Complacency in Diving :: Spirits Discovered on Old Wrecks :: Contributors' Picks – Opposites

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Canada
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Profile
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Papua New Guinea Wrecks

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Sequential Shots

Portfolio
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THE PHILIPPINES
Romblon

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COVER PHOTO: Flower butterfly seaslug, *Cyerce sp.*, Romblon, Philippines
Photo by Kate Jonker (**katejonker.com**)

contents

Pout fish on the *Saganaga* wreck, Newfoundland, Canada. Photo by Brandi Mueller

Justice for All Sentient Beings?

Most of us will agree that we should not be cruel to animals but treat them nicely. We have animal welfare laws in place, for example, and pet owners will testify that their animals—often considered members of the family—have personalities and feelings. It is also widely accepted that a number of wild animals possess considerable intelligence and social skills, such as primates, marine animals, and some birds, to name a few.

Some animals even have certain rights or protections. Neglecting or mistreating pets or livestock is, in most places, a crime and animal welfare laws dictate that livestock should be provided with tolerable living conditions and enough stimuli, and they should not suffer any unnecessary pain.

But which animals do such rights and duty of care extend to? Just the familiar species, such as those we keep as pets, raise as livestock, or think are cute?

How about the sentient beings we encounter in the ocean?

Our appreciation of sharks has come a long way since the days when they were considered fearsome monsters and single-minded eating machines to our current understanding of them today as quite intelligent and sentient beings, with social interactions and structure. But does that mean they should also have legal rights?

The prominent philosopher and ethicist Martha Nussbaum thinks so.

Her "Capabilities Approach" is a philosophical framework that aims to provide a more comprehensive and human-centred perspective for evaluating well-being and social justice.

In her recent book, *Justice for Animals* (which I aim to review in the future), she argues for an expansion of her influential approach, to encompass all sentient beings. She makes a good case albeit one fraught with challenges, including some cultural and legal in nature.

It also made me speculate what counts as "sentient." As we have frequently covered in this publication, even smaller fish have cognitive skills once thought way beyond them, and feelings too.

Crustaceans are known to feel pain, fear and stress, and are likely to also have cognitive skills that we just have not documented yet.

But what about even smaller critters? What, if anything, do they think and feel? There simply is no agreed to minimum size of brain considered capable of supporting sentience, so we cannot rule it out.

The philosophical, ethical and legal implications are enough to make my brain hurt. That being said, it is quite clear that sentient beings matter, and we must do better by them.

When I dive, I therefore do not take anything for granted but acknowledge that even the smallest and seemingly insignificant creature just might be capable of some degree of sentience.

This realisation has not only left me more careful and respectful around other life forms, but has also added to the sense of wonder, profound as it already is, that has made diving so fulfilling.

— Peter Symes
Publisher & Editor-in-Chief

Edited by
Peter Symes

Endangered corals show encouraging resilience

A recent study reveals that endangered elkhorn coral off the coast of Florida demonstrates resilience through natural adaptation, offering hope for coral reef preservation.

In the face of daunting challenges to our planet's coral reefs, a glimmer of hope emerges from Florida's coastal waters.

Scientists from Ohio State University discovered that the endangered elkhorn coral population in the Dry Tortugas National Park in Florida were highly resilient in its ability to adapt and thrive, despite adverse factors like climate change, pollution and disease outbreaks.

In their study, they observed that the coral colonies were successfully reproducing and expanding their population through a natural process called fragmentation. As portions of the coral broke off, the fragments settled in new locations and continued to grow, allowing the species to establish new colonies in otherwise challenging environments.

The site where the elkhorn coral colonies were found had a propensity for periodic upwellings in which bursts of nutrient-rich water rose up to the surface from colder, deeper waters. This subsequently created favorable conditions for the corals to thrive and reproduce.

These little pulses of extra food can make a big difference in coral survival and the things we measured are consistent with that interpretation.

— Andréa Grottoli, Professor of Earth Sciences, Ohio State University

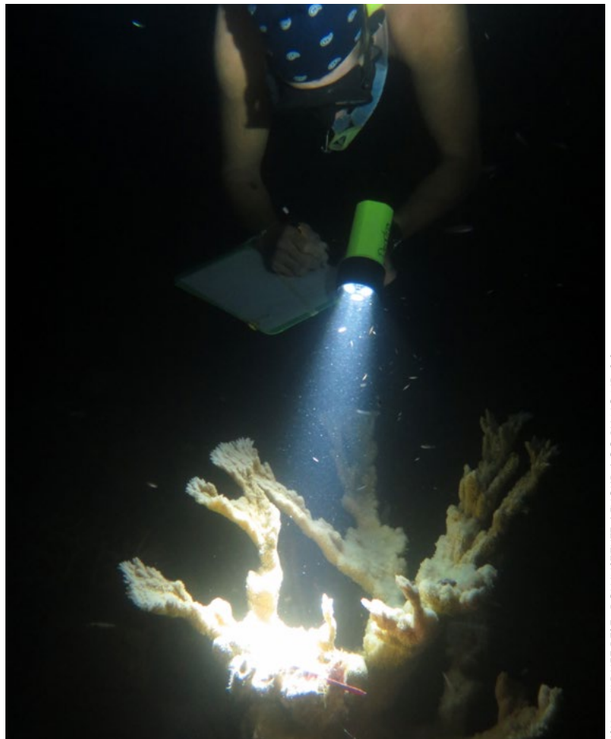
Nature's resilience

The National Oceanic and Atmospheric Administration (NOAA) has recognized the elkhorn coral's significance and its role in maintaining the biodiversity and health of coral reef ecosystems. In fact, the coral is listed as a threatened species under the Endangered Species Act, highlighting the urgent need to protect and restore their marine habitats. As scientists and conservationists search for solutions to preserve coral reefs, this discovery of the elkhorn coral's resilience is a reminder of nature's ability to adapt and recover. By combining research, conservation efforts and global cooperation, there is hope that our coral reefs can continue to thrive and remain a part of our planet's marine biodiversity. □

SOURCE: OHIO STATE UNIVERSITY

JOHN BROOKS, NATIONAL PARK SERVICE / PUBLIC DOMAIN

Health profiles of the elkhorn coral greatly differed among five examined areas, but the coral samples in the Dry Tortugas thrived compared to all the other sites.



US FWC FISH & WILDLIFE RESEARCH INSTITUTE / FLICKR / CC BY-NC-ND 2.0

Researcher observes elkhorn coral spawning in the Dry Tortugas.

Record number of loggerhead turtle nests in Florida

As of the end of July, Loggerhead Marinelife Center documented a record-breaking 22,469 loggerhead turtle nests on their local beaches in Florida.

Loggerhead Marinelife Center (LMC) is a non-profit education and ocean conservation facility located on the Atlantic Ocean in Palm Beach County, Florida. The research team at LMC monitors a 9.5-mile stretch of beach from Juno Beach up to Jupiter Island between March and October. Juno Beach is one of the world's most densely nested sea turtle beaches in the world!

As of the end of July, the research team documented record-breaking nesting numbers, now totalling 22,469 nests to date this season on local beaches.

With another three months to go, this year's nesting count has already beaten LMC's previous record set in 2019, totalling 20,998 nests.

Nesting behaviour

Loggerhead sea turtles (*Caretta caretta*) exhibit a remarkable nesting behaviour. These ancient mariners return to their birthplaces to lay their eggs, typically under the cover of darkness. The female loggerheads laboriously dig nests in the sand using their flippers, depositing around 100 to 126 eggs per clutch.

These nests are carefully camouflaged, aiding in their protection from predators and environmental factors. After an incubation period of about 55 to 60 days, the hatchlings emerge and instinctively make their way to the ocean, guided by the moonlight's reflection on the water.

Unfortunately, due to various threats, including habitat loss and climate change, protecting these vital nesting sites has become crucial for the survival of these magnificent creatures. □

SOURCE: LOGGERHEAD MARINELIFE CENTER

PEGGY ORSULAK/USFWS VOLUNTEER / PUBLIC DOMAIN

Newly hatched loggerhead sea turtles

SARAH ACKERMAN / CC BY 2.0

Great Barrier Reef narrowly escapes UNESCO World Heritage downgrade

Amid mounting climate change concerns and looming El Niño summer, the iconic Great Barrier Reef narrowly dodges a World Heritage status downgrade from UNESCO, underscoring the urgency for intensified global conservation efforts.

Australia's Great Barrier Reef, a UNESCO World Heritage site since 1981, narrowly avoided a downgrade to the "in danger" status during a recent meeting of the World Heritage Committee. The decision was made despite the repeated warnings by experts about the escalating impact of climate change on the world's largest coral reef system.

Australia's conservation efforts acknowledged

UNESCO acknowledged Australia's efforts towards preserving the reef but cautioned that intensive actions were still required. The Australian government's Reef 2050 Plan, dedicated to improving the reef's health, was lauded as a considerable effort, albeit alongside concerns over its effectiveness in the face of worsening climate phenomena like the intensifying El Niño cycles.

In this context, it is important to acknowledge the Australian Institute of Marine Science's (AIMS) reminder that the reef's health is not a binary situation of "fine" or "dying". AIMS emphasises the complexity of the Great Barrier Reef's health, stating that it is in a constant state of flux influenced by a myriad of stressors.

Rising concerns over marine heatwaves

The Great Barrier Reef has undergone unprecedented bleaching events in the past five years, driven by prolonged marine heatwaves. A recent marine heatwave in northeastern Queensland set off alarms over the reef's health, sparking concerns about a potential severe bleaching event in the upcoming summer, heightened by the anticipated El Niño conditions.

Just a reprieve

Preservationists worldwide view the UNESCO decision as a reprieve, emphasising the reef's survival as a global responsibility. Australia's efforts to mitigate climate change, coupled with international collaboration, are crucial for preventing the reef from facing the "in danger" status in future assessments.

The UNESCO status reprieve should not lull anyone into complacency. The complexity of the reef's health requires continuous, comprehensive and adaptive management strategies.

The threat of downgrading highlights the urgent need for effective climate action to preserve the precious ecosystem of the Great Barrier Reef, which supports a vast array of marine life and contributes significantly to Australia's economy through tourism. □ SOURCES: CNN, THE GUARDIAN, THE SYDNEY MORNING HERALD

SCHMIDT OCEAN INSTITUTE / VIA PRESS RELEASE

Researchers found *Muusoctopus* nursery grounds on a low-temperature hydrothermal vent off the shore of Costa Rica. The octopuses hang on to the rocks in inverted positions in order to protect their eggs.

Octopus nursery discovered in Costa Rica

International scientists have identified a new deep-sea octopus nursery off the coast of Costa Rica. This revelation, combined with the confirmation of a previously known nursery's activity, brings the total number of known octopus nurseries worldwide to three.

The team, aboard the Schmidt Ocean Institute's research vessel Falkor, located the nursery nearly 2,800m below the ocean's surface. The expedition's footage, captured by the underwater robot ROV SuBastian, showcased breathtaking marine life, including octopus hatchlings, tripod fish, and vibrant coral gardens.

The site, situated near low-temperature hydrothermal vents, was teeming with mother octopuses brooding their eggs and newly hatched young. Intriguingly, the octopuses observed might represent a new species within the *Muusoctopus* genus, which notably lacks an ink sac.

Historically, the Dorado Outcrop was the first site where scientists observed female octopuses congregating to brood their eggs. However, the absence of developing embryos during its initial discovery in 2013 led to speculations about the site's suitability for octopus growth.

This recent expedition has dispelled those doubts, with scientists witnessing the miraculous moment of octopuses hatching.

Beyond the nurseries, the expedition explored five previously unknown seamounts in Costa Rican waters, revealing a rich biodiversity. Many of the creatures discovered are suspected to be new species.

Jorge Cortes, a marine biologist from the University of Costa Rica, emphasized the significance of these findings for Costa Rica, stating that the data will be instrumental in "raising awareness of what we have and why we should protect it." See **video >>>**

SOURCE: SCHMIDT OCEAN INSTITUTE

We estimate a collapse of the AMOC to occur around mid-century under the current scenario of future emissions.

— Ditlevsen et al

Is the Gulf Stream about to collapse?

As climate change accelerates, the Gulf Stream shows signs of instability. Is a collapse imminent, or is the narrative more nuanced?

A study just published in *Nature Communications* suggests that the Atlantic Meridional Overturning Circulation (AMOC), of which the Gulf Stream is a part, could be approaching a tipping point. The AMOC, which has been gradually weakening over the last century and is reportedly at its weakest in over a millennium, could shift from its current strong mode to a weak one, with profound implications for the global climate.

The potential collapse of the Gulf Stream might have far-reaching impacts, which got a lot of commentators and the general public alarmed. It could disrupt rainfall patterns, affecting billions of people in India, South America and West Africa who rely on these rains for food. It could also increase storms and lower temperatures in Europe, raise sea levels off eastern North America, and further endanger the Amazon rainforest and Antarctic ice sheets.

The salient point

The Gulf Stream itself is, however, mainly driven by the rotation of the Earth so in order for it to collapse the Earth would have to stop spinning. What climate scientists are worried about is that the Atlantic Meridional Overturning Circulation stops.

Dissent

However, not all scientists agree on the immediacy of such a collapse. As reported by *Scientific American*, some experts argue that the evidence for an imminent shutdown is insufficient. They say that the Gulf Stream is more resilient than currently portrayed and that its collapse is not imminent.

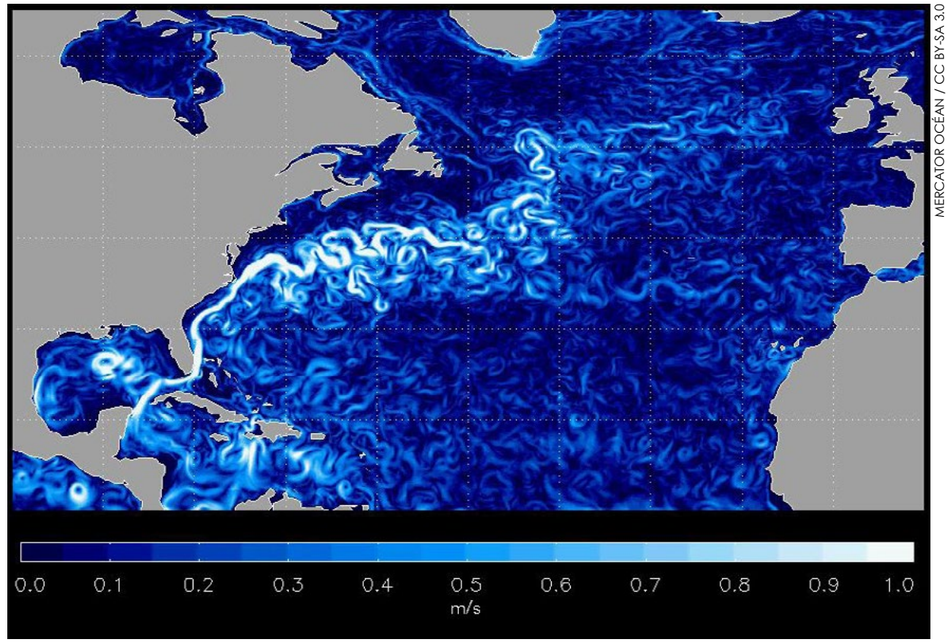
They point out that while the AMOC is weakening, it is unlikely to fully collapse within the next 100 years. The Intergovernmental Panel on Climate Change shares this view, stating that there is "medium confidence" the AMOC will not collapse before the end of this century.

Complicated matter

The debate is further complicated by the limitations of climate models, which may underestimate the AMOC's weakening. Some scientists argue that these models do not adequately simulate the influx of freshwater from melting ice, a major factor in the current's slowing.

Our knowledge about these complex systems is insufficient. We don't even know which changes to prepare for.

— Sabine Hossenfelder



MERCATOR OCEAN / CC BY-SA 3.0

The Gulf stream current and its speed

The complexity of the AMOC system and the uncertainty over future global heating levels make it challenging to predict the exact timing of a potential collapse. However, the severity of the potential impacts means that this is a risk we cannot afford to take. As one scientist puts it, "The signs of destabilization being visible already is something that I wouldn't have expected and that I find scary."

Despite these differing viewpoints, the consensus is clear: The Gulf Stream is a critical component of our global climate system, and its potential collapse should not be taken lightly. As we continue to grapple with the issue, it is clear that every step we take towards reducing greenhouse gas emissions is a step away from the tipping point.

Background article

An article in *X-Ray Mag* #11, entitled, "Ocean conveyor belt—the thermohaline circulation," explains how the globe is encircled by a pattern of ocean currents known as the ocean conveyor belt. Heat is transported from the equator towards the poles by both the atmosphere and by ocean currents, with warm water near the surface and cold water at deeper levels. **Read more >>>** □

SOURCE: NATURE

Atlantic Meridional Overturning Circulation (AMOC)

The Atlantic Meridional Overturning Circulation (AMOC) is a system of ocean currents that transports warm, salty water from the tropics to the North Atlantic. As the water cools and sinks in the north, it flows back towards the equator at depth, creating a "conveyor belt" of ocean circulation.

The AMOC plays a crucial role in regulating Earth's climate by distributing heat and influencing weather patterns. However, climate change is causing the AMOC to weaken, potentially disrupting this balance. Scientists are closely monitoring the AMOC as its collapse could have far-reaching impact on global climate. □

Edited by
Peter Symes

BERNARD DUPONT / CC BY-SA 2.0

When the trumpetfish swims alongside another species, it either remains hidden or is not recognised as a threat due to its altered shape.

The trumpetfish's unique hunting strategy

An experiment on coral reefs provides the first evidence that predators use other animals for motion camouflage to approach their prey without detection.

The trumpetfish, with its long, slender body, shadows non-threatening species like the parrotfish. This allows it to get closer to its prey, such as damselfish, without being detected. Dr Sam Matchette, a leading researcher from the University of Cambridge, explains that when the trumpetfish swims alongside another species, it either remains hidden or is not recognised as a threat due to its altered shape.

Research conducted in the Caribbean Sea involved using 3D-printed models of trumpetfish and observing the reactions of damselfish colonies. When the trumpetfish model was shadowing a model of a herbivorous parrotfish, the damselfish did not detect the predatory threat, showcasing the effectiveness of this camouflage strategy.

Adaptive response

With coral reefs globally facing threats like climate change and overfishing, the trumpetfish's shadowing behaviour might be an adaptive response. Dr James Herbert-Read from the University of Cambridge suggests that as reef structures diminish, this stealthy approach could become more prevalent.

This study, a collaboration between the University of Cambridge and the University of Bristol, highlights the innovative ways marine life adapts to environmental challenges. The trumpetfish's shadowing behaviour offers a fascinating glimpse into the intricate dynamics of underwater ecosystems.

What is motion camouflage?

Motion camouflage is a dynamic form of concealment employed by certain animals during movement. Instead of remaining stationary or blending into their surroundings, these animals move in such a way that they appear stationary to their target, despite getting closer. This is achieved by maintaining a consistent angle between themselves and their target during approach.

Predators use this tactic to stealthily approach prey, while some species use it to avoid detection by predators. The strategy minimizes the apparent motion of the camouflaging animal relative to the target, allowing for a covert approach. See **video >>>**

SOURCE: CURRENT BIOLOGY

Sea stars can help to restore kelp forests

Endangered sunflower sea stars show promise in restoring kelp forest health.

The sunflower sea star was once a common sight along North America's Pacific coast. Although it is now an endangered species, scientists are hailing it as a potential saviour of the region's threatened kelp forests.

Recent research reveals its crucial role in controlling the population of kelp-eating urchins, thus offering a glimmer of hope for these vital marine ecosystems.

Preying on kelp grazer

Scientists at Oregon State University have discovered that sunflower sea stars prey on significant numbers of kelp-eating urchins. This predation can help to maintain, and potentially restore, the health of kelp forests.

"What we saw suggests a clear link between the crash of sea stars, the explosion in sea urchin populations, and the decline in kelp," said paper co-author Sarah Gravem, a Research Associate at the university's department of integrative biology.

Impact of sea star decline

The sunflower sea star's role in this ecological balance should not be taken lightly, given the recent 90.6 percent decline in their population due to an unidentified disease. This subsequently led to an explosion in the urchin population in many regions, placing even more pressure on the already stressed kelp forests.

Breeding sea stars

At the University of Washington's Friday Harbor Laboratories, efforts are underway to breed sunflower sea stars in captivity. This project is a partnership with The Nature Conservancy; it aims to learn more about these sea stars and explore their potential reintroduction to the wild. The goal is to aid the recovery of the sunflower sea star and, ultimately, the health of threatened ecosystems like kelp forests.

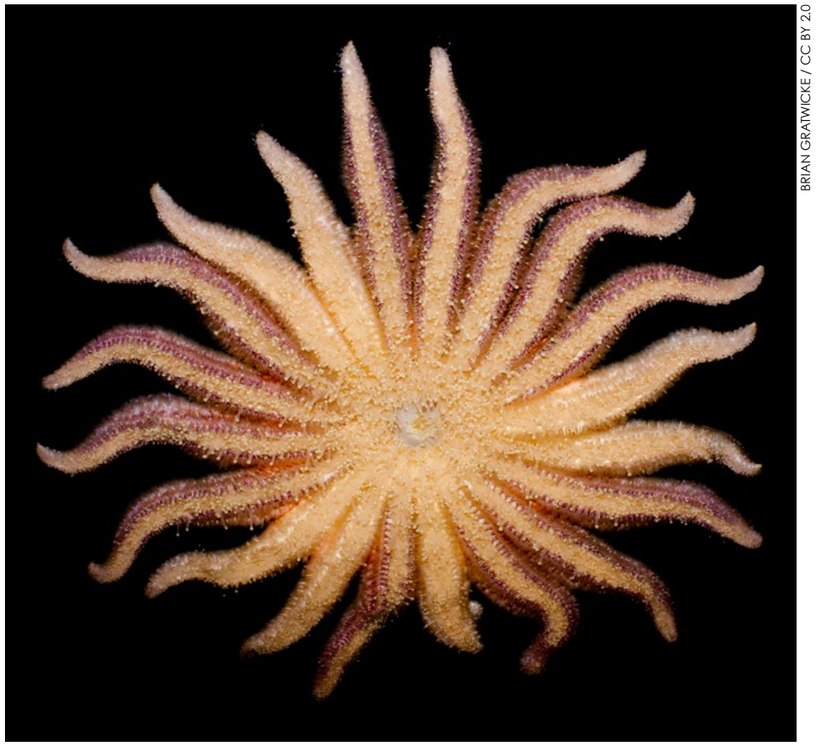
Restoring kelp forests

On average, sunflower sea stars consume about 0.68 sea urchins per day, regardless of whether the urchins are starved or well-fed. Hence, if we reintroduced them into their former habitats, they could help keep urchin populations in check.

Their potential role in kelp forest recovery shows the interconnectedness of our marine ecosystems. It underscores the importance of every species, no matter how small or large, in maintaining the health and balance of our oceans.

As we continue to face the challenges of climate change and environmental degradation, it is crucial that we understand and protect these intricate relationships.

SOURCES: PROCEEDINGS OF THE ROYAL SOCIETY B, OREGON STATE UNIVERSITY



BRIAN GRATWICKE / CC BY 2.0

The largest sea star in the world, the sunflower sea star is a predatory sea star usually with 16 to 24 limbs called rays.

Beer & Booze from Wrecks

COMPOSITE BY PETER SYMES

Text edited by Peter Symes

Exploring the world of sub-merged beverages: From 400-year-old liquor to age-defying wines and 19th-century beers, a liquid legacy emerges from the ocean depths.

The mystique of sunken treasures has captured the imagination of adventurers and dreamers for centuries, and in more recent times, divers too. However, some recent discoveries are not of gold and jewels but rather of liquid gold that has been ageing gracefully at the bottom of the ocean for decades and even centuries.

From a 400-year-old liquor recreated from finds on the fabled *Vasa* wreck to Argentinian wines aged in the sea, and even beer dating back to the 1840s, these submerged spirits and wines are turning the tide in the world of beverages, intriguing collectors, historians and divers alike. These sunken vessels have become time capsules, preserving liquid legacies that tell tales of the past and offer a glimpse into the craftsmanship of bygone eras.

As we delve into the depths of the ocean to uncover these hidden treasures, we become time travellers, immersed in the rich history and cultural significance of these submerged beverages.

RICHARD MORTEL / FLICKR / CC-BY-2.0

The 17th-century ship *Vasa* sank in 1628 in Stockholm, Sweden

Vasa 1628: A toast to maritime heritage

The *Vasa* is arguably the world's most famous shipwreck, perhaps next to the *Titanic*. The majestic Swedish warship, which sank in 1628 during its maiden voyage, was rediscovered just a few kilo-

BJÖRN LANDSTRÖM / WIKIMEDIA COMMONS / CC0 1.0

The Swedish steamship *Kyros*, which carried hundreds of bottles of cognac when it was sunk by a German U-boat in 1917 (above); Painting by Björn Landström of the Swedish warship *Vasa* (left)

metres outside Stockholm's old city centre in 1961, raised and put on display in its own museum. The *Vasa* has since become one of Sweden's most visited tourist attractions and an invaluable source for marine archaeological research.

Amidst the well-preserved remains of this 17th-century marvel, researchers made an astonishing discovery—a unique alcoholic beverage. This ancient liquor provides a rare window into the drinking habits of sailors and offers an intimate connection to the maritime culture of the era. As historians and enthusiasts delve deeper into the *Vasa*'s legacy, they unlock the secrets of this liquid treasure, painting a vivid picture of life at sea in the distant past.

Cognac from the Baltic abyss

Another liquor was discovered in the Baltic Sea in 2012 by Finnish divers. The 220-tonne Swedish steamship *Kyros* was carrying hundreds of bottles of cognac and liqueurs when it was torpedoed by a German U-boat on 19 May 1917. According to the Finnish media *Yle*, the wreck's location remained a well-kept secret for decades, until recent times when divers uncovered bottles of well-aged cognac on the wreck, which rests at a depth of around 80 metres.

With each bottle containing a timeless liquor, offering a tantalising glimpse into the past, evoking the spirit of an earlier era and the allure of long-lost voyages. As the veil of history is lifted, the story of this precious cognac continues to captivate the imaginations of enthusiasts and historians alike.

Champagne from the Baltic

Another shipwreck in the Baltic Sea, which came to be known among divers as the "Champagne wreck," revealed a treasure trove of 170-year-old champagne bottles. One hundred

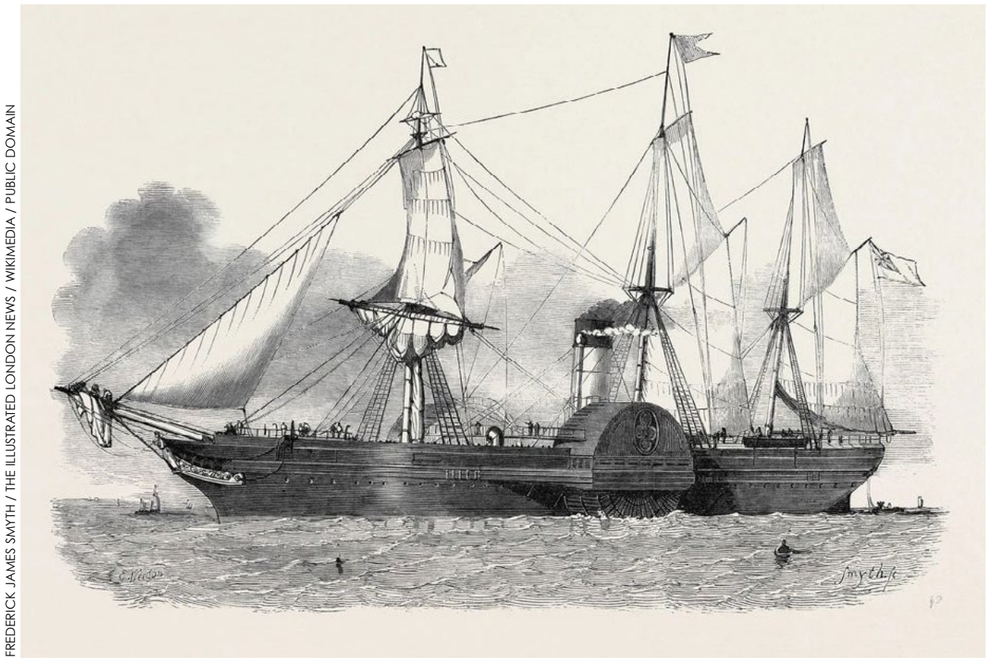
sixty-eight bottles were found 50m beneath the Baltic Sea in July 2010, several of them unusually well-preserved due to the stable, cold and dark conditions. Forty-seven of the 168 bottles in the wreck contained Veuve Clicquot, one of the most famous and coveted champagnes. According to records, Clicquot champagne was first produced in 1772. The bottles are alleged to have been destined for the court of the Russian czar.

Reports from BBC, *Decanter* and *Smithsonian Magazine* highlighted the excitement surrounding this discovery. Auctioned at record prices, the vintage champagne's rarity and allure captivated enthusiasts and collectors worldwide.

American whiskey from a 170-year-old shipwreck

Yet another 170-year-old shipwreck holds an invaluable treasure of American whiskey. This sunken vessel, a passenger steamer called *The Westmoreland*, which foundered in the frigid waters of northern Lake Michigan in 1854 and was since forgotten, has become a repository of golden spirits, with barrels of well-preserved whiskey lying untouched for generations. These well-preserved bottles provide a glimpse into the past, immersing collectors and historians in the stories of the 1800s.

The allure of this find extends well beyond its monetary worth, as experts speculate that the whiskey's ageing process underwater might have bestowed upon it unique and sought-after flavours. Those fortunate enough to experience a sip of this liquid time capsule are transported back to the 19th century, savouring the essence of a bygone age with every drop. According to *Forbes*, this sunken treasure could be worth millions.



FREDERICK JAMES SMYTH / THE ILLUSTRATED LONDON NEWS / WIKIMEDIA / PUBLIC DOMAIN

Illustration by Frederick James Smyth of the British Mail steamship *Asia*, which was similar to *The Westmoreland*

COMPOSITE BY PETER SYMES

Glasgow's tragic tale

A decanter of whisky was rescued by divers from the 130-year-old shipwreck of SS *Wallachia* that sank in the Firth of Clyde in 1895 while carrying a precious cargo of whisky and beer, which was thought to have been lost forever.

The excitement does not end with the discovery of submerged treasures; some of these historical beverages find their way to auction houses. A diver has been putting his find up for auction, including what is believed to be one of only two decanters of Wilkinson's Famous Liqueur Whisky recovered from the wreck. "Reports from those who have been brave enough to sample these whiskies in the past range from 'elegant and moving' to an 'utter abomination,' suggesting that anyone looking to sample this 125-year-old amber nectar should tread carefully," the *Scotsman* reported.

Oceanic wine maturation: The art of patience

From Argentina to Australia, innovative wineries have delved into the art of oceanic wine maturation by storing their barrels or bottles of wine and beer in submerged cellars. The gentle rocking motion and consistent temperature variations underwater appear to offer a more stable environment for wine to evolve, leading to the refinement of its taste and texture. Winemakers embrace this method as an exciting way to enhance the complexity of their vintages and present wine enthusiasts with a one-of-a-kind sensory experience.

Wine enthusiasts indulging in these unique beverages are offered a taste of history,

where the passage of time intertwines with the maritime elements. As the trend of underwater wine maturation gains momentum, wine enthusiasts worldwide eagerly anticipate the emergence of these sunken gems, where liquid alchemy marries with the enigmatic embrace of the sea.

The ocean's cradle becomes a playground for viticulture, where wine enthusiasts savour wines enriched by the environment's embrace.

AD MESKENS / WIKIMEDIA COMMONS / CC BY-SA 3.0

Reconstruction of Greek amphorae stacked as they may have been placed on ships in ancient times.

Back in 2013, *X-Ray Mag* contributors Larry Cohen and Olga Torrey visited Casa Joncols in Spain on a dive trip where they sampled some of the local wine, which was matured under the sea. Dive centre staff submerged crates of young wine to a depth of 33ft (10m) in the Mediterranean Sea. After eight months, tastings and lab tests revealed that the underwater pressure indeed improved their maturation process. Vailet (white), ViDivi (red) and Escuturit Brut Cava (sparkling) were among the submerged wines, which matured faster within the ocean's embrace. Now, exclusively served at Cala Joncols, these underwater-aged wines are offered at double the price. As a special treat for divers, Euro-Divers runs a thrilling scavenger hunt, granting the lucky finders a bottle from the sunken treasure.

Wine matured in amphorae

In 2017, *X-Ray Mag* reported on the opening of another underwater winery, this time in Croatia. In the picturesque town of Dra□e, situated on the Pelješac peninsula about an hour north of Dubrovnik, lies the Edivo Vina winery. A unique and innovative approach to wine storage awaits visitors, as the winery submerges clay jugs, known as amphorae, in the depths of Mali Ston Bay. The wines rest underwater for one to two years, maturing at the bottom of the Adriatic Sea, before being ready for consumption.

Before taking the plunge into the sea, the wines undergo initial above-ground ageing for three months. The brains behind this unconventional method are the owners of the winery, Ivo and Anto Šegovic, and Edi Bajurin. Inspired by ancient Greek practices, where amphoras were used to store wine, the trio aimed to infuse their wines with the delicate aroma of pinewood while safeguarding their quality, colour and aroma. Remarkably, the wines emerge from their aquatic sanctuary unscathed, offering an exceptional sensory experience to those who partake in their nautical journey.

COMPOSITE BY PETER SYMES

Down under, Ocean Aged stands at the forefront of underwater wine maturation, inspired by the maritime heritage of Australia. In a delightful fusion of tradition and innovation, this boutique winery embraces the ocean's wisdom to shape the character of its wines.

Authorities' scrutiny of underwater wine

In a turn of events, *X-Ray Mag* also reported on US authorities scrutinising the practice of underwater wine maturation. As this approach gained popularity, regulatory bodies have raised concerns about the risk of contamination by the ingress of seawater as well as the possible impact on marine ecosystems. While winemakers continue experimenting with this unique ageing method, they must navigate the delicate balance between innovation, regulatory requirements and environmental preservation.

Ancient beers and shipwrecked yeasts

Diving into maritime history, experts have unearthed two fascinating tales of ancient shipwreck beers.

The first discovery involves beer dating back 220 years, retrieved from the protected Historic Shipwreck Sydney Cove (1797) at Preservation Island, Tasmania, which is believed to be the world's oldest surviving beer. The research team has isolated live yeast from the bottle contents and used it to

COMPOSITE BY PETER SYMES

brew beer using period recipes, revealing insights into historical brewing techniques, and offering enthusiasts a chance to taste beer of over two centuries ago.

Beer barrels were also found on the 1840s shipwreck, *Wallachia*, which resurfaced with well-preserved yeast, enticing brewers to resurrect centuries-old flavours.

Notably, the shipwrecked yeasts are revolutionising modern brewing practices. Researchers believe these ancient microorganisms could alter beer's taste and aroma, offering a distinctive and novel experience for beer lovers worldwide. As these beers of yore are carefully examined, brewers eagerly explore the potential of shipwrecked yeasts, inviting us to sip history in every brew.

JAMES F CLAY / FLICKR / CC BY-NC 2.0

Theft in the deep

Amidst the allure of submerged treasures, a cautionary tale of thievery also surfaced. In 2021, reports emerged that audacious thieves targeted a submerged cache of beer left ageing in barrels within a shipwreck and somehow made off with the sunken beverages. A reminder of the importance of preserving these liquid legacies, this incident highlights the need to safeguard these unique products.

