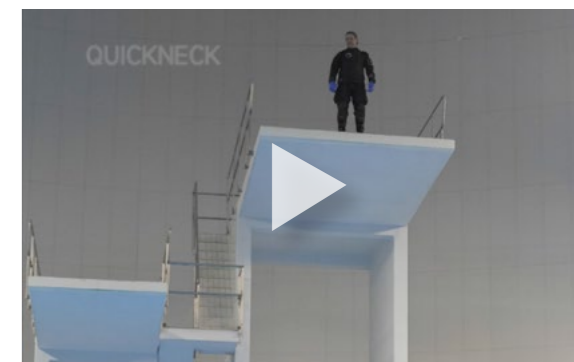
When changing the seal, first

pull off the yellow locking ring and the seal from the ring that is glued to the suit. Then remove the old seal, fold a new seal around the locking ring, mount the seal and the locking ring into the ring on the suit with the help of the installation tool, and it's done!

As the neck seal is clamped, it is also possible to use silicone neck seals. The silicone neck seal is as flexible outdoors in sub-zero temperatures as indoors when, for example, diving in a pool. And if you have the slightest tendency of a latex allergy, then a silicone neck seal is the solution to the problem. I think that SI TECH has succeeded in making a good product into something even better with the development of the Quick Neck. ■



Associate editor Lelle Malmström is a JJ-CCR technical diver and dive writer based near Stockholm in Sweden. He served as editor-in-chief of the Swedish dive magazine Sportdykaren of the Swedish Sport Diving Association from 2013 to 2020 and has assisted in archaeological excavations of the 17th-century Swedish warship Regalskeppet Kronan. He has also been involved in arranging the Scandinavian dive show Dykmässan in Gothenburg and is a member of SI TECH's reference group, testing new dive products before their release on the market.



Click image above to watch the **video**.



Under the “warm neck” collar of the drysuit, one can see the Quick Neck ring.





Text by Simon Pridmore

Readers of my Scuba books often say how useful they find the stories I tell to illustrate key messages. The stories are all true. I wish I could say I made them up, but I am not that creative. Fortunately, life tends to be able to conjure up real situations that are far more instructive than those I could ever invent.

The stories I tell include events I experienced myself, things I have observed happening to others and incidents that fellow divers tell me about. Many concern close calls, and some recount events in which a series of apparently minor issues combine to create a near-disaster.

This is one of those stories. It took place in the islands of south Penghu a couple of years ago while I was doing research for the *Dive into Taiwan* book.

In search of barracuda

We joined a boat heading out to find a huge school of yellowfin barracuda that were known to gather at a particular site when the current was running. The moon would be full that night and the tide charts looked promising, so everyone was hoping for action. One of the groups on board was from a local club and consisted of a



The Barracuda Dive

dive leader with six divers in his charge.

An hour out of port, we reached our destination off the southern tip of a rocky outcrop, and the boat captain executed a search. He sighted a large mass of marine life on his fish finder and issued instructions to his crew. The divers were

divided into three groups, and we were teamed up with the divers from the club.

On a signal, we dropped into calm shallow water in a small bay nearby, descended and swam out to sea, with the club divers just ahead of us. As we emerged from the protection of the bay,

the current picked us up and swept us away. We soon found ourselves drifting fast along a seabed at a depth of around 20m, passing a succession of coral mounds of various sizes, all surrounded by schools of small fish.

When we found a bommie that

seemed large enough to provide a little shelter from the moving water, we tucked in behind it, set our reef hooks and floated up to hang above the reef in the "wind," gazing out into the blue and hoping for a barracuda sighting. The dive leader and his team were doing the

KYO LU





same thing above a larger bommie a few metres away.

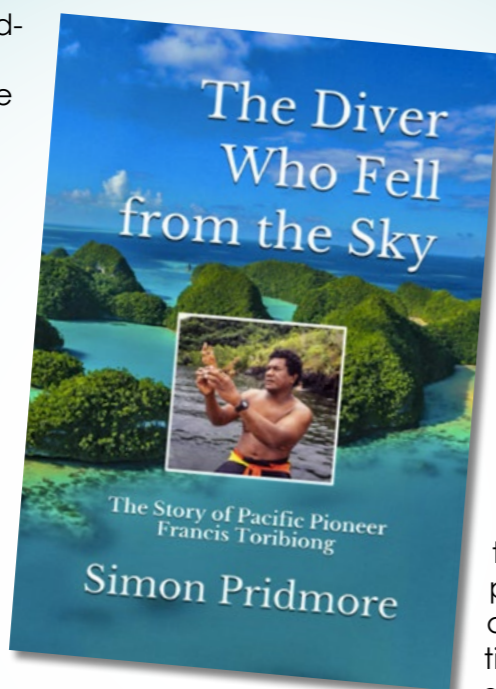
After 20 minutes or so, a rotating school of a couple of hundred barracuda appeared in the distance. The mass of long, silver, yellow-tailed, chevroned, sharp-toothed predators approached and started circling around us. It felt like

we were in the vortex of a cyclone, the eye of a fish storm. We hit the shoot button on our cameras and got some great video as the barracuda came close enough to touch, sometimes obscuring our vision of the reef completely.

Eventually, the school moved away. We glanced over at the dive leader and his

A New Book from Simon Pridmore

When his country needed him most, Palauan Francis Toribiong came along and helped the Pacific island nation find its place in the world and become an independent, forward-looking 20th century state. And he achieved this, improbably, via the sport of scuba diving. This is the inspiring tale of an absolutely unique life, written by Simon Pridmore and illustrated with images of the beautiful islands of Palau, above and below the water.



him this title, people were speaking both literally and figuratively.

Toribiong was so completely different from all of his contemporaries in terms of his demeanor, his ambitions and his vision, that it was as if he had come from outer space. Palau had never seen anybody quite like him and there was no historical precedent for what he did. He had no operations manual to consult and no examples to follow. He wrote his own life.

Toribiong was born poor, had no academic leanings and no talent for diplomacy. Yet he was driven to succeed by a combination of duty, faith, a deep-seated determination to do the right thing and an absolute refusal ever to compromise his values. And, as well as all that, he was Palau's first ever parachutist—known by islanders as “the Palauan who fell from the sky.” In giving

Toribiong was the first Palauan ever to seek and seize the international narrative. No Palauan, in any context or field, had previously thought to go out into the world and say: “This is Palau—what we have is wonderful. Come and see!” This is his astonishing story.

Available in paperback or ebook on: **Amazon, Apple, GooglePlay and Kobo**



CHENWU / FLICKR / CC BY-2.0

team. They unhooked from the reef and started to drift again. We followed their example. Who knows? Maybe we would come across the barracuda again?

Ascending pair

Then, we saw two members of the team start to ascend. We guessed they might be low on air, due to a combination of the excitement and the effort of staying balanced on the end of their reef hook lines in the face of the current.

The dive leader did not seem to have noticed, so we glanced at each other and moved a little closer to the ascending pair, prepared to lend help if necessary. At the same time, we noticed that the seabed was falling away and guessed that the bommies below were now at around 25 to 30m. We had no desire to go any deeper at this point in the dive. We had seen what we came to see.

Then the school of barracuda returned, swimming around us again as we drifted serenely along in midwater. However, the

two divers who had broken away from their team immediately dropped to the seabed when they saw the barracuda come back, presumably so they would have a more stable platform to take pictures from. They were both breathing heavily as they struggled to redeploy their reef hooks and get into position. They were both generating an almost constant stream of bubbles.

We watched from above, finning steadily to stay in place above them. This time, the barracuda did not stay long, and we saw the two divers begin to ascend again. One kept looking at his pressure gauge. The dive leader appeared, swam over to the anxious diver and, after a brief exchange of signals, they started sharing air and began to ascend slowly together. The dive leader kept looking over at the second diver, evidently concerned but powerless to help.

Second diver

We approached the second diver and

signalled to ask if he was all right. The diver replied OK, but we were dubious and decided to stay close by. Nevertheless, we were still not close enough to do anything when he suddenly started heading for the surface, apparently out of control. All we could do was hope that he would manage to arrest his ascent before he hit the surface.

This he did, by deflating his BCD. Then he reached for his delayed surface maker buoy (DSMB). Good, we thought, he will now do a safety stop, then go up.

Unfortunately, the diver seemed to be having difficulty attaching a small reel to his DSMB and was concentrating so much on sorting it out that he did not notice that he was descending again, and fast. He must have just emptied his BCD completely. We were at about 13m when he came plummeting past us, heading quickly back towards the seabed. Finally, he got his reel attached, added air to his BCD to halt his fall and started inflating his DSMB. Having inflated





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Diver deploying a DSMB

it and let it go, he clipped the reel onto the chest D-ring on his BCD.

Buoy problem

At this point, he encountered a new problem. He must have been at a depth of around 25m when he put up his DSMB, but evidently, he had much less than 25m of line on his mini-reel. As the DSMB was about halfway through its journey to the surface, the line on the reel ran out.

The impetus of the expanding air in the DSMB was greater than the diver's weight so up he went again, this time dragged towards the surface by the buoy spiraling through the water and connected to him by the clip on the reel. The diver had the presence of mind to push the dump on his BCD as he shot up, to slow his ascent once the DSMB hit the surface, but this time he just made the briefest of safety stops. By this

point, he probably just wanted to get the dive over. Or maybe he finally ran out of air?

When we got back on the boat, the diver was there, looking a bit shell-shocked and sheepish, but otherwise he seemed fine. We noticed he did not do any more diving that day, however.

Takeaways

1. Stay focused on your air and decompression status, especially when you are diving in a current.
2. Practice controlled breathing so that it becomes instinctive. You will then be able to manage stressful situations without increasing your breathing rate and using up more air.
3. Don't allow yourself to become distracted and get your priorities confused. The primary aim

on every dive is to complete the dive safely, not see big fish or take photos.

4. Practise raising your DSMB from depth while staying neutrally buoyant until this skill also becomes instinctive.
5. Be aware of your depth as you are raising your DSMB. Turn your computer so that it is on the inside of your wrist, so you can easily see the screen while you manipulate your reel and line.
6. Know how much line you have attached to your DSMB. Measure it on land and write the length in indelible marker

on the body of the reel as a reminder.

7. Never clip a reel off to your BCD. Keep it in your hand so you can release it if something goes wrong. ■

Simon Pridmore is the author of the international bestsellers *Scuba Fundamental: Start Diving the Right Way*, *Scuba Confidential: An Insider's Guide to Becoming a Better Diver*, *Scuba Exceptional: Become the Best Diver You Can Be*, and *Scuba Professional: Insights into Sport Diver Training & Operations*.

Insights into Sport Diver Training & Operations, which are now available in a compendium. He is also the co-author of the *Diving & Snorkeling Guide to Bali and the Diving & Snorkeling Guide to Raja Ampat & Northeast Indonesia*. His recent published books include *The Diver Who Fell From The Sky*, *Dive into Taiwan*, *Scuba Physiological: Think You Know All About Scuba Medicine? Think Again!* and the *Dining with Divers* series of cookbooks. For more information, please see his website at: SimonPridmore.com.

New e-Book

Author Simon Pridmore has just released a new single volume e-book that brings together four books in his bestselling *Scuba* series:

- *Scuba Fundamental – Start Diving the Right Way*
- *Scuba Confidential – An Insider's Guide to Becoming a Better Diver*
- *Scuba Exceptional – Become the Best Diver You Can Be*, and
- *Scuba Professional – Insights into Sport Diver Training & Operations*

As Simon puts it, this is "a remastering and repackaging of the original albums rather than a greatest hits." Nothing is missing. *Scuba Compendium* gives e-book readers the advantage of being able to access all the knowledge contained in the four books in one place, making this a unique and easily searchable work of reference for divers at every level.

Simon has always promoted the idea of safer diving through the acquisition of knowledge, which is why he has chosen to release this highly accessible version. If you have read his work before, you will know that he provides divers with extremely useful advice and information, much of it unavailable elsewhere; his points often illustrated by real life experiences and cautionary



Simon Pridmore

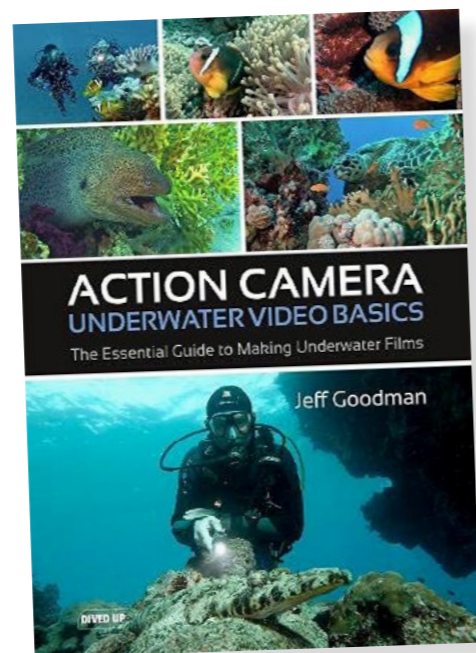
tales. He examines familiar issues from new angles, looks at the wider picture and borrows techniques and procedures from other areas of human activity.

