

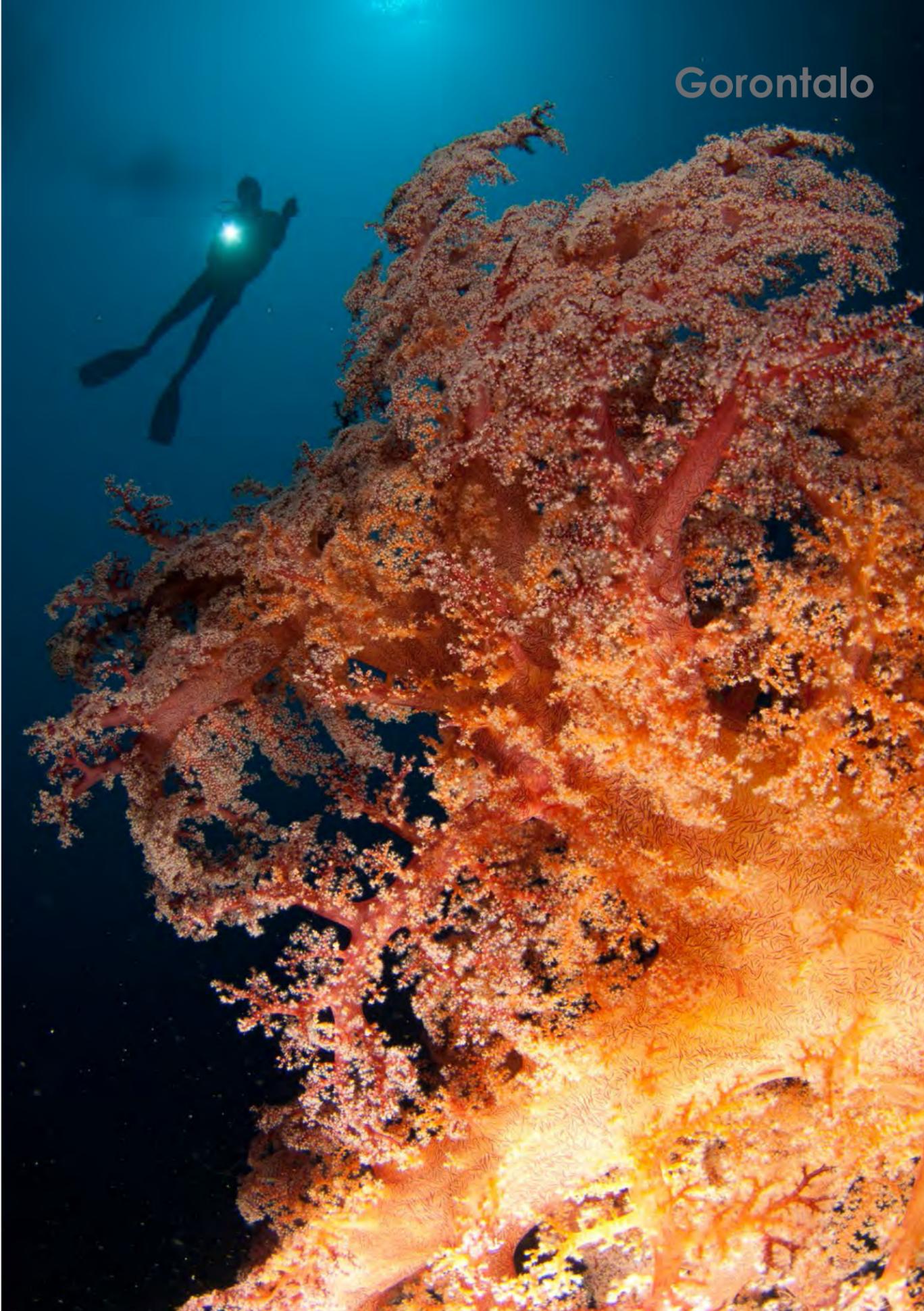


The Surreal Shores of
Gorontalo
Indonesia

Text and photos by Steve Jones



Scenes from Gorontalo, Sulawesi, Indonesia. Spotted porcelain crab, *Neopetrolisthes maculatus*, in anemone (left); Side view (above) of squat anemone shrimp, *Thor amboinensis*; Close-up detail of tree soft coral, *Dendronephthya* sp., with diver (right). PREVIOUS PAGE: A very rare blue sea fan, *Acanthogorgia* sp., found below 45 metres depth, with diver, Gorontalo, Indonesia



Text and photos by Steve Jones
www.millionfish.com

Barely beaten tracks are an increasingly rare find for travellers in this ever more accessible world. Yet on the shores of Tomini Bay on the Indonesian Island of Sulawesi, one such place still exists. Here the lesser explored waters teem with the intensity of the biodiversity found in this part of the world. The name of this place is Gorontalo, an oasis often bypassed as visitors descend on the world famous destinations of Bunaken and Lembeh Strait further up the Sulawesi coastline.

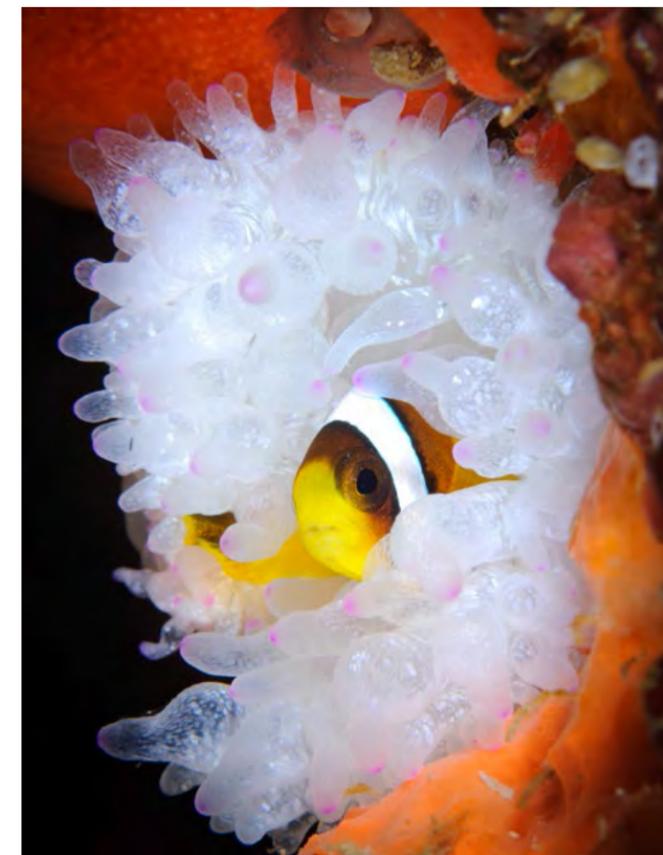
Gorontalo Province lies on a peninsula extending from the northeast of the flower-shaped island of Sulawesi, reaching out towards the Philippines. This peninsula, known as the Minahasa, is bounded by the Celebes Sea to the north and the Gulf of Tomini to the south, and it is on this southern ocean boundary that the provincial capital, Gorontalo City, lies. The term *City*, however, is deceptive, since Gorontalo is more akin to a rural town, where chickens risk all as they cross roads that are traversed by over-laden scooters and motorised rickshaws, known locally as *bentor*.

Along the main streets, double-parked horse-drawn carts contrast sharply with shops that hint at influences of the modern world—the mobile phone accessory outlets that fuel Indonesia’s fascination with mobile communications. This is an obsession that has led the country to become the world’s fourth largest user of cellular phones. Yet, despite

these few signs of the emergence of modern day culture, Gorontalo City remains distinctly traditional and a world away from the usual hustle and bustle you expect to find in an Indonesian city.

Legend has it that when the seas subsided, Gorontalo appeared on a plateau amongst three surrounding mountains. Whether the legend is true or not, there is no denying that the landscape here is ruggedly beautiful, comprising steep cliffs and valleys that channel fresh water on a downward journey toward the sea, cutting swathes through the soft limestone on the way. It is at the coastline where the vulnerability of limestone to natural erosion is most strongly evident and the impact on the underwater topography is dramatic.

To the east and west of Gorontalo City, steep cliffs plummet vertically into the sea and underwater channels and gulleys lead the way to the extreme depths of the bay. These are



Diver (left) looks into cavern at sponge; Diver (above) with one at the Salvador Dali sponges (*Petrosia lignosa*) which only grow with this intricate swirling surface pattern in Gorontalo waters. These sponges grow to up to 3m in length. Anemonefish in anemone (right)

often beautifully interlaced with catacombs of chimneys, caverns and tunnels, providing refuge for some of Gorontalo's numerous species, some of which are endemic.

Tomini Bay is over 4,000 metres deep, and the seabed drops so rapidly that it is common to see open ocean species such as whales, dolphins and strange pelagic invertebrates close to the shoreline. A plummeting seascape so close to land also has other benefits, in providing a near-shore habitat for sessile species that would otherwise be vulnerable to shallow water wave action and therefore in the depths they can thrive.

digestive system and rely on their collar cells to force water through their structures, bringing in nutrients and oxygen and taking away carbon dioxide. Here in Gorontalo's depths they are able to grow to enormous sizes.

Amongst Gorontalo's healthy sponge population, a phenomenon has occurred that illustrates perfectly how local conditions can influence evolution. The sponge in question is *Petrosia lignosa*, a species found only in Sulawesi and the Philippines and first described by renowned zoologist Henry Van Peters Wilson in 1925.

In Gorontalo waters it grows with an intricate, deep swirling pattern etched on its surface, which so far has only been observed here. Local dive pioneer Rantje Allen was the first man to document this unusual morphology and has christened the species with a name befitting the bizarre patterns—"Salavador Dali"—named of course after the surrealist Spanish painter.

These sponges come in various shapes



Peacock mantis shrimp

Giant sponges

Descending past 20 meters, you enter the domain of the giant sponges, firmly gripping the porous limestone while the nutrient rich currents wash over them. Simple multi-cellular animals rather than plants, there are around 8,000 described species of sponge, with the total number of species thought to be upward of 15,000^[1], classified collectively under the scientific phylum Porifera, which means "pore bearing".

Filter feeders, they also lack any distinct



and sizes, the largest can be over three metres in length. All of them display the distinctive patterns, from juveniles of only 20cm in length to those that have reached gargantuan sizes. The Salvador Dali's have been observed in two colours, a dark shade of brown, sometimes with a green tint, or light grey for the ones that dwell out of direct sunlight. Allen has christened this variety the albino Salvador.

The larger sponges extrude

into the bay from Gorontalo's ocean facing walls in a seeming act of defiance against the currents, however living in such an exposed location is not without its hazards. Occasionally even the mighty Dali succumbs to the rigours of ocean life, lose their grip on the wall and tumble away to the depths.