Don't drink and dive

On a concluding note, diving and alcohol do not mix. We advocate nothing of the sort. This article is merely intended as light-natured infotainment about interesting finds from historic shipwrecks and how the sea is occasionally being used to mature alcoholic beverages. Those of us who are both avid divers and who enjoy a good glass of wine for dinner, or collect fine spirits, may also find it interesting or fun to enjoy a beverage that has a relationship with the sea and diving. □

REFERENCES: VASA1628

NATIONAL SUPERINTENDENCY FOR UNDERWATER CULTURAL HERITAGE / PRESS RELEASE

Screenshot from the **video** about the discovery of ancient glassware

Ancient Roman shipwreck reveals a trove of preserved glassware

Archaeologists have recovered exquisitely preserved Roman glassware from a 2,000-year-old shipwreck near the coast of Rome, shedding light on ancient maritime trade routes.

Underwater archaeologists recently discovered the remains of an ancient Roman cargo ship off Rome's coast. This significant find goes beyond merely finding another shipwreck; it offers an intriguing glimpse into the complexities of ancient Roman seafaring, trade practices and the far-reaching influence of Rome's maritime network.

The Capo Corso 2 wreck was discovered in 2012 at a depth of around 350 metres between Sicily's Capo Corso and the island of Capraia which lies off Tuscany, Italy.

Ancient glassware

Underneath centuries of silt and sea life, the archaeologists uncovered a collection of beautifully preserved Roman glassware. These artefacts, dating back 2,000 years, have been encased and safeguarded by the sea bed, enabling their delicate structures and intricate designs to endure throughout the ages. Their exceptional state of preservation suggests that the ship sank quickly, leaving the cargo undisturbed until now.

Insight into maritime trade

The ship's vast and diverse cargo points to the extensive trade relations the ancient Romans maintained throughout the Mediterranean. The fact that such delicate items could be transported vast distances by sea underscores the skill and sophistication of Roman mariners, and their sturdy vessels. As such, the discovery provides crucial insights into Rome's intricate maritime trade network, giving us a better understanding of the economy and trade practices of that era.

Skilled glassmakers

The discovery of this ship and its cargo enhances our understanding of ancient Roman life, commerce and artistry. In particular, it sheds light on the skills of Roman glassmakers, and the types of goods that were deemed valuable enough to transport across the risky waters of the Mediterranean. □ SOURCE: ITALY'S NATIONAL SUPERINTENDENCY FOR UNDERWATER CULTURAL HERITAGE

Discovery of 1879 Lake Superior shipwreck

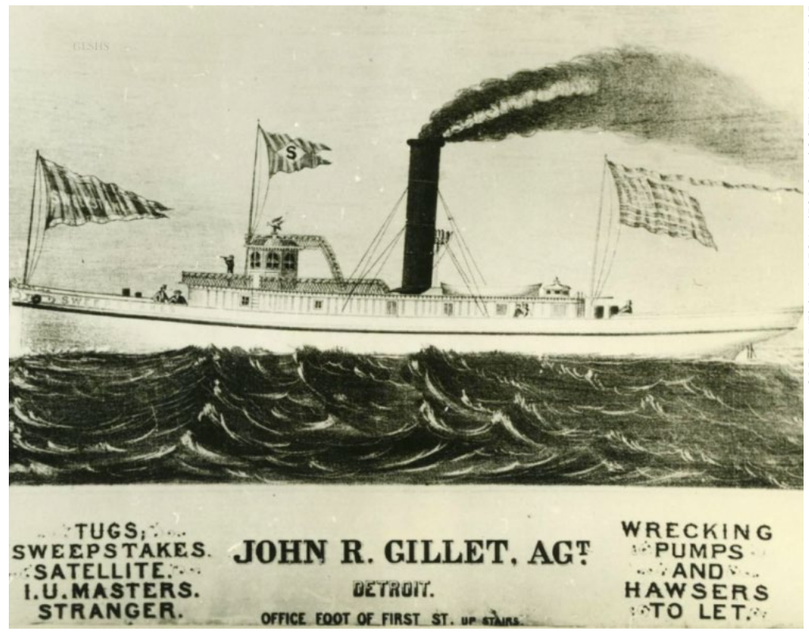
A tug boat that disappeared into Lake Superior 144 years ago has been found, according to the Great Lakes Shipwreck Historical Society.

The *Satellite* sank on 21 June 1879, according to the historical society, either as a consequence of a technical issue or because the boat collided with a floating log. The ship capsized, but no one perished. In the summer of 2022, the society worked with Josh Gates of the Discovery Channel's *Expedition Unknown* to produce a show about two French minesweepers that vanished on their maiden voyage in 1918.

After a remotely controlled vehicle photographed a shipwreck in the lake, it was concluded that it was the *Satellite* and not a minesweeper because the ship was constructed of wood and not steel. The historical organization stated that there were no known photographs of the *Satellite*.

At the time of its demise, the *Satellite* was regarded as one of the Great Lakes' most exquisite ships.

"It is said that her cabin and upper works were the most elaborate put upon a craft of her kind," the *Detroit Press and Tribune* reported. □ SOURCE: GREAT LAKES SHIPWRECK HISTORICAL SOCIETY



GREAT LAKES SHIPWRECK HISTORICAL SOCIETY / PRESS RELEASE

Possible illustration of the *Satellite*

MARK CARTWRIGHT / CC BY-SA 3.0

Phoenician ship carved on the face of a sarcophagus from the second century AD

Spanish archaeologists to rescue 2,500-year-old Phoenician shipwreck

A 2,500-year-old Phoenician shipwreck off the coast of Mazarrón is slated for an unprecedented rescue operation by Spanish archaeologists.

The submerged relic, a testament to the advanced seafaring capabilities of the ancient Phoenicians, lies off the coast of Mazarrón in the Mediterranean Sea.

Unveiling Phoenician maritime prowess

Discovered more than three decades ago, this Phoenician ship is one of the best-preserved examples of ancient seafaring vessels. The remarkable condition of the shipwreck promises invaluable insights into Phoenician shipbuilding, navigation and trade practices that were a cornerstone of their civilization.

The rescue plan

The recovery operation involves a delicate process of transferring the vessel from its underwater resting place to a custom-built facility for preservation and study. This audacious plan could pave the way for similar efforts worldwide, providing a roadmap for safeguarding our shared maritime heritage.

A portal to the past

As anticipation builds around the planned rescue, it is clear that this project offers more than just the retrieval of an ancient artefact. It represents a bridge to our past, illuminating the ingenuity and resilience of the Phoenicians, a culture that thrived over two millennia ago.

Who were the Phoenicians?

The Phoenicians were an ancient maritime trading culture that originated in the eastern Mediterranean around 1200 BC. Renowned as master shipbuilders and sailors, they established trade routes and colonies across the Mediterranean, including in modern-day Lebanon, Syria and northern Israel.

The Phoenicians' most notable contributions include the development of the alphabet that forms the basis of modern Western scripts and the production of a purple dye that was a symbol of royalty. □

SOURCE: ARKEONEWS

UNESCO-led mission discovers three ancient shipwrecks off Tunisian coast

Recent underwater archaeological efforts by UNESCO and eight Member States have revealed three shipwrecks, contributing to the protection of our shared underwater heritage.

According to reports, these shipwrecks are believed to date back to Roman times. Although the Mediterranean Sea is known for its rich history of maritime trade and naval warfare, the discovery of intact ancient shipwrecks remains a rare occurrence.

The shipwrecks were discovered during an operation intended to protect underwater heritage. UNESCO and the eight participating Member States launched this mission, recognizing the critical value of these sites in understanding our collective past.

Details still limited

The archaeologists involved in the mission have yet to fully analyze and date the recovered artifacts. Details of the shipwrecks remain limited, but their discovery adds to a growing list of archaeological finds in the Mediterranean region.

These sites serve as underwater time capsules, providing us with unique insights into the trade networks, craftsmanship and seafaring traditions of ancient civilizations.

This event highlights the ongoing need for multinational initiatives to protect our shared cultural heritage, both on land and underwater. As these shipwrecks are studied further, they will undoubtedly yield more exciting glimpses into our rich maritime past. □ SOURCE: UNESCO

DRASSM UNESCO

One of the three shipwrecks found in Tunisia's Skerki Bank during a 2022 expedition

How to avoid mosquito bites

Tips to minimize the impact of the most quintessential nuisance when going on dive trips to some tropical areas.

Amid the buzzing hum of the relentless mosquito, it appears that our everyday habits may be making us more alluring to these pesky insects. In a surprising discovery, it appears that your favourite body wash may be your downfall when it comes to warding off mosquitoes.

Your shower routine

A paper1 published in *iScience* highlighted a potential link between body wash and our attractiveness to mosquitoes. The study described how certain substances found in soap products increased the mosquitoes' attraction towards humans. This revelation came about during laboratory experiments in which mosquitoes to different scents, with soap odor proving to be an unexpected favorite.

An article in *New Scientist* further detailed this relationship, explaining how soap chemicals could alter our scent, creating a more appealing aroma for mosquitoes. The report also emphasised the selective nature of mosquitoes, drawn to specific types of soap scents, potentially making some people more attractive to mosquitoes than others.

Fragrance-free does it

Katie Westby, a disease ecologist with Tyson Research Center, recommends using fragrance-free products to reduce your attractiveness to mosquitoes. Other possible strategies include wearing long-sleeved clothing and using mosquito repellent. □

SOURCE: CELL (JOURNAL)

MOHAMED NUZRATH/ PIXABAY LICENSE

Mosquito bites cause itching and discomfort, and in some cases carry diseases such as malaria.

US administration targets "resort fees" and other hidden travel costs

Bipartisan Senate bill aims to enhance transparency in travel industry pricing.

A new bipartisan Senate bill, the "Hotel Fees Transparency Act," seeks to make hotel pricing more transparent by ensuring that consumers are better protected from hidden costs and made aware of the total cost of their stay, including any additional fees, at the time of booking. This move is in response to the growing concern over hidden charges that often surprise guests upon checkout.

Hotel resort fees

Hotels began charging resort fees as early as 1997, covering amenities like pool towels and fitness centre access. While some transparency has been introduced since an FTC action in 2012, these fees remain a point of contention for many consumers.

Too often, Americans making reservations online are being met with hidden fees that make it difficult to compare prices and understand the true cost of an overnight stay.

— Sen. Amy Klobuchar, D-Minn

The Council of Economic Advisers highlighted the prevalence of junk fees in various sectors, from concert tickets to hotel stays, illustrating the challenges they pose to consumers and competition.

Drip pricing in travel

Another significant concern is "drip pricing," where additional costs are added during the shopping process. This practice often leads to consumers paying more than the initially advertised price. This is particularly common in the travel sector, where additional charges such as baggage and seat selection are standard practice. In fact, data from the Bureau of Transportation Statistics reveals that in 2021, US airlines amassed a staggering US$5.3 billion solely from baggage fees. □

SOURCE: US WHITE HOUSE

COMPOSITE BY PETER SYMES

Airlines are raking it in on ancilliary fees. In 2021, US airlines alone amassed a staggering $5.3 billion solely from baggage fees.

The Philippines' Romblon

Mystical Island of Phantoms, Ghosts & Butterflies

Text and photos by Kate Jonker

Nestled in the heart of the Philippines is a hidden gem of an island called Romblon, located in the Mimaropa region. Kate Jonker takes us there to discover the underwater treasures and rare marine species that beckon divers and photographers from all over the world.

"Ladies and gentlemen, please note that all flights have been cancelled until further notice. We will keep you updated." A feeling of cold dread washed over me—we still had another flight and a ferry to catch, and time was running out. Were we going to make it? And what would happen if we did not?

It was with a rollercoaster of emotions that we embarked on our journey to Romblon in the Philippines in May 2023. We had been eagerly awaiting this dive trip for three long years, and with the Covid-related travel restrictions finally behind us, we could not wait to make the most of it.

But as we sat at Changi Airport in Singapore, we were hit with the news that all flights to Manila were cancelled due to a thunderstorm. My heart sank as I peered gloomily out of the terminal windows, watching the sheets of rain and lightning flashes. It seemed like our dreams were about to be shattered once again.

The much-loved "Shaun the Sheep" sacoglossan sea slug, *Costasiella kuroshimae* (top left); Tiny flower butterfly seaslug, *Cyerce sp.* (top right); Scorpion shrimp, *Metapontonia fungiacola* (above); Braun's pughead pipefish, *Bulbonaricus brauni* (left); *Melibe colemani*, the phantom nudibranch (previous page)

Breath-taking view from Sunbird Ridge on Romblon Island, showing Bangung Island on the left-hand side, and Logbon Island towards the right of the image (above); Colourful boats and houses at the promenade of Romblon Town, Romblon Island (left); Belfry of Romblon Cathedral, officially, Saint Joseph Cathedral Parish, is said to date back to ca. 1635 and was constructed from blocks of carved coral stone (far left); The "town square" in the heart of Romblon Town, with its vibrant "taxi rank" of tricycles (below)

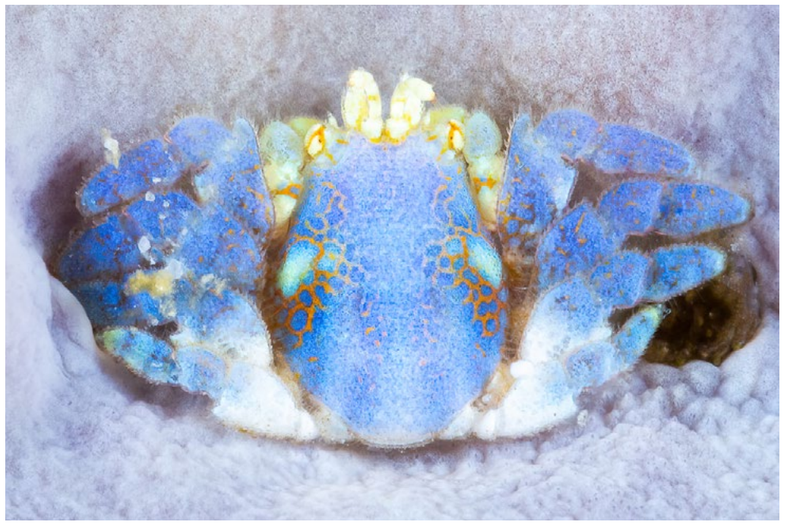
Thankfully, the thunderstorm eventually passed, and we landed in Manila, but another storm of delays awaited us there. Our disembarkation was postponed by 30 minutes, and we found ourselves two hours behind schedule. To add to our worries, our drivers, who were supposed to take us to Batangas Port for the 19:00 ferry check-in deadline, looked visibly anxious.

As we left the airport, I could not help but express my nervousness to our driver about making it to the port in time as I knew it took three hours to travel from Manila to Batangas Port. It was already 4 p.m., the clock was ticking, and we were stuck in the middle of Manila's Friday afternoon rush-hour traffic jam.

"I will try, but I'm not sure," our driver replied, skilfully navigating through the grid-locked afternoon traffic at breakneck speed.

Incredibly, just before we approached the two-hour mark, we saw our first signs for Batangas and knew we were there! Safe and sound, albeit feeling a bit shell-shocked, we were also immensely relieved. It had been an intense race against time and the elements, but we made it! Our long-awaited dive trip to Romblon was still within our grasp.

Finally, as the ferry set sail at 10 p.m. that evening, leaving Manila and its challenges behind, we looked forward to the adventures and beauty that awaited us in Romblon.



Most of the shrimps were very well camouflaged, like this *Periclimenaeus sp*. (above); *Okenia liklik* dorid nudibranch (top right); Brilliant coral gall crab, *Pseudocryptochirus viridis* (right); *Phestilla melanobrachia* aeolid nudibranch (left)

Romblon

Romblon Island is a hidden gem nestled in the heart of the Philippines. Not only is this enchanting island known as the marble capital of the Philippines, but it also boasts a vibrant ecosystem, lush rainforests and a mystical world that lies beneath the ocean's surface.

As an avid diver and underwater photographer, this destination had long been on my bucket list due to its high probability of encountering rare butterfly, phantom and ghost nudibranchs, as well as other elusive marine species rarely found elsewhere.

Getting to Romblon

Getting to Romblon Island requires some logistical planning and patience, with two main options available. The first involves flying from Manila to Romblon's neighbouring Tablas Island and then taking a boat to Romblon Island. The second option, which was the one we chose, entails a three-hour road trip from Manila to Batangas Port, followed by a 10-hour overnight ferry to Tablas Island, a two-hour drive across Tablas Island, and finally, a one-hour boat trip to reach Romblon Island.

As we arrived on Romblon Island, we were greeted with the local form of transport—tricycles. These unique vehicles consist of a motorcycle with a sidecar and a back seat. Deon, my husband, and I squeezed into the sidecar, designed for the more finely built Filipinos, while our luggage occupied the back seat. With our driver at the helm, we set off along a winding coastal road, our eyes wide with wonder as we took in the lush green jungle, local houses in various shapes and colours, bustling schools and little roadside shops, with glimpses of a turquoise ocean in-between. The journey led us to our dive resort, where we finally disembarked, peeling ourselves out of the front seat.

Diving is done from Bangka boats with one guide for every four divers (right); The well-designed wet area at the resort where we washed our dive gear and camera equipment (below)

Staying in Romblon

We had decided to make The Three P Beach Resort and Ducks Diving Romblon, affectionately known as "3P," our home for the duration of our stay in Romblon. Established in 2009 by the three brothers: Peter, Philipp and Patrick, this laid-back resort on Romblon Island promised to be the perfect destination for our group.

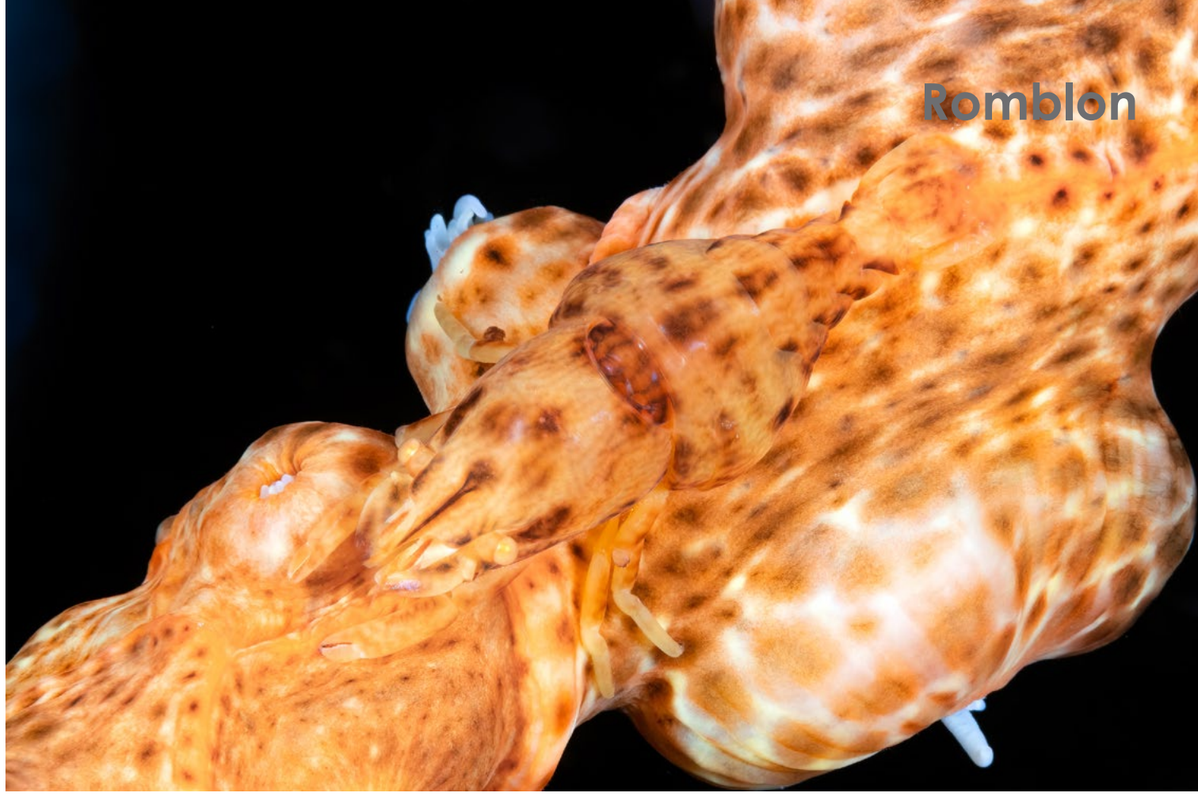
Hailing from South Africa, Hawaii, Mozambique, Dubai and Saudi Arabia, our group of 13 divers received a warm welcome from the owners, Kati and Philipp, and Chef David. They guided us to our comfortable en-suite rooms, which had been thoughtfully designed with underwater photographers in mind. The well-equipped rooms featured spacious worktables, ample lighting and numerous power points for charging camera batteries—perfect for preparing and organising underwater photography gear.

Once settled, we gathered in the resort's dining room on the top floor of the main building to complete necessary paperwork and indulge in a much-needed lunch. From this vantage point, we were treated to breath-taking views of lush gardens and trees, where yellow sugarbirds flitted among vibrant frangipani flowers, serenading us with their cheerful melodies.

Throughout our stay, Chef David delighted us with a gastronomic feast. His diverse culinary skills were showcased in a range of dishes, ranging from traditional Filipino, right through to Italian cuisine. Each morning, he sourced the freshest ingredients from the local market. Breakfasts offered a variety of options, including fresh fruit, bread, cheese, cold cuts, pancakes and eggs cooked to order. Our lunches were hearty cooked meals, and dinners consisted of a delectable trio—starter, main course and dessert.

The dive centre

The dive centre is designed and fully equipped to meet the needs of divers and underwater photographers alike. There is a wet area where we could rinse and hang our gear, along



There are some very nice frogfish to be found, like this clown frogfish, *Antennarius maculatus* (above); Leopard shrimp, *Izucaris masudai*, an example of how well-camouflaged the critters are in Romblon (top right); Beautiful little painted tunicate shrimp, *Odontonia katoi* (right); The splendid tiger butterfly seaslug, *Cyerce nigra* (left)

with a dedicated freshwater tank for cleaning our underwater photography equipment. The attention to detail ensured a seamless and enjoyable experience for all the underwater enthusiasts in our group.

Our daily schedule kicked off with breakfast at 7 a.m., followed by a meet-up on the boat at 8 a.m. In the morning, we enjoyed two dives, returned to the resort for lunch and to change camera batteries, and then embarked on a third dive at 3 p.m. On some occasions, we stayed on the boat for a night dive around 6 p.m.

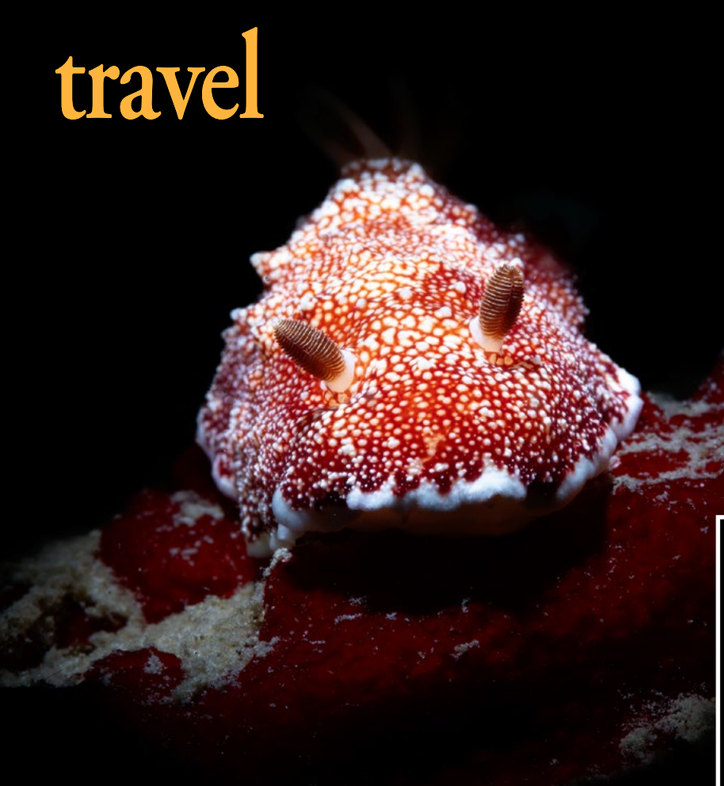
During our visit in late May, the water temperature in Romblon averaged around 29°C (□ 84°F). Most of us opted for 3mm wetsuits, which suited the conditions well. I personally found wearing a hoodie helpful for ear protection.

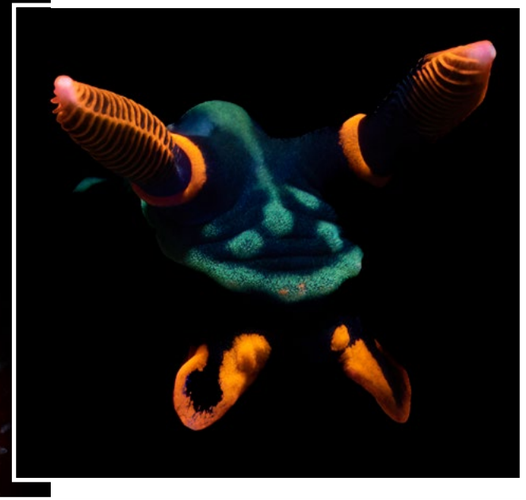
The dive boats

We used traditional *Bangka* boats for diving, with one dive guide for every four divers. With our boat accommodating six divers, we had two dive guides, Bobby and Rolly, who stayed with us throughout the trip. They were incredibly helpful and even insisted on carrying our heavy camera gear to and from the boat for us.

Once on board, we kept our cameras at our feet since there was not a

Tiny pink hairy shrimp, *Phycocaris simulans*, approximately 2mm in size





One of the larger nudibranchs in Romblon, *Goniobranchus sp.* (top left); *Nembrotha kubaryana* nudibranch, photographed using a snoot (top centre); Well-camouflaged Zanzibar shrimp, *Dasycaris zanzibarica* (left); Cute little pygmy squid, *Xipholeptos notoides* (above); One of the many rare shrimps in Romblon, the chocolate shrimp, *Periclimenes sp.* (bottom left)

Juvenile harlequin sweetlips, *Plectorhinchus chaetodonoides*, photographed using a slow shutter speed to create a deliberate blur

designated area for them. Although we had to be careful not to step on them, it was not much of an issue since only three out of the six divers on our boat were photographers.

The captain and the team were very accommodating and professional, assisting us with our gear and providing towels and hot ginger tea between dives. These thoughtful gestures were highly appreciated, especially as our trip coincided with the arrival of Typhoon Betty, bringing fierce winds and lots of rain for most of our stay, making some surface intervals quite chilly.

The diving

For the first part of our trip, the wind and rain were so strong that the boats had to be moved to a more sheltered spot. Even the schools were shut for two days! This did not thwart our diving, although it did mean The 3P had to arrange for us to be taken to the boats in minibuses and on tricycles (which was quite a novelty).

While our diving was limited to the more sheltered dive sites due to the weather conditions, by the end of our visit, we had explored a total of 20 different dive sites and completed 29 dives. Our underwater adventures took us around Bangug, a small island near Bonbon Beach, across the bay to Logbon Island, and closer to Romblon Town itself.

Most dives began at around 5m, starting off as vibrant coral gardens or sandy seagrass beds, then dropping down sandy slopes with coral outcrops or steep-sided coral reefs to depths of approximately 30m. On most dives, the visibility averaged between 20 to 30 metres.

At the beginning of each dive, Bobby and Rolly guided us to the deeper sections of the reef, where they promptly found interesting subjects like leopard shrimps or Denise's pygmy seahorses for us to photograph. We would then leisurely ascend the slope, listening out for the tell-tale "ting-ting" from our guides as they tapped their cylinders to attract

our attention. We would eagerly swim back and forth between them, capturing the abundant marine life Romblon had to offer. Dive times had no restrictions, so most of us surfaced after around 70 to 80 minutes. Safety stops were usually carried out at the shallower parts of the reef, just under the boat.

Towards the end of the trip, we decided to revisit some of our favourite dive sites. Among them were Logbon Sanctuary for its Cyerce nudibranchs, Sandslope where "Shaun the Sheep" nudibranchs could be found in the shallows, Logbon Mangroves for the Melibe nudibranchs, and Coral Canyon for its beautiful healthy hard and soft corals, as well as schools of fish.

The critters

Romblon is renowned for its elusive and rare critters, and it is worth noting that many of them are incredibly small, measuring only 2 to 5mm in size. Their exceptional camouflage also makes them a challenge to spot, and I struggled to find them for the first couple of days. Bobby and Rolly skilfully used their pointers to lead us to these hidden creatures, and I found that following their pointers downwards through my viewfinder really helped locate the critters' positions.

Shrimp enthusiasts will be captivated by the variety of shrimps in Romblon, and the tiny Sashimi shrimp found on night dives is particularly enthralling. Crab enthusiasts will appreciate the stunning array of tiny crabs, especially

It took me ages to find this very tiny bryozoan snapping shrimp through my camera's viewfinder (above); Pale gill nembrotha nudibranch (top right); Many nudibranchs looked just like corals and blended into the reef, like this *Phyllodesmium briareum* (top left); *Goniobranchus geometricus* dorid nudibranch (bottom left)

Ghost nudibranch, *Melibe engeli* (top left); Masters of camouflage, two red cryptic sponge shrimps, *Gelastocaris paronae* (above); Bumpy *Mexichromis multituberculata* nudibranch (right); Green dragon shrimp, *Miropandalus hardingi* (far right); *Hypselodoris violacea* dorid nudibranch (left)

the beautiful little coral gall crabs. Fish lovers will enjoy spotting the endemic fish, while seahorse and pipefish enthusiasts will test their patience with some of the most uncooperative subjects on the reef. Nudibranch fanatics will be in awe of the rare and wonderful species found here, and Romblon does not disappoint.

In just two days, Bobby and Rolly astonished us with their discoveries of phantom nudibranchs (*Melibe colemani*), ghost nudibranchs (*Melibe engeli*), and the beautiful butterfly sacoglossan sea slugs, *Cyerce nigra* and *Cyerce sp.*, along with the tiny "Shaun the Sheep" sacoglossan sea slug (*Costasiella kuroshimae*). They also found the rare and incredibly difficult-to-photograph Braun's pughead pipefish (*Bulbonaricus brauni*) and the glittering pipefish (*Halicampus nitidus*) hidden deep inside their hard coral homes.

The variety of nudibranchs, shrimps, crabs and fishes we encountered during our stay at The Three P was extensive. The photos in this article represent just a fraction of what we witnessed. Bobby and Rolly consistently went above and beyond to find us fascinating subjects to capture. Throughout our underwater explorations, we felt truly pampered.

Overall, our diving experience in Romblon was awe-inspiring. The dedication and expertise of our guides, combined with the abundance of unique marine life, surpassed our expectations. Despite the challenges posed by Typhoon Betty, we managed to capture extraordinary images and create unforgettable memories in this remarkable underwater paradise.

Other highlights

While Romblon is a haven for scuba diving and underwater photography, the island offers more to explore. Embark on a motorbike or tricycle tour to discover Romblon's Botanical Garden, Agpanabat Scenic Point and Fort San Andres—a historic Spanish fort with panoramic views of Romblon Town. Visit the beautiful St Joseph Church, a National Cultural Treasure, or indulge in a refreshing drink at Sunbird Ridge while enjoying breath-taking views of the bay. Romblon's pristine beaches invite visitors to relax and soak in the island's natural beauty. □

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***.

Sponge ghost goby, *Pleurosicya plicata*, almost invisible on this purple sponge

FACT FILE: ROMBLON, PHILIPPINES

Getting there. Fly from Manila to Tablas Island on a Tuesday, Thursday and Saturday on Air Swift. Return flights are on the same days. Once on Tablas Island, catch a private van to St Augustine pier, followed by a boat ride to Romblon Island. The Three P Beach Resort (3P) can arrange transport from Tablas Island Airport to their resort for you.

Alternatively, one can fly to Manila and take a public bus or book a private van from Manila to Batangas Pier, then catch a direct overnight ferry from Batangas to Romblon (Starlite Ferries). Depending on your arrival date, you might need to book a ferry (2Go Travel) via Tablas Island (Odiongan), followed by a private van to take you to St Augustine and a boat ride to Romblon Island. The 3P resort can arrange transport from Manila's international airport to the resort for you.

Visa. Passport holders from most countries can visit visa-free for up to 30 days, although it is always best to check the Philippine Embassy website for your country before travelling.

Language. Filipino and English are both official languages of the Philippines, and you should be able to get by speaking English in Romblon.

Currency. The current exchange rate of the Philippine Peso (PHP) to the US Dollar (USD) is 1 USD = 55.53 PHP.

Electricity. All outlets are good for standard European (two round pins) sockets, and US-American plugs. The standard voltage is 220 V in the Philippines (the frequency is 60 Hz). Your appliances are suitable for usage in the Philippines if the standard voltage in your home country is in between 220 and 240 V (Europe, United Kingdom, Australia and most of Asia and Africa). □

Newfoundland

Cold Water, Warm People & Endless Adventure

Text and photos by Brandi Mueller
Underwater mine photos by Trent Zawaly

Bell Island (above), off Newfoundland, has historic iron ore mines that stretch out for miles, under the sea. Only a handful of technical divers have ever dived the mines; Kayaking around Bell Island (center)

Newfoundland, part of the easternmost province of Canada, is a place of wild nature where one can dive on WWII wrecks, in historic iron-ore mines, birdwatch, snorkel with humpback whales and kayak with minke whales. Brandi Mueller shares her adventure there.

There are not many places from which I depart with a tear in my eye, but I will be honest with you: I pushed my flight back a day and wished for a delay (which I got) and even sort of hoped to miss my flight. I am quite confident these are the sort of feelings many people have when it is time to leave Newfoundland. They say you leave part of your soul behind, and somewhere between the rugged cliffs dotted with birds, the stormy blue water erupting with humpback whales, the WWII wrecks hidden below and the genuinely kind people above, I think a little bit of my soul was left behind too.

How it all started

Newfoundland was not on my bucket list. It was not even on my

Anemones and a crab on the wreck of SS *Rose Castle* (above)

Newfoundland

Misty cliffs as seen from the whale tour zodiac boat (top left); Drone shot of the Ocean Quest dive boat, *Mermaid*, taking divers to a dive site (above); Humpback whale surfacing near the whale tour boat (right); Petty Harbour (bottom left)

radar. In fact, all I knew about Newfoundland was that it was to the north, and cold… and it was in the Broadway musical, *Come from Away* (ed. – based on a true story about the kind hospitality of a tiny town in Newfoundland towards 7,000 passengers who were grounded there in the wake of 9/11). But around a year ago, I was speaking at the Boston Sea Rovers Show, and an old dive buddy came to see me. While walking around the booths, he stopped to chat with Rick Stanley of Ocean Quest Adventures about a trip he did with them many years ago, to dive the shipwrecks. World War II wrecks? In Newfoundland? I had no idea.

Cold water is not usually my thing, unless there is something really good to see. But as he reminisced and Rick talked about all Newfoundland had to offer, I found myself enraptured, looking around the booth at all their photos and video. I thought, "So, wait… There are humpback whales, too? And puffins? And WWII wrecks?" In my mind, I started dusting off my drysuit and buying some thicker thermals.

