



GLOBAL EDITION  
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COVER PHOTO BY SCOTT BENNETT

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Anemone hermit crab at Ampera, Alor Island, Indonesia. Photo by Scott Bennett



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# The price we have to pay

I have just booked my flight to the DEMA Show—the world’s largest dive show and industry event. When I made my reservation, I selected Scandinavian Airlines because they now offer travellers the option of purchasing sustainable biofuel as part of the flight ticket, so one can fly with lower CO<sub>2</sub> emissions. I also opted to pay for a full carbon offset of my trip. It hurt my wallet, but it lifted the ache I had in my tummy. Being a transatlantic trip, it did not come cheap, but I do not see that one has a choice any longer.

I cannot in good conscience go on and on about how we should protect the environment and do whatever is necessary to save the planet for future generations, and then just climb aboard an intercontinental jet as if it were business as usual. That would make me a hypocrite of the worst kind.

Some sort of proven-effective carbon offset, or purchase of biofuel, should, in fact, be included in the ticket price, because it would be naive to think that more than a few of us would ever voluntarily pay more than strictly necessary for our flights. We all go shopping for bargains or the lowest price. That is how the free market and human minds work.

Such measures would likely make travel significantly more expensive in the short term until the necessary infrastructure has been developed and deployed. But then again, do we really have a choice any longer? I think not.

That being said, I am painfully aware that this position is probably not going to win me many friends in the dive industry which, after all, is largely dependent on a well-functioning travel sector. But we all have to adapt, and the sacrifices we have to make need not be all that hard. It is mainly a matter of priorities, such as giving up or postponing the purchase of another shiny new toy or working a few extra hours. Or it is a shift in perspective. In both the short and long term, it is an investment in us, as a species, and our only home, Earth.

But we must be selective and choose wisely. Not all carbon offset projects are equal. Some are not effective at all or even add carbon emissions. A recent **analysis** by *The Guardian* and Corporate Accountability revealed that the majority of the most frequently used offset projects were “likely junk.” In response to widespread concerns about carbon offsetting credits, **new quality standards** for the carbon offset industry were pub-

lished by the Integrity Council for the Voluntary Carbon Market (ICVCM), so buyers seeking high-quality credits can look for the ICVCM stamp of approval, *The Guardian* reported earlier this year.

Let us not forget that diving is a luxury, not a necessity like food and clean water, access to medical services, and basic safety. If we want to indulge in our chosen luxuries, we must accept that there will be a price to pay, and it should not be at the planet’s expense.

Instead, consider it an insurance policy, an investment, a legacy, or a gift to the next generation, our children and grandchildren, and those who are already suffering from the effects of climate heating. They will never forgive us if we do not step up, act and do what is rightfully expected of our generation.

Ensuring that there is some sort of effective carbon offset or sustainable biofuel associated with your purchases of travel, however imperfect the various current schemes may be, is quite a small price to pay in the grander scheme of things. Above all, it is something we can all do.

— Peter Symes  
 Publisher & Editor-in-Chief

# NEWS

from the deep

Edited by  
Peter Symes



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**THE DIVER'S  
CHOICE FOR  
30 YEARS**

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## North Atlantic marine protected area gets better protection



North Atlantic Ocean map; Right whale cow and calf (top left)

Long-finned pilot whale (above)

### Revised strategy expands the protection of the marine environment of the North-East Atlantic.

Nestled in the heart of the North Atlantic Ocean, the **North Atlantic Current and Evlanov Sea basin (NACES)** Marine Protected Area, spans an area larger than the land mass of the United Kingdom and Germany combined. It is home to a vast range of marine biodiversity and contains globally important populations of many marine species.

The OSPAR Convention aims to protect the North-East Atlantic maritime area against the adverse effects of

human activities to conserve marine ecosystems and, when practicable, restore marine areas, which have been adversely affected. Established in 2021 to protect seabirds, OSPAR did not, however, include the seafloor of NACES in the designation of the site. Seafloor ecosystems are key in safeguarding the food chain that all species depend on.

### Seabed protected

This omission has now been rectified, and the convention has been amended to protect the seabed and several species and habitats. As a result, the NACES marine protected area now has greater conservation objectives, which

will also cover the seabed and other species and habitats, such as coral gardens and deep-sea sharks. The decision to expand the conservation objectives of the site beyond seabirds underscores the influential role that these species play in leading the way toward comprehensive ocean protection.

To deliver on the revised vision for the North-East Atlantic, the OSPAR commission has formulated 12 strategic objectives towards achieving good

environmental status in the marine environment. The strategic objectives are grouped under four themes. Delivery of the strategy will be reviewed by the OSPAR commission, taking into account measures taken in other relevant forums, such as the United Nations and the European Union.

Marine Protected Areas are an essential tool for the protection and restoration of marine biodiversity, and for the long-term sustainability of seas and oceans.

*“Our vision is a clean, healthy and biologically diverse North-East Atlantic Ocean, which is productive, used sustainably and resilient to climate change and ocean acidification.”*

— Osparvision Commission

They maintain and improve the provision of a wide range of ecosystem services and related socio-economic benefits, including food security.

Major challenges include pollution, eutrophication, over-exploitation of living and non-living resources, incidental by-catch, non-indigenous species, underwater noise, and damage to the seabed. Marine litter, including microplastics, continues to blight our seas and cause severe impacts on the marine environment. ■

SOURCE:

**STRATEGY OF THE OSPAR COMMISSION FOR THE PROTECTION OF THE MARINE ENVIRONMENT OF THE NORTH-EAST ATLANTIC**

Edited by  
Peter Symes

Exterior view of  
the expo entrance  
(centre) and  
Gothia Towers  
(on the right)



COURTESY OF DYKMÄSSAN

## Scandinavian Dive Show to be held alongside Boat Show in Gothenburg

For its tenth anniversary, **DykMässan, the Scandinavian Dive Show, will return to Gothenburg, the cradle of diving in Sweden. And, in a new collaboration with The Boat Show (Båtmässan), visitors to either show can visit both shows with just one ticket.**

Since its inception in 2014, the Scandinavian Dive Show (DykMässan) has been held as a standalone event. Come 2024, it will start a new chapter.

In its tenth year, DykMässan will return to Gothenburg, where diving in Sweden first took root. And with DykMässan teaming up with Båtmässan, visitors can now visit both shows with just one ticket.

Båtmässan will be held from 3 to 11 February 2024, encompassing two weekends; DykMässan will take place on the second weekend, from 9 to 11 February. Although the two shows will remain as separate events, they will be held in adjoining halls at the Swedish Exhibition & Congress Centre in Gothenburg, so visitors can pass seamlessly between the two on 9 to 11 February.

For the entire duration of the event (3 to 11 February), there will be a new and larger diving pool where visitors who wish to get a taste of diving can borrow equipment and do a try-dive under the guidance of qualified instructors.

The organisers envisage that the visitors and exhibitors of both events will gain much added value from visiting both shows at the same time. Visitors can have

access to a wider range of related products and services, while the exhibitors have the opportunity to meet new customers and practitioners from both industries.

"Many divers use boats, and we know that they have a close relationship with water. Hence, they may consider buying a boat for themselves. Through this collaboration, we are developing the fair as a meeting place, and can offer new—and even better—opportunities to experience boating," said Jacob Ryder, business manager at Båtmässan.

Tommy Jarnbrink, organiser of DykMässan, said that many of their visitors have wanted to see a selection of dive boats at the show, so organising the two shows at the same time will be a win-win for everyone. ■

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Edited by  
G. Symes



Visitors and exhibitors at MIDE 2023, held at MITEC in Kuala Lumpur (above and lower left)

# Malaysia International Dive Expo 2024 to be held in Kuala Lumpur, 7-9 June

The 18th annual Malaysia International Dive Expo (MIDE) 2024 will take place 7-9 June 2024 at the Malaysia International Trade & Exhibition Centre (MITEC) in Kuala Lumpur.

With this year's theme, "Embracing the Ocean's Majesty," the organizers are keen to welcome even more divers, businesses and water sports-related professionals from around the globe.

Playing a significant role in

promoting, strengthening and expanding the dive community and businesses in the region, MIDE is a one-stop-hub for all things related to the water world, including travel, equipment, training, conservation, education, boating/sailing and other water sports. Visitors have the opportunity to connect with a myriad of dive operators, resorts, and local and international brands, while exhibitors will gain increased brand awareness and sales leads.

Established in 2006 and welcoming more than 220,000-plus attendees over the last 17 years,

MIDE has garnered worldwide recognition as a prominent event in the dive industry.

### Exhibitors, register today!

Exhibitors' registration for MIDE 2024 is now open. The organizers warmly welcome all dive business entrepreneurs and dive enthusiasts to be part of the "Hottest and Coolest Dive Expo," connecting your business to the underwater world, for continuous exploration, education and enjoyment.

Get in early to avoid disappointment. Contact the team at [info@mide.com.my](mailto:info@mide.com.my). For more

information, see [mide.com.my](http://mide.com.my) and social media pages @MIDEEXPO for regular updates.

### About the organizer

Established in Malaysia and Australia to provide end-to-end services and expertise in event management, exhibitions, media services and project management, the AsiaEvents Exsic (AEE) team has a combined 25 years' of experience as consultants in planning, technical support, management of leisure and hospitality projects as well as the organization of international and local exhibitions, seminars and conferences. AEE is also a public relations, marketing and media advertising house. As

COURTESY OF MIDE



a strategic advisor for exhibition management, AEE also supports bridging businesses in the marketplace and new partnership ventures. The organization has been honoured with awards for "Exhibition

Excellence" in 2018 and another award in 2022 for "Above & Beyond Recognition" for commendable effort and achievement in organizing the MIDE show in December 2021, during the pandemic. ■



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- 04 Dive Courses
- 05 Dive Packages
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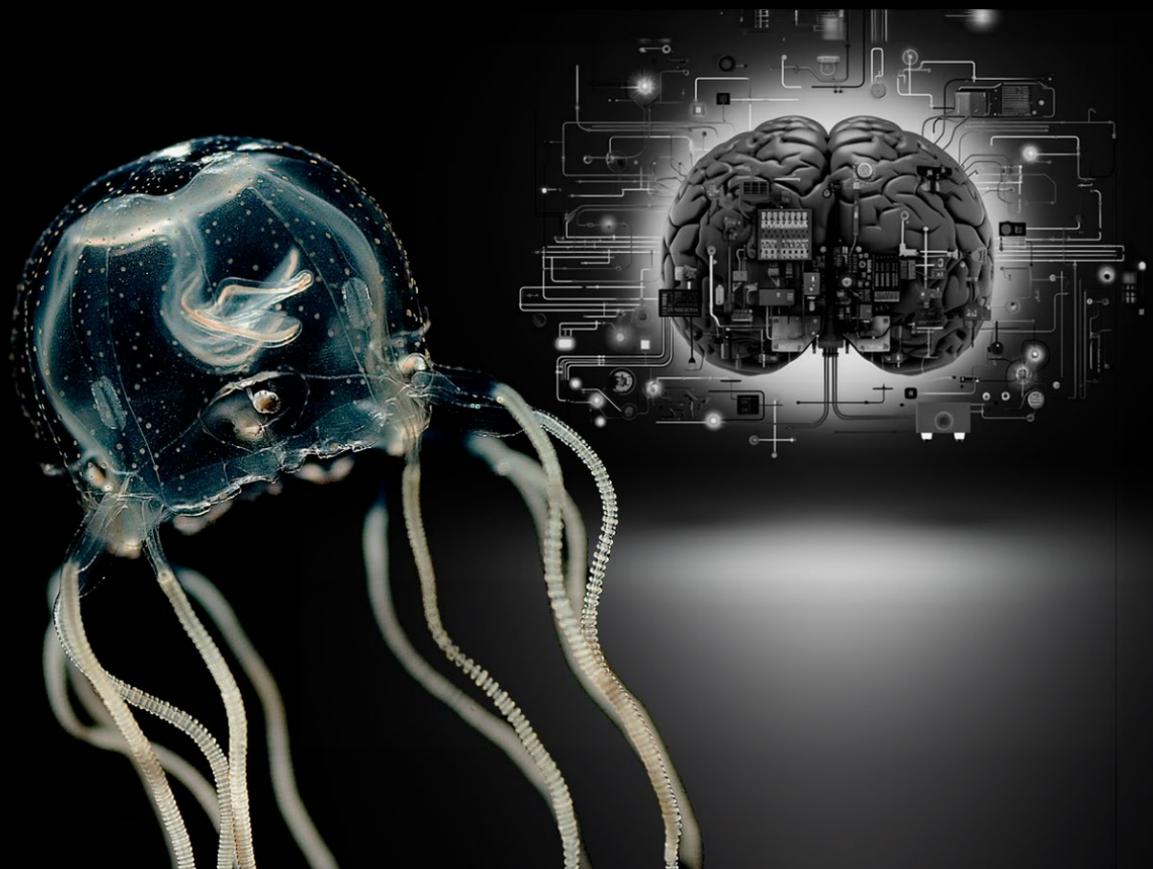


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COURTESY OF MIDE

Edited by  
Peter Symes



COMPOSITE: PETER SYMES. JELLYFISH PHOTO: BIELECKI, ET AL. / CC BY-SA 4.0

*Tripedalia cystophora* is a small species of box jellyfish in the family Tripedaliidae.

## Jellyfish: Not so mindless after all

**While jellyfish lack the complex nervous systems of many animals, they possess a network of nerves, sensors and specialized structures that allow them to detect and respond to their environment.**

This includes simple eyespots, called rhopalia, which can sense light and help them navigate the ocean's depths. Another intriguing facet of jellyfish biology is their ability to

enter a sleep-like state despite their brainless existence.

Despite its small, decentralized brain, *Tripedalia cystophora*, a type of jellyfish known as a sea wasp, displays advanced learning capabilities. Researchers previously believed that jellyfish, due to their mere 1,000 nerve cells, could only engage in basic forms of learning, such as becoming accustomed to specific sounds.

### Learning from mistakes

However, a closer examination of their behaviour has revealed a more sophisticated capacity

for learning, including the ability to learn from mistakes.

Through experiments manipulating jellyfish's surroundings, scientists observed their reactions. By altering the colour contrast of their tentacles, they deceived the jellyfish into perceiving danger where there was none. Initially, the inexperienced jellyfish believed the threat was distant but quickly adapted, demonstrating an ability to comprehend the consequences of their actions and avoid future stressors. ■

SOURCE: CURRENT BIOLOGY

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Edited by Peter Symes

The humble sea cucumber is a marine delicacy loved across Asia, but also a key ingredient in preventing diabetes, according to new research from the University of South Australia.



JERRY KIRKHART / WIKIMEDIA / CC BY 2.0

## How sea cucumbers could help combat diabetes

**Research from the University of South Australia reveals that the humble sea cucumber has a promising role in preventing diabetes, adding to its wide-ranging medicinal properties.**

Sea cucumbers considered a marine delicacy in Asia, are widely known for their anti-inflammatory and antioxidant properties. Now, new research from the University of South Australia suggests that they might be a crucial ingredient in the fight against diabetes.

### The key compound

The study focused on the medicinal

properties of a specific species of sea cucumber, *Holothuria scabra*. The team found that processed dried sea cucumber with salt extracts and collagen can inhibit a compound named Advanced Glycation End product (AGE). To date, there is no commercially available therapeutic agent to inhibit the formation of AGE.

AGEs are formed when proteins or fats combine with sugars in the bloodstream. Their accumulation in high levels is associated with complications of type 2 diabetes and other diseases including heart disease, Alzheimer's, Parkinson's, kidney disease, and cancer.

### AGE inhibition

Lead researcher, UniSA's Dr Permal Deo, explained the significance of these findings. "We know that an accumulation of AGEs is associated with complications of type 2 diabetes, so strategies to prevent this may reduce the risk of developing diabetic complications," said Deo.

The team discovered that processed dried sea cucumber with salt extracts and collagen can significantly inhibit AGEs, thereby reducing a range of sugar-related metabolites in the body and minimizing the risk of diabetes.

### The diabetes problem

Diabetes is a global health issue. In

Australia alone, almost 1.3 million people have type 2 diabetes, and globally, about 422 million people live with the disease. Diabetes-related deaths tally up to 1.5 million every year.

### A functional food

Deo emphasized the need for practical measures to combat this global health concern. "Almost 60% of all cases of type 2 diabetes can be delayed or prevented with changes to diet and lifestyle. These results provide sound evidence that sea cucumbers could be developed as a functional food product to help battle the onset of diabetes and diabetic complications," he said.



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SOURCES: INTERNATIONAL JOURNAL OF FOOD SCIENCE AND TECHNOLOGY. UNIVERSITY OF AUSTRALIA



Diver Zach Whitrock at the site of the *Trinidad* wreck

## Historical society finds 1880s shipwreck in Lake Michigan

**The Wisconsin Historical Society has announced the discovery of a ship that had been lost since the late 1800s in Lake Michigan.**

According to a Facebook post, shipwreck enthusiasts and historians Brendon Bailod and Bob Jaeck located the schooner *Trinidad* earlier this year, submerged in 270 feet of water off Algoma.

The schooner, constructed in 1867 in New York, was a "canal-ler," specifically designed for

navigating the Welland Canal connecting Lake Erie and Ontario. It primarily served the Great Lakes grain trade, shuttling coal and iron from New York and returning with Midwest grain.

The historical society noted that the ship's owners did not invest much in its maintenance, resulting in its relatively short career. On its last voyage on 11 May 1881, as the *Trinidad* headed down Wisconsin's coast toward Milwaukee, it started taking on water. Despite the vessel's continued course, it suddenly and violently lurched, and began to sink.

The captain and crew escaped in the ship's yawl, ultimately making it to Algoma (then known as Ahnapee). Sadly, the ship's mascot, a large Newfoundland dog, was asleep and perished in the sinking.

The historical society described the discovery as "remarkable," highlighting that while the *Trinidad* might not be well-known among the many undiscovered shipwrecks in Wisconsin waters, this remained a significant find. ■

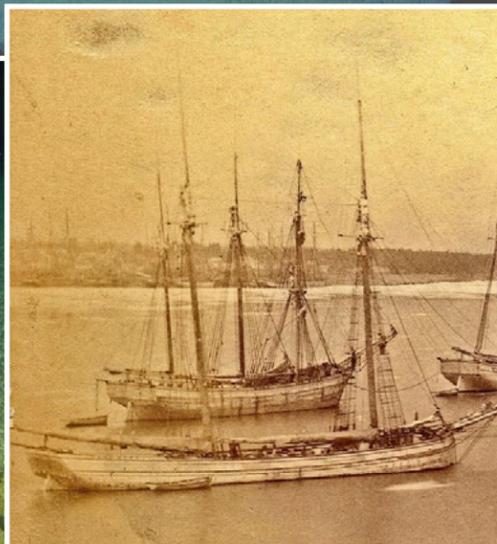
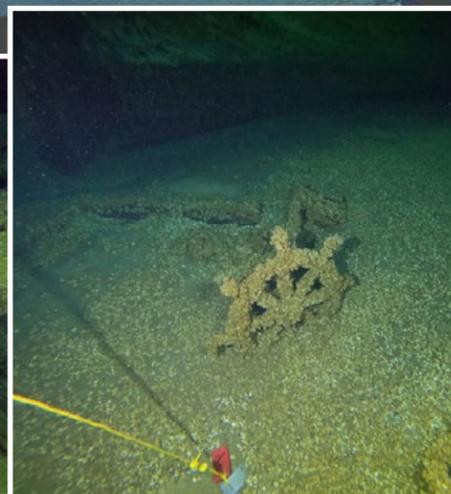
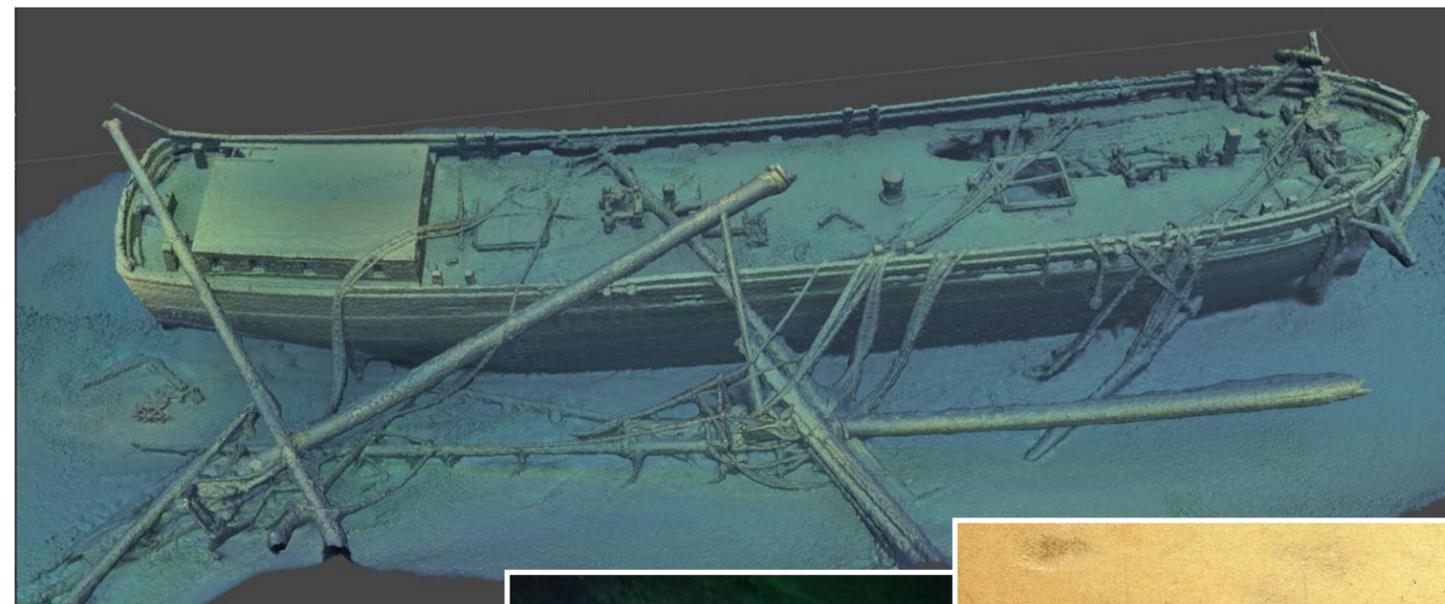
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### Wreck of the *Trinidad* in 3D

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CLOCKWISE FROM TOP: The schooner *Trinidad* as it appears today; *Trinidad* wintering at Sarnia, Ontario, 1873 (image by John S. Rochon); *Trinidad*'s wheel; *Trinidad*'s bell

TAMARA THOMSEN, STATE HISTORICAL SOCIETY OF WISCONSIN

TAMARA THOMSEN, STATE HISTORICAL SOCIETY OF WISCONSIN

Edited by Peter Symes

The schooner *Kyle Spangler*, which sank in 1860 in what is now Thunder Bay National Marine Sanctuary, is almost completely encrusted with invasive quagga mussels. Image taken in 2008.



USGS / PUBLIC DOMAIN

Quagga mussel

## Quagga mussels destroying Great Lakes shipwrecks

**The rapid destruction caused by quagga mussels is erasing important pieces of history, making the efforts to locate and preserve the shipwrecks more crucial than ever.**

Quagga mussels have become the dominant invasive species in the lower Great Lakes over the past 30 years and are now wreaking havoc on the Great Lakes' historical shipwrecks.

They firmly attach themselves to shipwreck surfaces, enveloping them entirely and initiating corrosion. Their acidic secretions further break down various materials, leading to the ac-

celerated destruction of these invaluable historical sites.

This rapid devastation is erasing significant historical artefacts, underscoring the urgency to locate and preserve the shipwrecks. Historians and researchers are racing against time as the mussels swiftly obliterate numerous shipwrecks.

Efforts to discover and safeguard these shipwrecks are paramount for comprehending the Great Lakes region's historical and cultural significance. Additionally, raising awareness about the invasive species' impact on historical sites is crucial in the battle to conserve the Great Lakes' maritime heritage. ■

### FACT FILE

The quagga mussel (*Dreissena bugensis*) is a freshwater bivalve mollusc native to Ukraine and Russia. It was unintentionally introduced to the Great Lakes in North America, where it has become an invasive species.

The mussel disrupts local ecosystems by outcompeting native species for food and habitat. It attaches to hard surfaces, causing damage to infrastructure and increasing maintenance costs.

The quagga mussel filters water to feed on plankton, leading to increased water clarity and promoting algal blooms, which can have further detrimental effects on the ecosystem. The species is named after the quagga, an extinct subspecies of plains zebra, due to the striped pattern on its shell. ■

NOAA / PUBLIC DOMAIN



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Edited by Peter Symes

Unlock travel savings with VPNs: Choose a provider, download the app, and access global deals on flights and hotels. Navigate travel smartly and securely.



COMPOSITE BY PETER SYMES

## Tip: Use VPN to check flight prices

**Airlines, hotels and car rental services often base their prices on your location. Want to pay less? Use a VPN to book from a different country!**

A VPN (Virtual Private Network) masks your computer's IP address, making it appear as though you are browsing from a different location.

Why does this matter for travel bookings? Flight and hotel prices can vary based on the region from which you are searching. For instance, a flight might be cheaper if booked from a country with a lower average income compared to a wealthier nation.

By switching your virtual location using a VPN, you can explore multiple price points from various countries, potentially unlocking significant savings. It is a simple trick; just connect to a server in another region and refresh your booking site. Voila! You might just see a price drop.

### How to use a VPN

To get started, you will need to choose from the myriad of VPN providers available. Once you have made your pick, sign up and download their app. Most providers charge a small subscription fee, but the potential savings on travel can quickly offset this cost. Many providers offer a free trial period.

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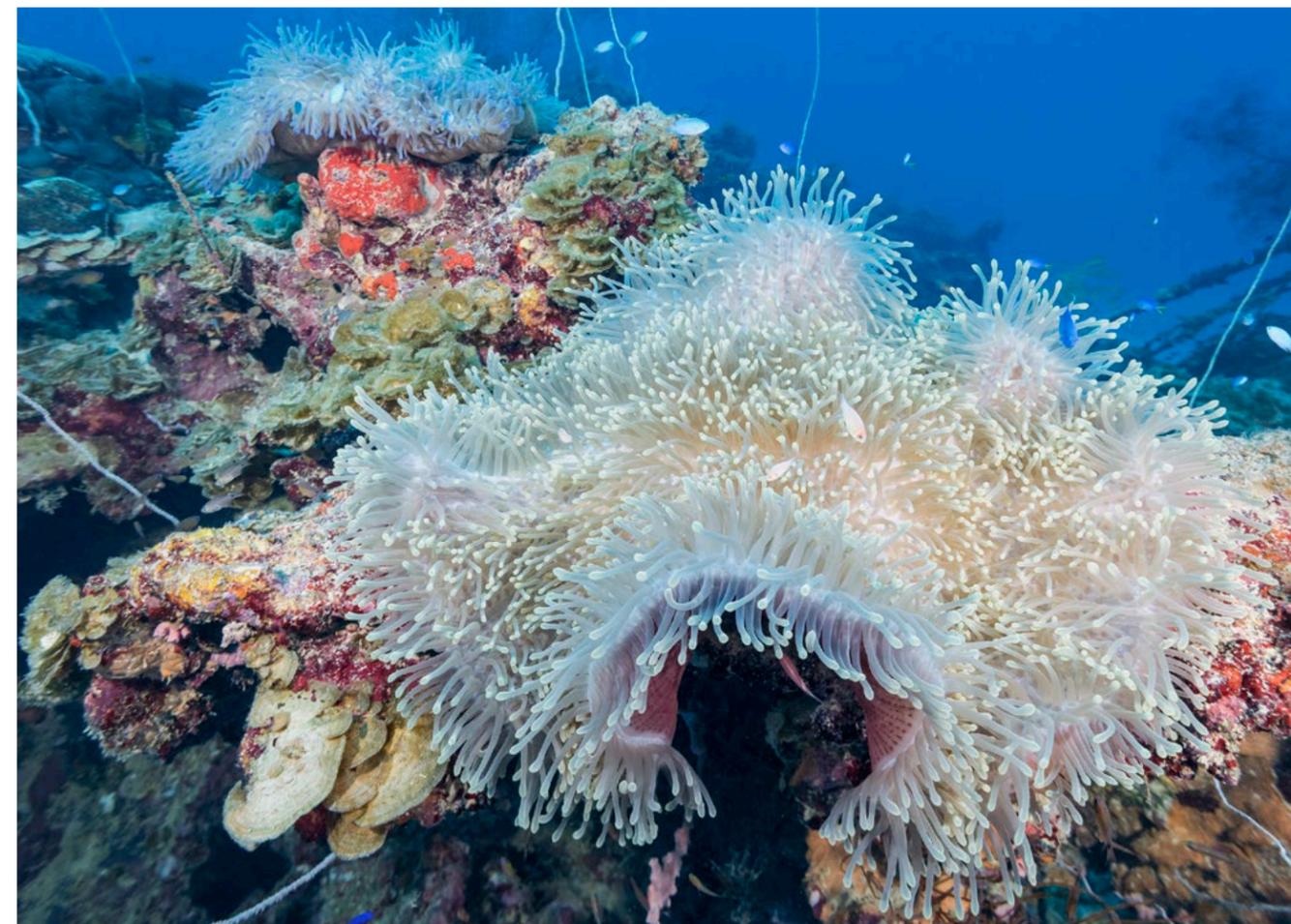
# Truk Lagoon

*A Wreck-reational Diver's Paradise*

Text and photos by  
Matthew Meier



Truk Lagoon



**Picturesque, remote tropical islands, a serene, protected atoll, endless warm water, colorful soft corals, encrusting sponges, schooling reef fish and the occasional spotted eagle ray, shark or other pelagic... What more could a diver ask for? How about over 60 shipwrecks, plane wrecks and even a submarine steeped in WWII history—95 percent of which are within recreational diving limits. Contrary to what you may have heard, Truk Lagoon is definitely not just for the technical diving community. Matthew Meier shares his adventure there.**

Considered by many to be the wreck diving capital of the world, Truk Lagoon has been on my proverbial bucket list for years, so when the opportunity arose to visit this far-away corner of the planet, I jumped at the chance. Some readers may remember my article on diving the Solomon Islands in **issue 85**; I have an affinity for WWII history in the Pacific theater, and thus, was very excited to see Truk for myself.

**History**

The Japanese utilized Truk Lagoon as a staging area for their war efforts during WWII, transporting ships, planes, supplies, munitions and fuel; they even performed repairs in its protected waters. Through airborne reconnaissance efforts, US forces

ultimately discovered that Truk was Japan's largest military base and plans for an attack began in earnest. On 17 and 18 February 1944, more than 500 US warplanes carried out a devastating assault in what was known as *Operation Hailstone*.

The planes were launched from five aircraft carriers and another four light carriers, supported by a multitude of battleships, cruisers, destroyers and submarines. Pilots used bombs and torpedoes to target ships at anchor during their initial attack on the 17th, as well as concentrating on the five airstrips and seaplane bases that had been constructed on various islands, in an effort to limit Japan's ability to launch planes into the air for their own defense. Fuel and munition bunkers were the

Pink anemonefish in large carpet anemones on the Japanese submarine I-169 (above); View of the islands and coral reefs in Truk Lagoon, on flight from Guam (top right); Brilliant soft corals, damselfish, fusiliers and cardinalfish on the king post of the *Sankisan Maru*, near the surface (top left); Schooling fish, colorful corals, sponges and sea fans on the king post of the *Fujikawa Maru* (previous page)





Aerial view of the islands and coral reefs in Truk Lagoon (left); The western side of Tonoas Island in morning sunlight (above); The *Heian Maru's* starboard propeller covered in colorful corals, schooling fish, sponges and sea rods (right)



primary objective on day two, since destroying these earlier would have resulted in expansive plumes of smoke and hindered the pilots' ability to sight in the ships. The strategy and execution were so effective that the planned third day of shelling was essentially deemed unnecessary.

The Imperial Japanese Navy lost dozens of ships, hundreds of planes and thousands of lives over those two days, hampering the efforts of their remaining troops spread out across the Pacific. Many of the sunken vessels were merchant ships, and per Japanese naming convention, they were given a name that ended with "Maru," which translates to "circle". The name was meant to bring good fortune, in hopes that each vessel would be able to leave port, navigate to its destination and return home safely, completing the circle.

**The wrecks**

The majority of the wrecks in the lagoon are concentrated in three separate anchorages, in relatively close proximity to one another, and are accessible by no more than a 15- to 40-minute boat ride from shore.

After nearly 80 years underwater, there is significant growth on many of the shipwrecks (especially those at shallower depths) and impressive amounts of sea life living on these unintended artificial reefs.

**The location**

Situated in the western Pacific Ocean, roughly a two-hour flight from Guam and about halfway between the Philippines and Hawaii, Truk Lagoon is found in the country of the Federated States of Micronesia (FSM). Comprising more than 600 islands, FSM is made up of four island states known as Kosrae, Pohnpei, Yap and Chuuk. The latter is also used as a spelling for the lagoon, and you will see and hear the area referred to as both Truk Lagoon and Chuuk Lagoon. It was explained to me that "Chuuk" is most commonly used when referring to the land or state itself within FSM, and "Truk" is more frequently used when speaking of the lagoon and the dive sites therein.

**Getting there**

**United Airlines** is currently the only air carrier with flights from the United



States to Micronesia, offering two different routes, each includes a stopover in Hawaii. Traveling from the West Coast, our journey began with a 9 a.m. departure from Los Angeles, followed by a short layover in Honolulu, before flying directly on to Guam. Arriving a little after 7 p.m. local

time, we took a shuttle to a hotel for a few hours' sleep before our 8 a.m. flight to Truk the next morning. Since our layover was over 12 hours, regulations stated that checked bags had to be collected in Guam and could not be tagged directly to our final destination. However, once in Guam,

After nearly 80 years underwater, the *Fujikawa Maru's* bow is covered in schooling fish, corals and sponges



School of glassfish on colorful, coral-encrusted metal decking (above) and dually truck axle covered in colorful corals, sponges and algae, resting near the edge of the deck (right) on the *Sankisan Maru*; Starboard propeller, covered in colorful encrusting corals, sponges and algae on IJN Susuki patrol boat PB-34

airport personnel informed us that bags could be checked in up to 12 hours in advance for our morning flight.

**PRO TIP:** To avoid dragging luggage to a hotel for the night, walk the bags upstairs and re-check them to Truk after passing through customs, as you will now be inside that 12-hour window.

For those returning on United to the United States via Guam at the end of your Truk adventure, this flight path also currently requires an overnight stay. Thankfully, the airline is accommodating on when you make that next flight to Hawaii. So, if you have the flex-

ibility, stay and spend a few days on Guam. We had a lovely time enjoying its white sandy beaches and snorkeling the marine reserve right in front of our hotel. Plus, the adjusted schedule made for a shorter Hawaii connection and a quicker trip back to Los Angeles.

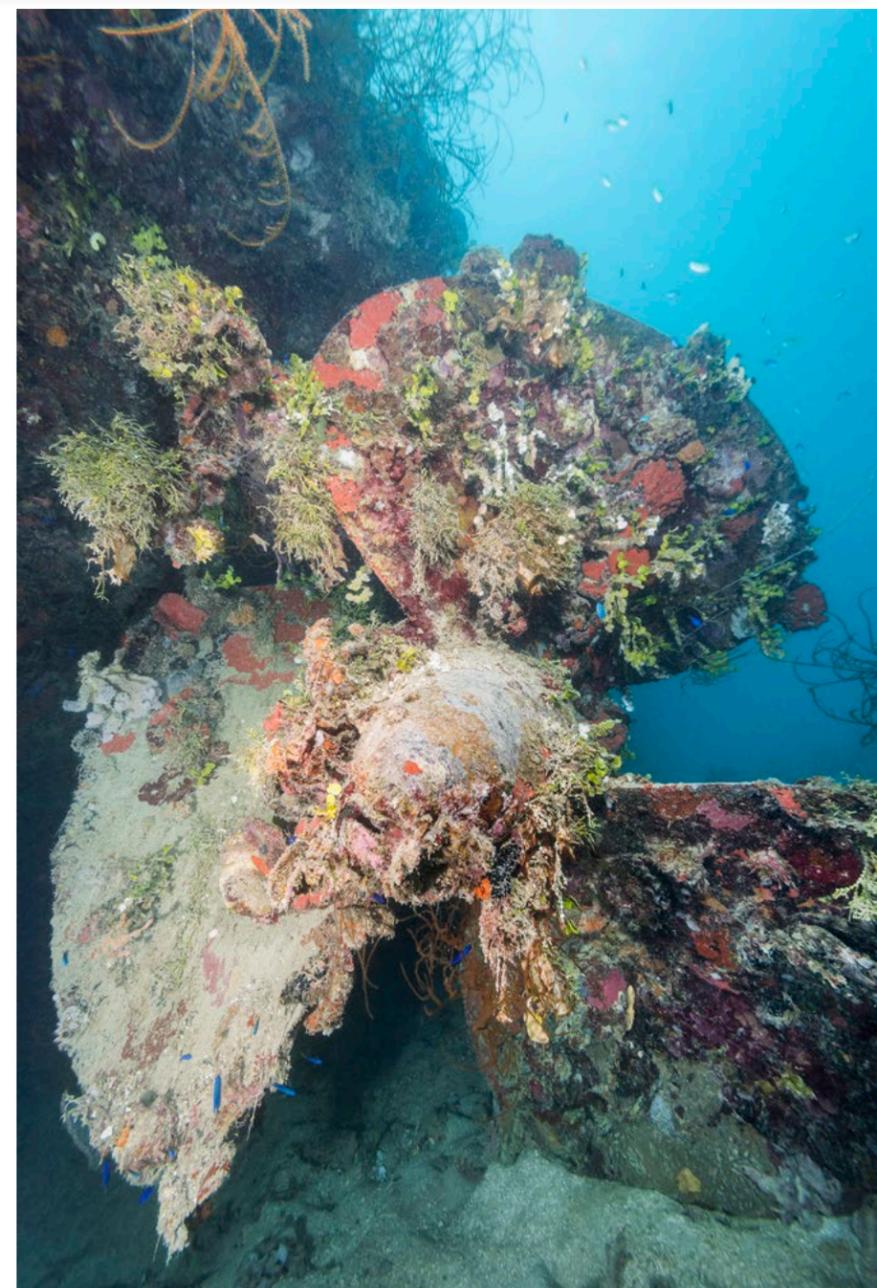
Dubbed the Island Hopper, this alternate route was established in 1968 and has been operating continuously ever since. Originally serviced by Air Micronesia, a subsidiary of the now defunct Continental Airlines (which merged with United in 2012), the flight operates three times per week from Honolulu to Guam and from Guam to Honolulu, with sojourns along the way in the Marshall

Islands and FSM. The total travel duration, including time on the ground, is 16 hours end-to-end and includes stopovers at Majuro Atoll, Kwajalein Atoll, Kosrae, Pohnpei and Chuuk.

For many of these destinations, this was their only scheduled air service, and for travelers, this was a great way to see more of the islands. Our flight the next morning from Guam to Truk was actually the first leg of the Island Hopper, effectively meaning that at this time, there were only three flights per week in or out of Truk Lagoon. For international travelers, there were various airlines that could deliver

you to either Hawaii or Guam; but ultimately, you would connect with one of these United flights to get to Chuuk.

As with any remote travel, especially when boarding a liveaboard dive boat that may or may not be able to return to port to collect a late arrival or missing luggage,





The Japanese built an airstrip on Etten Island during WWII and used bricks along the shoreline to create an “unsinkable aircraft carrier” (above); Japanese pillbox constructed in WWII looking out over the lagoon at Weno Island (right)

it is advisable to arrive a day or two ahead of time to prevent unforeseen travel delays from disrupting your vacation. I also highly recommend purchasing travel insurance to help recover expenses when things do not go as planned, despite one’s best intentions or due to Mother Nature herself. In the case of Truk, with only three flights per week, that might mean arriving up to three days early.

We touched down at the airport on Weno Island, the capital of Chuuk, on a Thursday morning well in advance of our Sunday afternoon departure on the *Pacific Master* ([masterliveaboards.com](http://masterliveaboards.com)). The idea was to decompress for a few days, allow our bodies to adjust to the time zone change, and explore some of the WWII sites on land.

**The resort**

Truk’s first dive operator, Blue Lagoon Resort, sat at the far southwestern end of the island. This rustic, though newly renovated property, would

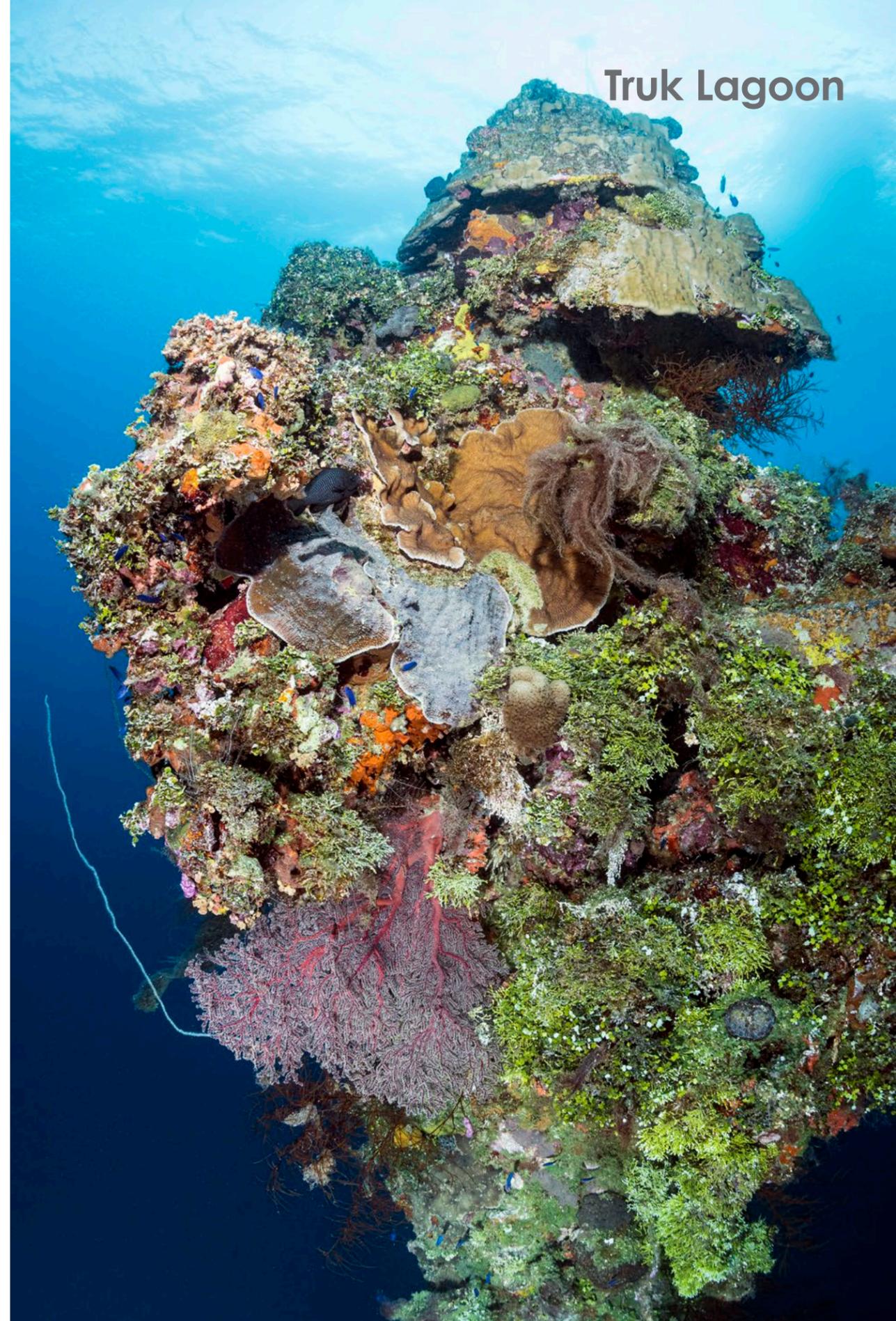


serve as our home base for the next three days. Founded in 1973 by the late Kimiuo Aisek, a pioneer in the dive industry of Truk Lagoon, the resort was nestled amongst swaying palm trees, with stunning water’s-edge views of the lagoon. It is still a family-run resort.