Sadly, once fallen onto the sea floor, these giants can no longer filter enough nutrients to survive. Within a few weeks the

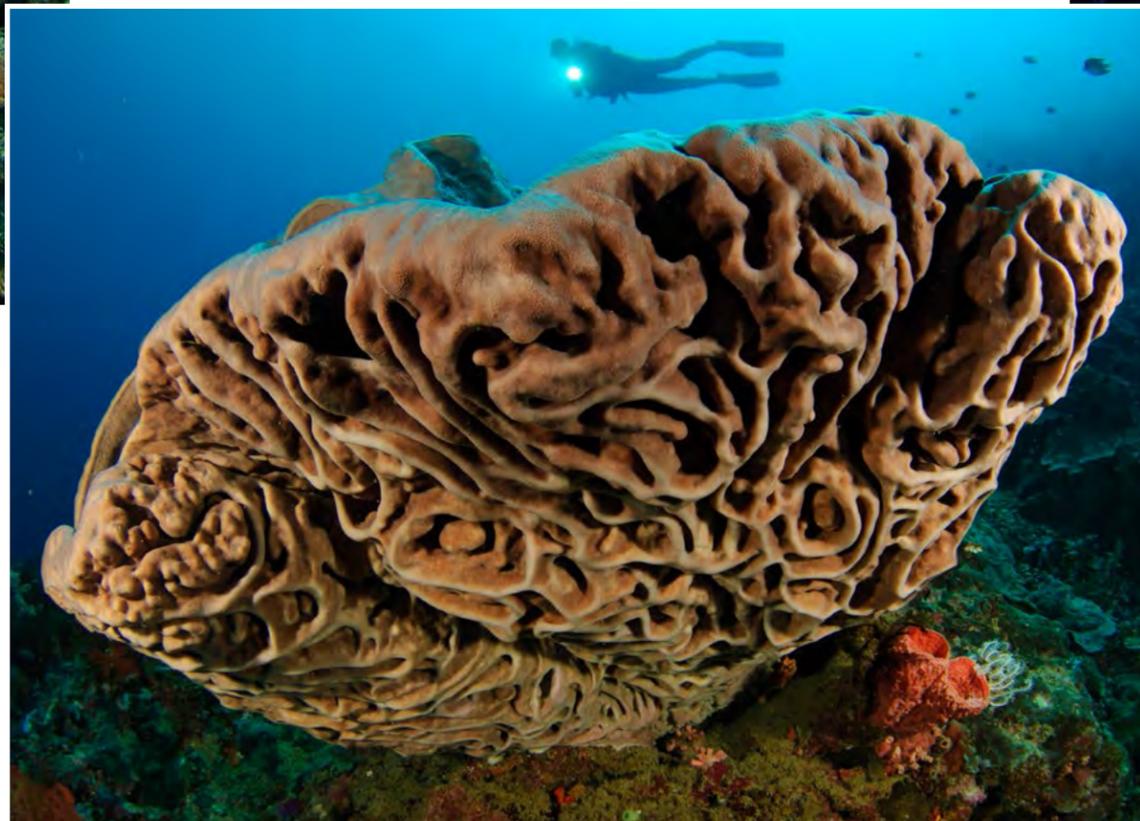


once rock-hard sponge begins to crumble, dissolve into dust and disappear without a trace.

Emphasising just how unexplored these waters are, no one has yet documented how far along the coastline this phenomenon occurs on this species.

However, it is known that by the time you reach Lembeh Strait or even the nearby Togian Islands, the morphing of *Petrosia lignosa* cannot be observed.

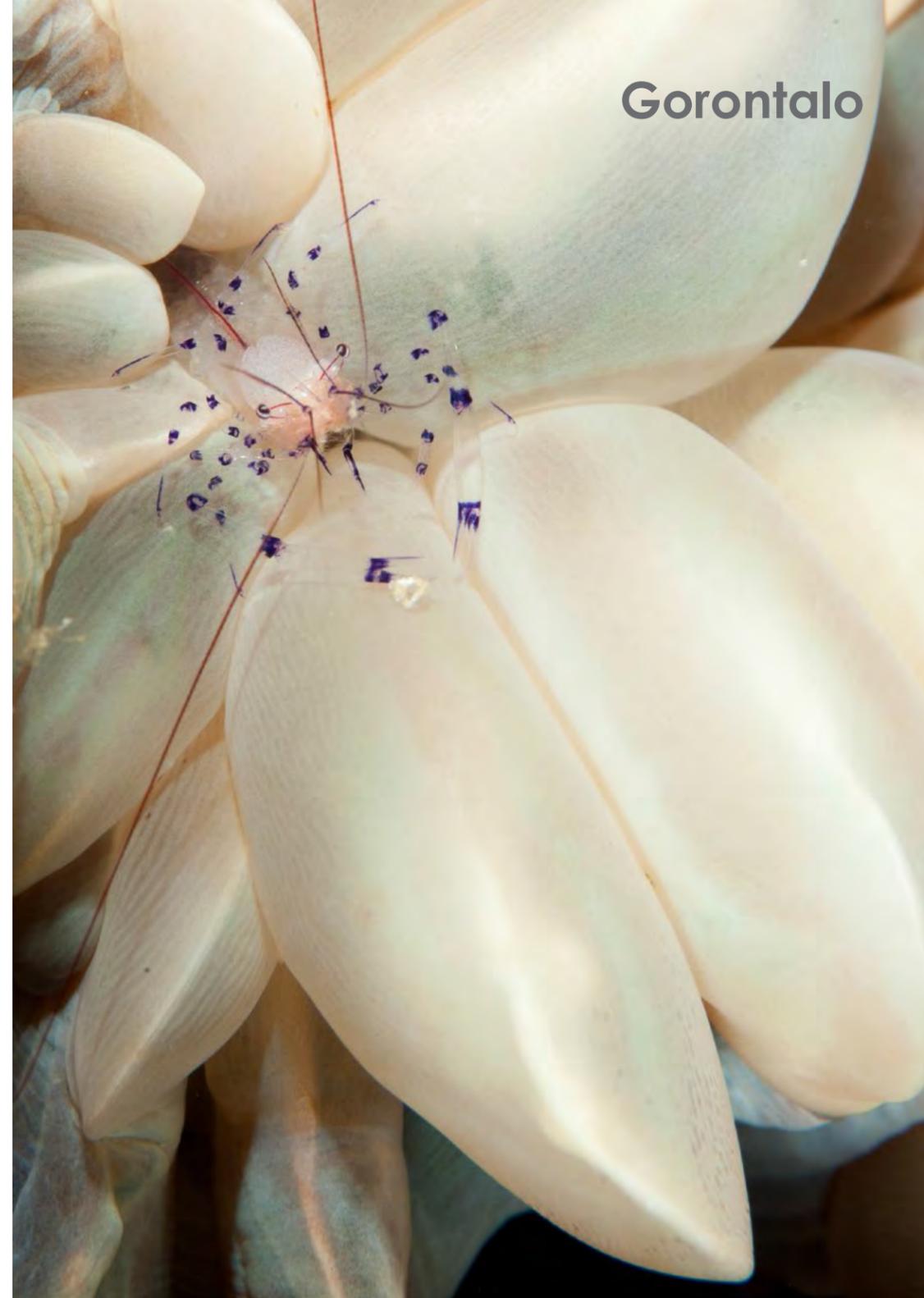
Allen recalls in his highly acclaimed book, *Gorontalo: Hidden Paradise*, of when he first



THIS PAGE:
Several versions of the huge Salvador Dali sponges, with their unique swirling patterns, only found in Gorontalo

"When I paint, the ocean roars. Others merely paddle in their bath."

Salvador Dali



Gorontalo



TOP LEFT TO RIGHT: Diver and giant stonefish; Diver and ornate ghost pipefish on volcanic debris; Rare Coleman's coral shrimp

confirmed the identity of the species.

"Even though I was calling it the 'Salvador Dali sponge,' I suspected it had to have a proper name. So, we sent samples from two sponges to Nicole J. de Voogd of the Institute for Biodiversity and Ecosystem Dynamics, Zoological Museum, University of Amsterdam. After looking at the maze of spicules under a microscope, she was able to identify it as *Petrosia lignosa*. Our sponge expert says that the genus is aptly named since petrosia means 'stony hard' and



Spinecheek anemonefish

all Petrosid sponges are hard and rock-like. This particular sponge species is peculiar to vertical walls in Indonesia. The wildly carved surface is a morphology only known to Gorontalo. Divers can only see the Salvador Dali sponge here."^[2] said Allen.

Local stewardship

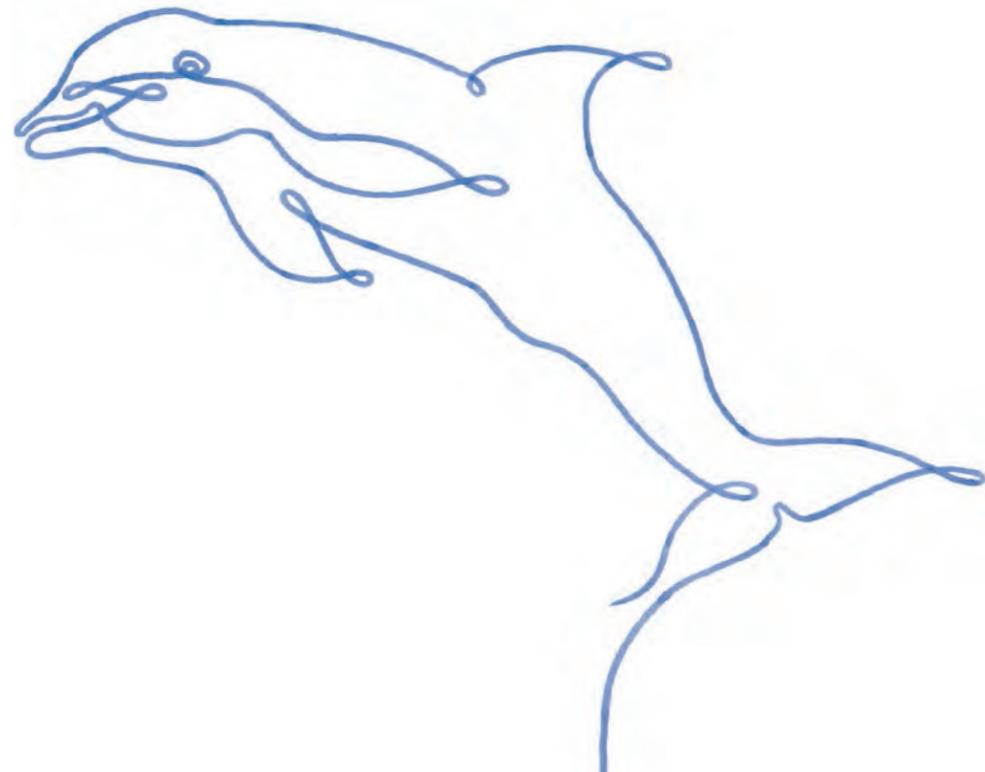
The steep drop of the seabed has had another significant benefit, in helping to preserve Gorontalo's pristine reefs and coastline. The fishermen here are able to deploy handlines from their traditional outrigger canoes and wrestle with species normally found offshore, such as the yellowfin tuna. Coupled with a lack of horizontal reef

Broadclub cuttlefish





silver



cinema of dreams



www.seacam.com



Gorontalo



Diver and grand sea whip (above); Shorthead sabretooth (fang) blenny peering from a discarded plastic bottle (left)

surface area, this has negated the appeal of enormously destructive practices such as blast fishing, a scourge of reefs in some parts of Indonesia.