Then Rick pulled out a bottle of Screech, a slightly dubious-looking brown liquid, and small plastic shot glasses. I looked at my watch and it was 10:30 in the morning—plus I would be speaking in a few hours—not really what I would consider a good time for shots. But pretty soon, they had convinced me to drink their special rum.

Apparently, back in the day, Newfoundland shipped cod fish in barrels to Jamaica, and around the world. Then, in Jamaica, they filled the empty cod barrels back up with rum and sent them back to Newfoundland. The story goes that this liquor made you screech when you drank it; hence, the name. I can confirm, it sort of does.

I left my friend and Rick, still chatting, to go get ready for my talk and mostly forgot about Newfoundland until a few weeks later, when I was wandering around the DEMA Show and passed the Ocean Quest booth. Stopping to say hello (but luckily escaping without a morning shot of rum), I could not get the island off my mind. A few weeks later, I contacted Rick about coming for a visit… during what *should* be the warmest time possible—July, the dead of summer.

Eight months later, I was on my way, albeit showing up a day late due to a cancelled flight; it took much persuasion of multiple airlines to get me there the next day instead of two days later. After an unexpected overnight stay in Montreal and arriving back at the airport to find out I was removed from the early morning flight for unknown reasons, I managed to snag the last seat on standby, with just minutes to spare. Frustrations aside, I was ecstatic to arrive in Newfoundland, exiting the airport into blue skies and summer-like conditions—and I even had my luggage with me.

Kayaking around Bell Island (left); The living room (top center) and the kitchen (above) at Ocean Quest Adventures Lodge

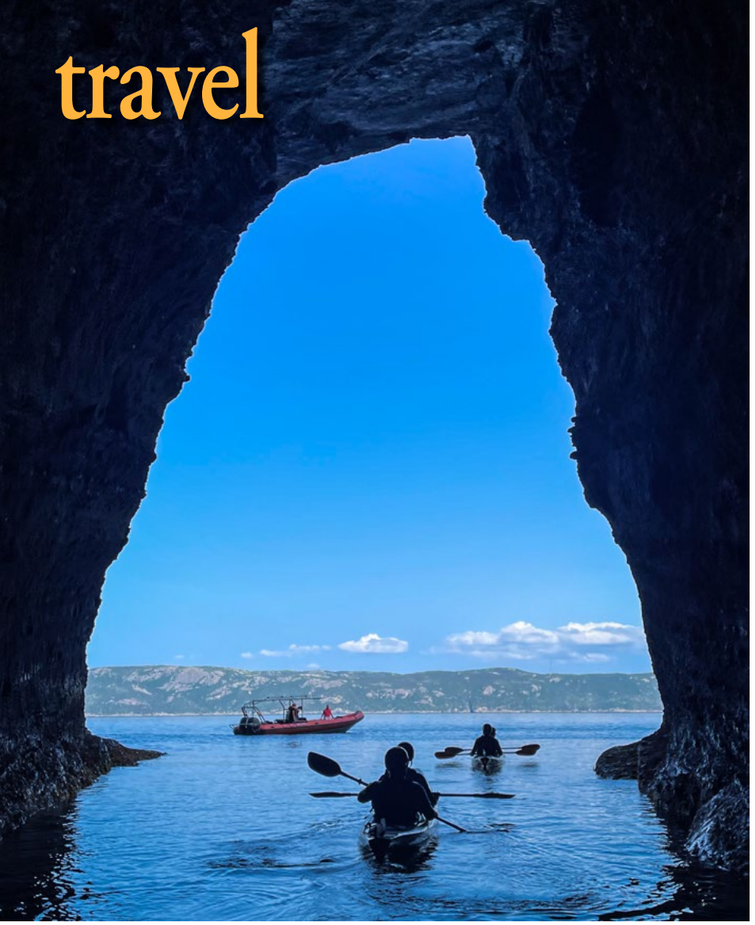
No time to rest

Rick picked me up, and after regaling him with my airport frustrations, he informed me I was scheduled to be kayaking in a few hours. Any plans of a nap or organizing my dive gear were forgotten, and we drove about 20 minutes past the town of St Johns and on to Conception Bay South, where the main Ocean Quest dive shop and lodge were located.

The Ocean Quest Lodge was basically the Airbnb of your dreams, with room for you and twelve of your closest friends (or people who were about to be your new best friends). There was an ocean view and two decks upon which to relax after dives and watch the sunset. Plus, a full kitchen was equipped with everything you needed to make an amazing fried cod and flourless chocolate cake, with your aforementioned new best friends.

Another building housed a dive gear prep area. Each diver had a cubby, and there were places to hang drysuits, with a dehumidifier to dry them overnight. Ocean Quest supports all levels of divers from beginners (they teach classes and have an onsite pool) through CCR divers, several of whom were diving the week I was there. Outside, there was ample space to hang gear, and one of my favorite touches were the nails around the deck, where one could hang wet gloves, boots and hoods. Plus, there was a lovely fire pit for evening entertainment.

In addition, there was parking, six rooms that accommodated up to 13 people, six bathrooms, and even a washer and drier (to keep those smelly undergarments fresh day after day). The living room area was full of stuff to look at, including styrofoam cups that had been taken to the *Titanic*, artifacts, bottles of Screech, and numerous awards bestowed upon Ocean Quest. Then, there were the bookshelves, which contained



Kayaking around Bell Island (left); The bell-shaped opening for which Bell Island is named (above); With clouds reflected in the water, moon jellyfish looked as if they were floating in the sky (lower right).

a small library of my dreams, with books on diving, fish life, shipwrecks, Newfoundland, history and the world beyond. I wrote down a few titles for later and thought it would be fun to spend a week just reading the books, but I could tell already that there probably would not be that kind of free time during the upcoming week.

Kayak tour

After a quick tour of the house and gathering my camera gear, I was sent off to kayak around Bell Island. The boat was departing just a five-minute walk from the lodge, and in the near 80°F (~27°C) heat, I was quickly realizing I had packed all wrong, bringing mostly sweatshirts and long sleeves. I expected wind, clouds and cold; but it was all sunshine and hot outside, with the ocean as calm as a lake. To me, it was a beautiful day, but to Newfoundlanders, it was a heat wave.

Departing the harbor, we headed by zodiac towards Bell Island. The rugged, green island was off in the distance, making for a picture-perfect scene, along with a white sailboat, which graced the seascape, almost as if it had been placed there for the photo. Then, the black hump and fin of a minke whale made its presence known. We had been on the water less than five minutes.

On closer inspection, minke whales seemed to be surfacing all around us, but we kept going. Rounding the back side of Bell Island, the sheer cliffs and rock pinnacles looked like a place in which some sort of mythical creature might live, but, in reality, over 2,000 people live there today. In the heyday of the island's iron ore mine, which operated from 1895 to 1966, the island had as many as 12,000 people.

Then, we saw the view that gave the island its name, a bell-shaped opening between the main island and a rock pinnacle. Our captain skillfully glided the boat through the bell. Looking down into the clear waters, we could see fish, kelp and jellyfish.

Continuing on our way, we stopped the zodiac and offloaded the kayaks. The sea was still glassy, and we began paddling close to the island and exploring the inside of several sea caves. A slight swell lifted us up and rolled us back down, as we looked up at the sheer cliffs. Another minke came up for a breath of air, revealing itself to be quite close and swimming in our direction, so we all stopped and hoped it would surface closer. Waiting for the whale to breathe again, we noticed there were moon and lion's mane jellyfish all around us. The clouds reflected perfectly in the still water, so the moon jellyfish seemed to be swimming through a watery sky of clouds.

The whale finally surfaced about ten minutes later, well past us, and we kayaked back to the zodiac to pack up and head back to shore.

Owners of Ocean Quest, Debbie and Rick, kindly invited me out to dinner with some of their friends. I wondered if I was going to be a bit of an outsider, but pretty soon, I was laughing and listening to the group sing along with the open-mic-night musicians—songs I had never heard before. I could not help tapping my foot and occasionally whipping out my smartphone to record the scene. After a few delicious local beers and enjoying a Newfoundland staple of cod fish-n-chips, I was full, happy and ready to crash.

The dinner was also my first introduction to Newfoundlander slang,

Petty Harbour cloaked in mist (above); Row of canons at Signal Hill (top right); Ice cream in a fish-shaped cone (right); Cod fish and chips, a common dish in Newfoundland (far right); Lighthouse at Cape Spear in the fog (bottom right)

and my dinner companions fired sayings at me, to see if I could guess what they meant. "Would you like some 'Newfoundland Steak'?" they asked. I am not a big steak-eater, so I said, no. But they erupted in laughter, as they told me it was actually bologna (sausage). What were locally known as "nippers," which came out as the sun started to set, were actually mosquitoes. And, of course, as a visitor, I was one of those who "come from away."

The fog

I woke up the next morning quite early, but it was already bright daylight and blue skies outside. The sun rises around 5:00 in the morning in July. Rick told me the keys were in the truck, and I should go "get lost," because that is what you do in Newfoundland. I reconfirmed a 7 a.m. starting point for the next day, for diving, to make sure I was "unlost" by that point.

Making my way towards Cape Spear, the most easterly point in North America, I seemed to pick up clouds and fog on my tail as I crossed over the island and arrived in a white, rolling mist. I had been hoping to see whale spouts from the high vantage point, but all I saw was fog. Setting off to see the lighthouse, it felt like I was only 10ft from it before it finally came into view. I could imagine the expansive blue water extending all the way to Europe, but I could not make out a single wave through the mist.

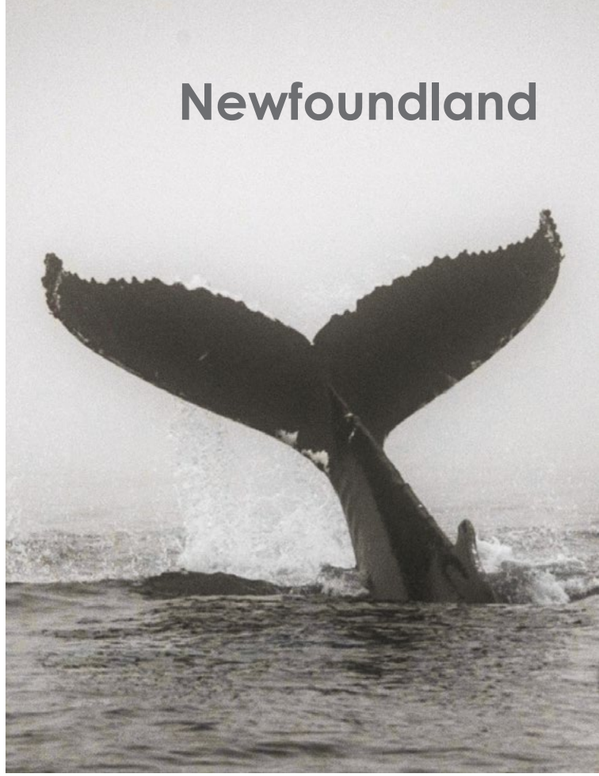
In World War II, a Canadian-manned gun battery, as well as barracks and bunkers, was built here to defend the area. I walked past a 10-inch M1888 gun and onto the cliff, to see inside the bunkers. I climbed some stairs leading up into the haze, and soon there was a lighthouse in front of me. Next to it was a café, where I stopped for a cup of coffee and could not resist an ice cream in a "fish waffle."

As I sat outside eating cold ice cream and drinking warm coffee, the mist lifted for a moment, and I realized I was incredibly close to the parking lot. I had taken a much longer route up and around when I could have just gone up a few steps to the lighthouse. But in the fog, I had known no better. The long route was actually more fun to hike anyway.

In search of whales

My next stop was Petty Harbour, where I would be joining one of Ocean Quest's wildlife snorkeling tours. I met up with Meg from yesterday's kayak tour and Jonny O, the CFO (or "Chief Fun Officer") of Ocean Quest and got settled in with a wetsuit, gloves and hood.

We departed Petty Harbour, in that same cloak of white mist. Just as I wondered how we would spot the whales in this dense fog, Johnny O told the group, "Well folks, today we will be finding whales by sound and smell." I understood the part about the "sound." Humpback whales are mammals and must come to the surface to breathe, releasing spent air, loudly, back into the atmosphere—but the smell? Well, apparently, whale exhales have the aromatic qualities of fish rotting in the sun.



Humpback whale fluke spotted on the whale tour (above); Passing beautiful scenery during the whale tour in the zodiac boat (right); Humpback's tail fin breaks the surface as it dives (far right); A humpback whale approaches closely to the zodiac, spouting a mist of its fishy-smelling breath (bottom right).

I do not know how confident I was in Johnny O's sound and smell whale-finding skills, but his charisma was top-notch, so it was tough to doubt him. Soon enough, we were off, speeding over lake-calm water, through an enchanting and maybe slightly eerie haze. Smoke on the water.

Outside of the harbor, I could just barely make out the cliffs to our right—they were nothing more than gray texture and green dots in the fog. "Thar she blows!" We had not even been out for five minutes, and a whale surfaced mere feet from the boat—so close that my telephoto lens zoomed all the way in, and I still could not get the whole tail in frame. They had told me Johnny O had a sixth sense for finding whales. I guess they were not kidding.

We continued in the fog, and I was happy to see there was GPS on the boat, so we would not accidently end up on land due to the mist. This really brought home the difficulties of being a seafarer in this part of the world. Often, one cannot see anything.

The boat steered close to land, and the cliffs in the mist rose up like something out of a fairytale. Flocks of puffins flew by, appearing out of nowhere and disappearing just as fast. We came across a few other whales and eventually made our way back to Petty Harbour.

Bell Island wrecks & iron ore

There is overwhelming history in and around Newfoundland. The Vikings left their mark over a thousand years ago, and then Europeans made their way there, first arriving in 1497. They gave it the name "New Found Land," and the British flag was raised here until 1949, when the province became Canadian. Other fun facts include Water Street in St Johns being the oldest city in North America, and just above St Johns is Signal Hill, where the first transatlantic radio signal was received in 1901.

Bell Island was originally known for fishing but reports of valuable iron ore came as early as 1578. In the 1890s, professional mining companies started to develop the site, beginning operations officially in 1895. The island made it easy to load ships with the iron and transfer it, first to Nova Scotia and soon afar, as it became a vital point for world steel production, with steel being shipped to the United States and Continental Europe.

The small island, only 5.9 miles (9.5km) long and about 2 miles (3km) wide, turned out to have much iron ore below and beyond. Rich with a layer of 51 percent iron ore that extended miles out under the sea, the mine was very productive.

Germany was a main buyer in the early 1900s, but when WWI began (and Newfoundland was still under British rule), they stopped selling to their rival. The iron ore continued to go to Britain and was used to defend Britain against Germany.

After WWI, the Germans once again became a purchaser. In 1939, over 500,000 tons were exported to Germany. But in a similar vein, when WWII started, the Germans were cut off from their supply. The Allies then continued to receive the resource for the development of their weapons. This clearly did not make the Germans happy. Not only did they want the resource, they also did not want the Allies to have it, to make weapons to be used against them.

It is not surprising that the Germans wanted to disrupt this supply chain, and fully loaded cargo ships would be easy targets in the harbor. On the night of 4 September 1942, the U-*513*, cap-

Newfoundland

Rick operates the elevator bringing a diver back on the boat (lower left); Dive gear on board, with Bell Island in the background (left); Debbie Stanley jumps in (above); Rick Stanley gives a dive briefing on the boat (right).

tained by Rolf Rüggeberg, snuck into the harbor under the cover of the stern of the SS *Evelyn B*. Captain Rüggeberg hid until the morning and fired twice on the SS *Lord Strathcona*, but the torpedo detonators had not been armed, and they simply sank to the bottom.

The *Evelyn B* spotted the sub and opened fire, but the U-*513* dived. It decided on its next target, the SS *Saganaga*, hitting it twice and sinking it within minutes. It then went back to the *Strathcona*, although the *Strathcona* swung around and hit the U-boat's conning tower. It caused some damage to the sub, but the U-boat went under and fired two torpedoes, sinking the *Strathcona* in minutes. Chaos ensued and small fishing boats came from all over to try and rescue survivors, but the U-boat disappeared into the Atlantic.

This was not the only attack on the area. Less than two months later, on 2 November 1942, the U-*518,* led by Friedrich Wissmann, made a similar play. Making its way inside the harbor, the U-*518* fired on the *Anna T*, but missed and struck the Scotia cargo pier instead, severely damaging it. Then, it sent two torpedoes to the SS *Rose Castle*, one hitting the stern and one hitting the bow, sinking it.

The *PLM-27* (Paris, Lyon, Marseilles), a British-owned, free French Naval Forces ship, fired flares to try and help the survivors, but in its efforts also illuminated itself to the U-*518*. A torpedo struck amidships, almost splitting the ship in two. As boats came out to rescue, this U-boat also escaped under darkness and confusion.

Sixty-five lives were lost between the two attacks. For the Germans, it was a huge success, sending thousands of tons of iron ore, which would otherwise be used against them, to the bottom of the sea and removing four of the ships that carried it. A month later, the Newfoundland government responded by putting anti-submarine nets in Conception Bay, and no further attacks occurred.

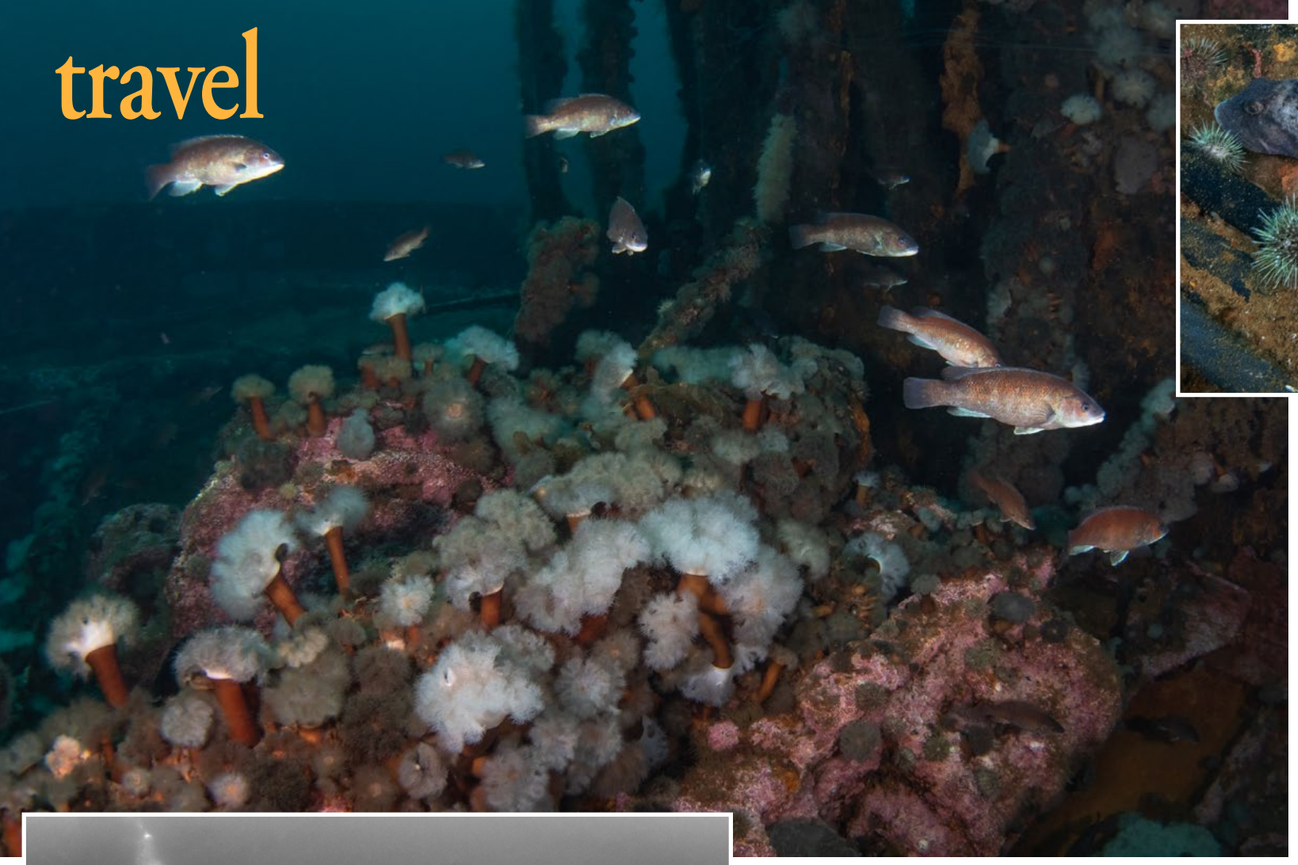
Wrecks of 5 September 1942

Waking up early on my first day of diving, I made my way up to the kitchen and found I was no longer alone in the lodge. A group of divers from Dan's Dive Shop in Ontario had arrived the night before, and we would be on the boat together. Heading out to prepare gear, Rick had a truck backed up to the dive gear room, and we loaded the tanks onto the truck, then the gear, then the drysuits. The sight was almost comical: a big truck overflowing with dive gear.

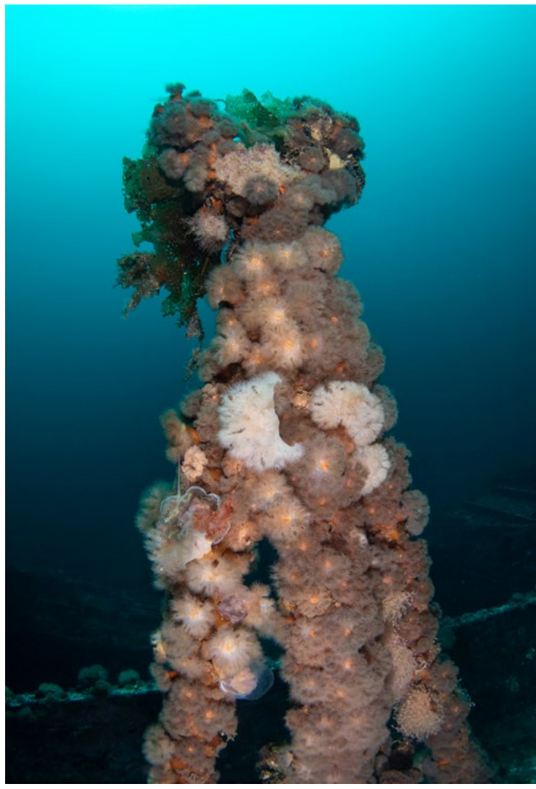
We had a dive briefing to prepare for the week's dives, and Rick discussed Ocean Quest's "Pillars of Success," something I had already heard about on the kayak and snorkel tours. It included being respectful to other people on the trip, the importance of education and learning something, and being respectful to the environment. I appreciated Ocean Quest's dedication in taking care of their customers and the phenomenal environment they were about to take us to. I mentally wished every dive operation had something similar, to remind people of the privilege and responsibility we have.

It was blue skies again, and the day was already heating up. We walked five minutes down to the harbor and loaded the 42ft cruiser,

Newfoundland



On SS *Strathcona*: Fish life and anemones (left and right); Pout fish and sea urchins on the wreck (above); Anemones cover the wreck structures (lower right); Anchor on the deck (below); Divers exploring the wreck (lower left)



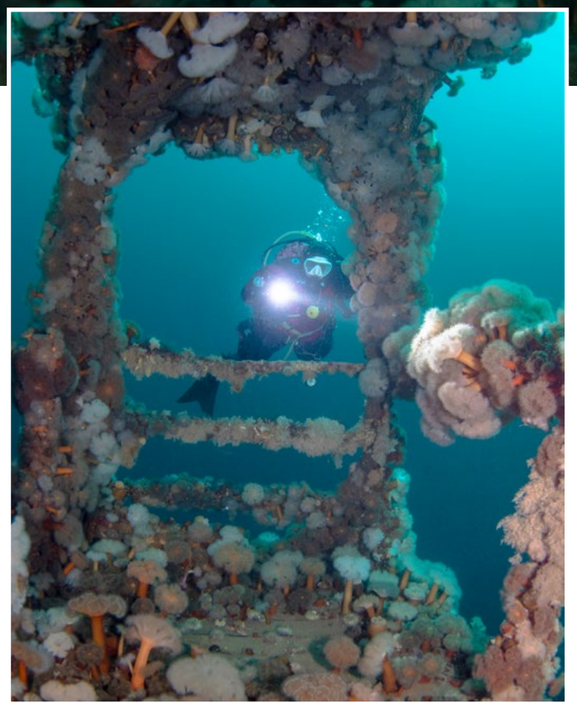
SS *Lord Strathcona*. Our first dive was on SS *Lord Strathcona*. I had the honor of having Rick as my dive buddy and guide, and we waited for the rest of the divers to get in before we geared up and joined them. As a mostly tropical-water diver, the entry into cold water was "an awakening," to say the least. But I felt cozy in my drysuit. We swam to the bow of the dive boat and headed down the line. At around 15ft (3m), there was a very severe thermocline, and let's just say, the water was brisk.

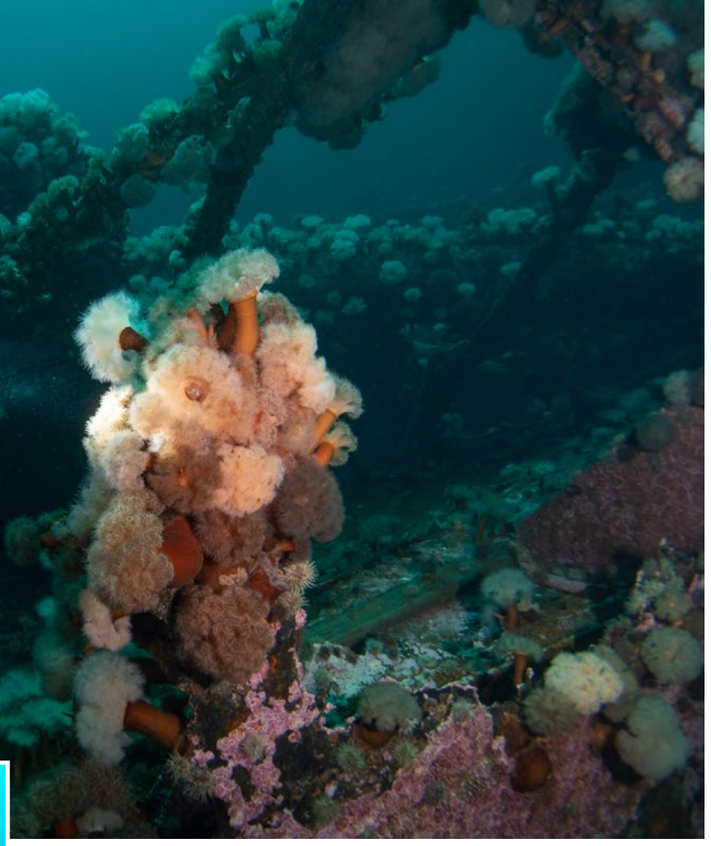
As we made our way down the line, it was not long before the massive ship came into view. The visibility was incredible, and the first thing I noticed was how much life was on the wreck. Anemones of pink, white and orange covered the wreck's structures. The second thing I noticed was how intact the ship was. It looked as if it might have sunk just a few years ago—not over 80. We swam about half the length the ship, with Rick pointing out interesting objects like an anchor on the deck and the 4.7-inch deck gun.

I wanted to stay longer, but at around twenty minutes into the dive, my poor fingers were frozen. I signaled that I was okay, but cold and ready to go up. I did not even want to look at my dive computer to find out how cold it really was. I realized as we made our slow ascent back to glorious summer sunshine, into what the Newfoundlanders were calling a heat wave (and I considered normal temperatures), that I had never really asked what the temperature would be underwater. I knew it would be cold, but for some reason, I had it in my head that it would be around 55°F (~13°C), which was the typical surface temperature this time of year—but the thermocline came quick and drastic.

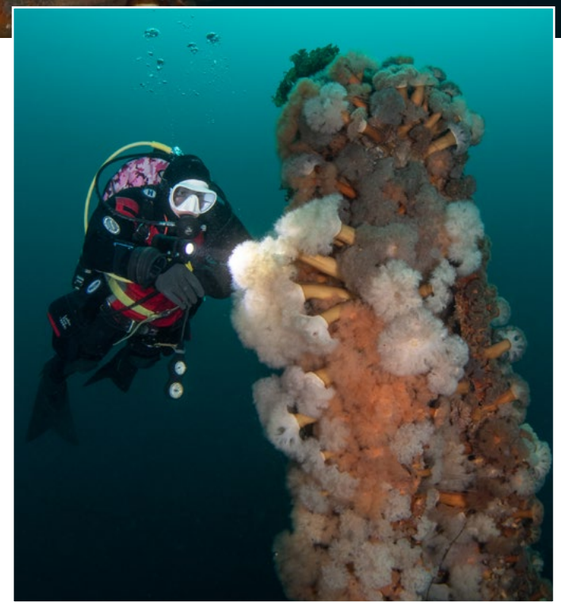
called the *Mermaid*, with gear. Then, we headed out to the wrecks. Minke whales were once again making themselves known, with black fins breaking the surface, and we were surrounded by stunning landscapes everywhere we looked.

Back on the boat, the other divers started returning and talking about the excellent dive—plus, everyone was enjoying the fantastic elevator/





Debbie Stanley lights up anemones on SS *Saganaga*



lift system on the back of the boat, which brought divers up and on board, without any difficult work climbing ladders. It was then that someone said, "My computer read 32°F (0°C)." My eyes must have gotten wide, and I went to my dive computer to confirm this—no wonder my fingers were cold!

SS Saganaga. Warming up in the sunshine, we moved on to SS *Saganaga*. Here, I would be getting the golden treatment, as Debbie Stanley would be my dive guide and buddy for this dive. She said this was her favorite wreck, and she loved all the anemones and colorful marine life on it.

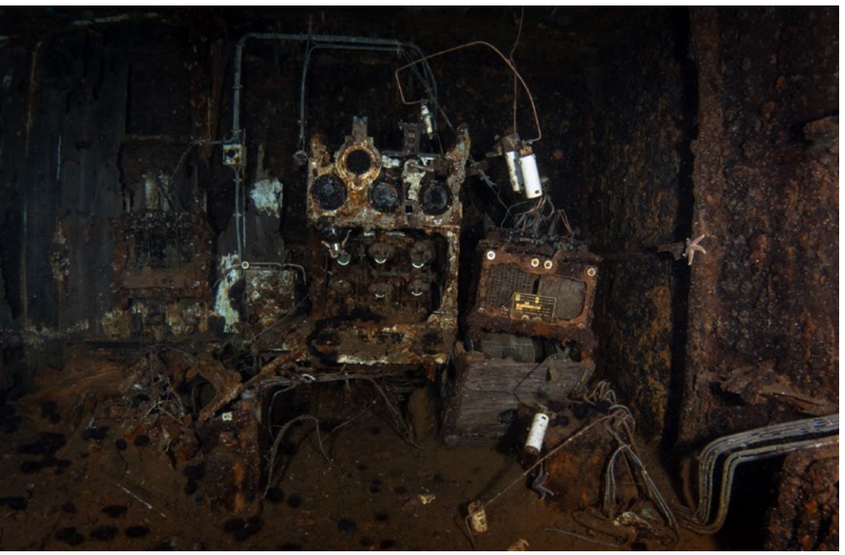
She was not kidding. The *Saganaga* was completely covered with anemones. When I flashed my strobes, the colors lit up like a pastel painting of a forest full of mushroom-like trees. It was really beautiful, and Debbie was a fantastic model, posing perfectly with her light shining and lighting up the anemones. I followed her through several swim-throughs, with nearly every square inch covered in puffball-like anemones. It felt more like a "Candy Land" than a WWII wreck.

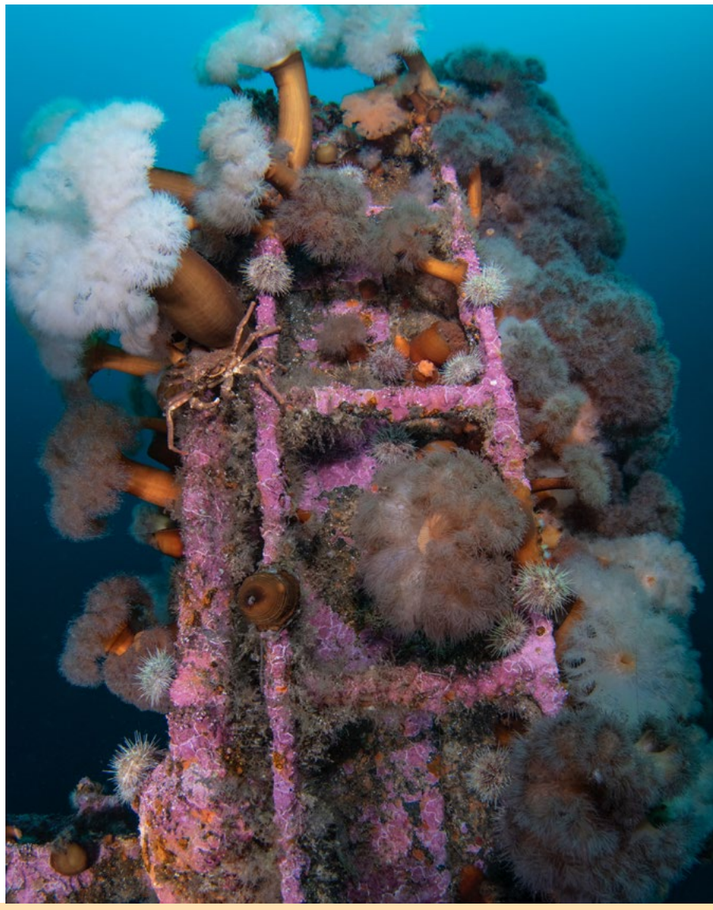
Once again, at around twenty minutes, my fingers were the determining factor of cold. (Next time, I will bring dry gloves). It was an internal struggle though. The wreck was so pretty, and I could have stayed an hour taking photos, but my fingers were struggling to operate the buttons on my camera. I gave the signal, and we headed back up. But wow, even with it being a short dive, it was a great dive!

I never expected to see so much life on a wreck so far north and at such low temperatures. There were colorful sponges covering the decks, and anemones crowded davits and seemingly any surface area sticking up from the wreck. Crabs were tucked into the anemones, mostly camouflaged, and fish slowly made their way around the wreck. There were flounder and ocean pout fish—so much life in an unlikely place. Apparently, this unique biodiversity was fostered by the cold Labrador Current meeting the warmer Gulf Stream, bringing together marine life from different ecosystems and making this area particularly rich.

Once again, I was exposing my frozen fingers to the sunlight to thaw. But Debbie and Rick had a better idea of how to warm us up: soup—homemade (with love). We all gathered inside the boat, warmed our fingers on the bowls and enjoyed the fantastic soup, as we made our way back to land.