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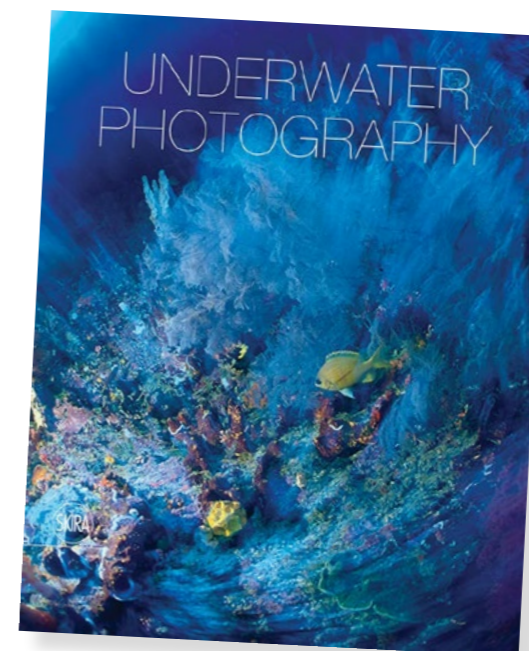


UW Videography

Action Camera Underwater Video Basics: The Essential Guide to Making Underwater Films, by Jeff Goodman

Focussing on small action cameras, like those made by GoPro, SeaLife and Paralenz, underwater cameraman Jeff Goodman highlights their versatility and shows readers how to get the best out of them. He cuts through the many equipment choices and homes in on what is useful for underwater videoing, and provides the necessary background knowledge essential to take good underwater videos. Two exercises are included to let readers put what they have learnt into practice. All the 200+ images in the book were shot with an action camera.

Publisher: Dived Up Publications
Dates: 26 October 2021
Paperback: 192 pages
ISBN-10: 190945544X
ISBN-13: 978-1909455443

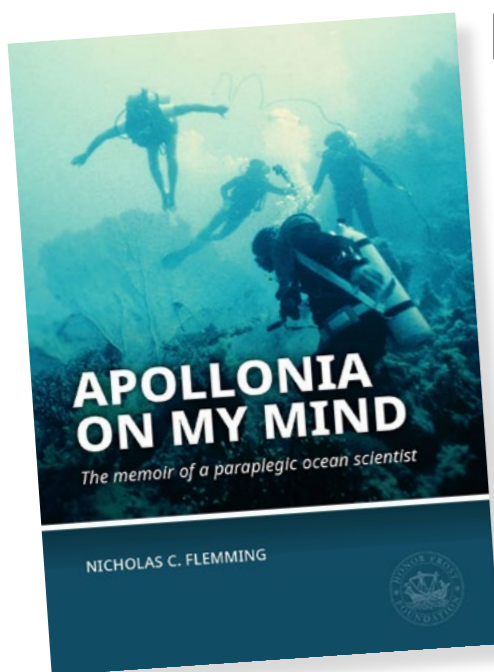


UW Photography

Underwater Photography, by Vincenzo Paolillo

This hardcover book presents a glimpse into the underwater realm through the eyes of Italian photographer Vincenzo Paolillo. Here, the world beneath the waves transforms into a fantastical dimension, with brightly coloured fish, neon-toned coral formations, semitransparent jellyfish, etc. The images are categorised into five sections: colour, shape, place, movement and light. Under each heading, readers come to appreciate the underwater world's inherent artistic beauty through the magic of underwater photography.

Publisher: Skira
Date: 30 November 2021
Hardcover: 263 pages
ISBN-10: 8857245233
ISBN-13: 978-8857245232



Dive Memoir

Apollonia on my Mind: The memoir of a paraplegic ocean scientist, by Dr Nicholas C. Flemming

This memoir relates the life of a pioneer in ocean science. Over the decades, Nicholas Flemming's experience stacked high, and involved such diverse as-

pects like underwater cities, submerged Ice Age caverns, ocean climate change, prehistoric settlements on the continental shelf, ocean law and safe scientific diving. This multidisciplinary book examines how different skills and fields interact creatively with surprising results. One chapter also assesses how, despite being paralyzed from the neck down, Flemming has continued to work in rough conditions, visiting 60 countries since his accident.

Publisher: Sidestone Press
Date: 16 December 2021
Hardcover: 550 pages
ISBN-10: 9464260335
ISBN-13: 978-9464260335



Seagrass Carbon Sink

Blue Carbon in Seagrass Ecosystem: Guideline for the Assessment of Carbon Stock and Sequestration in Southeast Asia, by Susi Rahmawati, et al.

Recent research has indicated the seagrass ecosystem as a promising carbon sequester and carbon sink. Compared to tropical rainforests, seagrass meadows have more potential to capture and store a large amount of carbon (i.e. blue carbon). Although ASEAN countries have equal responsibility to preserve the seagrass ecosystem, each country has its unique characteristics, and this poses challenges when assessing the contribution of each country. A platform was required to collect data and calculate the carbon sequestration, so as to compare data and information among the countries. As such, this guideline has been developed as a means to fulfil this need.

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ASIN: B09N39B1SF
Publisher: Gadjah Mada University Press / UGM Press
Date: 5 December 2021
File size: 50985 KB
Print length: 183 pages



Diver Mystery

FLOTSAM: A Divemaster Ricky Mystery, by Tracy Grogan

This novel starts with a strong protagonist whose morning dive is interrupted by a tangle of chairs, bodies and what appears to be a truck axle. Throw in a tropical setting, organised crime, murder investigations, WWII tunnels, a high-speed chase, and best of all scuba diving, and you have the ingredients of an exciting thriller on your hands. Written from the first-person perspective, this page-turner is highly readable.

ASIN: B09KNGHRYV
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ISBN-13: 979-8985014006

Text by Michael Mason
Photos courtesy of Michael
Mason and Peter Symes

Human factors is about making it easier to do the right thing and harder to do the wrong thing. Therefore, for divemasters, human factors is about making it easier for them and their divers to do the right thing and harder to do the wrong thing.

Human factors is usually considered a way to make diving safer, but it actually goes far beyond that and can be used to great benefit to maximise individual and team performance and get much more out of diving.

The world of human factors is huge, so this article will focus on a few subjects that come under the human factors umbrella. Besides offering some specific guidance, it will hopefully provoke some thought into how you might apply the concepts to your own dive-mastering style.

Is there a problem?

Most of the diving involving divemasters is relatively shallow and recreational in nature, but it comes with its own set of challenges. Bad things do happen to divers while under the supervision of divemasters, which we obviously want to avoid.

Almost all accidents and incidents happen as a result of several small things coming together, resulting in something bigger going wrong. In isolation, the small things do not usually matter until a big thing happens, and

we look back with hindsight and see the small things clearly. The main problem therefore are all these small things that have the potential to add up to become a big thing.

It is very difficult, if not impossible, to change human behaviour, as we have been this way for millennia. What we can do more easily is change the conditions associated with a situation or

environment that encourage or promote human error rather than change the errors themselves.

Not quite a “drift” dive

Here is a real-life story, which is

a great way of getting the concept across:

A group of divers surfaced from a dive and found themselves farther away from their boat than they expected due to

more current than anticipated. Attempts to signal the boat were unsuccessful, and they eventually drifted out of sight. Some two to three hours later, they luckily came across an oil platform and



Apply Human Factors *Be a Better Divemaster*

PHOTOILLUSTRATION BY G. SYMES COMPILED WITH IMAGES FROM PIXABAY





COURTESY OF MICHAEL MASON



PETER SYMES



PETER SYMES

that almost came together to result in something very serious. Let's consider three aspects from this story and what we could do about them.

- More current than expected
- Boat crew not keeping sufficient lookout
- Divers being hard to see

So, how do human factors fit into all this? Here are three things to consider:

Devices & lookouts. Identify the conditions present that make an unfavourable outcome more likely. Make it easier to do the right thing. In this case, ensuring that divemasters have a surface marker buoy (SMB) from the start or sending up a delayed surface marker buoy (DSMB) early, once the current is noticed, will allow the boat to track the divers better from the surface.

Make sure that lookouts on the boat have a good, preferably elevated vantage point and are

especially active once the intended dive time has expired. (An accurate dive log is very helpful here.) Take bigger and/or better signalling devices. DSMBs come in many shapes and sizes, but whistles or flares/emergency beacons can be useful too.

Debrief. The main thing that you can do is have a debriefing when things do not go according to plan. An effective debrief requires good communication skills to ensure that lessons are learnt, and all the relevant information is disseminated and understood by everyone involved. A debrief must not be about identifying who is to blame. A debrief needs to be about identifying what caused the problem.

Leadership. Divemasters are leaders. Effective leadership comes in many forms, and for the divemaster, the dive brief is the perfect time to set the tone and demonstrate that you are the divemaster you, yourself, would

want to follow. When giving the dive brief, let your divers know what to probably expect but also what to possibly expect. This will all help the team if and when things do not go exactly to plan.

Specific techniques

Here are some specific things a divemaster can do before, during and after a dive. While primarily they are there to help make the dive safer, they will also help the whole team get more out of the dive and learn for future dives.

Before the dive

Personal introductions. This is all part of the foundation of psychological safety, which has to do with creating an environment where people in a team feel safe to speak up about things that they are not comfortable with. Greet people with a smile, maintain eye contact, start a conversation. Tell them your name and that you will be their divemaster. Make sure you ask for their names and try to remember them. Encourage

them to come to you with any questions and concerns they may have.

Check gear. Check people's gear because you want to know how it works. How do you get rid of their weights? How do you inflate their BCD or wing? It is important that you tell them why you are doing this, so they do not think you are just double-checking their setups. They need to know you are doing it for everyone's benefit.

Tailorise briefings. Engage your audience during the brief and tailor it to them. If everyone has done the site before, there is no point in describing the site in detail. Check the understanding of hand signals. Find out what responses you will get if you tap your fingers into your palm (asking for gas amount). Different countries use psi and bar; different agencies teach different signals to show gas amount. It is far



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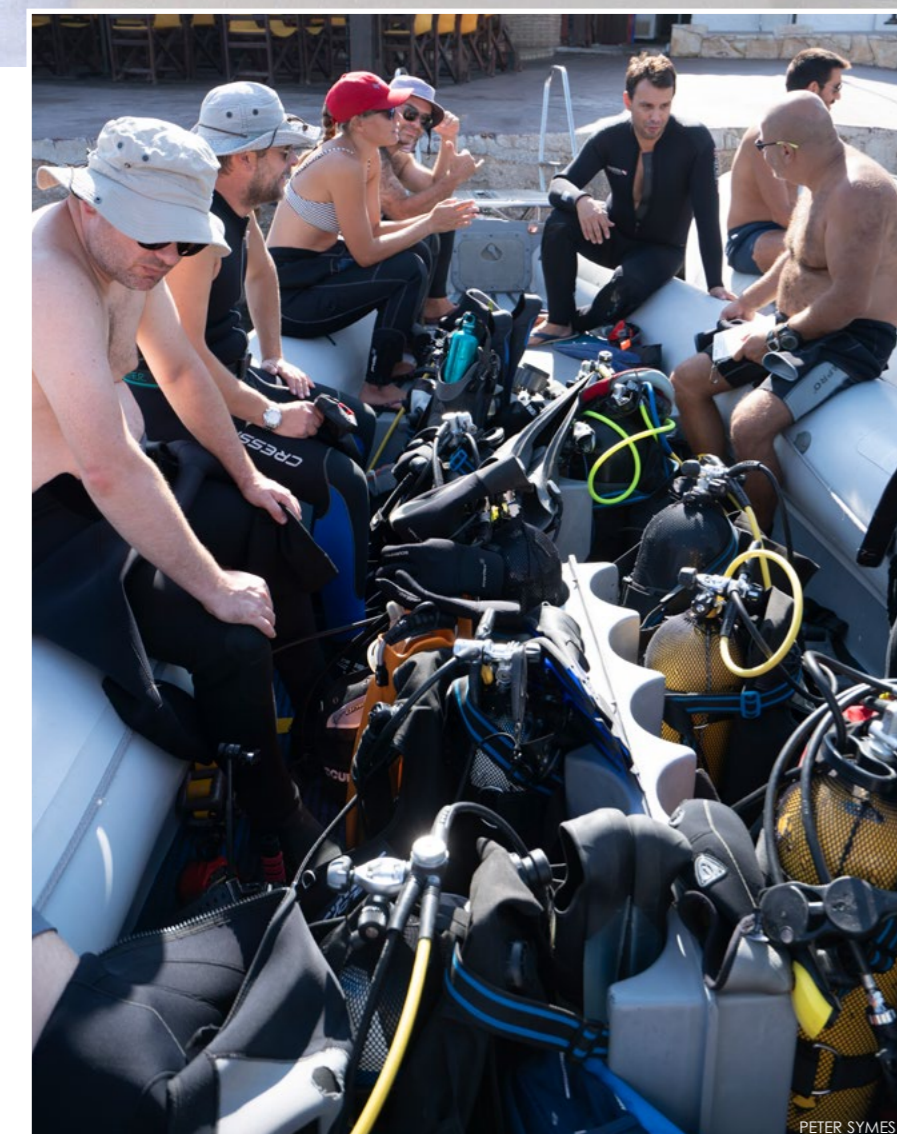
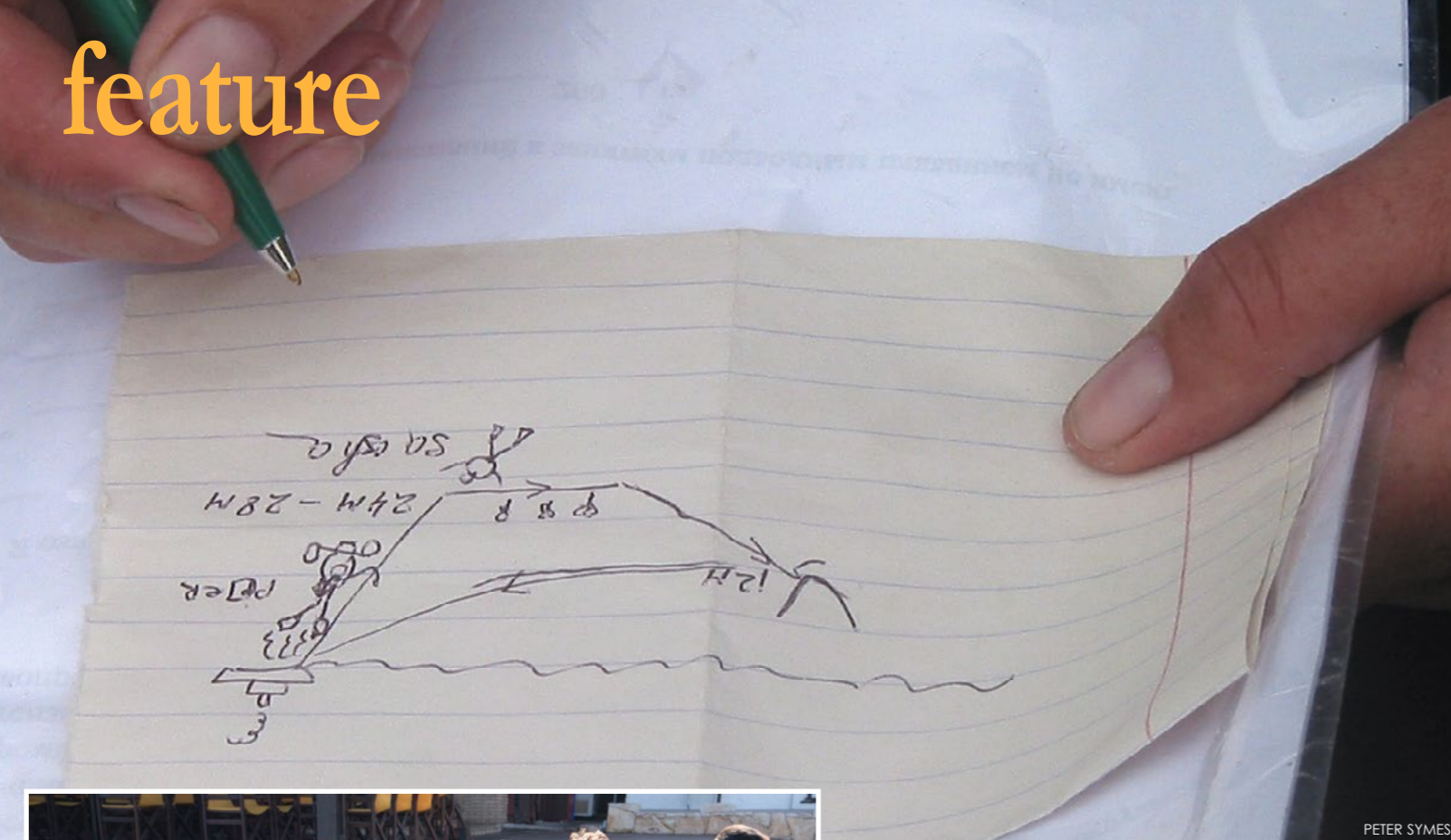
easier to figure this out on the surface beforehand.