The Kimiuo Aisek Memorial Museum was opened on site in his honor back in 2014 and is a must-see during your visit. The space was filled

with WWII artifacts, along with historical pictures and stories from the wrecks in the lagoon, most of which Kimiuo located or helped to locate after witnessing their destruction in person as a teenager. There were several other relics scattered around the grounds, including an impressive concrete and stone pillbox looking out over the lagoon, which was constructed by the Japanese to help fortify the island.

Truk Lagoon



Colorful corals, sponges and sea fans growing on the king post of the *Fujikawa Maru*



**The liveaboard**

We were joined by several other guests from the hotel as we transferred by skiff to the waiting ship tied to the dock in the commercial harbor. Liveaboard life began as we unpacked personal items, organized dive gear and assembled underwater housings in-between filling out paperwork, checking dive cards and listening to the always crucial boat and dive safety briefings.

There was a good mix of recreational and technical divers, primarily from the United Kingdom and the United States, plus one solo traveler from Hong Kong, among the group. Dive setups ranged from rebreathers to twin tanks with bailout bottles, to

us recreational/no decompression divers on single tanks of nitrox. Divers must be at least advanced-open-water certified to dive Truk, and a deep diving specialty to 40 m (130 ft) is highly recommended.

One gentleman was here for the fifth time, having had such a fantastic experience on his first trip that he went home and become rebreather certified, so he could spend more time on each dive exploring the wrecks. His interest lay primarily in the wrecks themselves and their WWII history, as he frequently lamented the “bio-clutter” obscuring his view after a dive—a term I am absolutely stealing whenever discussing vivid soft corals and plentiful fish life, moving forward!

Sadly, I have zero chance of properly imitating the fabulous British accent with which my new favorite phrase was originally uttered.

**Diving**

Truk Lagoon is one of the few places I have visited where a large number of the same dive sites are accessible by both liveaboard and land-based dive operations. The advantage of being on a liveaboard is the ability to wake up, enjoy breakfast and be already moored directly above a wreck for the first dive of the day. Afterwards, you can relax on your surface interval while the crew positions the boat for the next dive—you would not have to worry about long transits on small

Diver entering the forward cargo hold on the *Fujikawa Maru* (above); Light fixture emerges from encrusting coral on the bow of *Heian Maru* (center inset); Large colony of *Montipora* sp. plate corals and sponges in the shallow waters surrounding IJN Susuki patrol boat PB-34 (top left)



*Fujikawa Maru's 6-inch (152mm) stern gun covered in a school of threestripe fusilier fish, corals and sponges (top left); Fuselage and wing of a Japanese Zero fighter plane in cargo hold #2 (top center); Mechanical room (center); Upper tank sounding port on the deck near the bow (top right); Rusting oil drums in cargo hold #1 (center right); Brass plate (right) showing a serial number and manufacturing date of "1899," on the backside of the 6-inch (152mm) bow gun; Stainless steel plaque (left) to honor Kimiuo Aisek, who witnessed Operation Hailstone, and in 1973, opened the Blue Lagoon Dive Shop, the first dive shop in Chuuk.*

boats to and from each dive spot.

A liveaboard also has the ability to visit shipwrecks that are too far to reasonably dive from shore and access the coral reefs around the edge of the atoll. Depending on the site, both

recreational and technical divers can explore the same wreck at different depths, or one group can take a short ride on a skiff to dive a more appropriate site nearby.

Due to extended bottom times, deco stops, and no small amount of precaution given the remote location, technical divers are limited to only one morning and one afternoon dive per day. On the other hand, recreational divers can typically get in three

to four dives daily, at least when diving from a liveaboard.

There are far too many memorable wrecks to make mention of them all here, but I thought I would detail a few of the more famous one, the must-see spots, and perhaps one or two of my favorites from the trip.

**Fujikawa Maru.** The *Fujikawa Maru* is a 132m (433ft) former cargo and passenger carrier built in 1938, now sitting upright in 39m (128ft) of water, that falls into all three of the above categories. It was fitted with 6-inch (15.24cm) bow and stern guns when

the Japanese thrust it into service in 1940, both of which are thoroughly covered in bio-clutter.

A brass plate is still visible at the rear of the bow gun, displaying its serial number and "1899" manufacturing date. Two separate holds are filled with supplies, munitions and airplane parts, including the fuselage of a Japanese "Zero" fighter plane, wings, wheels, nose cones and tail assemblies, in addition to hundreds of glass sake bottles. Several mechanical rooms and the engine room are accessible and mostly intact, with gauges and instruments on display, including one of the more





Diver swimming through companionway (above) and on elevated walkway (right) on *Shinkoko Maru*; Fuel transfer pump in upper engine room (bottom right); Ladder covered in encrusting corals and sponges (below); Engine order telegraph on the stern deck (left)



famous air compressors in Truk Lagoon known as "R2D2." As I ascended to our safety stop alongside the king posts, which top out at only 9m (30ft), I marveled at the incredibly colorful coral and sponge growth concealing nearly every aspect of the metal structure. We split the hull between the bow and stern over the



course of two dives but could easily have spent multiple days exploring the intricacies of this fascinating shipwreck.

**Shinkoku Maru.** Resting upright at a similar depth, the *Shinkoku*



*Maru* was a 152m (500ft) former oil tanker that is a must-see for its array of artifacts, accessibility, vibrant marine life and its immense size as the second-largest vessel in the lagoon. A kaleidoscope of colorful soft corals and



sponges encased the elevated walkway above the deck, which sat at around 18m (60ft) and was still open inside to allow divers to swim the length of what was once a passageway. A spare propeller blade re-

mained strapped to the wall of a storage room near the entrance to the cavernous upper engine room, with still-functional staircases and an impressive-looking fuel transfer pump. Engine order telegraphs, which

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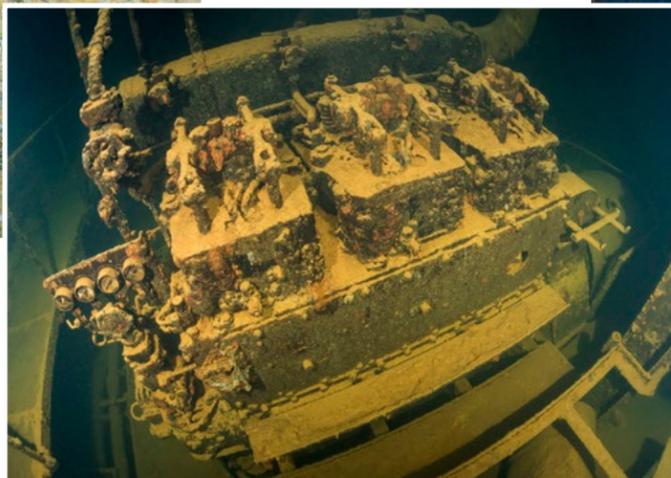


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Porcelain sink (above) manufactured in Toyohashi, Japan, found on the deck, near the opening to the engine room on the *Kensho Maru*



Typewriter (above), with only two keys remaining, and other artifacts, including porcelain sinks, glass bottles, rubber boots and lanterns, arranged on deck near opening to engine room on the *Kensho Maru*



Cavernous upper engine room, *Kensho Maru*

the pilot once used to communicate orders for speed and direction to the engine room, were still intact and encrusted with sponges at the bow, stern and bridge. In the forward superstructure, there were washrooms with tile floors and rows of urinals attached to the wall, plus rooms with operating tables, med kits and medicinal glass bottles.

**Kensho Maru.** The upper engine room on the *Kensho Maru* was perhaps the largest interior open space I experienced during my trip. With a ceiling height of over two stories, divers could access this massive complex by slipping through the open skylights aft of the superstructure. Companionways and staircases led farther into the ship and down to the lower engine com-

partments where immense crescent wrenches were all neatly hanging on the wall, right where the engineer left them nearly 80 years ago.

Scattered around the deck near the entrance to the engine room were hundreds of artifacts deposited by divers from years past, including porcelain sinks, rubber boots, lanterns, glass bottles and even a typewriter, with only the keys "I" and "O" enduring. This 117m (384ft) former cargo and passenger ship, which rested at 38m (125ft), had a 3-inch (7.62 cm) forward gun that was fully engulfed in corals. The king posts were decorated with a lurid rainbow of soft corals and surrounded by a school of goldtail demoiselle fish, creating one of my favorite photos from the trip.



Fusiliers and damselfish swimming over the colorful, coral encrusted, 3-inch bow gun on the *Kensho Maru* (above); Electronic switches in lower engine room (left); Colorful soft corals and school of goldtail demoiselle fish engulf the king post (right)



### Plenty to see

As I allude to the various features of particular wrecks, I feel I should also mention that for those who are not comfortable penetrating or being in a confined or overhead space, it is certainly not a requirement for enjoying your time in Truk. There is so much marine life on many of these ships, including scattered artifacts and other points of interest on the exterior, that venturing inside is simply an added bonus for those with the experience and expertise to safely navigate the inner workings. Most of the vessels in the lagoon are well over a football field in length, and it would take days to thoroughly examine their external surface.

A typical dive day for the recreational divers consisted of a 6 a.m. wake-up call, a light breakfast and



Superstructure and bridge listing to port (left), remnants of a truck hanging over the edge of the port side forward deck, surrounded by a school of goldtail demoiselles fish (far left), field artillery gun on the aft deck (below), and steering helm, with the brass ring of the steering wheel still connected, and the engine order telegraph in the background, on the bridge (lower right) of the *Nippo Maru*

Type 95 Japanese tank resting on the port side forward deck (right) and a spotted eagle ray swimming past the large king post covered with coral growth (below) on the *Nippo Maru*



a dive briefing for Dive 1. A full breakfast and a rest period followed the dive, along with the briefing for Dive 2, often on the same wreck but focused on a different area. Another surface interval and lunch back on board accompanied the third dive briefing, and then there was frequently a visit to a different wreck for the afternoon. If time and conditions allowed, a fourth dive was briefed after another break and planned for late afternoon. Each dive was led by a guide, though we had a bit of freedom to ex-

plore with our dive buddies, so long as we did not lose track of the group.

**Nippo Maru.** Sitting upright and listing slightly to port at 48m (157ft), the *Nippo Maru* was a wreck on which recreational divers could only go slightly past the deck, but there was still a great deal to see. Just in front of the superstructure, on the port side, sat a Type 95 Japanese tank, mysteriously missing its turret, and closer to the forward hold was a well-adorned truck chassis, balanc-

ing precariously over the edge. Inside the hold, gas masks, ammunition, bottles and other fascinating artifacts could be found. But beware: Just don't lose track of your depth.

Aft, on the deck near the rear hold, were several field artillery guns, with their rubber tires still in place albeit decorated in sponges and corals. Coming shallower, towards the end of the dive, the bridge has a well-preserved steering helm, complete with the brass ring from the steering wheel and the engine order

telegraph in the background. Here again, the king post was full of life, though not as easy to scale, given a slight current and the mooring line leading upward and away from the starboard deck. On both dives here, we encountered spotted eagle rays and a large school of barracuda swimming in the blue.

**Japanese submarine I-169.** I would be remiss not to mention the I-169, one of only three known dive-able Japanese

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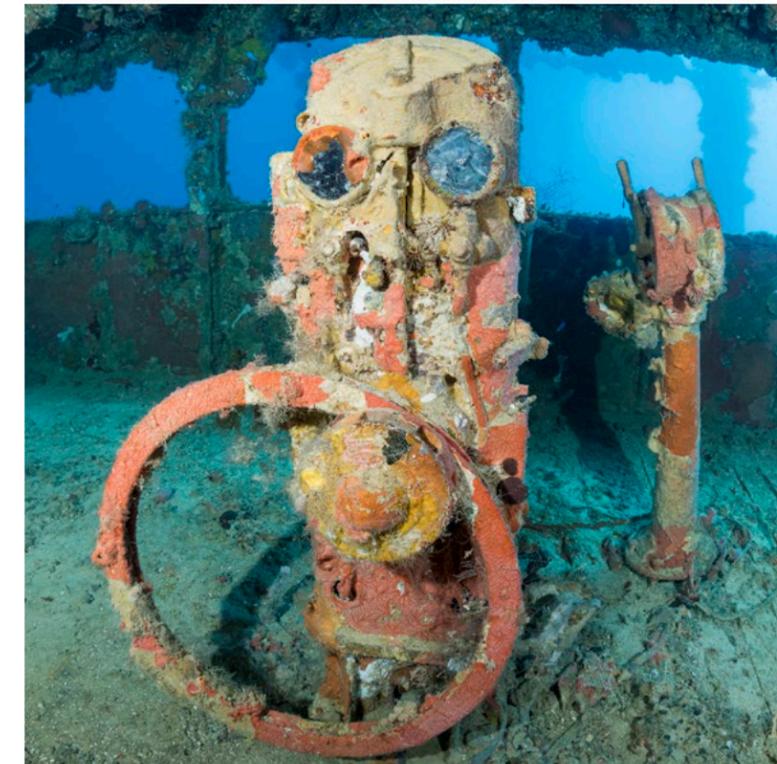
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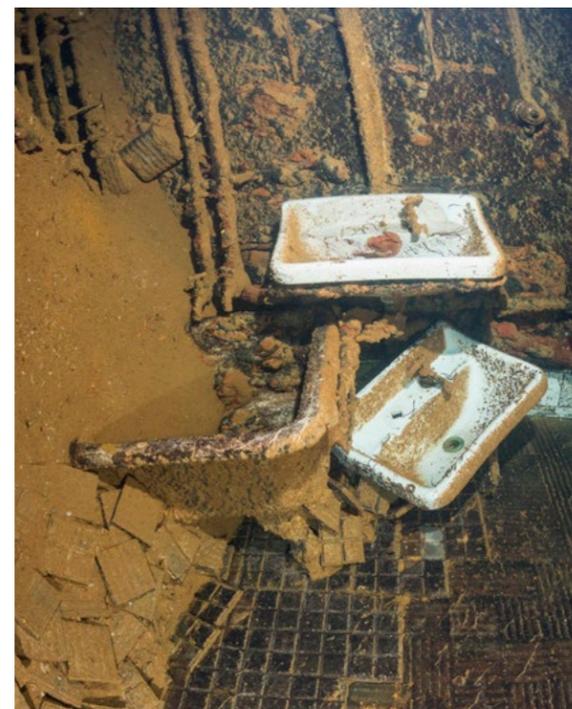




Threestripe fusiliers on the starboard side (left), stairway leading down to the lower engine room (above), and encrusting corals and sponges among hard coral formations covering the entire starboard side (right) on the *Kiyosumi Maru*



Collage of rear portion of the Japanese submarine I-169 (above); Light fixture with intact light bulb in lower engine room (right) and portions of the upper engine room (center) on the *Kiyosumi Maru* wreck



Porcelain sinks, wash tub and floor tiles in restroom just off the upper engine room (above left) and gas mask on hard coral (above right) on the *Kiyosumi Maru*

submarines in existence. Originally, 102m (336ft) long and 8m (26ft) wide, it currently rests in 42m (138ft) of water, with its shallowest point at 30m (99ft).

It sank in April 1944, in a follow-up attack of Truk, due to a diving accident in which not all its hatches were closed as it submerged to escape the bombardment. The crew was able to seal off the water-filled compartments, but the vessel could not be raised, nor was a rescue possible, and all on

board perished. Their remains were the first to be recovered by the Japanese in the 1970s. It was a somber reminder that the wrecks in Truk Lagoon were all part of a mass war grave.

The forward section of the sub was later blown apart by depth charges, though it re-

mained largely intact from the conning tower to the stern. Penetration was not possible, yet there were a few places where one could peer inside, and the twin rear-facing torpedo tubes were easy to spot. Several sprawling carpet anemones with pink anemone-

fish could be found near the midship blast crater, and large colonies of black corals could be found all along the wreck.

**Kiyosumi Maru.** The most impressive hard coral growth I encountered was on the 138m (453ft) *Kiyosumi Maru*, which

lay in 33m (108ft) of water, on its port side. Dropping down the mooring line to the starboard railing at 12m (40ft), we saw the ship was indistinguishable, as the entire hull was covered in dome-shaped encrusting corals. It was not until we slipped over the edge

to visit the hold or bridge, that the scene remotely resembled a man-made structure.

Once inside, the hold was filled with decaying 55-gallon drums, and the upper engine room had a large exhaust fan next to the doorway of a restroom, with attached porcelain

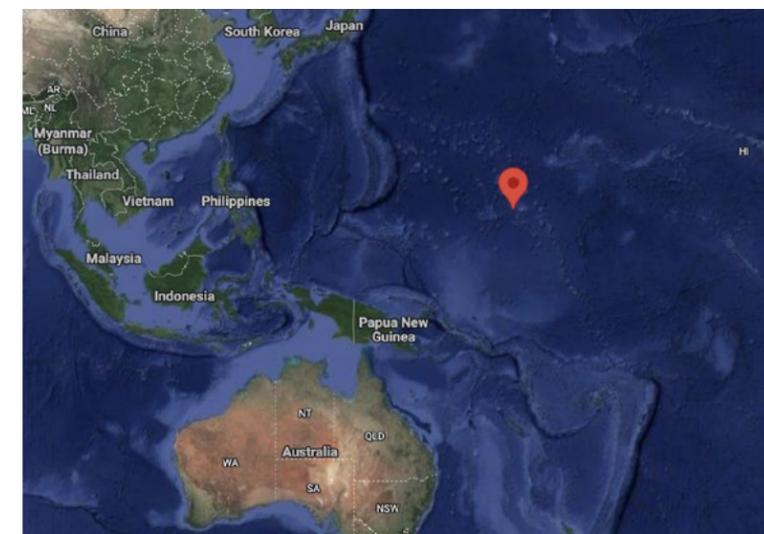
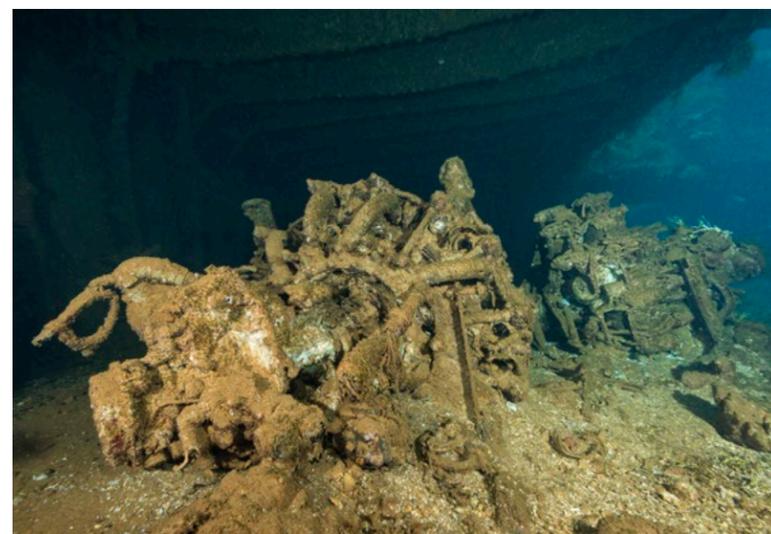
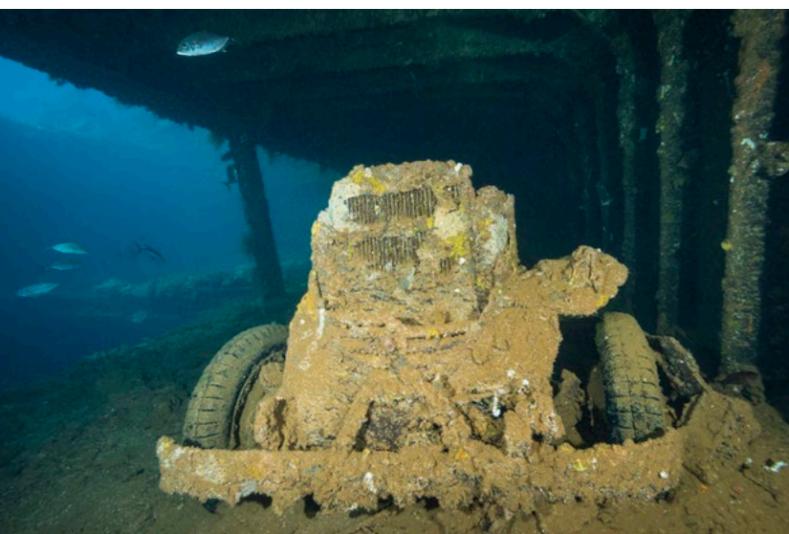




Dually truck axle, covered in colorful corals and sponges, resting on the forward deck of the *Sankisan Maru* (left); Thousands of small glass medicine bottles of various colors were buried in the silt of the cargo hold (above); Colorful soft corals and damselfish at the base of the king post on the forward deck of the *Sankisan Maru* (right); SECOND ROW, LEFT TO RIGHT: Truck chassis with an intact engine, radiator, steering wheel and tires in the cargo hold; Large pile of machine gun bullets on the floor of the cargo hold; Pair of airplane engines in the cargo hold; Location of Bikini Atoll on regional map



Truk Lagoon



sinks, a washtub and delaminated floor tiles. Since the wreck was on its side, one actually had to poke one's head up vertically through the doorframe to see inside. There was also a symmetrical descending staircase leading to the lower engine room that one entered by swimming horizontally down the stairs, to discover a light fixture with an intact light bulb still in place.

**Sankisan Maru.** A final favorite of mine from the trip was the 116m (380ft)

*Sankisan Maru*, which split into two parts during its sinking, with the rear portion in much deeper water and rarely visited. The forward half was only in 24m (80ft) of water and had two large open holds containing three truck chassis, consisting mainly of their radiators, engines and frames. Inside were a pair of airplane engines, thousands of rounds of machine gun bullets, and countless small glass bottles hidden in the silt.

Up on deck were two more sponge-encrusted dually truck axles and a

large school of pulsating glassfish. The king posts rose from the deck nearly to the surface, stopping at just 3m (10ft) deep and were fully immersed in multicolored sponges and soft corals. I spent the entire second half of the dive and all of my safety stop focused solely on shooting bio-clutter.

**Afterthoughts**

It would take a lifetime to investigate all the wrecks in the lagoon, and I can certainly understand why so many

divers flock to Truk and continue to return year after year. My own content bias aside, the diving was absolutely fabulous and far exceeded even my expectations. I highly recommend a visit of your own, and I look forward to a return trip as soon as I can make it happen. There is so much more to see and explore! ■

Special thanks to Master Liveboards ([masterliveboards.com](http://masterliveboards.com)) for hosting this adventure and to United Airlines

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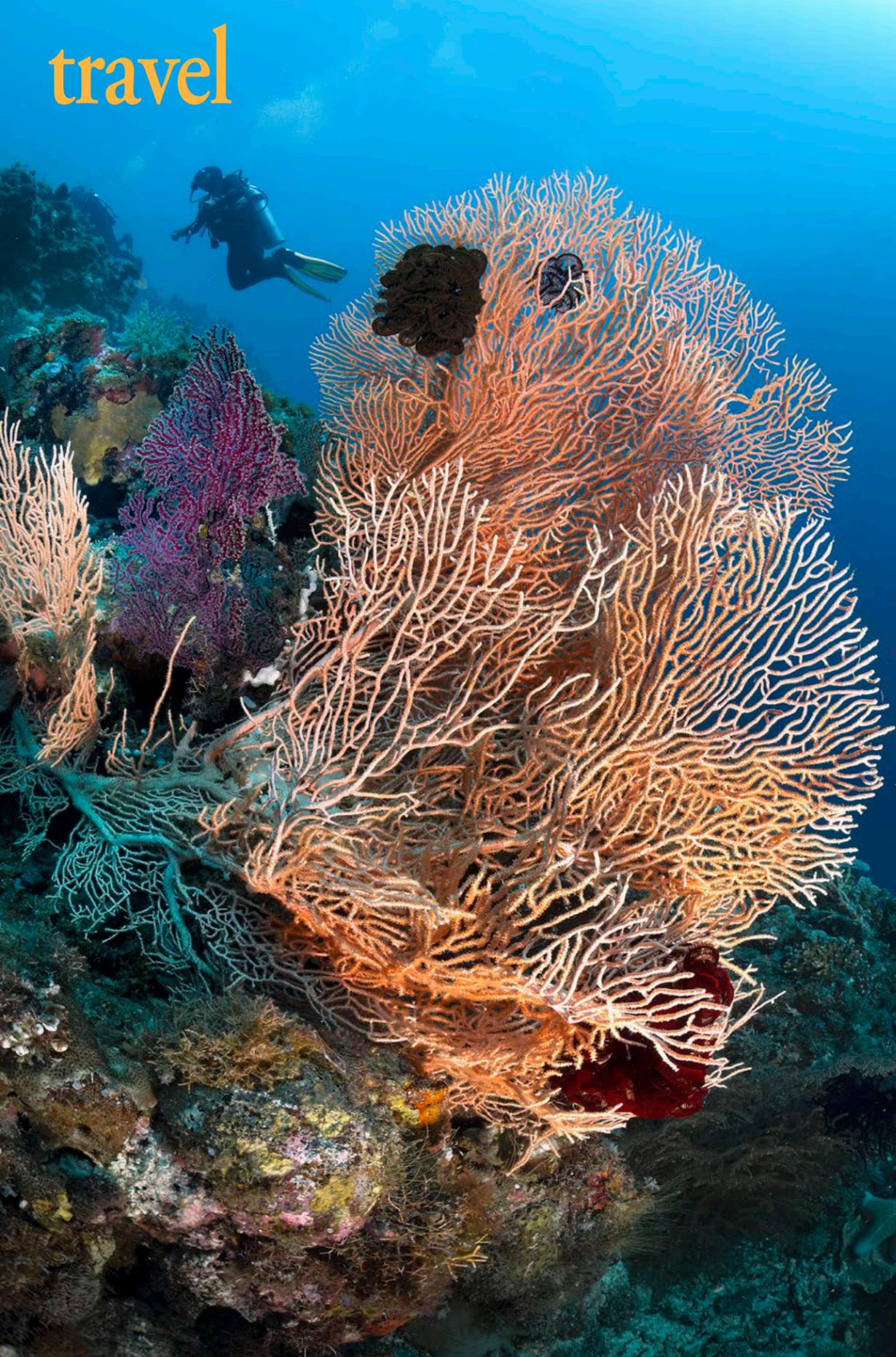
Matthew Meier is a professional underwater photographer and travel writer based in San Diego, California, USA. To see more of his work and to order photo prints, please visit: [matthewmeierphoto.com](http://matthewmeierphoto.com).

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*Indonesia's*  
**East Nusa Tenggara**  
*Liveaboard Safari to Komodo, Flores & Alor*

Text and photos by Scott Bennett



Reef scene at Permanah Kecil, Flores (above); Harlequin crab at Mucky Mosque, Alor (bottom right); Reef squid at Gereja Ampera, Alor (previous page)



Scorpionfish at Cannibal Rock, Komodo

**Located in the eastern half of Indonesia is the island chain of Nusa Tenggara where unique marine life can be found on brilliantly colourful reefs as well as sites with volcanic sands, great for muck diving and macro photography. Scott Bennett takes us on a liveaboard adventure to three of the islands: Alor, Flores and Komodo.**

When it comes to superlatives, diving and Indonesia certainly go hand in hand. Situated in East Nusa Tenggara in eastern Indonesia, the Alor Archipelago is certainly off the beaten track.

While everyone knows the World Heritage site of Komodo, these islands to the east are decidedly more remote, offering unspoilt reefs teeming with abundant marine life. Eager to dive someplace new, a trip aboard the *Gaia Love* immediately caught my attention. With an itinerary that included Alor, Flores and Komodo, how could I refuse?

The only downside? The distance. Although easily accessible from Southeast Asia, reaching the embarkation point of Flores from my home base of Toronto required five separate flights. Not wishing to arrive shattered, I opted to leave 10 days early, making stops along the way. After three nights in Singapore (my favou-





rite food city), I continued to Bali for a few days diving at Tulamben on the island's eastern coast. I then arrived in Labuan Bajo on the island of Flores two days before the live-aboard departure. Experience has taught me that arriving the day of departure is never a good idea, as cancelled or delayed flights and lost luggage can spell disaster.

Flores is one of those places that most people have never even heard of, let alone find on a map. One of the Lesser Sunda Islands in eastern Indonesia, it would be easy to assume it to be somewhere in Portugal, as Flores translates as "flow-ers" in Portuguese. The Portuguese first arrived in 1511 and have had a strong influence on the region ever since. However, I had an additional reason for the early arrival; Labuan Bajo is the jumping-off point for tours to Komodo National Park.

**Komodo**

In the old days, mariner maps would

label unexplored regions with "here be dragons," but Komodo is home to the real deal! I had wanted to visit on previous trips to Bali, but things never worked out. With day tours available, I would finally get my chance.

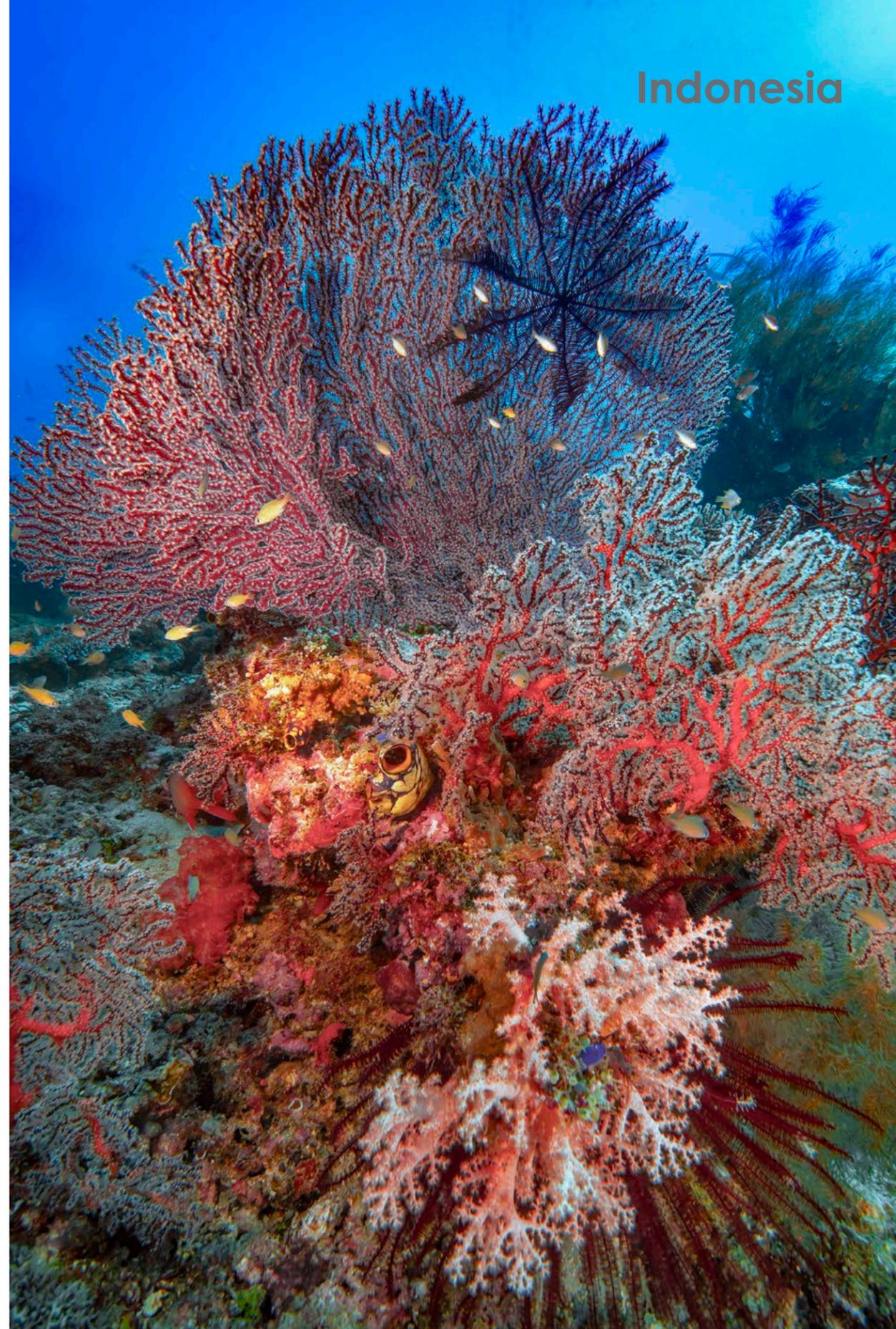
The day had an early start, with a 6:15 a.m. pickup. As it was peak tourist season, there were lots of people heading for the park, and the harbour was jam-packed with boats, the majority of which were liveaboards or day-trip vessels. Fortunately, I had opted for the speedboat option, which shortened travel time considerably. Nevertheless, it would be a long day of around 10 hours. With all 24 passengers aboard, we set out for the Komodo National Park by 7:00 a.m. and arrived at our first stop an hour later.

**Padar Island.** Padar Island features one of the most iconic views of the entire park. The island's geography is quite striking, with a series of peninsulas jutting outwards like extended fingers into the turquoise waters. A steep



trail leads to a spectacular lookout 185m and 800 steps above the island. With only a 90-minute stopover, I was uncertain I would make it, but decided to give it a shot.

The initial section was not too bad, with several viewpoints on the way up,



Reef scene at Gilli Lawa, Komodo (above); Diver on reef at Volcano Drop, Komba Island (top left); Tryon's Risbecia nudibranch, Cannibal Rock, Komodo (centre)





Pink Beach, Padar Island, Komodo (top left); Spectacular rugged landscape of Padar Island (above); Komodo dragon (right) and reef heron with fish (left) at Rinca Island, Komodo

each more spectacular than the last. The incline steepened with elevation, but I pushed on and finally made it to the top. Being the dry season, the landscape was a study in burnt sienna, especially dramatic in the morning light.

Descending proved easier on the lungs but harder on the knees. I suspected my leg muscles would protest the next day. (And they did!)

**Pink Beach.** Our next stop was Pink Beach, also located on Padar, a 15-min boat ride away. Nearly a dozen boats crowded the shoreline, as a multitude of snorkellers crowded the turquoise waters. Fringing the beach, a series of *warungs* (family-owned shops) sold snacks and cold drinks.

The beach really was pink, and not just a little bit. It was truly striking! With a 10-day liveaboard trip ahead, I opted to pass on the snorkelling.

**Komodo dragons**

Found only on Komodo, Rinca and a few neighbouring islands, Komodo dragons are the world's largest surviving lizard species. Measuring up to 3m in length, and armed with razor-

sharp claws and teeth, they are the top predators of their island domain. Aided by venomous saliva, they can tackle deer and even water buffalo. Despite this, the park rangers' sole line of defence is a large stick to push them away, an actuality that is both absurd and highly unnerving.

As is always the case with nature, seeing wildlife is never a guarantee; after all, it is a national park, not a zoo. In the end, we saw five dragons—a pretty good number. Groups visiting the previous day did not see any, causing some irate clients to demand a refund.



Exterior and interior views of the *Gaia Love* liveaboard.

2ND ROW, LEFT TO RIGHT: Camera room; Dining room; Duck salad; The *Gaia Love*



Indonesia



## On to the liveaboard

Finally, it was departure day. On hand to pick me up was Deddy, *Gaia*'s senior divemaster. From Labuan Bajo's harbour, it was a short skiff ride to the *Gaia*, which was anchored out in the bay. The entire staff was on hand to give me a warm welcome—actually, more of a rousing cheer! I then met Cruise Director Gerry, who gave me a tour of the boat. The main deck featured a spacious lounge and dining room, with a unique additional feature: The camera room lay adjacent to the lounge. Each camera station

provided ample space and plugs, while being inside ensured no unwanted moisture issues due to humidity.

Most liveaboard accommodation can be on the compact side, where laying on the top bunk means that your face is inches below the ceiling. Not so on the *Gaia*. I had an actual room, with twin beds and ensuite bathroom with separate shower. Between the beds was a desk and chair, with a trio of chocolate bars sitting on it. Suddenly, it hit me... This was no ordinary liveaboard; it was a luxury hotel that just happened to be a liveaboard.

With the remainder of the day at leisure, I decided to assemble my camera gear. By the camera room were the photos and names of *Gaia*'s entire staff of 22—but when they were kids. Amusingly, they were all recognizable. By mid-afternoon, the remaining six guests were aboard. In the end, we had four Americans, two Belgians and one lone Canadian. Around 4:00 p.m., everyone assembled in the lounge, where we met Giel, Gerry's partner and *Gaia*'s second cruise director. Over coffee and freshly baked cinnamon rolls, Giel

gave us a briefing about the vessel and the ensuing nine days.

The *Gaia* does not have a set-in-stone itinerary, with each day's sites to be dictated by local conditions, currents and other dive boats. We would start off in Komodo for the first three days, followed by a day in Flores and the remainder in Alor. With our route encompassing sites in both the Indian and Pacific Oceans, we would also experience some strong currents along with wild variances in water temperatures. Dive guides alternated between the boats daily, allowing

everyone a chance to dive with all four: Deddy, Refly, Ando and Farly.

## Culinary delights

With the diving portion finished, it was time for the important part—the food! Meals aboard the *Gaia* are plated, with a choice between meat and vegetarian options daily. As good as buffets are, they can become exhausting after a few days, let alone a week. Breakfast orders were taken after dinner while orders for lunch and dinner were taken by Giel after breakfast. We soon discov-

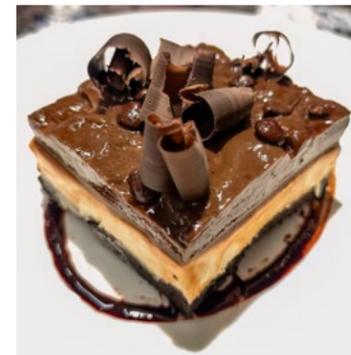


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Padar Island, Komodo (top left); Manta ray at Mawan, Komodo (top right). 2ND ROW, LEFT TO RIGHT: Andy with specialty coffee; Green mango salad; Lobster thermador; Tumeric chicken; Sweet and sour chicken with rice; Dragonfruit salad; Oreo lasagna

ered that the meals were real gourmet

fare, with exquisite presentation.

The vessel also has two coffee machines, one for regular coffee, cappuccino and latte, and the second was a special “bling-bling” machine (in Giel’s words)—the sole domain of barista extraordinaire, Andy. Every day, the period between 4:00 and 5:30, was specialty-coffee time, with a different creation daily. I promptly knew where I had to be at that

time, the rest of the week! (Day One was *affogato*, a coffee-based dessert).

### Diving Komodo

We then set out for Komodo, where we would spend our first night. En route, the rugged islands glowed orange in the waning daylight. By this time, the tourist boats were long gone, and the islands had reverted to their primordial atmosphere.

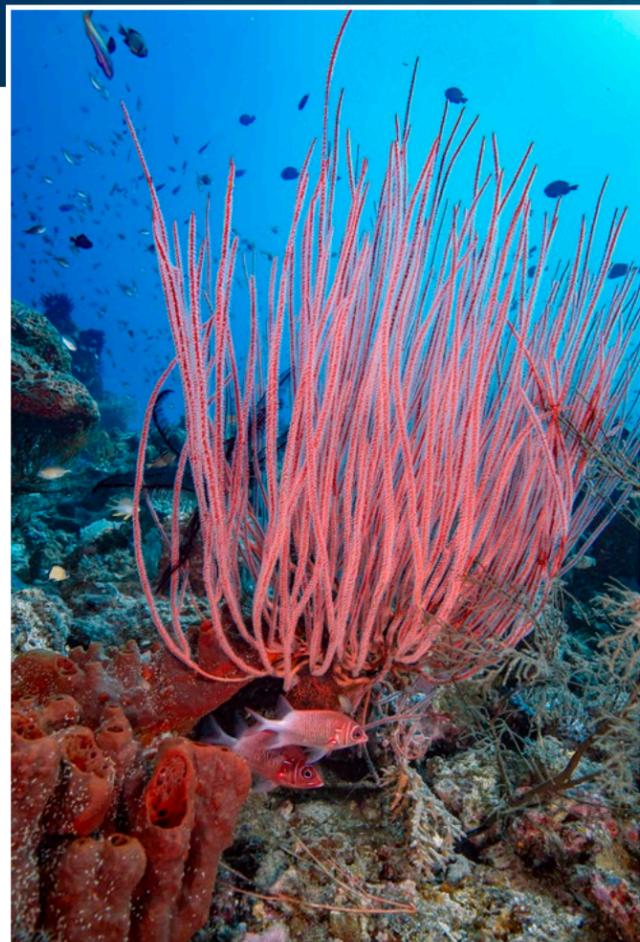
**Manta Alley.** The next morning, I was up at 6:00 a.m. and headed to the dining

room for a pre-dive snack of yoghurt and coffee. Our first two dives would be at Manta Alley, one of Komodo’s signature sites. Beforehand, Gerry and the guides set out to check the conditions, especially with regard to currents. Upon returning, they had one word for us—mantas! It was also just 22°C—a temperature one does not normally associate with tropical waters. Nevertheless, I decided to brave a 3mm suit. Hey, I am Canadian, after all!

Talk about a good omen, when the first

thing you see on a first dive is a manta, you just know the rest of the trip will be extraordinary! The visibility was not great, but that is exactly why the mantas were there, lured by the abundance of plankton in the water. Although I did not get close, there were plenty of them, and it was a joy just watching. Not to be outdone, the reef here was also impressive, with numerous rocky outcrops shrouded





Manta ray at Mawan (above), and whip coral at Gilli Lawa (left), in Komodo

with fans and soft corals. Heading back to the *Gaia*, the dive crew was ready and waiting with a rousing greeting of “Yabba-dabba-do!”