The fish stocks are also protected by the huge waves that come when the winds change from westerlies to easterlies between May and October, imposing natu-

tion is the best long-term defence against poor fishing practices. For the last ten years this group, which comprises representatives of the local government, students, and staff from Miguel's Diving Centre, have conducted regular public education

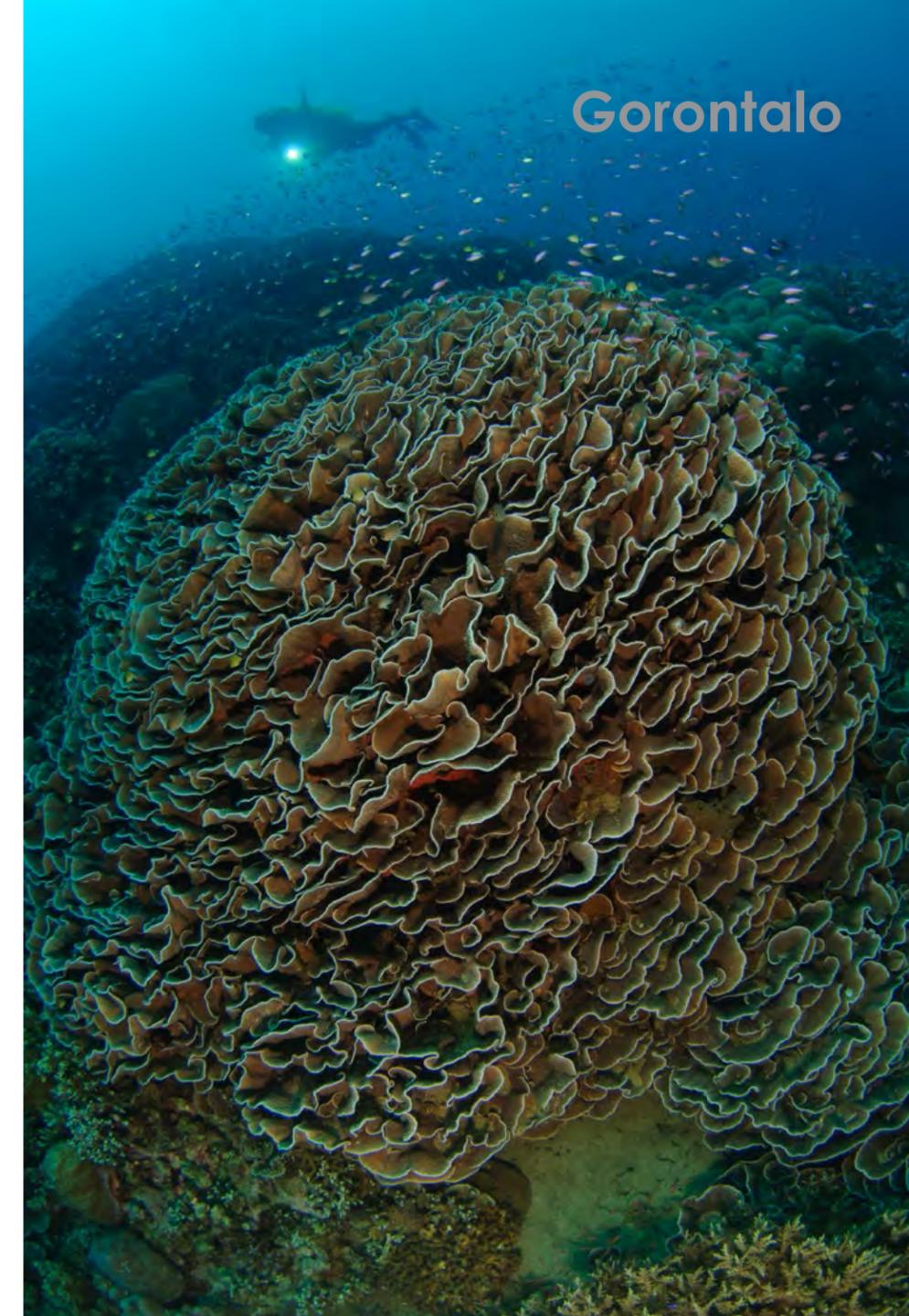
ral no-take zones as much of the coastline becomes inaccessible.

Finally, the reefs of Gorontalo have found ally in a group of forward thinking individuals who recognize that educa-

campaigns to deliver one simple message: "No coral, no fish, your choice." The message has hit home with many of the villages now showing evidence of a deep-rooted respect for the marine environment on which they are so



Pair of robust ghost pipefish on volcanic sand



Peacock razorfish



CLOCKWISE FROM ABOVE: Ornate anemone shrimp in anemone; Diver and bright red soft coral and sponge hanging from roof of cave; Sarasvati anemone shrimp; Diver and cabbage coral mountain

dependent.

Nowhere is this more evident than in the villagers of Olele who have really taken governance of the reefs to their hearts. Having already established a village level Marine Park, they guard and police their own reef, driving away any unwelcome visitors, sometimes even confiscating their equipment.

The recent expansion of the parks boundaries has been observed to have led to a noticeable rise in the number of large groupers, particularly coronation lyre-tailed and tiger, plus large midnight snappers. Populations of schooling fusiliers have increased also, further re-enforcing the value of good marine stewardship.

Finding a balance between long term sustainability and short term gain will continue to be a challenge for many other parts of Indonesia, yet the developed world has failed on a far grander scale to get to grips with this dilemma. Whilst modern fishing fleets efficiently

vacuum the oceans, industry policing groups all too often prove ineffective in leading positive change. Often heavily influenced by commercial agendas, their mandates are frequently distorted by those pushing for short term profit rather than leaving a world that is fit for our descendants to inhabit.

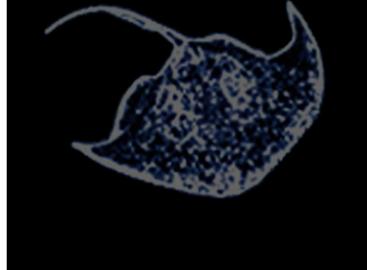
Curiously, the human race continues to behave in a way that is at complete odds with one of our strongest individual natural instincts, that of protecting our children at all costs. Yet on the surreal shores of Olele village in Gorontalo, the enlightened community has taken a huge step towards finding that balance. □

The author wishes to thank Rantje Allen, the staff of Miguels Diving Centre, Gorontalo, (www.miguelsdiving.com) and the people of Olele village. More of Steve Jone's work can be seen at www.millionfish.com

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- [1] HOOPER, J. N. A. & VAN SOEST, R. W. M. (2002) SYSTEMA PORIFERA. GUIDE TO THE SUPRASPECIFIC CLASSIFICATION OF SPONGES AND SPONGIOMORPHS (PORIFERA). PLENUM, NEW YORK.
- [2] ALLEN, RANTJE. GORONTALO: HIDDEN PARADISE, ISBN: 9789810561291

fact file



Indonesia



SOURCES: U.S. CIA WORLD FACTBOOK, NORTH-SULAWESI.ORG, D. SILCOCK

History Moslem merchants from Persia began visiting Indonesia in the 13th century and established trade links between this country and India and Persia. Along with trade, they propagated Islam among the Indonesian people, particularly along the coastal areas of Java. In 1511, the Portuguese arrived in search of spices after their conquest of the Islamic Empire of Malacca. They were followed by the Spaniards. Both began to propagate Christianity and were most successful in Minahasa/North Sulawesi and Maluku, also known as the Moluccas. However, it wasn't until the arrival of the Dutch in the early 17th century that Christianity became the predominant religion of North Sulawesi. From 1942 to 1945, Japan occupied Indonesia. Shortly before Japan's surrender in WWII, Indonesia declared its independence. However, it took four years of often brutal fighting, sporadic negotiations, and mediation by the United Nations before the Netherlands finally agreed in 1949 to transfer sovereignty. Strife continued in Indonesia's unstable parliamentary democracy until President Soekarno declared martial law in 1957. Soekarno was removed from power following a fruitless coup in 1965 by alleged Communist sympathizers. President Suharto ruled

Indonesia from 1966 until 1988. Suharto was toppled in 1998 following a round of riots, and in 1999, free and fair legislative elections took place. Indonesia is the world's third most populous democracy, Government: Republic. Capital: Jakarta.

Geography

Located in Southeastern Asia, Indonesia is an archipelago situated between the Indian and Pacific Oceans. Coastline: 54,716km. Terrain consists primarily of coastal lowlands, with interior mountains on larger islands.

Climate Tropical, hot and humid, with more moderate climate in the highlands. The water temperature is normally 28-29°C (84-86°F) year round, with an occasional "chilly" 27°C (82°F) spot. Most divers use 1mm neoprene suits. However, some people prefer 3mm.

Environmental issues

Challenges include industrial waste water pollution, sewage,

urban air pollution, deforestation, smoke and haze due to forest fires. Logging—the rainforests within the combined West Papua/Papua New Guinea land mass are second in size only to those of the Amazon, making it 'the lungs of Asia'. In 2001, there were 57 forest concession-holders in operation around the country and untold other forest ventures operating illegally. Mining—tailings from copper, nickel, and gold mining are real threats.

Economy A vast polyglot nation, Indonesia has experienced modest economic growth in recent years. Economic

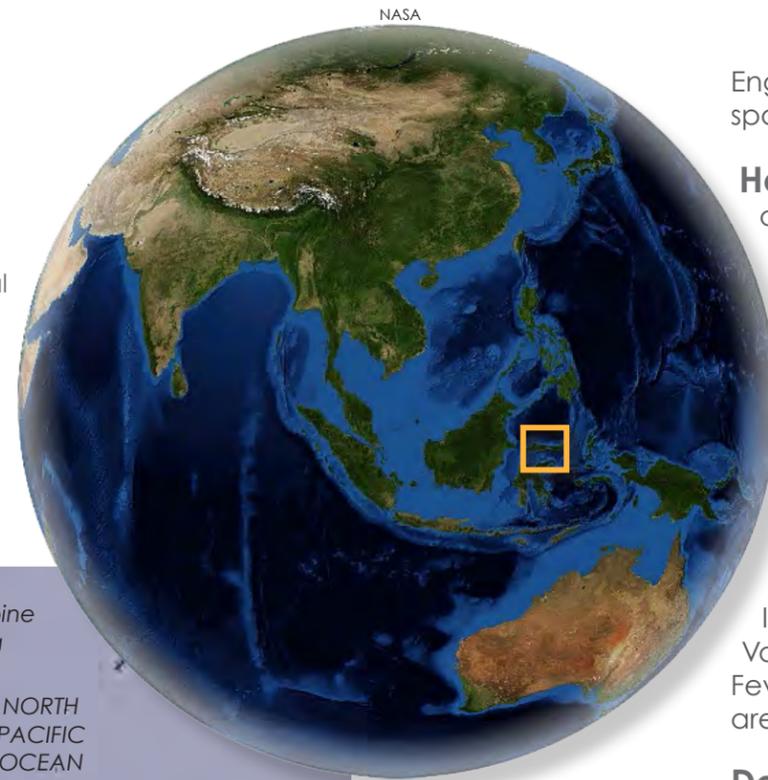
advances were made with significant financial reforms. In 2009, when the global financial crisis hit, Indonesia fared well compared to its regional neighbors. It was one of the only G20 members posting growth in 2009, alongside China and India. However, the government still faces ongoing challenges of improving the country's insufficient infrastructure, labor unrest over wages, and high oil prices affecting fuel subsidy programs.

Currency Indonesian Rupiah (IDR). Visa cards, Euros and U.S. Dollars (large bills issued after 1999) are widely accepted. ATM

251,160,124 (July 2013 est.) Ethnic groups: Javanese 40.6%, Sundanese 15%, Madurese 3.3%, Minangkabau 2.7%, Betawi 2.4%, Bugis 2.4%, Banten 2%, Banjar 1.7% (2000 census). Religions: Muslim 86.1%, Protestant 5.7%, Roman Catholic 3%, Hindu 1.8% (2000 census). Note: Indonesia is the largest Muslim country in the world. Visitors are encouraged to respect local traditions and dress modestly. Internet users: 20 million (2009)

Language Bahasa Indonesian is the official language, plus English, Dutch and local dialects are spoken. In tourist areas,

RIGHT: Global map with location of Gorontalo
BELOW: Location of Gorontalo on map of Indonesia
BOTTOM RIGHT: Lionfish, Gorontalo, Indonesia



machines in tourist areas offer the best exchange rates, Travellers cheques are becoming quite difficult to use except at banks. Exchange rates: 1EUR=12,723IDR; 1USD= 9,737IDR; 1GBP=15,127IDR; 1AUD= 9,972IDR; 1SGD= 7,908IDR

Population

English, Spanish and German are spoken.