Use a checklist. I encourage briefing from a checklist to minimise the chances of missing something. It is easy to get distracted during a brief and then forget what you were saying. A checklist can help remind you.

Set the example. Be the divemaster you would want to follow. Do

were subsequently picked up by the dive centre's boat.

This incident, like many others, had numerous small problems



your pre-dive checks with a buddy and make sure people see you doing them.

During the dive

Closed-loop communications. This has to do with repeating a message back to someone to check it has been understood correctly. As well as confirming understanding, it also cements the message better in your brain's memory banks by engaging more parts of the brain.

For example, when someone gives a hand signal for gas amount, repeat it back to them and say it to yourself through your regulator. That confirms to them that you have understood it correctly and gives you a better chance of remembering it after you have asked another five or six people.

When you give a signal, ask your divers to not just respond to you with the "OK" signal but to repeat the original signal back. When giving a "thumbs-up" at the end of the dive, you want to know that others know you are on ascent, and the best way for you to know they understand this

is for them to reply with the same "thumbs-up" signal.

Exaggerate correct technique. When you enter the water, use and even exaggerate the correct technique. For a giant stride, make it clear you are looking at the horizon and taking a big step out. When you are exiting the water, keep your regulator in and mask on until back in the boat. There are many stories out there of people doing poor giant strides and then their tanks hit the boat, causing it to hit the back of their head. There are also many stories out there of people being overcome by waves and spray on the surface, which would not have happened had they kept a regulator in their mouth. As the divemaster, set a good example—people are likely to follow your lead.

Take notes. If you see something you are not happy with, you can make a note to discuss it afterwards. For example, if someone has poor trim and their fins are constantly in the coral, you can talk to them about ways to improve and give them reasons why.

If you see a variety of interesting wildlife, notes will help people with their logbooks and can also help you if someone else points something out that you cannot identify at the time. I was at a local site a couple of months ago and my buddy pointed out what I thought was a frogfish. I made a note, which prompted me to ask him about it afterwards, and he confirmed it was a frogfish and that they are often found in that spot. This helps me offer a better service to other customers in the future.

After the dive

Have a debrief. It does not need to be a long, drawn-out affair. If the dive was uneventful, it can be enough to make sure everyone is feeling well and had a good time. Ask for any feedback and be grateful when it is offered. From the notes you have taken, ask others if they would like feedback. If they say "yes," offer them advice on how to improve.

To help with this, it is important to make feedback about observable



behaviour rather than the individual. For example, rather than saying, "Dave, your fins were constantly in the coral. You did so much damage. You need to do it better," say something like, "Dave, a horizontal swim-

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COURTESY OF MICHAEL MASON

Be the divemaster that you, yourself, would want to follow.

ming position is much better to avoid damaging the coral and is a much more efficient way to swim." The latter phrase is about Dave's technique or behaviour rather than specifically about Dave and is naturally more palatable, even though you are explaining the same concept.

Talk about mistakes. If you have done something wrong or made a mistake, talk about it. This demonstrates humility and encourages others to speak up. Recently, when leading a big group, it took me longer than I expected to get back to the anchor line, which led to us surfacing a few minutes over time and my buddy had slightly less than 50bar, which violated the standards I had set at the start. Afterwards, I discussed it with my buddy, reflected on it, and learnt that in future, with a big group at that site, I need to allow more time to get back to the anchor line.

Reply to feedback. If you do receive feedback, act on it and, if possible, show that you have acted on it. For example, if someone comments that your brief did not cover something, change your brief accordingly, especially if that someone is a regular customer and will hear your brief again!

If you receive feedback via email, take two minutes to reply. Too often, feedback disappears into the ether, and those who spent time giving it have no idea what happened to it so are less likely to give feedback in the future. I have sent a couple of emails to dive companies offering feedback after the trip and never had a reply, which I found quite disappointing.

Summary

Human factors is about making it easier to do the right thing. Whether you are planning, briefing, actually doing a dive, or reflecting on a dive you have done, look at the conditions present not just the errors themselves. Was there enough time for a thorough

briefing and pre-dive checks? Was effort made to engage with the novice divers in the group to make sure they were completely comfortable? If you have a real-life rescue situation but you have not done any rescue training as a team before, then do not be surprised if it does not go very well.

Set the example. Do your best with demonstrating technical skills, with briefings and with pre-dive checks. Engage with people—smile, maintain eye contact, be enthusiastic, but be humble and admit your mistakes. Enjoy what you are doing and show people that you are enjoying it.

Be the divemaster that you would want to follow. ■

Michael Mason is an experienced military pilot and flying instructor in his day job and works as a divemaster on weekends. He is also training to become an instructor for The Human Diver and is always striving to improve diving by applying human factors.

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marine mammals



Edited by Peter Symes

Pod of sperm whales in Dominica. Will humans ever understand what these cetaceans are saying?

A team of researchers is using artificial intelligence focused on processing written and spoken human language to contextualize and translate the communication of sperm whales. The team hopes to be able to communicate with sperm whales in just five years.

Project CETI is a nonprofit organisation applying machine learning and robotics to listen to and translate the communication of whales. The organisation is working to develop a deeper understanding of the complex system of communication that sperm whales use and share this understanding with the world.

Cetaceans are unique non-human model species, as they possess sophisticated acoustic communications but utilize a very different encoding system that evolved in an aquatic rather than terrestrial medium. Sperm whales, in particular, with their highly-developed neuroanatomical features, cognitive abilities, social structures, and discrete click-based encoding, make for an excellent starting point for advanced machine learning tools.

Codas

With brains six times larger than ours, sperm whales (*Physeter macrocephalus*) have intricate social structures and

spend much of their time socializing and exchanging patterned clicks. This symphony of clicks, known as codas, might be sophisticated enough to qualify as a full-fledged language.

Codas appear to be rich in information about the caller's identity, and there is some understanding of the diversity of coda types and the patterns of variation in their usage. Yet, the communicative function of particular codas

themselves is still largely a mystery. Codas are exchanged in duet-like sequences between two or more sperm whales. There is apparent turn-taking with whales responding within two seconds of each other, often overlapping and matching identical calls

Researchers are using natural language processing or NLP—a subfield of artificial intelligence focused on processing written and spoken human language—

which will be trained on the data of four billion sperm whale codas.

Analysis

The plan is to have the AI correlate each sound with a specific context—a feat that will take at least five years, according to the researchers. The hope is to expose the underlying architecture of whale chatter: What units make up whale communication? Is there grammar, syntax, or anything

analogous to words and sentences? The quest is likely the largest interspecies communication effort in history.

Michael Bronstein, the lead of machine learning for Project CETI, told *Hakai*: "If we discover that there is an entire civilization basically under our nose—maybe it will result in some shift in the way that we treat our environment." ■ SOURCES: PROJECT CETI, ROYAL SOCIETY OPEN SCIENCE



Will we learn to speak whale?

ERIC CHENG





photo & video

“Skydiver.” A common ocean squid just 50cm below the water’s surface with the sky and some clouds as an unusual background. Gear: Canon 40D camera, Canon EF-S 60mm macro lens, Ikelite housing, one Ikelite DS125 strobe. Exposure: ISO 200, f/9.5, 1/90s

Text and photos by Rico Besserdich

If you have been diving the same area with your camera for a long time, shooting the same animals and scenes again and again, sooner or later the question “What more is there?” might arise in your creative mind. It starts as a mild breeze and can end up a storm.

Let’s assume for now that you have diveable waters nearby or within easy reach. This is your home turf for underwater photography and might be the place where you, after a time, have made photographs of everything that grows, crawls or swims there. Your image archive is huge, but perhaps a lot of the images look a bit similar. If you are a photographer, you want more. You want to create something different, right? Then

keep reading!

Let me add a little extra spice to your soup of photographic creativity by sharing a few mini-tutorials and ideas with you. The good news: There is no need to sell the house to buy special

photography equipment or for you to book trips to incredibly expensive destinations. Just use what you’ve got, regarding underwater photo equipment and available dive sites.

1. A different angle of view

Simple and effective. The “classic school” of photography tells us to shoot on an “eye-to-eye” level or with a slightly upward angle. This always works well, but sometimes it results in many images

looking quite similar, regardless of how technically well they were made. We photographers often strive to attract the eyes of the viewer. However, as nowadays the eyes of viewers are pretty much used to the “classic” angles, it

A New Approach

— *Shooting Common* Subjects in *Different Ways*





photo & video

Sea goldie (anthia), Red Sea (right). Gear: Canon 7D camera, Canon EF-S 60mm macro lens, Easydive housing, two Sea&Sea YS110 alpha strobes. Exposure: ISO 200, f/3.5, 1/250s

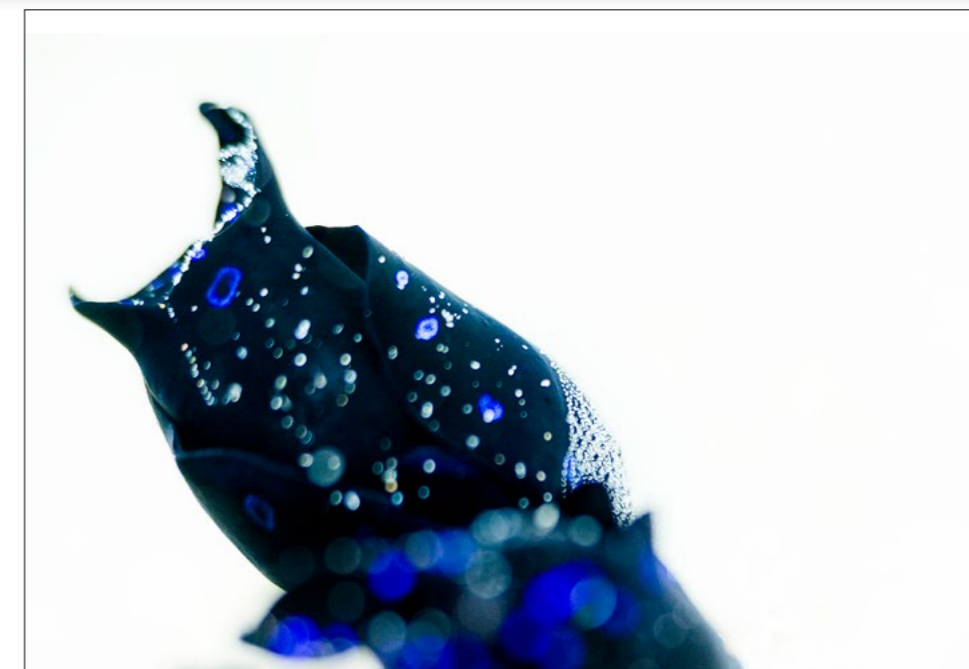


"Lightning Squids." A few juvenile common squid just below the water's surface at the end of a night dive in the Turkish Mediterranean Sea. A man standing on the jetty is watching me with curiosity. Gear: Canon 40D camera, Sigma 10-20mm lens (at the 10mm end) with +4 close-up filter attached, Ikelite housing, two Sea&Sea YS110 alpha strobes. Exposure: ISO 400, f/4, 1/40s



Juvenile lionfish, Red Sea (below). Gear: Canon 7D camera, EF-S 60mm macro lens, Easydive housing, two Sea&Sea YS 110 alpha strobes. Exposure: ISO 100, f/3.5, 1/250s

Approach



Slug, Red Sea. Gear: Canon 40D camera, EF-S 60mm macro lens, Ikelite housing, one Sea&Sea YS110 alpha strobe. Exposure: ISO 100, f/4, 1/250s

might be worth a thought to try something different.