Wrecks of 2 November 1942
Our second day of diving was similar to the first, but we would be diving SS *Rose Castle* and





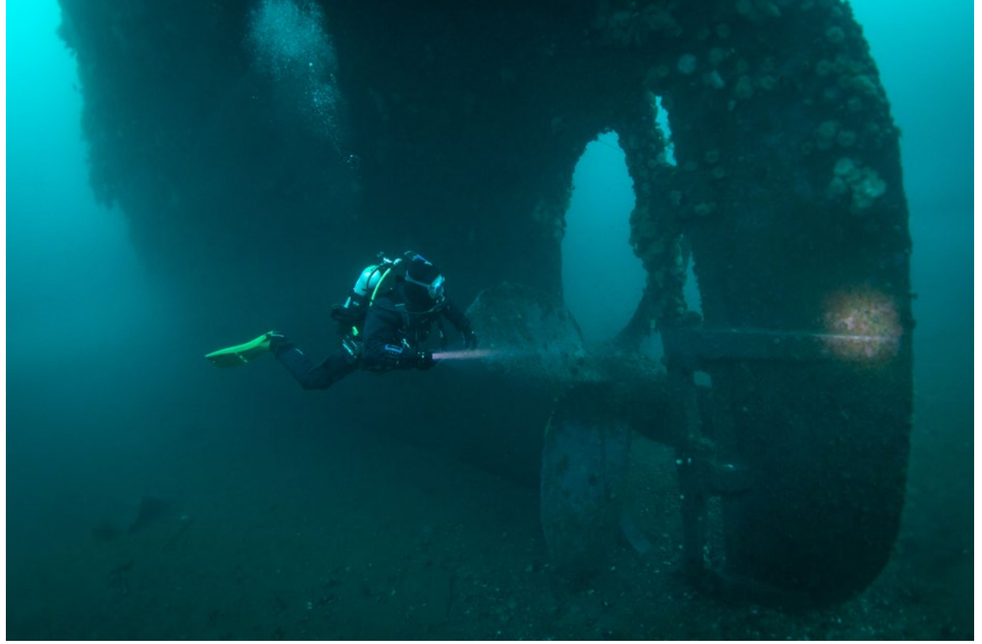
On *SS Rose Castle*: Gun with plumes of anemone sprouting off the end of it (right); Fish and light bulb on the wreck (far right); Ladder with anemones and crab (bottom right); Divers explore the wreck (center); The Marconi radio room inside the ship (below)

PLM-27 today. We loaded the gear onto the truck, made our way to the boat, and headed out, on a slightly windier and rainier day.

SS *Rose Castle*. The *Rose Castle* was the deepest wreck in the area, with the top deck being around 105ft (32m). Today, my dive guide would be the "fun officer" himself, Johnny O. After the dive briefing, he asked me where I wanted to go on the dive, and the main thing that stood out in my mind was what they called the "Marconi Room"—the ship's radio room, which was still very much intact.

That was where we headed first. Sticking my head (and camera) into the room (but not going in all the way, so as not to stir up silt for everyone else), I could see there was equipment, cords and even panels with writing still visible. It was as if one could still just turn a few knobs and call the Coast Guard, or maybe tune in to a 1940s radio station.

We swam around the superstructure for a bit, and visited the gun, which had a group of anemones growing right off the barrel. It looked as if someone had fired the gun and a balloon of pale pink anemones had exploded out



Newfoundland

On the *PLM-27* wreck (clockwise): Fish and marine life on a winch; Diver examines the propellor; A lion's mane jellyfish being eaten by the anemones growing on the ship; Divers swim over the massive damage done at midships during WWII

WRECKS OF BELL ISLAND

SUNK BY U-513 ON 5 SEPTEMBER 1942

SS *Lord Strathcona*
DEPTH: 65ft (20m) to 130ft (39m)
NATIONALITY: Canadian, built in 1915
LENGTH: 455ft (140m)
TONNAGE: 7,335 tons

SS *Saganaga*
DEPTH: 60ft (18m) to 115ft (35m)
NATIONALITY: British, built in 1935
LENGTH: 407ft (127m)
TONNAGE: 5,454 tons

SUNK BY U-518 ON 2 NOVEMBER 1942

SS *PLM 27* (Paris Lyon Marseilles).
DEPTH: 40ft (12m) to 100ft (30m) in the sand
NATIONALITY: British, built in 1925
LENGTH: 400ft (123m)
TONNAGE: 5,391 tons

SS *Rose Castle*
DEPTH: 105ft (32m) to 150ft (46m) in the sand
NATIONALITY: Canadian, built in 1915
LENGTH: 455ft (140m)
TONNAGE: 7,546 tons

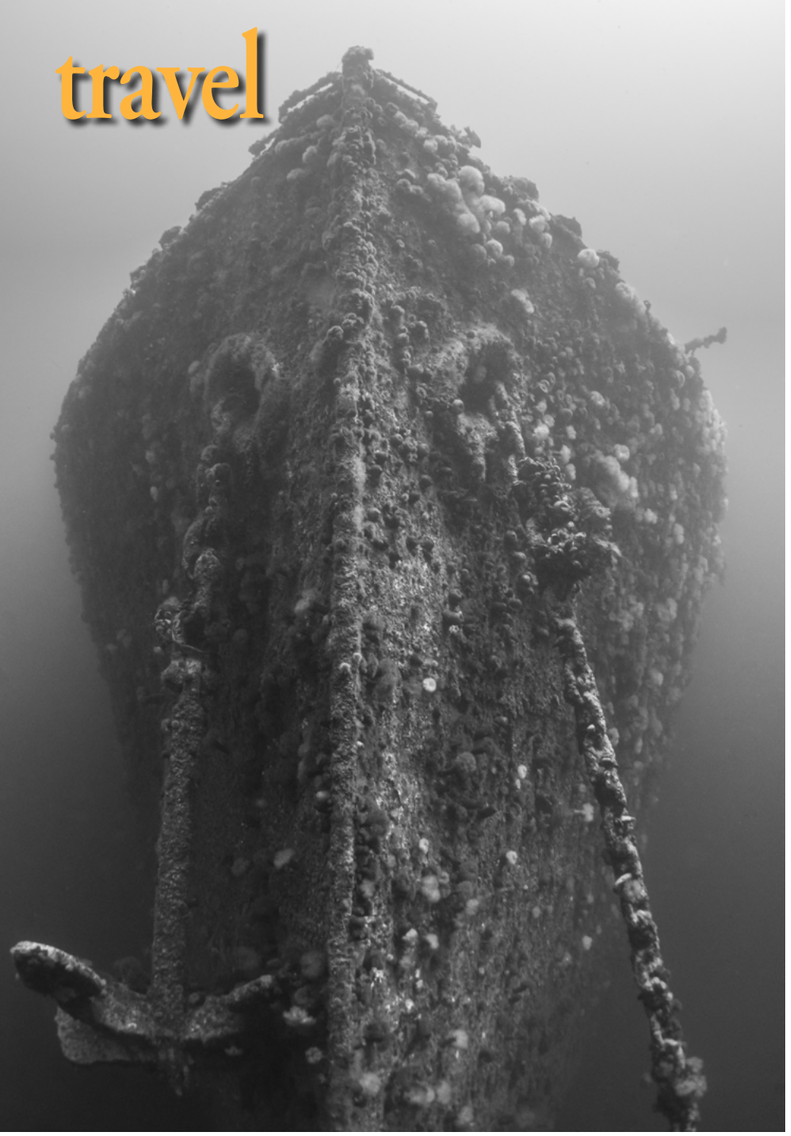
of it. Soon enough, the depth and cold got to me, and it was time to return to the surface.

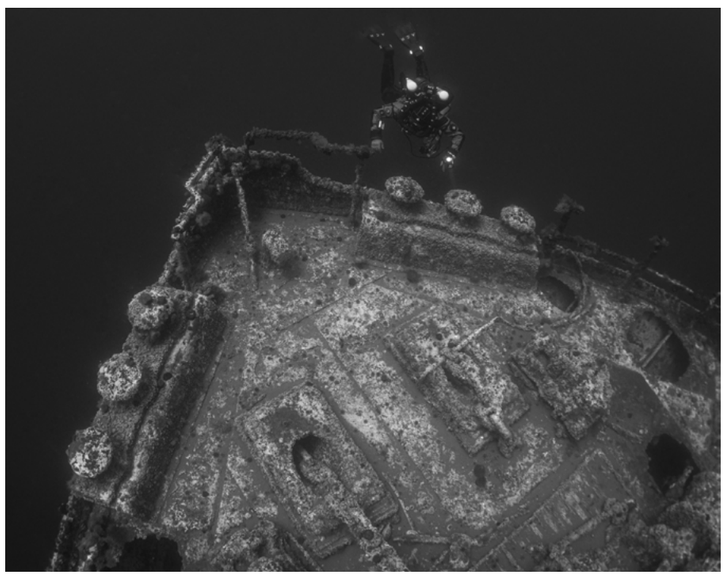
PLM-27. Our second dive was on the *PLM-27*. This ship was almost torn in two by a torpedo, which hit midship. Rick briefed us on the destruction caused by the torpedo, ripping and bending metal, and with dive guide Jason, we planned to swim around the ship, seeing the propellor and venturing around to the point of destruction.

Visibility was shockingly clear again, and dark maroon lion's mane jellyfish could be seen throughout the water column. The propellor was huge, and Jason posed in front of it, to give us a sense of scale. Then, we continued around the ship and the hole (or rather, the tear in the entire side of the ship). The metal was simply splayed open, bent, curled and jagged. It was clear it was the massive force of a torpedo strike that sank this ship.

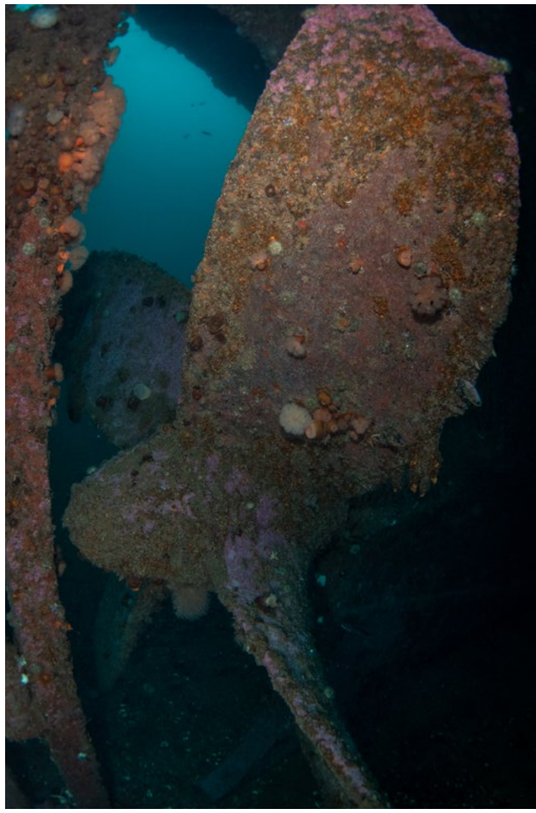
Swimming up through the destruction, we returned to the top deck. White, wispy haze could be seen coming up from the cargo holds. Probably an oxidation reaction, but the holds looked as if they were boiling over with steam. Visibility was so good, I could see the shadow of the *Mermaid* on the surface, from the wreck.

Back on the surface, it was time for soup again. Today's flavor was Moose Stew and was, by far, the fan favorite. The moose ended up in our bowls thanks to Rick himself (with per-





Newfoundland



Bow of the *PLM-27* (top left); Divers explore the wreck of *PLM-27* (top center and center-left); Propellor of *PLM-27* (above); Making dinner with the Canadians from Dan's Dive Shop (left)

mit, obviously). This may sound cliché, but I felt like one could actually taste the love in the soup: their love of the Bell Island wrecks, their love of diving and adventures, and their love for the people who "come from away."

The people you meet

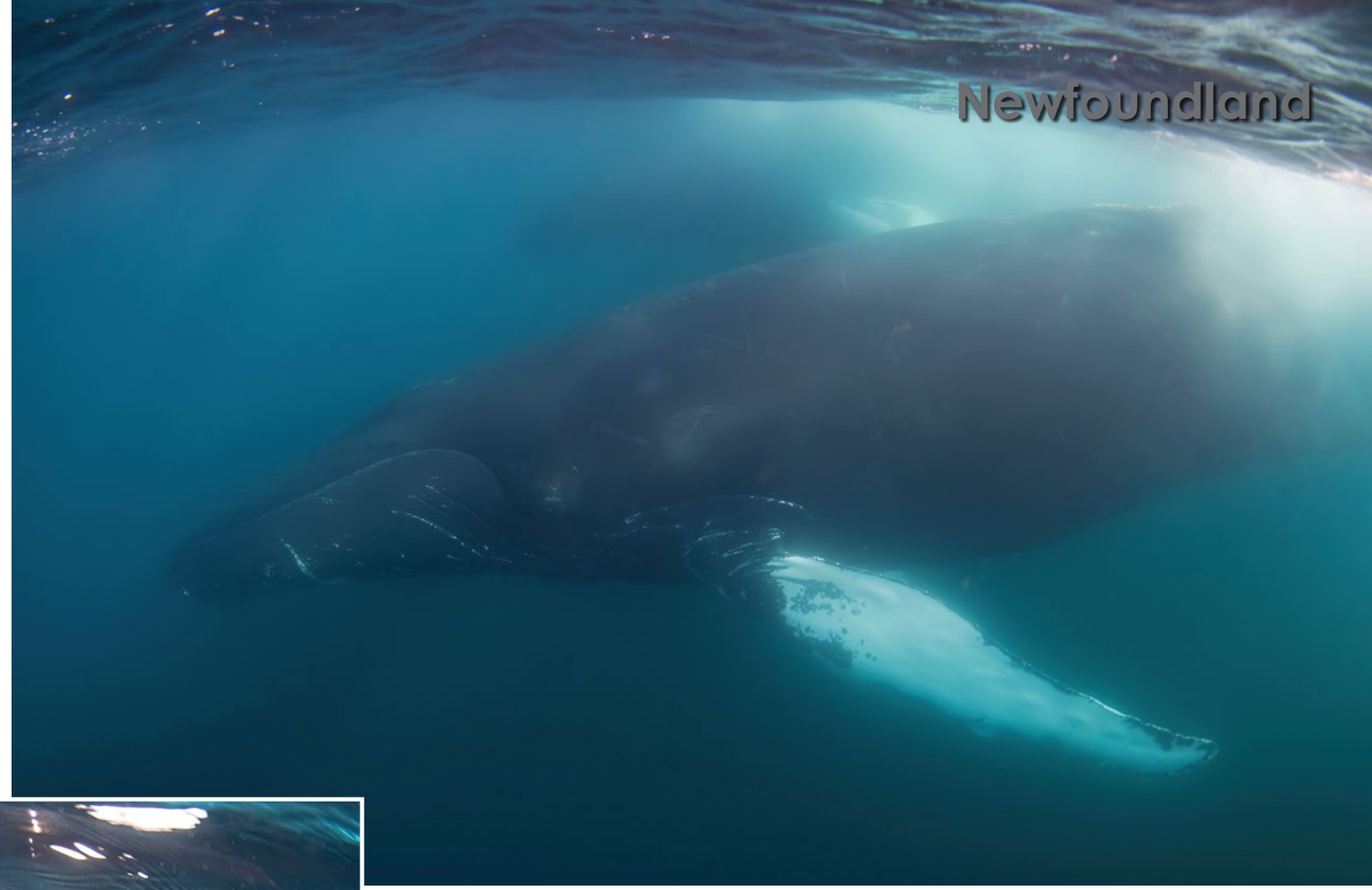
Back at the lodge, my new Canadian housemates were talking about making steaks for dinner. They invited me to join, so I ran to the grocery store to get ingredients for a cake for dessert. There may have been some wine involved, and pretty soon, the kitchen was full of people chopping vegetables, marinating steaks and refilling glasses. The dinner party eventually made its way outside to the firepit and lasted a bit longer into the night than was probably advisable, given the diving activities the next day.

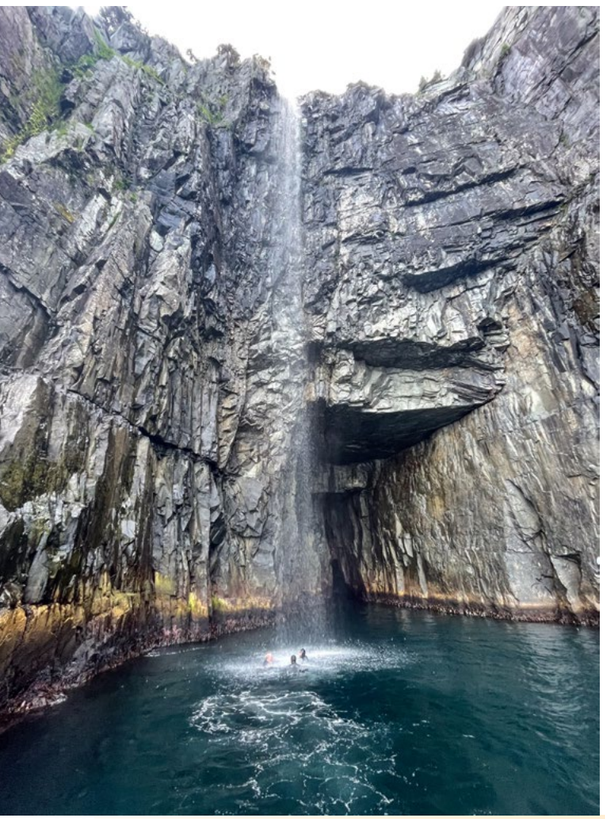
The lodge provided an exceptional atmosphere for a "feels-like-home" experience. For several nights, we cooked together. There were two more days of diving, visiting each of the four wrecks once again, and it was clear that two dives on each wreck were not nearly enough. Sometimes referred to as the Truk Lagoon of the north, this submerged battlefield was an underwater museum, frozen in time.

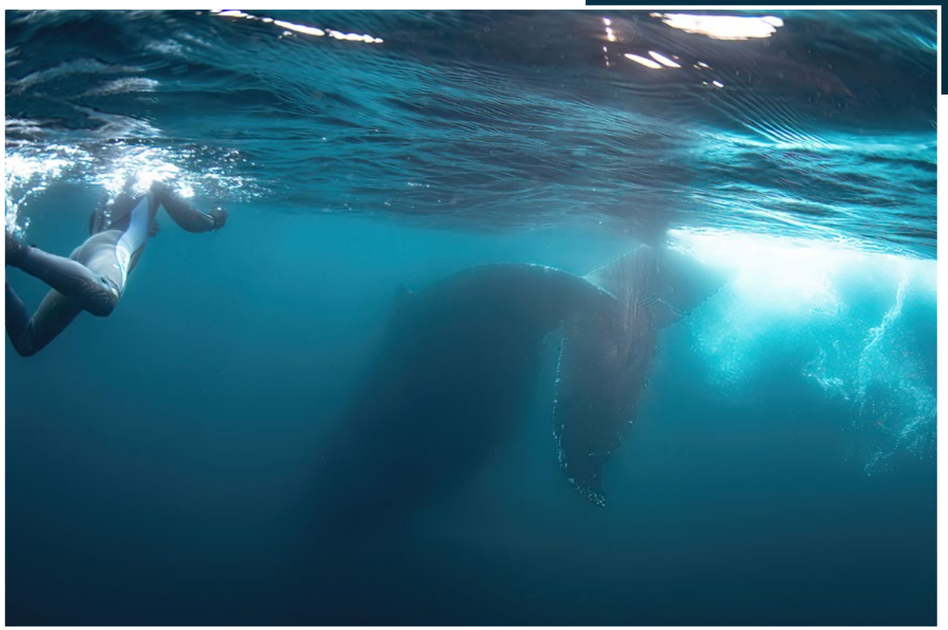
Searching for whales, part two

Rick was determined to show us whales, so after our last dives on the wrecks, we packed up our dive gear, grabbed some snorkels and headed to Petty Harbour. Blue skies and the vivid colors of the buildings in town greeted us, making the fog on my last visit a distant memory. We headed out in the zodiac and cruised along the sheer cliffs, which I could only just barely make out on my last visit. A baby bald eagle was spotted on the cliffs, along with endless birds.

We cruised into a sea cave, and a few people jumped in, under a waterfall, where the water pouring







Underwater scenes of a humpback whale during the whale tour (above, top left and left); Divers bask in a waterfall off the cliffs during the whale tour (far left).

down was warmer than the sea water. Moving offshore a little, we jumped in to check out some jellyfish and possibly some schooling capelan. While in the water, a spout occurred close by. I think Captain Johnny O was using his whale-whisperer skills again, and as we scanned the horizon and the blue water below, we got a glimpse of a humpback whale swimming right next to us. And then there were two. They did a pass by us, one towards the surface and the other under us, with its white belly up, as if showing off. The giant tails passed, and it reminded me of how small I was in this big ocean.

Assuming the encounter was over, we laughed and yelled in delight at what we had just witnessed, when we could hear Rick and Johnny yelling to us, "Behind you!" The whales had come back for another look. I could hear the massive exhale of one surfacing close by, and then, its head came into view underwater. Getting larger and closer to me, I could make out the eye looking right at me. There is something truly special about being eye-to-eye with a humpback whale—a memory I am sure none of us will forget.

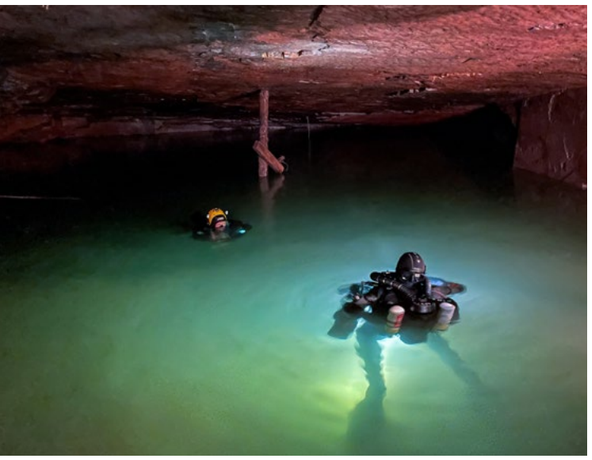
Even as we were getting back into the boat, the whales did not seem to want to leave us. They surfaced right next to the boat (blowing a very fishy aromatic scent over us with their breath). We waited for them to descend and slowly made our way back towards Petty Harbour, smiles all around.

Full circle and what to come back for

The last day of diving involved getting up extra early to catch the ferry to Bell Island. I had kayaked around it, dived the wrecks next to it, flown my drone beside it, but


TRENT ZAWALY

Diving in the mine (top left and lower left); Starting the mine dive (far lower left); Tanks were lined up to be moved down the mine to the dive entry (top center); Gear ready to be donned for the mine dive (left); Rick moves gear to the dive entry by golf cart (above).




TRENT ZAWALY

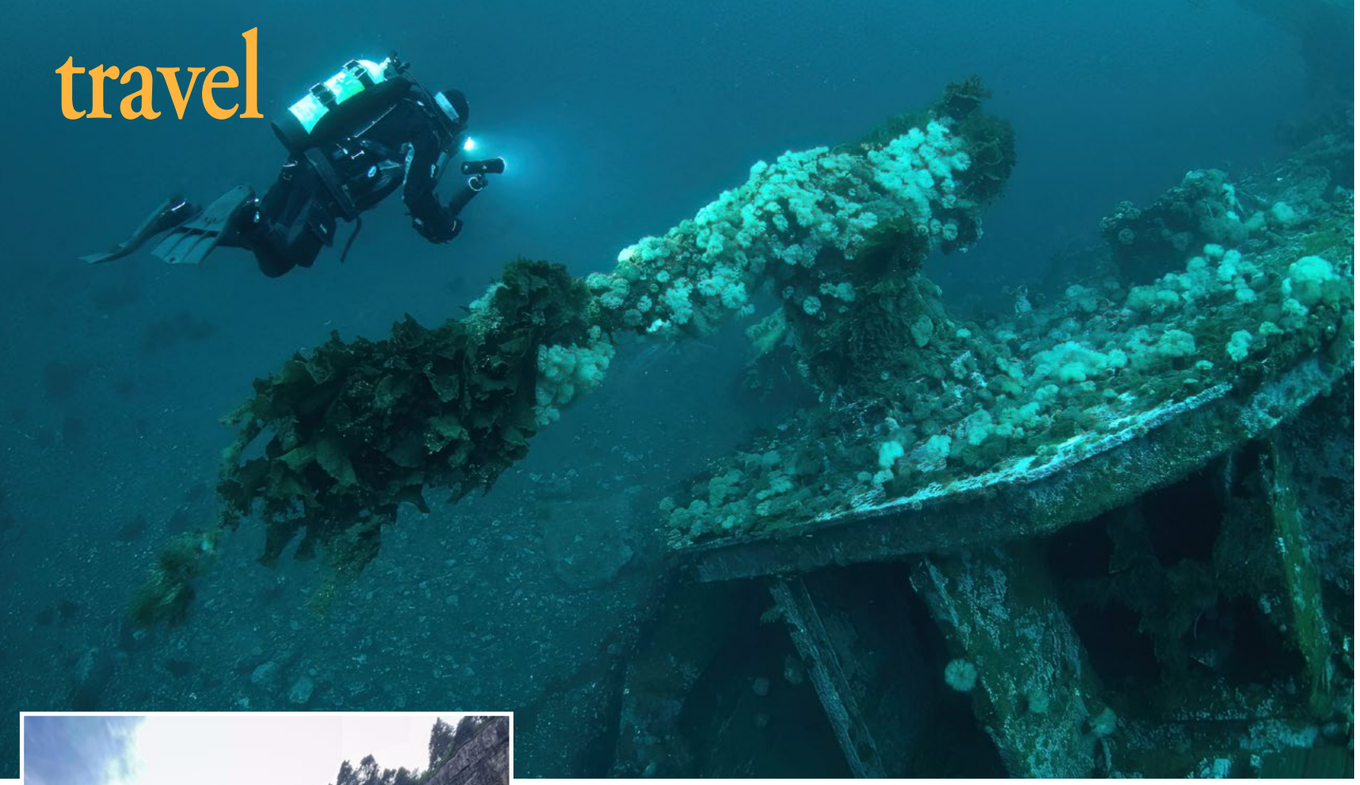
I had not yet touched land. Another bluebird day met us, although the 5 a.m. wakeup call still did not get me up in time to see the sun rise. I watched the other divers load their gear onto the truck. Today, I would just be observing, but they would be diving Bell Island's iron ore mine.

Throughout the history of the mine, it became more and more expensive for the mine to operate as they got farther and farther under the sea. By 1951, they were three miles out under the sea. As new technologies developed and other mines around the world were producing more ore, at less cost, the mines at Bell Island started closing. By April 1966, all mining had come to an end.

The reason behind the wrecks, which we had been diving, was this mine, so it only seemed natural that the next step for us would be to dive the mine. Rarely dived, and by a very small number of people, the group I had been sharing the lodge with were going to increase that number.

Listening to the dive briefing delivered by Rick and Johnny O—about the mine, dive plan and safety—I was struck by a comment: Johnny O said, "Remember that enough is as good as a feast." I hope to use this quote in technical diving in the future. I like how it acknowledges that we should plan our dives and dive our plans, and when the temptation to push a little bit more arises, because everything is going so well, maybe we should be content with what we have already had. Like the aforementioned "Pillars of Success," I appreciated the genuine and meaningful approach to safety that Ocean Quest has.

I played paparazzi for my new friends, as they prepared for their mine dive, and after most had entered the water, I made my way back above ground to the museum to meet with Teresita McCarthy, the director of the Bell Island Community Museum. She told me the fascinating history of the mine and how many of the employees, who gave tours at the museum, had family members who worked in the mines. The amazing artifacts in the museum included stunning images of the mine during its operation, artifacts and personal effects of the miners, relics from the Bell Island wrecks, and even German papers and insignia from Rolf Rüggeberg. (How that ended up there is



Rick at the gun on the *Strathcona* (above); Divers explore the *Strathcona* (top right); Spectacular scenery on the whale tour (left)

another story in itself.)

As with so many of the people I met in Newfoundland and the places I visited, the museum was a clear labor of love. The people who have built, maintained, expanded and continued to keep it operating have deep roots invested in the mine and the island, and their passion keeps it going—spreading that passion to everyone who comes to see it. The hard work and dedication of Rick, Debbie, the people of the Bell Island Community Museum and beyond, even got the German U-boat attacks at Bell Island in 1942 designated as a national historical event in 2019.

Back to the mine... All had gone well on the mine dive, and the divers told me about the old machinery they saw, just left behind when the mine abruptly closed and was flooded. On the dive, they had followed the line and the pipes that would have previously pumped water out of the mine. Admittedly, I suffered a bit from "fomo" (fear of missing out), having not dived with them, but there always has to be something to come back for. I will just have to return again, to dive the mine.

After packing up, we headed to lunch and a brief island tour. Then, it was back to Conception Bay to wash and dry dive gear, and prepare for the end of the trip.

Kissing a cod

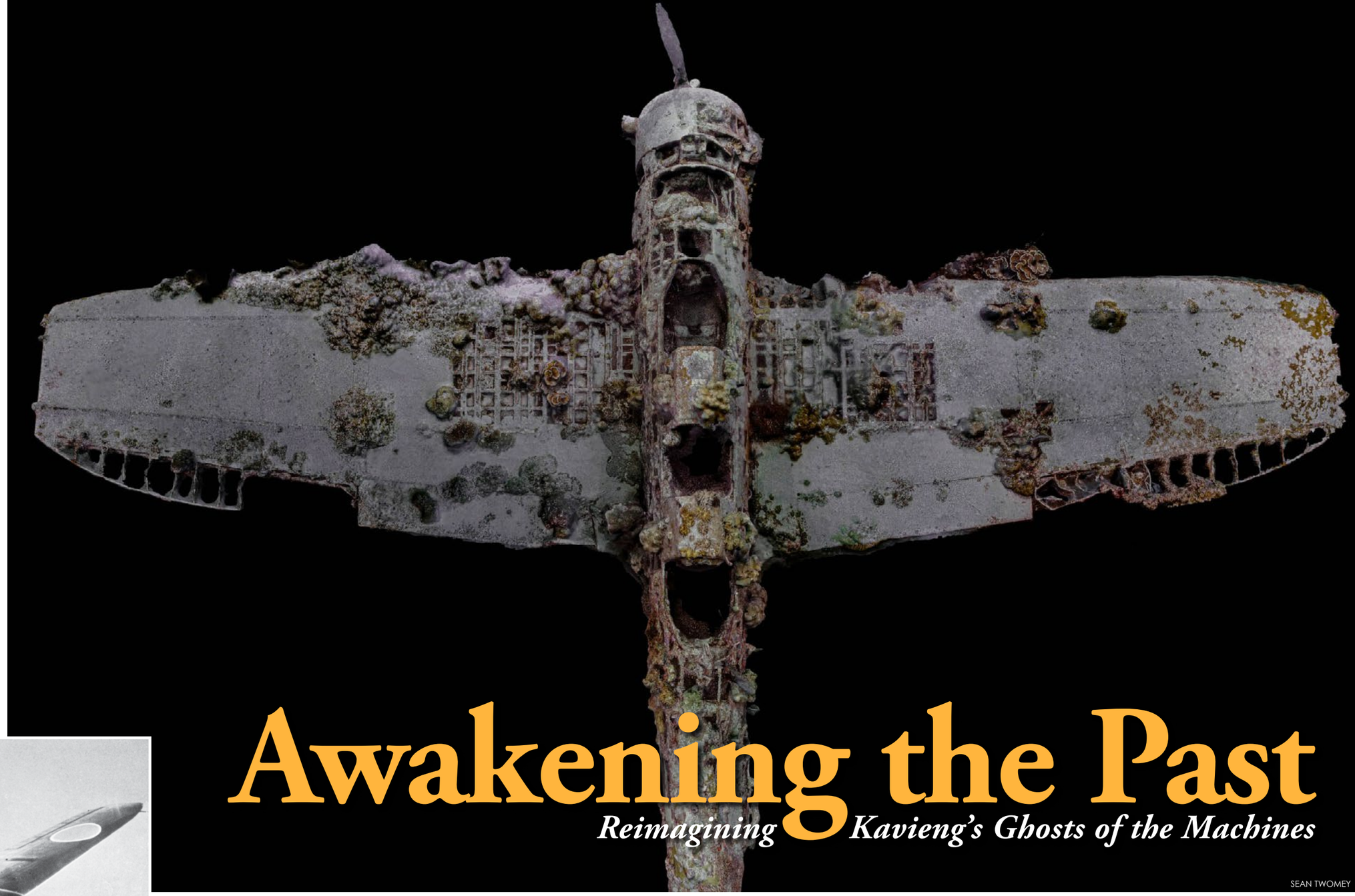
I ended up extending my trip an extra day, and the real reason behind this decision was the rumor I had heard about a famous party and initiation that would be taking place the next evening. I could not possibly miss becoming an honorary Newfoundlander, could I?

I do not know if I am allowed to reveal all the steps of this important ceremony, but I will say that the Screech I had first associated with Newfoundland was involved… and I kissed a cod fish. Plus, I got to do it with new friends.

Some places seem to have a certain magic about them—bringing people together to share fantastic experiences and create lifelong memories one will never forget. But please take into consideration, dear reader, another famous Newfoundlander quote, "Half of the lies I tell you are probably true." □

*Special thanks and appreciation go to owners Rick and Debbie Stanley and the fine staff at Ocean Quest Adventures (**oceanquestadventures.com**) for their hospitality, kindness and incredible sense of adventure.*

Brandi Mueller is an American photographer, writer, boat captain and scuba instructor based in Micronesia half of the year and traveling the rest. She is the author of The Airplane Graveyard, *featuring forgotten American WWII airplanes in Kwajalein Atoll, available on **Amazon.com**. See more of her work at: **brandiunderwater.com**.*



Photogrammetry image of the wreck of a Nakajima "Kate" B5N fighter-bomber in Kavieng, Papua New Guinea

Awakening the Past

Reimagining Kavieng's Ghosts of the Machines

SEAN TWOMEY

Text by Don Silcock
Underwater photos by Don Silcock
Photogrammetry images by Sean Twomey

There is a huge potential for wreck photogrammetry in Kavieng and the neighbouring large island of New Hanover in Papua New Guinea, for it is here that one can find several notable wrecks of WWII aircraft. Don Silcock shares his experience working with technical expert Sean Twomey in an initiative to capture photogrammetry imagery of the wrecks before they succumb to the ravages of time and eventually disappear.

World War II came to the Australian territory of New Guinea in January 1942 when the Imperial Japanese Army invaded Rabaul in New Britain, followed shortly after by the taking of Kavieng in nearby New Ireland.

The invasion turned New Guinea into a major theatre of war in the battle for the Pacific and there were many brutal encounters between the invading Japanese and the defending Australian forces.

Conditions were often appalling; the fighting was incredibly fierce, and many young lives were lost on both sides. To this day, the poignant relics of those battles are woven into the fabric of the now independent country of Papua New Guinea.

WWII was the first time air power played a major role in combat and both sides had some formidable aircraft in action during what is now referred to as the New Guinea Campaign.

War is, of course, deadly by nature, but for the pilots and crew of those aircraft, the rate of attrition was particularly high, and many were shot out of the sky, others suffered mechanical

SAN DIEGO AIR & SPACE MUSEUM / WIKIMEDIA COMMONS

Historical photo of a Nakajima "Kate" B5N fighter-bomber

WIKIMEDIA COMMONS

WIKIMEDIA COMMONS

Historical photos of Kavieng under attack (left) and the seaplane base in Kavieng during World War II (below)

failures and some just got lost and simply ran out of fuel.

Many of those planes went down in remote jungle locations or far out to sea and have never been found—but some have and each one has a special story.

Kavieng

During WWII, the small town of Kavieng played a very strategic role in the grand Japanese plan to seize all of New Guinea and use it as the launching pad to invade Australia to the south. Located on the northern tip of the long rifle-shaped island of New Ireland, Kavieng was effectively the backdoor to New Guinea and the entry point for supplies coming down from the main Imperial Naval base at Truk Lagoon.