Health There is a high degree of risk for food or waterborne diseases such as bacterial diarrhea, hepatitis A and E, and typhoid fever, as well as vectorborne diseases such as chikungunya, dengue fever and malaria. Check with WHO or your dive operator for prophylaxis recommendations. Larium is not effective. Bring insect repellents containing DEET. International Certificate of Vaccination required for Yellow Fever if arriving from infected area within five days.

Decompression chamber

Manado: Malalayang Hospital tel: +62 0811 430913
Makassar: Rumah Sakit Umum Wahidin Sudirohusodo tel: +62 0411 (584677) or 584675

Travel/Visa/Security

Passport valid for six months beyond intended stay is required. There is a Visa-On-Arrival for 35 countries including USA, UK, most European and Asian countries. It is US\$25 for a stay of up to 30 days. Although there is an active independence movement in Papua, tourists have not been impacted.

Web sites

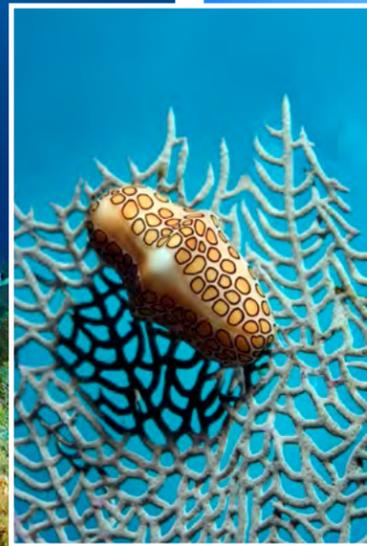
Indonesia Travel
www.indonesia.travel/en





The Best Shore Diving
Cayman Brac
In The Caribbean

Text and photos by
Lawson Wood



Diver with sea turtle resting on reef. PREVIOUS PAGE: Diver and wall with large sponges; Flamingo tongue (center inset)

Text and photos by Lawson Wood

First visited by Christopher Columbus in 1503, his reports tell of incredible numbers of fish, turtles and crocodiles hence their original name of Caimen or The Cayman Islands. This British Crown Colony is located south of Cuba in the central Caribbean and consists principally of three islands: Grand Cayman, which has the capital George Town and hosts her main airport; Little Cayman Island and Cayman Brac, which lie around 145km (90 miles) to the north-east of Grand Cayman.

Whether entering these waters as a novice or as a more experienced diver, what is obvious is that Cayman waters have some of the clearest waters in the Caribbean, with very few currents they are the ideal destination for virtually guaranteed results. The group of islands sit atop three huge submarine mountains and have incredibly deep water all around, resulting in any sedimentation or particulate in the water to sink into the depths, keeping the coastal waters nice and clear all year round.

Cayman Brac, Grand Cayman's farthest sister island is known affectionately as "the island that time forgot" and at only 20 km long (12 miles) by just over 1.6 km wide (1 mile) and with a resident population of only around 1500 people you can easily see why. There are only two hotels on the island: The Brac Reef Beach Resort and the Alexander. The

Brac Reef is home to the famous Reef Divers dive business, but there is a new dive centre, The Brac Scuba Shack run by the very experienced Martin & Liesel van der Touw that is now catering to the larger number of shore divers who are coming to stay on the island. Offering private boat charter and twin tank boat dives, they are perfectly suited for hiring and collecting your dive tanks for all the shore dives available, if you want to cater for yourself without the limits of time.

The Brac is roughly split into two, with the flat area to the west of the island where the airport and dive shops are located and the steep bluff with its remarkable ancient coral limestone cliff and caves at North East Point which rises to 42 metres (140 feet). The word "Brac" is Gaelic for "Bluff". The locals are known as Brackers and the island is

Diver on reef with a variety of coral growth, sponges and anemones, at Cayman Brac





Diver on wall with large sponges at Cayman Brac; Captain Charlie's Barcadere (right)



Peacock flounder; Diver in swim-through with silversides and sponges (right)

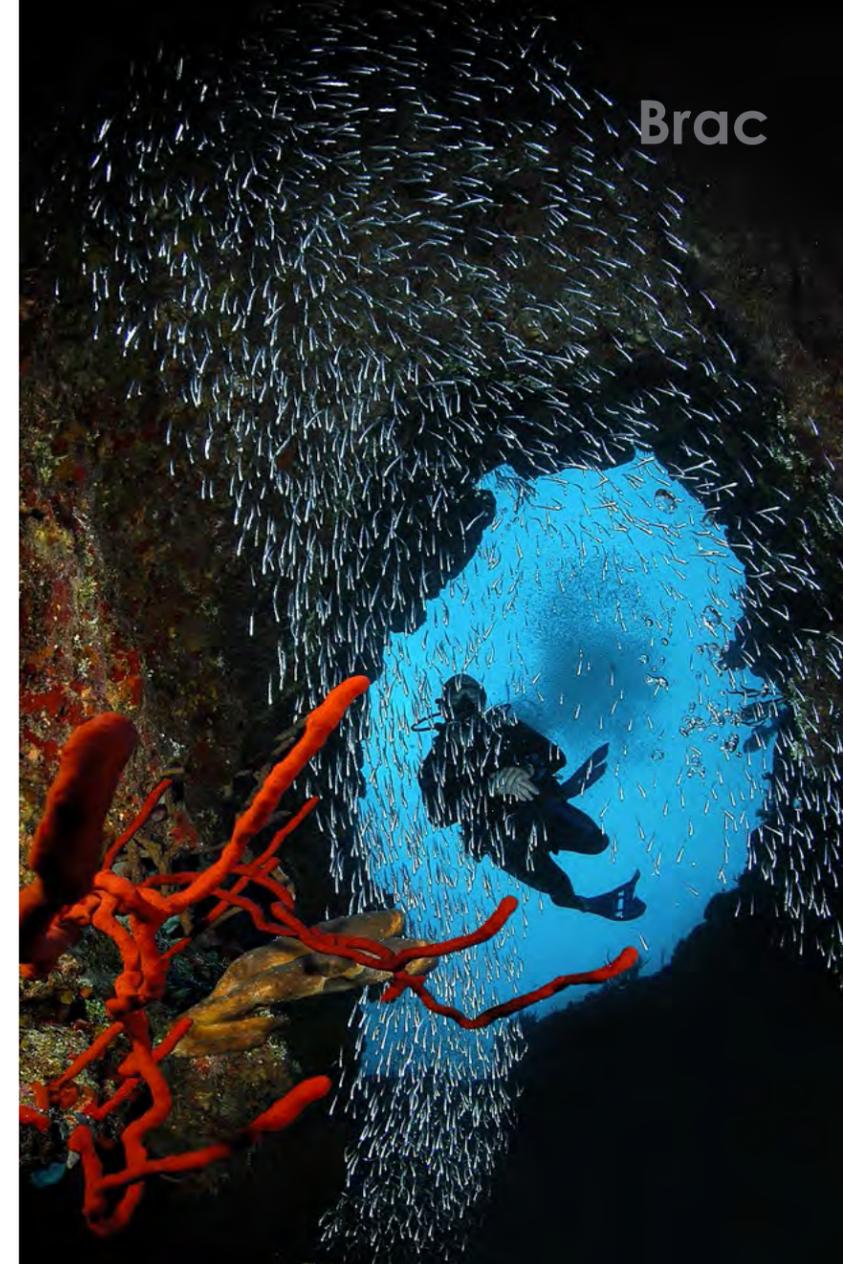
the smallest in the Caribbean to host a full jet service.

With direct jet flights from Miami into the Charles Kirkconnel International Airport and a large number of small B&B and rental apartments as well as the two resort hotels, Cayman Brac has rapidly earned its reputation as the top shore diving island in the entire Caribbean. (Bonaire used to hold this accolade, but a number of the sites are often off limits and several are quite difficult to undertake).

North shore

The beauty of Cayman Brac is that virtually the entire north shore

has small 'barcaderes'—or boat slips dating back several hundred years, where the famous Cat Boats were built and launched. These small slipways are perfect for easy access onto the shallow fringing and barrier reefs, plus, of course, the larger concrete slipways and stepped entries for more modern craft. Toilets and picnic tables can be found at a number of the shore sites, making things that bit more comfortable and with an almost total lack of diver pollution, the shore diving to be found off Cayman Brac is second to none. Weather dependent, the south shore also has a number of boat ramps and



slipways as well as direct access to all of the inshore reefs and the main sheltered lagoon at the west end.

The isolation of the Island has served it well. The corals are in good condition and there is a vast variety of marine life recorded in the registered 49 dive locations with mooring buoys, including seven wrecks. Now a new local initiative has placed markers at many new shore diving locations. Marked with a small red stone and a number, these sites are dotted all around the island and certainly expand the variety of dives on offer to around 100 accessible dives, each with their own particular attributes and are not necessarily the same as any other along on the same bay.





LEFT TO RIGHT: Banded coral shrimp; Dive boat over reef with sponge; Tarpon and school of silversides; Diamond-backed blenny

shore. This means that there are large areas of sand flats with small but very good quality coral growths on the lower slopes. Lots of elk horn coral as well as

numerous large sponges. However the area tends to be ignored as many visiting divers opt for the boat dive option of crossing the short distance to Little Cayman Island, this results in the reefs being relatively under dived.

ferent species of juvenile fish which congregate together to make one huge mass of moving fish, found in the summer months. This is a very interesting area for invertebrates including file clams, nudibranchs, arrow crabs and good quality sponges and sea fans. Pistol shrimp can be found amongst the coral rubble as well as jawfish and yellow sting rays. This is similar to the reef off Public Beach where there is a three tier reef structure starting in the shallows and ranging down to over 30m (100ft).



South side

The southern sites on Cayman Brac also resemble those on Grand Cayman, with a classic spur and groove reef system, but here it is more pronounced and the wall starts around 20 metres (66ft). The wall is more gently sloping in this area and starts much further out from the



Spotted butterflyfish

Fry Cove. One of the best dives is Fry Cave, located off Salt Water Point. Weather dependent and with a moderate swell, the cave is on the same type of rugged spur and groove reef and mini wall cut by many different gullies and canyons. Lots of elk horn and pillar corals in good structure and form make this a delightful dive. Snapper and sergeant majors make a nuisance of themselves. The fry of Fry Cave name are Silverside minnows comprising of four dif-

Prince Frederick wreck. When the sea is calm, the wreck of the *Prince Frederick* which sunk in 1888 can be accessed from the shore. It is situated about half way down the south shore and is eas-

ily identified as it is directly out from a curiously shaped building known as the 'Bubble House' and offers a shallow dive with easy sight of the remnants of the ship quite visible as there are a handful of superb Trotman anchors, a steel mast, anchor winch, 'ribs, hooks and knees'—are all identifiable with good



Stern (above) of *Captain Keith Tibbetts* wreck and mooring line (right) on *Topsy* wreck nearby; Horse-eye jacks and wreck



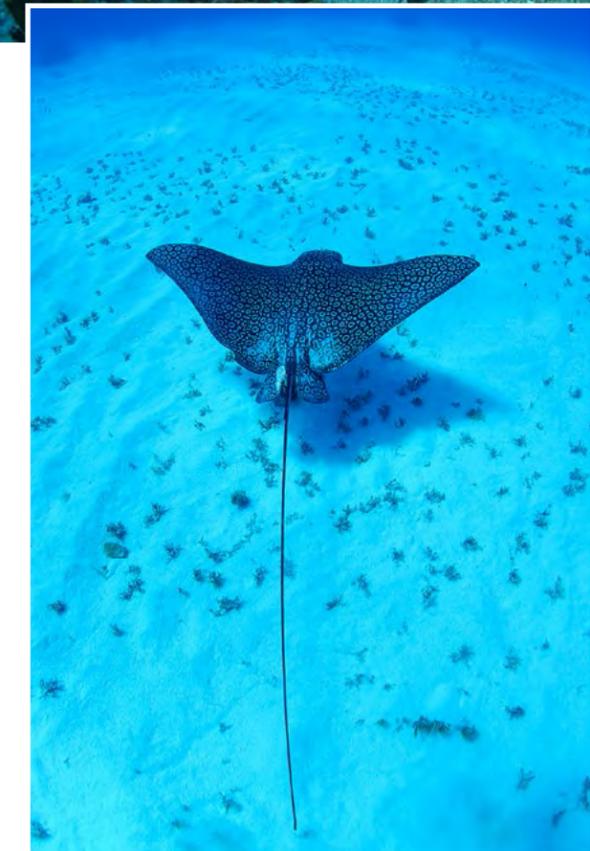
coral growth and many varieties of fish. The entire south shore coastline is accessible with some entries being made off the ironshore edge and others with easy access over a sandy beach. The coast further to the east has more difficult entry, but the results are superb as these sites are rarely, if ever, dived.