Try shooting with an extreme upward angle of view. "Looking up" is the key. At some spots, you might not be able to look through your camera's viewfinder. Shoot "from the hip" then. Once you know the basics of your camera and the focal range of your lens, this simple technique can get you very different results. The angle of view is one of the most powerful tools in photography in general, not just in underwater photography.

2. Going high-key

Black backgrounds with

a photogenic subject in the foreground is an all-time classic composition in underwater photography. Images made this way do always work, and that might be a reason why we see so many of them. So, how about doing the extreme opposite? Why not a white (or very bright) background?

In high-key photography, everything is done with light. To achieve a white background in an underwater image, you might carry an artificial one (a white plastic plate or blanket) with you, but this is not always practical, unless you have

several people assisting you. Remember: We must work with what we've got. A different way to do it is as follows:

- Find yourself an interesting subject that crawls or swims over sandy ground or swims in very shallow, brightly lit waters.
- You will need one or two powerful strobes (or a very powerful torch).
- Set your camera to "spot measuring" and measure only the main subject but not the sand or water.



photo & video

Christmas tree worm (right). Gear: Canon 40D camera, Canon EF-S 60mm macro lens, Ikelite housing, two Sea&Sea YS110 alpha strobes. Exposure: ISO 100, f/4, 1/180s

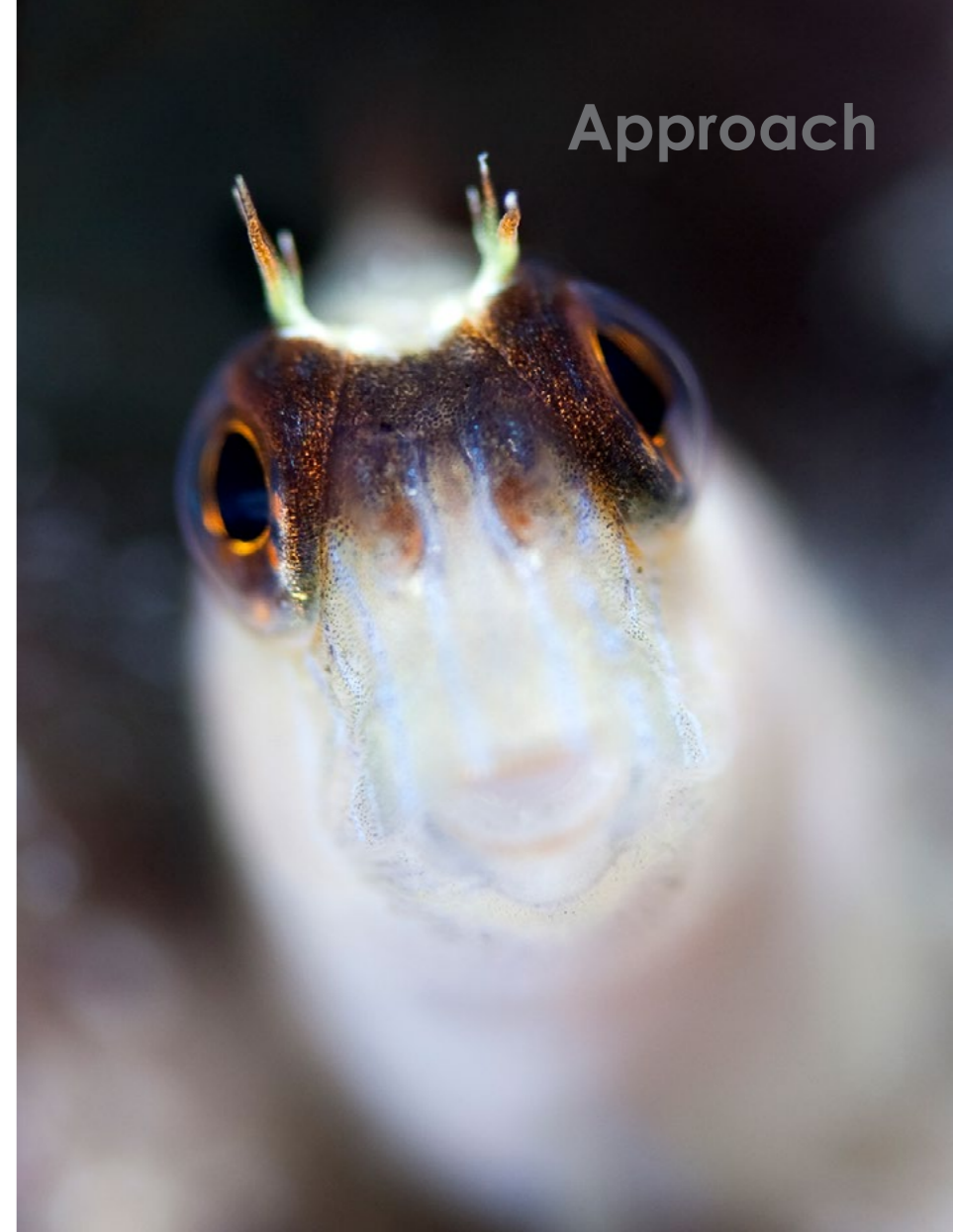


"The DOF Gang," Red Sea (above). Gear: Canon 7D camera, Canon EF-S 60mm macro lens, Easydive housing, two Sea&Sea YS-D1 strobes. Exposure: ISO 100, f/2.8, 1/250s

Crinoid (right). Gear: Canon 40D camera, Canon EF-S 60mm macro lens with SubSea +10 diopter attached, Ikelite housing, two Sea&Sea YS110 alpha strobes. Exposure: ISO 160, f/11, 1/160s. Please note: Longer (or extended) focal lengths can produce pleasing blurry backgrounds, even at f/8 to f/11.



Blenny face, Mediterranean Sea (right). Gear: Canon 40D camera, Canon EF-S 60mm macro lens, Ikelite housing, one Ikelite DS 125, plus one Sea&Sea YS110 alpha strobe. Exposure: ISO 200, f/3.5, 1/250s



Approach

- Your camera will then suggest to you a setting that provides a proper exposure of the main subject. Logically, the brighter background (sand) will then be overexposed, and that is the trick. We use overexposure as an element of composition.
- Take your shot. The sand will reflect the light of your flash, which results in a very bright to completely white background, while the main subject is still well-exposed. *Voilà!*

3. Going shallow

In classic macro photography (underwater or topside), it is usually the aim of the photographer to achieve an ideal depth of field,

having as many details as possible in the image of any macro subject. This is usually done by using f-stops between f/9 and f/16 (depending on the camera used). This works well, and it shows viewers of the image what they normally expect to see. But creative photographers rarely want to fulfil the expectations of the viewer. They want to create new imagery; they strive for a different perspective, a different approach.

Not meant as a "provocation" but as a different approach to underwater macro photography, let's go shallow. Let's work with wide-open f-stops (f/2.8 to f/4). The result then would be an image with an incredibly shallow depth of field, with only a small area of the subject in focus and the

rest smoothly blurred away. The "classic" technique here would be setting the focus only on the eye (of a fish) or the rhinospheres (of a nudibranch); however, setting the focus on different areas could open up other ways to create interesting abstract shots as well.

This technique is often called "bokeh," but actually, true bokeh affects the quality of the areas in the image that are out of focus and has little to do with shallow depth of field.

How to do it:

Just set your camera to the widest aperture (the lowest f/stop number) provided by the lens in use. On good macro lenses, f/2.8 is sometimes a little extreme, but f/3.5 to f/4 does often work well. Keep in





photo & video



Surgeonfish, Red Sea (above). Gear: Canon 40D camera, Canon EF-S 60mm macro lens, Ikelite housing, two Sea&Sea YS110 alpha strobes. Exposure: ISO 200, f/8, 1/90s



mind that with such an open aperture, much more light will hit your camera's sensor. You will need to adjust the ISO (to the lowest setting!), shutter speed (mostly higher than usual) and flash power (lower than usual, but it depends on the depth of your dive and the available ambient light) accordingly to prevent overexposed photos.

4. Abstract macro

One more tip for macro fans: Instead of working on macro photographs that clearly feature the typical characteristics of the photographed subject, a more abstract interpretation (be brave!) often results in pleasing and unusual images. Remember that in abstract photography, the subject itself is secondary. Often, viewers do not even know what the subject actually is, and this then gives them room for their own interpretations. Each person may see,

imagine or sense something different from someone else, when looking at such a photograph. They will look again and again, they will think and talk about it (the image), and for the photographer, this then could be the first step into the world of fine art. We do not have to dictate to the viewer anymore, what they have to see in images, we can leave it up to them to perceive what they "want" to see in the photograph.

Patterns of all kinds, shapes, details like fins, legs or the interplay of colours and light on any given macro subject, work well. It just needs a little courage on your part to step away from the "classics" and keep your eyes and mind open to a different approach to underwater photography. ■

Rico Besserlich is a German artist, lecturer, photography instructor, writer, photo contest judge and professional underwater



Approach

Lionfish spines, Red Sea (above). Exposure: ISO 250, f/2.8, 1/320s; and (bottom left). Exposure: ISO 250, f/2.8, 1/250s. Gear used for both images: Canon 7D camera, Canon EF-S 60mm macro lens, Easydive housing, one Easydive "Revolution" video light (2800 Lumen)

photographer living in Turkey. Involved in photography since 1978, he has specialised in underwater photography since 2000. His work has appeared in over 300 magazine and book publications around the world and has been translated into nine different languages. Rico also conducts workshops and seminars on "Artistic Underwater Photography" at the fine arts university HBKsaar in Germany, which is the first time a professional underwater photographer has been invited to do so. In addition, he has given presentations at various photography-related events, universities and dive shows in Europe and has displayed his work in several fine art photography exhibitions. Rico is a CMAS/IAC Instructor Trainer (Moniteur 3) with around 5,000+ logged dives. For more information, please visit: maviphoto.com.



Flatworm, Mediterranean Sea. Gear: Canon 40D camera, Canon EF-S 60mm macro lens, Ikelite housing, one Sea&Sea YS110 alpha strobe, plus one TillyTec dive torch. Exposure: ISO 200, f/11, 1/80s





Edited by Peter Symes



UNIVERSITY OF MIAMI RSMAS

Why do fish rub themselves against a shark?

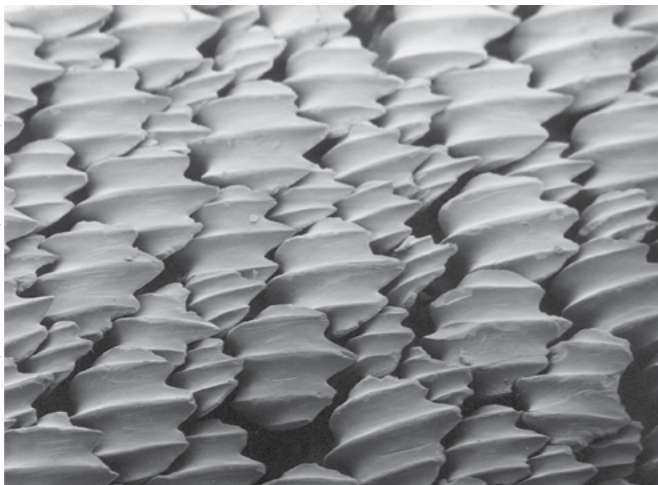
Fish have been spotted rubbing themselves against sharks. A recent study gives a possible reason for this behaviour.

Fish rubbing themselves against a shark's body may sound as if they have a death wish, but this is precisely what some fish have been spotted doing.

And it turns out that such behaviour is more widespread and frequent than one would think.

A study led by the University of Miami (UM) Shark Research and Conservation Program at the Rosenstiel School of Marine and Atmospheric Science uncovered over 40 instances of fish rubbing themselves against

PASCAL DEYNAT / ODONTOBASE / WIKIMEDIA / CC BY-SA 3.0



Dermal denticles of a lemon shark viewed through a scanning electron microscope

a shark's skin in over ten locations around the globe.

Chafing

This behaviour, called chafing, has been observed between fish and safe, inanimate objects like sand and rocky substrate. Why do fish do it with sharks?

Here's a possible reason: Shark skin is covered in small tooth-like scales

called dermal denticles, which provide a rough surface similar to sandpaper. According to UM Rosenstiel School research associate professor and study co-author Neil Hammerschlag, "We suspect that chafing against shark skin might play a vital role in the removal of parasites or other skin irritants, thus improving fish health and fitness."