To protect that backdoor, the Japanese established a naval facility, significantly expanded the original Australian-built airfield and set up a sea-plane base—all of which came under heavy attack when the Allied forces launched their counter-offensive in 1944. And so scattered around Kavieng, and its many small islands, are numerous WWII aircraft wrecks—the majority of which are easily accessible and dived.

Most are Japanese, with seemingly strange names like Kate, Pete and Jake. The names had been assigned by the Allies to make identification easier—with men's names for fighter aircraft, women's names for bombers and transport planes, bird names for gliders and tree names for trainer aircraft.

Diving the aircraft wrecks

As with all wrecks, the quality of the dive depends on the physical condition of the wreck and the prevailing conditions on the site. With the Kavieng aircraft wrecks, there are three flavours… starting with the ones that came to rest offshore. The best of those is the "Deep Pete"—a Mitsubishi F1M seaplane located on the western side of Nusa Lik (small Nusa) Island, which provides shelter for Kavieng's harbour.

The F1M was a biplane, with a single large central float and stabilising floats at each end of the lower wing. The wreck lies upside-down on flat white sand in 40m of water—hence the "Deep"—and its location on the Pacific Ocean side of

DON SILCOCK

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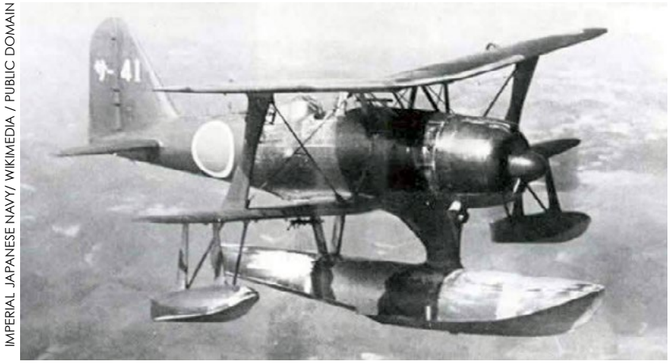
Views of "Deep Pete," the wreck of a Mitsubishi F1M seaplane, located on the western side of Nusa Lik (small Nusa) Island (above, top left and top right)



IMPERIAL JAPANESE NAVY/ WIKIMEDIA / PUBLIC DOMAIN

Historical photo of a Mitsubishi F1M "Pete" seaplane (left)

Kavieng means that the visibility is often in excess of 30m. What makes the *Deep Pete* so special is the large resident school of yellow sweetlips that stream around the wings and the batfish and barracuda that patrol above the wreck.

At the other end of the scale are the wrecks in the harbour or close to the mangroves around the islands, where the visibility can be extremely challenging, thus making photography almost a moot point. In-between are those wrecks in which the pilot had tried to bring the plane to rest in the shallows near one of the islands, and usually these are reasonably intact wrecks and interesting dives.

Photographing the aircraft wrecks

I have been fortunate to have dived all the wrecks, and certain ones, like the *Deep Pete*, several times. I have really enjoyed capturing what they have become and then researching the plane's history and reputation. Sometimes it is even possible to learn about who the pilot was and, if they survived the crash-landing, or what happened to them after the war—providing a touching vignette back into the turbulent and dangerous times of WWII.

While happy with my images and stories, I always felt limited by the fact that the wreck is what it is… Sure, you can use images from the internet to compare it with what it was, but the wreck is always what it has become after some 80 years underwater.

And then I met Sean…

Reimagining Kavieng's wrecks

Sean Twomey is an avid Irish technical diver who now lives in Sydney and subscribes strongly to the "Lust for Rust" philosophy of Pete Mesley, the technical expedition leader and wreck expert from New Zealand. His day job is technical support for 3D CAD/design software, so you could say he knows his "ones" from his "zeros" and, if it was not for his wonderfully redeeming Irish heritage and love of a pint or two, he could easily be confused with a "tech-head."


DON SILCOCK


SEAN TWOMEY

Underwater photo (above) and photogrammetry image (top right) of the wreck of a Nakajima "Kate" B5N fighter-bomber in Kavieng; Sean Twomey with his photogrammetry rig (right)

His software background has led him into the parallel universe of photogrammetry—a word that I could not even spell until I got to know Sean. For the uninitiated, photogrammetry, at its most basic level, involves taking a lot of repetitive, close-range images as an object is traversed. A specialised software is used to compile them into a 3D version of that object, which can be viewed from any perspective, animated and superimposed upon to illustrate its original state.

It is cool stuff and it really impressed me when Sean showed me the results of his first major project on the wreck of a Betty Bomber in Truk Lagoon—over an obligatory pint of Guinness in my local pub in Sydney. Sean had heard about my many trips to Papua New Guinea through a mutual acquaintance and approached me for advice on where to go for the best wrecks.

As soon as I saw the Betty Bomber animation, I thought of the incredible B17F Blackjack bomber wreck on the northern coast of New Guinea. But the wreck's 50m depth and remote location presented a considerable logistical challenge, so I suggested Kavieng because the variety of aircraft wrecks, the relative ease of diving them, and some wonderful people I knew there made it all a "no-brainer."

Lissenung Island

Dietmar Amon arrived in Papua New Guinea in 1996, looking for adventure and an escape from the cold weather of his native Austria. He got both in spades when he bought the small island of Lissenung, located about 30 minutes by small boat from Kavieng.

With no water or power on the island, Dietmar spent months sleeping under the stars while building the infrastructure for a dive resort. Joined in 2005 by his wife-to-be Ange, together they have built an excellent operation they proudly describe as the "best little dive resort in the South Pacific."

I have been to Lissenung several times and had some great adventures in the process. So, I knew how passionate Dietmar and Ange were about the area and its WWII heritage, and I was sure they would be interested in our project.

But this was May 2022, just as the dark clouds of the coronavirus pandemic were lifting, and the couple and their resort were just emerging from two years of almost zero guests, while still helping their staff survive in a country where there was no

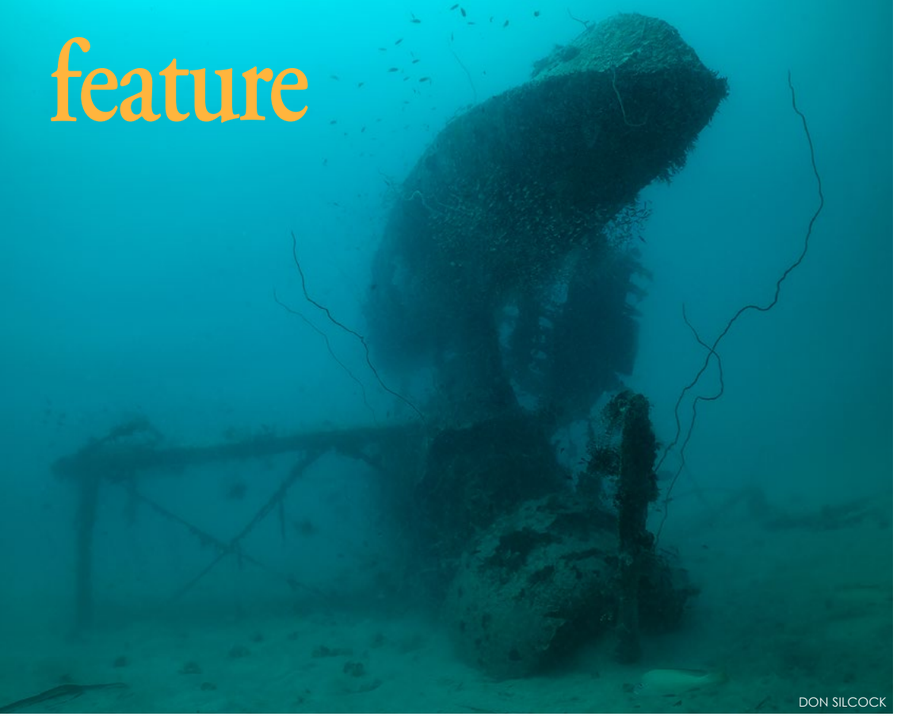

DON SILGOCK

government-funded assistance.

It was a BIG ASK, but there was no hesitation. "Just get here, and we will make the rest happen" was their response. And so, in November 2022, Sean and I left Sydney for the three-flight journey to Kavieng—Sean's first trip to Papua New Guinea, and my 24th… Hey, *it's addictive!*

The initial project

There is tremendous potential for wreck photogrammetry in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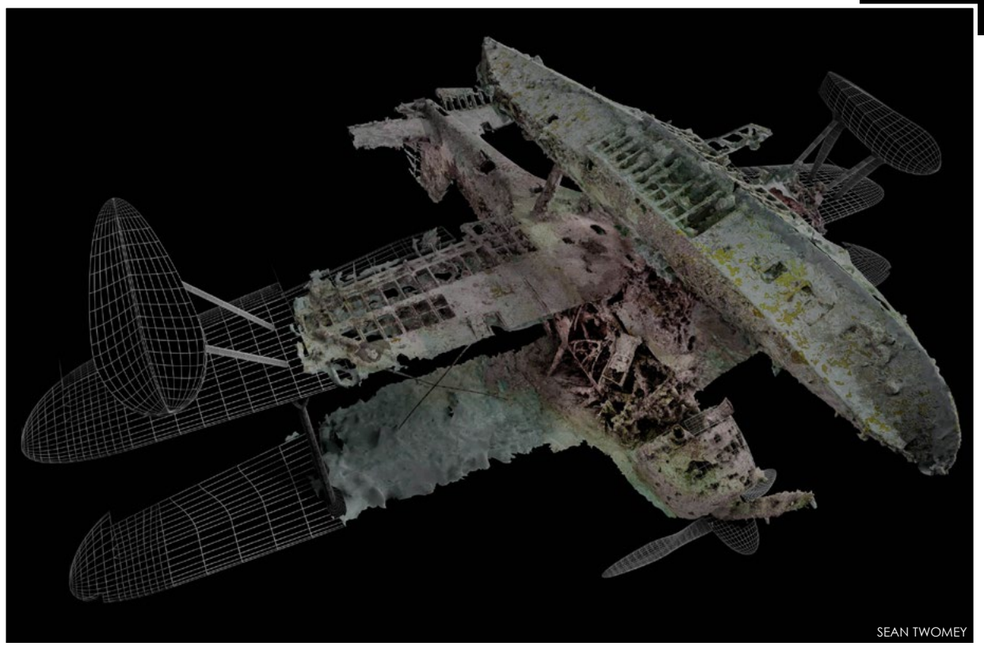
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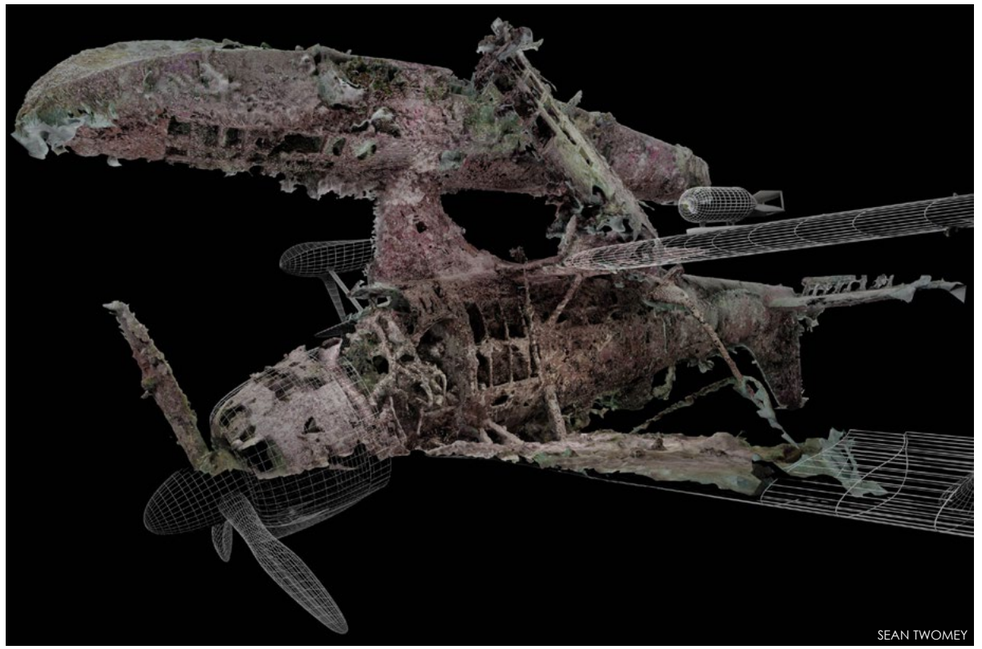

SEAN TWOMEY

Underwater photo (far left) and photogrammetry images (left, bottom right and bottom left) of the "Non-Deep Pete" Mitsubishi F1M seaplane, located in the murky waters of Kavieng's harbour

ABOUT KAVIENG & ITS DIVE SITES

Located just two degrees south of the Equator, Kavieng is often described as a typical "Somerset Maugham South Sea Island port"—which can be loosely translated as "friendly, laid-back and quiet."

It is both the main town on New Ireland and the provincial capital, plus it has a nice, new airport that is serviced by both Air Niugini and PNG Air, with regular flights from the capital Port Moresby.

THE RESORT

Lissenung Island Dive Resort is located about 30 minutes from Kavieng and is ideally positioned to dive the many excellent sites on both the Pacific Ocean side of New Ireland and those on the Bismarck Sea.

Dietmar Amon discovered many of the dive sites and wrecks, so he knows exactly when they can be dived (not straightforward, with up to six tides per day) and can tell you everything that is known about the wrecks and their histories.

PORT MORESBY

Papua New Guinea's capital of Port Moresby is the only international gateway into the country and is easily accessible from Brisbane and Cairns in Australia, Singapore and Manila. □

Kavieng and the neighbouring large island of New Hanover, but we decided to start with just three wrecks and make a success of them before taking on to bigger challenges.

We began with an intermediate "Goldilocks" wreck (not too deep and not too silted) of a Nakajima Kate B5N fighter-bomber. Sean was responsible for the photogrammetry images and I was responsible for taking the still images, all with the basic objective of complementing our images for the final result.

We then dived the *Deep Pete* and were able to capture it in all its glory with the sweetlips doing their thing around the wreck in exceptional visibility. We followed this up by trying the polar opposite and diving the "Non-Deep Pete"—another Mitsubishi F1M seaplane located in the rather murky waters of Kavieng's harbour.

The results

Photogrammetry is a time- and CPU-intensive process that Sean goes about with a quiet but determined concentration that makes all conversation redundant. But what emerged at the end was, for me, staggeringly good, as the level of detail that the processing software compiles is quite

Photogrammetry images of Non-Deep Pete Mitsubishi F1M seaplane (above, top left and lower left)

amazing and simply not apparent in the 2D still images.

That intense detail is created as the photogrammetry software consolidates all those repetitive, close-range images of the object of interest (the wreck) into what is effectively a layer of high-resolution texture. The texture layer is then wrapped onto the 3D model so that both the geometry and colour definition of the object can be rendered with virtual cameras, which enables an incredible array of options for viewing and orbiting, changing the field of view, animating and lighting the object.

The 3D model is so powerful and interactive that it is often considered as the result of a photogrammetry project. But in reality, it is just the starting point for adding extra dimension to the story-telling process, which can include emphasising details in specific focus areas of the existing wreck and recreating parts of the wreck that were either damaged on impact or have deteriorated over time.

What it all means

Diving and photographing aircraft wrecks is, for me, a special and quite intimate experience, as their small size and the damage they often suffer on impact always makes me really feel for what the pilot and crew might have gone through. Obviously, WWII aircraft wrecks are a diminishing asset, as more are not being made, and their condition can only deteriorate.

For many years after the war, they were left alone—or worse, as in the case of the Non-Deep Pete, which stood vertically with its heavy nose-mounted engine in the sand and was used as a harbour mooring until it fell over!

But the advent of recreational and technical diving has led to a search for more wrecks while advances in digital photography have allowed them to be documented. Photogrammetry, in my opinion, takes that exploration and documentation to the next level, as there is just no other way to capture the detail and condition of these wrecks like it does. In addition, the compiled 3D model is "spatially aware" through the mapping of the reference points, so original design drawings can be used to "virtually repair" impact damage and provide perspectives of what the original aircraft would look like in its watery grave. □

Don Silcock is an Australian underwater photographer based in Bali, Indonesia. Find extensive location guides, articles and images of some of the best dive locations in the Indo-Pacific region, as well as "big animal" experiences globally, on his website at: ***indopacificimages.com.***

Variations on the Theme of

Opposites

Contributors' Picks


ANITA GEORGE-ARES

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

We asked our contributors to share their favorite underwater images showing variations on the theme of "Opposites," and they came back with a diverse range of color and black-and-white photos featuring marine life from large whales to tiny nudibranchs and fellow divers on reefs and wrecks, in caverns and cenotes as well as open waters. Here, *X-Ray Mag* contributors share their favorite images from the tropical waters of French Polynesia, Micronesia, the Philippines, Indonesia, Malaysia, the Maldives, Bonaire, the Bahamas, Turks & Caicos, the Cayman Islands, Mexico and Honduras, to the temperate waters of Newfoundland and the US East Coast.

Photo 1. Moray eels, Maldives (previous page). Gear: Canon EOS Rebel SL1 camera, Canon EF-S 18-55mm f/3.5-5.6 IS STM lens (at 26mm), Ikelite housing, two Ikelite DS161 strobes. Exposure: ISO 200, f/8, 1/160s; Photo 2. Crescent-tail bigeyes, Maldives (above). Gear: Canon EOS Rebel SL1 camera, Canon EF-S 18-55mm f/3.5-5.6 IS STM lens (at 26mm), Ikelite housing, two Ikelite DS161 strobes Exposure: ISO 200, f/8, 1/160s

Facings, Phases, Color and Camouflage

Text and photos by Anita George-Ares, PhD

In Photo 1 (previous page), a large, undulated moray faces the opposite direction of the smaller, white-eye moray. Moray eels are abundant at the Fish Factory dive site in the Maldives. The daily dumping of processed fish waste ensures an abundance of marine life.

A school of crescent-tail bigeyes (Photo 2) also inhabits the Fish Factory site. The bright red phase of some fish is the opposite of the pale, silvery phase displayed by the other fish in the school.

Photo 3 shows two sleek unicornfish. This species exhibits a variety of color patterns that can quickly change. The colors are not gender-specific. The bottom fish displays opposing light and dark colors.

Male flamboyant cuttlefish are typically smaller than the females. The cuttlefish depicted in Photo 4 are of similar size, but the female on the right differs by being camouflaged and flattened (Hanlon and McManus, 2020). The bold-colored males (left and center) display three pairs of arms whereas the female does not. Visit: **facebook.com/profile.php?id=100016947967639**

REFERENCE:

HANLON, R. T. AND G. MCMANUS. (2020). FLAMBOYANT CUTTLEFISH BEHAVIOR: CAMOUFLAGE TACTICS AND COMPLEX COLORFUL REPRODUCTIVE BEHAVIOR ASSESSED DURING FIELD STUDIES AT LEMBEH STRAIT, INDONESIA. *JOURNAL OF EXPERIMENTAL MARINE BIOLOGY AND ECOLOGY* 529. HTTPS://DOI.ORG/10.1016/J.JEMBE.2020.151397

Photo 3. Sleek unicornfish, Maldives (above). Gear: Canon EOS Rebel SL1 camera, Canon EF-S 18-55mm f/3.5-5.6 IS STM lens (at 18mm), Ikelite housing, two Ikelite DS161 strobes. Exposure: ISO 200, f/8, 1/200s; Photo 4. Flamboyant cuttlefish, Dumaguete, Philippines (top right). Gear: Canon EOS Rebel SL1 camera, Canon EF-S 60mm f/2.8 macro USM lens, Ikelite housing, one Ikelite DS161 strobe, Bigblue VL4200P video light. Exposure: ISO 200, f/11, 1/160s

Opposites

Photo 3. Three squid, Fort Wetherill, Rhode Island, USA (left). Gear: Nikonos II camera, 35mm lens, single Ikelite S-125 strobe. Exposure: ISO 100, f/8, 1/60s

Photos 4 and 5. Rhinopias scorpionfishes, Indo-Pacific (below), Canon Rebel SL1 camera, Canon 100mm f/2.8 USM macro lens, Ikelite housing, twin Ikelite DS-161 strobes. Exposure: ISO 1200, f/11, 1/200s

Photo 2. Spadefish and cleaner wrasse, Dumaguete, Philippines (above). Gear: Canon Rebel SL1 camera, Canon 100mm f/2.8 USM macro lens, Ikelite housing, twin Ikelite DS-161 strobes. Exposure: ISO 400, f/11, 1/200s

Photo 1. Humpback whale mother and calf, Moorea, French Polynesia (above). Gear: Canon Rebel SL1 camera, Sigma 11-18mm lens (at 10mm), Ikelite housing, available light. Exposure: ISO 3200, f/14, 1/320s

Size, Facing and Direction

Text and photos by John A. Ares

First up, for the theme of "opposites," is size (big vs. small). The mother humpback is around 45 to 50ft long, while the calf is about 15ft (Photo 1). The calf is about three months old and needs to surface every five minutes to breathe. The mother can stay down typically for 20 minutes on a breath.

In Photo 2, the spadefish and cleaner wrasse were different sizes and facing different directions. Their eye contact was riveting as the wrasse was trying to sell its cleaning services. The intensity of the eye-to-eye exchange was palpable.

In Photo 3, the three squid were pulling in opposite directions. Most likely, it was two males "negotiating" to win a female. This image was taken on a night dive. In Rhode Island, shore dives in late May reliably produce squid that are "in the mood." Bright, moon-lit nights were productive. They were pairing up in the day also.

Photos 4 and 5 shows a side-by-side comparison of two *Rhinopias* scorpionfish (facing opposite directions, contrasting in color, with light vs. dark backgrounds) in the Indo-Pacific Coral Triangle. The purple one was in North Sulawesi, Indonesia. The orange *Rhinopias* scorpionfish was in Puerto Galera, Philippines. *Rhinopias* scorpionfishes are not common. Due to rarity, both photos were produced with competition from other photographers. If you see a *Rhinopias* scorpionfish, do not waste time making 30 well-composed images. Get your three or four quick safety shots, and then negotiate the opportunity to "circle back." *Rhinopias* scorpionfishes do not spook easily with careful photographers. Visit: **JohnAres.com**

CLOCKWISE FROM ABOVE:
Photo 1. Lost in the crowd, Orange Wall, West Caicos, Turks and Caicos Islands (top left). Gear: Canon PowerShot SD700 camera (at 8.64mm), Canon PowerShot housing, available light. Exposure: f/3.2, 1/100s

Photo 2. Home alone, Catacombs, Turks and Caicos Islands (top center). Gear: Canon PowerShot G11 camera, at 8.9mm, Canon PowerShot housing, available light. Exposure: ISO 200, f/4, 1/160s

Photo 3. Octopus, Piranha Cove, Turks and Caicos (top right). Gear: Canon PowerShot G11 6.1-30.5mm camera (at 18.098mm), Canon PowerShot housing for G11. Exposure: ISO 200, f/5.6, 1/60s

Photo 4. Scorpionfish, Labyrinth Wall, Roatan, Honduras (second row, far right). Gear: Olympus OM-D E-M5 Mark II camera, Olympus M.60mm f/2.8 at 60mm, Olympus PT-EP13 housing, Sea&Sea YS D-1 strobes. Exposure: ISO 200, f/11, 1/125s

Numbers, Textures and Conditions

Text and photos by Sheryl Checkman

Whenever I see a school of fish swim by, the first thing I notice is how they swim as a unit, in the same direction—each individual fish just a part of the crowd—as the snappers in Photo 1, which was taken at Orange Wall in West Caicos. In contrast, the little lone squirrelfish in Photo 2 is peering out from its solitary hiding spot within the coral at the Catacombs dive site in Turks and Caicos.

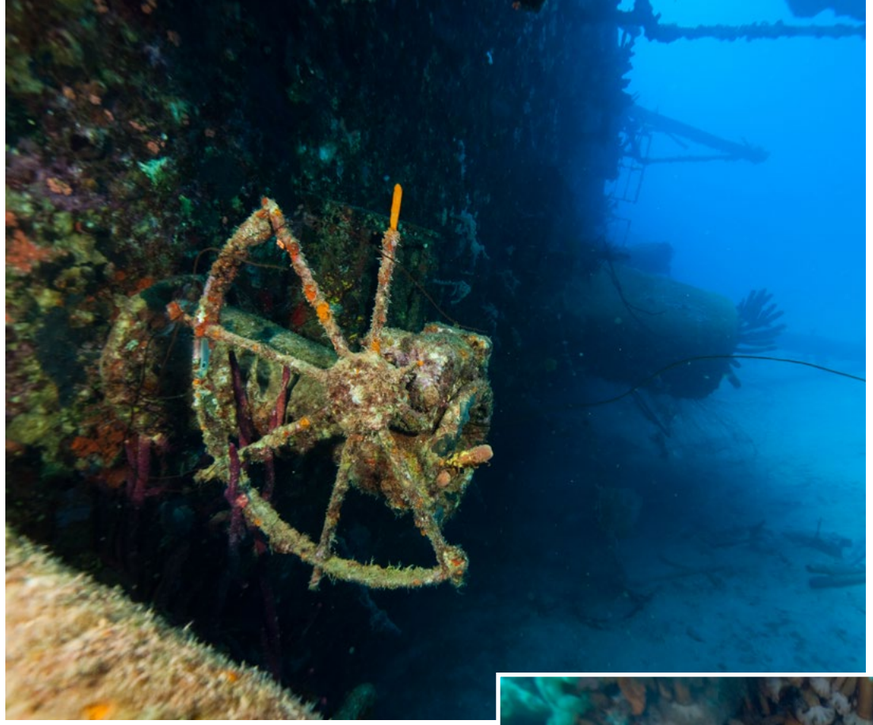
The smooth and shape-altering body of the octopus, as seen at Piranha Cove in Turks and Caicos in Photo 3, has turned itself white to blend in with its surroundings, by mimicking the coloration of the sandy sea floor. In contrast, the scorpionfish in Photo 4 is using its bright color and leafy appearance to hide in plain sight, in the reef at Labyrinth Wall in Roatan, Honduras.

After spending up to an hour beneath the ocean, you never know what conditions await you on the surface. At Roatan in Honduras after diving on Nabs Dive Wall, I surfaced to find a stormy sky, choppy seas and rain pelting down upon me as I awaited my turn to climb aboard our dive boat (Photo 5). After a dive at Cumber Caves, in Little Cayman of the Cayman Islands, however, quite the opposite conditions greeted me—the sea was calm, and the skies were blue (Photo 6). Visit: **Instagram.com/sherylcheckman**

Photo 5. Bad weather, Nabs Dive Wall, Roatan, Honduras (second row, center). Gear: Olympus OM-D E-M5 Mark II camera, Olympus M. 9-18mm lens (at 18mm), Olympus PT-EP13 housing, Sea&Sea YS D-1 strobes. Exposure: ISO 200, f/8, 1/100s

Photo 6. Good weather, Cumbers Caves, Little Cayman, Cayman Islands (second row, far left). Gear: Olympus OM-D E-M5 Mark II camera, Olympus M. 9-18mm f/4.0-5.6 lens (at 9mm), Olympus PT-EP13 housing, Sea&Sea YS D-1 strobes. Exposure: ISO 200, f/11, 1/125s

Diver investigates the stern winch of the *PLM 27*, Bell Island, Newfoundland, Canada (left). Gear: Olympus E-620 camera, Olympus 7-14mm lens, Olympus housing, Sea&Sea YS-01 strobes. Exposure: ISO 400, f/5.6, 1/30s



Helm stand on the *Hilma Hooker*, Bonaire (left). Gear: Olympus E-620 camera, Olympus 7-14mm lens, Olympus housing, Sea&Sea YS-01 strobes. Exposure: ISO 400, f/4, 1/30s

Opposites

Helm on the *Hilma Hooker*, Bonaire (left). Gear: Olympus E-620 camera, Olympus 7-14mm lens, Olympus housing, Sea&Sea YS-01 strobes. Exposure: ISO 100, f/4, 1/60s

Anemones decorate the sunken ship *Lord Strathcona*, Bell Island, Newfoundland, Canada (below). Gear: Olympus E-620 camera, Olympus 7-14mm lens, Olympus housing, Sea&Sea YS-01 strobes. Exposure: ISO 400, f/4, 1/30s

Warm and Cold Wrecks

Text and photos by Larry Cohen

Shipwrecks have always been my passion. Whether I need a drysuit or a wetsuit, I enjoy diving and documenting the underwater history found on wrecks. Newfoundland is an island northeast of Nova Scotia. Ocean Quest Adventure, owned by Rick and Debbie Stanley, is a great dive operation for exploring the Bell Island wrecks. To do these dives, you need a drysuit, and a heated vest will help you be more comfortable.

The story of the Bell Island wrecks is one of the most fascinating stories of World War II. Bell Island is located near St John's in Conception Bay. In the 1890s, high-grade iron ore was discovered and mined here. In the 1930s, a large percentage of this iron ore went to Germany for rearmament. Once World War II broke out, shipments to Germany ceased, and the iron ore was redirected to support armaments for the Allied Forces. Germany knew how vital the iron ore was to the Allied war effort, so they attempted to disrupt its flow to Europe. Doing so posed little challenge to German U-boats since Germany already knew the harbor. On September 4th and November 4th, 1942, the German U-boat U-*518* entered Wabana Harbor and sunk the *Rose Castle*, *SS Saganaga*, *Lord Strathcona* and *PLM 27*. Diving these wrecks in icy waters is worth the effort.

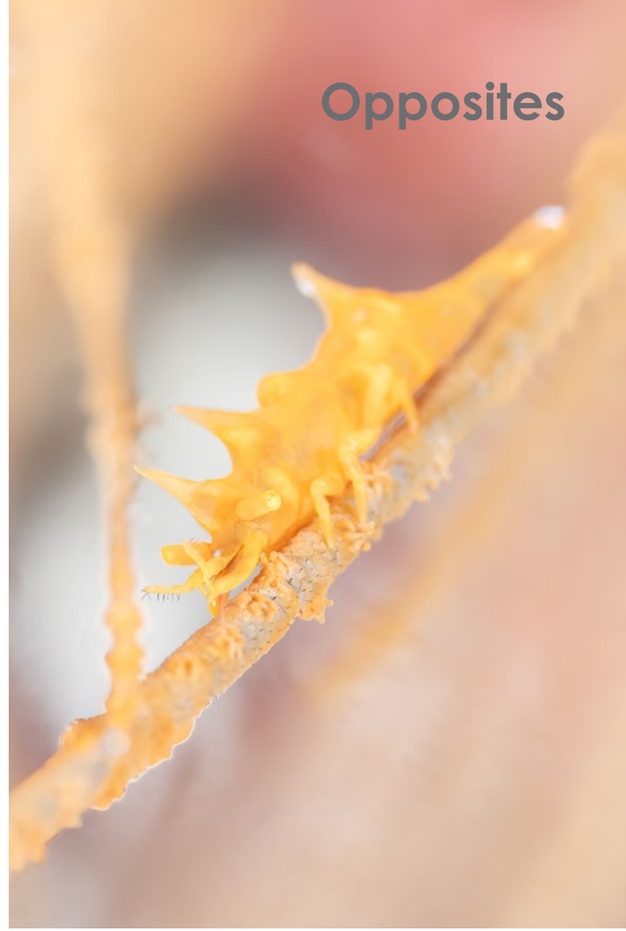
The *Hilma Hooker* is a shipwreck in the bath-tub-warm waters of Bonaire. In 1984, the *Hilma Hooker* had engine problems and was towed to Kralendijk, Bonaire. When docked at the town pier, the ship was inspected, and authorities found 25,000 lb (11,340kg) of marijuana behind a fake bulkhead. The vessel was held as evidence for months and started to take in water. It was towed to an anchorage and, on 12 September 1984, took in water, rolled over on its starboard side, and sank in 100ft (30m) of water. My dive buddy, Olga Torrey, and I did the wreck as a shore dive and had to swim for about 15 minutes to get to the buoy that marks the wreck's location. Exploring the ship's exterior and interior in the comfortable water temperatures there was a pleasure. Visit: **liquidimagesuw.com**

Whip coral goby, *Bryaninops loki*, Romblon Island, Philippines—photographed using camera settings to create a blue background (far left). Exposure: ISO 160, f/5.6, 1/160s

Whip coral goby at Romblon, photographed using a faster shutter speed and smaller aperture to create a black background (left). Exposure: ISO 160, f/18, 1/200s. Gear for both images: Canon R5 camera, Canon 100mm macro lens, Marelux MX-R5 housing, two Supe D-Pro strobes

Red dragon shrimp, *Miropandalus hardingi*, Romblon Island, Philippines—photographed using a wide-open aperture to render a soft bokeh effect (right). Gear: Canon R5 camera, Canon 100mm macro lens, Marelux MX-R5 housing, two Supe D-Pro strobes. Exposure: ISO 160, f/7.1, 1/200s

The same dragon shrimp photographed using a small aperture to ensure the entire subject is in focus (below). Gear: Canon R5 camera, Canon 100mm macro lens, Marelux MX-R5 housing, two Supe D-Pro strobes. Exposure: ISO 160, f/18, 1/200s



Same Subject, Opposite Effects

Text and photos by Kate Jonker

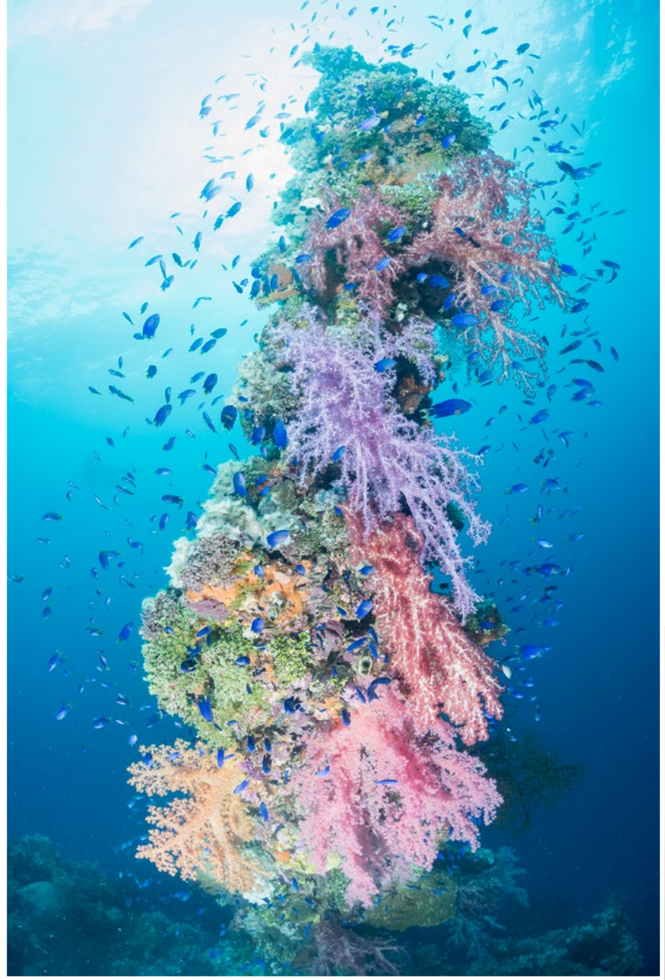
Using your camera settings and lighting are a wonderful way to create different results when photographing the same (or similar) subject. It helps add interest to your portfolio, continues to challenge your photography skills and keeps you thinking "outside of the box."