Captain Keith Tibbetts and Topsy wreck. The majority of all dives are undertaken along the north shore of Cayman Brac. Virtually all of the wreck sites are here, as well as some absolutely cracking reef dives, both down the wall and in the shallows for your second dive each morning. Along the northwest shore can be found the wreck of the Russian Frigate #356, renamed the *Captain Keith*

Tibbetts after one of the islands notable men, is a must to dive. It is the largest shipwreck on all three islands that can be reached from the shore. Now referred to simply as the "356" this shipwreck is superb for all levels of diver.

The shore entry for this dive is from the sea pool at Buccaneer with very easy entry and exit. This shoreline is perfect for snorkelers, too, as they will come across the wreckage from the *Topsy* in only a metre (3ft) of water. The *Topsy's* anchor is used as a mooring for the day dive boats but is also handy as a visual aid for diving the site at night.

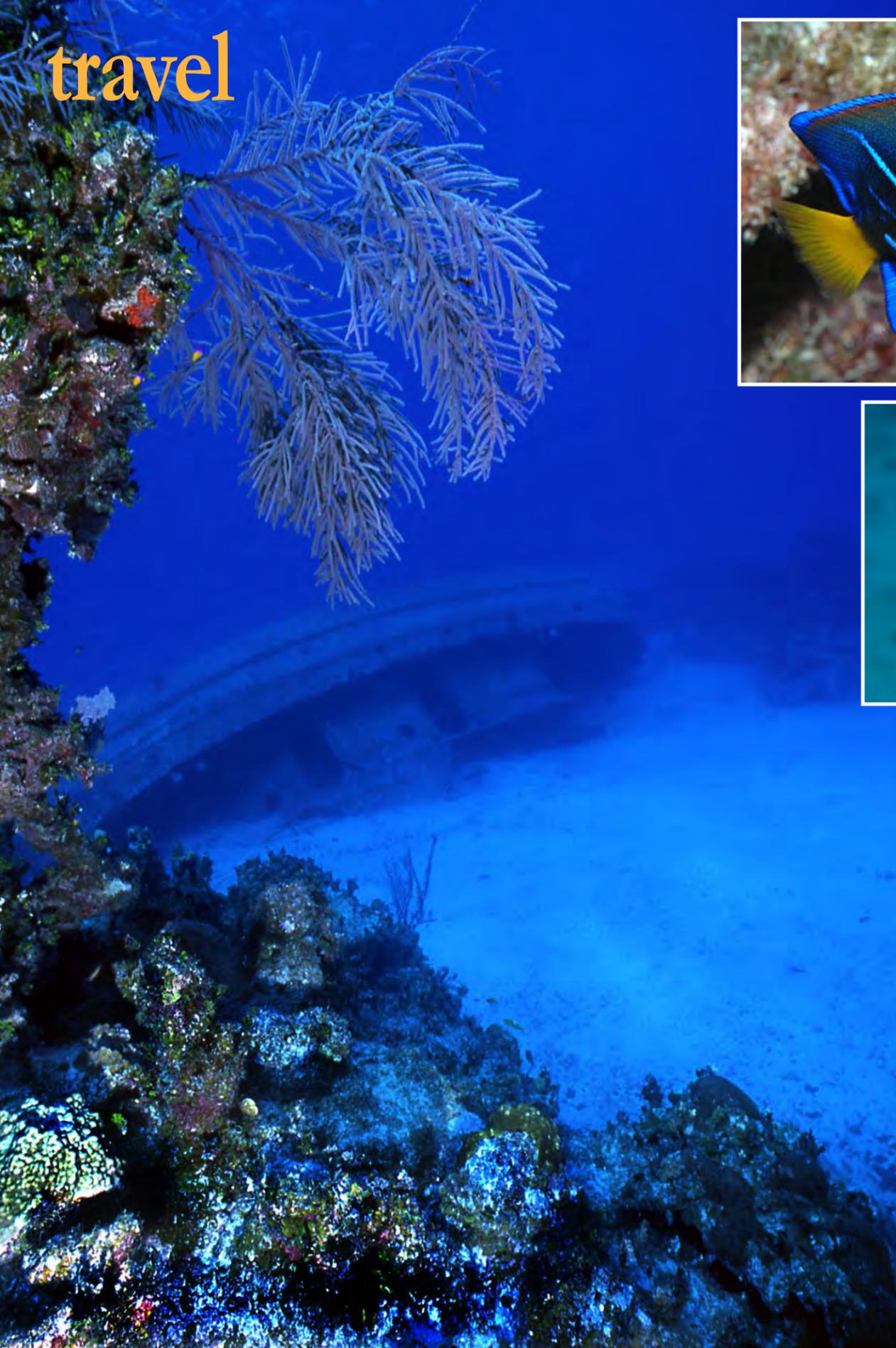
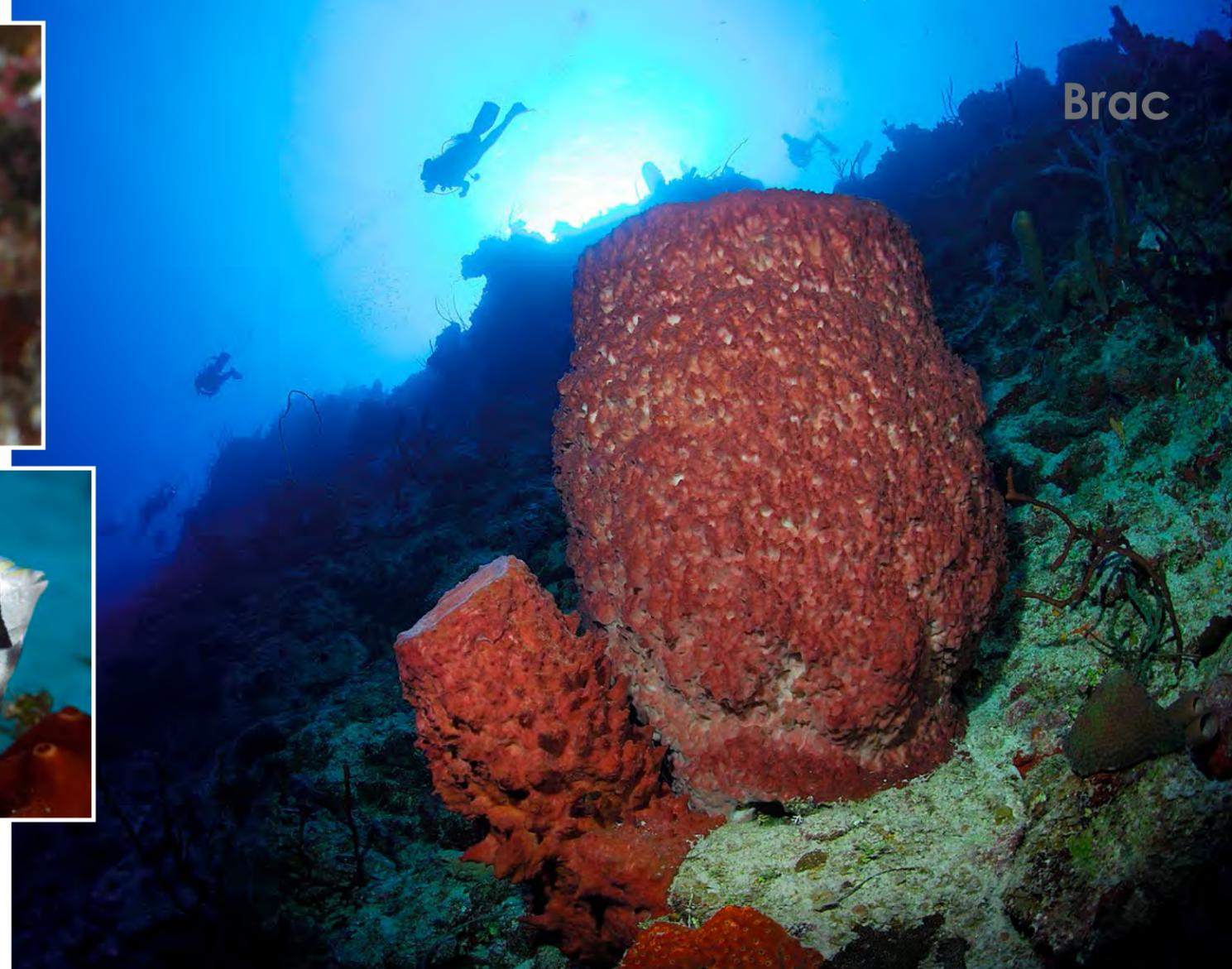
Charlie's Reef. Charlie's Reef is another shore dive that can easily be accessed, leaving your vehicle on the concrete dock; you are able to enter the water either by a fool hardy leap, or a more sedate entry from the stainless steel steps. The wall here starts fairly close to shore and whilst many people are quite content to spend their time amongst the excellent spur and groove reef formations, most quite often opt for the longer swim out to the wall and a better chance to see large jacks, eagle rays and sharks.



Eagle ray gliding over sandy bottom



Queen angelfish (top);
Banded butterflyfish
(above); Huge barrel
sponges (right) on reef;
French angelfish (low right)



Kissimmee wreck rests almost upside down in 12m

Kissimmee wreck. Nearby is the Kissimmee wreck, located just northwest of Scott's Pier, nearby the airport; it sits in 12m (40ft) of water and is almost upside down. This retired tug boat was deliberately sunk in 1982 as an addition to the reef system and provides an interesting start to a shore dive that can take you out to the edge of the reef wall, as this is the closest point on the island to undertake this type of dive. The wreck is a favourite site for photographers, and during the summer months, large numbers of rays can be seen. This location is also superb for night dives as there is easy access and the rock pier has overhead lights, which makes things easier for navigation. Here, we always find octopus, squid, juvenile spotted drum fish and many species of shrimp.

Barbara Ann wreck. The wreckage of the *Barbara Ann*, a former landing craft, is well spread out in the shallows, but it is superb as it has become its own little eco-system and is stuffed full of incredibly colourful sponges, sea fans, and tons of invertebrates and small fish species such as pufferfish, wrasse and various blennies and gobies. This is one of the few sites where you can always find juvenile queen angelfish and painted lady cleaning shrimps.