The second dive was even better. Switching from my 15mm lens to a 16-35mm lens, I parked in front of a cleaning station, and was able to get closer shots of the mantas. As long as you stayed still and lower than them, they came quite close. I am still in awe at the grace and majesty of these creatures. If I had to name a favourite sea creature, the manta is it!

**Cannibal Rock.** After lunch, it was time to move on to our third dive site situated near Rinca Island. Another of Komodo's iconic sites, Cannibal Rock is a small seamount situated in Loh Dasami Bay, between Rinca and Nusa Kode. Ascending from more than 40m to within a few metres of the surface, the site is home to an astonishing array of life, from vibrant soft corals and sponges to colourful invertebrates.

For photographers, it is a tough call—macro or wide angle? Ideally both! Alas, with only one dive, it was macro. There were



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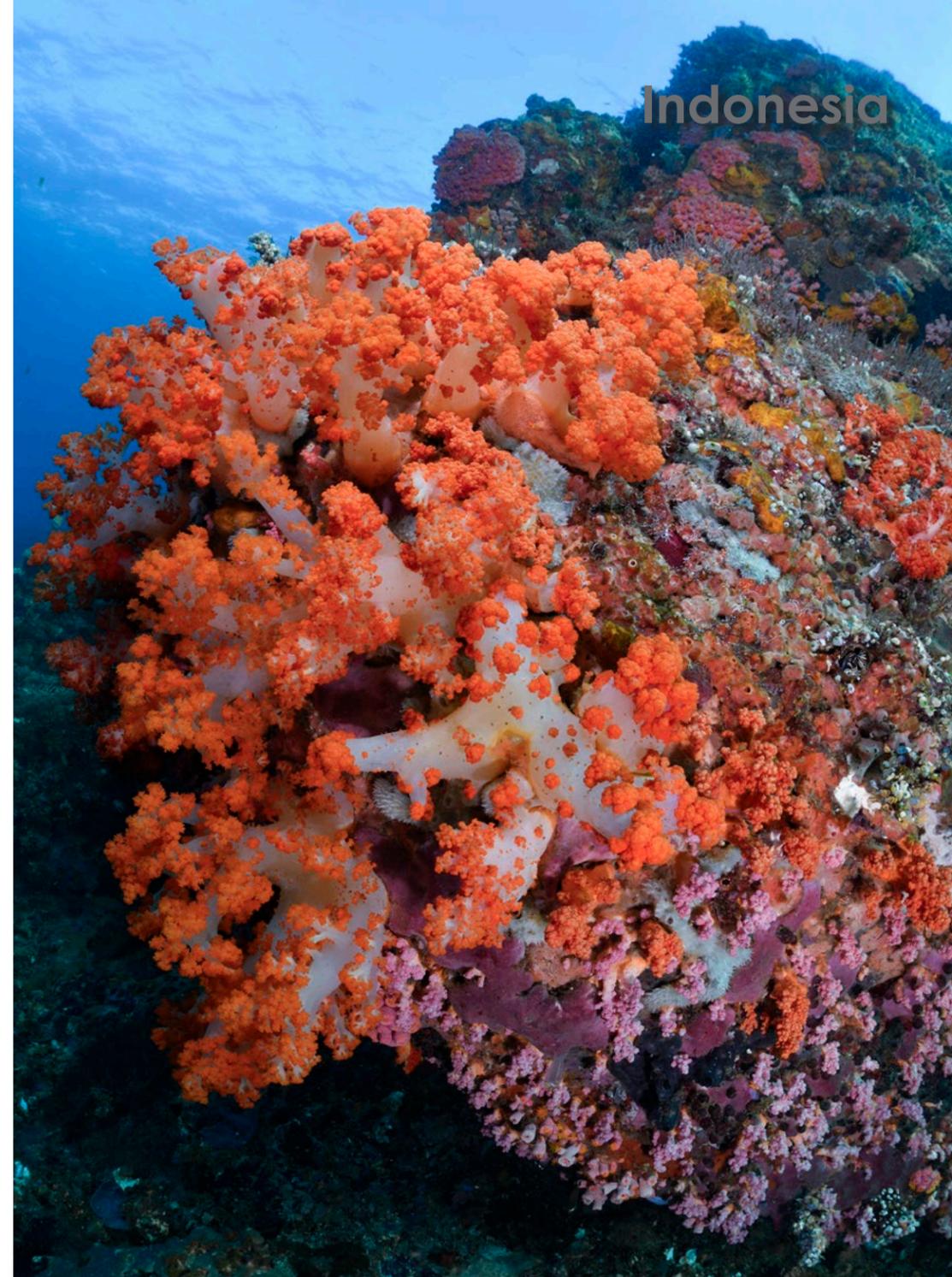
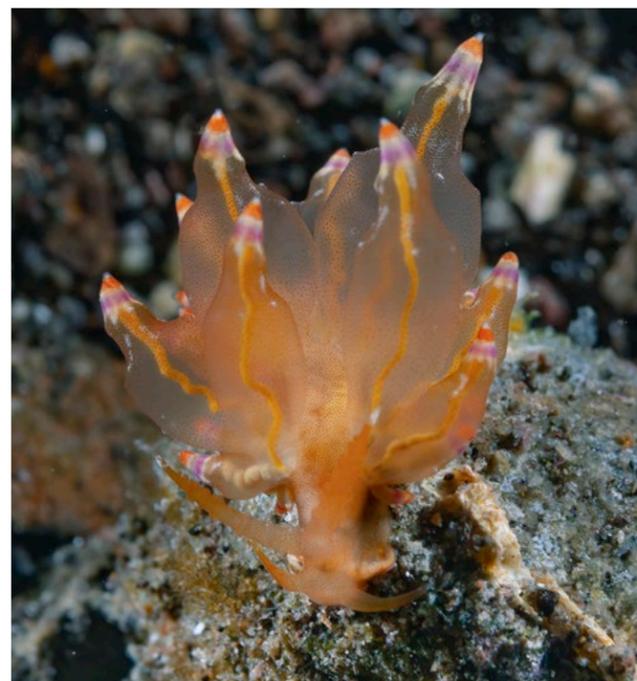
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nudibranchs galore along with legions of tiny yellow sea cucumbers, nudibranchs, zebra crabs, scorpionfish and feather duster worms in a dazzling array of colours. With so much to take in, it was difficult to know where to aim the camera.

**More dragons.** Before the night dive, we had the option to go out for a cruise along the shoreline to look for dragons. In years past, the liveboards would bait them with chicken meat, but since the Covid pandemic, the park authorities put a stop to these practices. At that time, the sound of a boat would lure them to the beach, en masse; but nowadays, sightings are not a guarantee. Still, we saw a few, with one coming down to lay right on the beach. Despite their presence, plenty of wildlife was about, including monkeys, wild pigs, sea eagles and reef herons.

**Torpedo Alley.** The night dive at Torpedo Alley would be a bonfire dive, where lights would be set up in advance prior to our entry to attract weird critters from the deep. Awkwardly, I back-rolled in, minus a weight belt, and had to wait for the other skiff to bring one over (something I would *not* repeat again). By the time I reached the bottom, the only thing the lights attracted were huge

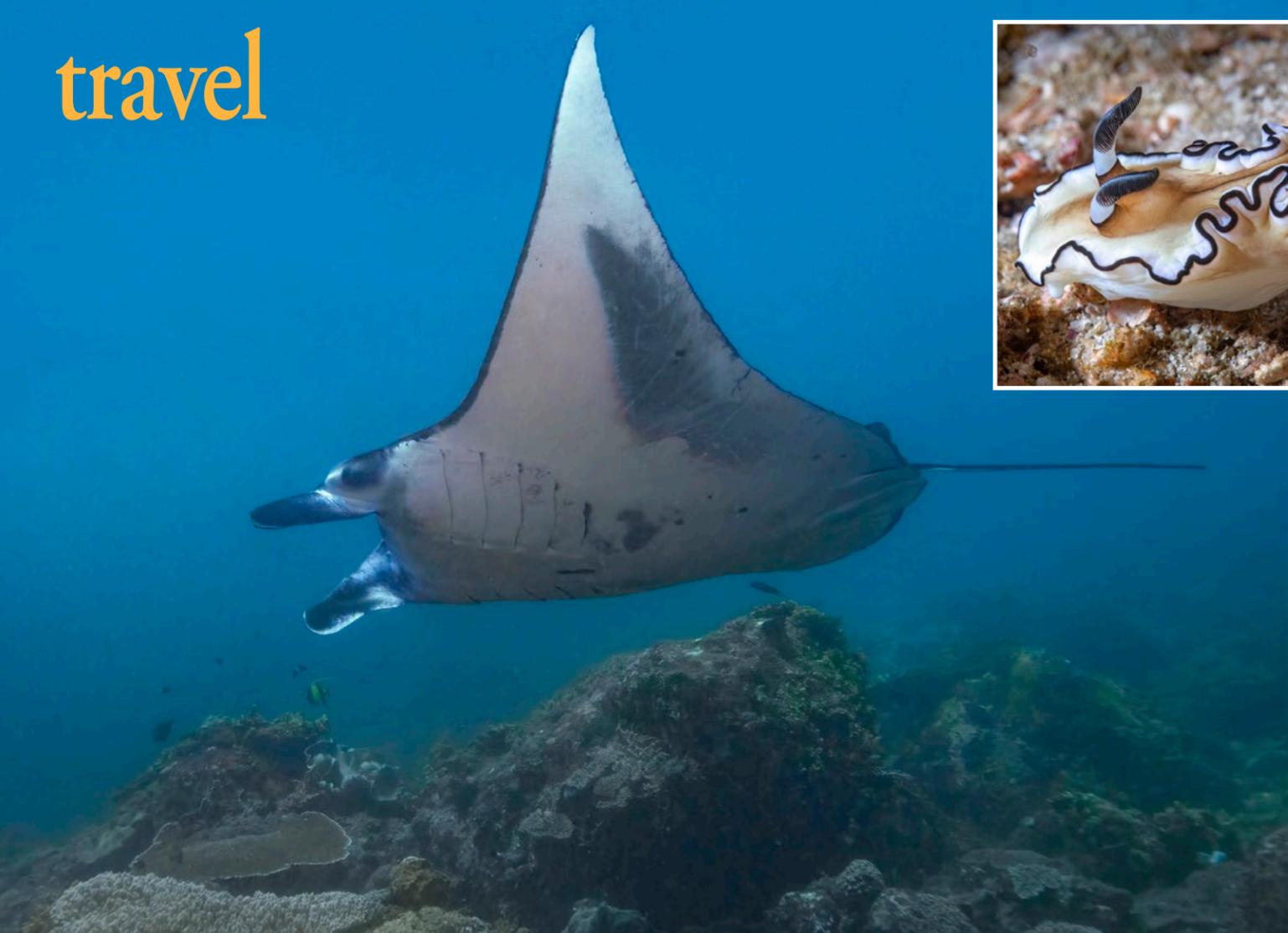
numbers of tiny shrimp. Like clouds of undersea gnats, they promptly engulfed my strobes' spotting lights, making photography a challenge. Moving on, we found plenty of subjects, including painted frogfish, various nudibranchs, mantis shrimp, tiny crabs on sea pens and cuttlefish.

**Gili Lawa Laut.** After dinner (seriously, Beef Wellington?!), we weighed

In Komodo: Painted frogfish at Torpedo Alley (top left); Magnificent chromodoris nudibranch at Gili Lawa Darat (top centre); Soft corals at Manta Alley (right); Doto nudibranch at Torpedo Alley (above); *Pseudobiceros* sp flatworm on sponge at Gili Lawa Darat (left)

anchor and set out for Gili Lawa Laut, a small island situated off the northern coast of Komodo. The first dive would be at the ominously named Shotgun, a channel between two bays. Giel recommended leaving cameras behind, so I decided to pass. Instead, I had an early breakfast, this time indulging in *nasi goreng*, fried rice with vegetables and an egg. Thanks, Andy!

**Current City.** We then moved on to an area of Komodo called Current City. Here, warmer water from the Pacific surges between the islands to collide with cold upwellings from the Indian Ocean, creating powerful currents, eddies and whirlpools that were a sight to behold! In places, it resembled the rapids of a fast-moving river in the ocean. I knew Komodo currents were legendary, but I had never



Manta ray at Manta Alley (above); Black-margined glossodoris nudibranch at Cannibal Rock (top centre)

seen anything like this!

We spent the next two days here diving four different sites. Currents were strong but tolerable, but the rewards were vibrant reefs and 30m visibility. Currents bring in the fish and there were plenty of them, including yellow-ribbon and giant sweetlips, black-spotted porcupinefish, surgeonfish and dense schools of anthias.

**Gili Lawa Darat.** After the third dive, two of us accompanied Giel to the island of Gili Lawa Darat for a sunset hike. We did not go all the way up, but even from the lower viewpoint, the view facing Komodo Island

was spectacular! We finished with a night dive right near the island's jetty. The highlight was shooting a portrait of a slumbering flying gurnard, a fish I have never been able to photograph up close.

**Batu Bolong.** The next day started off with a real adrenaline rush at Batu Bolong. Essentially an isolated rock in a raging torrent, we would dive the protected leeward side where the water was calm. However, severe downcurrents were possible in conjunction with powerful currents at the corners.

As a result, the dive briefing was more detailed than usual.

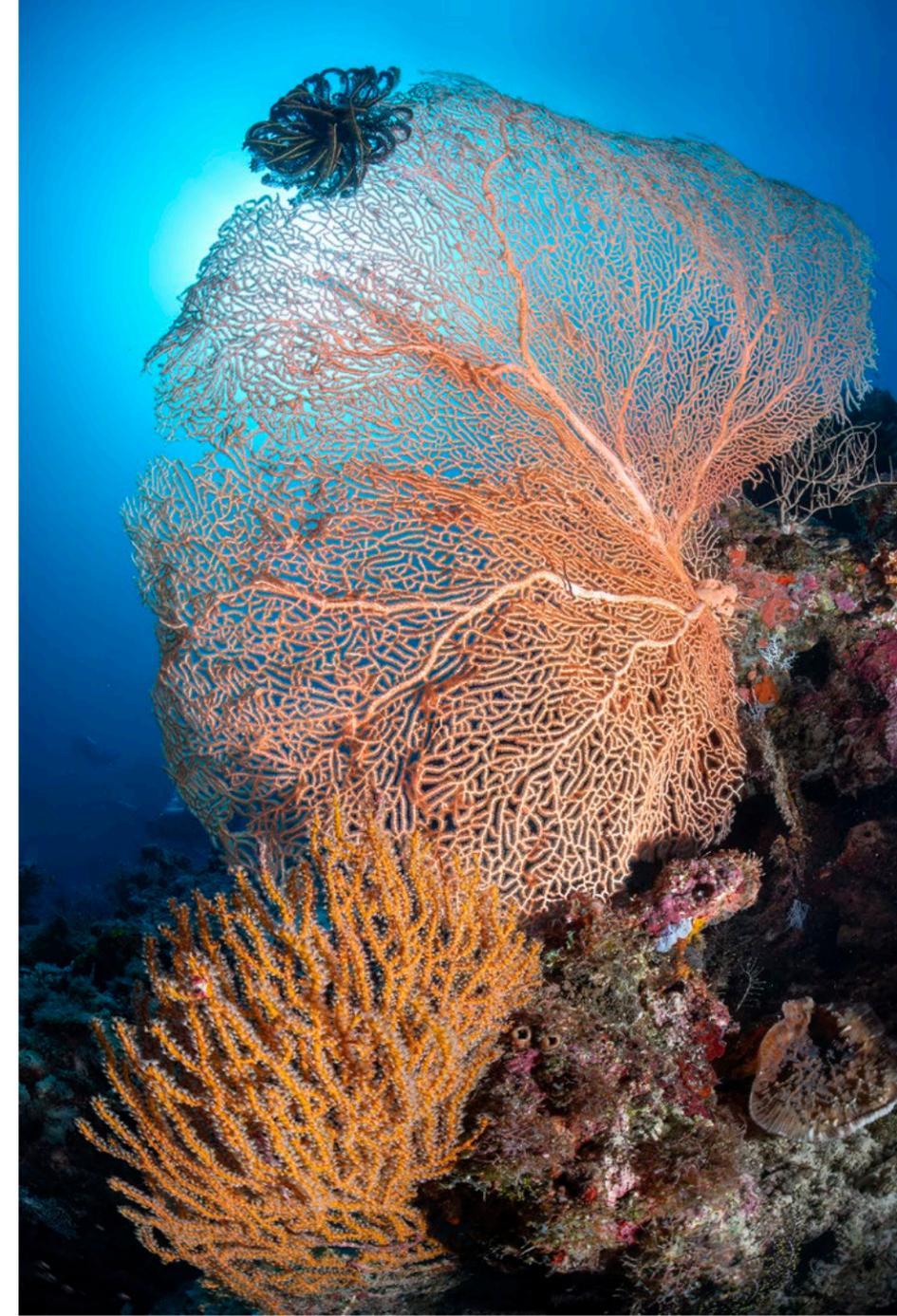
Safety was paramount; it was imperative to always stay near the guides. People have died here, and we did not want to contribute to the statistics.

Plunging in, the water was calm, but the marine life was astounding! Reef fish pulsed along the wall, while out in the blue, whitetip sharks and giant trevally patrolled in search of food. A few Napoleon wrasse kept their distance, almost tempting us to chase them.

We descended to 30m, where an overhang sheltered several soldierfish and striped sweetlips. We then commenced on a slow zig-zag ascent up the slope, ensuring



At Komodo: Reef scene at Batu Bolong (top right); Flying gurnard at Gili Lawa Darat (above right); Blackspotted porcupinefish at Siaba Kecil (above left)



In Flores: Jawfish with eggs (top left), bobtail squid (top centre), and Emma's hypselodoris nudibranch (above centre) at Tanjung Wotang; Fan coral at Permanah Kecil (right)

to keep well clear of the treacherous currents at the edges. There was so much going on, I could have easily spent an hour watching the show. During my safety stop, a diver from another boat crashed right into me, and Gerry had to literally pull the diver off. Fortunately, I was spared the downcurrents and finished the dive unscathed and exhilarated.

**Takat Makassar.** Our next dive could not have been more different. A barren expanse of broken coral punctuated with the odd coral bommie, Takat Makassar will not win any awards in the beauty department. Looks are deceiving, however, as it turned out to be a manta highway with plenty of traffic! Drifting with the current, we saw many, either hovering in the current or zooming past us.

However, it was the final encounter that would be the best. A pair were hanging in the current a short distance away, and our entire group decided to wait. Despite the current, I was able to position myself beside a large coral bommie. To my amazement, they slowly drifted in my direction until they were right beside me. It turned out the bommie was a cleaning station, and they had arrived for servicing. I dared not move, as I did not want to alarm them. A truly exhilarating moment!

**On to Flores**

After a third dive nearer to mainland, we bid Komodo adieu and commenced our overnight voyage to the northern coast of Flores. Unfortunately, strong unseasonal winds hampered our progress, so the

dive schedule was adjusted accordingly, with three dives instead of the planned four.

**Pemanah Kecil and Serbete.**

Featuring a massive wall and amazing visibility, Pemanah Kecil offered an impressive start to the day. It was one of the prettiest reefs of the trip, with huge orange and lavender fan corals draped with feather stars and 30m visibility. Farther south, we visited Serbete for a late afternoon dive, arriving just as blacktip and whitetip reef sharks had just come out to hunt.

**Tanjung Wotang.** Dinner was at 6:00 p.m. followed by a night dive at

Tanjung Wotang at 7:30 p.m. All day long, Gerry had regaled us with accolades for this site, so I could not wait! While gearing up, I remarked that I would love to photograph a bobtail squid, having seen only one in 30 years of diving.

The water was a cool 22°C, but from the first critter, the cold was quickly forgotten. Just beneath the surface, a small reef squid was attracted by my torch beam and held still just long enough for me to capture a few images of it. Minutes

Pygmy squid eating shrimp at Tanjung Wotang





In Alor: Fan coral at Volcano Drop (top left); Komba Island (top right); Sponge decorator crab (above right), *Phyllodesmium* sp. nudibranch (above left), and cuttlefish (left) at Ampera; *Pustulose marionia* nudibranch at Mucky Mosque (far left)

later, Refly pointed out a dark blotch on the sand. Upon closer inspection, my jaw dropped—it was a bobtail squid! In my torchlight, it was positively radiant, glowing like tiled blue porcelain. We found two more, each obligingly posing for photos.

My good fortune did not end there. Whenever Refly pointed out some-

thing, I quickly learnt to take a picture, regardless of whether I saw anything or not. That instinct paid off, big time. In one shot, I captured a minuscule yellow squid eating a shrimp!

The photo ops were relentless; it seemed there was a new critter in every square metre. While photographing a scorpionfish, Refly franti-

cally tried to get my attention. I continued with the scorpionfish, but he was *really* insistent, and I soon found out why. Finning over, I discovered a jawfish with a mouth full of eggs. In all my years of diving, it was a subject I had long dreamt of photographing. Inching closer, I was astonished to see the eyes of the babies clearly visible!

Along with an assortment of nudibranchs, a striking blenny caught my attention. Its head boldly patterned

blue and black, it turned out to be a Namiye's combtooth blenny, a species I had never seen, let alone heard of. Amazingly, all the subjects I photographed were very tolerant. I guess they have not been overwhelmed by the macro paparazzi found at popular muck sites elsewhere.

Back aboard the skiff, I started shivering, but a hot shower was only minutes away. No sooner had I ascended the stairs, a warm towel was draped over my shoulders while

a steaming mug of hot chocolate was waiting at my station. It simply does not get any better than this!

**Alor Watu Balu.** After another overnight journey, we finally arrived in Alor. Our first dive was at Watu Balu, off the island of Pantar. Like Komodo's Current City, conditions were challenging, with Pacific currents going out and the cold Indian Ocean currents coming in. We would dive the



Mantis shrimp under feather star (left), painted frogfish (above), and wonderpus (right) at Beangabang, Alor



island's leeward side, so there would not be any issues. Well, there was one, and it was a doozy: the temperature. If anyone was not fully awake before the dive, that would change quickly. In the shallows, it was a chilly 20°C. Despite this, the reef was vibrant, with beautiful sponges, and leather and hard corals in the shallows at 3m.

Descending to 20m, things got really interesting. I hit a thermocline and the temperature plummeted to 17°C! It was barely tolerable in my 3mm suit, and one of the Americans did not fare so well. He indicated "dive over" and headed back to the surface.

Fortunately, the thermocline was temporary, and temperatures returned to the relative warmth of 20°C.

Forgetting the cold, I enjoyed the rest of the dive. Schools of anthias and blue and gold fusiliers swarmed in abundance, while on a ledge beneath an overhang, Geddy found a resting wobbegong shark. Back on the *Gaia*, Gerry said she spotted a mola mola (sunfish) at 35m but did not go after it. I cannot say I blame her, with those temperatures.

At breakfast, Andy served me a steaming bowl of *bubur ayam*, an Indonesian porridge with chicken—just the ticket for warding off the dive's chill. A

second cup of coffee did not hurt either.

**Beangabang.** After a second dive off Pantar, we headed for our final stop at Beangabang, regarded as one of Alor's premier muck sites. We would do two dives here, one in the afternoon, followed by a night dive. Switching my camera setup to macro, I could not wait to get in the water!

The local kids came out to greet us in their boats as we geared up for the first dive. Although it was relatively shallow, there was plenty to see. Seahorses, juvenile boxfish, giant mantis shrimp, sea hares, stick pipefish and squat shrimp

all competed for my camera's attention.

Towards the end, Refly was excited by something and motioned me over. At that moment, a wonderpus octopus erupted from the sand! Boasting dramatic white stripes on a copper-hued body, it drifted, tentacles fluttering gently before settling back on the sand. The only downside was that I had the 105mm lens on my camera, which could not encapsulate the depth of field to keep the entire creature sharp—a minor inconvenience, as it is a privilege just seeing one.

The night dive proved even better than the first, featuring a different cast of intrigu-

Solar-powered nudibranch, *Phyllodesmium longicirra*, at Gereja Ampera, Alor (right)



Hard corals at School's Out, Alor (right); Dwarf scorpionfish (bottom right) and cardinalfish with eggs in its mouth (left) at Gereja Ampera, Alor



ing characters: stonefish, juvenile clown frogfish and a variety of nudibranchs, including pleurobranchs, flabellinas and elysias. Refly proved to be the “nudibranch whisperer,” as he had a real knack for finding them. The dive was capped off with another bobtail squid, this one resting on a bed of red algae.

We spent the next three days exploring a variety of sites around Alor and the surrounding islands of Pantar, Pura and Reta, and the highlights were many.

**Tanjung Muna.** A morning dive at Tanjung Muna, off Pantar, featured a spectacular wall with large sea fans, black corals and barrel sponges, patrolled by golden sergeants, pyramid butterflyfish, sergeant majors and a massive school of black snappers. One in our group even spotted a few hammerhead sharks cruising below 30m. In the shallows, a school of pinnate batfish allowed a close

approach, while a pair of spotted eagle rays and a giant barracuda were not as obliging.

**Geraja Tua.** At Geraja Tua, the local village’s fishing nets provided interesting photo subjects, with superlative visibility revealing the boats on the surface above. Yellow-ribbon sweetlips darted amongst the bommies, as bluefin trevally patrolled in search of a meal. By this point, 22°C temperatures did not bother me in the slightest. During the checkout before our dive, Gerry spotted the fin of a mola mola breaking the surface, but we did not get to see it.

**Kampung Yan & School's Out.** Off Pura Island, Kampung Yan and School's Out were home to impressive expanses of hard coral gardens, including some truly immense table corals. It was especially heart-





At Alor: Bobtail squid at Beangabang (above); *Cerberilla annulata* nudibranch at Mucky Mosque (top centre); Aeolid nudibranch at Mucky Mosque (right); Diver with fish trap on reef at Geraja Tua (far right)

virtually no effects of coral bleaching. Then again, warm water is not exactly an issue here!

**Crucifixion Point.** Crucifixion Point, named for the trio of crosses commemorating a small passenger ferry that capsized here, was another beautiful site, with abundant fans, tubastrea, soft corals and barrel sponges. Orange cup corals were especially prolific, their outstretched tentacles feeding in the current.

**Intervals**

Between dives, there was still plenty of time for relaxation. I frequented the comfortable couch in the lounge, which was conveniently located beside a big jar of Oreo cookies. There was also a masseur on board,

and his services were in especially high demand in the afternoons.

All through the week, the meals continued to impress. Dishes ranged from Asian specialties such as grilled turmeric chicken, papaya salad with prawns, and *soto ayam* (Indonesian chicken soup) to rib-eye steak, red snapper and even lobster thermidor! And then there were the desserts...

**Muck diving**

As good as the reef diving was, for me, the night dives were the real stars of the show. Indonesia is famous for muck diving, and Alor is as good as I have ever seen. For three nights, we anchored along the northern coast of Kalabahi Bay, which is home to several outstanding sites. Best of all, we had them all to ourselves!

Mucky Mosque takes the prize for the trip's most unusual site name. No, we were not diving a mosque, but a black sandy slope offshore from one. Alor's muck sites are home to some of the weirdest nudibranchs I have ever seen, and here, they were out in full force! Boasting stalk-like appendages, a *Pustulose marionia* was a new species for my list, along with some crazy phyllodesmiums. There is one red species I photographed I have yet to

identify. Other notables included a pair of leaf scorpionfish, a large reef octopus, banded pipefish, harlequin and decorator crabs, and a feeding melibe nudibranch. With photo subjects everywhere, the hour just flew by. I did not want it to end.

**Geraja Ampera.** Our final muck dive at Geraja Ampera certainly went out with a bang! Several long-cirri phyllodesmium (solar nudibranchs)

appeared along with Spanish dancers, reef squid, dwarf cuttlefish, a vivid red dwarf scorpionfish, and a few more indescribable nudibranchs. Ascending the slope, long-spined urchins were everywhere, and I am still amazed I did not impale myself. However, there was one final surprise: a cardinalfish brooding a clutch of eggs in its mouth, with one of the babies clearly visible, making an exit. Wow!



In Alor: Reef scene at Watu Balu (above); Wobbegong shark at Watu Balu (top right); Diver with batfish at Tanjung Muna (bottom right); Devil scorpionfish at Ampera (right)

**Komba**

Sadly, it was time to bid Alor farewell and after dinner, we set out on the overnight trip to our final destination. Arguably, Giel and Gerry had saved the most spectacular location for last. Our final two dives would be off the island of Komba, situated some 70km northeast of Lembata Island, in the Flores Sea. This was no ordinary island, being home to the imposing silhouette of Mount Batutara, an active volcano. Until fairly recently, eruptions would occur every 20 minutes, but now it slumbered, a steady plume of steam indicating that its current state was only temporary.

**Volcano Drop.** Our first dive site was the aptly named Volcano Drop. The scale of this location was truly epic. From below the surface, dramatic walls plunged precipitously to the depths. One would not expect vibrant coral gardens alongside an active volcano, but here they were. Massive gorgonians crowded the walls, interspersed with delicate lace, organ pipe and plate corals.

However, frequent signs indicated things were not all benign. Immense flows of black sand cascaded downwards, an indication that Mount Batutara was still very much alive. According to Giel, during its more active phase, you could hear the



booms from the eruptions underwater, startling the schools of fish (and probably a few divers). In the shallows, it was fascinating to see corals growing right out of the black sand, something I have never seen before.

**Komba Southwest.** Our second and final dive at Komba Southwest proved equally dramatic. However,

Komba offered something else we had not experienced on the entire trip—the water temperature was a balmy 28°C. That is an 11-degree temperature difference between the warmest and coldest sites.

**On to Maumere**

With our final dive concluded, it was time for the long journey back to





Diver on reef at Serbete in Flores (left); Dive boats at Gili Lawa Darat dive site in Komodo (top right); Local youths in double-outrigger canoe at Adunara in Flores (centre); Komodo dragon on Komodo Island (far right)



Komodo, Flores and Alor are located in East Nusa Tenggara (above), Indonesia (global map)

Maumere. We would arrive in port late that evening, where we would spend the night before disembarking the following morning. At least there was no rush to disassemble my camera gear and pack.

However, *Gaia* had one final surprise in store. For our final dinner, we would be having a full-blown *Rijsttafel*, a Dutch word meaning “rice table.” In short, it was an

Indonesian buffet of rice surrounded by dishes of meat and vegetables in mouth-watering sauces. The amount of food was both delicious and overwhelming; we could barely put a dent in it! Afterwards, the entire crew gathered to serenade us with music. It really felt like we were one big family, which would make leaving that much sadder.

I awoke to an empty boat, as all the other guests had departed for the airport. After breakfast and one final coffee from Andy, I bid farewell to *Gaia* and her crew and was transferred to the jetty. However, my adventure was not quite over.

**Kelimutu**  
Years earlier, I read about a volcano called Kelimutu and

Beautiful white sandy beach at Koka on the southern coast of Flores (right); Village of Saga (below); Kelimutu Ecolodge (bottom right)

its trio of multicoloured crater lakes located on the island of Flores. I mentally filed it away as a place I would like to see but did not really expect to. After all, when would I ever get there? While planning my trip, I remembered Kelimutu and was curious to see where it was on the island. When I realized Maumere was only a few hours away by road, I decided to visit after the liveaboard trip. For the land tour operator, Gaia's marketing manager, Cassandra Dragon, recommended Safari Tours & Travel in Manado, which arranged a



two-day, one-night trip. I was set!

At the jetty, I met guide Ben and driver Tanto for my land excursion from Maumere to the city of Ende on the southern coast. Maumere is the largest city in Flores, but you would not know it on a Sunday morning. As the Flores population is 80 percent Catholic, the streets were virtually empty. Little did I know, this would be the last stretch of straight road we would encounter for nearly two full days.

Our drive to the Kelimutu Ecolodge would take around four hours. The island was really beautiful, with rugged, forested mountains interspersed with rice fields and charming villages. Physical distance has no bearing on driving time due to the steep grades and serpentine roads.

En route, we made a number of stops, including at a century-old church in Sikka and the beautiful white

beach at Koka on the southern coast. By mid-afternoon, we arrived at the lodge, situated near the Kelimutu National Park. Nestled amongst rice fields framed by mountains, the location was idyllic and a great place to chill—a good thing, as the next day was going to be intense!

### Hiking

The crater lakes of Kelimutu must be one of the most spectacular sights in all of Indonesia. Amazingly, each is a different colour, ranging from blue, green, pink or even brown and can change colour up to six times annually. Scientists still are not



certain why the lakes change colour, but it is believed to be due to underlying gases and chemical elements.

However, getting there for sunrise required some effort. For starters, there is a 3:30 a.m. wakeup call for a 4:00 a.m. departure. Then, there is a 30-minute drive to the national park, followed



Dramatic sunrise over the crater lakes of Kelimutu (above); One of the crater lakes (right)

by a 20-minute walk to the viewpoint. Ben said the hike would be a few hundred steps, but it would not be steep like the ascent on Padar Island. I brought a headlamp, but trudging up steps in pitch blackness, with occasional swathes of fog wafting across was still unnerving. “Almost there,” said Ben, and before long, we came to the top, where a few people had arrived before us.

Just after 5:00 a.m., I could just start discerning details. Below, two of the crater lakes were just becoming visible, separated by a narrow rocky isthmus. Despite this, they were totally different colours. As we were over 1,600m, I wore my fleece jacket, but the temperature was not especially cold, even in the predawn hours. However, it was very windy. I really wished there had been

someone there selling coffee!

With clouds still passing over, I was concerned we would not get our sunrise. While fussing about with my gear, I glanced up to discover the fog illuminated by golden light. The view was one that leaves travel writers grappling for adjectives. Sorry, I must go for the cliché: It was jaw-dropping! Encircled by fog and bathed with golden light, it was one of the most spectacular scenes I have ever encountered. The early start and uphill slog instantly forgotten, I savoured the moment, even putting down the camera to breathe it all in.

On the opposite side of the viewing area was the third and smallest of the lakes. Almost something of a geological afterthought, it was a darker blue, contrasting sharply with the turquoise tones

of the other two. After photographing to my heart's content, we started heading back down. En route, we stopped at another viewpoint looking over the farthest lake. From there, I could see just how high we had ascended. Kelimutu is one of those places that really must be seen in person and is a must if you are visiting Flores.

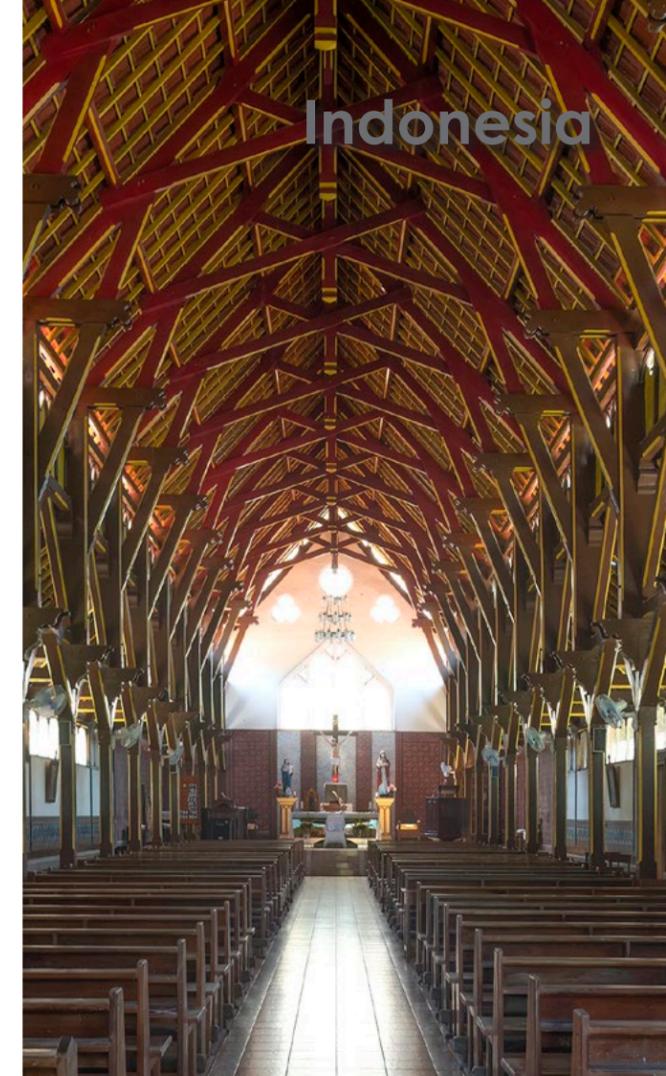
Back at the Ecolodge for breakfast, Ben noticed that I liked coffee. “Would you like to visit a coffee plantation today?” he queried. I could not say yes fast enough! After a rest, we checked out by late morning and started to make our way to Ende. We made numerous stops, including at a beautiful waterfall and a local market to buy some fruit. The passionfruit was easily the most delicious I have ever eaten!

The lookout point atop a summit overlooking one of the crater lakes





Coffee beans at the Wolopaku coffee plantation (above)



Interior of the century-old church in Sikka (above); Cloves drying in the sun, at the church grounds (left)



not to be missed. Getting there may not have been easy, but the rewards were many. ■

*Special thanks and appreciation go to the owners and staff of the Gaia Love liveaboard ([divegaia.com](http://divegaia.com)) for their generous hospitality, outstanding service and superb assistance.*

*Associate editor Scott Bennett is a widely published underwater photographer and dive travel writer based in Toronto, Canada, covering the Caribbean, Mediterranean, Red Sea, Europe, Africa, Southeast Asia, Oceania, and South and East Pacific. See more of his stories at: [xray-mag.com/Contributors/Scott-Bennett](http://xray-mag.com/Contributors/Scott-Bennett)*

Lush forests cover the mountainous landscape of Flores (above)

**Wolopaku coffee plantation.** We had planned on stopping at a traditional village called Wologai, but it was closed to visitors due to a traditional ceremony. Instead, we headed to the Wolopaku coffee plantation. Here, I met owners Jakob and his partner Susan, who gave me a tour. At the end was the best part: sampling! I had no idea Flores grew coffee, and it was superb. I ended up buying a bag to take home.

**Saga.** Before arriving at Ende, we stopped at another traditional village

called Saga. Constructed on multiple levels on a steep hillside (great... more steps), the village is home to the Lio people and features traditional wooden houses with towering, thatched roofs. This was no tourist attraction, but the real thing. The steps were well worth the effort.

**Afterthoughts**

After nearly two action-packed weeks, my adventure had finally come to a close. Between the fantastic diving and the beauty of Komodo

and Flores, I was overwhelmed. There was a lot to process, both mentally and photographically. This really was a special part of Indonesia and one



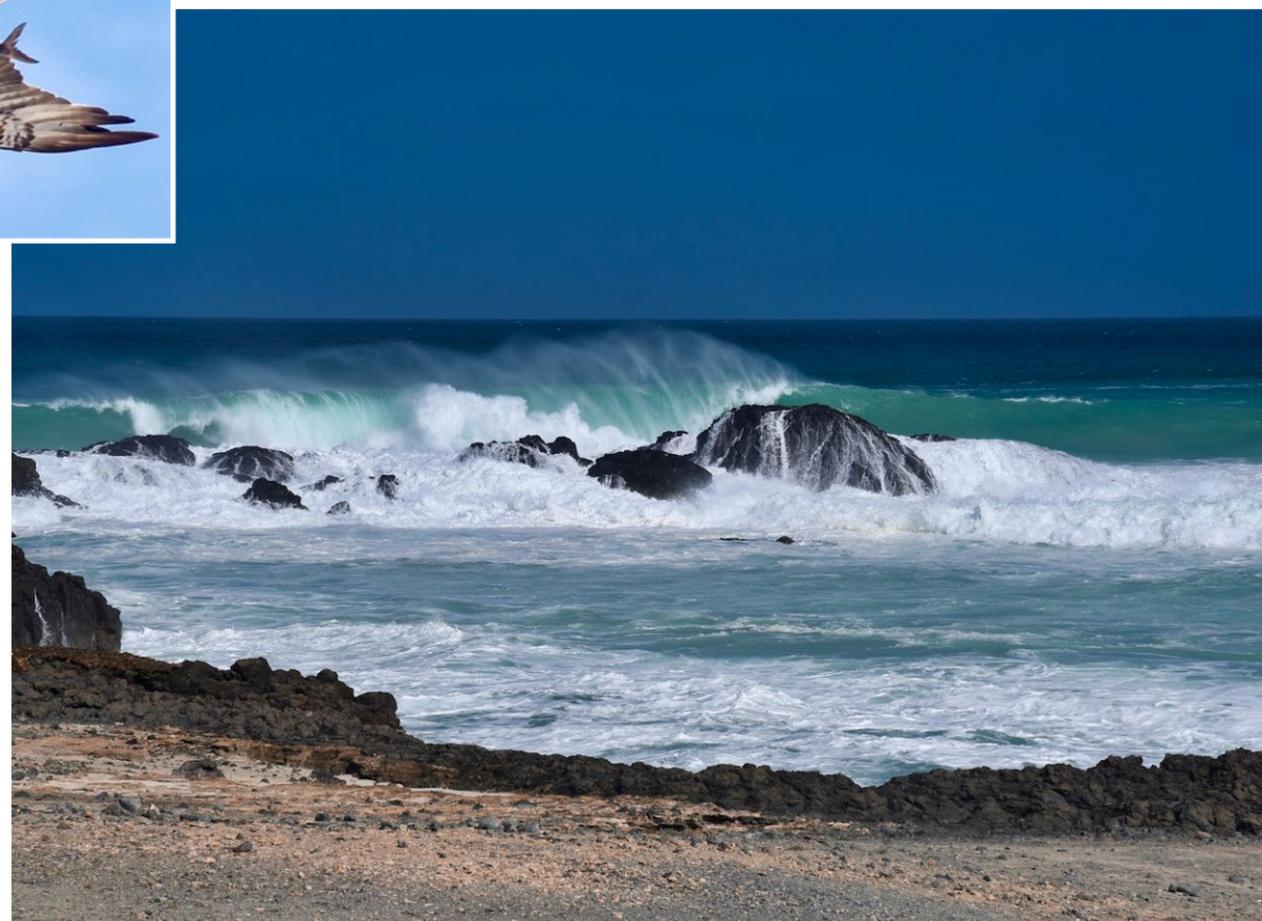
Market vendor in the village of Saga



# Cape Verde

*Diving the Barlavento Islands*

Text and photos by Pierre Constant



The cliffs on the northern coast of Santo Antão Island (above); Peaks above Coculi, Santo Antão Island (previous page)

**Located in the central Atlantic Ocean, off the westernmost point of Africa, Cape Verde is an island country made up of an archipelago of ten volcanic islands. Pierre Constant shares his adventure diving, hiking and trekking in the rugged northern group of isles called the Barlavento Islands.**

It was a long full-day trip to the Cape Verde Islands. The TAP Air Portugal flight left Paris in the late morning for Lisbon, with a six-hour stopover,

before I could catch the connection to Sal Island at 9 p.m. Fortunately, I managed to sneak into the TAP transit lounge, which made the waiting time somewhat more pleasurable, with food, drinks and internet access!