Dark vs light backgrounds. To achieve a light background, use a slower shutter speed, wider aperture, and higher ISO. In contrast, for a dark background, opt for a fast shutter speed, small aperture, and lowest ISO. Use your strobes to light your subject. When using this technique, look for a subject that only has the water column behind it.

All in focus vs little in focus. A wide-open aperture creates a shallow depth of field, separating your subject from the background and foreground, producing a pleasing blurry bokeh effect. On the other hand, a completely different image can be created using a smaller aperture to ensure the subject and surrounds are more in focus.

Next time you embark on a macro dive, try employing these techniques to capture the completely opposite images of the same subjects. It promises an enjoyable experience, yielding remarkably diverse photos from just a few dives. (For more images from the Philippines, see my article on Romblon in this issue.) Visit: **katejonker.com**

Diver, swimming through the cavernous upper engine room of the *Kensho Maru* shipwreck, Truk Lagoon, Chuuk, Micronesia (right and below). Gear: Nikon D810 camera, Sigma 15mm fisheye lens, Subal housing, Sea&Sea YS-D3 strobes. Exposure: ISO 1600, f/4, 1/15s



Opposites

Colorful soft corals and a school of goldtail demoiselle fish engulf the king posts of the *Kensho Maru* shipwreck, Truk Lagoon, Chuuk, Micronesia (left). Gear: Nikon D810 camera, Sigma 15mm fisheye lens, Subal Housing, Sea&Sea YS-D3 strobes. Exposure: ISO 800, f/7.1, 1/160s

Large king post covered with coral growth and schooling fish on the *Nippo Maru* shipwreck, Truk Lagoon, Chuuk, Micronesia (below). Gear: Nikon D810 camera, Sigma 15mm fisheye lens, Subal housing, available light. Exposure: ISO 800, f/7.1, 1/60s

Color vs Monochrome

Text & photos by Matthew Meier

For my take on the theme of "opposites," I thought I would give readers a sneak peek at a few images from my recent travels to Truk (Chuuk) Lagoon in Micronesia (see the full article in issue #121). Back in March, I had the pleasure of diving, with **Master Liveaboards,** at what is often referred to as the wreck-diving capital of the world and thoroughly loved the experience!

I was immediately struck by the amount of life—both coral, and invertebrate and fish species—that were growing on and swimming around these decaying man-made structures, which have been underwater for nearly 80 years. It is sobering to consider the immense loss of human life, resources, materials and ingenuity embodied by these wrecks, which have now provided artificial homes for so many other creatures.

These images also illustrate the theme of "opposites" by comparing color and monochrome images, either as a different view of the same scene or as dissimilar ways to photograph a kindred subject. The engine room on the *Kensho Maru*, I believe, has more contrast, depth and clarity in black and white than when viewed in color. The soft corals and fish life on the king posts of several wrecks were spectacular, and here, they are captured up-close with strobes to highlight that kaleidoscope of color, and far away with available light to showcase the structure itself. Visit: **MatthewMeierphoto.com**

Opposites

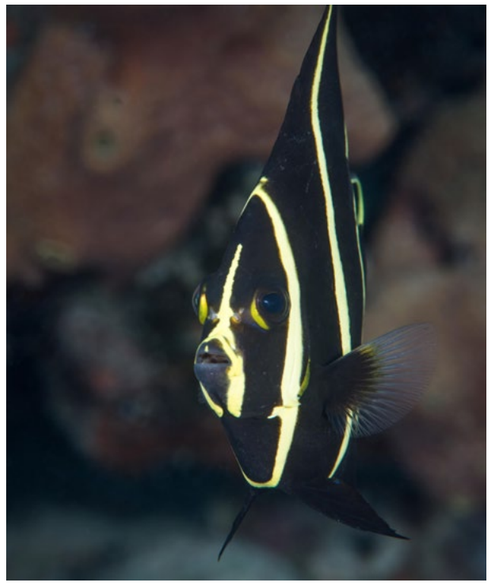
Juvenile sweetlips, Philippines (left). Gear: Nikon D750 camera, Nikon 60mm lens, Ikelite housing, dual Ikelite DS161 strobes. Exposure: ISO 250, f/20, 1/200s

Adult sweetlips, Komodo, Indonesia (far left). Gear: Nikon D750 camera, Nikon 10mm fisheye lens, Ikelite housing, dual Ikelite DS161 strobes. Exposure: ISO 250, f/16, 1/160s

Adult queen angelfish, Bahamas (right). Gear: Nikon D850 camera, Nikon 105mm lens, Ikelite housing, dual Ikelite DS161 strobes. Exposure: ISO 320, f/10, 1/125s

Juvenile queen angelfish, Bahamas (lower right). Gear: Nikon D850 camera, Nikon 105mm lens, Ikelite housing, dual Ikelite DS161 strobes. Exposure: ISO 200, f/13, 1/200s

Juvenile French angelfish, Bahamas (center). Gear: Nikon D850 camera, Nikon 105mm lens, Ikelite housing, dual Ikelite DS161 strobes. Exposure: ISO 320, f/13, 1/125s; Adult French angelfish, Roatan, Honduras (center right). Gear: Nikon D7100 camera, Nikon 10mm fisheye lens, Ikelite housing, dual Ikelite DS161 strobes. Exposure: ISO 200, f/13, 1/125s



Adult emperor angelfish, Mabul, Malaysia (above). Gear: Nikon D750 camera, Nikon 60mm lens, Ikelite housing, dual Ikelite DS161 strobes. Exposure: ISO 250, f/18, 1/200s; Juvenile emperor angelfish, Mabul, Malaysia (right). Gear: Nikon D750 camera, Nikon 60mm lens, Ikelite housing, dual Ikelite DS161 strobes. Exposure: ISO 250, f/22, 1/200s

Juvenile vs Adult

Text and photos by Brandi Mueller

When I think of "opposites" in the ocean, one of the first things that come to mind is how some fish change entirely from their juvenile to adult stage. For example, the harlequin sweetlips starts out light brown with big white spots and fin tips (and they are known to dance or undulate to prevent predation by mimicking toxic flatworms or nudibranchs). Once they become adults, they are elongated and darker overall, with many dark spots, and they stop dancing.

The emperor angelfish begins a beautiful blue, with white circles, and grows up to have blue stripes with a mostly yellow body, white face, and black eyes and fins. Other species of angelfish also have very contrary juvenile and adult stages. The French angelfish starts out black, with yellow stripes, and becomes grayer, with yellow scales, as an adult. The queen angelfish has orange on its lower body, as well as blue and dark stripes. As an adult, it becomes greener and bluer throughout, with yellow accents and a crown of blue on its head. Visit: **brandiunderwater.com**

All photos were taken with a Nikon D500 camera, Tokina 10-17mm lens, Nauticam housing and Inon Z330 strobes. Tiger shark at night (top left). She appears from the mysterious dark. Focus is on her mouth and the power of her body fading into the dark. Exposure: ISO 320, FL 17, f/16, 1/125s; Tiger shark at day (top center). The transition between sand and seagrass, along with the clear, tropical warmth of the water, evokes a sense of ease and comfort. Exposure: ISO 100, FL 17, f/10, 1/200s; Lemon shark at night, always smiling (center). The needle-like teeth are highlighted. Exposure: ISO 100, FL 10, f/8, 1/125s; Lemon shark at day, always smiling and sociable (above). Exposure: ISO 200, FL 10, f/8, 1/125s

Opposites do Attract!

Text and photos by Gary Rose, MD

I am not one who likes to quote clichés. But in this case, for this article, there could not be a better title than "Opposites do Attract!" As soon as I thought about which photos to use to illustrate this story, my thoughts immediately brought me to these four photos, which are two pairs of night and day captures. They absolutely draw me in and attract me every time I view them.

There is a definite contrast between the mystery and primeval fear engendered in seeing sharks at night, when compared to viewing them during the day, as they glide through the sea. We can all thank the movie *Jaws* for that. The same beautiful sharks, when seen in daylight, evoke a feeling of warmth and curiosity. Sharks, by nature, are very inquisitive and cannot help but provoke wonderment and curiosity when we see them in the water or view them in photographs.

In Photo 1, we can immediately feel the mystery of this beautiful, metallic-appearing tiger shark, emerging from the blackness behind her. The subtle pink of her mouth draws attention to her razor-sharp, serrated teeth. Also, the power of her body is clearly seen, as it fades into the dark behind her. In Photo 2, the crystal-clear and warm tropical water, at the transition between sand and healthy seagrass, creates a sense of comfort and ease. Yes, this is a tiger shark—so NEVER LOSE EYE-TO-EYE contact. Whenever I shoot shark photos, particularly of ambush hunters such as tiger sharks and great white sharks, I always use a very wide-angle lens and shoot from the hip.

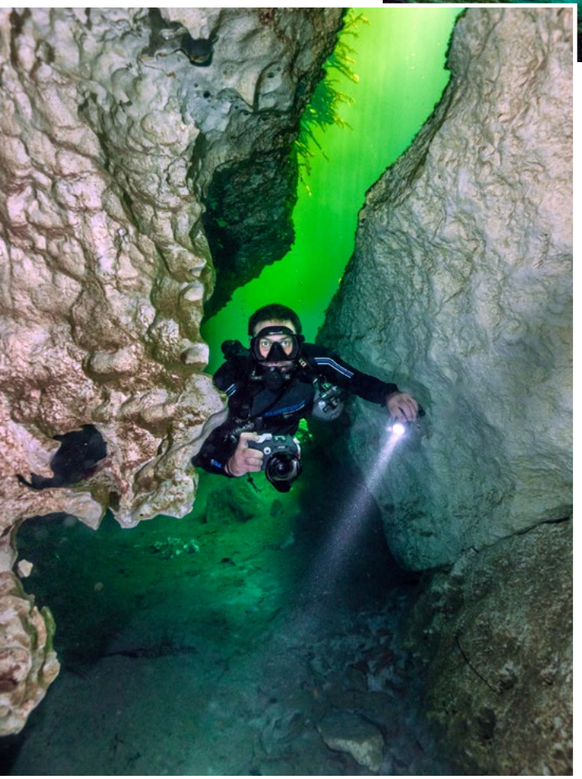
Photo 3 is very similar to Photo 1, at first glance—a shark emerging from a black void. But, in this photo, this lemon shark does not portray anything near the menace of the tiger shark. Notice that in this photo, the subtle pink of the mouth also draws your immediate attention to her needle-like teeth. In fact, she appears to be smiling, which is something lemon sharks regularly appear to do. These are helpful shark-identifying features, which help make a dive more interesting and safer for a diver who understands and recalls the differences in shark behavior between these two species.

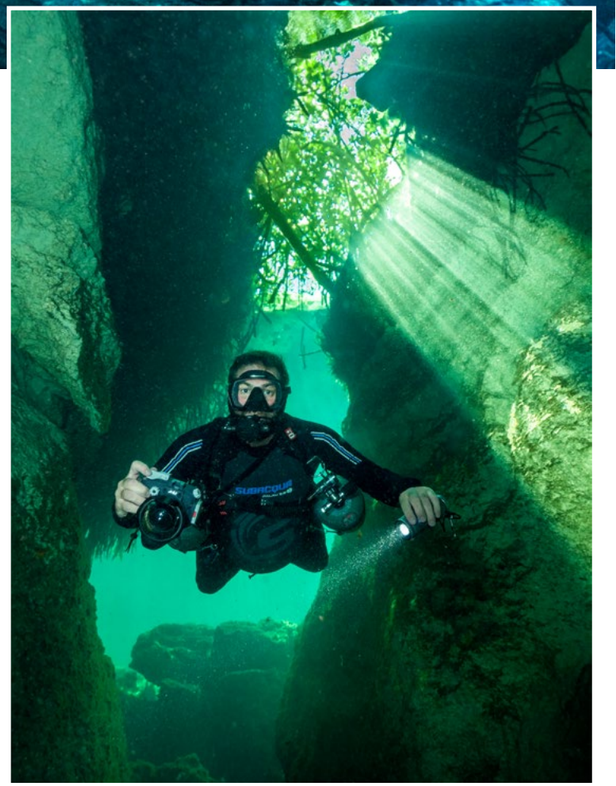
Photo 4 was taken on a daylight dive, and therefore automatically not as threatening to divers and photographers. The beautiful and curious lemon shark in the photo has come over to visit and investigate the diver, and me, the photographer. Have you noticed the big smile on the diver's face? Lemon sharks are among the friendliest and most fun to have around during a dive. They are exceptionally social and love to play like puppy dogs!

Night and day, each create a totally different atmosphere. Dark—foreboding and mysterious. Day—warm, inviting and friendly. They are Yin and Yang—opposite, but interconnected, attracting forces. Visit: **garyrosephotos.com**

Cenote Garden of Eden, Playa del Carmen, Mexico (far right). Gear: Olympus OM-D E-M5 camera, Panasonic fisheye 8mm lens, Nauticam housing, dual Sea&Sea strobes. Exposure: ISO 2000, f/7.1, 1/40s

Cenote Garden of Eden, Playa del Carmen, Mexico (right). Gear: Olympus OM-D E-M5 camera, Panasonic fisheye 8mm lens, Nauticam housing, dual Sea&Sea strobes. Exposure: ISO 2000, f/7.1, 1/30s





Cenote Casa, Tulum, Quintana Roo, Mexico (bottom right). Gear: Olympus XZ-1 camera, wide-angle conversion lens, Olympus PT-050 housing, dual Sea&Sea YS-01 strobes. Exposure: ISO 500, f/6.3, 1/125s; Cenote Casa, Tulum, Quintana Roo, Mexico (bottom left). Gear: Olympus OM-D E-M5 camera, Olympus M. 12-50mm lens, Nauticam housing, dual Sea&Sea strobes. Exposure: ISO 500, f/6.3, 1/125s

Wavelengths and Seasons

Text and photos by Olga Torrey

Cenote Garden of Eden has crystal-clear waters, which are excellent for scuba diving and photography. It is a cavern with large rooms, huge chambers, vaults and gigantic galleries. The cenote has plenty of natural sunlight, making the diving experience on a sunny day more enjoyable. Diving with the bright blue rays shooting down from the surface in the Cenote Garden of Eden provides a mesmerizing experience and shows off the cenote at its best!

Blue light has short wavelengths and has higher energy to penetrate deeper than other colors, as seen in the Cenote Garden of Eden. Divers will find all underwater features only in blue, once they reach a certain depth. So, underwater photographers flash white light on an object underwater to capture the full spectrum of colors.

Cenote Casa is close to the ocean and is home to a mix of freshwater and saltwater fish. We can see in this cenote the diversity of flora and fauna found on the Caribbean coastline of Mexico. The cenote is separated from the sea by the beach and a tunnel of about 50 meters. The dive starts in an open water area between the mangroves.

Transparent water with a low accumulation of dissolved materials appears blue, but during the rainy season, the cenote water changes colors, because it becomes rich in phytoplankton and other algae, and usually appears green. Cenote Casa did not disappoint and gave me many opportunities for photography. Visit: **fitimage.nyc**

SOURCES: MANOA.HAWAII.EDU, WATERBOARDS.CA.GOV

Max Ammer

Pioneer of Diving in Raja Ampat & Conservation Champion

DON SILCOCK

Max Ammer is the founder of Papua Diving Resorts, including the Sorido Bay Resort (in front) and Kri Eco Resort (at right), located on Kri Island in Raja Ampat, Indonesia.

Text by Don Silcock
Photos courtesy of Max Ammer and Don Silcock

Unveiling Max Ammer's extraordinary journey—from pioneering Raja Ampat as a world-class diving site to his relentless dedication towards uplifting local communities and championing environmental conservation—Don Silcock has the story.

It really is quite incredible that in just over 20 years, Raja Ampat has gone from a little-known, remote outpost of the huge Indonesian archipelago to one of the must-do diving locations globally. Google "Raja Ampat diving" and you will be bombarded with dozens of options, ranging across the full spectrum of liveaboard vessels—huge and luxurious, spa-suite behemoths—to the floating equivalent of backpacker hostels. In addition, on land, the options range from beautiful resorts to village homestays, with everything in-between!

The huge wave of tourism that has washed over Raja Ampat changed many things for the better; the main town of Sorong now has a new airport, several well-stocked supermarkets, and numerous good hotels. Whereas back in the late '90s and early '00s, it was quite different with the old airport feeling like something out of the 1950s (because it was), very limited shopping options and basic accommodation.

Choices for diving in Raja Ampat were also very limited with the only land-based option a beach camp on the island of Kri, at the western end of the Dampier Strait, some two to three hours' journey by small boat from Sorong! It was when I was first looking into that beach camp that I heard of Max Ammer—one of the handful of adventurous and entrepreneurial "bules" (foreigners) who have made Indonesia their home and helped make Raja Ampat the global diving location it is today.

Max is always busy, but he carved out some time for me in late 2022 for a phone interview to talk about his life and adventures in Raja Ampat. Then, in April 2023, I returned to Raja Ampat and visited Max at his Sorido Bay resort on Cape Kri to complete the interview.

I spent many fascinating hours chatting with him about his life, adventures and the inevitable ups and downs of a life literally lived to the full.

COURTESY OF MAX AMMER

Max Ammer flying a Super Drifter ultralight floatplane

COURTESY OF MAX AMMER

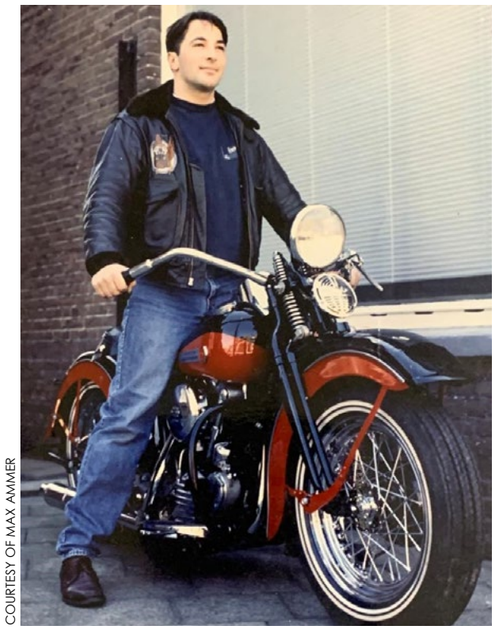
Max Ammer as a child in Nigeria (above); Rich biodiversity on Raja Ampat reef (right)

DON SILCOCK

Early days

Psychologists tell us that our early years have a profound impact on the direction our lives take. So, I was interested in Max's early days and his first 14 years spent in Nigeria where his father worked in the country's oil and gas industry. It was a period in his life about which he spoke with deep warmth—describing his family's expat villa as nearly an open zoo for the animals that lived in the large tropical gardens.

Elements of Africa clearly seeped into his DNA during those formative years because when the family returned to their home in Holland, he felt that the country was too small and highly regulated—almost the polar opposite of Nigeria.



COURTESY OF MAX AMMER

Max, as a teenager, with his motorcycle

It was back in Europe as a teenager that Max developed his enduring passion for WWII Harley Davidson motorcycles. At just 17, he bought a Harley Davidson WLA and set about returning it to its former glory and ultimately beginning his first career restoring other vintage Harleys for their owners.

Discovering Indonesia

While looking for suitable premises to base that small business, he met the person who would introduce him to Indonesia. The owner of the building was a WWII veteran who had witnessed the dumping of US Army Willys jeeps on the remote island of Morotai in the northern end of Halmahera province.

The Army's contract with Willys stipulated that none of their jeeps could be brought back to the United States at the end of WWII, so there was no choice but to dump some 100-plus brand-new jeeps on the edge of Morotai's jungle. Max was intrigued and sensed a business opportunity, so he went to Morotai to try and find those jeeps.

That was in 1989, when Max was just 28, and decades before the internet opened the world. Just getting to Morotai by Indonesian ferry was an adventure in itself, but finding the jeeps, salvaging key components, and then selling them to collectors around the world bring thoughts of "Indiana Jones" to mind! He did not know it at the time, but Max had found a new home and now says there were many things about Indonesia that reminded him of those early years in Nigeria.

Discovering Raja Ampat

While he was in Morotai, Max heard stories about American WWII aircraft wrecks in Raja Ampat and made his way there by ferry. It turned out that many of them were underwater, so he set about getting the necessary equipment to be able to find and then dive them.

To put that in perspective, at that point in time, very few people were diving in Indonesia, and nobody was diving in Raja Ampat—so there were no tanks, compressors, or anybody to help. Finding the wrecks required a lot of solo diving in the strong currents of the Dampier Strait, and he was completely dependent on the support of the local Papuans who were helping him. While they had no understanding whatsoever of what was under the water, they knew those currents like the backs of their hands, which helped keep Max safe.

Although he was searching for aircraft wrecks, what Max discovered underwater in Raja Ampat is what we now know as probably the best tropi-


DON SILCOCK

Sorido Bay's jetty ar sunrise (above);
The lounge at Sorido Bay (right)


DON SILCOCK

Max Ammer (second from left) meeting with the locals (below).


COURTESY OF MAX AMMER


COURTESY OF MAX AMMER

Max Ammer


COURTESY OF MAX AMMER

Max Ammer with a local friend (above);
A young Max Ammer (holding the paddle) with some of his first guests (lower left)

cal diving in the world. And it was during that discovery that he developed his strong affection for the local Papuans—the people of West Papua.

Papuans are predominantly of Melanesian (Oceania) extraction and are known for their diverse cultures, languages and distinctive physical features. Max found them to be friendly and helpful, but almost like second-class citizens in their own land because of the Javanese-centric way the Republic of Indonesia works.

Eco-dive camps

Max's experience in Raja Ampat convinced him to do two key things: start a business that would provide him with a source of income, and therefore, a way to help Papuans live better lives. Tourism seemed to offer the best and quickest way forward as Raja Ampat was an incredibly scenic location, and he had seen what was under the water, but how to start when there was simply no infrastructure?

His solution was a beach "eco-camp" on the island of Kri, offering adventurous travellers the opportunity for exceptional diving in a beautiful but truly off-the-grid location. He took the idea to Yenbuba village and got permission to run the camps on the site that would later become his Eco Resort on the northern coast.

The next step was to get the first customers, and so he placed an advertisement for the adventure in a Dutch newspaper and sure enough, got some takers, which meant that he had to take a loan of US$100,000 from his father to make it all happen. It turned out Max was right, and soon he had bookings two years in advance from Europeans and Americans wanting a taste of Raja Ampat adventure. From those very humble beginnings, Max has grown his dive-tourism business by taking a two-prong approach with the Eco Resort catering to the lower end of the market and his bespoke Sorido Bay Resort on Cape Kri itself.

Enabling the Papuans

Establishing a successful dive business in Raja Ampat has allowed Max to pursue his desire to improve the lives of the Papuan people, and I was keen to understand what that meant. The world's second largest island, New Guinea was so-named by the first European explorers because the features of the indigenous people were very similar to those of the people of the West African region of Guinea.

It is truly an incredible part of the world with amazing topography, geography, cultures and biodiversity. Its eastern half is now the independent country of Papua New Guinea and the western half is the Indonesian province of West Papua.

Most Papuans live traditional subsistence and hunter-gatherer lifestyles, where the land and/or the sea provide enough to eat and trade. But outside the larger towns, access to good schools and teachers is practically and logistically difficult at best. Upward mobility and hopes of a better life were almost impossible as the whole province was largely ignored by the Indonesian government—unless they got restive.

What Max has tried to do, initially through dive tourism and then with his other ventures, is create opportunities for Papuans to work, earn money and progress up Maslow's hierarchy. Basically, that boils down to helping them acquire skills and employing them at the resorts, where 90 percent of the staff are Papuan. But as time progressed, this initiative expanded into the making of all the furniture for the resorts and then the building of boats used for both diving and transport.

One of those other ventures is Frontier Aviation—a volunteer-based, nonprofit organisation dedicated to training Papuans to build, maintain and fly multiple types of aircraft. Max was particularly proud that the first fully-fledged local pilot, Noor Hilapok, had graduated recently.

And, to try and improve access to good education in Raja Ampat, through his Raja Ampat Research and Conservation Center (RARCC) foundation, Max has been supporting a school in the remote village of Yarweser, on the large island of Batanta, since 2018. "Support" means getting teachers properly trained to teach as well as providing teach-

Max Ammer

COURTESY OF MAX AMMER

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COURTESY OF MAX AMMER

COURTESY OF MAX AMMER

Max Ammer with one of his Bell P47 helicopters (above); Super Drifter ultralight floatplane on the beach (top right); Yarweser school pupils with their teacher (right)

Frontier Aviation (above); Noor Hilapok (second from right) became a captain and did his first solo flight in Papua, with Frontier Aviation (right)

ing materials and books, new school buildings and accommodation for the teacher.

Conservation

Max is what I would describe as a pragmatic conservationist. Having seen Raja Ampat's reefs and stunning biodiversity long before anybody else, he knows, shall we say, what "good" really looks like. And having pioneered land-based dive tourism, using small boats with outboard engines, he knows the damage leaked two-stroke oil can do, now that the number of those boats in daily use has mushroomed. He has also seen the number of liveaboards in Raja Ampat skyrocket and worries about what unmonitored raw sewage discharges will do to those reefs.

His approach is to actively support initiatives to quantify such issues and then put in place measures to reduce the impact. Max gave me a guided tour of the Sorido Bay Resort and showed me the rainwater collection systems that provide all the freshwater. Then there are the wastewater gardens, the recycling system that sends all rubbish back to Sorong for proper disposal, and the boatbuilding that will use much more environmentally-friendly inboard-powered catamarans to replace the current outboard-powered boats.

Max also works closely with Mark Erdmann, the Asia-Pacific VP of Conservation International (CI), and supports CI's programmes and initiatives in West Papua, which have been very effective in raising overall awareness of just how special the area is. CI has been particularly effective in helping the Indonesian government to improve the conservation and management of sharks and rays.

Expeditions

One final and very impressive thing I learnt about Max is his exploration of remote and isolated areas of West Papua, including leading expeditions for acclaimed author and ULCA Professor of Geography Jared Diamond. Much of that exploration was done using the two-seat, Rotax engine-powered Super Drifter ultralight floatplane, with the longest flight accomplished being from Misool to Arguni Bay near Fakfak—a journey that took 7.5 hours of flight time.

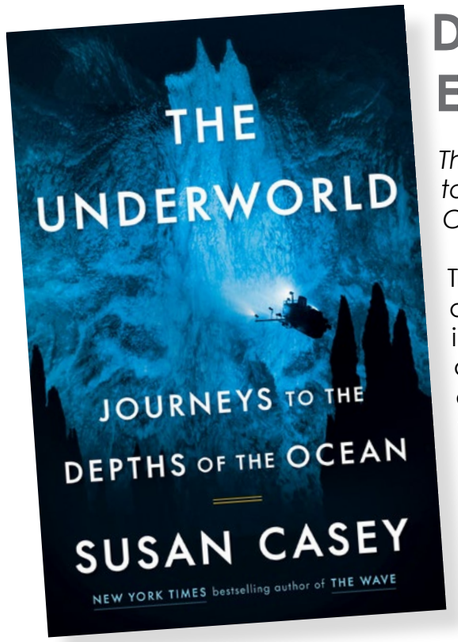
A life lived to the full (or should that be the "Max"?)

I have been interested in learning more about Max since I first heard about those beach camps on Kri and talking to him on the phone was really intriguing. But sitting down with him and chatting numerous times at Sorido Bay was "next level."

The guy has done so much that, at times, it really becomes difficult to absorb it all, and I would have to tell him, "Max, I am getting dizzy." He is into so many things and is very passionate about them all but remains very humble and matter-of-fact. There is no braggadocio… *None!*

What he has done and continues to do is simply incredible. In many ways, it seems to me that if Max had never existed, Raja Ampat would have had to invent him. □

Don Silcock is an Australian underwater photographer based in Bali, Indonesia. Find extensive location guides, articles and images of some of the best diving locations in the Indo-Pacific region, as well as "big animal" experiences globally, on his website at: ***indopacificimages.com***.



Deep Exploration

The Underworld: Journeys to the Depths of the Ocean, by Susan Casey

This book explores the deep ocean, uncovering its mysteries as it delves into the history of deep-sea exploration, from ancient myths to contemporary discoveries. The writer joins scientists and explorers on deep dives, discussing the significance of this hidden world. She also highlights the need to understand the ocean's ecological importance in the face of climate change, pollution and industrial activities, bringing forth a compelling call to protect this vital realm.

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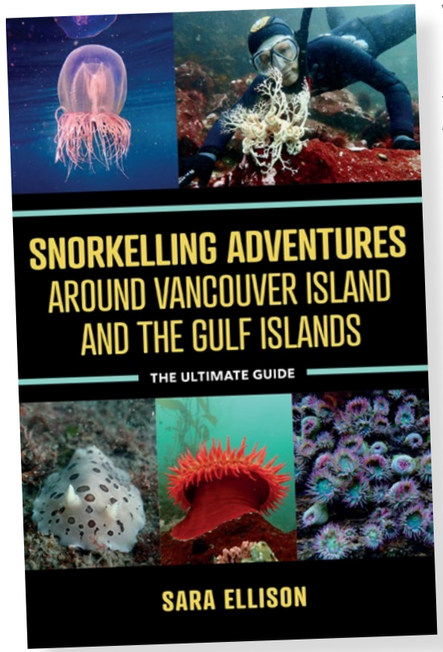

Vancouver Island

Snorkelling Adventures Around Vancouver Island and the Gulf Islands: The Ultimate Guide, by Sara Ellison

This guidebook caters exclusively to snorkellers in the waters of Vancouver Island and the Gulf Islands. It covers fifty destinations, with information on access, expected species encounters, and tips for safety and comfort. It describes the challenges faced by snorkellers in the region, such as staying warm in the cold North Pacific waters and navigating tides and currents. Suitable for both beginners and experienced marine enthusiasts.

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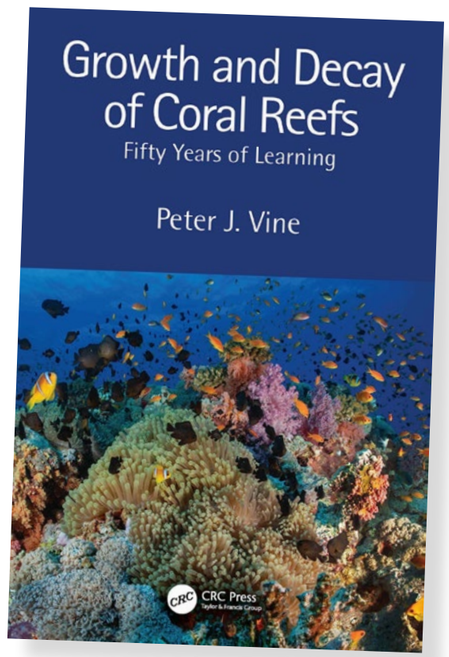

Sudan's Coral Reefs

Growth and Decay of Coral Reefs: Fifty Years of Learning, by Peter J. Vine

This book explores the dynamic history of coral reefs along the Sudanese coast over five decades. It highlights the intricate balance of reef ecosystems, where small disturbances can lead to catastrophic collapses. It also reflects on changing perspectives and the lessons learnt in coral reef conservation. Topics covered include coral reef fish, coral reef profiles, threats like climate change and diseases, and various research aspects. It provides a comprehensive understanding of these vital ecosystems.

Publisher: CRC Press
Date: 15 September 2023
Hardcover: 184 pages
ISBN-10: 1032371951
ISBN-13: 978-1032371955

Ocean Creativity

The Ocean as a Creative Experience: Architecture, Art, and Sound, by Jüergen Claus

This book offers a unique exploration of marine themes, including emerging marine architectures and post-disaster designs. It also describes how the seascape has become a canvas for visual artists and sound artists, blending art with sustainability. Using his experience as an artist and diver, Jürgen Claus enriches the descriptions of multimedia ocean installations, inspiring readers to embark on their creative endeavours.

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The Insidious Threat of Complacency

PHOTO ILLUSTRATION BY G. SYMES
IMAGE SOURCES: SAMUEL JOHN/CC BY-SA 2-0
AND PETER SOUTHWOOD/CC BY-SA 3-0

Text by Simon Pridmore

People commonly say that experienced divers should guard against complacency, but what does that mean? Some associate the idea of complacency with arrogance, carelessness or negligence, and reassure themselves that if character traits such as these do not apply to them, then they do not have to worry about being complacent. Simon Pridmore offers insights into this phenomenon and how to prevent it.

The process of becoming complacent about the way you dive is insidious. It can sneak up on you stealthily and unremarked until one day, something happens, which makes you realise with a jolt, that you may not be the careful, conscientious, omniscient diver that you thought you were.

Here are a couple of examples.

This could never happen to me!

Amy was a professional dive guide. At the time this incident occurred, she had been working in diving for 12 years and had logged well in excess of 2,500 dives. She was on vacation, diving off the island of Halmahera in northeast Indonesia. It was the first dive of the day. She slipped her gear on in the boat, did her usual checks and back-rolled into the water. She had a problem descending at first so exhaled a little more fully than usual, ducked headfirst below the surface and kicked down.

The dive was a muck dive on a sandy slope, and she was concentrating, as usual, on trying to find stuff. Fifteen minutes into the dive at a depth of around 30m, her tank valve started banging into her head. This was a bit annoying, so she took her gear off, adjusted her tank strap, and

NIKLAS MORBERG / FLICKR / CC BY-SA 2.0

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."

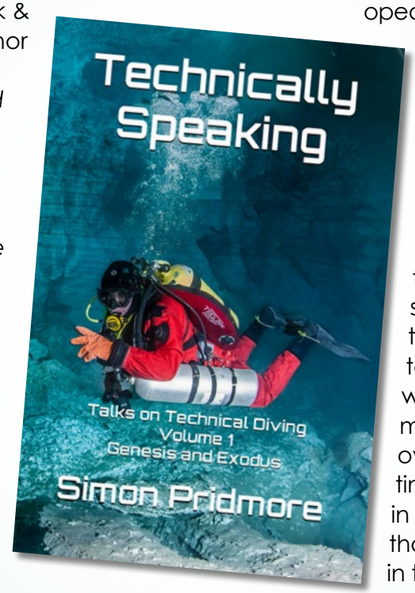
— David Strike, Oztek & Tekdive Convenor

"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***

then put her gear back on.

She set off again but soon started finding it hard to breathe.

"Damn it," she grumbled to herself, "this is going to be one of these pesky dives when everything goes wrong."

She tried switching to her octopus, but it was breathing hard too, so she switched back to her primary and kept going. Then she checked her pressure gauge, not because she believed she had an air supply problem (after all, she was still less than halfway through her dive), she was just making her usual routine occasional check.

The needle was at zero!

"What the…", was her first thought.

"Hmm, I need my buddy," was her second.

Fortunately, he was nearby taking pictures and proved to be a very capable dive partner. He had plenty of air to spare and escorted her to the surface without any further drama.

When she got back to the dive centre, Amy's first mission was to find out what had happened. Apparently, the staff on the boat had not changed her cylinder overnight, and she had gone into the water just with the 80 bar or so remaining from her last dive of the previous day.

Although the dive centre had made a mistake, Amy was quite willing to accept total responsibility for having run out of air. Before this incident, if you had asked her if she always checked her gauge before going in the water and then again frequently during the dive, she would have categorically said, "Absolutely… 100 percent, every dive!"

Well, apparently, she didn't.

Later, she tried to analyse how she had lost the habit of carrying out one of scuba diving's most basic pre-dive procedures. She concluded that maybe it was because, over the years, she had come to assume that her tank would always be full and, having never run out of air and with a lower air consumption rate than almost everybody else she dived with, she had subconsciously stopped bothering with it.