Although instances of fish chafing against sharks have previously been observed, this study finds this cross-species behaviour to be more pervasive than previously understood. The research team examined underwater photos, video, drone footage, and witness reports to find

Shark fishing is now illegal in Hawaiian waters

Passed during the last legislative session in the US state of Hawaii, Act 51 (House Bill 533) makes it illegal for anyone to knowingly capture, entangle, or kill any species of shark in Hawaiian waters.

The ban does not apply to people with permits issued by the state's Department of Land and Natural Resources (DLNR), shark fishing for public safety, sharks captured for self-defence, or sharks taken outside of state marine waters with required documentation.

According to Act 51, the conditions of non-commercial permits for the take of sharks "shall include native Hawaiian cultural protocol, size and species restrictions, and a prohibition on species listed as endangered or threatened."

"We are well aware of how important sharks are to maintain healthy marine

ecosystems. We also recognize their importance in native Hawaiian cultural practices and beliefs," said DLNR Administrator Brian Neilson.

Fines and fees

Violating the law is only a misdemeanour, but carries a \$500 fine for the first offence, a \$2,000 fine for the second offence, and a \$10,000 fine for third and subsequent offences.

Those breaking the law could face additional fines and fees, as well as seizure and forfeiture of any captured sharks and equipment.

The DLNR recommends people avoid fishing in areas known to be frequented by sharks and use barbless circle hooks. If a shark is caught accidentally, officials say fishers should avoid bringing it onto the vessel whenever possible. To release it, cut the line as safely as possible close to the shark's mouth. ■ SOURCE: DEPARTMENT OF LAND AND NATURAL RESOURCES

47 instances of fish rubbing themselves against a shark's skin. The chafing events, which were documented in 13 locations around the world, varied in duration from eight seconds to over five minutes.

While chafing has been well documented between fish and inanimate objects, such as sand or rocky substrate, this shark-chafing phenomenon appears to be the only scenario in nature where prey actively seek out and rub up against a predator.

They recorded 12 finfish chafing against eight different species of shark, including great whites. The team even documented silky sharks chafing on the head of a whale shark. The number of fish chafing against sharks

ranged from one to over 100 individuals at a time.

The findings of the study have been published in *The Scientific Naturalist* journal. ■ SOURCE: UNIVERSITY OF MIAMI

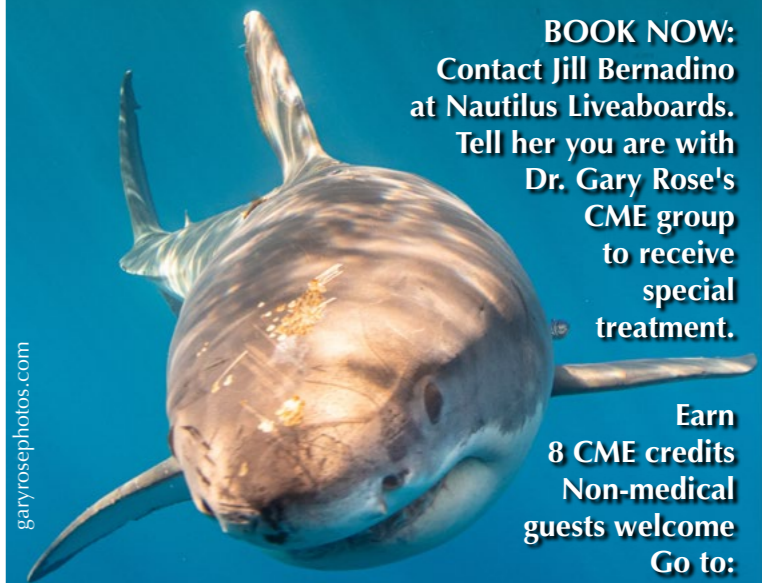
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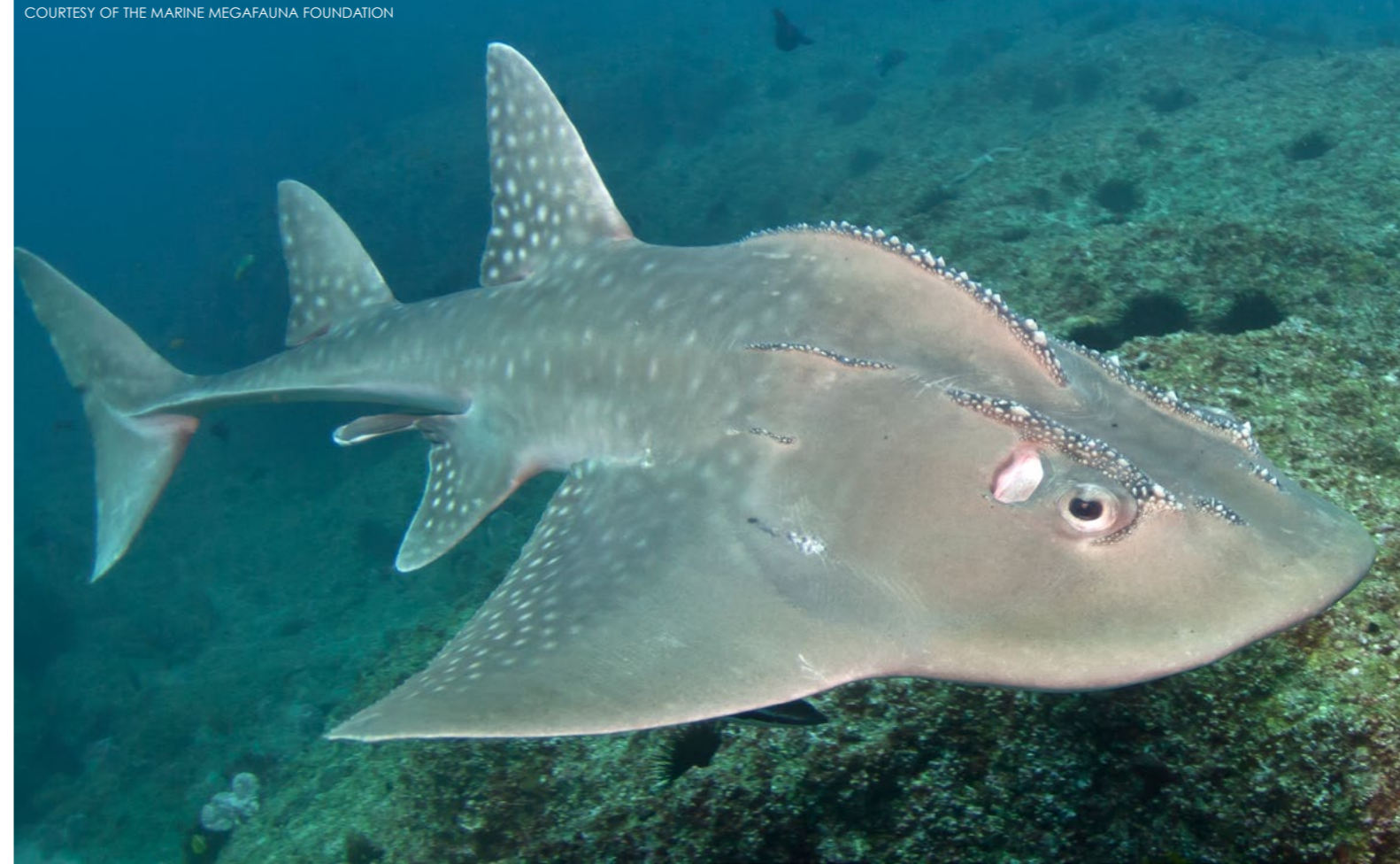
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Edited by Peter Symes



COURTESY OF THE MARINE MEGAFUNA FOUNDATION



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Wedgefish being tagged by Dr Andrea Marshall (above); Bowmouth guitarshark, Southern Mozambique (right and top right); First satellite-tagged bottlenose wedgefish (bottom right)

Tagging wedgefish in Mozambique

Scientists from the Marine Megafauna Foundation (MMF) have placed satellite tags on the bottlenose wedgefish and bowmouth guitarfish, two species of critically endangered wedgefish.

This signalled the start of a first-of-its-kind study for these species in Mozambique, with the objectives of identifying primary aggregation sites, under-

standing their movements and home range and identifying the threats they face in the region. Two types of tags are being used in the study—acoustic and pop-up archival satellite tags—so that both fine and broad-scale movements can be studied.

“By using this particular combination of tags, we can learn where the animals spend most of their time, whether visits to specific sites are year-round or seasonal, how far they move, how deep they dive, and which temperatures they

prefer,” Dr Andrea Marshall explained. She is the MMF co-founder and co-leader of the project. “This will help to identify areas of critical habitat that must be prioritised for protection,” she added.

Focussing on the protected waters of the Bazaruto Archipelago National Park and the Vilanculos Coastal Wildlife Sanctuary, the researchers are working alongside park authorities and managers to facilitate the study.

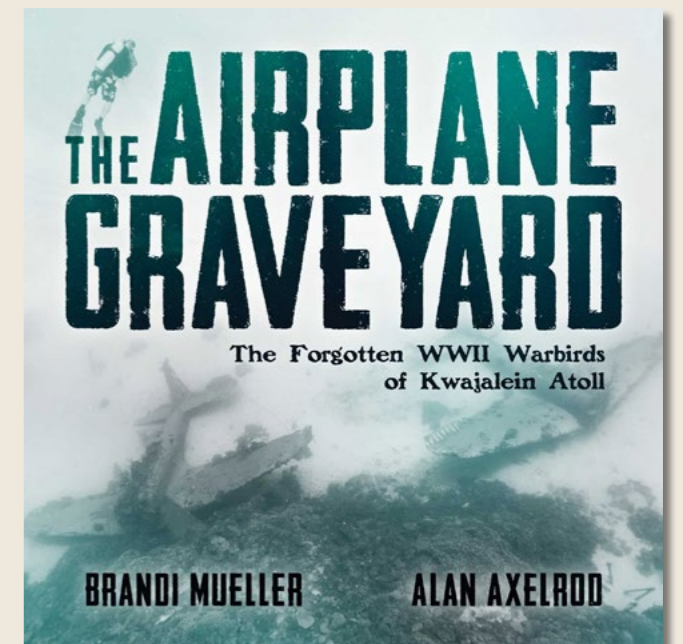
■ SOURCE: MARINE MEGAFUNA FOUNDATION



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Never before published in book form, see extraordinary images of the forgotten American WWII airplanes resting on the bottom of the Kwajalein Atoll lagoon, from award-winning underwater photographer Brandi Mueller. Available on: [Amazon.com](https://www.amazon.com)





Underwater scene inside Bilpa Jama in Slovenia

Text, photos and videos by Andrea Murdock Alpini

Freedom! That was the feeling I had in June 2020 when I left my home to go on a trip alone. Caves, abandoned mines, alpine lakes and a few wrecks were in my plan for a great adventure.

The first lockdown was over a couple of weeks ago. I was scared, yet burning to get out and meet people. Social distancing had left a wound inside. Closing my the door to my house behind me, I loaded up my "wreck van" with plenty of stuff to survive alone for a long month of communing with nature, amongst rivers, lakes, mountains and forests, as well as doing some diving.

At the time, it was impossible to travel for tourism in Italy or abroad to Europe.



The author's "cave van" before a dive at Šteberg Cave in Slovenia



Solo Cave Diving

in Slovenia

The coronavirus had closed the borders. However, with me, I carried a couple of on-location assignment letters from my editor for the customs officials. Just for this trip, I had converted my wreck van into a "cave van," fully equipped with a 300-

bar air compressor, helium, oxygen, decompression cylinders, twinsets of different sizes, gas boosters, fins, mountain boots, tent, camp stove, and brand-new drysuits and thermal underwear to be tested for my company, PHY Diving Equipment.

On the road

I clearly remember the day when I crossed the border between Italy and Slovenia—I was thrilled! After eight hours of driving, I had left behind the "prison" I had been in, limited to 200 metres





Underwater scene inside Bilpa Jama in Slovenia

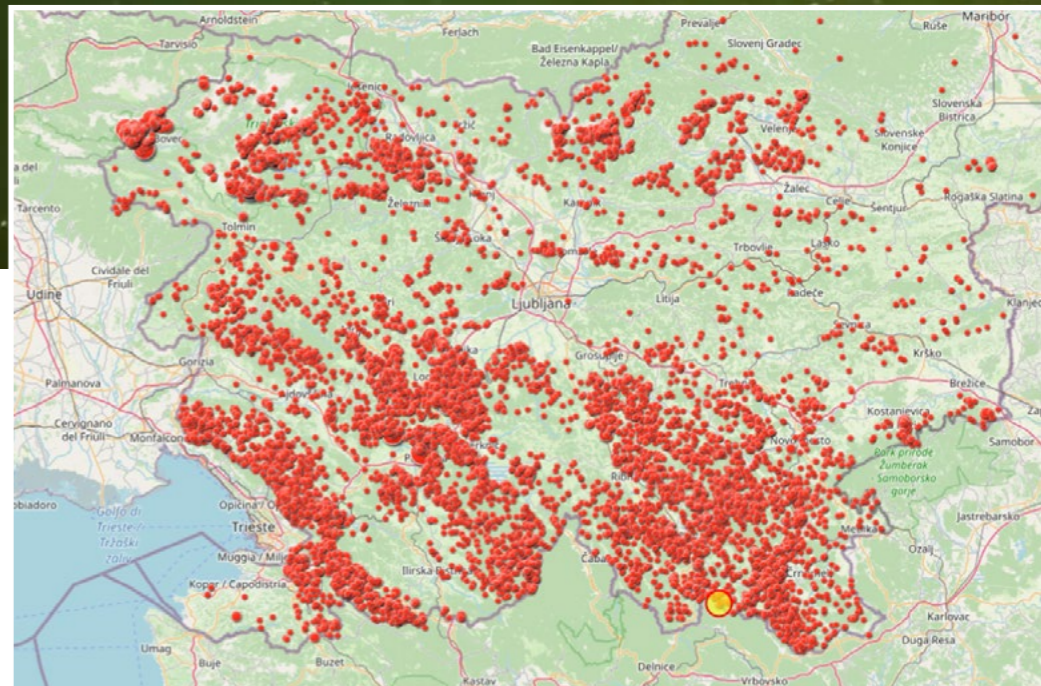
around my house due to Covid-19 restrictions, to have the sensation of freedom, walking into wild nature, on my own. The mental switch was awesome and unexpected. I made just one phone call abroad, followed by an incredible conversation in Russian with the first guy I met in a small rural village in Slovenia. He had emigrated some years ago and now welcomed travellers at his farmstead.