The plane landed at Amilcar Cabral International Airport well after midnight. Needless to say, I was tired out. The fact that no one was waiting for me upon arrival came as a bad surprise. There was no other option but to take a taxi to the town of Santa Maria. At the hotel, the night watch called the manager, so he could come and check me into a room. "I was expecting you tomor-

row," he confessed, with a mischievous smile. *Gosh!*

A horse-shaped cluster of islands, Cape Verde is a volcanic hotspot, born of the Atlantic Ocean, which lays between 600 and 800km from the coast of Senegal—more precisely, from the tip of Cap-Vert, the westernmost point of western Africa. Located between 17°07' N latitude and 25°17'10 W longitude (Santo Antão), and 14°93' N latitude and 24°38'30 W longitude (Fogo), it consists of ten islands and eight islets, comprising a total land surface of 4,033 sq km. Part of the Macaronesia ecoregion (Azores, Canary Islands

Rough seas in Sal Rei, Boa Vista (above); Moravia doctorfish, blackbar soldierfish and yellow cup coral in cave at Tres Grutas dive site (top right); Osprey in flight, with its catch, at Boa Vista Island (centre inset)





CLOCKWISE FROM ABOVE: Fishing boats at the beach in Mindelo, São Vicente Island; Cape Verde lagoon sparrow, *Passer iagoensis*, endemic bird of Santo Antão Island; Volcanic landscape of Vale de Paul, north-eastern Santo Antão; The fort on a rocky islet in Mindelo; Brightly colored houses in Coculi on Santo Antão Island; Black-winged stilt, *Himantopus himantopus*, at Sal Rei, Boa Vista Island

- The southern Sotavento (or Leeward) Islands of Maio, Santiago, Fogo and Brava.

The islands lie on a bathymetric swell known as the Cape Verde Rise. The rise is bounded by the Canary Basin to the north and the Cape Verde Basin to the south. Numerous seamounts are located on the rise. The waters above the Cape Verde Rise constitute the Canary Current, flow-



ing to the southwest. The waters south of the Cape Verde Rise are from the North Equatorial Current. At the eastern end of the rise is the Dakar Canyon,

900km long, between the 14° and 22° parallels.

Geologically speaking, the oldest rocks, east of the rise, would be between 180 mil-



and Madeira), the islands are divided into two groups:

- The northern Barlavento (or Windward) Islands of Santo Antão, São Vicente, Santa Luzia, São Nicolau, Sal and Boa Vista.



Terraces in Alto Mira, northwestern Santo Antão Island (above); Cape Verde sparrow, *Passer iagoensis*, eating *Aloe vera* flowers (left)

years ago. Most geoscientists agree that the archipelago is fed by a mantle plume, which is responsible for the volcanic activity. A substantial uplift has been noted in the upper mantle. Petrological evidence indicates a deep mantle source. Volcanic and plutonic rocks are distinctively basic in their chemical composition.

The oldest islands are to the east. The largest active volcano, Pico do Fogo, at an elevation of 2,829m, erupted in 2014, resulting in an 8km-wide caldera.

**History**

Uninhabited until the 15th century, Cape Verde Islands were

discovered by Genoese and Portuguese navigators around the year 1456. Genoa-born Antonio de Noli was appointed governor by Portuguese king Afonso V. Portuguese settlers landed on Santiago Island and founded Ribeira Grande. In the 16th century, the Atlantic slave trade gave prosperity to the archipelago, attracting the interest of pirates.

English privateer Francis Drake sacked the capital twice in 1585. Following an attack by French pirate Jacques Cassard in 1712, the capital was changed to Praia on Santiago Island in 1770. The end of the slave trade in the 19th

lion and 150 million years old. However, the islands would have been volcanically active between 15 million and 7 million



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The salt lagoons of Santa Maria, Sal Island (above); "Kite Beach," a place for kite surfers in Santa Maria (top left); Souvenir shop in Santa Maria (top right); Dog and street art in Santa Maria (right); Mural of a wave, in Santa Maria (centre)

century brought about an economic crisis. But the port of Mindelo, on São Vicente, became an important commercial centre. Aboard the HMS *Beagle*, Charles Darwin made his first stop here in 1832, while on his round-the-world journey.

Despite the change of status from a colony to an overseas province of Portugal in 1951, a growing discontentment amongst the locals led Amílcar Cabral to create the clandestine African Party for Independence

of Guinea and Cape Verde Islands (PAIGC) in 1956. It became an armed rebellion against Portugal.

Portuguese Guinea declared independence in 1973. Despite the assassination of Amílcar Cabral the same year, his half-brother achieved his goal and Cape Verde became independent in 1975. Jose Maria Neves was sworn in as the new president of Cape Verde on 9 November 2021. The democratic republic was praised for its stability.

### Sal Island

Following an almost sleepless night, I woke up in Santa Maria. Sal Island is desperately flat, deserts and sandy, with a number of *salinas* or salt lagoons in the southern part. Any trace of volcanoes is absent, for Sal is already a very old island, unlike its younger neighbours to the west.

The town is a collection of hotels, five-star resorts, restaurants, bars and souvenir shops. In the outskirts, it looks like a depressive unachieved





Blackbar soldierfish, Atlantic glasseye, European parrotfish (above), and tiger snake eel (left) at Tres Grutas

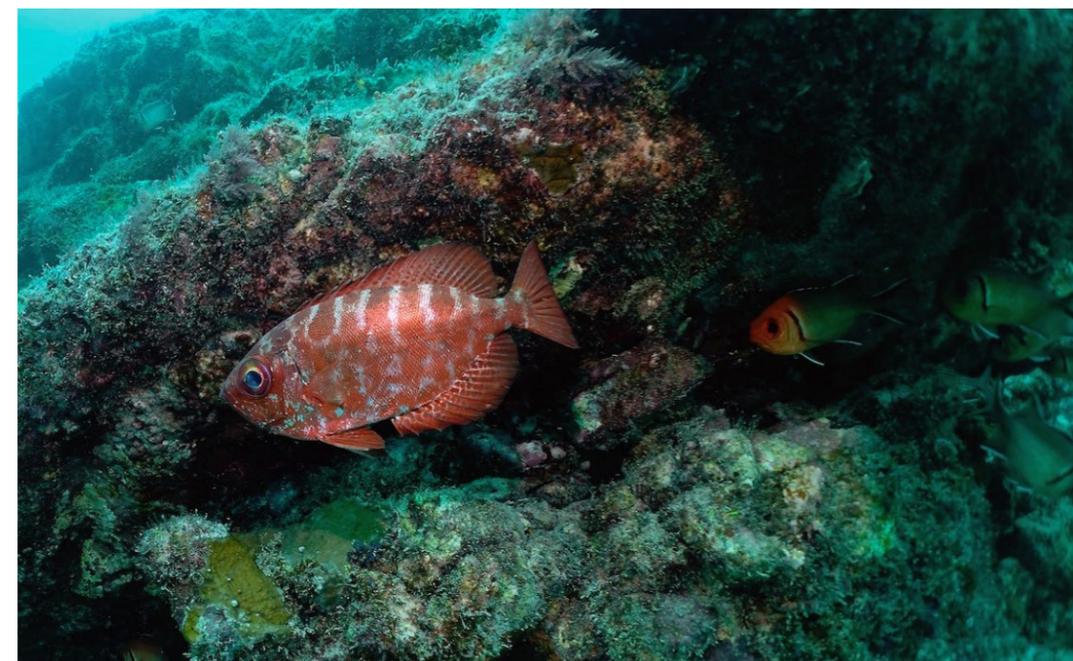
**Diving**

I found the dive centre on the beach, five minutes down the road. The cool-looking “rasta” fellow, sporting a hairdo of bleached locks, greeted me with a warm smile. “No stress!” he beamed, after I started asking all sorts of questions about the boat and logistics. I would be diving tomorrow, first thing.

Twelve-litre steel tanks were used with the DIN system, but opercula (converters) were provided if necessary. The banana boat was minimalistic, with no benches, no sitting area, with standing area only on the sides. South of Sal, the ocean was choppy, with a bit

of wind and waves, and the expected water temperature was 21°C (in February). “Not the best season!” I was told. Never mind, my 5mm wetsuit would do, but the dive centre even provided 7mm wetsuits.

**Tres Grutas.** We were off to the Tres Grutas dive site, five minutes away. Today, I was the only one on board. Two other dive boats were already on location, and we tied up to the last one. Dive guide Wilson and I hopped into the water against the current, making our way towards the bow of the first boat. As I caught my breath, we followed the mooring line



Atlantic glasseye, *Heteropriacanthus cruentatus*, at Tres Grutas (above); School of blackbar soldierfish, *Myripristis jacobus*, at Tres Grutas (top right)

construction site—not really my expectation of a tropical island paradise. It is all commercial for sure, catering mainly to elderly Europeans and families on a holiday.

The streets are paved, adding some local charm to the eccentric collection of buildings—a mix of old and new, as well as many ugly local houses of cement blocks.





Roughbar frogfish, *Fowlerichthys senegalensis*, at Ancora

down to the bottom at 18 metres. The visibility was poor, and the dull rocky bottom was totally uninspiring.

Wilson led me along a ledge, checking overhangs with his torch. Soon, I noticed the abundance of blackbar soldierfish (*Myripristis jacobus*) and the odd Mediterranean parrotfish (*Sparisoma cretense*)—the female was red with a pretty yellow patch on the tail base. A school of yellow-banded goatfish passed by.

The small caves at the site were a haven for trumpetfish. These were decorated by lots of attractive yellow-cup corals, which literally carpeted the walls. There, I encountered the magnificent Monrovia doctorfish

(*Acanthurus monroviae*), a grey surgeonfish with a round golden dot on the scalpel-like spines of the tail. The Atlantic glasseye (*Heteropriacanthus cruentatus*), which was speckled red and silver, completed the picture, with a number of red squirrelfish.

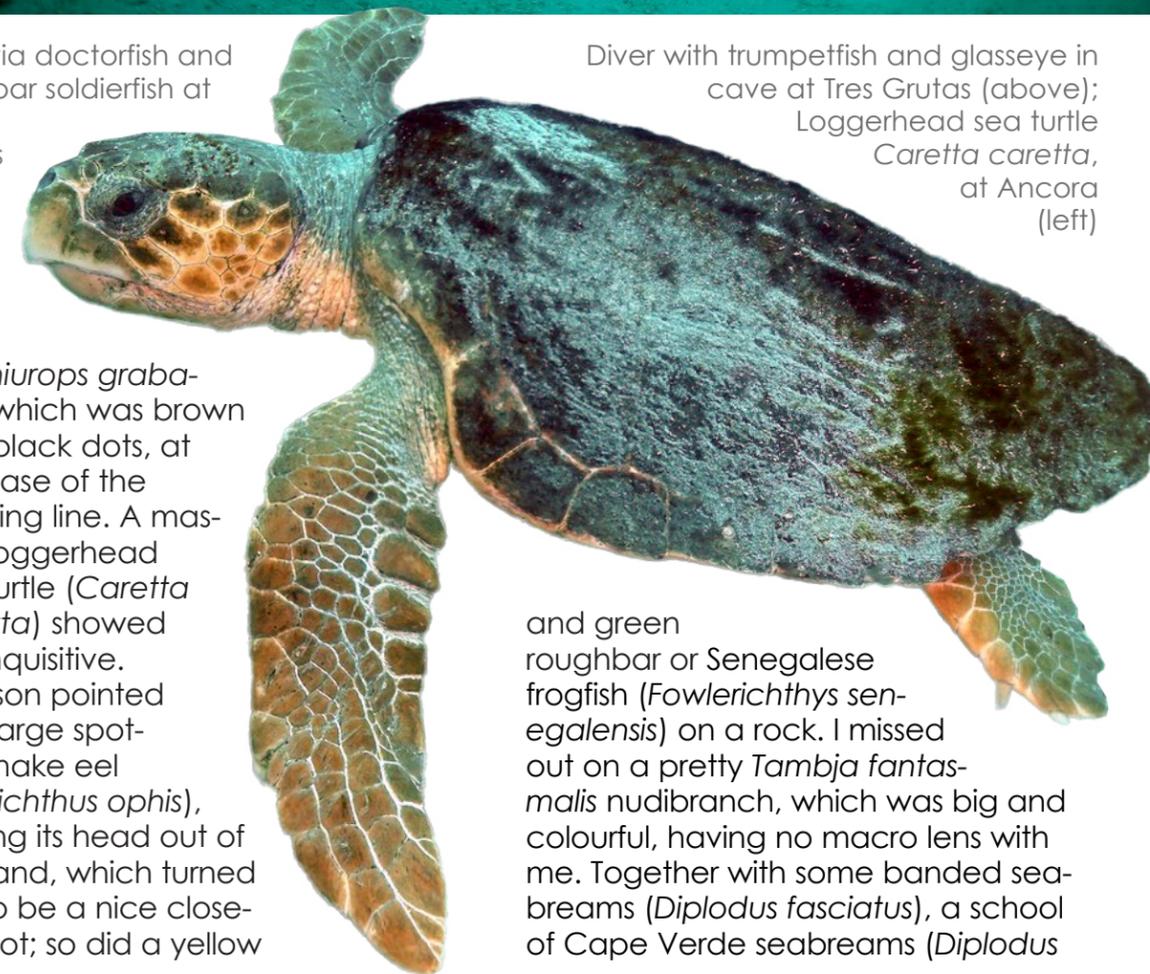
My dive lasted only 39 minutes; I realised that I needed 2kg weight. On top of it all, I was shivering. The one-hour interval time was hard to negotiate, as Wilson wanted to go again after 20 minutes, but I refused.

**Ancora.** The dive site of Ancora was rather similar, with a succession of short terraces descending into the deep. I fell upon a round fantail stingray



Moravia doctorfish and blackbar soldierfish at Tres Grutas (left)

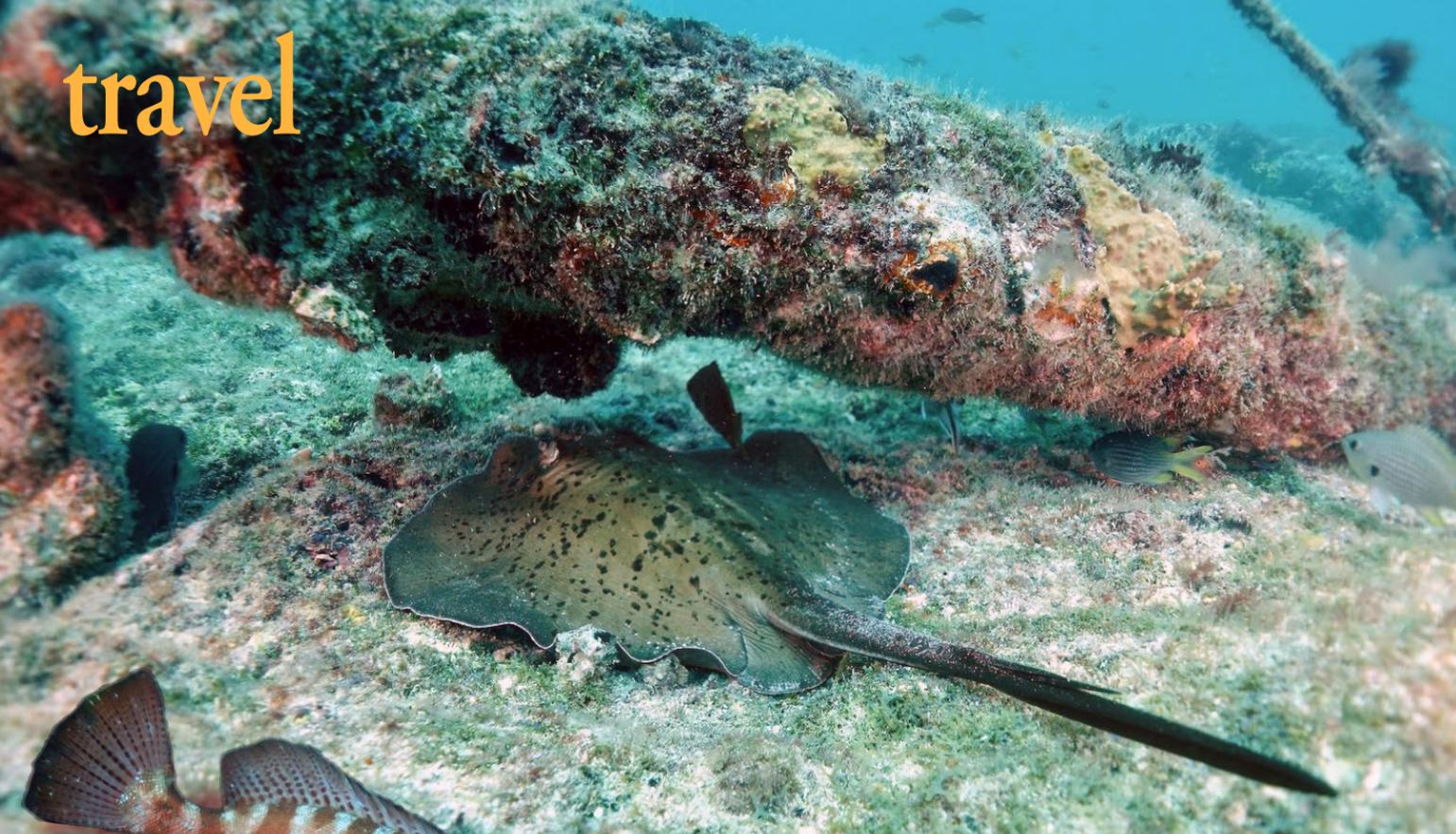
Diver with trumpetfish and glasseye in cave at Tres Grutas (above); Loggerhead sea turtle *Caretta caretta*, at Ancora (left)



(*Taeniurops grabatus*), which was brown with black dots, at the base of the mooring line. A massive loggerhead sea turtle (*Caretta caretta*) showed up, inquisitive.

Wilson pointed to a large spotted snake eel (*Ophichthus ophis*), sticking its head out of the sand, which turned out to be a nice close-up shot; so did a yellow

and green roughbar or Senegalese frogfish (*Fowlerichthys senegalensis*) on a rock. I missed out on a pretty *Tambja fantasmalis* nudibranch, which was big and colourful, having no macro lens with me. Together with some banded seabreams (*Diplodus fasciatus*), a school of Cape Verde seabreams (*Diplodus*



Atlantic glass eel (above), round fantail stingray, *Taeniurus grabatus* (top left), and spotted snake eel, *Ophichthus ophis*, in the sand (right) at Ancora dive site

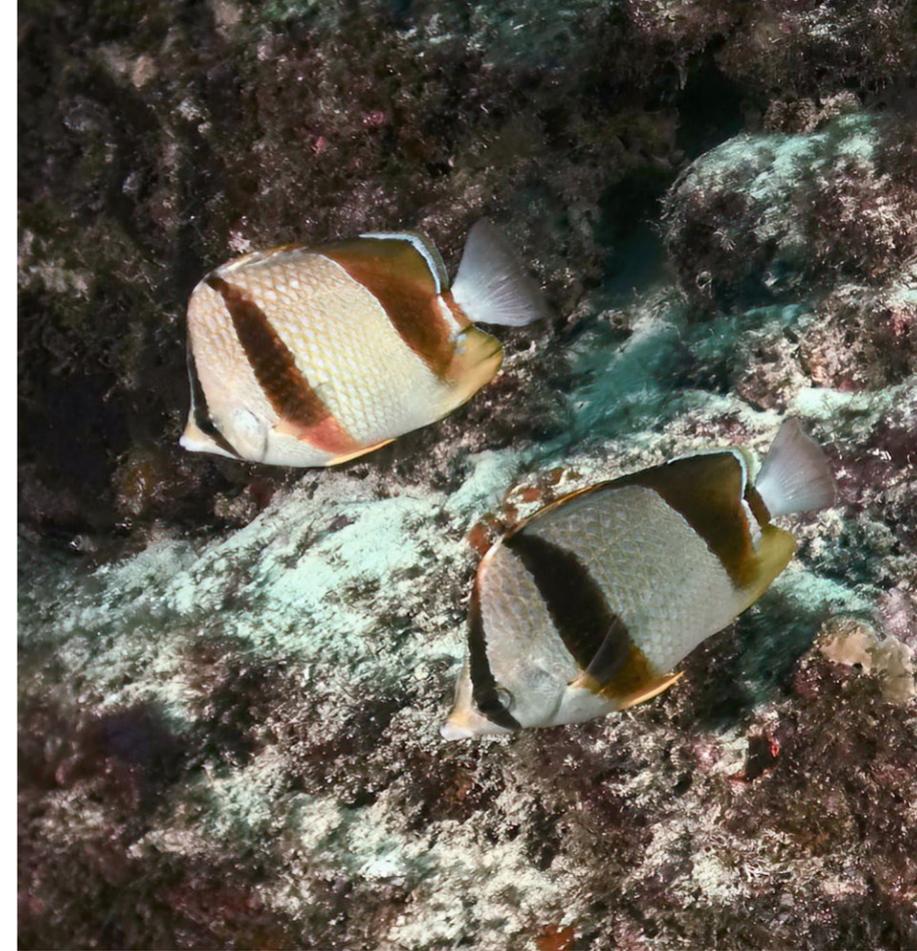


*lineatus*)—both were endemic to the archipelago—moved along the short wall like a wave.  
 A cute soapfish (*Rypticus saponaceus*) rested placidly on the bottom, while a scrawled filefish cruised shyly overhead. The three-banded butterflyfish (*Chaetodon robustus*) reminded me of the species found in the Galápagos, although with different colours. I was in awe with the African hind (*Cephalopholis taeniops*), a reddish grouper with tiny blue spots. Unfortunately, I could not recognise the Guinean parrotfish (*Scarus hoefleri*), an endemic species, often found on one's dinner plate here—a local delicacy known as *bedion*.

**Pontinha.** The next day, the sky was overcast, with overall grey weather. There was even some rain, which was not very inviting for diving, but I forced myself to go. "It is very rare in this season," confided the old, white-haired dive shop owner. There would be four divers on board. Ben, the dive guide, was a big Cape Verdian



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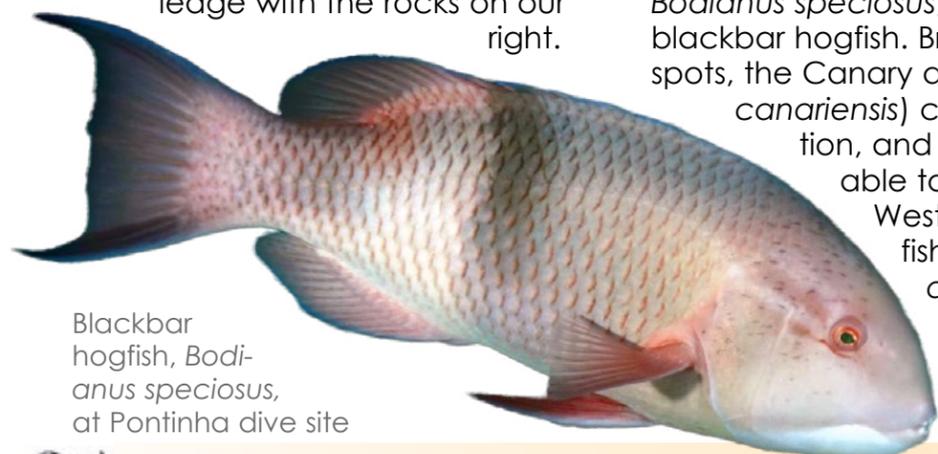


African angelfish, *Holacanthus africanus* (left), and three-banded butterflyfish, *Chaetodon robustus* (above), at Pontinha

fellow, male-sealion-sized.

We headed to the Pontinha dive site near the “farol” (lighthouse), on the southwestern end of the island. I had a 2kg weight belt but did not expect to last too long.

We descended the mooring line to a depth of 18m and followed a ledge with the rocks on our right.



Blackbar hogfish, *Bodianus speciosus*, at Pontinha dive site

The visibility was not clear, and it was rather dark underwater. We encountered a few specimens of the three-banded butterflyfish and some Guinean grunts (*Parapristipoma humile*), which were whitish with a yellow tail, as well as a number of highly inquisitive *Bodianus speciosus*, also known as blackbar hogfish. Brown with black spots, the Canary drum (*Umbrina canariensis*) caught my attention, and I was glad to be able to take a shot of a West African angelfish (*Holacanthus africanus*), which was brownish cream in colour with a black

dot behind the pectoral fin.

Plunging a bit deeper to another ledge, a lovely honeycomb moray (*Muraena melanotis*), which was white with black dots and two little horns, was on the watch for passing prey. It posed gracefully in front of the camera.

Having signalled the dive guide, I turned around with 100 bars left in my tank and slowly headed back to the mooring line, with a strong urge to pee. Back on the boat in the cold wind, feeling miserable, I chose to quit the second dive. “It is the wrong time of the year; I do not blame you. You should come in July to August when the water temperature is 26 to 27°C,” reassured the old-timer, who has been a dive operator here for



Honeycomb moray, *Muraena melanotis*, at Pontinha dive site



Black bar hogfish (above), Canary drum, *Umbrina canariensis* (top right), honeycomb moray, *Muraena melanotis* (bottom right), and banded seabream, *Diplodus fasciatus* (left), at Pontinha

30 years.

You may argue that I was kind of a wimp to feel cold in 21°C temperature, but I am, after all, 68, you see. I recall the days when I was diving in 14°C of water, and even below, in the same wetsuit, with no problems. Time flies, I guess... "Well, you just arrived; you've got to tune in to the environment," comforted the old-timer.

**Ecology and oceanography**

With very little rainfall, Cape Verde is part of the Sahelian arid belt. Irregular heavy downpours occur in August to October. Sal's total rainfall of 145mm per year classify as desertic environ-

ment. Other islands, high in elevation such as Santiago or Santo Antão, receive more rainfall due to orographic lift—enough to support rainforest habitat, dry monsoon forest, laurel forest and Canary pine forest.

Being located roughly between the 15th and 20th parallel, north of the Equator in the eastern Atlantic, the archipelago is—from an oceanographic perspective—affected by two major domains: the southeastern boundary of the North Atlantic Subtropical Gyre (NASG) and by the northeastern North Atlantic Tropical Gyre (NATG). These two gyres combine as the Canary Current Large Marine Ecosystem (CCLME). The latter becomes the North Equatorial Current, flowing from the northeast to the west.

The preponderant Canary Current is a cold-water current from the north of the Cape Verde Rise; 1,500km west of the rise is the Mid-Atlantic Ridge. In many ways, the oceanographic configuration of Cape Verde Islands is similar to that of the Galápagos Islands in the eastern Pacific, except that Cape Verde is found north of the Equator and the Galápagos south of the Equator.

The zoogeographic composition of the coastal ichthyo-fauna of Cape Verde archipelago shows a predominance of Guinean species, followed by tropical-subtropical fishes of the Atlantic and several endemic species. The most recent checklist of coastal fish in Cape Verde mentions 315 species (Wirtz & al. 2013), with a





"Palacio" in Mindelo (top centre); A drink at the marina (right); CV Interilhas ferry departing Mindelo for Santo Antão (top right); WWII cannon at western point of Mindelo (far right)



LEFT COLUMN, TOP TO BOTTOM: View of the town of Mindelo on São Vicente Island; Colonial street in the old quarter of Mindelo; Carnival reveller in festive mask, Porto Novo, Santo Antão Island

rate of endemism at 10,2 percent (20 species).

Forty percent of the bony fish comes from the Atlantic, 22 percent from tropical western Africa, 22 percent from eastern Atlantic, and 5.4 percent from Macaronesia (in other archipelagos of the eastern Atlantic). A high degree of endemism is found in the cryptobenthic fish of *Blenniidae*, *Labrisomidae* and *Gobiidae*.

Current endemic reef fishes of Cape Verde include Lubbock's chromis (*Chromis lubbocki*), bulldog dentex (*Virididentex acromegalus*), Cape damsel (*Similiparma hermani*), blackfish drummer or Atlantic Cabo Verde nibbler (*Girella stuebeli*), Cape Verde seabream (*Diplodus lineatus*) and Guinean parrotfish (*Scarus hoefleri*). Other endemics include Cape Verde skate (*Raja herwigi*), Cape Verde

mullet (*Chelon bispinosus*), *Platybelone lovii* needlefish, banded seabream (*Diplodus fasciatus*) and Praya or two-banded seabream (*Diplodus prayensis*), Cadenat's sole (*Pegusa cadenati*), Barbel clingfish (*Apletodon barbatus*). Cape Verde has a high spard endemism attributed to multiple radiations, by populations with different trophic ecologies.

### On to São Vicente Island

To make it convenient for, and with sheer consideration of, visiting foreigners, the CV Interilhas ferry bound for São Vicente Island was scheduled to depart at 11 p.m.—for a 14-hour ocean crossing, that is. However, the cargo-passenger boat did not leave before 1 a.m. The ship was obviously full of locals, eager to travel on the cheap. The main lounge turned out to be as lively as a

bird aviary, because the Cape Verdians talk loudly, naturally! (Be forewarned, just in case you thought you might be able to get some sleep on the trip...) By the time I reached Mindelo on the northwestern coast, after a stopover in São Nicolau, it was early afternoon, and I was glad that the ordeal was over.

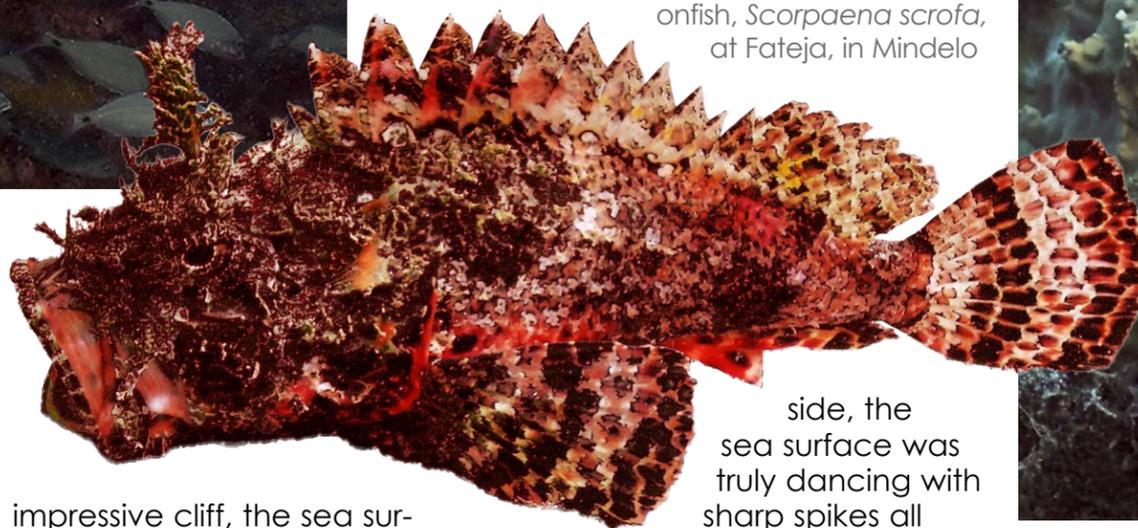
The second largest city after Praia, Mindelo is the true touristic capital of Cape Verde. It is the musical core of the archipelago, because of the national song, "Morna," a melancholic and lyric tune made world-famous by female singer Cesária Évora—the barefooted "Queen of Morna." Mindelo's carnival is another yearly event that attracts many tourists towards the end of February. This indeed had originally triggered my wish to stay for a week and take the chance to enjoy some diving as well.

Local with a bronze statue and mural celebrating Cape Verde's "Morna" music, Sal Rei, Boa Vista Island (above)





CLOCKWISE: Cape Verde seabream, *Diplodus lineatus*, Mindelo harbour; Planehead filefish, *Stephanolepis hispidus*; African hind, *Cephalopholis taeniops*; and red scorpionfish, *Scorpaena scrofa*, at Fateja, in Mindelo



side, the sea surface was truly dancing with sharp spikes all over! Bad luck again...

Finally heading south to a secluded cove, calm waters offered a relief. But the visibility was poor, the sandy bottom among the rocks was boring. Frankly disappointed, I encountered a

large-scaled scorpionfish (*Scorpaena scrofa*), plenty of trumpetfish and a honeycomb moray. A desperate green moray had a fishing hook stuck in the corner of its mouth, attached to a nylon thread and a loose rock. The

impressive cliff, the sea surface had light green waters and was deemed to be unsuitable by the dive guides.

We moved back to a rocky islet with an old Portuguese fort, at the entrance of the bay. In the so-called protected

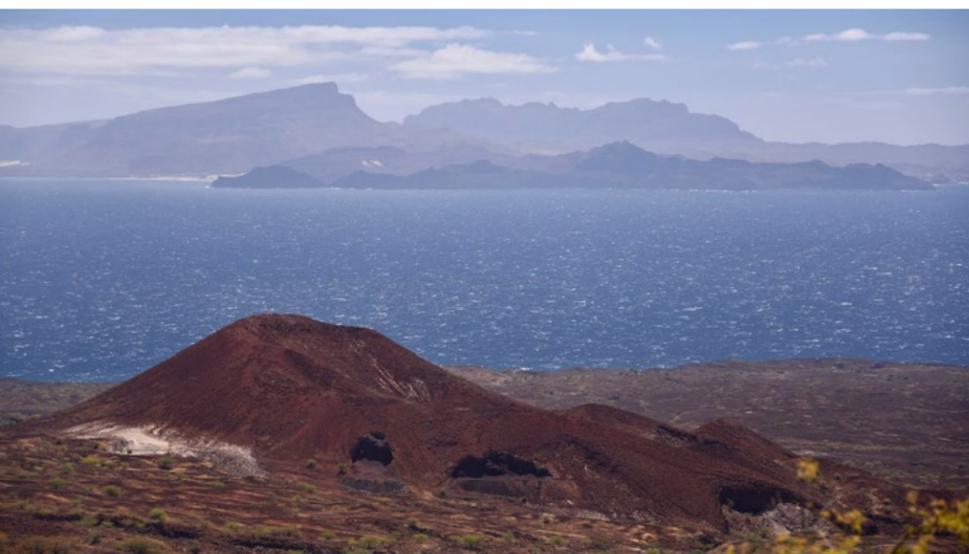
### Diving in Mindelo

The dive centre was hidden below a restaurant on the waterfront, a stone's throw away from the ferry terminal, which was a 15-minute trek downhill from my small apartment on the slope overlooking the town. Again, the guys were cool-looking, and I arranged some dives for two days later. The RIB (rigid inflatable boat) looked very professional, with a 150 HP outboard motor. I was to dive with a couple from Holland.

The ocean was rough, as we headed to a dive site north of Mindelo, half an hour away. At the bottom of an



Mediterranean red sea star



TOP TO BOTTOM: Volcanic cones and lava flows, north of Morro do Brejo; "Caminho da Cruz," northern coast of Santo Antão; Tuff cone on Santo Antão, with São Vicente Island in the background



Cova crater, Santo Antão Island (above); Goat in the wild (top right); Wild Aloe vera plant in the highlands of Santo Antão (centre right); Volcanic pinnacle in the morning mist, Vale de Paul (right)

poor thing was thrashing about furiously, trying to get rid of the load, without any success. Then the dive guide nailed the nylon thread with a knife into the sand. The moray got free with probably a torn jaw.

The second dive was a muck dive into Mindelo's harbour—not even worth a mention, besides a school of Cape Verde seabreams (*Diplodus lineatus*). My São Vicente experience was consequently disastrous.

When I found out eventually that I had to buy a ticket for the carnival, I went one early morning to the Centro de Estágio

to purchase one. However, I stared aghast at the 300m-long queue, along a wall on the sidewalk—not really knowing what to expect in the end. "Not for me," I thought.

### On to Santo Antão Island

I was off to Santo Antão Island the next day, one hour away by ferry. A new journey would start, dedicated to hiking and trekking a very authentic, although dramatic, island, with volcanic peaks up to 1,800m in elevation, deep valleys and canyons in a mountainous landscape. The volcanic material was abso-



lutely jaw-dropping with rusty coloured tuff cones in an arid countryside (in the southeast),

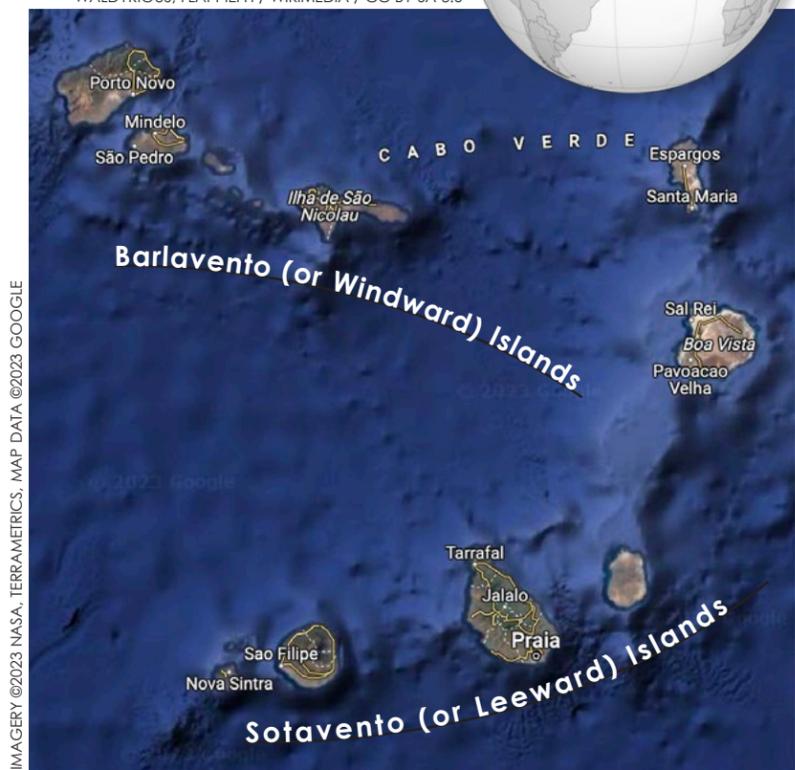
sheer basalt cliffs on the eastern and northern coasts, beds of white ashes intertwined with



Praia da Varandinha beach, Povoação Velha, Boa Vista Island (above)



WALDYRIOUS, FLAPPIEFH / WIKIMEDIA / CC BY-SA 3.0



layers of scoriae, lava flows and extensive phases of rocky projections and bombs—a true capharnaum of volcanic events.

Needless to say, the trails on paved winding tracks were steep, up and down, over passes, into remote valleys—or following the seashore, along cliff sides overlooking the ocean. The most famous —albeit, touristy—trail started from the top of Cova Crater, up in the highlands at 1,500m, and led steeply down into the valley of Paul and Vila das Pombas, at sea level.

For the sake of exercise and to go against the flow, I chose to climb up from Cabo da Ribeira (500m), instead of going downhill. It only took me one hour and 10 minutes one way, but I was on “4x4-mode,” alright! The only disadvantage was that I found myself in thick fog soon after I started ascending the trail fringed by wild aloe vera plants with yellow flowers—the only touch of colour in an otherwise rocky landscape. Nevertheless, it attracted lots of endemic Cape Verde lagoon sparrows (*Passer iagoensis*), which fed on the flowers.

Before reaching the rim of the crater, I entered the Canary pine forest, with mosses. It had an eerie atmosphere, which

was out of this world. Other treks worth doing included Ponta do Sol to Cruzinha, Alto Mira to Cha Morte, and Boca Ambas Ribeiras to Cha de Igreja.

### Afterthoughts

Should you fancy a visit and diving at Cape Verde Islands, just remember to come during the European summer, in July and August, when the water is warm, and visibility is best. Mind you, if you are into kitesurfing, February and March are good. For the windward Barlavento Islands, that is the best season! ■

*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. Visit: [calaolifestyle.com](http://calaolifestyle.com)*

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TOP TO BOTTOM: Flock of sanderlings, *Calidris alba*, Varandinha beach; Rocky shore near Paul, Santo Antão; Wreck of MS Cabo Santa Maria (stranded in 1968), Praia de Atalanta, Boa Vista

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POINT & CLICK  
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# Equipment

Edited by  
Peter Symes

## Lungfish Orca V6

The Lungfish Orca V6 CCR is a versatile unit suitable for both novice and expert divers. It combines ease of use with advanced performance, featuring an advanced control system that instantly adjusts to fit individual divers, ensuring exceptional water stability and buoyancy control. The unit's state-of-the-art electronics include a CO<sub>2</sub> monitor, self-monitoring, and a clear display visible from all angles. The design prioritises reliability, with no exposed wiring and the capacity to integrate additional computers via wet-mateable connectors. Lighter than standard scuba equipment, the Orca V6 is also convenient for airline travel.

[Lungfishdivesystems.com](http://Lungfishdivesystems.com)



## Waterproof Ultima Twist

The Swedish manufacturer has introduced a new version of its drysuit system—the Ultima Twist. This upgraded system allows divers to easily wear and remove gloves with just a twist, eliminating the need for a push-pull system. Compatible with most Waterproof Drysuits with Integrated Silicone Seals (ISS), the Ultima Twist also fits drysuits with fixed latex seals. Its intuitive design lets divers know when the ring is correctly connected. However, it is not suitable for sizes 3XL and 3XL/t+. Each set includes suit rings, glove rings, O-rings, silicone covers, lubricant and a Combi Tool. Note: Gloves and silicone seals are sold separately. [Waterproof.eu](http://Waterproof.eu)



## Oceanic app

Oceanic unveils Oceanic+ 2.0, an enhanced app offering advanced features for divers. The updated app integrates with Apple Watch Ultra and Ultra 2, allowing freediving up to 40m (130ft). It introduces a Freedive mode with custom alarms, surface heart rate tracking, and a unique "Stealth mode" that dims the screen underwater to avoid startling marine life. The app provides detailed dive logs, including ascent/descent times and heart rate data. An "Activity Map" visualises dives globally, and divers can log tank details. Oceanic+ 2.0 also offers advanced photo/video colour correction, editing for photos/videos, and is available in both free and premium versions. [Oceanic Plus](http://Oceanic Plus)



## Halcyon UniVision

Crafted for divers with smaller or narrower faces, Halcyon's UniVision mask boasts a sleek black frame encompassing a single lens, ensuring expansive visibility. Its unique soft-silicone design guarantees comfort and a snug fit. The easily foldable skirt not only enhances flexibility but also positions the UniVision as an ideal pocketable backup. Clear underwater vision is paramount, and Halcyon's UniVision offers an optimal blend of expansive view in a compact form, making it perfect as both a primary and backup mask. [Halcyon.net](http://Halcyon.net)



NEW **iX3M 2** DIVE COMPUTER **RATIO COMPUTERS**

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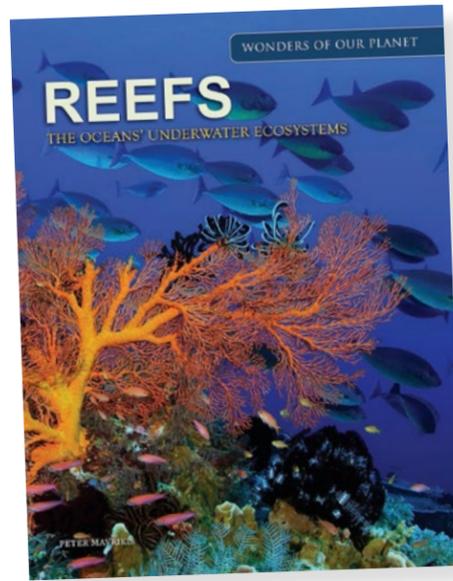
## Seaweed

*The Seaweed Revolution*, by Vincent Doumeizel

This book explores the immense potential of marine algae to re-shape our world. From feeding populations

and replacing plastics to advancing medicine and combating climate change, seaweed's versatility is astonishing. Author Vincent Doumeizel advocates for a reconnection with this forgotten treasure, offering solutions to contemporary global challenges. The book's endorsements by environmental experts underscore its significance in a time of crisis. An eye-opening and forward-thinking read, it encourages the reader to reconsider seaweed's role in sustaining the planet and offers hope for a more sustainable future.