Thinking back, she realised that, in addition to failing to check her gauge, she had completely missed several early-warning signs that, given her experience, she really should have picked up on. With less air in it, the tank was more buoyant, and that was why she had difficulty making her initial descent. This also explained why her tank valve was banging against the back of her head. Finally, the development that should have made her realise that her tank was nearly empty was when her regulator stopped working properly. She could only guess that the reason she did not pick up this obvious clue immediately was that narcosis at depth was slowing down her thought processes.

Ignoring it

Ben is a master instructor and was diving in South Komodo, Indonesia, when he had an unusual experience.

Ten minutes into his first dive of the

PHOTO ILLUSTRATION COMPILED BY G. SYMES WITH PUBLIC DOMAIN IMAGE FROM WIKIMEDIA COMMONS

day, at a depth of around 18m, Ben heard a massive explosion and felt a pressure wave battering him on the back of his head. His first thought was that he had been fish-bombed. After all, he was in remote Southeast Asia, and this had happened to him before. Only when the thunderous noise did not stop did it occur to him that this could not be a bomb. He then concluded—correctly this time—that he had probably just had a catastrophic air supply failure.

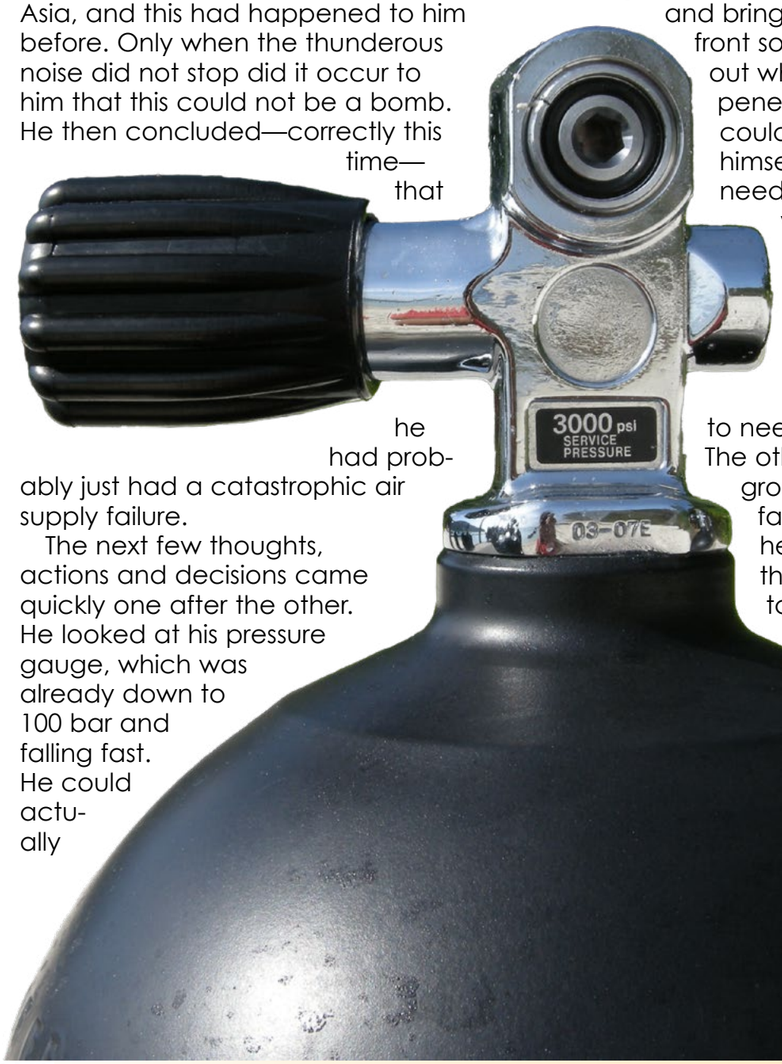
The next few thoughts, actions and decisions came quickly one after the other. He looked at his pressure gauge, which was already down to 100 bar and falling fast. He could actually see the needle moving. His regulator was working, and he still had air to breathe, but this would not be the case for long. His first thought was to slip his BCD off and bring it around to the front so he could find out what had happened and see if he could deal with it himself, but with the needle still moving worryingly fast across the dial, he was afraid he might not have enough time.

He was going to need some help. The other divers in the group were not too far away and, as he swam towards them, with a fountain of bubbles pouring out from the top of his tank, one of them guessed what the problem was, came over, deployed her octopus, and ascended with him to the surface.

When he got back on board the boat, Ben found that the tank valve-face O-ring had split. He knew this was unlikely to have happened instantly. It had probably been showing signs of damage for a while and hissing out a little stream of air, but he could not remember hearing anything. He had probably ignored it. It happened all the time. However, when it failed, it got his complete attention. He had seen a damaged O-ring blow on the surface before a dive many times but had never experienced it underwater. For some reason, he did not think it could happen!

Ben had always thought he would be able to deal with anything that happened to him on a dive without difficulty, but he did not expect to have so little time when his O-ring blew. The speed at which his tank pressure started dropping unnerved him. He looked online and found details of tests run by *Advanced Diver Magazine* in the USA, which showed that a valve O-ring failure would typically empty a full scuba cylinder in less than 90 seconds. Ben had no idea.

Now, he does. Now, he replaces all O-rings as soon as he notices bubbles, and he does not do deep dives alone, with just a single cylinder, anymore. □



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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***.

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 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.

E-book File Size: 5298 KB
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ASIN: B09DBGHJSC

simonpridmore.com

marine mammals

Edited by
Peter Symes

ROBERT PITTMAN / NOAA / PUBLIC DOMAIN

Orcas photographed off the southern side of Unimak Island, eastern Aleutian Islands, Alaska

Orcas battling strange skin disease

Orcas resident off the Pacific Northwest coast of Canada and the US appear to be suffering from some kind of skin disease, new research suggests.

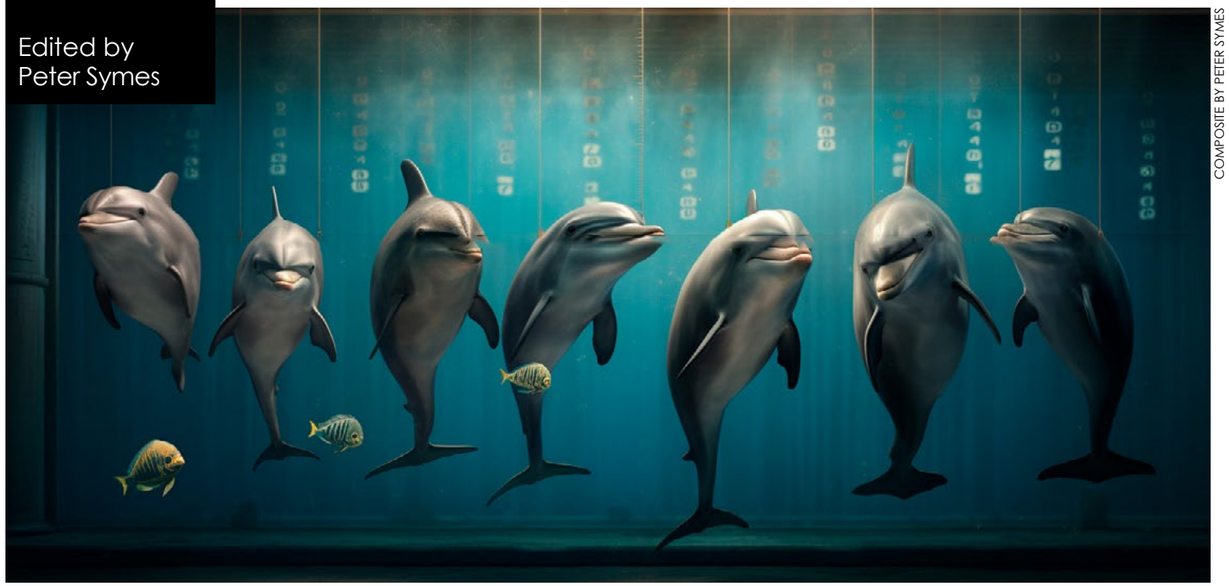
Scientists studying endangered southern resident orcas have noticed a steady increase of mysterious gray patches and gray targets (circular lesions which may appear on concentric rings – ed.) on the whales' skin from 2004 to 2016.

To date, researchers managed to identify six distinct types of lesions, with the two most common types being gray patches or targets. Some resemble tattooed skin.

They do not know the cause of the lesions and are worried that they could be due to underlying health problems in the struggling population.

After ruling out potential environmental factors, such as changes in water temperature or salinity, the authors hypothesize that the culprit could be an infectious agent. In addition, they suspect that the increased occurrence of these lesions may indicate a decrease in the whales' immunity.

The southern resident orcas are the smallest of the four communities of the exclusively fish-eating orca in the northeastern region of the North Pacific Ocean. Their ecotype received the name "resident," although there are other ecotypes also resident in the area. Only 75 southern resident orcas remain. □ SOURCE: PLOS ONE



COMPOSITE BY PETER SYMES

Facial recognition: Revolutionizing cetacean identification

Groundbreaking research uses facial recognition technology to identify individual whales and dolphins, providing new tools for conservation efforts.

In a world where facial recognition technology is becoming commonplace, it is not just humans who are being identified. A groundbreaking study has successfully applied this technology to identify individual whales and dolphins in the wild across 24 species.

Led by Philip Patton, a PhD student at the University of Hawaii at M□noa's Hawaii Institute of Marine Biology (HIMB), the research introduces a multispecies photo-identification model. This model was developed for a Kaggle competition organized by Happywhale.com. The competition challenged engineers to create a tool that could individually identify whales and dolphins using an algorithm.

Algorithm

The facial recognition model used in this study is based on a state-of-the-art method in human facial recognition known as the ArcFace classification head. It uses two such heads to jointly classify species and identities, allowing species to share information via shared weights within the network.

The algorithm can identify characteristics such as scarring, pigmentation and size on individual dolphins and whales. This accelerates the information-gathering process, allowing researchers to quickly estimate population size, population trends, and space use—all crucial factors for conserving Hawaiian whales and dolphins.

Ecologically, dolphins are very social, and this new tool provides a way to observe dolphin social behavior in a non-invasive way. □ SOURCES: HAWAII INSTITUTE OF MARINE BIOLOGY, METHODS IN ECOLOGY AND EVOLUTION

Dolphins speak "baby talk" to offspring

When people speak to small kids, they tend to change the pitch, sentence structure and speed of their speech. Now, marine biologists have discovered that dolphins do the same, according to a paper published in the journal *PNAS*.

Have you ever noticed that when adults speak to babies or small children, they speak in a distinctively specific manner? As if by instinct, they speak in a high-pitched voice, with clear pronunciation and longer pauses between words.

It seems that this "baby talk" is not reserved for humans. Researchers have discovered that dolphins indulge in baby talk too—by changing their characteristic whistles and frequencies—when they communicate with their offspring.

Strengthen emotional connection

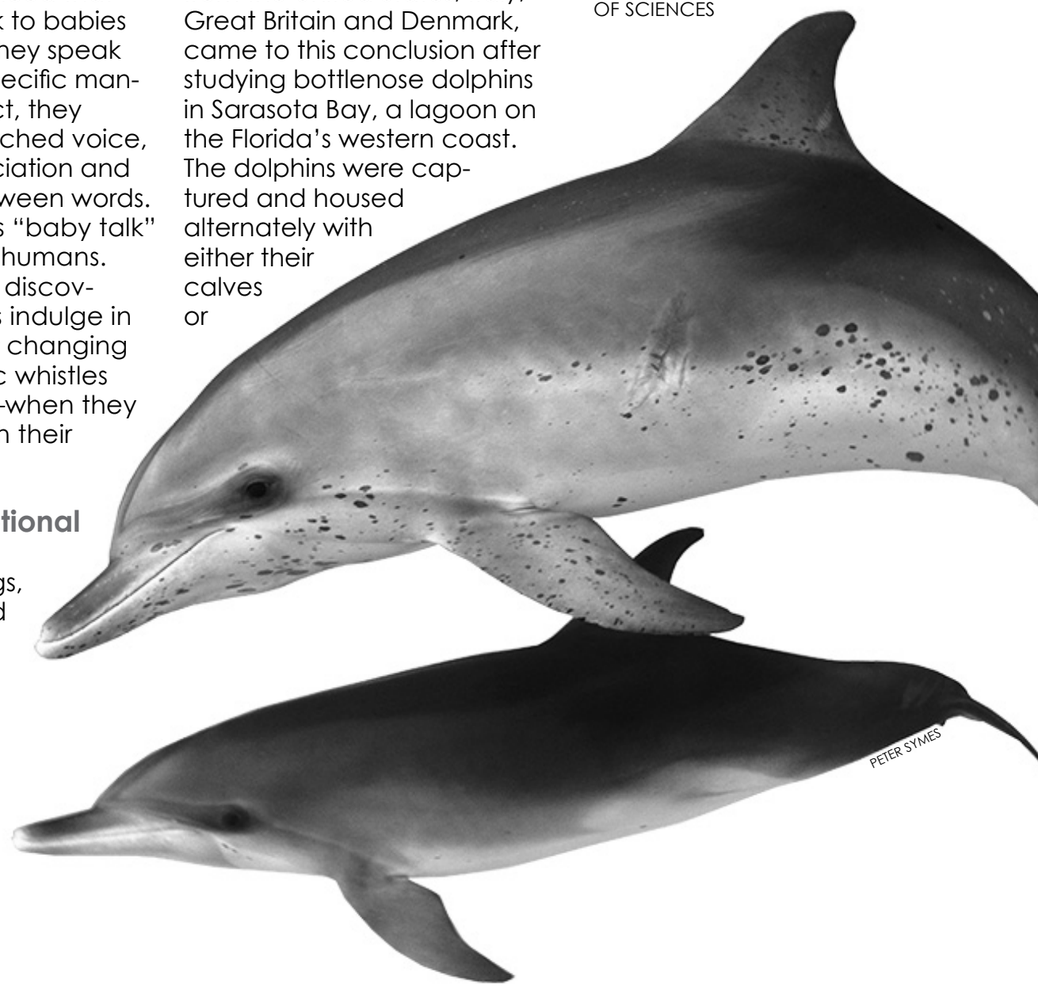
Among other things, studies have found that this special way of speaking can help with language acquisition. It is suggested that this special communication of the dolphin mothers with their offspring may help to increase attention, create an emotional bond and promote the calves' vocal learning.

To date, similar behaviour has not been detected in other animals.

The researchers, who hailed from the United States, Italy, Great Britain and Denmark, came to this conclusion after studying bottlenose dolphins in Sarasota Bay, a lagoon on the Florida's western coast. The dolphins were captured and housed alternately with either their calves or other adult dolphins.

During gatherings, calves and their mothers exchanged whistles almost continuously. It was observed that the mothers whistled at significantly higher maximum frequencies and with greater frequency deviations when they were with their calves, as compared to when they were with other adult dolphins. □

SOURCE: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES



PETER SYMES

Sharks as social and sentient beings

Recent research about sharks challenges perceptions, revealing their advanced cognitive and emotional capacities.

Recent scientific research has begun to challenge the long-standing perception of sharks as solitary hunters. Rather, it reveals their complex social structure that is borne out of a high level of cognitive function.

In fact, these studies suggest that sharks possess a level of social intelligence, problem-solving skills, and even emotional intelligence that far surpass previous beliefs, offering a fresh perspective on their behaviour and potential sentience.

Social intelligence in sharks

A comprehensive review of Chondrichthyan cognition (Chondrichthyes: cartilaginous fishes) published in the journal *Animal Cognition* provides empirical evidence of consistent and repeatable social networks among sharks. Despite changes in group size, the social network position of individual sharks remained consistent, thus suggesting that it was social preference that drove network structure.

The review highlights that the handful of species that have been cognitively assessed in some detail over the last decade have provided enough data to safely conclude that sharks and rays possess a high level of cognitive function.

Social groups

Further research published in the journal *Animal Behaviour* revealed that sharks form spatial groups characterized by nonrandom and long-term associations. These groups were found to be influenced by individual preferences and adaptation to local conditions, suggesting that the observed grouping patterns resulted from an active choice of individuals, a sign of sociability.

It has also been documented that blacktip reef sharks form groups did not form groups randomly or passively. Instead, their communities developed from an active selection of specific individuals, as a sign of sociability.

Fish Biology published a study on Port Jackson sharks, demonstrating highly repeatable individual differences in boldness and stress reactivity. This study provided the first evidence of individual personality differences in sharks, a crucial aspect of social intelligence.

Social learning

Another study in the journal *Animal Cognition* showed that juvenile lemon sharks are also capable of social learning. Researchers observed that the sharks were more likely to follow the path of another shark that had previously found food, suggesting that they can learn from the experiences of their peers.

This was also the case with juvenile Port Jackson sharks which learned the route to a hidden food reward when they could interact with a previously trained shark. Compared to individual learners, sharks that had the opportunity to watch others performing the task took fewer days to master the task, and more of them were successful.

This indicates that sharks, like many other animals, can use socially derived information to learn about novel features in their environment.

Problem-solving abilities

Beyond social intelligence, sharks have demonstrated problem-solving abilities. Sharks can adapt their behaviour based on new information. This level of cognitive flexibility was once thought to be exclusive to higher mammals. □ SOURCES: NATURE, BIOLOGY LETTERS, FISH BIOLOGY, ANIMAL COGNITION, ANIMAL BEHAVIOUR

COMPOSITE BY PETER SYMES

Research has begun to challenge the long-standing perception of sharks as solitary hunters, revealing instead a complex social structure that requires a high level of cognitive function.

Sharks and rays are intelligent and inquisitive creatures with surprising behavioural flexibility.

— Brown et al

"Miracles" can happen when one least expects it, as in the case of this small 6 to 7cm-long painted frogfish (*Antennarius pictus*), which was captured gaping in a long yawn, on a muck dive in Minahasa, North Sulawesi, Indonesia.

Sequential Shots

The transition from analog to digital cameras has been a boon for photographers, granting them unlimited shots and freedom of movement. These circumstances lend themselves well to the technique of shooting sequential stills. Underwater photographer Claudio Ziraldo shares his insights and tips on taking sequential shots underwater.

Text, photos and taxonomic research by Claudio Ziraldo
Translation edited by G. Symes

In the first decade of the 20th century, technological advances allowed the printing of photographs in magazines. Fashion photographs appeared for the first time in 1909, in the French magazine *La Mode Practique*.

Subsequently, attention moved from Europe to the United States, where some renowned photographers provided a further twist in a way of approaching this type of shooting, which involved abandoning rigid schemes and poses, giving greater freedom to the subjects of their works, which were portrayed in more natural positions.

Currently, fashion photographers take hundreds of shots during a photo shoot, in order to capture the moment when the models are in ideal conditions, positions and facial expressions. With the transition from analog to digital, even in underwater photography, it has become possible to have a practically unlimited number of shots available. This leaves us ample and total freedom of action.

With that said, let's get to the topic of this article.

Why take sequential shots?

There are several reasons for taking sequential shots. The first and most obvious (a bit like in fashion photography) is to have several images of the same subject or situation—perhaps by practising a little "bracketing"—and then choose the best shots.

Secondly, in the case of particularly interesting subjects that are often approached with difficulty, we can take close-up shots as long as the subject allows it. In this case, we may get to do a "photo shoot" with lots of shots, and thus obtain the desired effect. In any event, we will at least capture a few acceptable images, even if they are not at an optimal distance.

Sequential

Hardly ever exceeding 6cm in length, the little flamboyant cuttlefish (*Metasepia pfefferi*) is considered a rare speces found in the Indo-Pacific region. Taking a series of shots, as one gradually gets closer and closer to the subject, captures its chromatic and morphological characteristics.

There can, of course, be several other reasons. Three are mentioned below.

1. Yawning

In the past, I have stayed at the Minahasa Lagoon Dive and Tours Club, which is not far from Manado in Indonesia. The Minahasa area is a strategic location in which one can make interesting "muck dives" and take underwater photos of the environment along a splendid wall, which is located just a few minutes by boat from the resort. And, with a 40-minute boat ride, one can also reach Bunaken National Park.

There I was in Minahasa, in the water during a muck dive, when the dive guide drew my attention to a small 6 to 7cm-long frogfish (*Antennariidae*). It looked like it could be a *Antennarius pictus*, or painted frogfish. So, I got a little closer since I had left my 60mm lens in my car.

"Miracles" do happen when we least expect it, because suddenly, the fish opened its mouth in a very long yawn, which allowed me to take several shots.

In cases like this, it is important to be quick to react, and also to have your strobes' batteries always charged, so that repeated shots can be taken in a very short time. Among other things, if you photograph at short distances, the condenser will not discharge completely, and this is certainly helpful.

Focus is not a problem, because if you remain still, you are unlikely to lose focus, and the exposure is always the same. Having said that, we can consider this option to be particularly beneficial when taking advantage of situations that are a little out of the box.

2. Flamboyant cuttlefish

The flamboyant cuttlefish (*Metasepia pfefferi*) is a small animal, seldom exceeding 6cm. Its body is oval in shape, predominantly brown, and its maximum recorded length is 8cm. The body of this cuttlefish has several protuberances, two of which are above the eyes and several are in the ventral area.

If the animal is disturbed, red areas appear on the tentacles, and white or yellow streaks appear on the back, which

Sequential

The white-eyed moray eel (*Gymnothorax thyrsoideus*) is a fairly common marine animal in the Indo-Pacific region. Taking a series of photos of a moray eel at the footsteps of its den captures the gaping-mouth behaviour that is so characteristic of the species.

are rather variable, irregular and "move" as if they are flashing lights, which is very curious and interesting to observe. It is considered a rather rare critter. Nevertheless, it occupies a rather vast range, including the tropical Indo-Pacific region, Malaysia, Indonesia, the Philippines and northern Australia.

I have had the opportunity to shoot sequences of this cephalopod on several occasions. I suggest taking a steadily approaching shoot, in which a series of shots, little by little, highlight the chromatic and morphological characteristics of the flamboyant cuttlefish.

3. Moray eel

The white-eyed moray eel (*Gymnothorax thyrsoideus*) is a fairly common animal and occupies the same territorial range as the flamboyant cuttlefish. This moray eel generally dislikes light and is a nocturnal hunter. Sometimes, it is fearful and shy. If you try to get too close when taking pictures, it will withdraw into the darkness of its burrow.

In other cases, however, white-eyed moray eels will stay on the doorsteps of their dens, like old wives, to observe the passers-by. The posture that most characterises them is how they often keep their jaws wide open, which to most may appear a bit threatening. However, it is done simply for respiratory purposes.

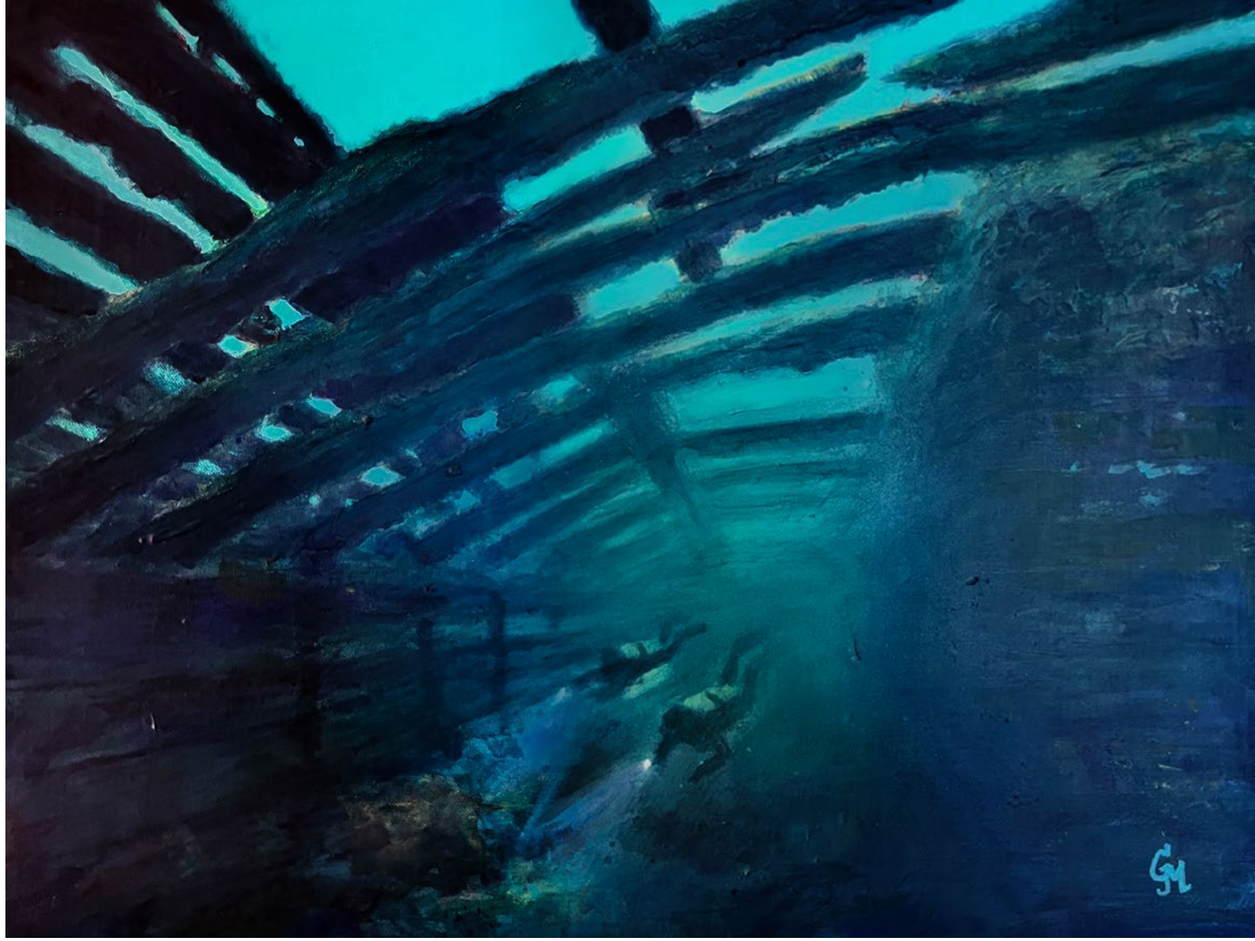
I will not go into the details of this behaviour here but leave it to biology experts to explain. However, it is precisely this particular behaviour that allows us to take suggestive images, which, quite often, impress non-experts.

The moray eel in my photos was very cooperative and never moved from its den's front door, until I left after taking more than a dozen shots. She probably felt like a star! □

Claudio Ziraldo is an architect with a great passion for the sea and nature. He serves as president of the Bollate Sub Association, a sports club that promotes diving and the disciplines connected to it. He is a diving and marine biology instructor as well as a successful underwater photographer, who has achieved prestigious international recognitions. In 1987, he won the "Nikon Photo Contest International Grand Prize" for an underwater shot, while in 1991, he obtained the "Prix Mondial du Livre d'Image Sous Marine" at the Antibes Underwater Image World Festival for the realisation of the depths in "Dreams of Light." In 2004, his book, Il Tempo della Luce, *won awards in both Italy and Malaysia.*

Grace Marquez

P O R T F O L I O



Night Dive, acrylic on paper mounted on canvas, 40.64 x 30.48cm (above); *Swimming Through*, acrylic on paper mounted on canvas, 40.64 x 30.48cm (right); *Inside the Vickery*, acrylic on canvas, 45.72 x 60.96cm (top right); and *Circling*, acrylic on canvas, 1.2 x 1.5m, by Grace Marquez (previous page)

Interview by G. Symes
Artwork and photos by Grace Marquez

Artist and technical diver Grace Marquez, who is based in Canada, creates dynamic paintings of sublime underwater scenes, with a keen eye for how to capture on canvas what it is like to dive on wrecks, reefs and in caves and caverns. *X-Ray Mag* interviewed the artist to learn more about her creative process and how technical diving has influenced her artwork and perspectives.

X-RAY MAG: Tell us about yourself, your background and how you became an artist as well as how you got into diving and later, technical diving.

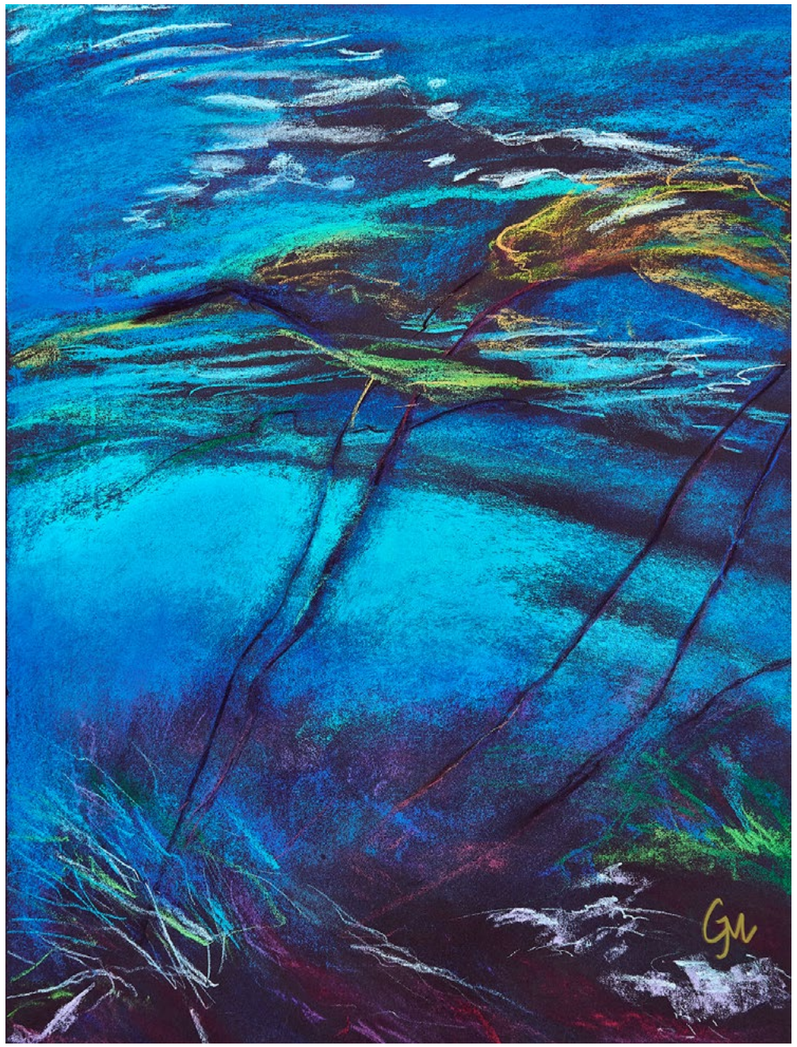
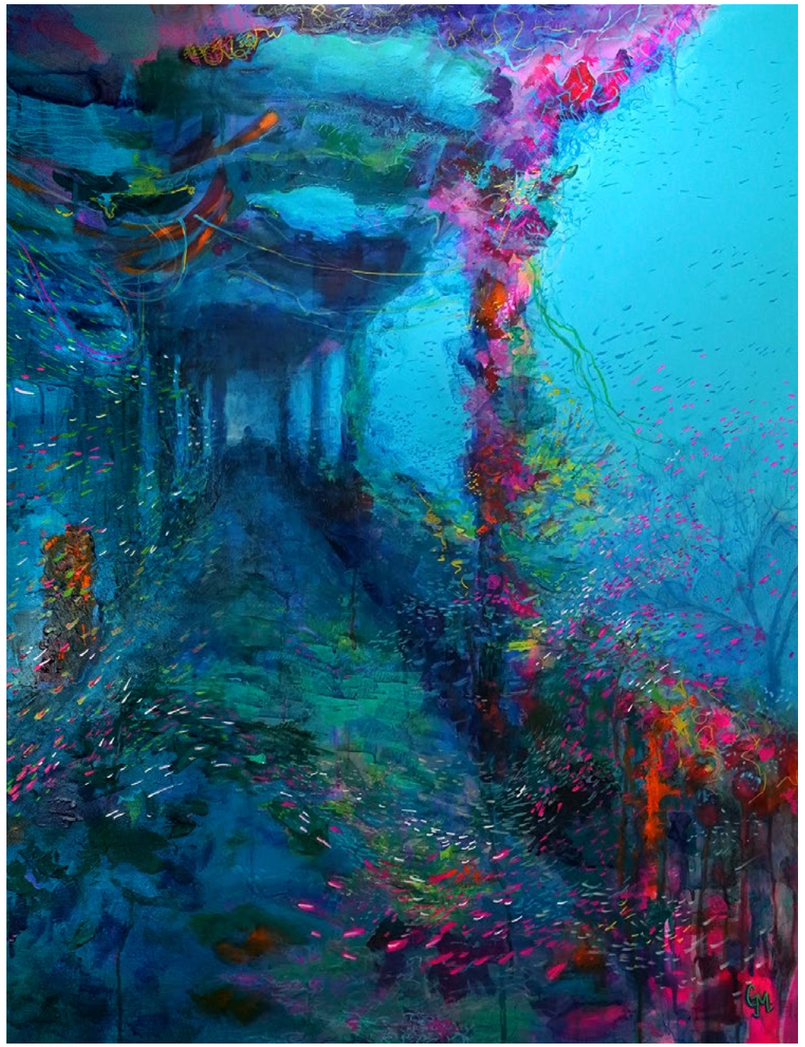
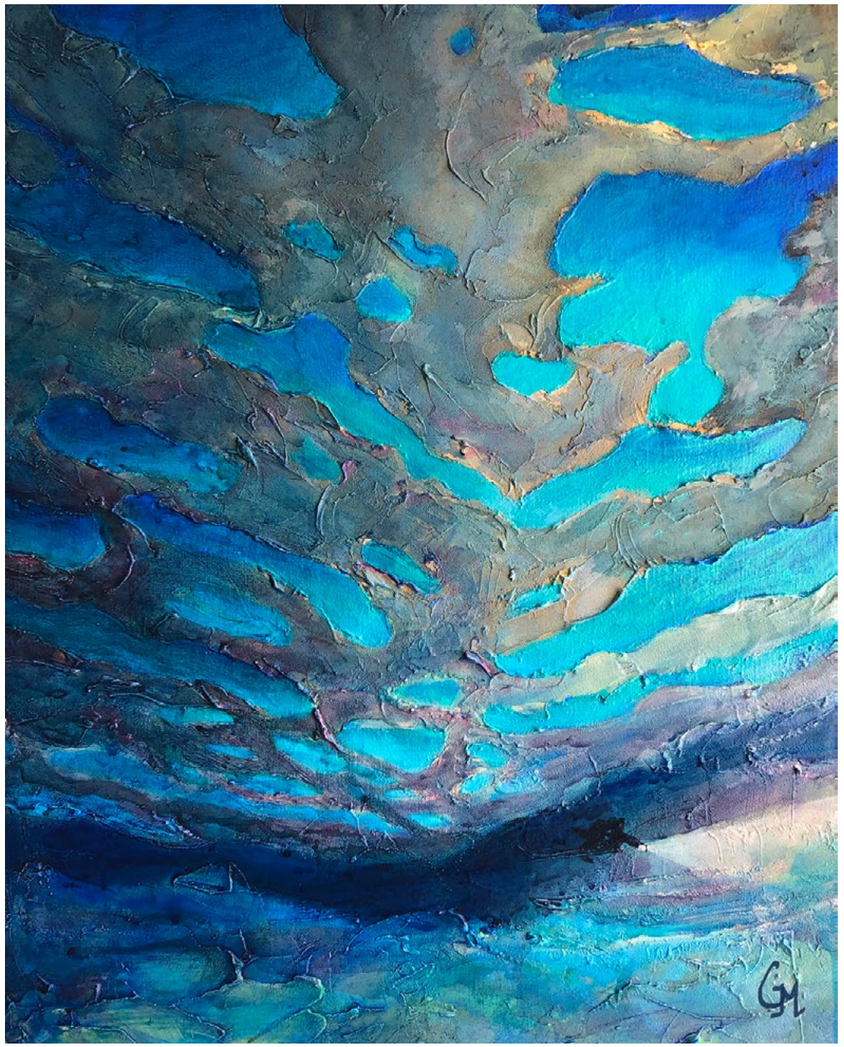
GM: I was born on a tiny island dubbed, "The Heart of the Philippines," called Marinduque, so I am an island girl at heart. My family immigrated to Canada when I was four, and I have lived my entire life in Canada. I have painted or drawn since I was a child and have a fine arts degree in art making, but I ended up working on the design side of advertising, marketing and tech for my career. In 2020, I left my career as a creative director to pursue my art full-time.