Anyway, once I arrived on site, I was not very welcomed by the weather: heavy rain. After the storm, I went out walking and filmed my surroundings with my smartphone. I decided to record the whole trip. Unfortunately, the rain came back again and never left me for the entire length of my trip (almost a month).

My tour would take me through Slovenia, Garda Lake in Italy, the Austrian end of the South Tyrol Alps, Tuscany's caves and finally, the central part of



The author after a dive at Bilpa Cave; Bilpa Jama, near the border of Croatia, is highlighted in yellow on an official map of Slovenia's surveying and mapping system (right).



Italy—the Appennini mountain range and its peaks. I had planned to visit two mines, but heavy rains put a halt to my plans.

Challenging conditions

Except for Slovenia, where I slept in a traditional bed, I spent the rest of the trip in my tent. Cold weather and storms were my buddies during the month-long journey. I did see a ray of sunlight, just for a few hours one day, but I never got the chance to dry my equipment, and I reverted to warming myself inside the van. Each night, I could only sleep for a few hours due to the noise of the wind and the intense rainfall. Day by day, I grew more and more tired, and more and more feeble. One day, while I was in South Tyrol, descending a mountain, three weeks after I had left home, I decided to

end my trip and retreat, back to the safety of home.

The goal of my trip was to tell dive adventures from a surface point of view, in which the water is only a part of the context and is not the objective. I filmed a mini-series made up of three chapters. Each one brings you inside the scene. The first episode of the trip can be found here: [youtube.com/watch?v=hq2eabK39ZA](https://www.youtube.com/watch?v=hq2eabK39ZA).

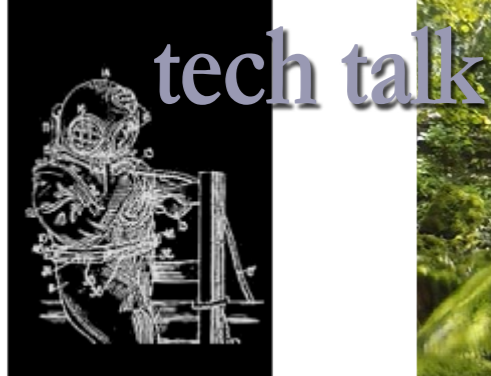
Diving

The first day of cave diving in Slovenia was

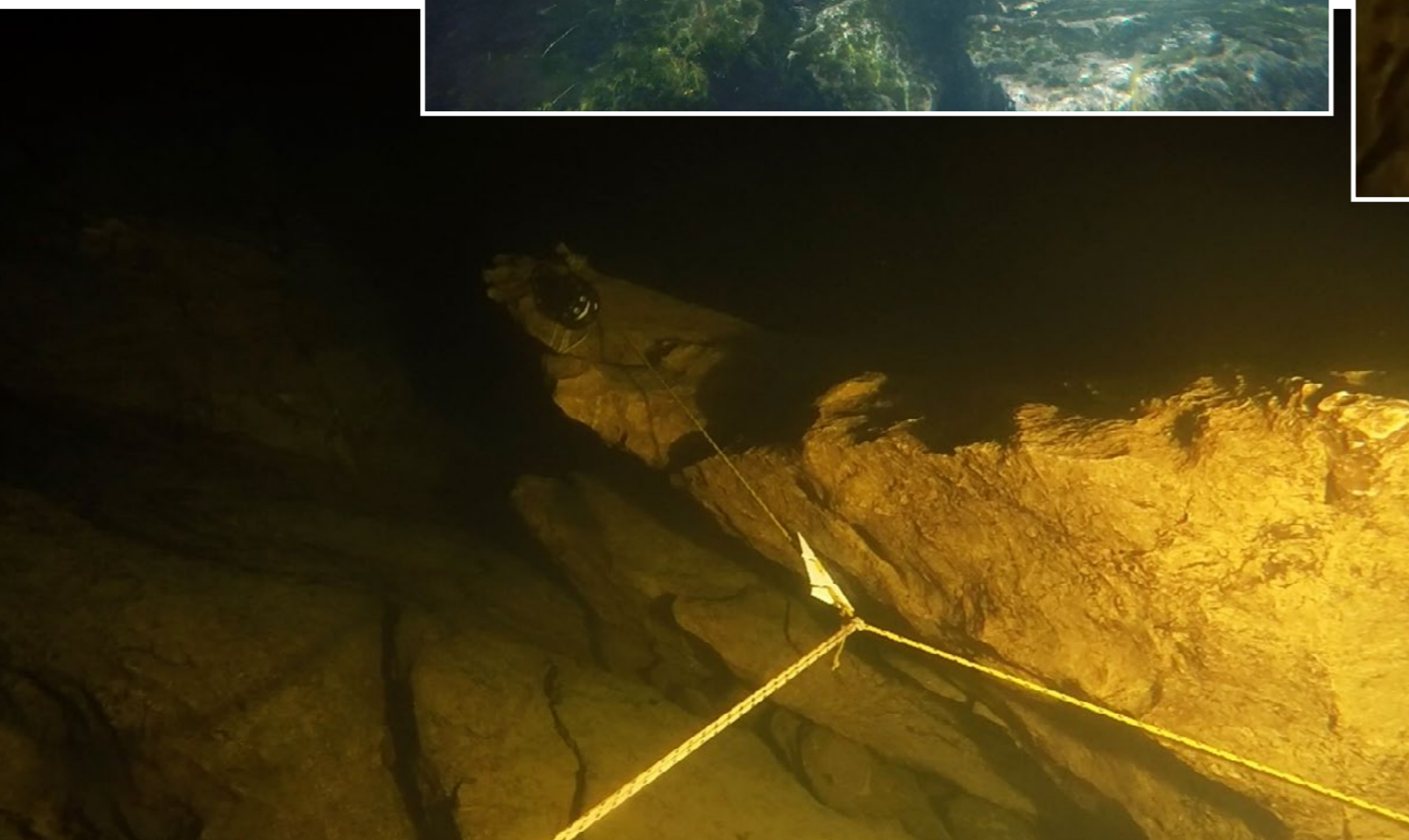
very tricky and full of adventure. I had no idea how the second day would be!

Around 6 a.m., I left my lodging after a good breakfast: cereal, dark chocolate with black coffee, dried fruit and tasty Italian parmesan cheese. Outside my window, I could not see anything. What was falling





View upon surfacing at the end of a dive at Bilpa Jama (right); Underwater scenes at Bilpa Jama (far right and below)



from the sky was not just a simple rain, it seemed like a deluge. My plan for the day? Burnt up in a few seconds.

Most of the dry caves within a few hundred kilometres were closed, so I decided to check the forecast, conditions and water levels in the caves close to the Croatian border. I had to drive around for four hours to get there

and personally find out if diving was allowed or not. Mind you, I did not forget that I was here, diving alone.

I set my wheels to the road, as local conditions at the destination seemed to be quite good. I had checked the weather on my laptop and decided to take the risk. If I was lucky, I could dive; if not, I had to drive back.

I drove through the Slovenian forests, meeting no one. Less than an hour away from my destination, I came across an abandoned farming village; it was completely empty.

Bilpa Jama

The dive inside the cave of Bilpa Jama was breathtaking. Afterwards, I sat at the water's

edge inside the cave, preparing hot soup to warm myself. I had enjoyed a stunning solo dive, and now I was cold. I just wanted to get a taste of the timeless feeling within this place. While I was stirring my cup of soup with a spoon, I heard a distant voice calling me; It was a policewoman asking me to stop eating and come quickly to her.

She looked over my passport, documents and permits. A few minutes later, a huge national army truck reached us. The soldier who came out of the truck to meet us was not of normal build, he was a walking mountain, dressed in army fatigues. One can just imagine now, how I was feeling in that moment!

Well, in the end, everything went really well, and I got a story to tell the grandkids one day. Once the passport control was over and they had checked that I had not crossed the border from Croatia to Slovenia illegally (the customs office was only a few hundred metres from us), I had the chance to get back to my soup, which had turned cold. I warmed it up again and spent

half an hour looking at the beauty of the forest surrounding me, as I sat on a slick stone covered in moss and lichens.

Then, I turned the key in the cave van again and headed out, playing a new playlist on the way back to my lodging.

Four hours later, I reached my country lodge. I was really tired and drained of energy, but I still had to refill tanks and plan the next day of diving. Once I finished all that stuff, I checked the forecast again. Unfortunately, the weather was getting bad again, so I decided not to dive and just take a surface interval. Tomorrow, I would drive, scout out the location, and gather information and GPS coordinates of the caves there. My plans for tomorrow had turned into a sketching and surveying day.

I drove and walked for hours and hours, up and down forests and lonely roads in search of the caves where I might return to dive in the winter or next year. During the last survey of the day, I ran into a talented young man playing a traditional concertina, what

a lovely way to end my day of hard work!

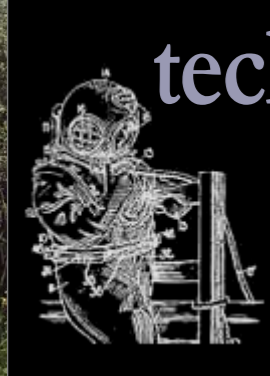
Suha Dolca

On the way home, I decided to take a last glance at the cave of Suha Dolca, my favourite one. This was the third consecutive day in which I had returned to this very spot. Observing it day by day, I had tried to figure out the best time to dive this cave. Up until now, it had been inaccessible due to strong current. But I wanted to dive here before leaving Slovenia.

Tired and driving as slow as a snail, I parked my van beside my lodging. I had had no lunch and was really hungry. A simple dinner was quickly prepared: dried fruit and a hot cup of noodle soup.

This trip, which I had dubbed "No Direction Home," was now at its peak, and I was getting in touch with the feeling of wandering. I was alone in wild countryside. Internet connection to do historical research and check the weather forecast was the only technology I used. On the other hand, I was living in a simple way: walking, diving,





Picturesque lake view of Cerkniško Jezero, surrounding the cave Suha Dolca (above); Underwater scene inside Suha Dolca Jama (left); The wall of rock at the cave entrance of Suha Dolca (right)

I came from. Footstep after footstep, I walked the path again.

Chapter Three

The third chapter in my video documentary of my solo cave diving trip in Slovenia is the one I prefer, recalling the indecision I experienced at the time: Do I stay, or do I go? Solo trips are intricately linked to one's life decisions.

The last day I was in Slovenia, I left my lodging and asked another farmer, located close to a different cave, if I could sleep inside the barn and dive the river hole the following day. I was in the same place where I dived the first day. He told me I could not stay in the barn due to the high risk of bears, which lived in the surrounding area. I jumped in my van again and drove to the lake next to the cave of Suha Dolca. I descended the path several times, carrying and transporting, piece by piece, all my dive gear.

In the late afternoon, I decided to give myself a chance to fulfil my aspirations of diving this cave. I had no other choice. Once I was inside the cave, however, it was unbelievable! I had a very nice dive, even though I was really tired and had again broken the light arms and camera housing of my rig. I resurfaced after the dive into a reed lake, which made me feel like a beaver.

After the tricky, yet stunning dive, I left Slovenia that same night, with conflicting feelings. Bears, awesome forests and rural areas were now behind my shoulders.

Inside the cave van, a new disc was playing. I needed to shake off recent endeavours and look forward to my new goals: the wrecks of Garda Lake and South Tyrol's stunning

lakes in Italy, and finally, Austria—the country of green and wide grazing lands, where I wanted to dive surrounded by the amazing scenery of the beautiful Alps. (See: [youtube.com/watch?v=S_VE_dapzw](https://www.youtube.com/watch?v=S_VE_dapzw))

At 9.30 p.m., I crossed the border again: Italy was now straight ahead. ■

Based in Italy, author Andrea Murdock Alpini is a technical diving instructor for TDI, CMAS and PSAI. Diving since 1997, he is a professional diver focused on advanced trimix deep diving, log dives with open circuit, decompression studies, and research on wrecks, mines and caves. Diving uncommon spots and arranging dive expeditions, he shoots footage of wrecks and writes presentations for conferences and articles for dive publications and websites such as *ScubaPortal*, *Relitti in Liguria*, *Nautica Report*, *ScubaZone*, *Ocean4Future*, *InDepth* and

X-Ray Mag. He is also a member of the *Historical Diving Society Italy (HDSI)*, and holds a master's degree in architecture and an MBA in economics of arts. He is the founder of *PHY Diving Equipment (phidiving.com)*, which specialises in undergarments for diving, as well as drysuits, hoods and tools for cave and wreck diving. Among other wrecks, he has dived the *Scapa Flow wrecks heritage*, *Malin Head's wrecks* and the *HMHS Britannic (-118m)*, *Fw58C (-110m)*, *SS Nina (-115m)*, *Motonave Viminale (-108m)*, *SS Marsala (-105m)*, *UJ-2208 (-108m)* and the submarine *U-455 (-119m)*—always on an open circuit system. His first book (in Italian), *Deep Blue*, about scuba diving exploration was released in January 2020 (see [amazon.it](https://www.amazon.it)). For more information on courses, expeditions and dived wrecks, please visit: [wreckdiving.it](https://www.wreckdiving.it).

writing and filming my experience with a mobile phone. (See: [youtube.com/watch?v=A5Gx0zRjLU](https://www.youtube.com/watch?v=A5Gx0zRjLU))

The rains continued to be more challenging than expected. I had to pause my plans for two days, not just one, as I had hoped. Following my surveys, I started preparing my video equipment for the next day and saving images and video footage onto my laptop's hard disk.