Stake Bay. Further east along the coast at Stake Bay are more superb shore diving sites. Stake Bay is where the island's government administration buildings and museum are located, and there is a huge ramp and stepped slipway to make access nice and easy. This region of the north coast is quite protected,



and there are some simply massive barrel sponges and ginormous sea fans and soft corals. This site also has two sculpture structures, the first is of dolphins and rays, and the second is a local artist known as Fouts and his rendition of his



Burt Brothers. One of the best of the shore dives along the northeast is Burt Brothers, located opposite a small shop called NiM Things (Native Island Made). A concrete boat ramp is great for access, and from here, it is just a short swim to some massive coral structures edged with deep-water gorgonians and their usual spider crabs. Hammerhead sharks are seen here in January and February, but really it is the colourful and very good corals that make this dive special.

Bluff. Under the ancient Bluff is always the feather in a diver's cap, as it is very rare that the sea conditions are so perfect to allow this diving in an otherwise pristine diving location. Scoured by storms, there are very few robust seafans or sponges as everything is low lying. However, there are kazillions of featherduster worms, small nudibranchs, blennies and gobies and an otherwise undived terrain of huge boulders, with interesting swimthroughs, various shipwrecks' parts and simply staggering visibility, as there are no sandy

areas to get kicked up by rough waters.

Benefits of Brac

Great emphasis has always been placed on the diving on Grand Cayman and the North Wall is outstanding, plus everyone raves about Bloody Bay Wall on Little Cayman Island, but many fail to appreciate the facts that Cayman Brac has much smaller diver numbers; more shore diving sites making for unlimited shore and night diving; four major wreck sites as shore dives and diving conditions and reefs that more than match all the other islands in the Caribbean.

With the island being only 20km long (12mi) long, everything is so close by that it makes the shore diving and snorkelling that much easier. There is, in fact, very little else to do on the island, other than exploring the historic caves and caverns; visiting the museum; birding; rock climb-



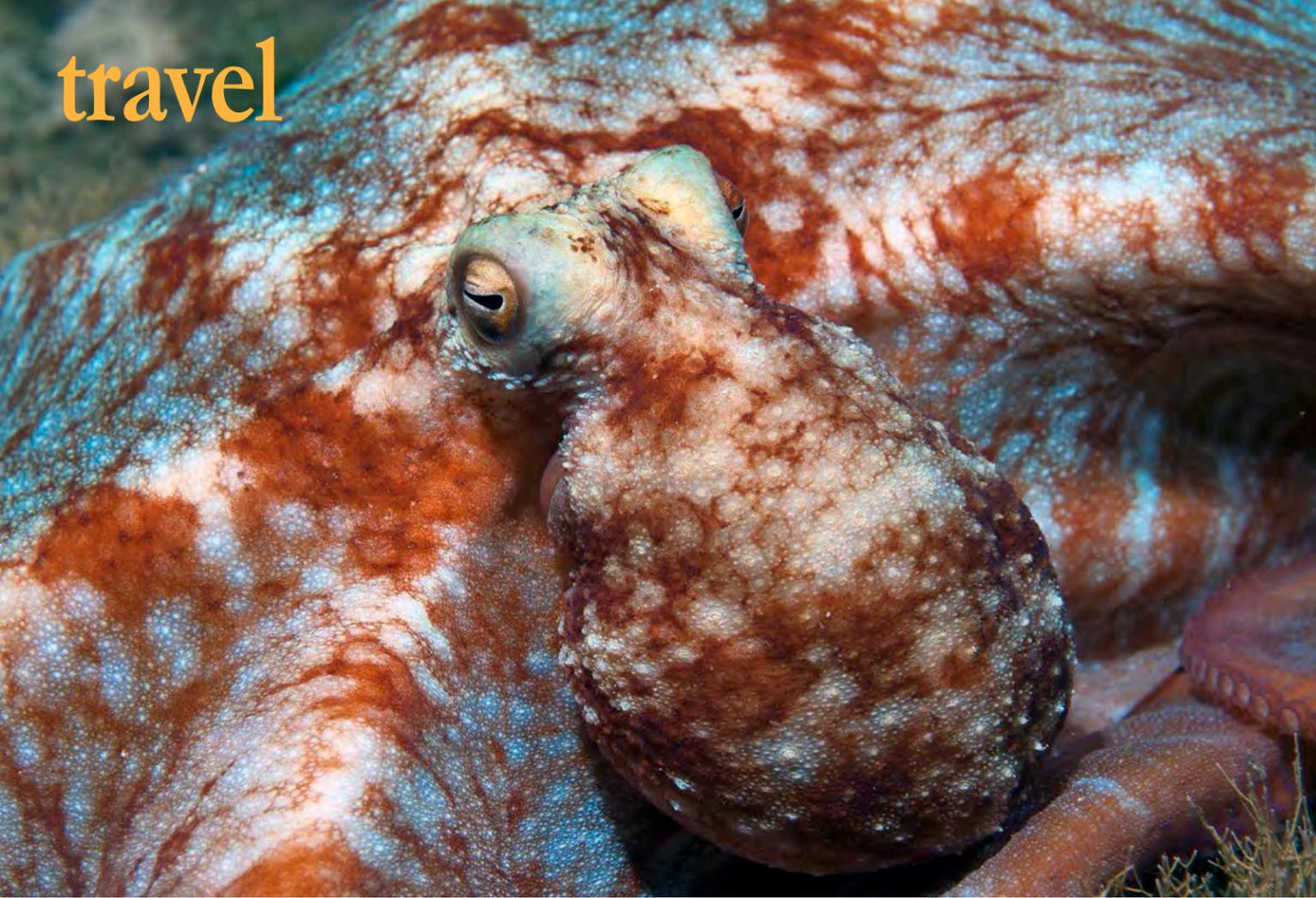
ing; snorkelling; kayaking; windsurfing; fishing or generally laying back and enjoying the superb beaches along the south shore; rockpooling or having fun getting drenched at the blowholes.

Each of the major families has a provisions store of some sort and

CLOCKWISE FROM TOP LEFT: Arrow crab; Gaping grouper on reef; Hawksbill sea turtle; Barred hamlet; Darkheaded blenny

idea of Atlantis. There are statues, columns a huge sun dial and other artefacts. These are now all covered in sponge growth and make for an interesting photographic backdrop.

Cayman Brac Dock. The Cayman Brac Dock is off limits whilst it is open, but as you can imagine, when it is closed, it is accessible from either side and large schools of big barracuda can be found hanging out in the shade. The construction spoil is well overgrown, and you can always find a huge variety of tropical fish and invertebrates.



CLOCKWISE FROM LEFT: Octopus on reef; Diver and sea turtle on reef; Blue-striped grunt; Boxfish; Pygmy filefish



the underwater visibility is very rarely less than 30m (100ft). The temperature ranges from around 22°C (72°F) in December to 29°C (84°F) in July.

Where to stay

All of the accommodation is similarly priced and styled. Apart from the individual self catering apartments and villas, the hotels have good restaurants attached, particularly the Brac Reef Hotel, which is superb.

Meals are generally buffet style and there is plenty of it, more than enough for the active diver. Lunches tend to be a local spicy dish of fish or chicken, soup, salad and a sweet of some kind as well as fruit and soft drinks.

Many visiting divers keep the last afternoon free to off-gas and explore the caves and caverns and obviously the local gift shops for a piece of Caymanite jewellery, or perhaps go exploring along the shore to perhaps find your own piece of Caymanite

private charter. They also offer advice on all types of accommodation.

Brac Reef Beach Resort is a newly refurbished hotel with comfortable rooms, complete wifi throughout the complex, with a swimming pool, a raised deck area and a great bar right on the beach. Its own dive centre is situated next to the jetty. Reef Divers has a well-stocked shop, and the local photo pro, Ed Beaty, is on hand to guide you through the many and varied steps of digital underwater photography and videography. Barbecues are common on the grounds and at night downwards facing flood lights attract tarpon, squid and stingrays into the shallows, a perfect end to the day's diving.

The Alexander Hotel is located near the beach at the west end



of the island. Rooms are modern with wifi access, and the bar looks to the east over a large brackish pond popular with wild fowl. □

Lawson Wood is a widely published underwater photographer and author of many dive guides and books including The Cayman Islands: Complete Guide to Diving and Snorkeling. For more information, visit: www.lawsonwood.com



across.

If you are not diving, then you are thinking about it, or getting your cameras ready, or travelling to or from a dive site. Cayman Brac diving is similar to Grand Cayman, without the numbers of divers, and for that reason, it has become a great favourite with the world's diving fraternity—particularly those who prefer to dive

away from the madding crowd.

Best time to go

With air temperatures averaging 30-40°C (80-90°F) in the summer, it can be hot and humid, and as always in the Caribbean, hurricane season is from June to

November each year. However, some of the best diving is also done in these same months as the sea is generally at its most calm, there are less tourists and better opportunities for marine life encounters. You can dive all year round, as the island has plenty of great dive sites that are always available depending on wind and weather.

One point to make here is that



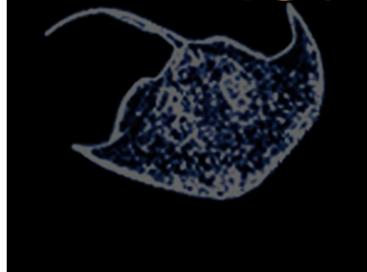
rock or up on the outer Bluff edge to catch those spectacular sunsets.

Brac Scuba Shack is a great dive shop with excellent, qualified staff and catering for those who prefer shore diving or

all will sell homemade jams and chutneys (in season) as well as the usual goods. I would recommend that you buy the local (very rare) Caymanite Rock jewellery; the island craftsmen are excellent. The local residents are some of the friendliest I have come



fact file



Cayman Islands



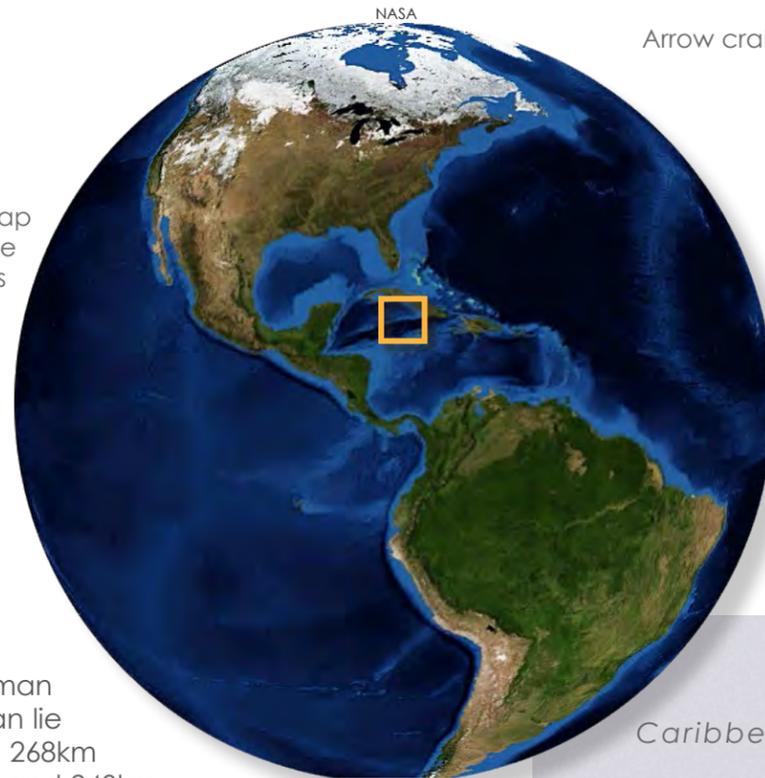
SOURCES: U.S. CIA WORLD FACTBOOK, CDC, GOV, LONDONDIVINGCHAMBER.CO.UK

History During the 18th and 19th centuries, the British colonized the Cayman Islands from Jamaica whereby they were administered after 1863. The islands became a part of the Federation of the West Indies in 1959. In 1962, the Federation dis-

solved and the Cayman Islands decided to stay a British dependency. Government: Parliamentary democracy. Capital: George Town, Grand Cayman Island.