Publisher: Legend Press US  
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ISBN-13: 978-1915643858

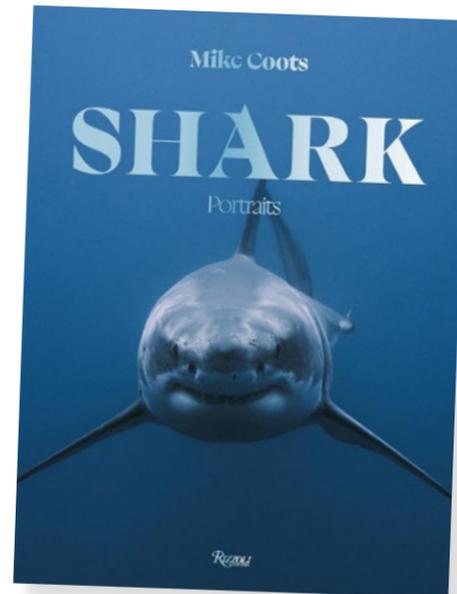


## Coral Reefs

*Reefs: The Oceans' Underwater Ecosystems*, by Peter Mavrikis

This book is a visual tribute to the diverse marine ecosystems found on coral, rock, and sand reefs worldwide. From iconic locations like the Great Barrier Reef and the Red Sea to lesser-known gems such as Mabul Island and the Amazon Reef, it highlights the interdependence of life found on these reefs. It also addresses the threat of coral bleaching. Featuring over 200 vibrant photographs, it offers a glimpse into the wealth of marine life found at reefs, from gender-switching clownfish to harlequin shrimp and purple starfish. Entries are conveniently organised by location, and are accompanied by insightful captions.

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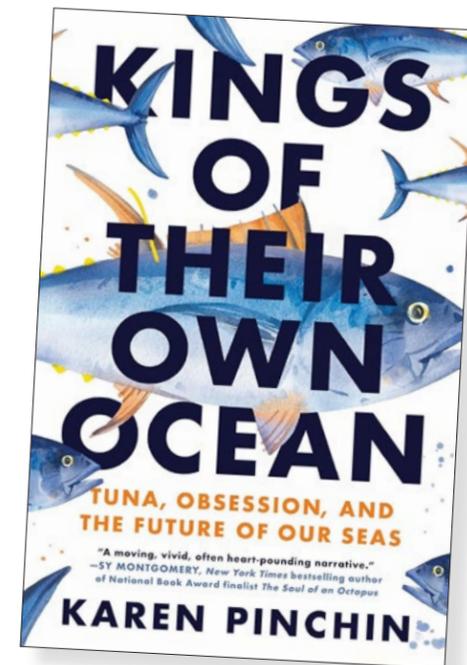


## Sharks

*Shark: Portraits*, by Mike Coots

In a world witnessing a shift from fear to adoration of sharks, Mike Coots, a shark attack survivor turned advocate, offers an intimate portrayal of these apex predators. Through travels to places like Hawaii, Mexico, New Zealand, the Bahamas and the Maldives, he captures up-close encounters with sharks. His portraits reveal the strength and intelligence of a diverse range of shark species. His photography humanises them, offering intimate images that convey the unique character of each species.

Publisher: Rizzoli  
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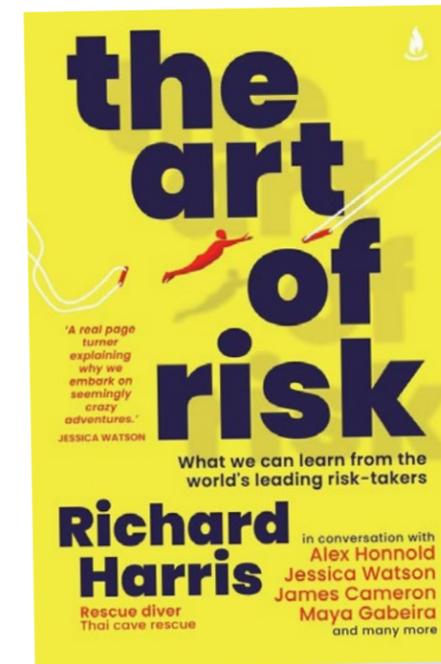


## Tuna

*Kings of Their Own Ocean: Tuna, Obsession, and the Future of Our Seas*, by Karen Pinchin

This book tells of human obsession, an exceptional tuna and the relentless fisherman who, in 2004, tagged an Atlantic bluefin off New England's coast. Its demise in a Mediterranean trap fourteen years later started Karen Pinchin's investigation into the species' wonders and challenges. This book weaves science, commerce, crime and environmental justice into an urgent narrative. Through exclusive access and a multifaceted perspective, readers are transported to tuna hot spots and global laboratories, experiencing the trials and glimpses of hope for our oceans' future.

Publisher: Dutton  
Date: 18 July 2023  
Hardcover: 320 pages  
ISBN-10: 0593471474  
ISBN-13: 978-0593471470



## Risk

*The Art of Risk*, by Richard Harris

Dr Richard Harris, a renowned cave diver and anaesthetist, played a pivotal role in the daring 2018 Thai cave rescue. He utilized his expertise in both diving and anaesthesia to save a trapped youth soccer team from certain peril. Now, in his book *The Art of Risk*, he explores the allure of danger through interviews with fellow risk-takers, such as soldiers, climbers, and divers. Harris delves into their motivations, highlighting how confronting adversity fosters strength and resilience. As co-author of *Against all Odds* and 2019 Australian of the Year, Harris's heroic actions and insights shed light on the human pursuit of challenge and adventure.

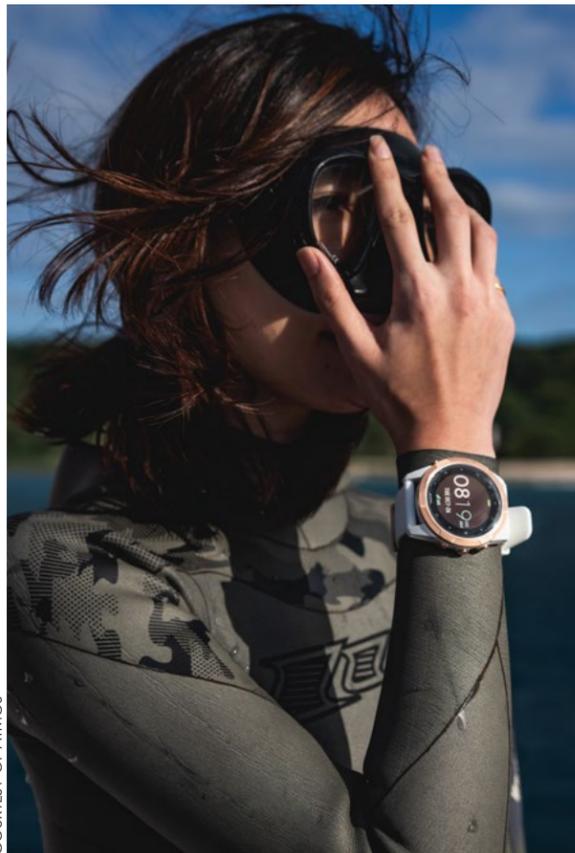
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# opinion

Atmos Mission 2 with realtime GPS and digital compass. monitors diving as well as swimming, biking, skiing, running, walking, heart rate, steps, calories and sleep.

Text by Simon Pridmore

**Smartwatch dive computers are here. Are we on the cusp of a safety revolution? And are we prepared for the changes that this revolution may bring? Simon Pridmore takes a closer look.**



Atmos Mission One dive computer



*Smartwatch Dive Computers:*

# A Safety Revolution?

COURTESY OF ATMOS

At the Taipei Dive Resort and Travel (DRT) Show earlier this year, I walked around the hall, chatting with old friends, making new friends and checking out the booths. I like dive shows, but, for obvious reasons, this was the first I had attended

in over three years.

Not so long ago, you would find me manning a stand at a dozen or more shows a year, all over the world. In January, one weekend I would be in Paris, the next in Dusseldorf. In April,

it would be New Jersey, followed by Singapore. It was the life of a jet-setting scuba diver, except I was not getting much diving done. One of my fellow travellers in those days was X-Ray Mag maestro Peter Symes, who was promoting his

revolutionary idea of an online dive magazine. I wonder how that went for him.

In those days, I was running my own training agency franchise and was also working with Kevin Gurr and Nick Bushell of Delta P Technology. For the best part of





Crest smartwatch dive computer (above and right)

twenty years, from the mid-1980s onwards, Kevin and Nick built the most advanced sport diving computers in the world. Each one of their designs, from the ACE nitrox-only models to the multipurpose VR series, was state of the art at the time.

Technical diving needed tools for managing decompression on mixed gas and closed-circuit, and Kevin and Nick were creating them. My first VR computer was a massive, rectangular lump of shiny

metal we called "the brick." It might have been heavy and unwieldy, but it helped keep me alive for a few years, no matter how deep I went or what gases I was breathing.

Because of my Delta P history, I take a particular interest in what is happening in the world of dive computers, and at DRT Taipei, I noticed that

COURTESY OF CREST DIVING



Apple Watch Ultra with Oceanic Plus app

four brands had stands at the show—Shearwater, Atmos, Crest and Garmin. I know Shearwater very well, as this was the company that took up the technical diving computer baton when Kevin and Nick moved on to focus solely on rebreathers, and it was being represented at the show by one of Taiwan's leading technical divers, as you might expect.

I had never seen the other names at a dive show before. I knew of Garmin, of course, and was aware that they had started dabbling in the scuba diving pond, but I had not expected to see them at this show, especially not with such a large stand right in the middle of the hall and a large crowd of enthusiastic divers milling around.

During the weekend, I spoke with the folks at the Atmos, Crest and Garmin stands and learnt that, over the past



CREST DIVING

## A New Dive Book from Simon Pridmore

"Simon Pridmore's new book, *Technically Speaking* is an outstanding tour de force from one of modern diving's most accomplished practitioners and best-selling authors."

— David Strike, Oztek & Tekdive Convenor

"Simon has completed a complex task with consummate skill and has accurately unravelled the when's, the who's and some of the why's, much of which would have been unjustifiably lost in the mists of time if not for this work."

— Kevin Gurr, Technical Diving Inventor & Innovator

"It will take some doing to better this account of tech's first steps... as no matter how much you know or think you know; you will still find many obscure historical gems..."

— Kevin Denlay, Early Adopter & Wreck Finder

*Technically Speaking* is the latest book from best-selling Scuba series author Simon Pridmore. It is a selection of themed talks telling the early history of technical diving—where it came from, how it developed, how it expanded across

the world, who the important movers were and how, in the decade from 1989 to 1999, the efforts of a few determined people changed scuba diving forever.

These ten years saw the greatest shake-up the sport has ever seen but technical diving's road to universal acceptance was anything but smooth, many obstacles had to be overcome and there were times when even viewed in retrospect, it seemed that its advocates might fail in their mission. Ultimately, success came down to perseverance, people power, good timing and more than a little luck.



Available in hardback, paperback and ebook at **Amazon Worldwide, Apple, Kobo, and Tolino.** See **SimonPridmore.com**

three years, a revolution had taken place in the Taiwan scuba market, which is youthful, open-minded and highly accepting of innovation. All three companies manufacture smart fitness watches, which have full dive computer functionality and monitor aspects of your physiological status all the time, not only while you are diving, but while you sleep, while you work, and while you play—basically whenever you are wearing them. They therefore also track what you are doing between dives. Bear that in mind when I move on to talk about dive safety later in this article.

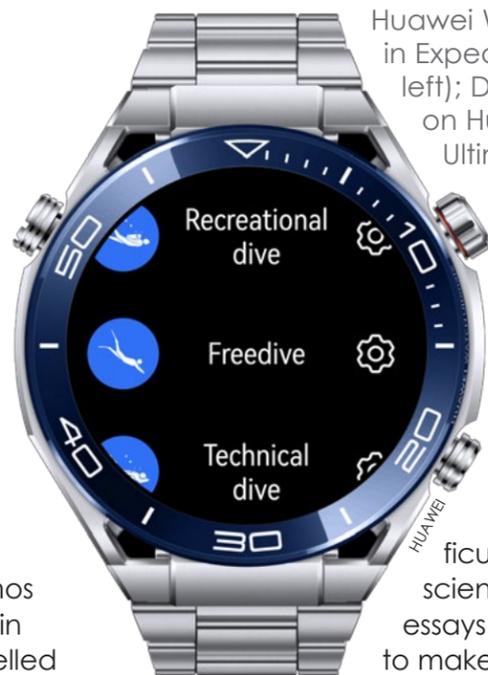
These brands are now responsible for over 90 percent of the dive computer

market in Taiwan. Mainstream divers are no longer buying dive computers that you only wear while diving. A few months ago, I ran a story in my *Scuba Conversational* newsletter about the Oceanic app that has been created for the new Apple Watch Ultra, turning it into a fully functional dive computer. Now, Huawei has just announced its own fully scuba-capable smartwatch, called the Ultimate.

### Lifestyle devices

These devices are a world away from the watch-sized dive computers that emerged in the 1990s. Those were just dive computers miniaturised and modified so that you could wear them all the





Huawei Watch Ultimate in Expedition Black (far left); Diving selections on Huawei Watch Ultimate (left)

time to tell the world that you were a diver. These new models are lifestyle devices with scuba capability, made by the biggest tech companies in the world.

As the website Techcrunch.com put it in its review of the Apple Watch Ultra: "Apple has a long history of putting legacy businesses out of business, and it looks like dive computers are next. The company just announced that its newest watch can be used as a full-on scuba-diving watch. At US\$799, it is competitive with high-end dive computers, price-wise, but it adds a ton of powerful functionality that hasn't been available in a dive computer in the past, mostly by virtue of being a general device rather than a specialised tool for diving only."

Part of the review's title reads: "...Suunto should be terrified..."

When I was involved with Delta P, we were limited by the technology available to us and that was always years behind the curve. We were using chips and screens that were left over when the mobile phone industry moved on to better things. We could not afford to buy newer technology because the scuba diving market is a small niche market, and we could not mass produce. Each computer was put together by hand. And our top-of-the-line version still retailed for US\$1,500 even though, if you compared it to your phone, it was as if you were looking at different decades.

No longer! Apple, Huawei, Crest, Atmos and Garmin have propelled

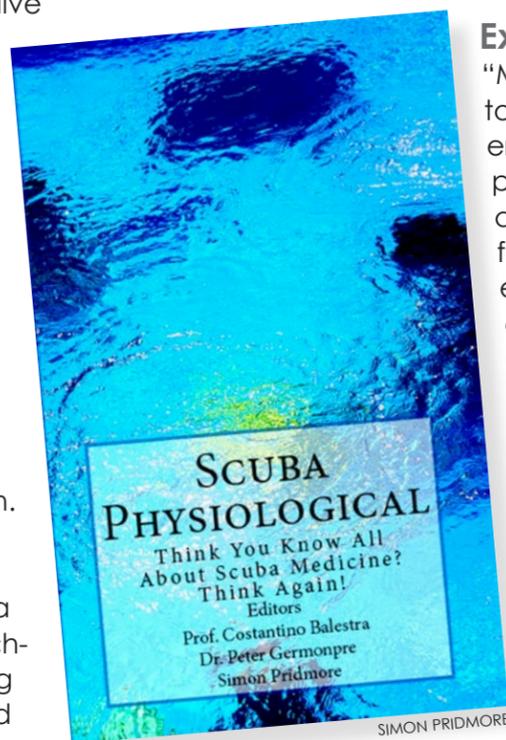
dive computer technology out of the past and into the future. From here on, dive computer technology will be cutting-edge. There is good reason to think that this may bring more younger people into diving, that more new divers will be using electronics to monitor their dives from dive one onwards, and that they will be using devices they already own and are well used to working with.

### Improving dive safety

These are huge positives. But the biggest news is that this development may mark a huge leap forward in terms of dive safety too. Let me explain.

In 2017, I published a book called *Scuba Physiological*, which was a series of essays by researchers and specialists in diving medicine that summarised what we currently know about what happens to

our bodies when we dive. These essays had initially been published in *The Science of Diving*, a book written by scientists for scientists, which was quite difficult to read if you were not a scientist. My aim in rewriting the essays for *Scuba Physiological* was to make the important information they contained more accessible for layman divers, like me and you, who do not have PhDs. A couple of extracts from these essays, which were written about 10 years ago, make even more interesting reading today, considering where we can see dive computer technology going.



*Scuba Physiological: Think You Know All About Scuba Medicine? Think Again!* by Simon Pridmore

### Extract 1

"Most recreational divers today use dive computers and trust them completely. However ... the algorithms they use are far from perfect and even the most reliable computers still accept a probability of DCS ranging from 2 to 5% ... Most recreational divers do not know this. Professionals in diving medicine and technology know that DCS is always possible, albeit rare.

"The complex physiology of decompression involves not only

## NEW 4 in 1!

Simon Pridmore has released a new single-volume e-book, bringing together four books in his bestselling Scuba series:

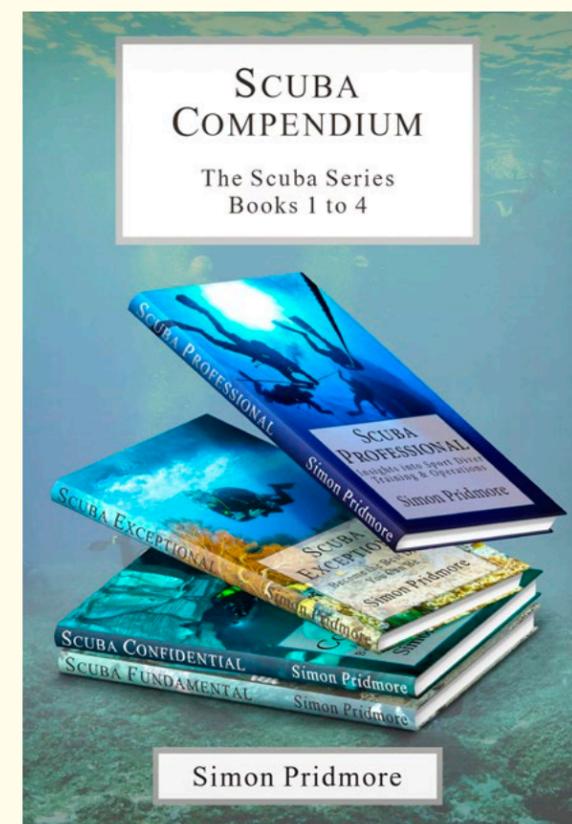
- *Scuba Fundamental – Start Diving the Right Way*
- *Scuba Confidential – An Insider's Guide to Becoming a Better Diver*
- *Scuba Exceptional – Become the Best Diver You Can Be, and*
- *Scuba Professional – Insights into Sport Diver Training & Operations*

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

gas pressures and virtual compartments or other models, but also highly variable physiological parameters such as body temperature and hydration state. We believe that any major effort to improve decompression algorithms in recreational dive computers may be a costly and ultimately rather futile endeavour unless this is directed towards a personalised decompression algorithm that considers individual physiological parameters.

"The reliability limit of existing dive



of it unavailable elsewhere; his points often illustrated by real life experiences and cautionary 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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**simonpridmore.com**

computer validation protocols has been reached and the new frontier will be to further improve our ability to customise the conservatism levels in dive computers according to physiological variables. This could be based on ... real-time sensor technology permitting a direct diver-to-dive computer interface."

### Extract 2

"In recreational diving ... any algorithm will end up giving roughly the same



ANGELO SHI / TAIWAN DIVE, GREEN ISLAND

Simon Pridmore and his wife, Sofie, putting the Atmos Mission 2 through its paces at Taiwan's Green Island

decompression profile, but this does not mean the physics and physiology modelling behind it are correct. Neither the physics of scuba diving nor the physiological changes associated with it are fully understood. Since the risk of DCS has been shown to be dependent on numerous physiological variables, research needs to focus on how individual physiological factors affect bubble number and bubble growth, so this information can be incorporated into personalised decompression algorithms, taking into account physiological factors and interpersonal differences including personal factors like exercise, fitness, obesity, hydra-

tion, and temperature, genetic factors and individual responses to stress. Currently, dive computers have no way to accurately predict your off-gassing rate, certainly not after you have surfaced. Computers do not know your heart condition or breathing rate. They cannot tell if you are young or old, fit, or unfit, fat, or thin. They have no idea what physical activity you do between dives, nor do they know how well or poorly hydrated you are."

### Current and future tech

But your smartwatch knows. Present-day technology can already supply most of this information and acquiring the rest of

the data would just be a question of input and programming.

Notice the frequent use of the word "personalised." Your smartwatch is monitoring your "personalised" physiological status all the time, and you can easily envisage an algorithm being introduced that would interpret its readings to assess levels of post-dive decompression stress. Perhaps, in the future, sensors could be added that monitor the presence and quantity of bubbles in the bloodstream.

We could be on the cusp of a dive safety revolution, but I leave you with a key factor to consider.

In the future, it is likely that, although you and your dive part-

ner have the same dive history and are using the same device with the same settings, your physiological status will not be the same. You will have different medical histories, different sleep patterns, different height/weight ratios and different exercise patterns and heart rates. Your activities pre-dive and between dives will not be identical. One of you may have drunk more water than the other or taken more rest.

Therefore, your smartwatch, taking all these factors into consideration, may set each of you a different no-stop limit or require one of you to do longer decompression stops than the other, based on your physiological status. In certain circumstances, it may even recommend that you sit out the next dive. And, if you insist on rejecting its recommendation, it may refuse to function.

Would you accept this?

Some technical divers have already experienced this dilemma. The controller for the Poseidon Cis-Lunar Mk V rebreather has a dive/no dive function. If it detects that something is not right with the unit—the gas mixture, the oxygen sensor, the electronics, anything—it will refuse to go into dive mode and render the rebreather undiveable until it confirms that everything is as it should be. This, you may think, makes perfect sense and is a feature that

can save lives. And you would be completely correct. But you can imagine how frustrating it is when you are out on the dive boat and want to go diving, and the computer says "No!" There have been instances where rebreather divers (not using the

Poseidon) have reacted to warning alarms by switching them off and going diving anyway, only to drown on the dive.

In the future, will we be smart enough to listen to our smartwatches when they tell us how to dive or even if we should dive or not? Will we even have a choice? ■

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*, 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](http://SimonPridmore.com).



Garmin Descent G1 Solar dive smartwatch in Hurricane Blue



Microplastics were found embedded in the tissues of about two-thirds of marine mammals studied.

*“Some proportion of their mass is now plastic.”*

— Greg Merrill Jr.,  
Duke University  
Marine Lab

PHOTO ILLUSTRATION: G. SYMES  
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garyrosephotos.com

## Microplastics discovered in tissues of dolphins and whales

Recent research led by graduate student Greg Merrill Jr. at Duke University Marine Lab has uncovered a concerning prevalence of microplastics in the tissues of marine mammals.

The study, set to be published in the October 15th issue of *Environmental Pollution*, has provided evidence that microscopic plastic particles, which were discovered in the fats and lungs of around two-thirds of the marine mammals investigated, are not confined to the digestive tracts of these creatures but can migrate and embed themselves in their vital tissues.

Between 2000 and 2021, samples from 32 stranded or subsistence-harvested marine mammals in Alaska, California, and North Caro-

lina were examined in this study. These samples were taken from twelve different species, including a bearded seal.

Microplastics, minuscule plastic particles ranging from 198 to 537 microns in size (human hairs are 100 microns), were found in various tissues, including fats, lungs, and other essential organs. Plastics are lipophilic (attracted to fats), so they can readily accumulate in blubber, the sound-producing melon on toothed whales' foreheads, and the fat pads along the lower jaw that direct sound to their internal ears. This raises concerns about potential harm to the animals' health.

Merrill emphasized the added burden that microplastics pose to marine mammals already facing numerous challenges such as climate

change, pollution, and noise pollution. He stated, “Some proportion of their mass is now plastic.”

The study found that polyester fibers, commonly produced by laundry machines, and polyethylene, a component of beverage containers, were the most frequently identified types of plastics in the tissues. Blue plastic emerged as the predominant color in all four types of tissues examined.

### Impacts

Merrill highlighted the need to investigate the metabolic impact of these embedded plastics on marine mammals. His forthcoming research will involve toxicology tests using cell lines grown from biopsied whale tissues.

This issue has broader implications as well. A 2022 study published in *Nature Communications* estimated

that filter-feeding blue whales might ingest up to 95 pounds of plastic waste per day, given the high concentration of microplastics in their feeding grounds. Furthermore, whales and dolphins that prey on fish and larger organisms could accumulate plastic through their diet.

Merrill emphasized the urgency of addressing this problem, stating, “For me, this just underscores the ubiquity of ocean plastics and the scale of this problem.” The study's samples, dating back to 2001, indicate that this issue has persisted for at least two decades.

The research received support from various organizations, including the National Science Foundation, North Carolina Wildlife Federation and North Carolina Sea Grant. ■

SOURCE: SCIENCEDAILY

## Update On Diving Medicine

Gary Rose, MD, Tour Leader

**Saba & St. Kitts, December 9-16, 2023**

Dive the untouched and beautiful walls, reefs and spires, with *Caribbean Explorer 2*. **BOOK NOW:** [explorerverventures.com/special-trips/further-your-medical-education](http://explorerverventures.com/special-trips/further-your-medical-education)

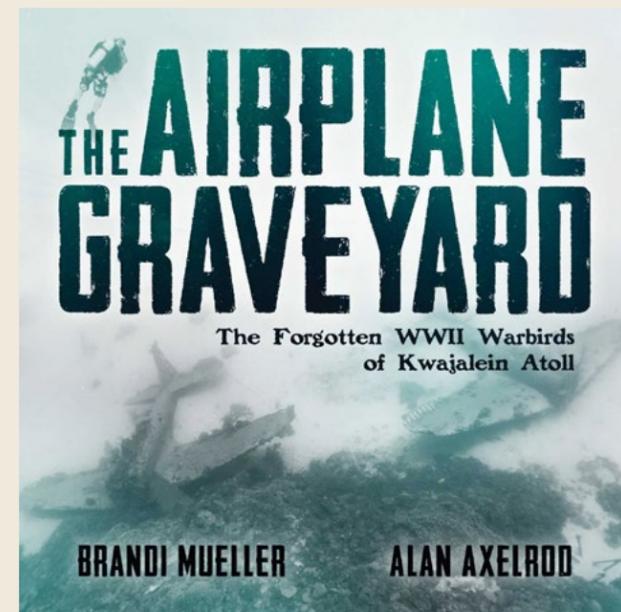
**Tiger Beach, Bahamas, May 11-15, 2024**

See tiger sharks, as well as hammerheads, Caribbean reef sharks, and lemon sharks, with Epic Diving. **BOOK NOW:** [epicdiving.com/package/cme-course-for-medical-professionals](http://epicdiving.com/package/cme-course-for-medical-professionals)

Anyone can attend and those affiliated as healthcare providers will receive **8 CME/CEU credits**.



garyrosephotos.com



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**.



*Great White Shark Triptych*, by Gary Rose. This photo was taken in Guadalupe Island, Mexico, and printed on white aluminum panels. Gear: Nikon D500 camera, Tokina 10-17mm lens at 17mm, Nauticam housing, Inon Z330 strobes. Exposure: ISO 320, f/11, 1/125s

Text and photos by John A. Ares, Sheryl Checkman, Larry Cohen, Anita George-Ares, Matthew Meier, Brandi Mueller, Gary Rose and Olga Torrey

**We asked our contributors to create an underwater “triptych,” and they returned with an artistic range of color, black-and-white and toned compilations, from abstract close-ups to wide-angle shots, featuring a variety of marine life, large and small, as well as divers, on reefs and wrecks, and in open water, lakes, and even an aquarium. Here, *X-Ray Mag* contributors share their favorite images from the tropical waters of Fiji, the Philippines, Indonesia, Malaysia, the Egyptian Red Sea, Bonaire and the Cayman Islands, to the temperate waters of the US East Coast and California.**

# Triptychs

*Contributors' Picks*





Photo 1. (far left) Original post-production image; Photo 2. (left) Image prepped by extending negative space of blue water on the left border to create better balance for the triptych; Triptych mounted on a wall (below)

## Triptychs



All photos were taken with a Nikon D500 camera, Tokina 10-17mm lens at 17mm, Nauticam housing, with Inon Z330 strobes. Exposure: ISO 320, f/11, 1/125s. SECOND ROW, LEFT TO RIGHT: Photo 3. Left third of triptych; Photo 4. Middle third, first cut; Photo 5. Middle third, second cut; Photo 6. Right third of triptych; Photo 7. (previous page) Final triptych assembled

### Great White Triptych — Not Just Another Portrait

Text & photos by Gary Rose, MD

Often, when I look at shark photography on social media, in magazines, or at many presentations, I have noticed that, although the photos are of interesting sharks and technically excellent, they lack size—the wow factor! Why is that? Most underwater photographers are so caught up in the capture, that they forget about creating a story or an imaginative and artsy photograph, and just photograph the standard side-view portrait. Granted, many underwater photographers have taken a huge step out of their comfort zone, just to dive with and photograph sharks, and are thrilled to bring home a portrait photograph of a shark to share with friends

and family. Let's take it to the next step.

I usually set out on a shark photoshoot with a plan. Once I am in the water, I consider the visibility, lighting and my surroundings—blue water, reef or sand. After a few test shots to maximize the color saturation and balance of negative space (which will frame and not visually distract from my subject), I am ready to shoot.

Photo 1 is an iconic portrait of a great white shark. The viewers' attention is immediately focused on the huge and jagged teeth, and the bottomless depth of the sinister black eye. Next, the viewer will follow the natural flow along the streamlined body and react to the bulk, and the mating scars, of the great white shark. This portrait is a little more interesting because the shark is slightly at an angle

as it was gliding towards me. The intense deep blue of the negative space highlights the magnificent silver and white coloration of the shark.

I was familiar with the groundbreaking artwork by Damien Hirst, featuring a fully preserved tiger shark in a triptych, which was enclosed in glass cases. He rocked the art world in 1991 with this unique creation (ed. – entitled *The Physical Impossibility of Death in the Mind of Someone Living*). I decided I would try to emulate him—with a great white shark tryptic, on metal.

In the original (Photo 1), the shark tail was abutted against the border of the photograph. To improve the balance of the three panels of the triptych, I added negative-space pixels to the left border (Photo 2). Photos 3 to 6 demonstrate where I made the cuts to pre-



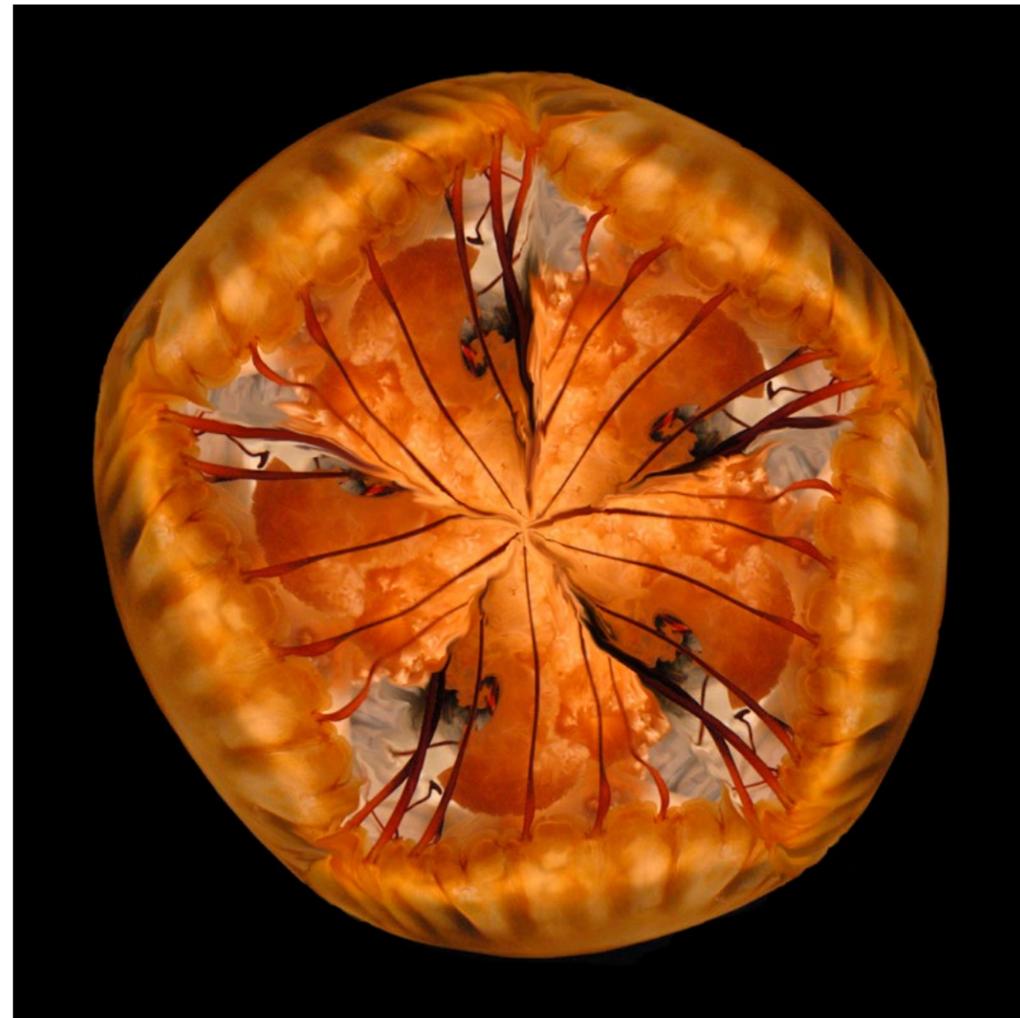
serve the sleek and efficient torpedo-like outline of the shark. Note the slight change between Photo 4 and Photo 5. In the latter, the cut is a couple of inches closer to the snout, maintaining the outline, flow and proportions of the great white. The surface markings of the shark, particularly the

countershading at the border of the silver and white coloring, were my road map.

The final relationship of the three panels, and correct spacing between them, is critical. Too much or too little space between the panels creates very unnatural border step-offs and throws off the

movement of the viewers' eye as well as the natural flow from the snout to the tail (Photo 7). The spacing must be correct. An additional bonus of creating a triptych such as this, is that it creates a feeling of the great white shark actually gliding right out of the deep blue. Visit: [garyrosephotos.com](http://garyrosephotos.com)





**Triple Madness: Pizza & Pinwheels**

Text and photos by John A. Ares

For the idea of a triptych, I was unsure if I would do a treatment of texture or “Pizzas & Pinwheels.” Sometimes, images contain aspects that can benefit from being repeated several times. The sum of the individual elements can be more interesting than a “documentary” shot. There are books on the subject. To some, these types of rounded multiple images are called “mandalas.”

I have a series of composite photos that lend themselves to abstract interpreta-

tion. All of these were enlargements sold individually at auction at the US expo, Beneath the Sea. Being competent with Photoshop compositing is necessary in creating these images. For more on compositing, see my previous article in **issue 114**.

Photo 1 (left) began life as two photos of a sea anemone in Bonaire. After staring at the images for a while, I realized they could become a “pinwheel.” The two images seem to blend nicely. Art results from your imagination, not getting “the perfect exposure with the perfect camera.”

Photo 2 (center) started all this madness. I took a jellyfish picture in an aquarium.

When I looked at the image on the computer, I realized that it vaguely resembled a slice of pizza, and *voilà*—a jellyfish pizza.

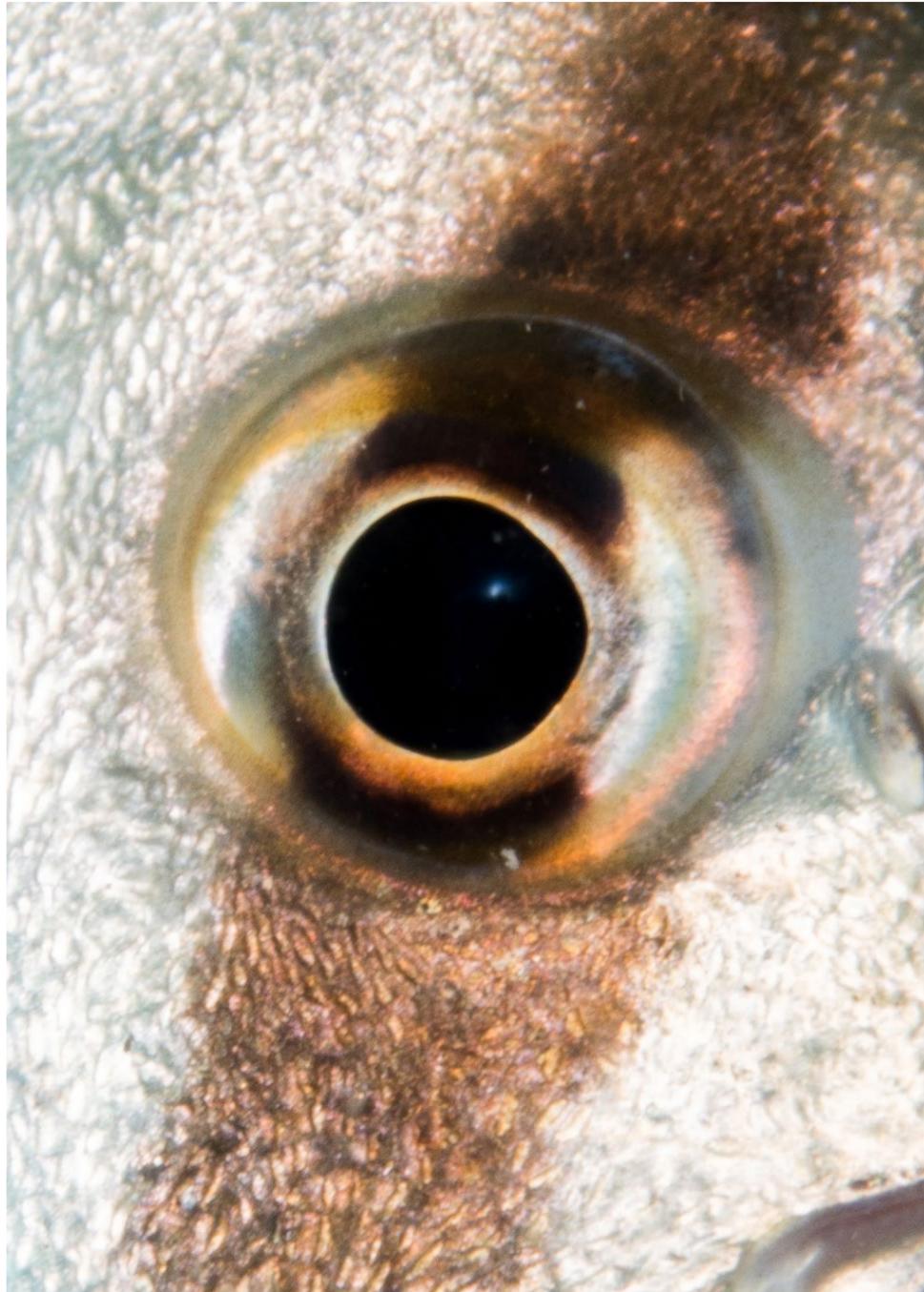
Photo 3 (right) was a flatworm shot in Fiji. As with Photo 1, when I stared at the image for a while, I realized it had the elements to become a “pinwheel” as well. Visit: [JohnAres.com](http://JohnAres.com)

REFERENCES:  
 CUNNINGHAM, L.B. (2020). THE MANDALA BOOK: PATTERNS OF THE UNIVERSE. UNION SQUARE & CO.  
[EN.WIKIPEDIA.ORG/WIKI/MANDALA](http://EN.WIKIPEDIA.ORG/WIKI/MANDALA)

Photo 1. (left) Anemone Pinwheel, Bonaire, Netherlands Antilles. Gear: Canon 10D camera, Sigma 50mm macro lens, Ikelite housing, twin Ikelite DS161 strobes. Exposure: ISO 100, f/32, 1/160s

Photo 2. (center) Jellyfish Pizza, aquarium shot. Gear: Canon 10D camera, Canon 100mm f/2.8 USM macro lens, available light. Exposure: ISO 3200, f/19, 1/30s

Photo 3. (right) Flatworm Pinwheel, Fiji. Gear: Nikonos II camera, 35mm lens, 1:2 extension tube, single Ikelite DS125 strobe. Exposure: Digitized ISO 100 film, f/8, 1/60s



### Fish-Eye Triptych

Text and photos by Sheryl Checkman

For this feature, I chose to get up close to focus on the eyes of three different fish. By cropping into this macro view, the fish eyes become more of an abstraction, with shape,

line and color defining each image. Just as each individual fish is different, each eye is unique as well. By isolating the eyes, you can see the differences that make each individual fish unique from the others.

The photo on the left is a close-up of the eye of a spadefish taken at Blue Heron Bridge in West Palm Beach,

Florida. There is a clearly defined brown stripe crossing the eye against a silver background. The center shot of a scrawled filefish was taken on a night dive in Alor, Indonesia, on the house reef adjacent to the resort. The blue circles and lines surrounding the eye create the look of an abstract painting, as does the shadow created by

the protruding eye socket. And finally, the shot on the right is of a mutton snapper at Nancy's Cup of Tea dive site in Little Cayman, Cayman Islands.