I had too many ideas, with no one clear direction to focus on, and too many cave diagrams and GPS points to

reorganise, so a day off from diving was compulsory.

I just went out for a few hours to check the conditions at the cave of Suha Dolca. Today, it seemed the current was getting more stable, and the general water conditions were also getting better. I had to be patient and wait one or two more days; eventually, the current would definitely stop. During this time, I tried to figure out a solution, but the water always showed me the door. She told me to wait and go back to where

Rico Besserdich



P O R T F O L I O

portfolio

No. 1 (previous page)
No. 2 (right) and No. 10
(below), photographs
by Rico Besserdich

Besserdich

Interview by Peter Symes
Photos by Rico Besserdich

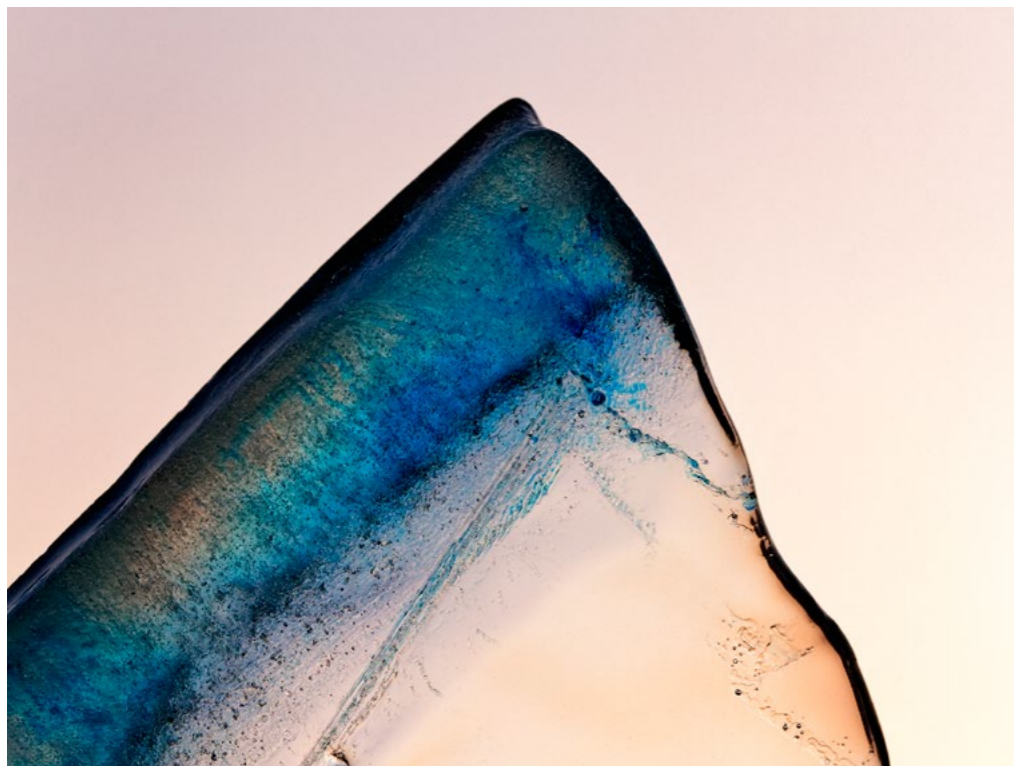
Rico Besserdich is a widely published German artist, lecturer, photography instructor, writer, adjudicator and professional underwater photographer living in Turkey. His work has appeared in over 300 magazine and book publications around the world and has been translated into nine different languages. A CMAS/IAC Instructor Trainer with 5,000+ logged dives, he gives presentations at various photography-related events, universities and dive shows in Europe and has displayed his work in several fine art photography exhibitions.

PS: Music and photography are both expressions of waveforms, sound and light. In both art forms, we talk about expression, composition and mood. You are a lifelong photographer and musician. What are the similarities, as you experience them? Does one art form take inspiration from the other in your creative work?

RB: For me, in both art forms mentioned, the process of creation

has the same importance as the end result. In other words, "doing it" is an important step of any artistic process, and as such, is a part of the art itself. All good artists know, we will do it wrong a million times before getting it right. But that is just part of the process, and hence, elementary for the quality of whatever we might present as a "final" result.

The art begins with the very first step of just doing it, whether it is



the first note played on an instrument or the very first shot taken with a camera.

Four years before I became a professional musician, I took private lessons. Learning to read scores was a part of it. The first song I played from a score was "The Girl from Ipanema" (written in 1962, music by Antônio Carlos Jobim and Portuguese lyrics by

Vinícius de Moraes).

In the original tune, the bass plays only half-notes. Meaning, in a single 4/4 measure, the bass plays only two notes. I asked my teacher, "What is the point in this boring thing? I want to play something cool!" He answered, "It all depends on how you play your two notes. The 'how' makes the difference."

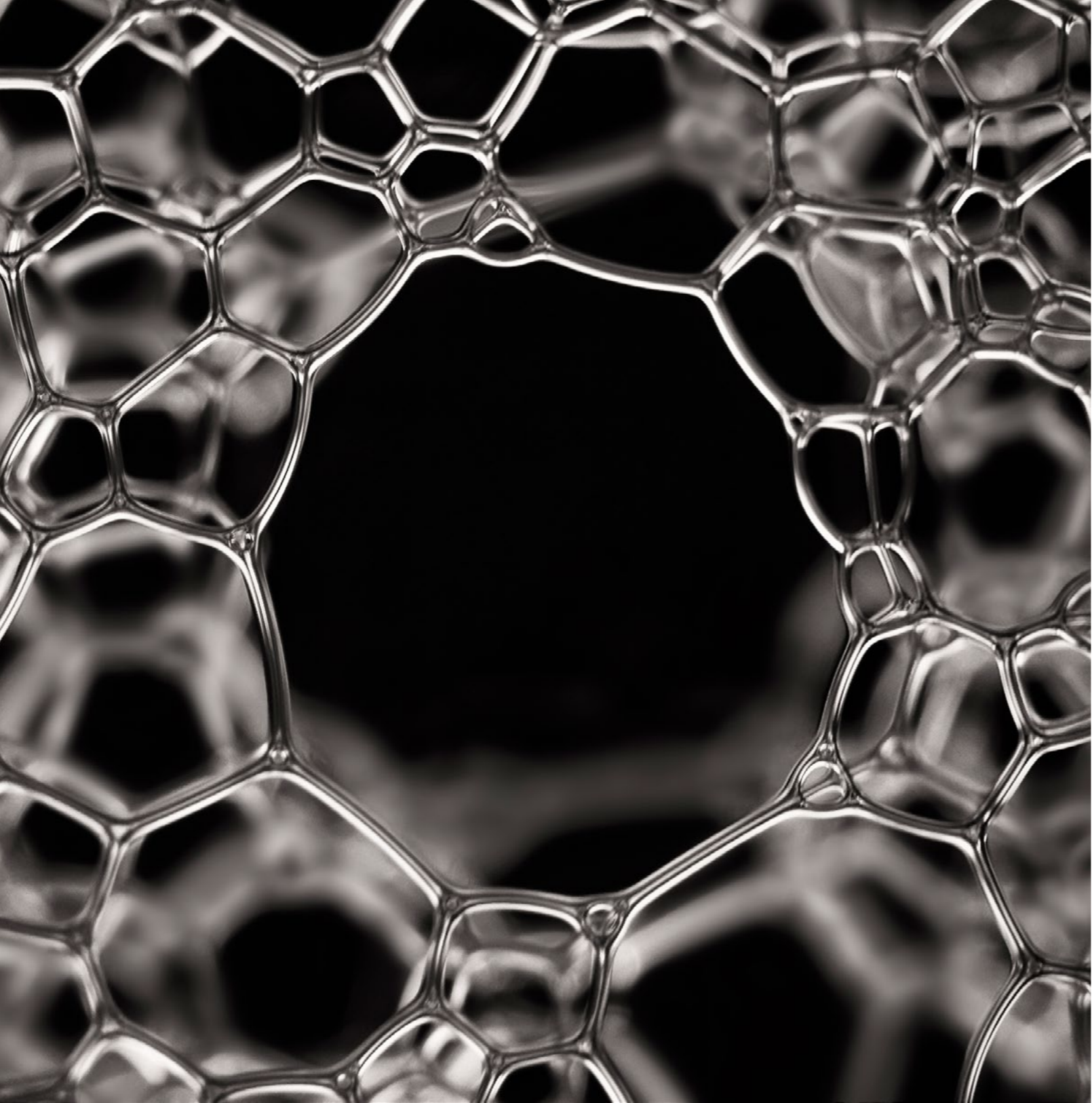
Photography feels very similar to

me. In photography, you can make one and the same scene, or subject, into a visual rock song, a waltz, or a symphony—metaphorically-speaking. It all depends on how you play your "notes." This includes playing it wrong, or "not right," so to speak. The path to mastery is a very long one; I have experienced this in both music and photography. Actually, for those who keep an open

mind, all art forms inspire one another endlessly. Everything is always moving and shifting.

PS: In your books, you seem to have focused a lot on basic shapes in nature such as drops, bubbles, ice crystals, etc. Is this just an aesthetic choice or artistic exploration, or is there also an educational aspect?





No. 4, photograph by Rico Besserdich

Besserdich

RB: This is just my personal opinion, but I tend to say, whilst science tries to find answers to questions, art creates questions—or at least, it provides room for one's own interpretations, which then is not something much liked in science.

But I certainly do agree that many known artists are very good observers. They might use science to simply understand things better, and such deeper insights certainly reflect in the art created. Just take the art of the great master Leonardo da Vinci as an example, whose well-known work, "Vitruvian Man," is also a perfect match to the Fibonacci numbers.

To me, not everything needs an explanation—especially not a scientific one. I prefer to create new questions, providing my viewers room for own interpretations and feelings.

There are, of course, some artists I personally find inspirational. But when I create something, I simply disconnect myself from everything else. Inspiration is good, but influence is not, as this would bias me and my artistic work. First, I create. Then, I (in some cases) might think about how all of it can be explained on a logical level. But the latter, is not that important to me. Yet, I still love the Fibonacci numbers and have highest respect for all science.

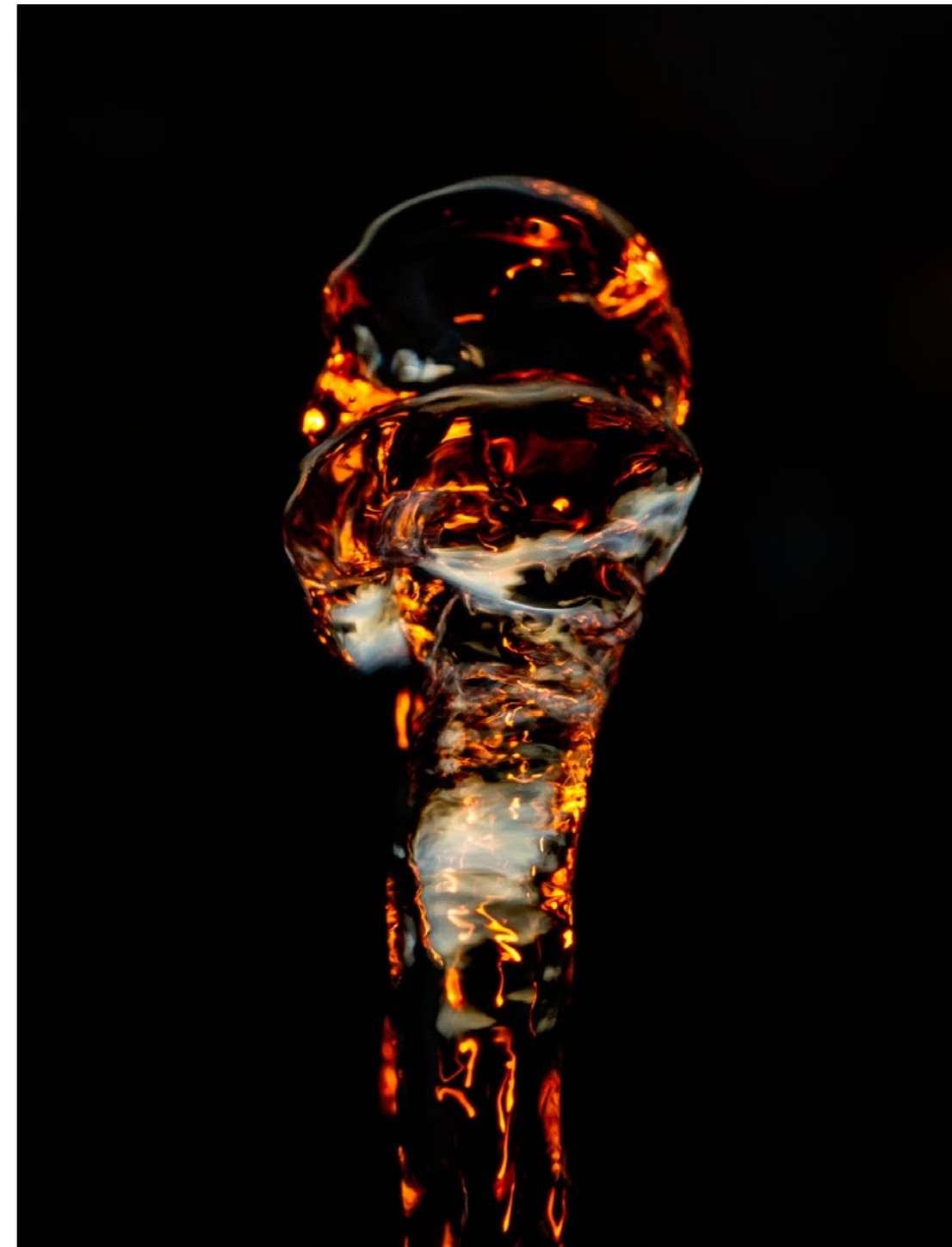
PS: Can images be both documentary and artistic at the same time, or do we always have to make a choice?