Geography The three-island group of the Caymans are locat-

RIGHT: Global map with location of the Cayman Islands
LOWER RIGHT: Location of Cayman Brac on map of the Cayman Islands. BELOW: Hawksbill sea turtle, Cayman Brac



NASA
Arrow crab



ed in the Caribbean. Grand Cayman, Cayman Brac and Little Cayman lie in the Caribbean Sea, 268km northwest of Jamaica and 240km south of Cuba. They are situated in an important location between Central America and Cuba.

Coastline: 160km. Terrain is comprised of a base of low-lying limestone ringed by coral reefs.

Climate The Cayman Islands have a tropical marine climate, which is warm and rainy in the summer from May to October, cool and relatively dry in winter from November to April.

Environmental issues There are no natural freshwater resources, so drinking water is supplied by rainwater catchments.

Economy

There is no direct taxation on the Cayman Islands so it has become a prosperous offshore financial center. As of 2008, over 93,000 companies were registered in the Cayman Islands, including nearly 300 banks, 800 insurance companies and 10,000 mutual funds. In 1997, a stock exchange was opened. Tourism is the main industry, with 70% of GDP and 75% of foreign currency income. The luxury market is the main focus of the tourist industry, catering mostly to North American travelers. In 2008, there were over 1.9 million tourist arrivals, half of them from the United States. While the locals enjoy a high standard of living, much like the Swiss, almost 90% of the Cayman Islands' food and consumer goods have to be imported.

Currency Caymanian dollars (KYD). Exchange rates:

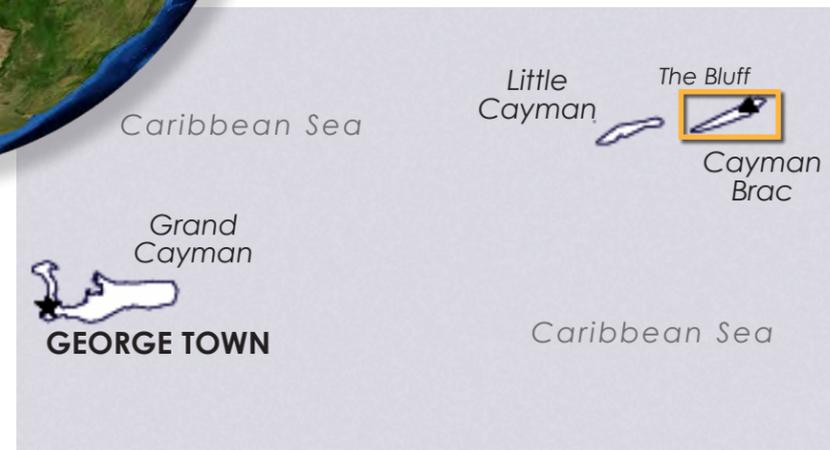
1EUR=1.13KYD; 1USD= .82KYD;
1GBP=1.38KYD; 1AUD=.77KYD;
1SGD=.65KYD

Population 251,160,124 (July 2013 est.) Ethnic groups: mixed 40%, white 20%, black 20%, expats of various ethnic backgrounds 20%. Religions: Protestant 67.8%, Roman Catholic 14.1%, Jehovah's Witness 1.1% (2010 est.). Internet users: 23,000 (2008)

Language English is the official language. Other languages include Spanish and Filipino.

Health

In the Caribbean, in general, there is a risk of food and water borne diseases such as Hepatitis A, as well as disease from insect



bites such as Dengue fever and Rabies. Please check with your doctor about Tetanus shots and updates on health risks and required vaccines at least 4-6 weeks prior to your trip to the Caymans.

Decompression chambers

On Grand Cayman:
Cayman Hyperbaric Services
Cayman Islands Hospital
24-Hour Phone: (345) 916-1198

George Town Hospital
Phone: (345) 949-8600

Travel/Visa/Security

Visas are not required for entry for U.S. and Canadian visitors—just proof of citizenship, such as a passport or official birth certificate, as well as a photo identification such as a driver's licence. Visitors from other countries should check with the nearest British embassy or consulate for entry requirements.

Websites

Cayman Islands Tourism
www.caymanislands.co.uk





Polar Diving
Antarctica

Text by Yoland Bosiger. Photos by Yoland Bosiger and Jerry Sutton
Addition photos by Erin McFadden and Chris Thrall

Iceberg palaces glimmer in the sun. PREVIOUS PAGE: Diver bubbles rise against a background of ice

On our journey north of the polar circle, my fellow adventurers and I were greeted by an astonishing spectacle. Over 20 orca were hunting an animal so rare that few people have seen them in the wild, let alone had the chance to study them. Using immense strength, agility and cunning intelligence, the orca worked as a team to hold the Arnoux's beaked whale under water to drown it. This was a story of nature at its most raw, untouched and unforgiving—a story that encapsulated wild Antarctica.

According to the Norwegian explorer Roald Amundsen, Antarctica is as desolate as no other country on our globe. In my case, Antarctica had taken me about as far away from my North Queensland, Australian home as remotely possible. Hot steaming rainforests had been replaced with ice palaces and blue green glaciers; kangaroos and cas-



YOLAND BOSIGER



YOLAND BOSIGER

The M/V Plancius at Hovegaard Island

sowaries had been substituted with penguins and seals; and my beloved shorts and singlet had been passed up for down jackets, heavy-duty waterproof overalls and beanie. About the only thing that was consistent was the intensity of the sun,

which had proceeded to turn me the color of a diner plate-sized Antarctic isopod—not a good look, I assure you.

OWUSS Rolex Scholar

Yet, despite the apparent severity of my situation, facing challenges like these was not new. I was nearing the end of a year-

long journey, which had taken me far outside my comfort zone, exposed me to new places, and taught me new skills. Antarctica was the tip of the iceberg at the end of my exciting and adventurous year as an Our World Underwater Scholarship Society Rolex Scholar.

The Our World Underwater Scholarship

Society Rolex Scholarship provides young people with the chance to explore marine fields from diving to science, engineering, medicine and media—providing these individuals with invaluable career-deciding opportunities. With the help of Expedition Leader and past British Antarctic Survey diver, Kelvin Murray, I





JERRY SUTTON



YOLAND BOSIGER

The southernmost town in the world: Ushuaia, Argentina; Mixture of Gentoo and Chinstrap Penguins at sunset (top right)

was able to experience Antarctica with Oceanwide Expeditions. My role onboard was threefold: to uncover the ins and outs of life aboard an expedition vessel, take pictures for Google Ocean and gain polar diving skills. This was an opportunity like no other.

Departing for southern seas

I made my journey from Australia to Ushuaia in Argentina—a picturesque town set at the foothills of the Martial Mountain Range and bounded at its edge by the Beagle Channel. Ushuaia and its surrounding wilderness are so beautiful that they make for an impressive tourist destination in themselves. In fact, I had been here three years previously for this very reason, hiking in the Terra Del Fuego National Park and getting my fill of empanadas (Argentinian pasties) and dulce de leche (caramel like spread).

Yet, as a result of its southern

location, Ushuaia is of course best known as the taking-off point for a large number of passenger cruise ships headed for Antarctica. The streets of this little town are chock-a-block with warm clothing outlets and camera stores for those who might have forgotten something critical.

Departure day arrived and Murray took me to see my new home for the next three weeks—the 89-meter-long, 114-passenger cruise vessel *M/V Plancius*. It didn't take long to be thrown into the thick of things, and if you have ever wondered how ten days worth of food is transported onto a large cruise vessel like this one, then you're in for a treat.

Boxes were winched onto the boat via crane and then manually transported via a long chain of crewmembers to the galley. I counted over 200 bottles of juice and got to move everything from

dry food and vegetables to entire wheels of cheese and foot-long salamis.

We then toasted the voyage and got ready for what we hoped would be a "Drake Lake", rather than a "Drake Shake". Well known for delivering giant waves and powerful winds, the Drake Passage has on occasion stymied even the most intrepid traveller. Luckily, we managed a relatively calm crossing and I spent my time attending onboard lectures and learning as much as I could about Antarctica's geology, wildlife and history.

Antarctica

Antarctica is the coldest, windiest and harshest place on our planet. In terms of size, Antarctica is the fifth largest continent (larger than Oceania and Europe) and is dominated by the Antarctic Ice Sheet. At its thickest point, the Antarctic Ice Sheet is 4.7km (2.9mi)



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Exploring the penguin colonies at Couvreville Island





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Antarctica

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deep, averaging a whopping 2.2km (1.4mi). An incredible 90 percent of all the world's ice and 70 percent of the entire world's freshwater is contained within this ice sheet. To put this in perspective, if the Antarctic ice sheet was to melt, world sea levels would rise by approximately 60m (197ft) everywhere.

Yet, Antarctica has not always been so heavily covered by ice. Fifty million years ago, Antarctica had a temperate climate with evergreen forests and many land animals. Nowadays, however, very little life can survive in the ice-covered Antarctic interior, except for algae and microbes.

Antarctica underwater

In contrast to life on land, Antarctica's marine environment is undoubtedly one of the most productive in the world's oceans. In summer, 24-hour sunlight combined with rich upwelling

causes phytoplankton to bloom, which in turn feeds small semi-transparent crustaceans called krill. These super-abundant and unusually large phytoplankton feeders allow Antarctica to support a great diversity of whales, seals and birds.

The waters of the Southern Ocean are also important for transporting essential nutrients all around the world. Icy cold, highly salty water known as Antarctic Bottom Water drips into the ocean from the surrounding sea ice, and in doing so, pushes warmer water upwards. This upwelling is so strong that it is responsible for driving all the oceans' currents.

Stepping onto dry land

After two days of extravagant dinners, steamy

hot chocolates and albatross photography, I seemed to be settling into my new environment quite nicely. Calm weather meant that we were able to make great time, and before long, we had crossed the Antarctic convergence and were within view of our first stunning sphinx-like icebergs. On the afternoon of our third day at sea, it was time to make landing at Aitcho, a tiny rocky island in the South Shetlands group. Eager to stretch our legs, we all made our way out onto the gangway and stared in wonder at the pink-tinged snowy mountains and pastel blue ocean.

Aitcho Island is home to three different spe-

Humpback whale at Hovegaard Island (above); Antarctica at sunrise (top left); Gentoo penguin feeding chick, Aitcho Island (top right); Spotting penguins at Cuverville Island (lower right)





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cies of penguin: the gentoo, Adélie and chinstrap. On shore, we were greeted by a flurry of activity as both gentoo and chinstrap penguins intently went about their business not the slightest bit disturbed by our presence. At one point, I stopped to take a picture of a

gentoo penguin feeding her chick only to find that a new chick had adopted me and was sitting obediently between my legs.

Google Ocean

Penguins have got to be some of the most photogenic animals on the planet. They are also intensely curious, so much so that they often waddle too close to one's camera and cause photographs to be out of focus. My purpose behind all this camera snapping was to help Murray collect and generate content to be uploaded to the Google Ocean Layer (for which Murray is a formal contributor) in the form of photos

and videos.