My first experience with diving was during a family trip to the Philippines in 2008 (returning for the first time since leaving the country). In only 20ft of gin-clear water, I saw a clownfish in an anemone, and I was hooked! As soon as I went back home, I got certified in Lake Ontario.

Most of my diving has been in the cold freshwater of the Great Lakes, diving walls and shipwrecks. I enjoyed diving so much that I became a PADI scuba instructor. I got into technical diving because I wanted to be able to stay down longer and enjoy a longer dive. As I got more comfortable with each level, I got into cave diving and eventually into rebreather diving as a means of lengthening dives.

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

GM: I have such a passion for the water world, and initially, only took photos of my dives. But I always felt like they were missing the true essence of the experience. My memory of the dive was different from what my little GoPro captured. An artist friend of mine actu-

Submerged in the Shallows, acrylic on paper, 60.96 x 45.72cm (left); *Reclamation: The Fujikawa Maru*, acrylic on cradled wood panel, 101.6 x 76.2cm (centre); and *Look Up*, acrylic on canvas, 50.8 x 40.64cm (right) by Grace Marquez

ally pointed out the obvious—to paint my underwater world. So, I started!

There are aspects of being on a dive when different areas come into and out of focus, and I try to capture that in my paintings, which is why they are somewhat abstract and somewhat representational in areas. I paint my impressions of the dive, rather than create a photographic record.

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

GM: My earliest influences came from the work of the masters J.M.W. Turner and Monet. I love their use of colour and light. More recently, I am loving the unexpected use of materials to create colour in the work of Gabriel Dawe, a Mexican installation artist who takes fibres of thread and arranges them in large spaces to create light and spectrums. The installations are really moving and such an original way to make light and form. I am also inspired by Canadian artist Claire Desjardins' work, which is bold and full of joy in her use of colour and mark-making. I have learnt to love pure colour from these two artists and have been integrating more and more of it in my own art, even in the dark spaces of the underwater caves that I paint.

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

GM: My artworks often start while I am on a dive. While I am underwater, I experience things and see sights that I immediately want to capture in colour and composition. On my dives, I take my GoPro with me to record what I see. Back in the studio, I review the footage and pull still shots from it. I use the still shots as a jumping-off point and reference. Then I sketch some different ideas until I come up with a composition that I like. I then start to work on the canvas.

I do not like working from a white canvas, so the first layer I paint on a canvas is a vivid colour, like fluo-

Through the Promenade of the Nippo Maru, by Grace Marquez. Acrylic on canvas, 45.72 x 60.96cm (right)

I Moved Through It as if in a Dream, acrylic on canvas, 45.72 x 60.96cm (left); and *Ice Tunnel*, acrylic on canvas, 27.94 x 35.5cm, by Grace Marquez (right)

rescent yellow or hot pink, or even lots of splashes of leftover paint on my palette from a previous work. This underpainting peeks through in some spots and always gives the painting more vibrancy and life. I then build colours on top, using lots of glazes, so that you can see the colours underneath coming through and anchoring it.

I often work with acrylic paint pens to help shape the composition with lines, and draw on top of them, over and over again. I also tend to obliterate what I paint a lot, using rags with glazes of colour. It is the building up of many layers of glazes that gives my paintings their light and depth.

I work intuitively, and at a certain point, I will abandon my photo or video reference and start to work purely in terms of the composition.

X-RAY MAG: What underwater equipment do you use to capture source/reference imagery used in your creative process?

GM: I use a GoPro Hero 9, mounted on a tray, with two Kraken Sports Hydra 1500 WSR lights.

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

GM: Being underwater is a place of complete wonder for me. I feel very much in harmony with the world when I am underwater. As I have progressed in my training from recreational to technical diving, the different dive environments have opened up to me.

It is hard to really say which is my favourite experience in the sea because every place is special for something. But for reef diving, I really loved diving the Sea of Cortez from

On the Deck of the Arabia, acrylic on canvas, 60.96 x 76.2cm (above); *Stern of the Forest City*, acrylic on canvas, 45.72 x 60.96cm (top left); *First Dive on the Acme Propeller*, acrylic on canvas, 30.48 x 40.64cm (left), by Grace Marquez

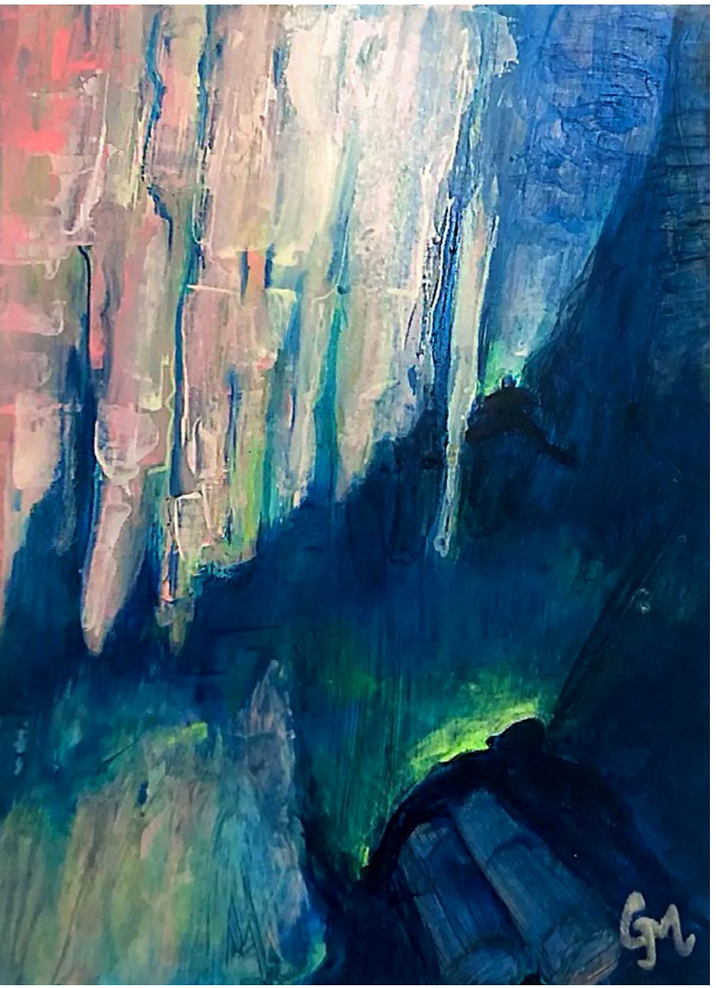
a liveaboard. The marine life was incredible, with a non-stop highway of fish, even on the shallow reefs. There was also the added bonus of a huge pod of hundreds of dolphins, dramatic sea mounts that rose up from the ocean floor, and a sea lion colony.

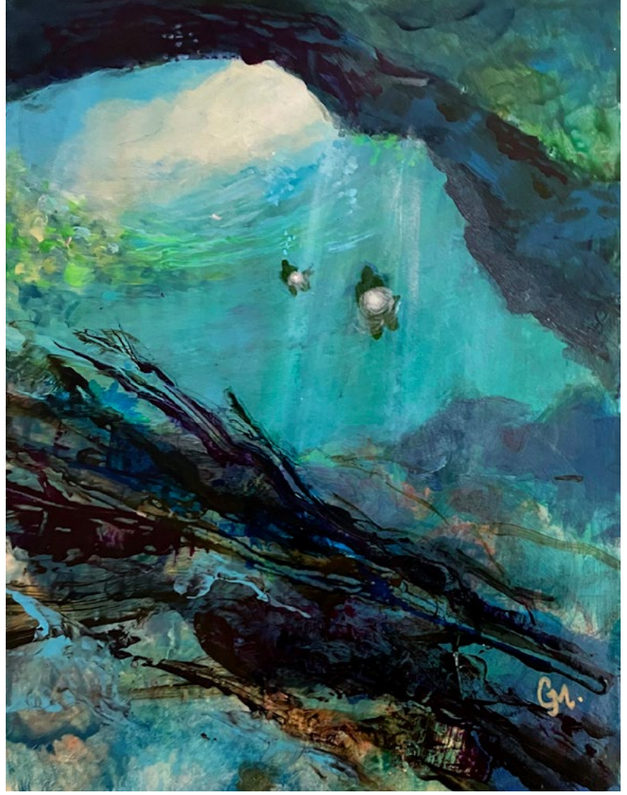
I had an amazing interaction with a massive bull sea lion, which roared loudly at me and swam inches above my head, as he passed over me. I have amazing video footage of his massive wide body and belly passing over me. He blew a line of bubbles to warn me not to come any closer to the many pups and females swimming nearby, and that was enough for me to start back-finning away!

X-RAY MAG: Your artwork shows an intimate knowledge and perspective of what it is like to be on a dive. Please tell us how you go about composing a scene and choosing a point of view or angle, and if and how you use divers as models for your artworks.

GM: Oftentimes, while just letting my GoPro record key features of a dive, I will take a "mental snapshot" of a scene that I really like—kind of like bookmarking that moment in my mind. I try and pan around to capture as many angles as possible of a scene that I like, so that I have a lot of reference material for later.

Gliding Past the Rock Curtain, by Grace Marquez. Acrylic on paper mounted on canvas, 35.56 x 27.94cm (below)





Descending, acrylic on paper mounted on canvas, 27.94 x 35.56cm (above); *Descending into Jackson Blue*, acrylic on canvas, 76.2 x 60.96cm (top centre); and *Follow Me*, acrylic on paper mounted on canvas, 45.72 x 45.72cm, by Grace Marquez

I almost always know what angle I want to paint when I see it, and it might be because it is a feature of a wreck that is interesting or the way the marine life is moving.

Unless it is a commission in which I want the diver to be recognisable in some way, when I have divers in a composition, they are there for scale or depth in a painting. It is not so much about the diver in the scene as it is about the uniqueness of the place. The divers are there, secondary to the environment itself.

X-RAY MAG: As a technical diver, what experiences in technical diving have found their way into your artwork? Compared with recreational diving, how has technical diving influenced or expanded your painting style and subject matter?

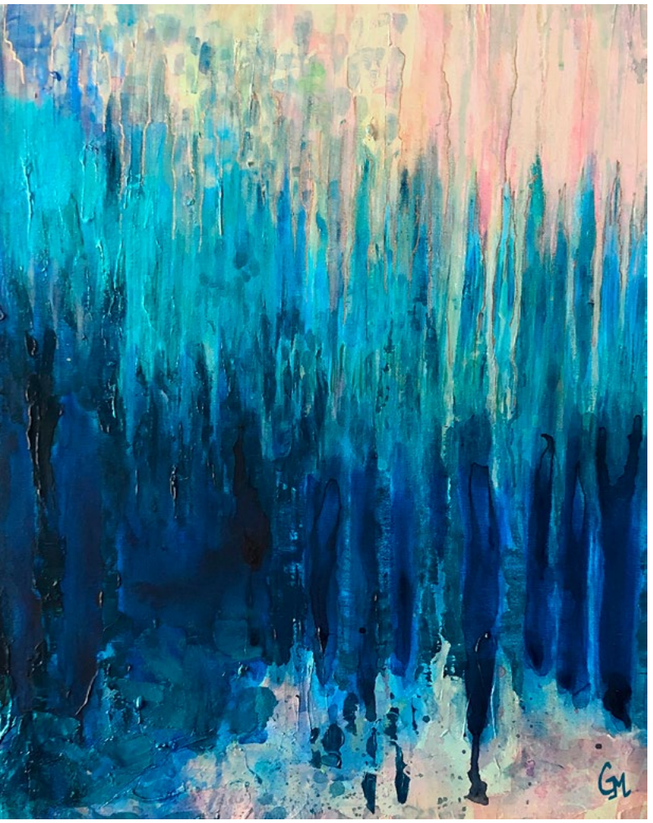
GM: Were it not for technical diving, I would not be able to dive the wrecks and caves that I have been fortunate to dive, and I would not have those experiences to paint. Technical diving really opened up a window for me into another level of experiences. As opposed to recreational diving, I have been able to capture more footage as my reference material, because I am able to stay down longer. I am able to paint some really unique environments because of the technical training that allows me to safely dive there.

I am also one of those people who reliably gets narked at 30 metres. It sounds a bit crazy, but breathing trimix has also allowed me to have greater clarity and alertness during my dives, and as a result, have a greater recollection of the dives, which I bring into my paintings. My earlier works tended to be darker but my later works, as I progressed into trimix diving, revealed to me that even at great depths in a cave, wreck or reef, there is an abundance of colour and detail that I can capture in my paintings.

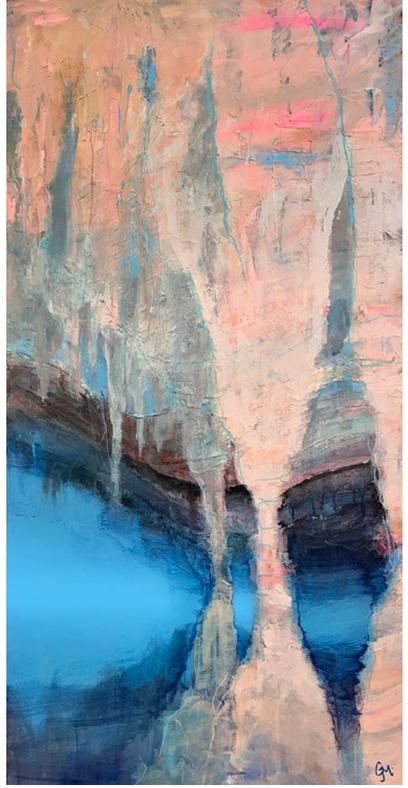
X-RAY MAG: What is it about wrecks and caves that captivate you and inspire you to create artworks of them? How is the process of painting wrecks and caves different from painting reefs and marine life?

GM: I love painting wrecks because each one has a story to tell. Each once served a specific purpose. Then, when it was wrecked, it transformed at the hand of Mother Nature, becoming an artificial reef. My latest series, *Afterlife*, explores this—how even a battleship that had served

portfolio



Look For Magic, by Grace Marquez. Acrylic on canvas, 50.8 x 40.64cm (below)



Oleg's Bat Cave, acrylic on canvas, 50.8 x 40.64cm (top right), and *Welcome Back to the Light Zone*, acrylic on canvas, 121.92 x 60.96cm (top left), by Grace Marquez

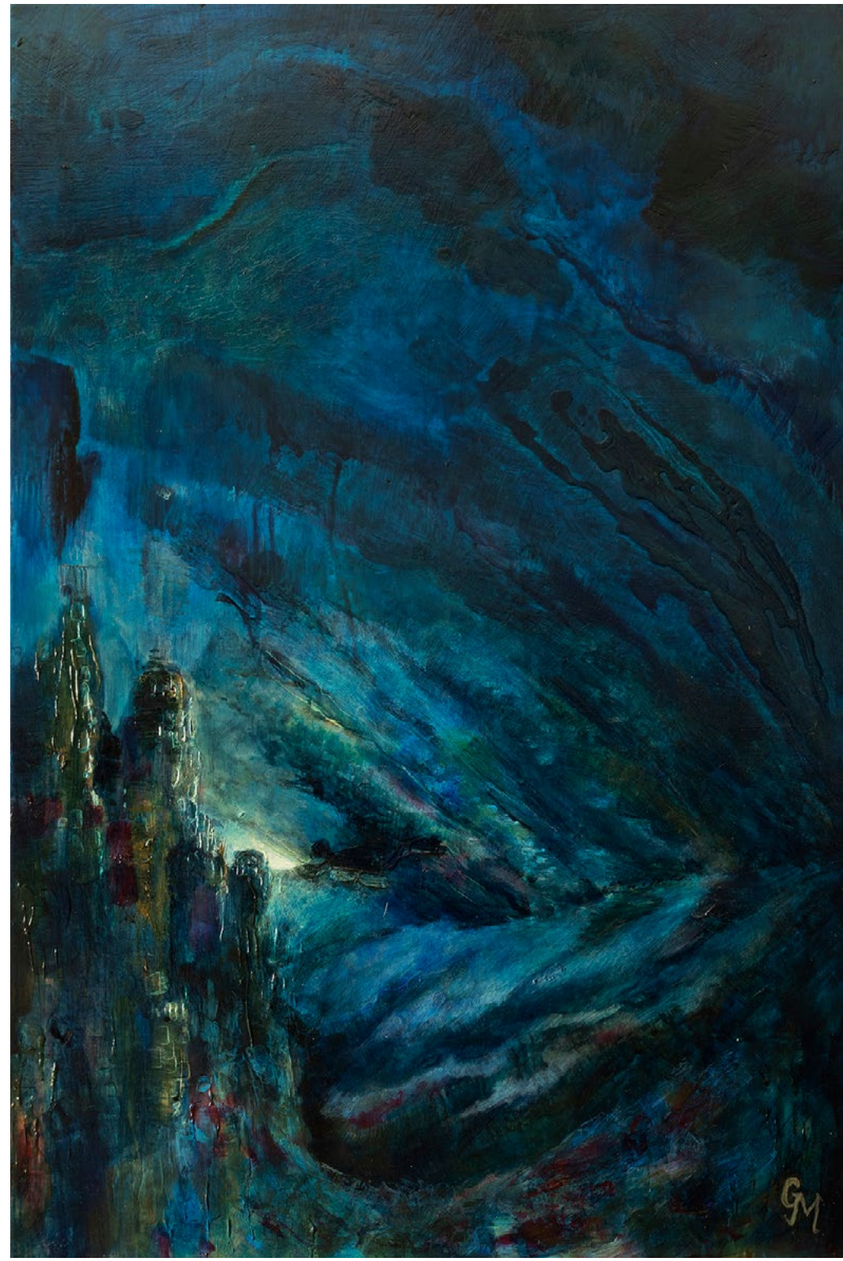
Grace Marquez

as a weapon of war in WWII, transformed in its afterlife to become a safe place for marine life, full of life and colour.

With caves, I am fascinated by the patterns of rock that show directly how water has carved and shaped it into being over time. I suppose it is seeing the hand of Mother Nature at work in these places that captivates me to record the effects through my art.

Painting reefs and caves are actually very similar because they are from nature, made by nature. Caves and reefs have beautiful patterns and a certain orderly randomness to the lines of rock or movement of schooling fish. There is colour that is visible and there is a feeling of "flow" in them, which I like to capture in my art, so that it is not a literal rendering of every single fish or coral in detail.

Wrecks, on the other hand, have a human presence, which is eventually covered over by



The Next Turn, acrylic on cradled wood panel, 101.6 x 76.2cm (above); and *The Bedding Plane*, acrylic on canvas, 27.94 x 35.5cm (left), by Grace Marquez

Afterlife: Swept Away, acrylic on canvas, 60.96 x 76.2cm (right); *Afterlife: The Service of Sara*, acrylic on canvas, 60.96 x 76.2cm (below); *Afterlife: Majestic*, acrylic on canvas, 76.2 x 60.96cm (bottom right), by Grace Marquez

time. This is truly the impression I get when seeing them. Painting wrecks is a similar process, but I like to stay true to some recognisable features. So, wreck paintings tend to have more of the manmade lines of form and structure, rather than the elegant and flowing shapes and lines of reefs and caves.

X-RAY MAG: What are your thoughts on ocean conservation and coral reef management and how does your artwork relate to these issues? How you source materials for your artworks and address sustainability?

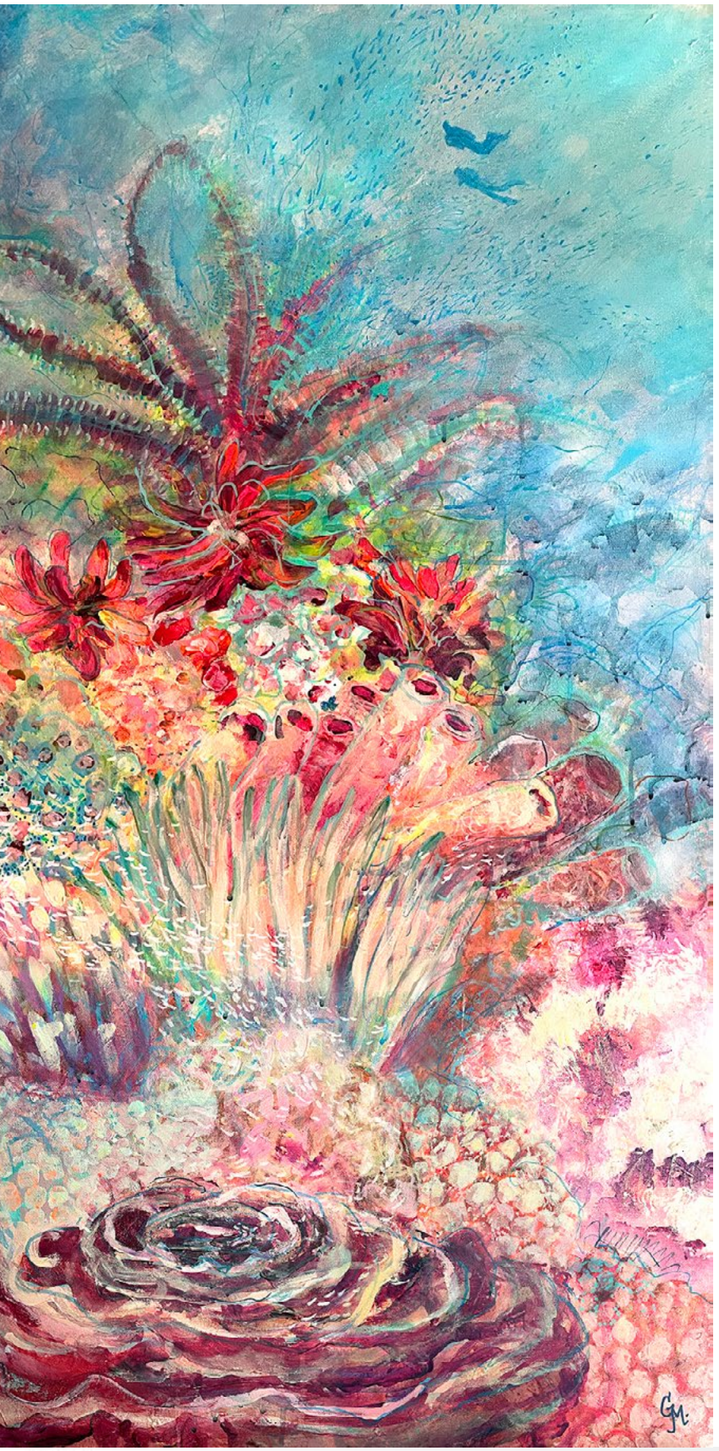
GM: It is hugely important. Awareness and education play a big part in this. I try to talk about these things through the storytelling behind my art. When I speak with people about my art, it is the perfect moment to share some interesting facts or experiences, and things I have seen or know about these issues. I also applaud the efforts of resorts around the world that integrate reef management and reef nurseries into the dive programmes for their guests.

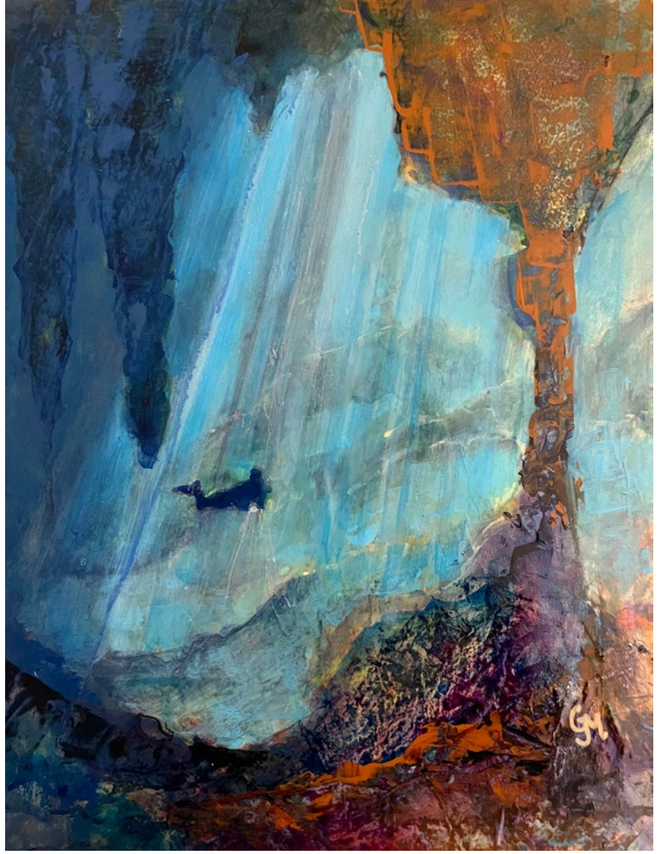
As an artist, I tend to reuse and repurpose everything into and in my studio—yogurt containers and glass jars become paint-mixing bowls or storage, and dish sponges become excellent mark-making tools on a painting. Old canvases, with paintings I am no longer attached to, are gessoed over, or their stretcher frames are reused to prep for new work.

I try to buy paints in large quantities, so that there is less packaging over time, and the packaging is large enough to reuse in the studio, thus avoiding the waste basket. If something does go into waste, I try to ensure that the packaging is fully recyclable.

When it is time to clean my brushes, I let the acrylic particles settle

The Playground, by Grace Marquez. Acrylic on canvas, 121.92 x 60.96cm (below)





The Gateway, acrylic on paper mounted on canvas, 35.56 x 27.94cm (above left); *Curious Kitty at Palancar Caves*, acrylic on canvas, 16.96 x 45.72cm (above right); *Looking Back on the San Francisco Maru*, acrylic on canvas, 60.96 x 45.72cm (right), by Grace Marquez

overnight to the bottom of the container. I pour the clean water that is on top out into a new jar to use and wipe the remaining sludge with a cloth rather than pour it down the drain. Any rags I use to dry my brushes, or wipe with, end up being used in applying paint during my painting process. Old rags, with different textures from paint drying in it, can add beautiful textures to a painting! It is kind of like the reusing of bathwater in olden days—I just keep using each material until it is really dirty, and then, and only then, dispose of it.

I also try to source eco-friendly materials. For example, for smaller works, my table easel is made from bamboo, which is a renewable and sustainable wood. I am picky with my art supplies, but where possible, I choose low-toxicity brands, without sacrificing the quality of the paint mediums.

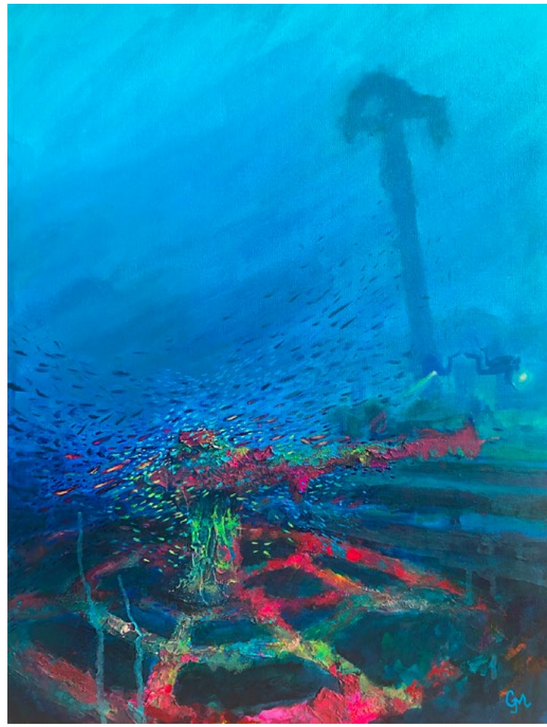
X-RAY MAG: What is the message or experience you want viewers of your artwork to have or understand?

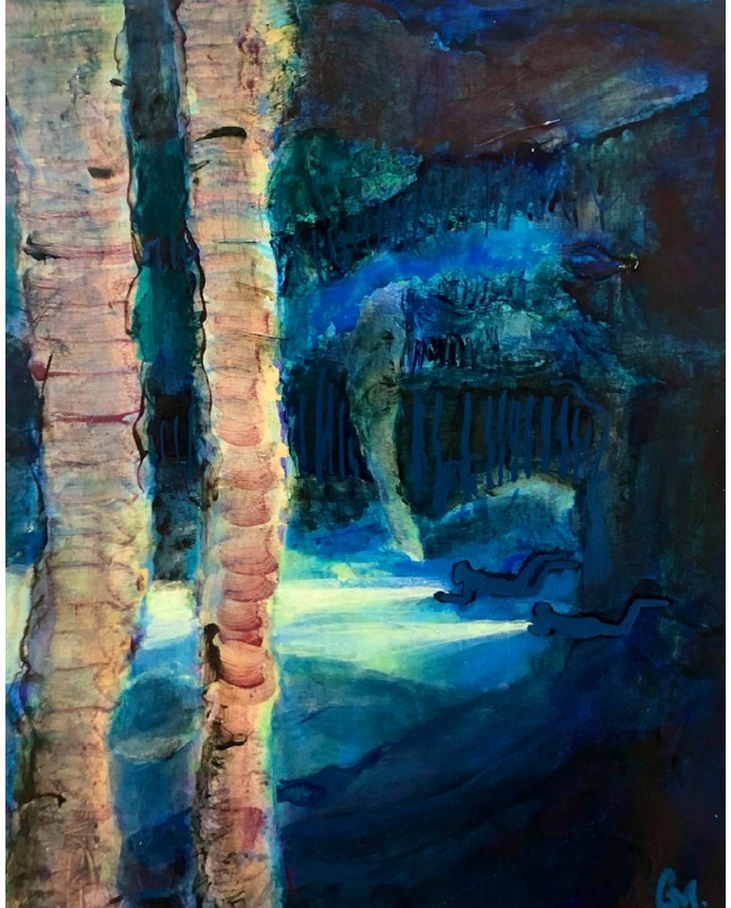
GM: There is magic right here in our world, and it is underwater. Through my paintings, I want viewers to feel the same sense of wonder and awe that I have—and get curious about the water world. I think when people are curious about it, they learn about it, and that is the first step in protecting it.

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?

GM: Artificial intelligence (AI) can be seen as a challenge or a benefit for artists today. I truly believe that people want the life story behind the work and the artist, as much as the art—otherwise, it is just decoration. AI is interesting to play with, visually, to help test ideas.

I think in a world that can often be about a quick fix or a short attention span, art still has the ability to make people pause and find moments of calm, inspiration, pride, joy and even reflection. Art





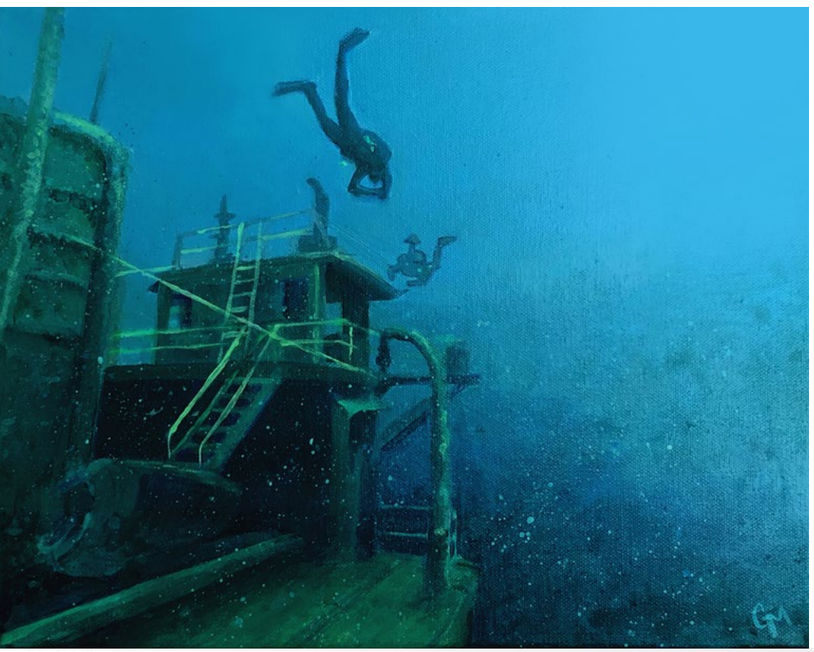
Together We Went Through It, acrylic on paper mounted on canvas, 35.56 x 27.94cm (right); *Down the Wall*, acrylic on paper mounted on cradled wood panel, 45.72 x 60.96cm (far right); and *Flying Above the Niagara 2*, acrylic on canvas, 27.94 x 35.5cm (below), by Grace Marquez

can be very powerful for artists—to connect with people. To artists in the ocean arts, I would say: Experience the ocean first-hand, if you are able. Immerse yourself in it. It will permeate your art in a unique way that will yield richer and more original results than just using a photo reference.

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

GM: People typically respond to my art with curiosity and wonder. They can appreciate the beauty of the underwater world and want to know more about it. They ask a lot of questions about the things I see underwater. Those who are divers have told me that my work gives them goals to work towards in terms of their diving, so that they too can experience these things. Once, a woman who came to one of my shows told me that my art made her less afraid of the water.

My most memorable interaction with a child viewing my painting of the bow of the *Saganaga* wreck in Newfoundland was her interpretation of it. Even as young as she was, she said that my painting was really beautiful, with all the colourful soft corals growing on it, but that she could also see the sadness in it, because it sank. So, it was like a circle of life for her. Deep thoughts, for a child!



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

GM: I am looking forward to a large solo show in 2024. In addition, I have a few projects that are related to my art, including writing and illustrating a children's story book, which features the adventures of a shark, as well as an adult colouring book in which my drawings can be used to help people unwind and relax with a little creativity.

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

GM: I would say that my paintings are a direct result of pushing myself out of my comfort zone. When I first started diving, I was not comfortable or confident. But I found the right dive shop and people to support me in my training. This allowed me to keep expanding my circle of comfort to the point where I was not only comfortable in the water, but I could take the time to really enjoy what I was experiencing.

If it were not for continuing to challenge myself and develop my abilities as a diver and master my own mind, I do not think I would be painting these scenes today. My art is 100 percent intertwined with each step of my growth as a diver.

So, if there is something you have been wanting to do, something you have been wanting to push past, to take yourself to that next level—why not go for it? You might open up a bunch of new possibilities for yourself! □

For more information and to purchase original artworks, prints and commissions, please visit the artist's website at: ***gracemarquezstudio.com****. Or follow her on* ***Facebook****,* ***Pinterest*** *and* ***Instagram*** *@GraceMarquezStudio.*