RB: No, there is no need to make a choice. Many photographers mistake the term "artistic" with something that is connected to specific techniques, tricks or even image manipulation. So, if underwater macro photography purists

say it must be f/16 and nothing else, but you do the shot with f/3.5, does that make you or your image "artistic"? No, because you just chose a different technique.

A very good example of an image that is both documentary and "artful" is the well-known "Napalm Girl," created by Nick Ut in

1972. This image is so "documentary" that it even shuffled governments and made the entire world re-think the Vietnam War. And at the same time, it is very artful, or artistic, because it fits many of the criteria that are crucial in imaging arts, including that it is technically well done, has a clear rhythm and



No. 3, photograph by Rico Besserdich

RB: The only educational aspect of my images may be that Nature itself is the greatest artist, and water is one of her favourite brushes. This kind of fact does not need to be taught; it goes straight to the heart and soul of anyone who has an open mind for this kind of message. Regarding my water-related images,

most of them are the result of artistic exploration. Water has its own will anyway. I cannot force or stage much in this medium. I can only explore, trying to capture those little liquid wonders.

PS: Throughout much of history, scientists and artists were often one and the same people. You

have touched on this ancient kinship between art and science in some of your photo tutorials, such as the one about the relationship between Fibonacci numbers, patterns in nature, and compositions in art. How much influence or inspiration do you find in science, or in other arts?



portfolio

No. 5, photograph by Rico Besserdich

great composition, and it awakens emotions and raises questions.

So, yes, of course images can be of documentary value and artistic at the same time.

PS: You are also an acclaimed underwater photographer but seemed to have moved past traditional or mainstream underwater photography to instead focus on the aforementioned basic shapes and compositions. Has traditional underwater or travel photography come to a standstill or is there just limits to what can be done while staying true to the reporting aspect of doing an article on either a dive destination or animal life? Can underwater photography further evolve, do you think?

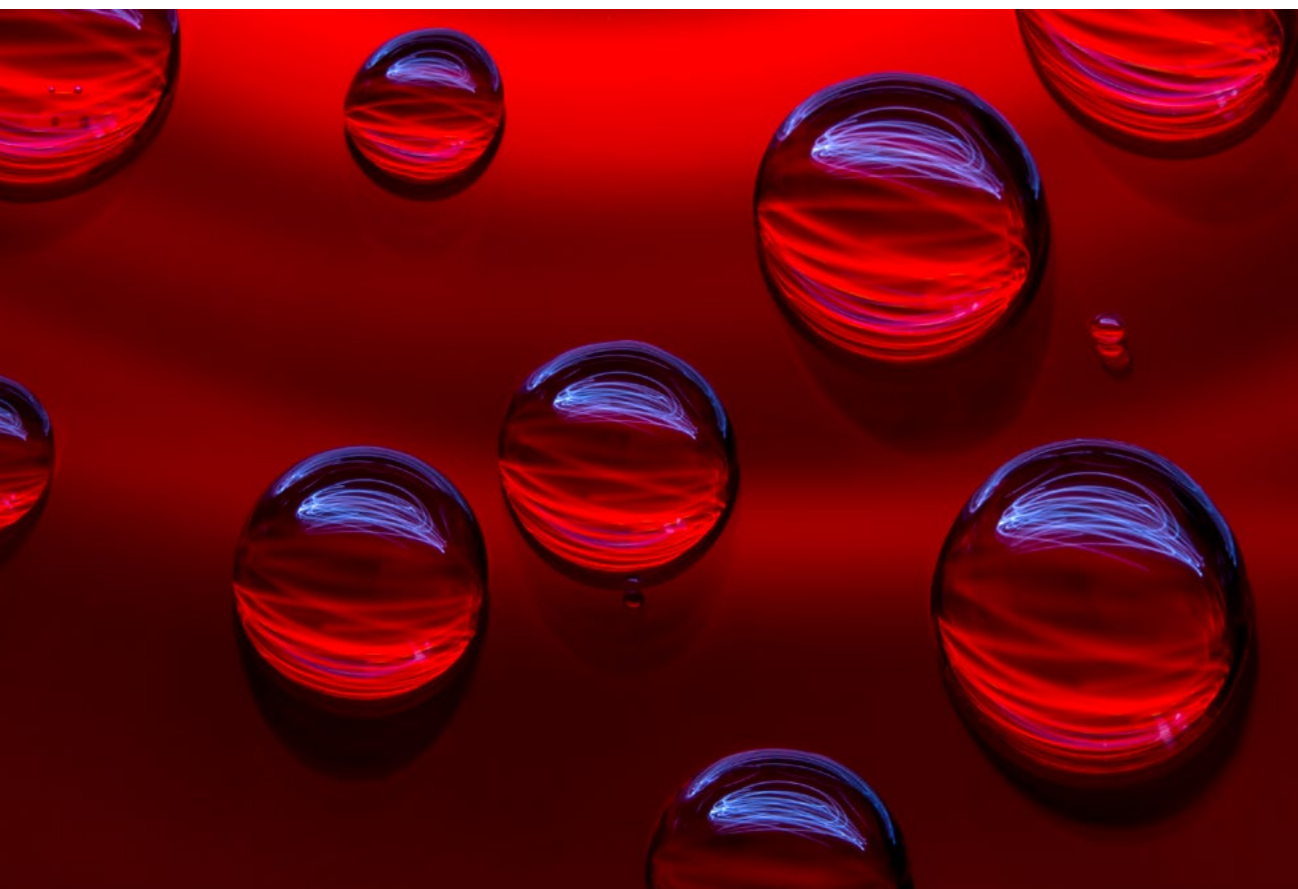
RB: This is just my very own path and personal way of doing things as an artist. To me, development is crucial. We always must go on. There is no point in repeating things we already know, again and

again. That is why I moved away from the style that some might call traditional underwater photography.

But back to traditional underwater photography (or travel photography)... I believe, as long as people like to dive and travel, and are curious about the wonders of our oceans, this sort of photography will always have a serious role to play.

Of course, we have seen a lot of great underwater photographs of many dream destinations, underwater and above. However, it is an almost traditional mistake of many underwater photographers to believe that everyone else knows (and has seen) what they know (and have seen).

Every year, thousands of newly certified scuba divers want to know where to go for diving. Even though, underwater and travel photography often repeats itself (almost everything is already well-documented in images), we should never forget the person looking at one's images in a magazine or somewhere online now, who was perhaps not even interested in



No. 6, photograph by Rico Besserdich

diving or travelling at all last year. These people do not look at back issues, older articles, and photography publications published one to five years ago. They are "hot" now, they want to know it now, therefore, they will refer to images that are available now.

That said, as long as people can and want to travel and dive, there is a strong need for photographs that show what can be discovered, even though some of the older folks might have seen similar-looking photographs already, in older publications.

Underwater photography perhaps could evolve in terms of image expression. When judging or reviewing images at art universities or fine art photography competitions, my colleagues and I always have the same question (for the students or contestants): "What is the message?"

Very often, images are technically very well done but are missing a message—something that makes viewers think twice and reflect deeper about an image. A beautiful image of a beautiful fish will be just another beautiful image. The internet is already full of them. Many underwater photographers need to understand that high-end gear, fancy locations or interesting subjects to shoot (fish, wrecks, etc.) do not automatically create a meaningful image, or an image with a message.

As I often say, the better image does not need a better camera but a better photographer. That said, technical aspects such as a better camera, lens and/or techniques are actually secondary. The primary aim is to awaken emotions and needs, making people think twice.

PS: You have also served as a judge in many photo competitions. Which long-term trends or evolution have you observed over the years, and has underwater photography evolved towards the better over time? Do photo competitions still serve a purpose, so you think, or it is a spent format in need of a fresh rethink?

RB: During the past few years, I have observed that some major photo competitions now place more value on the aspect of environmental protection. Everyone can create a beautiful image of... whatever, but only few can add an extra message to such an image. When shooting an image and claiming yourself to be a photographer, you are simply expected to know your craft. Knowing how to use a camera is only of little value; it is





aspiring photographers—underwater or otherwise?

RB: 1. Enjoy your journey. Just doing it, is the real thing!
2. Something like “the best image” does not exist. Your best image is always the one you will shoot tomorrow.
3. Quoting Ansel Adams: “I don’t take photos. I make photos.” Just do the same, and you will be all right.

PS: *A camera is just a mechanical tool. Art is an interpretation. How would you teach and train somebody to have an eye for creating interesting imagery? Is natural talent a prerequisite or can the right tutor and putting in the required effort take one all the way—to become a good, or even successful, artist?*

RB: In my experience, as someone who once taught art at a university, and is still conducting (private) one-on-one lessons (yes, you can book me), I tend to say that everything is about sensitisation.

In my humble opinion, a good way to teach the “creative eye” is to open the senses of students to small but important details. Artistic people see and sense things others do not.

Yes, from my own experiences, I can tell you, tutoring helps a lot if the “chemistry” between the tutor and student is well-balanced. Mastering the craft (such as learning how to use a camera, how to shoot portraits, architecture, nature, etc) is something we can learn from books, video tutorials and by just practising (a lot!). The eye for creating interesting imagery is something that can be learnt too, but that works better with a tutor as a coach or guide.

Talent might still play a role, yes. However, many art experts say that talent counts for just 10 percent of success, the other 90 percent is just hard training over a longer period of time.

PS: *From where do you get your inspiration? Is it something you seek? Does it*

considered self-evident.

Several photography competitions now support this idea—a development I highly appreciate. That said, photography competitions still serve a great purpose if they

do their jobs right.

I personally believe that underwater photography has indeed evolved to the better. I find that nowadays more underwater photographers have become

braver, even experimental, leaving some classical rules behind and creating something new. This is no surprise to me at all; I simply love this type of development. Furthermore, I enjoy seeing underwater

photographers include environmental matters as a key message in their images.

PS: *If you could use only three short sentences, what advice would you give to*

portfolio

No. 8, photograph by Rico Besserdich

arise out of creative experimentation, or is it something that tends to happen to you in the course of life—encounters with other people or things you study or read?

RB: Seeking inspiration is something that does not work for me. There is no need to seek it anyway, as I am surrounded by it all the time. As water is my element of artistic expression, I can find inspiration everywhere where water exists. Reflections on the water's surface, rain, fog, clouds, ice cubes in my deep freezer, or just water splashing in my kitchen sink while I am cleaning dishes; I am surrounded by a continuous flow of inspiration. When outside or even scuba diving, I often observe just the colours of water and how the sunlight creates magical patterns on the sea floor. This too is a great inspiration.

In terms of getting inspired, I prefer to "read" nature and light—that is all I need.

PS: What is the most interesting or promising photography (or photographer) you have seen lately?

RB: Not "lately," but over many years, I have followed the work of photographer Angel Fitor of Spain, who I consider to be one of the most interesting (underwater) photographers. His images are of such a profound aesthetic, whilst still serving as invaluable documentary at the very same time.

Fitor has a gift for creating astonishing art works out of objects that are actually very common. Moreover, he has a very unique style. You can just look at one of his images and instantly know it is an Angel Fitor photograph. There is no need to read the copyright or the photo credit. This kind of uniqueness defines a true artist.

PS: Can art be defined? What is your definition or concept of what constitutes art?



RB: Whilst many creators (in photography or elsewhere) believe their pieces certainly must be art, the main principle always remains the same. It always needs two to make art: The creator and the beholder. Anyone can claim to be an artist. Yet, if nobody else sees art in it, such an artist would be a very lonely one.

Just in my personal opinion, I tend to say art is something that makes people think and, ideally, reflect on specific matters in life, nature and social environments. There is no need to completely understand art; real art does not really want to be completely understood anyway. Art creates questions, not answers.

But the moment you look at something and your brain creates new synapses, leading you to really start to think about it, and then share your thoughts with someone else, this is where art evolves. Art evolves when people start to talk about it. That does not mean that everyone needs to agree. They can talk, even argue, or

discuss. They can hate it or love it. This all does not matter. What matters is that good art makes people think and talk, and by that act, the art itself evolves. ■

For more information, please visit the photographer's website at: mavipfoto.com.