Each of these close-ups, when seen together, are like three colorful windows into the souls of life beneath the sea. Visit: [Instagram.com/sherylcheckman](https://www.instagram.com/sherylcheckman)

LEFT TO RIGHT: Spadefish, Blue Heron Bridge, West Palm Beach, Florida, USA. Exposure: ISO 200, f/18, 1/125s; Scrawled filefish, House Reef, Alor, Indonesia. Exposure: ISO 200, f/18, 1/125s; Mutton snapper, Nancy's Cup of Tea, Little Cayman, Cayman Islands. Exposure: ISO 200, f/8, 1/200s. Gear used for all images: Olympus OMD EM5 Mark II camera, Olympus M.60mm f/2.8 lens at 60mm, Olympus PT-EP13 housing, Sea&Sea YS D-1 strobe.



## Olga at Dutch Springs

Text and photos by Larry Cohen

After scuba diving at Dutch Springs in Bethlehem, Pennsylvania, my dive buddy, Olga Torrey, and I decided to swim. We removed our dive gear and drysuits; the cold water was invigorating.

We agreed that we should take some photos besides having a relaxing swim. When Olga dived underwater, her flowing hair looked stunning. So, she repeated the dive, and I shot multiple images to get the right look.

The image that showed the old, abandoned smokestacks (of a nearby factory) on the surface was one of my favorite

images, so I selected that one first. When processing the RAW file in Lightroom, I loved the color photo, but I also converted it to black and white, and then played with adding colors, so it looked like a toned image.

I was never sure which version I liked better. By creating a triptych, I can use all three. Visit: [liquidimagesuw.com](http://liquidimagesuw.com)

Olga Torrey swimming at Dutch Springs, Bethlehem, Pennsylvania, USA. Gear: Olympus E-620 camera, Olympus 7-14mm f/4 lens, Olympus housing, Sea&Sea YS-01 strobes. Exposure: ISO 200, f/8, 1/30s



ANITA GEORGE-ARES



ANITA GEORGE-ARES



ANITA GEORGE-ARES

Coconut octopuses at Lembeh Strait in Indonesia. All photos were taken with a Canon EOS Rebel SL1 camera, Canon EF-S 60mm f/2.8 macro USM lens, Ikelite housing and two Ikelite DS161 strobes. Photo 1. (left) Exposure: ISO 200, f/8, 1/200s; Photo 2. (center) Exposure: ISO 200, f/11, 1/200s; Photo 3. (right) Exposure: ISO 100, f/11, 1/200s

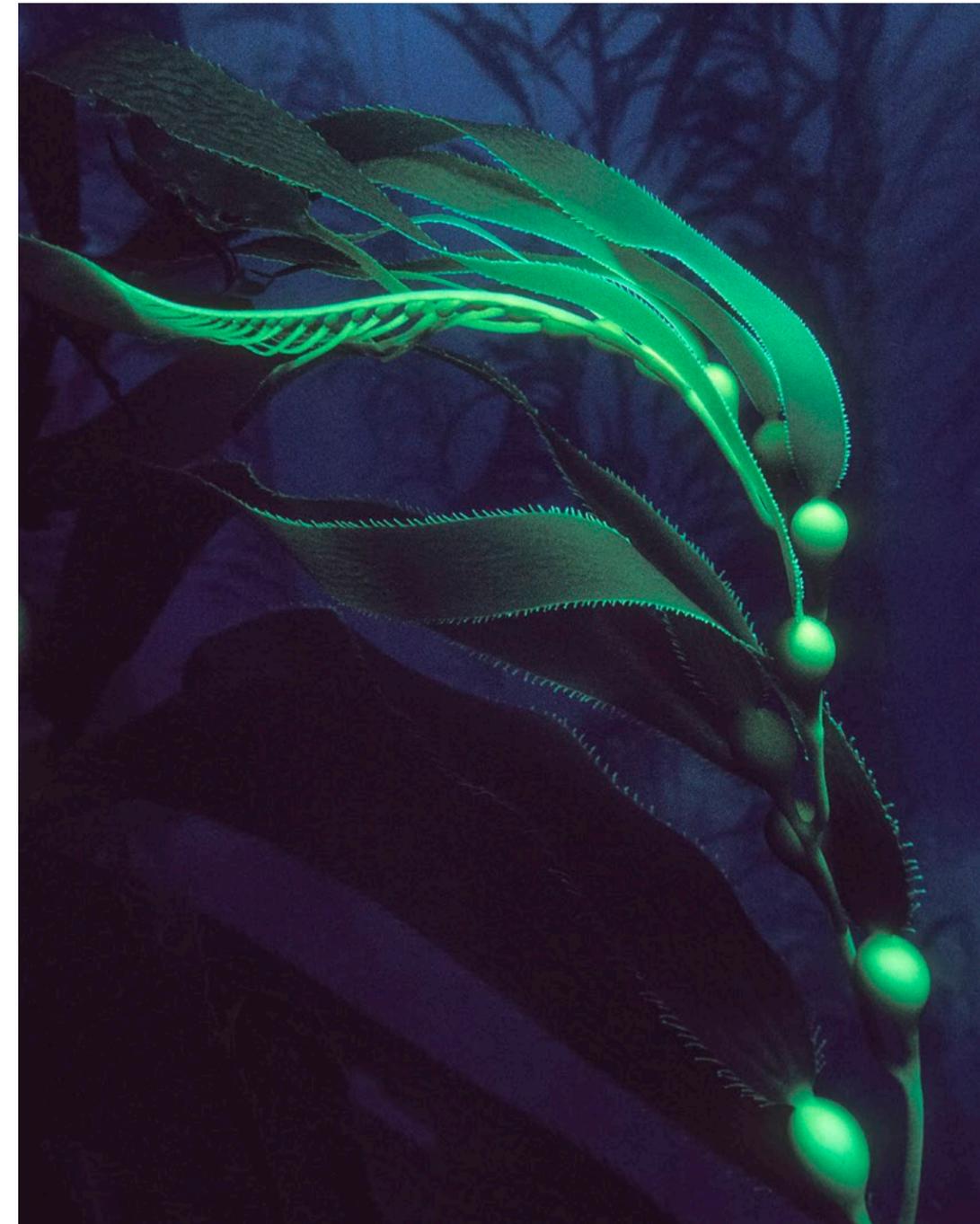
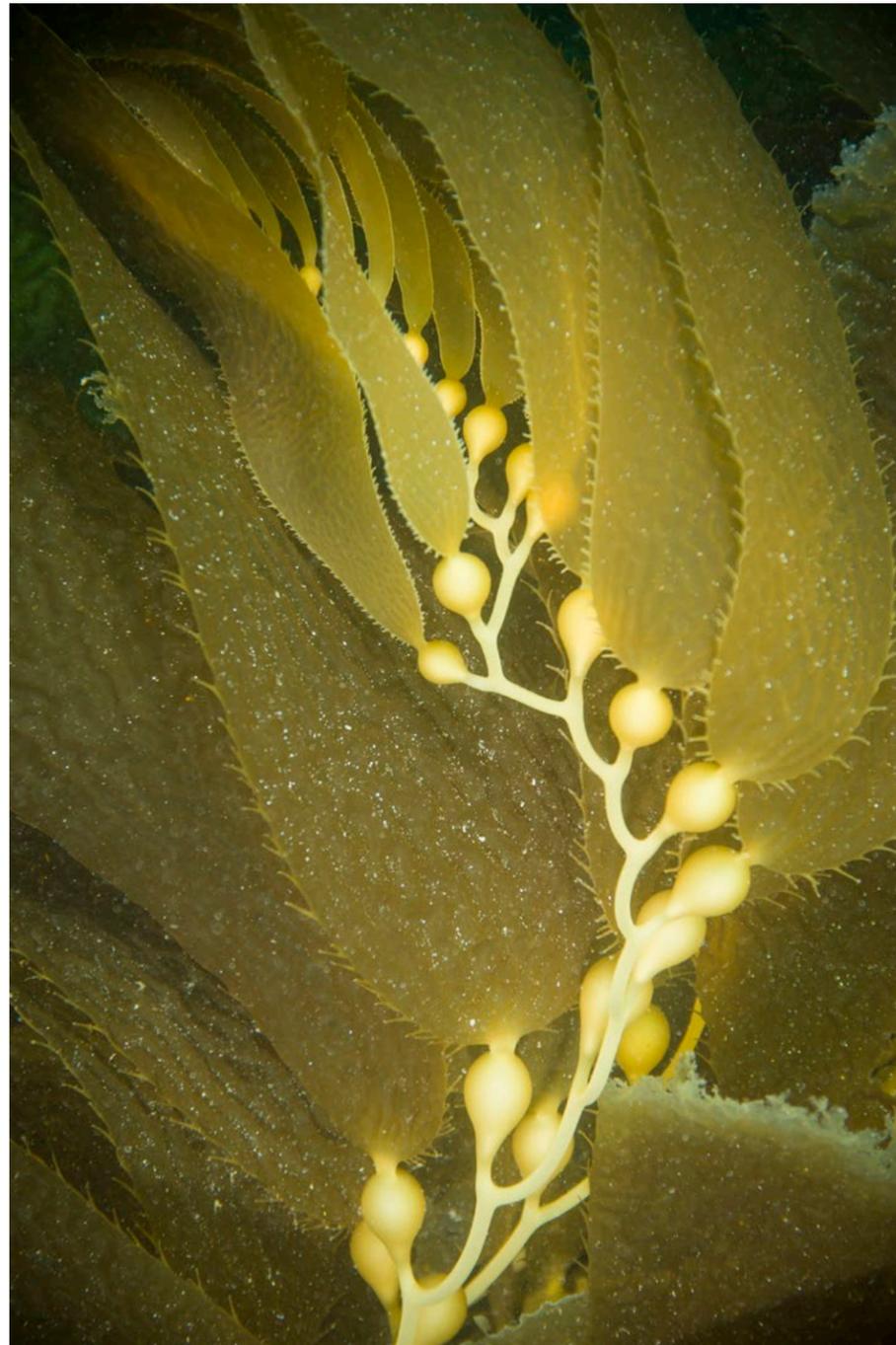
### Octopus on the Half Shell

Text and photos by Anita George-Ares, PhD

The coconut octopus is a common and very entertaining resident of Lembeh Strait, located between the Indonesian islands of Sulawesi and Lembeh. While coconut octopuses may be found sheltering in or carrying around coconut halves, they also occupy shells, cans and glass bottles. Coconut octopuses are widely distributed in the Indo-Pacific. I hope to see and photograph this species in a coconut shell one day.

The octopus in Photos 1 and 2 is the same individual. The octopus was constantly moving and changing its position on the shell while I was taking images. In the center image, the shell is nearly hidden by the octopus. Not wanting to stress the octopus, I swam away and found another coconut octopus (Photo 3) that sat quietly in its shell.

I chose these images for a triptych as the octopuses are the same species. They both sheltered in bivalve shells and were found on the same dive. The images have similar backgrounds of volcanic sand. Visit: [facebook.com/profile.php?id=100016947967639](https://www.facebook.com/profile.php?id=100016947967639)



## Giant Kelp Triptych

Text and photos by Matthew Meier

In thinking about which image or images I would use to create a triptych, I tried to envision what would look best “hung on the wall of a gallery.” That phrase was part of the descriptive instructions for this latest topic in the *Contributors’ Picks* series. So, when I start-

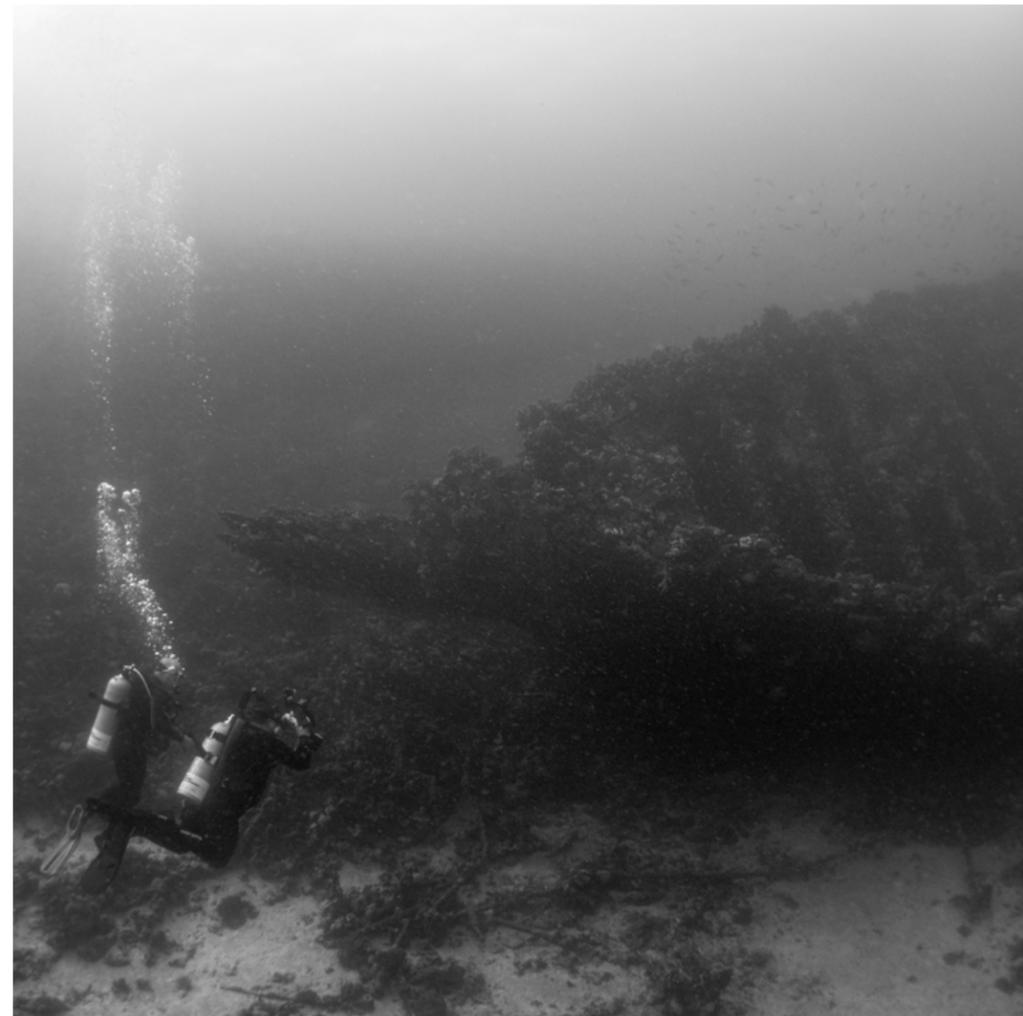
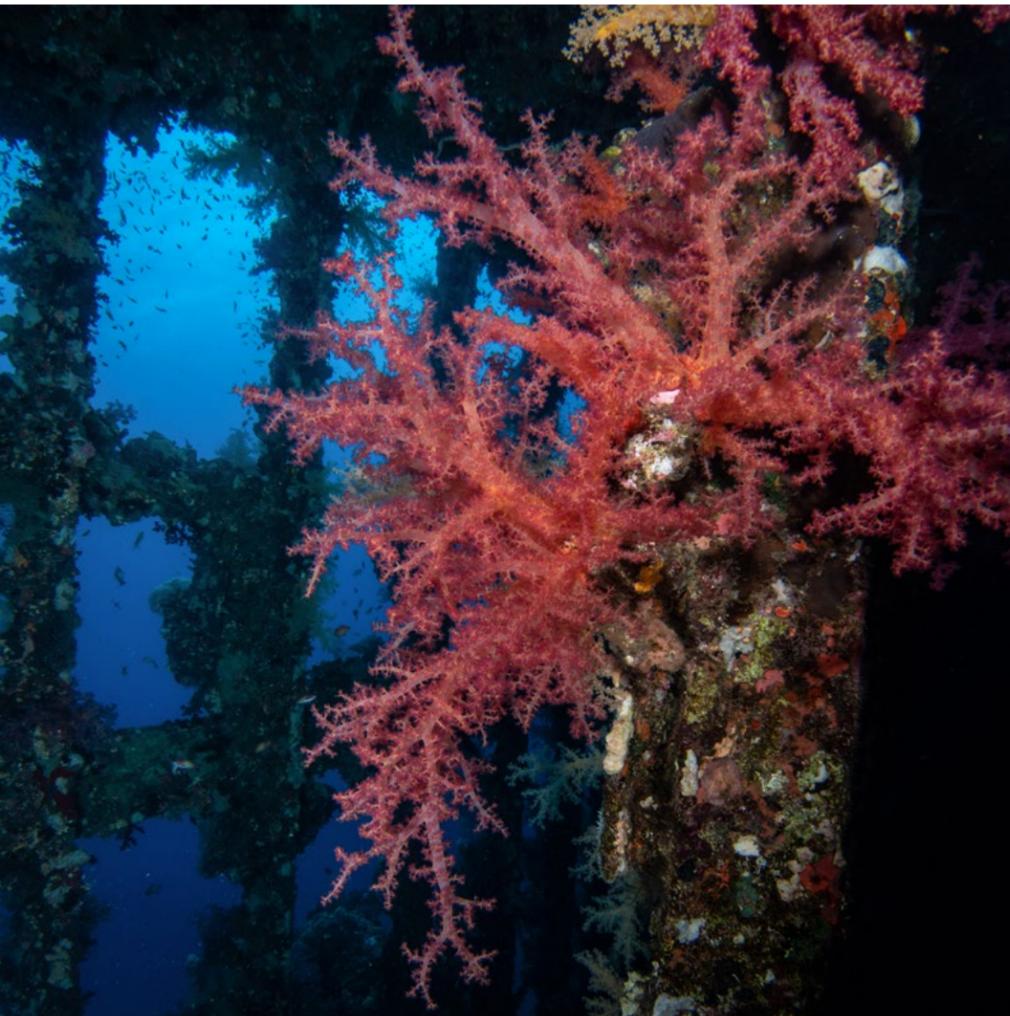
ed looking through my library, I searched for photos that were worthy of either being hung alone or together as a threesome.

Photo collages seemed more interesting to me than slicing up a single image, so ultimately, I created several themed combinations using either bold colors, specific species or a combination thereof, to come up with half a dozen striking triptychs. There was a trio of orange hairy frogfish; portraits of scorpion-

fish in red, pink and yellow; and families of clownfish swimming among their purple, red and green anemones.

However, as I could only submit one triptych for this assignment, I decided on similar compositions of giant kelp in shades of blue and green. Two of these photos are already hanging on my wall, so I look forward to rearranging some artwork to highlight this triptych in the near future. Visit: [MatthewMeierphoto.com](http://MatthewMeierphoto.com)

LEFT TO RIGHT: Giant kelp (*Macrocystis pyrifera*) with sun rays. Gear: Nikon F4 camera, Nikon 20mm lens, Subal housing, Ikelite strobes, Fuji Velvia film, settings unknown; New growth, giant kelp patterns. Gear: Nikon D3 camera, Nikon 24-85mm lens at 85mm, Subal housing, Sea&Sea YS-250 strobes. Exposure: ISO 200, f/5.6, 1/60s; Moody giant kelp. Gear: Nikon F4 camera, Nikon 20mm lens, Subal housing, Ikelite strobes, Fuji Velvia film, settings unknown. All images were taken at Santa Cruz Island, Channel Islands, California.



## LEFT TO RIGHT:

Pink soft corals inside the SS *Carnatic*, Red Sea, Egypt. Gear: Nikon D850 camera, 8-15mm fisheye lens, Ikelite housing, dual DS230 Ikelite strobes. Exposure: ISO 250, f/8, 1/125s

Divers admire the wreck from afar, to get a full view of the whole ship. Gear: Nikon D850 camera, 8-15mm fisheye lens, Ikelite housing, available light. Exposure: ISO 500, f/5.6, 1/100s

Parrotfish resting inside the ship. Gear: Nikon D850 camera, 105mm lens, Ikelite housing, dual DS230 Ikelite strobes. Exposure: ISO 200, f/16, 1/200s

## Wreck Triptych

Text and photos by Brandi Mueller

After a ship sinks in the ocean, it starts to become a new habitat for marine life. I love how much variety an underwater wreck might have. From a distance, it may still be a huge shadow of man-made metal; but as you get closer, the ocean takes over. In the case of the SS *Carnatic*, in the Red Sea, colorful soft corals adorn the wreck and fish life abounds. This British steamship, built in 1862, ran aground in 1869, and what remains is a beautiful artificial reef. As you get closer and closer, more marine life comes into view. Pipefish swim on the hull, parrotfish feast, anthias swarm, and schools of glass fish fill up the inside of the ship. Focus more closely, and more will come into view. Visit: [brandiunderwater.com](http://brandiunderwater.com)



### Nudibranchs in Malaysia

Text and photos by Olga Torrey

One of my favorite macro subjects to photograph are nudibranchs, also called sea slugs. These colorful creatures are snails without a protective shell. There are over 3,000 species in both tropical and cold waters. Many of them have brilliant colors and eye-catching patterns on their skins. They are often considered some of the most beautiful animals in the world.

I selected three images of nudibranchs that I had photographed in the warm waters of Malaysia and created a triptych of them. I chose photos that showed their various shapes, sizes, colors and patterns.

Visit: [fitimage.nyc](http://fitimage.nyc)

REFERENCE: WIKIPEDIA.ORG

LEFT TO RIGHT:

*Nembrotha lineolata* nudibranch, Mantabuan Island, Tun Sakaran Marine Park, Malaysia. Exposure: ISO 250, f/13, 1/60s

*Nembrotha milleri* nudibranch, Mantabuan Island, Tun Sakaran Marine Park, Malaysia. Exposure: ISO 250, f/11, 1/50s

*Phyllodesmium magnum* nudibranch, Sipadan Pom Pom Resort, Celebes Sea, Malaysia. Exposure: ISO 250, f/11, 1/80s

Gear for all images: Olympus OM-D E-M5 camera, Olympus M.Zuiko 12-50mm f/3.5-6.3 EZ micro lens, Nauticam NA-EM5 housing, Sea&Sea YS-D1 strobes

Edited by Peter Symes

Pair of manta rays spotted at Pearl and Hermes Atoll in Papahānaumokuākea Marine National Monument

*Social dynamics, the persistence of animal bonds over time, influence population structure.*



ANDREW GRAY / NOAA / PUBLIC DOMAIN

## Manta ray movements and social interactions

**Manta rays, with their selective friendships and structured social interactions, are more socially complex than previously thought. Recognising and respecting their social nature is crucial for both conservation and sustainable ecotourism.**

In the waters of Raja Ampat in West Papua, Indonesia, researchers have embarked on a journey to understand the intricate social behaviours and movement patterns of reef manta rays. Using underwater tracking devices on 27 of these majestic creatures, they observed their movements for up to 110 days. The primary goal was to discern how these rays interact with one another and navigate different marine territories.

**Short-lived social groups**  
Contrary to the belief that manta rays are solitary, recent findings reveal that they actively form structured social relationships. These rays, in fact, choose specific individuals to socialise with. Some of these associations are short-lived, lasting only a few weeks, while others span several months. Interestingly, rays that frequent the same area tend to form stronger social bonds. On the other hand, those that traverse different areas play a more central role in the broader manta ray community.

### Social hotspots: Cleaning stations

Cleaning stations, where smaller fish like cleaner wrasse help mantas by consuming parasites and dead tissue, serve as social hotspots. These stations are not

just about hygiene; they are also manta ray meet-up points. Females, in particular, are more frequent visitors, possibly due to their social nature. Some rays even show loyalty to specific cleaning stations, returning to the same spots over the years.

### The bigger picture

Understanding these social dynamics is pivotal for manta ray conservation. With their numbers declining by nearly 30 per cent globally over the past 75 years, every insight into their behaviour can aid conservation efforts. As ecotourism grows, especially in places like Raja Ampat Marine Park, it is essential to strike a balance. While it brings economic benefits, there is a risk of disrupting manta ray social structures, which could impact their reproduction. ■

SOURCE: ANIMAL BEHAVIOUR

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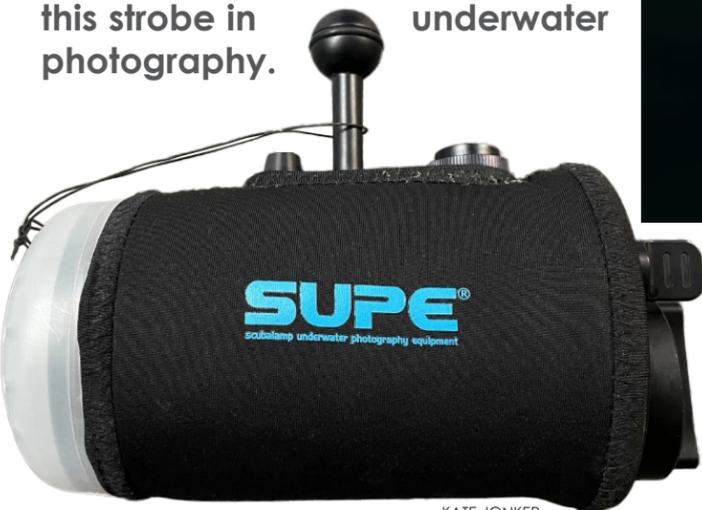
Photo : Dominique BARRAY



The vibrant reefs of Steenbras Deep, Gordon's Bay, South Africa (right). Gear: Canon R5 camera, Canon 8-15mm circular fisheye lens, Marelux housing, two SUPE D-Pro strobes. Settings: f/7.1, 1/125, ISO 500; Side view of SUPE D-Pro strobe showing neoprene cover to protect and add slight buoyancy (below).

Text by Kate Jonker  
Photos by Kate Jonker, Mike Bartick, Tim Ho, Wayne Jones, Ferran Sánchez, Robert Stansfield, William Tan, Scott "Gutsy" Tuason

Want to know more about the SUPE D-Pro strobe from Scubalamp? Kate Jonker put it through its paces and offers insights from several photographers who have used this strobe in underwater photography.



KATE JONKER



*Review:*

# SUPE D-Pro Strobe

*Illuminating the Depths*

KATE JONKER

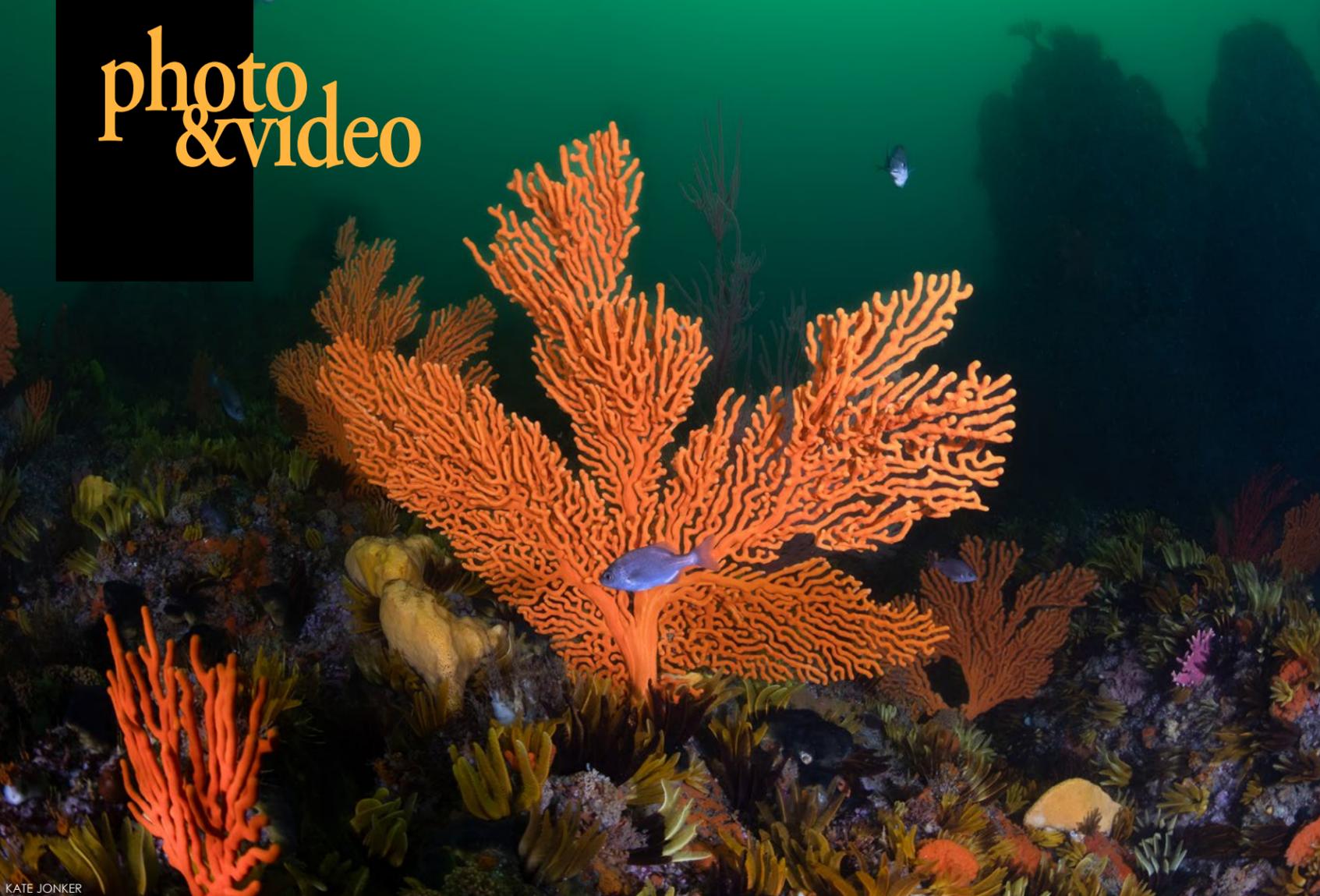
In the world of underwater photography, quality light is paramount. As an underwater photography coach, I often get asked about choosing the right strobes. It typically comes down to budget and your photography style.

Compact camera and macro enthusiasts can opt for smaller, budget-friendly strobes. However, for those progressing to DSLR or mirrorless cameras, investing in premium strobes is my recommendation. The good news is, once you have invest-

ed in quality strobes, you will not need to replace them anytime soon. Navigating the strobe market can be overwhelming. To make informed decisions, I rely on trusted feedback. In 2021, I was due for an upgrade, and after reading great

reviews of the SUPE D-Max strobes from Scubalamp, I decided to purchase a set. I was immediately impressed with their light quality and colour temperature, and they have been my go-to strobes for macro and wide-angle underwater





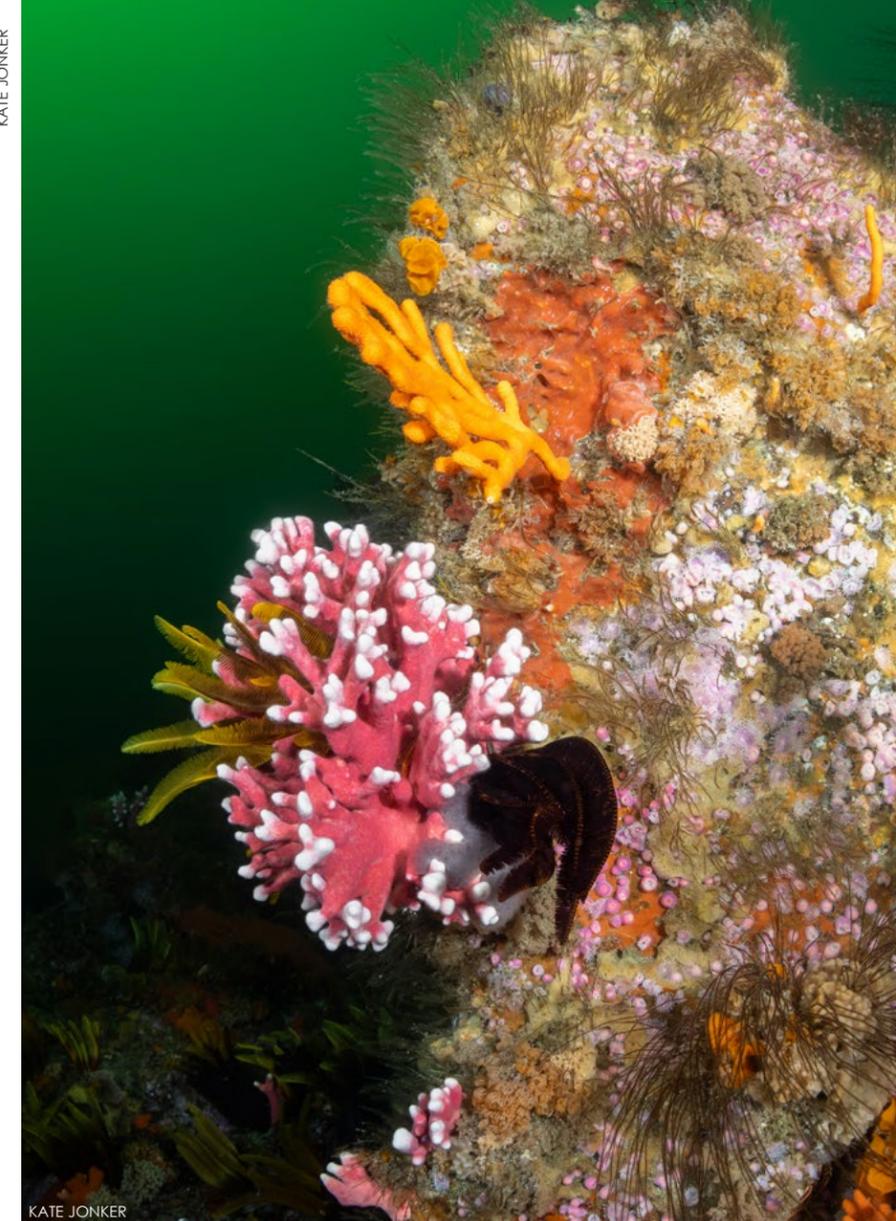
KATE JONKER

The vibrant reefs of Steenbras Deep, Gordon's Bay. Equipment: Canon R5 camera with Canon 8-15mm circular fisheye lens, Marelux housing, two SUPE D-Pro strobes. Settings: f/7.1, 1/125, ISO 500



KATE JONKER

Kate Jonker with her macro underwater setup (above): Canon R5 camera with 100mm macro lens in Marelux housing and two SUPE D-Pro strobes, plus Orcatorch D710V for spotting and focus light and Fantasea UCL-09F diopter (+12.5); Pink noble coral at Steenbras Deep, Gordon's Bay. Equipment: Canon R5 camera with Canon 8-15mm circular fish-eye lens, Marelux housing, and two SUPE D-Pro strobes. Settings: f/7.1, 1/125, ISO 500



KATE JONKER



KATE JONKER



KATE JONKER

Front view of SUPE D-Pro strobe, showing circular flash tube and central focus light, and rear view, showing On-Off knob (on the right) and Power knob (on the left).

photography ever since.

Earlier this year, SUPE offered to send me their new SUPE D-Pro strobes for a year-long test, and I accepted, keen to explore the impressive specifications of these strobes.

### Specifications

The SUPE D-Pro features the following specifications:

- Crafted from anodised aluminium, boasting a sealed battery compartment for added protection
- The SUPE D-Pro can be con-

nected to your camera via fibre optic cable, 5-pin sync cord and used in slave mode.

- Guide number at ISO100: 30
- A robust 160 Ws output
- Circular flash tube with a broad 150-degree beam angle (without diffusers)
- Swift recycle time of 0.1 to 1.1 seconds, allowing for continuous shooting without delay
- An LCD power indicator on the back showing light intensity and battery level
- At low power, it can sync at 10 flashes per second.
- Nine-step manual power con-

trols, offering complete creative control

- On-off and power knobs that are easy to use with gloves
- Equipped with a high-performance SUPE lithium-ion battery pack (3 x 18650 lithium batteries in a sealed unit), which provides 37.8wh for extended dives.
- SUPE battery pack that has a battery life of 500 flashes at full power per charge and 3,000 on lowest power
- Consistent colour temperature of 4,800K, delivering natural and warm hues to your images
- A powerful 500 lumen centre

focus/targeting light for precise framing and composition, especially when paired with the SUPE OSD snoot

- Built to withstand the depths, boasting a depth rating of 100 metres (330 ft)
- Size: 170mm x 90mm, designed for easy manoeuvrability
- Land weight of 1,080g without battery, and 120g underwater
- Includes protective neoprene covers to safeguard your strobes during travels

Note: SUPE strobes do not support S-TTL and TTL.



KATE JONKER



KATE JONKER

### Initial impressions

My Supe D-Pro strobes arrived just two days before a dive trip to Romblon, providing the perfect opportunity to test them in the field.

These strobes come well-protected with neoprene covers, shielding them from scratches and even adding a

touch of buoyancy. For added safeguarding during travel, each strobe's glass has its own neoprene cover. Inside the box, alongside each strobe, you will find a versatile 1-inch ball mount, ideal for securing the strobe to your arm system, and a sealed matte-red battery pack. Additionally, there is a battery charger and a user manual to complete the package. I travelled with these strobes in my carry-on, and they did increase my

backpack's weight, so I opted to carry the two battery packs in my jacket pockets to mitigate this somewhat.

Surprisingly, despite their weight on land, underwater, the strobes proved to be neutrally buoyant, making manoeuvring and photography a breeze. The user-friendly control knobs on the back were particularly handy, especially when wearing gloves. Plus, the LCD indicator, which shows the strobe power setting and battery level, was clear and easy to read.

SUPE also included two optional diffusers: the D200 for wide-angle underwater photography and the D210 for macro. They attach to the strobe's front by being pushed firmly onto an O-ring, although they did not stay as securely as I would have preferred. As a precaution, I secured them to the ball mount with some bungee cords, and they stayed put.

The battery life of these strobes was a real time-saver, easily lasting two

full days of diving on a single charge. Recharging was pleasantly quick as well, and it was great not having to take extra batteries along.

### Using the SUPE D-Pro strobes

To offer a well-rounded perspective, I reached out to renowned underwater photographers from across the globe who have been exploring the capabilities of these strobes within



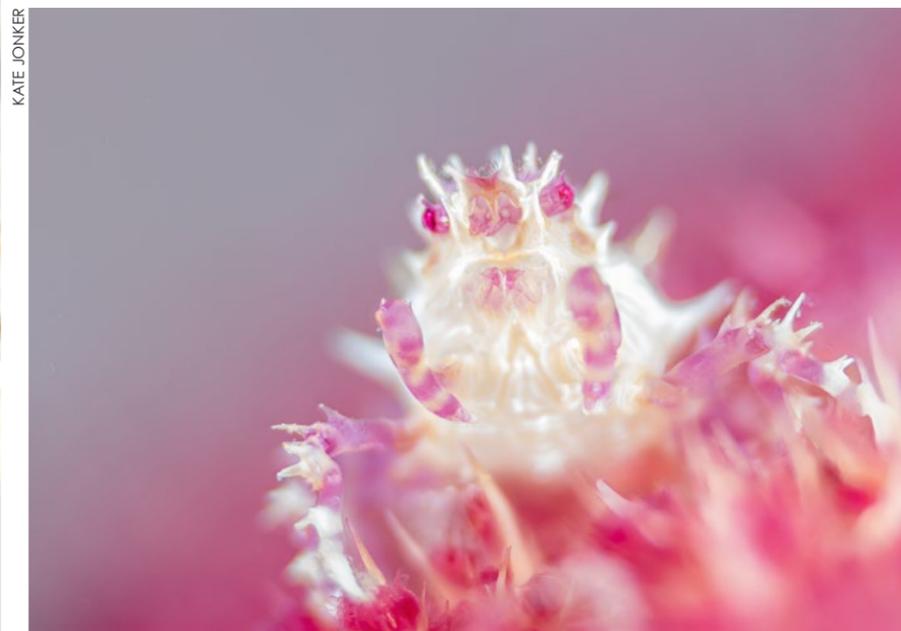
KATE JONKER



KATE JONKER

Hairy shrimp, *Phycocaris simulans*, Romblon (above). Equipment: Canon R5 camera, 100mm macro lens, Marelux housing, two SUPE D-Pro strobes, Orcatorch D710V for spotting and focus light, Fantasea UCL-09F diopter (+12.5). Settings: f/25, 1/200, ISO 160

Candy Crab, *Hoplophrys oatesi*, Romblon (below). Settings: f/5.6, 1/200, ISO 160; *Nembrotha cristata* nudibranch, Romblon (bottom right). Settings: f/29, 1/200, ISO 160. Equipment used for both images: Canon R5 camera with 100mm macro lens, Marelux housing, two SUPE D-Pro strobes, plus Orcatorch D710V for spotting and focus light, and Fantasea UCL-09F diopter (+12.5)



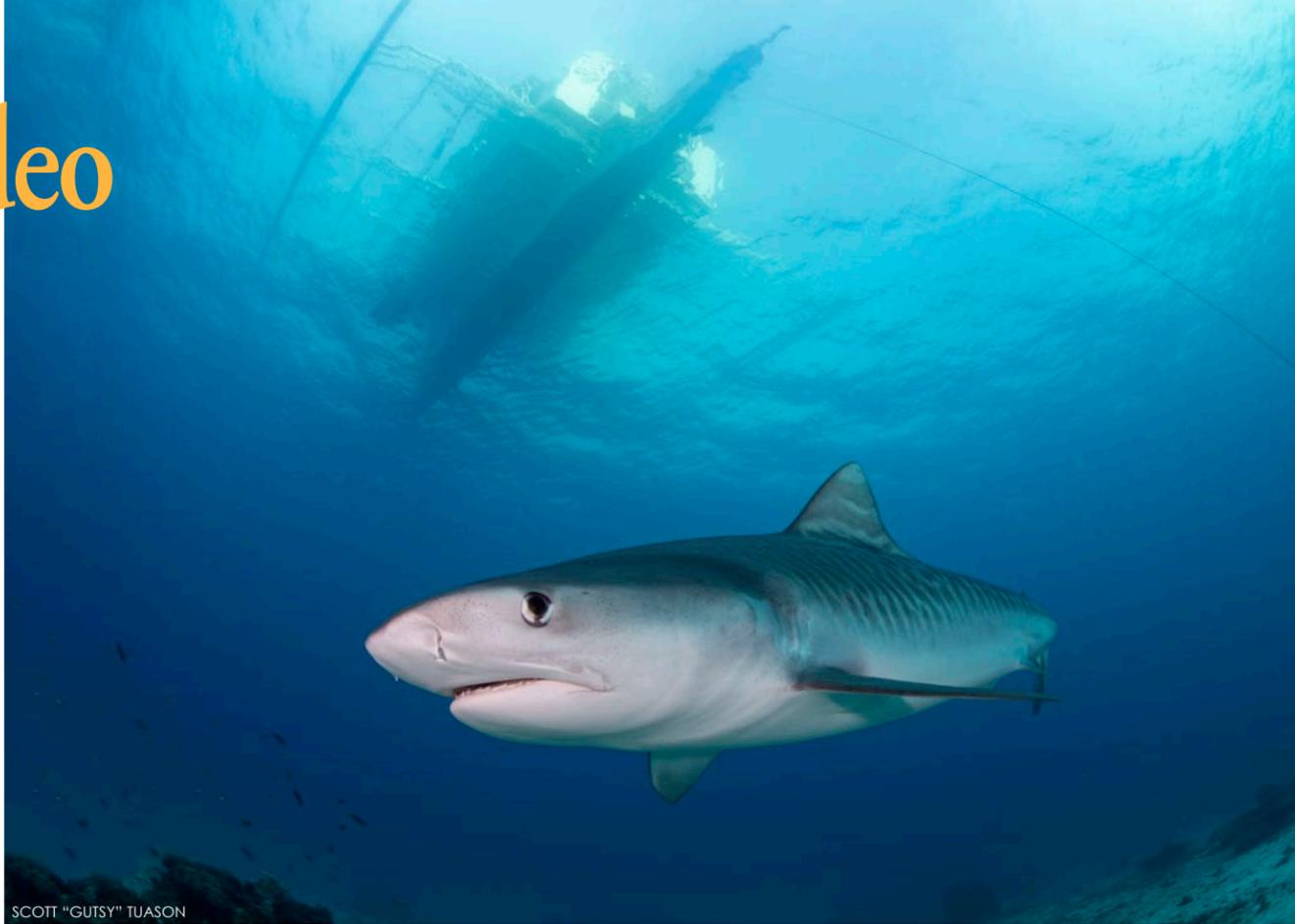
KATE JONKER



KATE JONKER



Tiger shark, by Scott "Gutsy" Tuason (right).  
Equipment: Nikon D5 camera, Sigma 15mm lens, Nauticam housing, 140mm Nauticam glass dome, two SUPE D-Pro strobes with wide angle diffuser. Settings: f/9, 1/100, ISO 400; Diver with sea fans, by Ferran Sánchez (far right).  
Equipment: Nikon D500 camera, Tokina 10-17mm fisheye lens, two SUPE D-Pro strobes. Settings: f/11, 1/125, ISO 640



SCOTT "GUTSY" TUASON



FERRAN SÁNCHEZ

their specific underwater photography niches.

## Wide-angle photography

In the realm of wide-angle underwater photography, achieving an even spread of light is paramount. The SUPE D-Pro's circular flash tube does just that, casting a wide, uniform light without any noticeable hot spots—even without the optional D200 diffuser. When the diffuser is added, the light becomes even softer, and the beam angle expands farther.

My own experiences with these strobes, while capturing images of the stunning reefs of Cape Town, have been remarkable. The colour temperature they provide truly enhances the vibrancy of our marine life. Despite the occasionally murky winter conditions, I found that removing the diffusers helped with backscatter issues, while the beam remained wide and soft enough to

produce high-quality images.

What is more, the strobes' recycling specifications are quite impressive. This is excellent news for wide-angle underwater photographers, especially when trying to capture fast-moving subjects.

To gain additional insights, I chatted with accomplished wide-angle underwater photographers Scott "Gutsy" Tuason, William Tan and Ferran Sánchez to get their thoughts on the SUPE D-Pros.

"The new SUPE D-Pro underwater strobes allow me to shoot in continuous bursts, so that I can choose a frame of my subject in its best position without missing out on the action," said Tan.

Sánchez added: "The D-Pro flashes provide the capability to capture underwater photographs with a wide angle and exceptional technical quality. This capability is attributed to their expansive 150-degree beam angle, which is further opti-

mised by combining two flashes, achieving outstanding coverage of underwater scenes. With recharge times ranging from 0.1 to 1.1 seconds, these flashes ensure the capture of every significant moment, eliminating the risk of missing out on valuable photographic opportunities. Moreover, the 4,800K colour temperature enhances colour saturation, adding a striking effect to the final images."

"With their blazing fast recycle time, ultra-wide beam of soft light and battery power that lasts for days, these are the best strobes I have used in years," concluded Tuason.

## Macro photography

When it comes to the intricate world of macro photography, the D-Pro's circular flash tube truly stands out. I have personally experienced how its gentle, even lighting works wonders in minimising harsh shadows, allowing for the creation of macro shots



WILLIAM TAN

Tiger shark, by William Tan (above). Equipment: Canon EOS R3 camera, RF 15-35mm f/2.8 L IS USM lens, Nauticam housing, Nauticam 230mm optical glass fisheye port, two SUPE D-Pro strobes. Settings: f/11, 1/200, ISO 500



WAYNE JONES



TIM HO

Goby, by Wayne Jones (above). Equipment: Canon 5RC camera, 100mm macro lens, Nauticam housing, two SUPE D-Pro strobes. Settings: f/8, 1/200, ISO 160; Yellow pygmy goby, by Tim Ho (top right). Equipment used: Canon 5D Mark III camera, 100mm f/2.8 lens, Sea&Sea housing, Inon diopter, two SUPE D-Pro strobes. Settings: f/18, 1/250, ISO 100; *Chromodoris annae* nudibranch, by Tim Ho (left). Equipment: Canon 5D Mark III camera, 100mm f/2.8 lens, Sea&Sea housing, Inon diopter, two SUPE D-Pro strobes. Settings: f/22, 1/200, ISO 100



TIM HO

that faithfully capture the subject's colours and details.

Whilst shooting at open apertures, I found that using a low strobe output combined with the D210 diffuser, tailor-made for macro underwater photography, introduced a beautiful softness to the light, preventing overexposed images. Additionally, these strobes delivered ample power when I worked with small apertures to capture minuscule subjects using a strong diopter.

In the underwater world of Romblon, where many subjects move very quickly

(particularly the butterfly nudibranchs), I came to appreciate the swift recycle time of these strobes. It enabled me to fire off a continuous stream of shots without any loss of strobe power whatsoever.

To gather further insights into how the SUPE D-Pro performs in the realm of macro underwater photography, I chatted with leading macro underwater photographers Tim Ho and Wayne Jones from Anilao Photo Academy in the Philippines.

"The strobes are close to neutral in the water despite

the impression of being big. The batteries have never run dry, even on the busiest of days—and the recycle time is fast, even when "machine-gun" shooting!" said Ho, who also particularly liked that the focus light was placed in the centre of the strobe, making targeting of a snout accurate. "The SUPE has its own snoot, the OSD, which works perfectly with the D-Pro," he added.

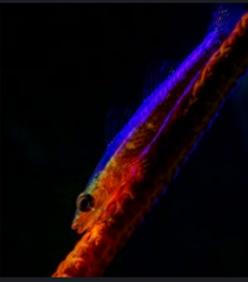
Jones gave his feedback, saying: "As a dive resort owner focused purposefully on underwater photography, I regularly come into con-



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Squid, by Robert Stansfield (below).  
Equipment: Nikon D500 camera, 60mm macro lens, Nauticam housing, SUPE D-Pro strobes.  
Settings: f/29, 1/250, ISO 500



ROBERT STANSFIELD

tact with all manner of underwater strobes, and have used a few different brands myself over the years. Now using the well-priced Supe D-Pro strobe, I have been very impressed by its performance for both macro and blackwater photography."

## Blackwater diving

I had been eager to thoroughly test the SUPE D-Pro strobes during some blackwater dives while in Romblon,

Stansfield from Cozumel in Mexico and Mike Bartick of Crystal Blue Resort at Anilao in the Philippines. I was keen to learn what they had to say about the SUPE D-Pro strobes in the context of blackwater underwater photography.

"These strobes don't miss a beat so the number of nice shots I'm generating is crazy," said Stansfield, who told me he was shooting in bursts of four or five photos at a time. "The colour



MIKE BARTICK

This photo by Mike Bartick (above) was taken while shooting at high speed as the octopus skimmed under the surface. Equipment: Nikon D850 camera, 60mm macro lens, two SUPE D-Pro strobes with D200 diffusers strobe (power 5, at 5 frames per second). Settings: f/16, 1/25, ISO 250; Flying fish, by Robert Stansfield (right). Equipment: Nikon D500 camera, 60mm macro lens, Nauticam housing, SUPE D-Pro strobes. Settings: f/20, 1/250, ISO 400

but our stay coincided with an unseasonal typhoon, and Mother Nature sadly put a damper on those plans.

Nonetheless, my curiosity persisted, and I sought the opinions of accomplished blackwater photographers, including Robert

temperature is fantastic, too. I really enjoy the build quality and it is wonderful to no longer have to manage 16 AA batteries. SUPE D-Pro strobes have simplified my world," he added.

His sentiments were echoed by Bartick, who said, "Speed, reliability and power are the three main components that I look for when considering equipment for shooting wildlife behaviour."

## Optional accessories

The D200 diffuser, designed for wide-angle underwater photography, produces soft, high-quality lighting and extends the already impressive 150-degree spread of light even further.

For macro underwater photography, the D210 diffuser comes in handy, creating softer light in your macro shots. I found it particularly valuable when shooting with wide-open apertures.

Now, let's talk about the SUPE OSD snoot. When used alongside the SUPE D-Pro, the OSD performs exceptionally well. Its focus light aligns precisely with where your strobe will illuminate. You can delve deeper into my review of the SUPE OSD in X-Ray Mag **issue #111**.

## Conclusion

The SUPE D-Pro Strobe is a versatile powerhouse suitable for both wide-angle and macro photography. With its wide beam angle, consistent performance and rapid recycle times, it excels in capturing underwater moments. Its adaptability spans various photography styles, from wide-angle vistas to macro critters and blackwater subjects, showcasing remarkable versatility. This strobe's thoughtful design and impressive capabilities should place it among top-tier underwater strobes. ■



ROBERT STANSFIELD

Special thanks go to the following photographers: Mike Bartick ([facebook.com/mike.bartick](https://www.facebook.com/mike.bartick)), Tim Ho ([facebook.com/tims-cuba](https://www.facebook.com/tims-cuba)), Wayne Jones ([facebook.com/1infinitejones](https://www.facebook.com/1infinitejones)), Ferran Sánchez ([facebook.com/ferran.foto-sub](https://www.facebook.com/ferran.foto-sub)), Robert Stansfield ([facebook.com/robert.stansfield.7](https://www.facebook.com/robert.stansfield.7)), William Tan ([facebook.com/william.tan.7334](https://www.facebook.com/william.tan.7334)) and Scott "Gutsy" Tuason ([facebook.com/scott.tuason](https://www.facebook.com/scott.tuason)).

Kate Jonker is an underwater photographer and dive writer, underwater photography instructor, dive guide and dive boat skipper based in South Africa who leads dive trips across the globe. For more information regarding diving and underwater photography workshops, divers are welcome to find her at: [katejonker.com](https://www.katejonker.com).

Edited by Rico Besserdich



## Isotta Housing for the Nikon Z9

Isotta has begun shipping its housing for the Z9, one of Nikon's most advanced full-frame mirrorless cameras. The Z9 housing has all the same features as other Isotta housings, including dual integrated adjustable handles, one-handed opening and closing via a rotary knob, dual O-ring seals on all buttons and removable parts, and an integrated moisture alarm. It is made of anodised aluminum and is finished in the company's trademark red. Two fibre-optic connectors are included on the housing (an optional trigger is required), and optional bulkheads allow for the attachment of strobes using electrical sync cables. Several accessories, like a vacuum valve or external monitor, can be installed using the one M28 and three M16 ports. [Isotecnic.it](http://Isotecnic.it)

## Nauticam Housing for the Nikon Z8

Nauticam has announced its underwater housing for the Nikon Z8 full-frame mirrorless camera. The NA-Z8 housing from Nauticam appears to be quite similar to the housings for cameras with a smaller form factor, which compete with the Z8, such as the NA-A7RV for the Sony a7R V and the NA-R5 for the Canon EOS R5. The Z8 is substantially smaller than the Z9, just as the Z8 is smaller than the Z9. With Nauticam, all crucial controls are always within easy reach of the built-in handles, and you can use the housing with any of the company's wide range of "water contact optics," such as the WACP-1 and WACP-C wide-angle conversion lenses and the SMC-1 and SMC-2 close-up lenses. Nikon's FTZ adapter allows you to use both original Z-mount and vintage F-mount lenses. The NA-Z8 housing from Nauticam has an M24 bulkhead for connecting an external monitor or recorder, such as the Atomos Ninja V or Ninja V+, via HDMI 2.0. [Nauticam.com](http://Nauticam.com)



## Nikon Z8 Camera

The successor to Nikon's ground-breaking flagship mirrorless camera, the Z8, has been formally launched. Nikon claims that "the Z8 condenses the advanced functionality and performance of the flagship Nikon Z9 into a compact and lightweight body while also maintaining superior robustness and reliability." The Z8's body is 15% smaller than the well-liked D850 and about 30% smaller than the Z9's. The 45.7MP stacked CMOS sensor and EXPEED 7 image-processing engine featured in the Z9 are the foundations of the Z8 as well. It also carries over Nikon's "blackout-free" viewfinder, completely electronic shutter, and 3D-tracking autofocus system built on deep learning technology. Similar to the Z9, the new model can shoot 20 frames per second in RAW, 30 frames per second in full resolution, and 60 frames per second in cropped (DX-format) JPEGs. Pre-release capture, another feature of the Z8, allows the buffer to take pictures even before the shutter is fully pushed. Videos may be captured in up to 4K/120p from (subsampling) 8.3K capture as well as 8K/60p in Nikon's proprietary, compressed 12-bit RAW format, N-RAW, both of which the Z9 later acquired via a firmware update. Additionally, the Z8 can record 12-bit RAW video in ProRes RAW 4K/60p. One CFexpress port and an SD card slot are available on the Z8. [Nikon.com](http://Nikon.com)



## Lexar CFexpress Type B Gold Series Memory Cards



New faster CFexpress Type B Gold Series memory cards from Lexar have been released, offering read and write speeds of up to 1,900MB/s and 1,500MB/s respectively. The cards' maximum read/write speeds in their prior iterations (with capacities of 128GB, 256GB, and 512GB) were 1,750MB/s and 1,500MB/s respectively. The series now includes new 1TB and 2TB iterations. With a minimum continuous write speed of 1,300MB/s, Lexar claims the cards can record 8K RAW footage without the fear of frame drops. The new Gold Series cards' minimum sustained write speed is just 300MB/s slower than that of Lexar's top-of-the-line Diamond Series cards. [Lexar.com](http://Lexar.com)



## Ikelite USB Charging & Data Transfer Bulkhead

Now, you can charge your camera and download photographs quickly through USB, using Ikelite's newest invention—a USB charging and data download bulkhead—exactly like how you would when you are on dry land. The new bulkhead is easy to install via the M16 port and is compatible with several Ikelite 200DL and 50DL underwater housings. It also comes with a USB-C to USB-C cable that links the port to your camera within the housing. All that is left to do after installation is to unscrew the bulkhead cap and plug in. Ikelite claims that 200DL housings for DSLRs or 200DLM housings will not be compatible; nonetheless, there is a long list of contemporary mirrorless cameras that have housings that will work. These include the Canon EOS R5 and EOS R6 II, Sony a7R V and a1, Nikon Z5 and Z50, and Sony a7R V. [Ikelite.com](http://Ikelite.com)

## Lens Beyond Ocean 2024: Call for submissions

Submissions accepted until 7 May 2024 for the 2024 Lens Beyond Ocean international competition.

As the organizers put it, Lens Beyond Ocean (LBO) "is more than a competition—it's an odyssey." And with that notion in mind, they invite photogra-

phers and videographers at all levels, from novice to professional, to take up the challenge, go on a quest to dive the seas, and bring back images of the magic, mystery and magnificence of the underwater world.

In 2024, LBO will proudly present its 13th annual international

LBO 2023 WINNERS: Best of Malaysia by Malaysian (below): *Fish Storm*, by Khaichuin Sim of Malaysia. Prize: 4-night bed & breakfast stay for one at Atlantis Puerto Galera or Atlantis Dumaguete, Philippines; Macro (bottom right): *Pygmy Seahorse*, by Q.J. Kang of Malaysia. Prize: 5-day/4-night stay for two, Silver Reef Dive Resort, Philippines

underwater photography competition. Over the past decade, the competition's primary aim has been to inspire and empower underwater photographers and videographers around the globe to capture the natural wonders of the underwater realm through their lenses.





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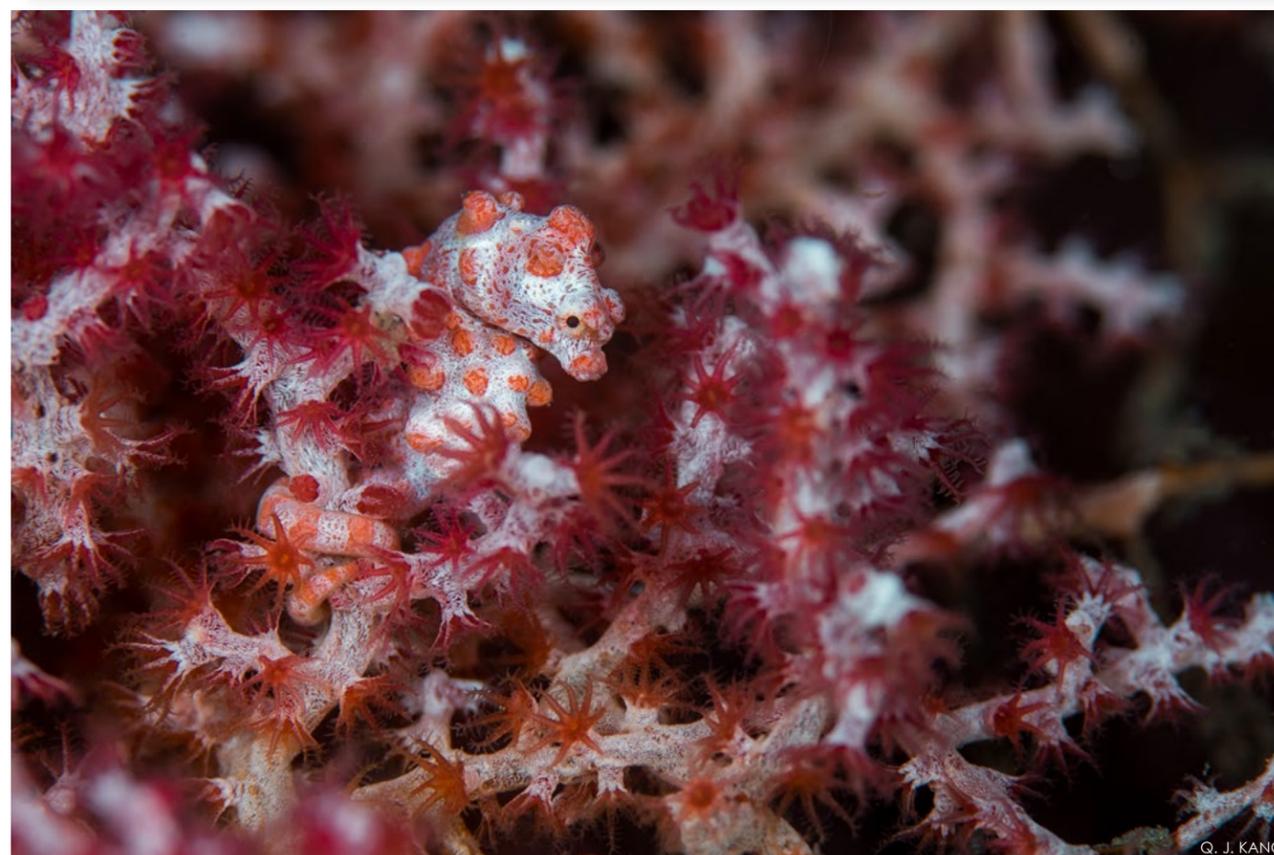
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CLOSING DATE: 7TH MAY 2024



Edited by  
G. Symes



CHONG WAN YONG

LBO 2023 Wide-Angle winner: *Secret Garden*, by Chong Wan Yong of Malaysia. Prize: 4-day/3-night stay for one at Cocotinos Manado or Lembeh dive package in Indonesia.

## Prizes

Since its start in 2011, the LBO photo competition has seen incredible growth, with over 1,000 underwater photographers from around the world participating every year. Contestants have the chance to win a fabulous array of prizes, which include dive trips and top-of-the-line dive gear and camera equipment.

## Be a winner

For avid divers yearning to share their imagery, artistry and experiences with the world, LBO offers an extraordinary platform to showcase their talents. Winners will be selected in each of the following five

categories: Macro, Wide-Angle, Compact Camera, 3-Minute Video, and Best of Malaysia by Malaysian. During the Malaysia International Dive Expo in Kuala Lumpur, which takes place 7-9 June 2024, the winning images will be displayed in the foyer, while the winning videos will be showcased on the Main Stage LED screen in Hall 2, Level 1, of the Malaysia International Trade and Exhibition Centre (MITEC).

## Call for sponsors

Businesses and organizations who are interested in sponsoring this event and contributing prizes are invited to contact the organizers. In exchange, sponsors will receive significant

international promotion and recognition.

## Call for photographers and videographers

Are you an underwater photographer or videographer with a passion for capturing the beauty of the deep blue? LBO invites you to step into the spotlight and proudly showcase your talent!

Register today at:  
[lensbeyondocean.com](http://lensbeyondocean.com)

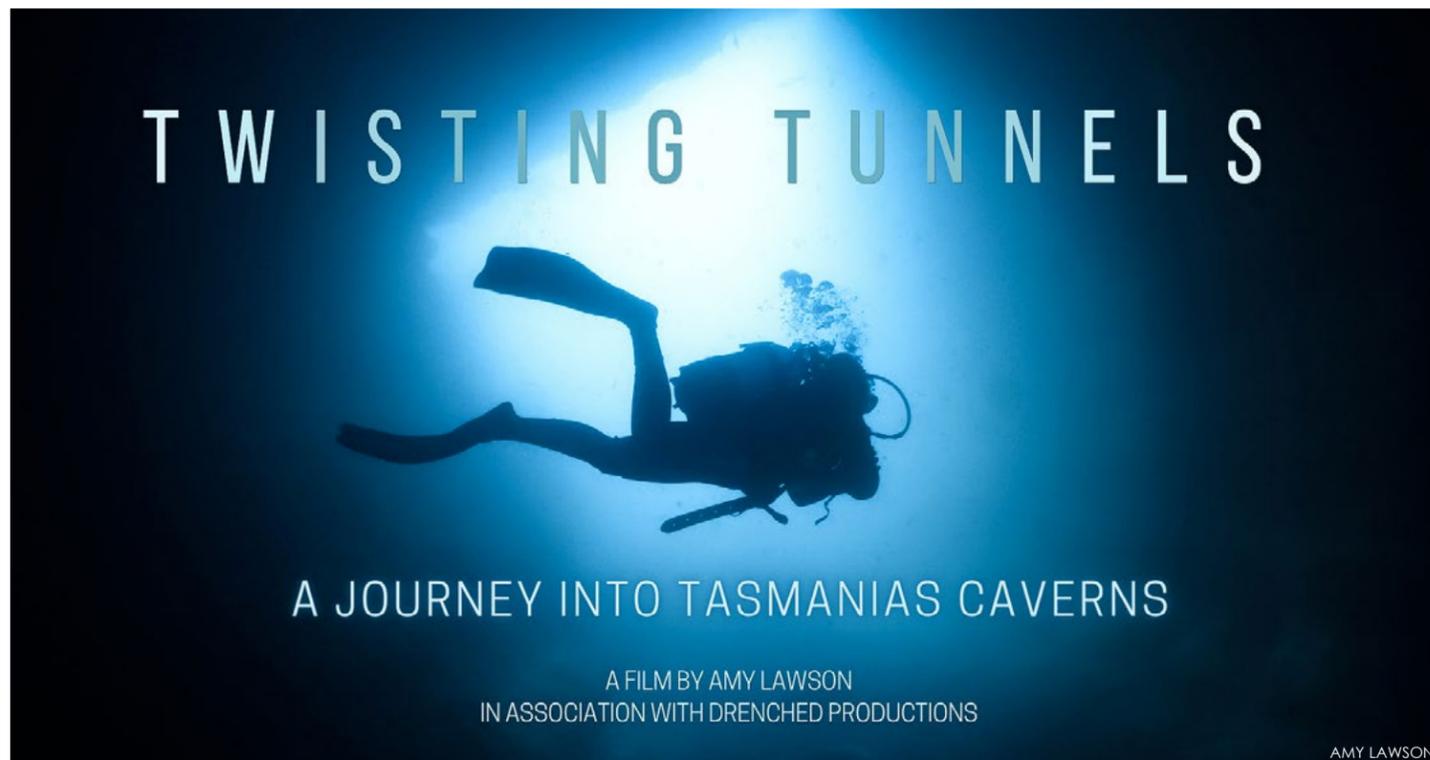
## Submission deadline

The final submission deadline is **7 May 2024**. It's time to share your underwater world with the LBO community and beyond. ■

GAETANO GARGIULO



LBO 2023 Compact Camera winner: *Brewing in the Bottle Mosman*, by Gaetano Gargiulo of Australia. Prize: 5-day/4-night stay for one, with 8 dives, at Luma' Selakan Resort, Semporna, Sabah, Malaysia



LBO 2023 3-Minute Video winner: *Twisting Tunnels – A Journey into Tasmania's Caverns*, by Amy Lawson, Australia. Prize: 8-night stay for one at Salaya Beach House and Amun Ini Beach Resort & Spa, Philippines



# Marguerita Hagan



P O R T F O L I O





*The Beautiful Woman Comes (Nefertiti)*, by Marguerita Hagan (various views on this page and previous page). Hand-built ceramic, 24K gold leaf, 15 x 9.5 x 10in, Michener Art Museum collection. Photos by Richard W. Gretzinger.

Interview by G. Symes  
All artwork by Marguerita Hagan

**American artist and diver Marguerita Hagan, who is based in Philadelphia, creates exquisite and intricate ceramic sculptures inspired by marine life and microorganisms found in our oceans. X-Ray Mag interviewed the artist to learn more about her creative process, research, and perspectives on the underwater realm and the interconnected ecosystems of our planet.**

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

MH: I was born with a passion to learn, an insatiable curiosity, and the ninth of eleven children. When I was nine months old, my



mother found me running across the mantelpiece. I was born to explore. This energy sustains, inspires and fuels me.

I was blessed with a mother who was an artist, and she infused her infectious spirit into the simplest things, as I was growing up, making the everyday a way of celebrating life. Her mother was a career artist and raised four children, single-handedly, during the Great Depression. I grew up with paintings and portraits in our home, and I visited my grandmother's studio for drawing and painting lessons. Art was revered and a natural part of our lives.

I grew up in Norfolk, Virginia, on the Lafayette River, which fed into the Elizabeth River and the mouth of the Chesapeake Bay at the Atlantic Ocean. Going to the beach to swim in the ocean and

finding treasures brought in with the tide was utter joy. As a child, I played on the beach of the tidal river, where I discovered clay. I instinctively made pinch pots and fashioned shelves on the tree branches with driftwood to keep my work safe until I could return. My first experience with clay was along the saltwater. I must have played at Little Beach from about the age of six to 10.

Nature gave us the greatest performances, as Mom would show us the beauty of a dramatic storm shifting the sky, and water moving up the river, the early morning dew drops in a flower, the sun and moon set or rise, and the stars at night. I have always been inspired by life and nature's diverse beauty and interconnectedness.

There was not much art available in school, from kindergarten through high school, and certainly no ceramics. I knew I was not an "artist" like my sister, who painted and drew with our grandmother. I came to learn my path when clay called me back. Following alternative



*Venus Flower Basket*, by Marguerita Hagan. Ceramic, 4.25 x 3.5 x 6in, inspired by the deep-sea glass sponge named for the Goddess of Love. The deep-sea love story begins when the male and female shrimp larvae move into the sponge, mating for life. As the shrimps grow, the sponge becomes their permanent home, in this symbiotic relationship. Photo by Richard W. Gretzinger.

*Argonaut Argo, Argonautidae*, by Marguerita Hagan. Hand-built ceramic, sterling silver and wood base, 5.75 x 5.25 x 2.5in, created for the invitational international cephalopod exhibit, *I Love You More*, at the CephslnAction and Cephalopod International Advisory Council (CIAC) Meeting in Crete, Greece. Photo by the artist.



Marguerita Hagan

paths, I introduced myself to Betty Kight who became my first clay teacher, at a craft show when I was 14. I asked her to teach me, and rode my bike across Norfolk to her studio, throughout high school. I found my first love in clay.

When entering college, Ceramics was the first and only class I knew I must be in. Since I learned how to throw on the wheel in high school, it was clear to me that being a potter would not hold my interest. My teacher, Masako Miyata at James Madison University, introduced me to the low-fire clay I have worked in throughout

my career. This opened the door to my visual voice. It was a defining moment, and I felt the universe light up inside me. I knew then that this was my “way”—it was like breathing for me. Clay has been my life companion, teacher and guide.

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

MH: Growing up in Norfolk, on the tidal river, I had salt in my veins. I have always had a profound connection

to, and lived on or by, saltwater. It is where all life began on Earth, giving her the name “The Blue Planet.” Water is life and our ocean produces over 50 percent of Earth’s oxygen, providing every other breath we take. I love celebrating, honoring, respecting and protecting ALL life.

My sister, Ann Hagan Carroll, worked with Captain Jacque-Yves Cousteau during the years the Cousteau Society was based in Norfolk, where I grew up. I remember the magical trips to the Cousteau Society while visiting her, meeting “The Captain,” Jean-Michel Cousteau, and the team there, and

seeing underwater equipment. My brother, Michael, was a commercial fisherman and a naturalist. Watching nature in and around the water, and the stars above, was and remains a magnificent life-long playground.

For me, working in clay is life-giving. I earned a Bachelor of Fine Arts de-

gree in ceramics, and immediately after college, I took a cross-country trek through sacred sites and geological marvels. My destination was Seattle, Washington, in the Pacific Northwest. I lived on the islands of Whidbey and Samish, and in the Skagit Valley, just off Padilla Bay,





Hand-built ceramic sculptures from the *Fauna Shield* series, by Marguerita Hagan. LEFT TO RIGHT: *Pufferfish Shield*, 20 x 8in; *Teardrop Butterfly Fish Shield*, 13 x 3.5in; *Loon Shield*, 13 x 3.5in; *Magnificent Sea Anemone*, 15 x 13 x 6in; *Blue Whale Shield*, 14 x 3.5in; *Jewel Pufferfish Shield*, 13 x 3.5in; *Weedy Sea Dragon Shield*, 17 x 5in; *Clownfish Shield*, 13 x 3.5in. Photos by Sabina Louise Pierce.

always close to marine waters. My *Wildlife* series of ceramic sculptures began during this time, when I was 25 years old and had just had my first snorkeling experience in tropical waters. I was blown away by the brilliant colors and patterns of the coral reef, and the marine life living within and around it. While underwater, I saw the budding series in my mind's eye and started it upon my return.

My work is deeply inspired by life in the sea, seeing it firsthand, and in collaborations with scientists; and although I am a research artist, once the inspiration sparks, my work is intuitive.

After being ignited by tropical wonders, I began researching and painting tropical sea life patterns on dinner plates, front and back. When I wanted to capture the pufferfish in clay, I found industrial woks in a

scrapyard to use as a convex form, and the sculpture then developed into a "shield." The first convex sculpture ballooned with dermal spines, on the wall. It begged for company, and the patterns on dinner plates expanded into my sculptural *Wildlife* series. But the most significant are the convex forms in saturated patterns and relief, known as my *Shields*. They started with the *Fauna* series, inspired by species in tropical and cold waters, as well as insects, birds, reptiles and creatures of the Amazon and Serengeti.

The convex ceramic forms play on the idea of a "shield," defined as a thing of protection. A shield also honors family lineage, and in this case, the countless species with which we share this planet. Like a lens or an eye, each of my *Shields* beckons the viewer to take a closer look, raising

wonder and awareness of our role as stewards in protecting each other and the species that make our lives possible on our blue-planet home.

The *Wildlife* work has evolved over the years, spawning *La Mer* and its myriad of series. More recently, the *Flora* and *Fungi* series have joined the *Fauna* series in the shield family. Respecting and honoring each other and our environment has been a life intention of mine, in which my strongest pull comes from the sea.

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

**MH:** No matter what I am working on, my creative process starts inside, intuitively. It may come in a moment of a dream state, or while exploring, diving, snorkeling or researching and learning

about an extraordinary phenomenon in a documentary film, an article, or while visiting a scientist. For example, the snorkel dive on a tropical reef at age 25 sparked my *Wildlife* series, which straddles nearly four decades now. Seeing the diverse wonder of life, color, patterns and textures, designed perfectly for its environment, left an indelible impression. It all began when I swam with the tropical treasures in the sea.

Once I see and "feel" the concept, its life force bubbles up like a spring and comes through me. Whether it is an abstract work, like *Nefertiti*, or one requiring scientific accuracy, such as *Flourish*, the work feels 75 percent complete when I see it in my mind's eye. Although there are many steps to physically realize the form, seeing it carries me through the process.

Some pieces develop with much

research and connecting with marine ecologists, diatomists, other scientists and experts from whom I can learn to best craft and communicate the work's message. My relationships with scientists and environmentalists, combined with my research, exploration and diving, buoy my current work.

With this fire lit, combined with an inner vision and insights into the life that inspires the work, be it an azure vase sea sponge or a spawning female brain coral, once I start building in clay, I listen and feel my way. Sometimes, there are surprising turns, but I trust the process.

Some of my work is intricate, and it is a blast to play outside the lines defying what appears physically possible. My earthenware sculptures are hand-built, and the process requires multiple firings, with the airbrush as an essential meth-



*Spotted Drum Fish Shield*, by Marguerita Hagan (left). Hand-built ceramic, 13 x 3.5in, inspired by the spotted drum she saw on a dive, 100ft down, on Cayman's North Wall, in the Cayman Islands (above). Photos by the artist.



*Wildlife tableware*, by Marguerita Hagan, was inspired by marine life in both tropical and cold waters, insects, reptiles and creatures of the Amazon and Serengeti. Photo by Robert Vinnedge.

od in applying color as well as a clear glaze when called for. Ceramics is full of science from engineering, physics, chemistry, electrical engineering and sometimes even quantum mechanics. Hold on to your masks and regulators for a virtual deep ceramic dive!

Once the wet earthenware (ball clay and talc) clay work is sculpted to completion at the greenware (pre-kiln firing) stage and carefully dried, I may spend extensive time sanding, to smooth the surface, as in the *Grow* and *Micro Grow* series. Or it may simply be ready for the first firing, a soft bisque at cone 010 (1,640°F/894°C). This secures the work enough to handle it with care, although it is still quite delicate. At this point, I may continue sanding the surface to a glowing polish, or it may simply be ready for airbrushing with underglaze, all depending on the piece. I may

need to run it through cone 010 bisque firing again, then airbrush and/or hand-paint the underglaze, sometimes through a few more stages.

The final bisque at the hottest temperature of my process is cone 04 (1,940°F/1,060°C), which stabilizes the previous steps. The temperature sets the underglaze, while burning out organic matter, for a successful smooth glaze surface. When the work is out of the 04 bisque kiln and a clear glaze (silica) is called for, I airbrush the larger surface areas, followed by a hand-painted touch-up with the clear glaze. Some works have isolated elements that need to be glazed to achieve a glossy surface while surrounded by a flat color. It requires a technician's hand to paint clear glaze, keeping it exactly where intended.

Loading the glaze firing is a balancing act when firing fully glazed work. The glaze goes

molten in the firing, so the work is carefully stilted (on ceramic bars with high-tempered steel pins) to rest on steel pins, so it floats safely above the kiln shelf to avoid the glass/glaze from fusing to anything during the glaze fire at cone 06 (1,830°F/999°C). If a luster is needed, like gold or white gold, etc, it is strategically painted over the selected glazed area for a shiny metallic pop. When isolated metallic or pearly accents are needed, it is a tight-wire act, keeping the luster only on the glazed area and to avoid staining the absorbent unglazed surrounding surfaces. The work is then fired at cone 018 (1,323°F/717°C) for the gold and other metallic lustres.

The final firing is the mother-of-pearl luster, at cone 020 (1,175°F/635°C). This is the lowest temperature of my process, to achieve the translucent iridescent magic. In some cases, like *Nefertiti*, *Ēvolvō* and *Stardust*,

work is completed post-kiln, firing with 24K gold leaf, for example.

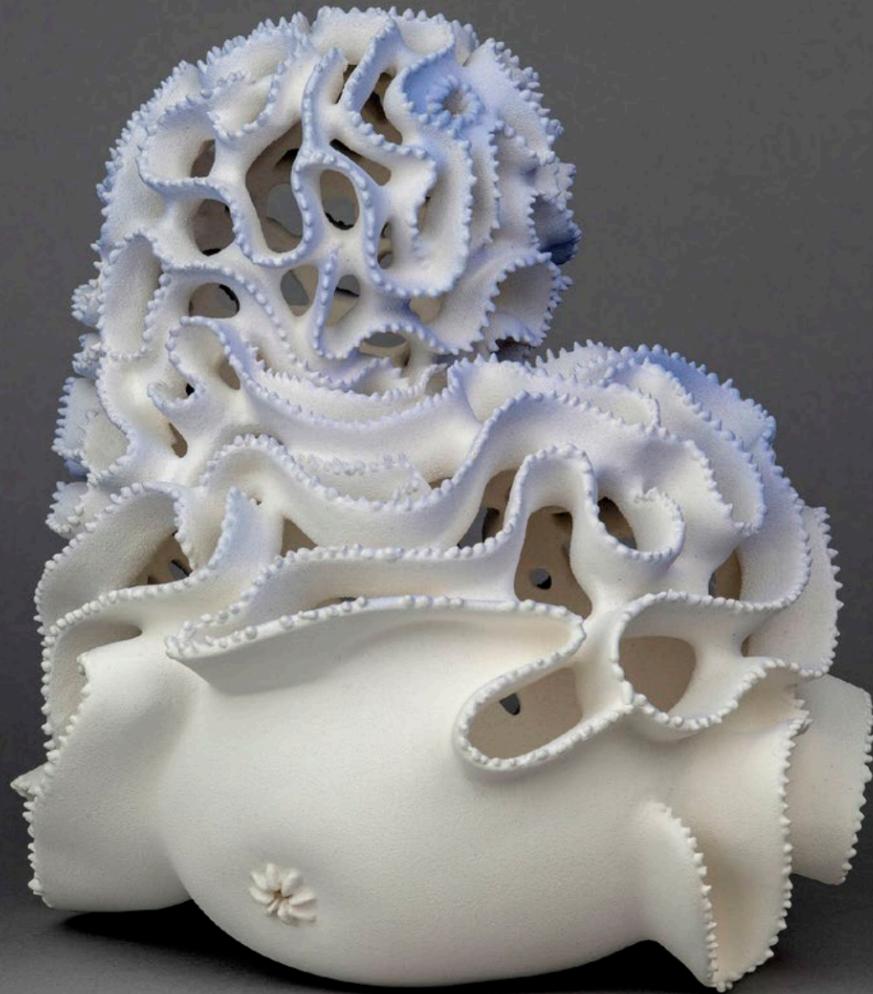
My sculptures, which are complex in form and research, earn a "legend" to guide the viewer through the ceramic and science details. Examples include *Flourish*, *Interdependence* and *Life, Flora Shield*.

As I began studying and sculpting work inspired by diatoms, I realized that the soft brick of my electric kiln was composed of diatomaceous earth. I remember as an undergraduate student, my teacher, Masako, told me that the brick

was sourced from the ocean. As I know now, when diatoms die, they fall as "marine snow," forming into a thick ooze on the ocean floor but alive with information. Micro-paleontologists decode the micro-remains, which hold Earth's history, including climate, past, present and future. Although diatoms are microscopic and just one-celled, while living, they, alone, provide over a fourth of all oxygen for our planet. They also provide my "artist breath," making my ceramic process and kiln firings possible.

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

**MH:** My maiden snorkel in the tropical waters of Hawaii, in 1984, inspired my entire *Wildlife* series and 40 years of work. My first dive in Martinique, in 1990, inspired my *Tropical Tea Party*, and so much more. Later dives, in 2019, inspired my *La*



*Cayo Blanco Day Dreaming*, by Marguerita Hagan (left). Hand-built ceramic, 5.25 x 6.75 x 5.75in, inspired by snorkeling among the brilliant brain coral in the sunlit reef of Cayo Blanco (White Key), a few hours off Trinidad, Cuba. Photo by Richard W. Gretzinger.



*Cayman Crush*, by Marguerita Hagan (right and below). Hand-built ceramic, 6.5 x 8.25 x 6.5in, inspired by the exquisite engineering of sea sponges seen while diving Cayman Island. Photos by Richard W. Gretzinger



Each dive is a gift, and yet, I feel my most dramatic experience is in my future, when I hope to dive with manta rays, whales and cuttlefish. Finding ways to continue diving and do at-sea residencies is invaluable, as each opportunity yields immeasurable rewards.

MH: Ocean management and restoration are essential. My sculpture magnifies life in the ocean from micro to macro, through exhibitions, lectures and projects. My practice gives visual voice to the ocean depths, uplifting awareness, education and stewardship of this fragile life support that is our planet, upon which our lives depend.

Not everyone can dive. It is a privilege and a gift to be able to do it. So, sharing the magical undersea realm is not just an honor, it is a responsibility. As Jacques Cousteau once said, "People protect what they love." My work is a request to fall in love, now.

Once you get a glimpse of and learn about the unseen world in the oceans, and its life-giving jewels, there is a universal response of "Love." You cannot help but love these gifts. Combined with commitment, love motivates sustainable

Mer coral and sponge series, *Marine Abstracts*. I returned and worked from May 2019 and onwards, for a year, on the coral and sponges, leading to the time of lockdown, when the pandemic reached the United States. I had never had an obsession with sponges before, but they pulled me in, with a marine tractor beam, on that Cayman trip.

By December 2020, the first Covid vaccine was developed, and I learned that it was modeled after the compounds in a sea sponge. I now understood why the sponges were getting

my attention. As the ocean's filter system, they clear bacteria, viruses, etc. This led me to learn that they were also the source of the first AIDS and cancer treatment. Again, our lives depend, in countless ways, on protecting our ocean and environment.

I had a few moments gifted to me in the Caymans. One was seeing my first spotted drum, a shy creature, at 100ft down on Cayman's North Wall. It had inspired one of my first designs, painted on dinner plates and large shields. So, I was over the moon, after 39 years of putting its pattern on my

work, to finally catch the beauty in person, before it hid under a rock. I was also tickled to see a pufferfish on this dive and—be still, my heart—an eagle ray, sailing by me from the wall to the infinite expanse.

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



*Manta Ray Shield*, by Marguerita Hagan (left). Hand-built ceramic, 21.5 x 34.5 x 10.25in, inspired by the manta ray, which is highly sensitive, social, intelligent and endangered.

*Leafy Sea Dragon Shield*, by Marguerita Hagan (right). Hand-built ceramic, 9 x 12 x 3.75in, inspired by the “leafies” that live off the southern and eastern coast of Australia.

*Stellate Diatom Thalassioema Colony Shield*, by Marguerita Hagan (below). Hand-built ceramic, 8 x 8 x 4in. Marine single-cell silica structure, housing plankton, forms star-shaped colonies. Photos this page by the artist.



## Marguerita Hagan

action, leading us to transform systems. We are intrinsically linked to the ocean, and it is in immediate need of our protection. Illuminating marine life invests in the mutual wellbeing of humanity and the planet.

One highlight in my environmental work experience was being part of a project at the American Geophysical Union (AGU) in Washington, D.C., in December 2018, when the AGU held its annual gathering of 26,000 earth and space scientists from around the world. I was honored to be one of two artists, along with two of the top coral scientists, and an American scientist's important work in Singapore, featured at AGU's fall meeting. We presented, “The Coral Reef Ecosystem: Observation, Configuration, Communication at the Intersection of Art and Science.”

At the core of the poster session was the concept that art and science are interconnected, each with the

power to inform people about our natural world and climate change, in particular. Thus, along with presentations of the 100 Island Challenge project of Sandin Labs at the Scripps Institution of Oceanography by Dr Stuart Sandin, the NOAA Coral Reef Watch program under Dr Mark Eakin, and Dr Nathalie Goodkin's work from Earth Observatory in Singapore, there were two artist presentations.

I exhibited a selection of my *La Mer* sculptures and shared inspiration from my marine research. Artist Diane Burko, who coordinated the event, shared her book, *Endangered: From Glaciers to Reefs*, which highlights her exhibition at the time at the National Academy of Sciences. The poster session served as an introduction to the associated panel, presented in a town hall meeting, including Sandin, Eakin, Goodkin, Burko and myself. Eakin was also the science specialist



on the Netflix film, *Chasing Coral* (a must-see, along with the documentary, *Mission Blue*, with “Her Deepness,” Dr Sylvia Earle, on Netflix.)

I have presented many times over the years, each one expanding the message to hearts and minds. The collaboration of art and science at the

AGU event, honoring our coral reef ecosystems, was a high-water mark. I look forward to ongoing opportunities to share my work and its message publicly with collaborators in art and science.

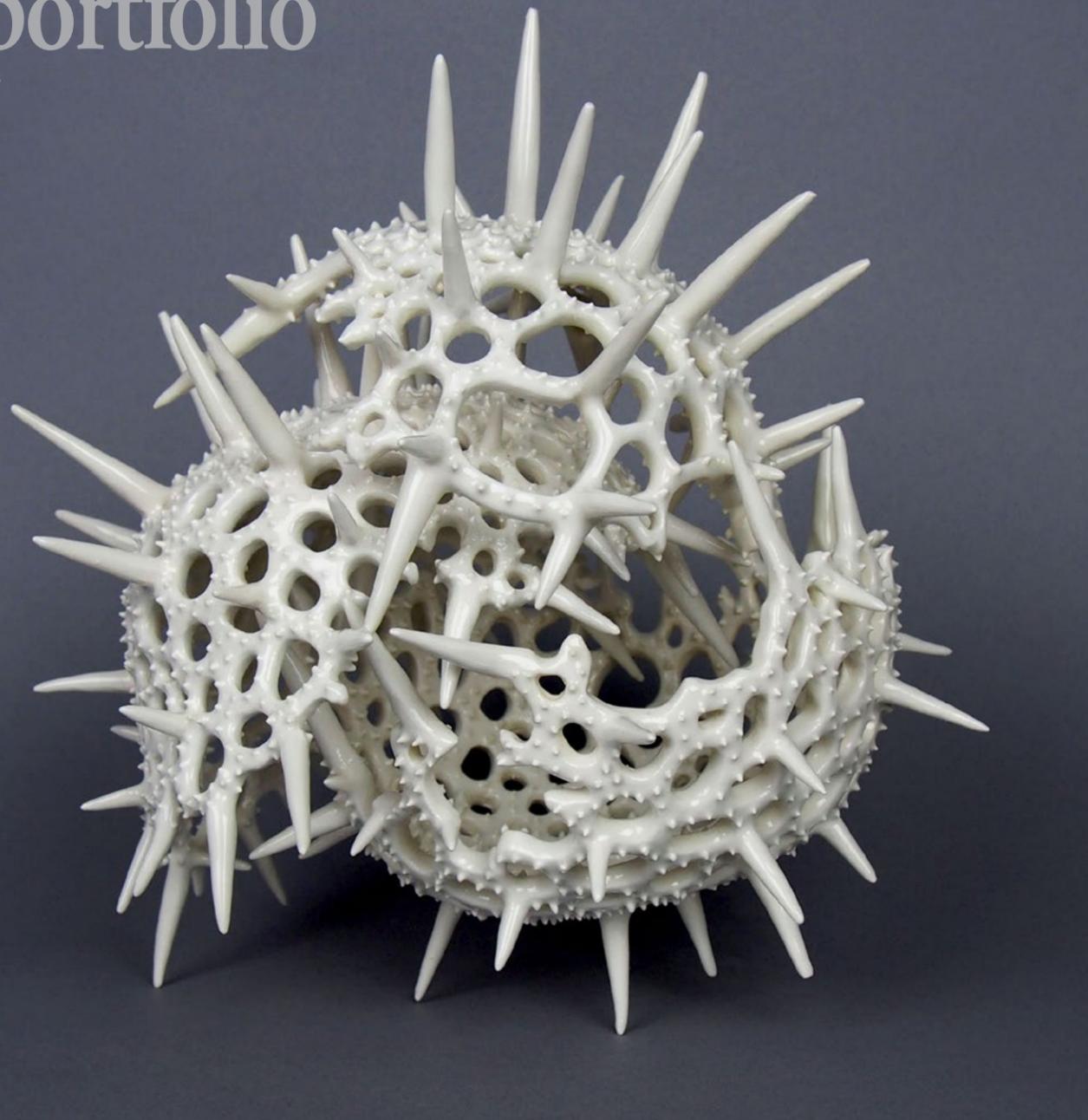
*X-RAY MAG: Several of your artworks embody complex science and marine biology. Please describe how you bring together art and science in your creative process.*

MH: It all started with my *Wildlife* work, 39 years ago. The launch of my *La Mer* series, eight years ago, accelerated this focus—the brilliant colors and patterns of tropical coral reef life to the abyss—evolving exponentially over the years. While preparing for

a solo show at Esther Klein Gallery, part of the University Science Center in Philadelphia, a new series was conceived. The curator, Angela McQuillan, offered me a solo show of my *Wildlife Shields*.

In preparation for an exhibit, I gather my species list—typically, a diverse list representing ecosystems around the globe. This time, however, 90 percent of the species I listed were from the ocean. I paused. I then revisited 19th-century artist and scientist Ernst Haeckel's drawings in *Art Forms in Nature*, originally published in 1899. I saw a page of exquisite spiky forms, which grabbed me by the shoulders. I was in love. These drawings were shields just waiting to be made! What they were, specifically, I was to discover, but the marine forms *had* me. I sensed I was going in deep and embarking on what would be a life-changing adventure.

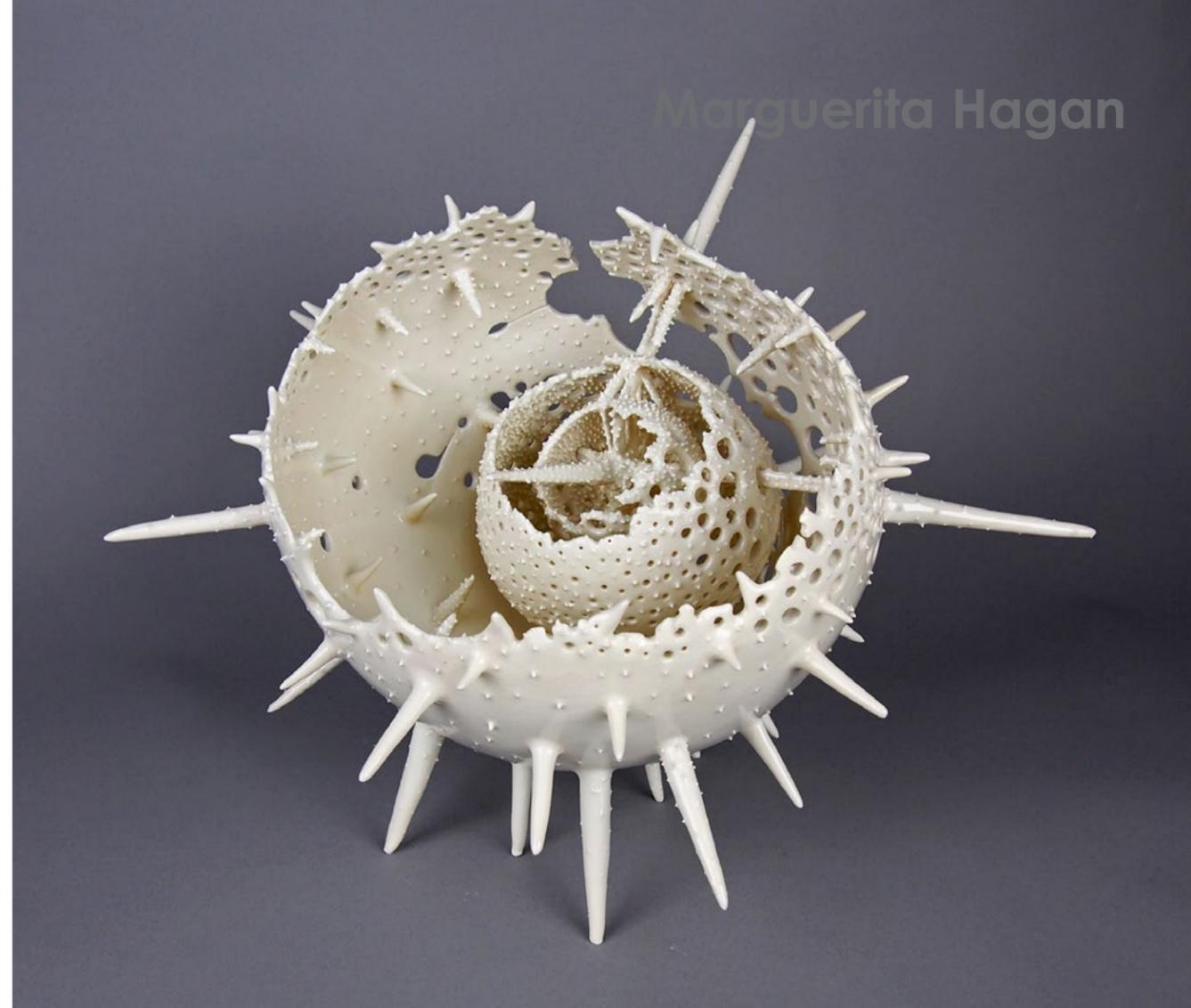
A new series was born devoted to



*Prickly Persistence*, by Marguerita Hagan (left). Hand-built ceramic, 9 x 9 x 9in. Celebrates the exquisite glass lace architecture and sustained life-giving aspects of one-celled radiolarians (zooplankton), which were some of the earliest life forms on Earth, developing with the Cambrian Period about 540 million years ago.

*Daughter Cells*, by Marguerita Hagan (right). Hand-built ceramic, 10.75 x 14 x 15in. A radiolaria-inspired abstract based on one-cell asexual reproduction, here splitting and producing second and even third "daughter cells."

*Perpetual Lophelia Pertusa*, by Marguerita Hagan (below). Hand-built ceramic, 5.75 x 6.5 x 4in. The radiating tentacles of this reef-building, deep-sea coral, intend continuous thriving of this endangered species. Photos this page by the artist.



Marguerita Hagan

the ocean, from micro primary producers to our largest living creature, the blue whale. *La Mer* set sail with the exhibit *Scintillare* at Esther Klein Gallery, during the first week of December 2015. That same week, world leaders gathered at the UN Climate Change Conference (COP21) in Paris. During my exhibition opening, they announced that they had extended the conference, and eventually reached a breakthrough on December 12th, 2015, known as the Paris Agreement. The only person in the talks not representing a country was Dr Sylvia Earle;

she was representing the ocean.

My environmental focus was not new, but it was time for a powerful human alert and response for a complete about-face towards positive change. *La Mer* was my answer to this call.

Through the exhibits, installations, residencies, collaborations and lectures with *La Mer*, I have connected to scientists, science museums, art and science residencies, lectures and projects. It has given me a voice and given voice to our planet's largest element, the ocean. I feel I have only just begun. There is much



ahead, and it is evolving with every new work, connection and sharing.

*X-RAY MAG*: On your website, you mention the interconnected relationship of all life on our planet and the fragile nature of our marine ecosystems. How does your artwork address these themes and what is the most important experience or message you want viewers of your artworks to have or understand?

MH: The comprehensive installation, *Interdependence*, embodies this spirit in fluid animation video projection, as well as its title, and the 139 *La Mer* ceramic sculptures swimming across the 33 x 15ft wall. The ceramic sculptures magnify the forms of microscopic organisms, anemones, squids, cuttlefish, manta rays and whales.

The installation was inspired by the 50th



*Broad Club Cuttlefish Shield*, by Marguerita Hagan (left). Hand-built ceramic, 22 x 15 x 8in, from Hagan's *La Mer* series, which plays on the idea of a shield, defined as an entity providing protection from harm. The cephalopod is the ultimate shapeshifter, color-changing technician, and indeed, cross-dresser. Found around the world, but absent in the Americas, it has three hearts, eight legs, "W"-shaped eyes and the largest brain of any invertebrate. Photo by the artist.

*Single-Cell Mingle*, by Marguerita Hagan (below). Hand-built ceramic sculptures, from 3 x 1.75 x 1.5in to 15 x 16 x 4in, featuring primary producers photosynthesizing from the sunlit layer of the ocean, including one-celled, microscopic radiolarians, foraminiferans, diatoms and dinoflagellates. Photo by the artist.

The Michener Art Museum presents  
**Rising Tides: Contemporary Art & The Ecology of Water**  
**INTERDEPENDENCE**  
 Marguerita Hagan, concept & ceramic  
 Richard W. Gretzinger, animation & video projection

A projection of Earth illuminating the ceramic flowing with ocean currents and a marine milky way, after a big picture and the interconnectedness of life. The initial video sequence is accompanied by the sound of space fading into a constant heartbeat of our planet's blue heart. The ocean, the most recognized photograph in the world, *The Blue Marble*, captured in 1972 by the astronauts of Apollo 17 became the symbol of Earth Day and today honors this 50th anniversary. A mother and calf humpback whale serenade as the lens and viewer plunge into the sea. Sculptures pulse and fade, creating reverberating ripples across the gallery walls. Mummuring plankton blooms immerse the sea and ceramic works in green to emphasize the one-cell organisms that provide over 50% of Earth's oxygen. Hagan plays with scale and the diversity of marine ecosystems, from microscopic to massive organisms like coral and the blue whale. *Interdependence* emphasizes the wonder and critically fragile state of our planet as a result of climate change from human damages. Hagan magnifies what is invisible to most, although its well-being is deeply intertwined with our own. She advocates for responsibility for our impact and relationship to the environment as if our lives depend on it, because they do. If colonies of microscopic organisms have supported the entire planet for millions of years, imagine what we can achieve together.

Curated by Laura Turner Igoe, Ph.D., Curator of American Art  
 Exhibition: July 20th, 2020 - January 10th, 2021  
 More information: michenerartmuseum.org, margueritahagan.com, richgretz.com

**LEGEND**

1. Dinoflagellate <i>Omnithocercus Magnificus</i> ; ceramic	19. Dinoflagellate <i>Ceratium Vultur</i> (Trio colony); ceramic	37. Diatom <i>Odonella Trio Colony</i> ; ceramic
2. Maria Bay; ceramic with luster	20. Dinoflagellate <i>Ceratium Longicolum</i> ; ceramic	38. Diatom <i>Odonella Pellis Shield</i> ; ceramic
3. Star Coral; ceramic with luster	21. Dinoflagellate <i>Ceratium Longicolum</i> ; ceramic	39. Humpback Whale Shield, Megaptera Novaeanglor; ceramic
4. Radiolaria <i>Cyrtolidea 1</i> ; ceramic	22. Dinoflagellate <i>Ceratium Fusus</i> ; ceramic	40. Radiolaria <i>Cyrtolidea 1</i> Shield; ceramic
5. Dinoflagellate <i>Fusus Partners</i> ; ceramic	23. Dinoflagellate <i>Ceratium Furcoides</i> ; ceramic	41. Broad Club Cuttlefish Shield, Sepia Latimanus; ceramic
6. Bird Cage Foraminifera; ceramic	24. Dinoflagellate <i>Ceratium Gravulum</i> (small); ceramic	42. Blue Whale; ceramic with luster
7. Dinoflagellate <i>Ceratium Furcoides</i> ; ceramic	25. Dinoflagellate <i>Ceratium Gravulum</i> , medium; ceramic	43. Grand Skeleton Diatom Colony; ceramic with luster
8. Dinoflagellate <i>Ceratium Furcoides</i> ; ceramic	26. Dinoflagellate <i>Ceratium Gravulum</i> , medium; ceramic	44. Dinoflagellate <i>Ceratium Arcticum</i> (large); ceramic
9. Dinoflagellate <i>Ceratium Candelabra</i> ; ceramic	27. Pellis Skeleton Diatom Colony (center of image); ceramic	45. Sea Anemone; ceramic
10. Dinoflagellate <i>Ceratium Furca</i> ; ceramic	28. Individual Medium <i>Thalassionema</i> ; ceramic	46. Frilly Squid; ceramic
11. Dinoflagellate <i>Ceratium 1</i> ; ceramic	29. Skeleton Diatom Colony; ceramic	47. Diatom <i>Kilonia Eborata</i> ; ceramic
12. Dinoflagellate <i>Ceratium Ranpes Spectaculare</i> ; ceramic	30. Diatom <i>Thalassionema Cross</i> (7); ceramic	48. Beautiful Swimmer, Blue Crab Shield; ceramic
13. Dinoflagellate <i>Ceratium Ranpes 2</i> ; ceramic	31. Diatom <i>Thalassionema</i> (8) Strand; ceramic	49. Diatom <i>Odonella</i> Shield; ceramic
14. Dinoflagellate <i>Ceratium Ranpes 2</i> ; ceramic	32. Diatom <i>Thalassionema</i> (7) Strand; ceramic	50. Diatom <i>Fragilopis</i> ; ceramic
15. Dinoflagellate <i>Ceratium Ranpes</i> (small); ceramic	33. Diatom <i>Thalassiothrix Spatulatas</i> (5); ceramic	51. Skeleton Diatom <i>Thalassionema</i> Colony Shield; ceramic
16. Dinoflagellate <i>Ceratium Ranpes</i> (small); ceramic	34. Star Shaped Foraminifera <i>Protistas</i> ; ceramic	52. Chain <i>Cochlodinium Polykoides</i> , Dinoflagellata; ceramic
17. Dinoflagellate <i>Ceratium Arcticum</i> (small); ceramic	35. Radiolaria <i>Androcyclos Gomphonychia</i> ; ceramic	53. Eastern Emerald <i>Elysia Chlorotica</i> ; ceramic
18. Dinoflagellate <i>Ceratium Arcticum</i> ; ceramic	36. Diatom <i>Odonella</i> ; ceramic	

anniversary of Earth Day, on April 22, 2020, which the Michener Art Museum celebrated in the exhibit, *Rising Tides: Contemporary Art and the Ecology of Water*, curated by Laura Turner Igoe. I chose to lead with the first image of our blue planet fully illuminated by the sun, which was taken by the

astronauts of Apollo 17 when they broke protocol from their strict schedule. The most recognized photograph on Earth, *The Blue Marble*, became the iconic symbol of Earth Day.

In the installation, the *La Mer* sculptures flow with the ocean currents around Antarctica and Africa, and the



surrounding oceans. When viewers approach the wall, their shadows are intentionally imposed on the installation. We

See **videos and legend** about sculptures and species in the installation, *Interdependence*

leave a mark wherever we are, and seeing one's life-size impression on our planet and oceans makes a bold statement. The only impact we have time for now, or ever, is a positive one. The inclusive title of the installation, *Interdependence*, illuminates the

message in my work. The video projection with audio, mapped onto the *La Mer* sculptures, creates an immer-

sive experience, presenting the big picture, with highlights on the jewels of our oceans and our responsibility as stewards. *Interdependence* is a collaboration with cinematographer and friend Richard W. Gretzinger who mastered the video and animation. There are four two-minute segments in the looping eight-minute animated video (*Earth, Dive, Plankton and Stillness*).

Engaging viewers to step into this inclusive perspective raises wonder, awareness and action for a complete change in the way we see and live, during this increasingly critical time on Earth.

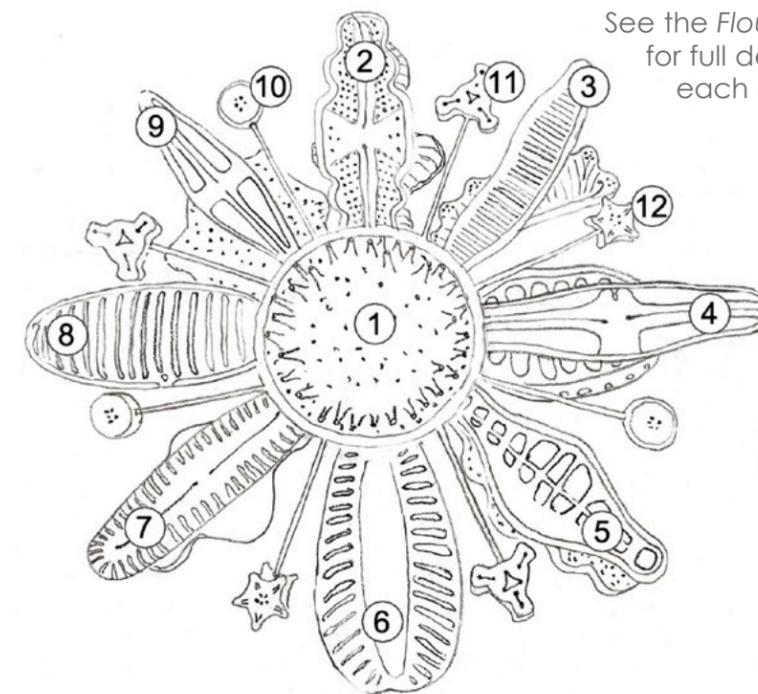
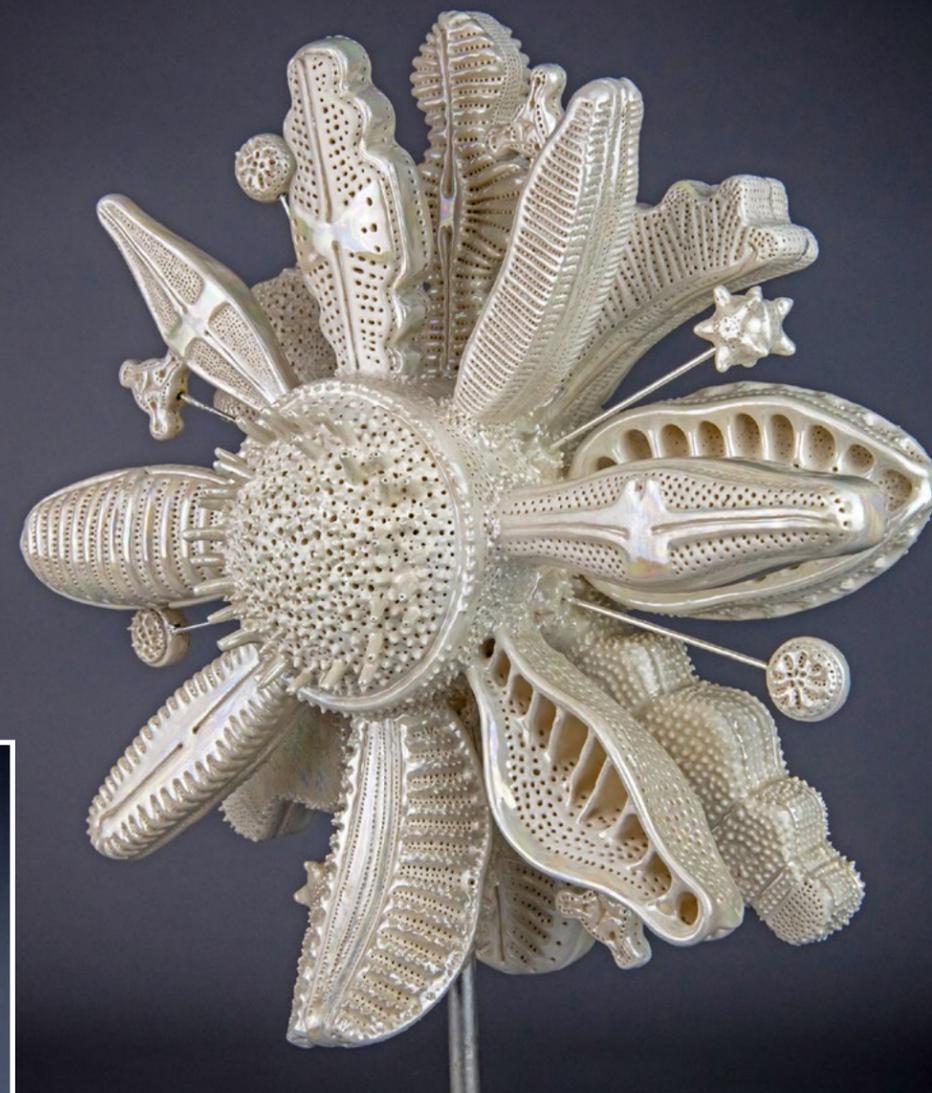
The video starts with Earth as seen by the astronauts on the

1972 mission. This is our home, and we are part of a vast and interconnected universe. We hear the sound of space (NASA sonifications) with a subtle heartbeat. Dr Sylvania Earle calls the ocean the blue heart of our planet and we must take care of her heart. As the video zooms into the sea, one can hear mother and calf humpback whales begin to sing to each other.

The one-celled marine organisms in the sunlit layer of the ocean produce our every other breath. Their engineering expands with the exquisite colonies that serve the greater good. It is time we got the memo. They are microscopic, but they power our planet at



*Flourish*, by Marguerita Hagan. Hand-built ceramic, steel, silver leaf, 10 x 11 x 7in. View A (right) *Diatoms: Ice & Snow*; View B (below) *Diatoms: Matriarchal Homage*; Detail of View A (left). Created for the *Invisible World of Water* exhibit at the Academy of Natural Sciences of Drexel University in Philadelphia, this sculpture is a blossoming homage to the wonder of diatoms—microalgae, which are phytoplankton, found in oceans, waterways and sediment. Photos by Richard W. Gretzinger.



See the *Flourish* legend for full details of each diatom.

the macro level, which can be seen in satellite video from space of plankton blooms in spring. *Interdependence* brings this to light with the sequence of swirling green, dancing across the installation.

Water is life, and protecting the environment is essential for our own survival. Mother Nature will thrive without us, but our lives depend on her.

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

MH: Artists historically have been among the pioneers of new ideas and directions. Typically living “outside the lines” of the mainstream offers an expansive perspective for those lucky to see and feel it. Look to art across the timeline to get the pulse of consciousness at any given era. This role is an investment and responsibility, especially at this intense time on our planet. Everyone makes a difference, and working together

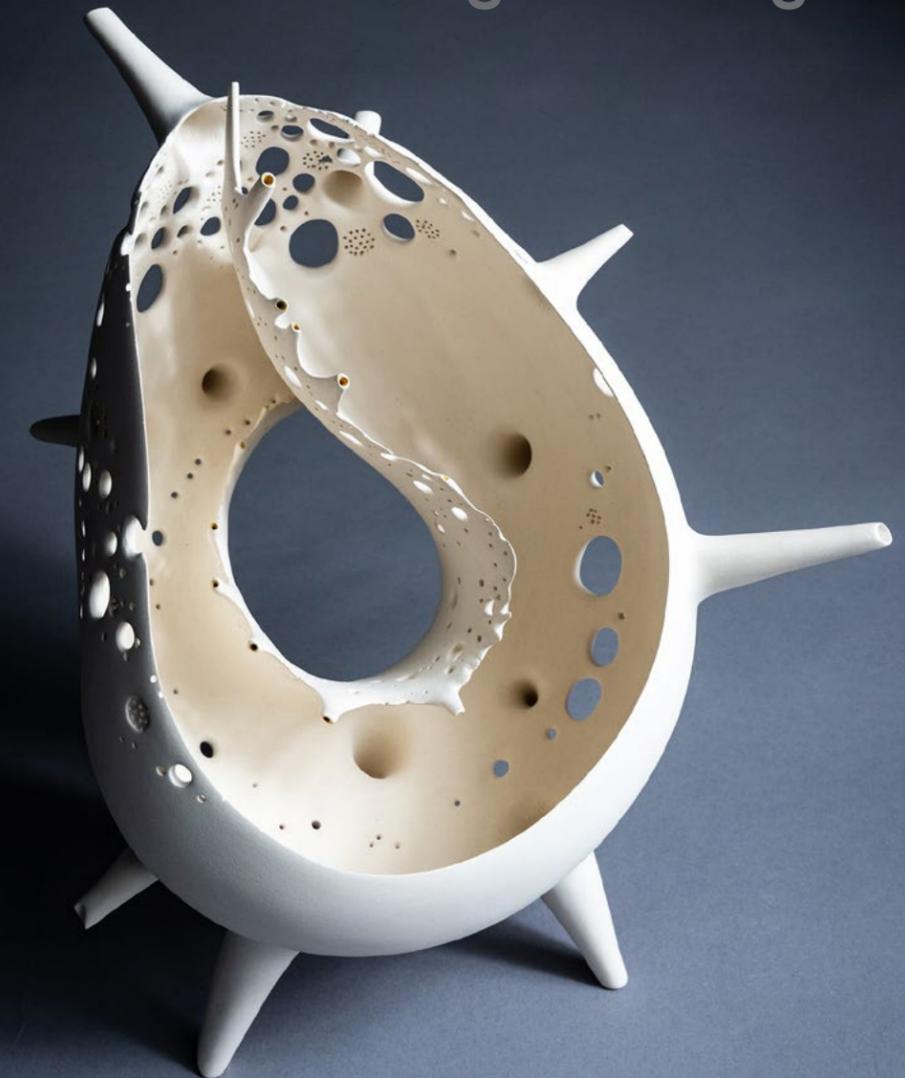
is how we can transform systems into inclusive support. Dive in and keep following your vision. Connect with those of like mind and spirit to build community. “No one is an island,” indeed. Look at coral reef communities for an inspiring model.

Jacques Cousteau said we need to play more. He once described that he and Émile Gagnan were “playing” in 1943, when they invented a self-contained system that made it possible to breathe for long periods of time underwater. Curiosity and imagination gave us scuba, and a self-contained underwater breathing apparatus was born 80 years ago.

Just 67 years ago, an underwater camera was designed for Cousteau by Belgian engineer, Jean de Wouters. It was the year 1956, and the camera was called the

Calypso-phot. Look at how rapidly technology has raised our perspective and visual communications, and where we are today. As challenging as it is on our planet, there are equally extraordinary developments, discoveries and inventions every moment.





*Evolvō, Life Story*, from the *Micro Grow* series, by Marguerita Hagan (above and top center). Ceramic, 6.5 x 6 x 5.75in. Photos this page by Ananda Connolly.

*Star Dust*, from the *Micro Grow* series, by Marguerita Hagan (above and left). Ceramic, gold leaf, 8.25 x 10.75 x 9.5in.

We must keep our sights high above the horizon and trust in the infinite resourcefulness within and around us.

We are in this together, and the only way forward is inclusively. It can be overwhelming at times, but we must remember that in this spirit, every positive intention makes a difference, and with focus, manifests into action. Each step, no matter how small, creates a positive shift moving us forward collectively.

You are not alone. We are united through the most beneficial outcome

possible. Consider the diatoms that have been contributing to our atmosphere for over 200 million years, one microscopic cell at a time. As the human family and ambassadors of our beautiful blue planet, turning this ship around requires shifting our perspective. It is an ongoing process and continual adaptation, learning and creating sustainably. Everyone's voice and gifts play a unique role and contribution.

*X-RAY MAG:* Your projects with students and young people are inspiring. Please share with us your approach to art in education as well a memorable moment with the students.

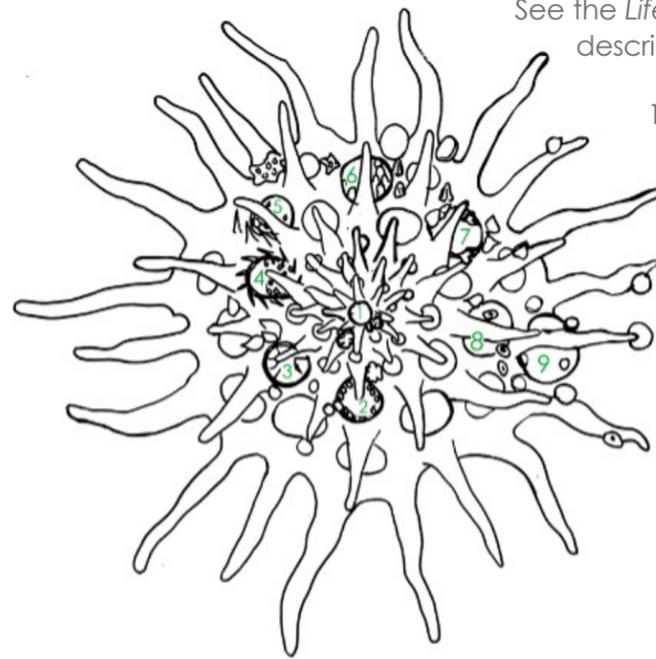
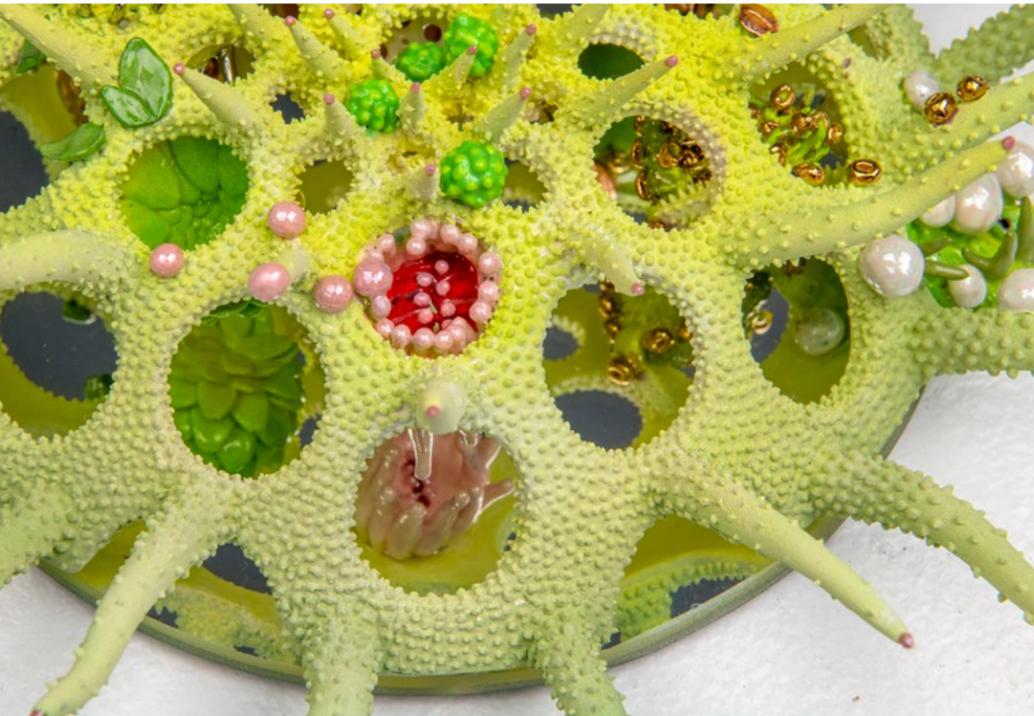
MH: Everyone has a dream and path of their own. As a teacher, it is a joy to support individuals in cultivating their own voices and visions. Over my career, I have worked with children from age three to 103 years old. Intergenerational projects hold a special place

in my heart. I have had the privilege of working with bright and brave souls on inspiring projects.

There are two examples on my **Projects** webpage and more to be included. Let me share the permanent installation at Westtown Friends School entitled, *Primary Producers: Primary Artists*. I was invited by teaching artist, Jeff Waring, to guide his pre-kindergarten, kindergarten and first-grade artists on an expedition. Being "primary students," the jewel-like marine "primary

producers" felt like a perfect focus.

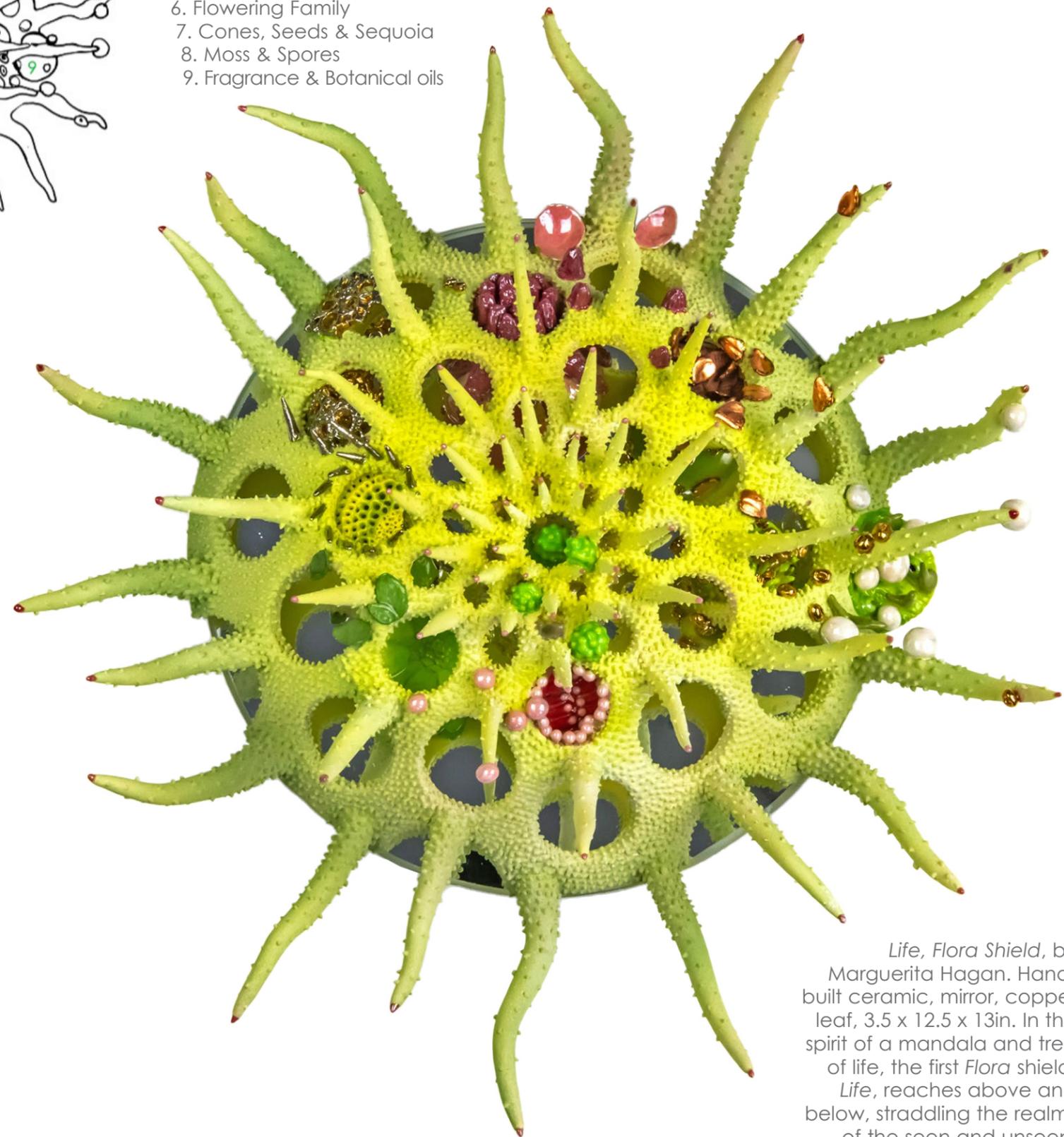
We studied the microorganisms of the sunlit layer, their essential role, and our need to care for them and the ocean. Children are natural artists, and this was a brilliant experience, watching them soar with their drawings, works in clay, and paintings. You can see the gorgeous results, and it was so fun that the installation was placed by the entrance to the playground.



See the *Life, Flora Shield* **legend** for full description of microorganisms in each realm:

1. Phytoplankton
2. Coral Reefs
3. Leaf Engineering
4. Grasses
5. Cactus
6. Flowering Family
7. Cones, Seeds & Sequoia
8. Moss & Spores
9. Fragrance & Botanical oils

Detail of *Life, Flora Shield*. The mirror inside the sculpture reflects the interior, and ourselves, as we peer into it. Photos this page by Richard W. Gretzinger.



*Life, Flora Shield*, by Marguerita Hagan. Hand-built ceramic, mirror, copper leaf, 3.5 x 12.5 x 13in. In the spirit of a mandala and tree of life, the first *Flora shield*, *Life*, reaches above and below, straddling the realms of the seen and unseen.

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

MH: As an activist for thriving, mutually sustainable communities and environments, “interdependence” is the focus of my practice, in my sculpture, teaching and community arts. I am inspired by life’s interconnected and diverse wonders, both within and around us.

Nature has been modeling this forever, be it microorganisms forming exquisite colonies to produce more oxygen collectively, oak tree roots grafting for miles in interconnected systems, or the “wood wide web” of mycorrhizal fungi mutualism. It is this light force that has enabled all life to thrive for eons that fuels my practice. We must work together

er to move forward in all ways socially and environmentally, as if our lives depend on it, because they do.

Supporting each other, especially our younger generations, is a part of this inclusive perspective. Seeing and realizing possibility in ourselves, each other, and everything around us is powerful and a lot more fun. We have to have fun and be kind.

This message is beyond critical now, as we have tipped our planetary scales. Broadcasting these little-known, mighty, marine beauties serves as a climactic wake-up call. The time is now for humans to take responsibility for our dire damages and dive into imperative restoration.

If one-celled organisms can support the entire planet for millions of years, imagine what

we can do when engaged together. ■

See videos in the installation, *Interdependence*, at: [margueritahagan.com/installations](http://margueritahagan.com/installations)

More information and views of the sculptures can be seen at: [margueritahagan.com](http://margueritahagan.com). Follow the artist on Instagram [@marguerita](https://www.instagram.com/marguerita).

See the artist’s current **exhibits**. Click on the links below for more information:

**In The Umbra**, at Chimaera Gallery until 28 Oct. 2023

**Magnificare**, at the HUB-Roberson Galleries until 22 Feb. 2024

**No Synthetic Colors**, at the Pennsylvania Academy of Fine Arts until 7 Apr. 2024