Google Ocean was inspired after Dr Sylvia Earle, legendary ocean researcher and National Geographic Explorer-in-Residence, made a 'wish' for influential organisations and individuals to make a concerted effort to protect the planet's life support system—the oceans. By using Google Ocean, you can take a visual journey from shallow coral reefs to the depths of the deep sea and can learn about important research discoveries.

Reaching the Peninsula

Getting to our destination of Neko Harbour on the Antarctic Peninsula took us first through the Gerlache Strait. With my camera ready, I stood upstairs just outside the ship's bridge and tried to decide on what to photograph. Everything was so immense, so raw, and yet so delicate and magical that I decided to do the opposite—just watch and take it all in.

As we continued through the channel, huge craggy mountains rose



JERRY SUTTON



JERRY SUTTON

Leopard seal underwater at Petermann Island; Orca hunting an Arnoux's Beaked Whale (top right)

Recovering dive tanks after a snowy night; Transferring into zodiacs for a land excursion (top left)





JERRY SUTTON

JERRY SUTTON

JERRY SUTTON

THIS PAGE: Scenes from ice diving at Neko Harbour; Anemone at Vernadsky Wall (left)

comfort of the *M/V Plancius*, Antarctica seemed romantic and beautiful, but at that moment, my mind went to those early explorers who—using man-hauled sleds, with limited food supplies and primitive clothing—fought their way through this harsh and unforgiving terrain. What different opinions they must have had.

Ice diving

Although initially thought to be the exclusive dominion of documentary dive teams and specialised technical divers, Antarctica has been made accessible to recreational diving by Oceanwide Expeditions for the last 15 years. Provided conditions are favourable, divers on the *M/V Plancius* have the opportunity to

experience the majesty of ice underwater as well as a great variety of benthic marine life, penguins, fur seals and even leopard seals.

Dive sites in Antarctica vary from shallow ice diving to wall diving and even wreck diving. Diving can be from the beach or from the zodiac, and the maximum depth is 20m (60ft). Given the remoteness of Antarctica (there are no decompression chambers or hospitals) safety is of utmost concern. The diving is not for beginners, and it is crucial to be experienced with cold water diving before embarking on a trip.

The epitome of polar diving for many underwater enthusiasts is getting to dive on an iceberg. With 90 percent of their

mass underwater, it's only logical that these masses of floating ice should be explored from below.

The first time I propelled myself into the

-1°C waters, I was glad my regulator was in my mouth for a couple of reasons. The first and most obvious reason was to stop myself from swallowing water. The sec-



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abruptly out of the infinite abyss of blue and green. Icebergs in the shapes of cathedrals and castles glistened and shone under the sunrays. It was like being in paradise, yet I was aware of the irony in this statement. Certainly from the



JERRY SUTTON

JERRY SUTTON



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CLOCKWISE FROM LEFT: Pair of red starfish; Marine invertebrates just outside Vernadsky Station; Shipwreck heavily encrusted with sponges and sea urchins; Intact wooden beams of the *Gouvernøren* wreck

ond and arguably as vital purpose was to stop myself from shouting the most perverse profanities I didn't even know I was capable of. Thankfully the elaborate textures and beauty of the iceberg provided a welcoming distraction, and as my face and lips went numb, the pain eventually subsided.

from a seal's-eye-view. We could see the faint white mist hanging next to the ice and could hear the corresponding fizzing sound as trapped air bubbles escaped into the salt water. With aggressive determination I made my freezing fingers work the shutter button—my own dive bubbles making for interesting subjects against

the background of white corrugations and shades of turquoise.

At the surface, fringes of icicles hung off the edge of the berg and enclosed a gallery of emerald crystals. I was frozen, but delighted. Antarctica had just delivered one of the most awesome dives of my life.

***Gouvernøren* wreck**

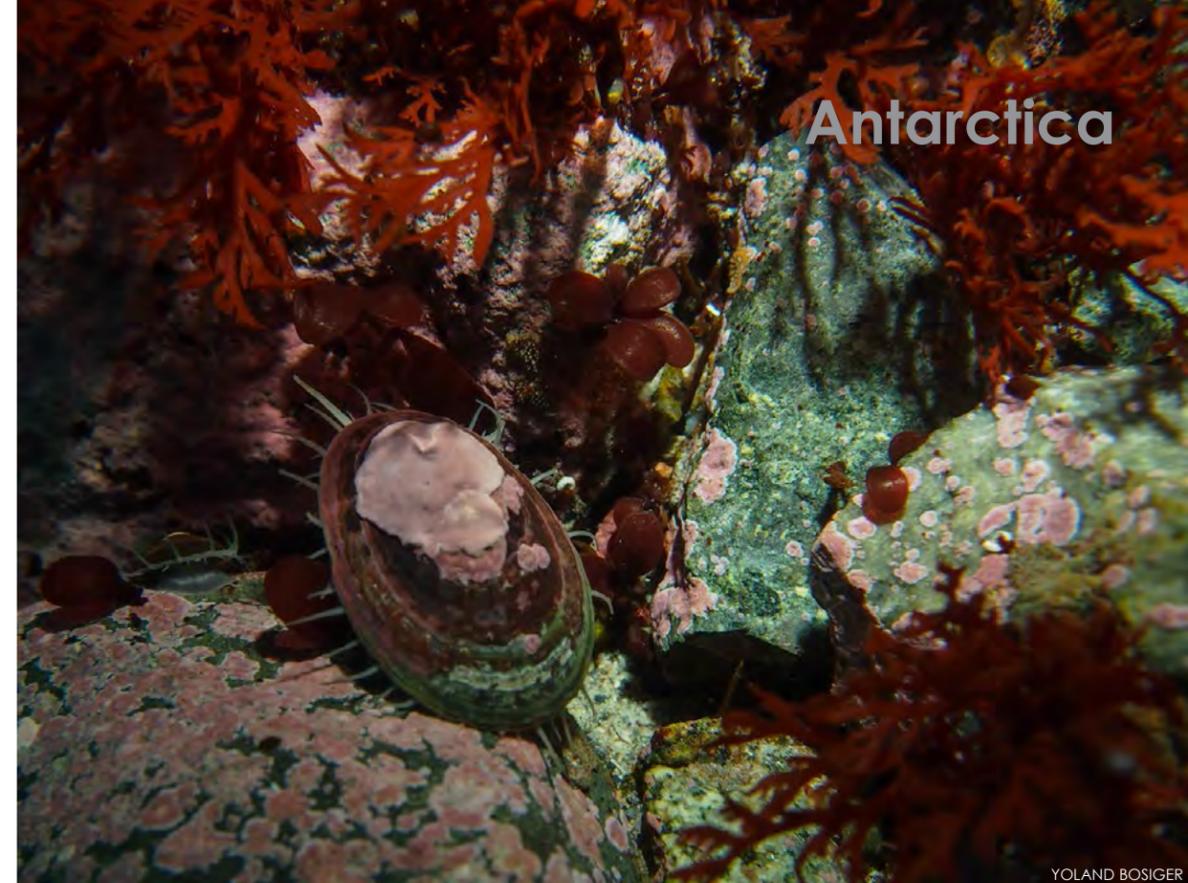
While humans have never permanently inhabited Antarctica, they have certainly left their mark here. It's thought that over a million whales were killed between 1904 and 1987 to supply human-kind's thirst for oil. Breaking the surface just ahead of us was the bow of *Gouvernøren*, a Norwegian whaling transport vessel that burned and sank



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in 1916. This was the first time any divers on our vessel (including the divemaster), had dived a wreck in Antarctica, and we were super excited about what surprises

might lie ahead. My first view of the wreck was a gigantic, slightly ominous superstructure. As the gloom began to separate, the upper



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Steel barrels (left) and main deck at entrance to the forward holds (above) on *Gouvernøren* wreck; Antarctic limpet (top right); Entering Vernadsky Station (right)

Swimming along the submerged ship revealed tell-tail signs of the ship's past life in the whaling industry, including numerous winches for hauling the whales on deck. As I adjusted my buoyancy to avoid stirring up the sediment, I couldn't help wonder what life must have been like for these early whalers and how terrifying it must have been to be stranded and sinking in this icy wasteland.

As we approached the stern of the vessel, the amount of marine life increased dramatically. Overhangs created by the hull formed ideal spaces for kelp, sponges and starfish, the intensity

of which culminated under the stern and around the rudder. It was like diving in a room full of ornate candelabras except that in place of candles were bright yellow, flinger-like sponges.

Vernadsky Station

Apart from whales, birds, seals, penguins, and the occasional tourist, Antarctica's other main resident is the "research scientist". As a result of the International Geophysical Year (IGY) and the need to defuse competing ter-



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ritorial claims, countries ratified the Antarctic Treaty in 1961, formally setting Antarctica aside for peaceful, scientific purposes.

One research outpost that we were able to visit during our journey was the Ukrainian Station of

Vernadsky, a former British Base that was sold to the Ukraine in 1996 for the bargain price of one pound! The scientists at Vernadsky conduct many experiments, most of which relate to atmospheric science. We also visited Wordie

deck became visible revealing intact wooden decking. The cold Antarctic waters had preserved

these antique timbers, and invading icebergs had kept them clean of encroaching marine life.





View of steep mountains and glacier from the safety of the *M/V Plancius*; Penguin (lower left) feeding its chick at Aitcho Island; Leopard seal (below)



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wall nowhere to be seen. Eventually, the gully led to slightly deeper water and all of a sudden the rocks dropped off to an obvious wall plunging vertically to below 20m.

Compared to the icy white surface, the rock wall presented a kaleidoscope of colour and animal life. Antarctic

isopods, colorful anemones and nudibranchs occupied the flat outcroppings and many species of urchin hid in the numerous crevices.

Predator and prey

Antarctica is one of the rare places where large predators still dominate

the ecosystem, and where both predators and prey are relatively unafraid of human beings.

Our dive at Vernadsky was followed by one of the highlights of our trip—a leopard seal hunting a penguin. Leopard seals are bold, powerful and curious animals that grow to up to 3.5m. When hunting penguins, leopard seals patrol the waters near the edges of the ice, almost completely submerged, waiting for the birds to return from hunting.

From our zodiac, we watched the gentoo penguins swim obliviously towards the leopard seal. As the seal made its surprise attack, penguin pandemonium ensued with groups of up to 20 flying in every direction, porpoising madly to escape the seal's deadly jaws.



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Leopard seal hunting a penguin just outside Vernadsky Station

House, an abandoned British station that had everything from pans, books, stove and typewriter still in place.

Our diving challenge at Vernadsky Station was to find a particularly elusive wall just outside the base. Twenty minutes into the dive and we were still following a shallow gully over the ice—the



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Antarctica at sunrise on the *M/V Plancius*; Surface interval on an iceberg at Neko Harbour (right)



CHRIS THRALL

While I certainly wouldn't say I'm a lover of gory killing scenes, observing the leopard seal was mesmerizing.

The seal grabbed the penguin by its feet and shook it violently, repeatedly beating its body against the surface of the water in an attempt to kill it. At one point the leopard seal even threw the penguin in the air

like it was playing a game of catch, triggering a crescendo of squeals and camera snaps. While leopard seals can consume a number of penguins a day in the summer, this extravaganza will not last, and many will be forced back to a diet of krill during the winter.

An unforgettable journey

My trip to Antarctica was a journey of education, exploration, adventure and discovery. I'd experienced the challenge of diving underwater, indulged in stunning, icy scenery and photographed spectacular species of wildlife

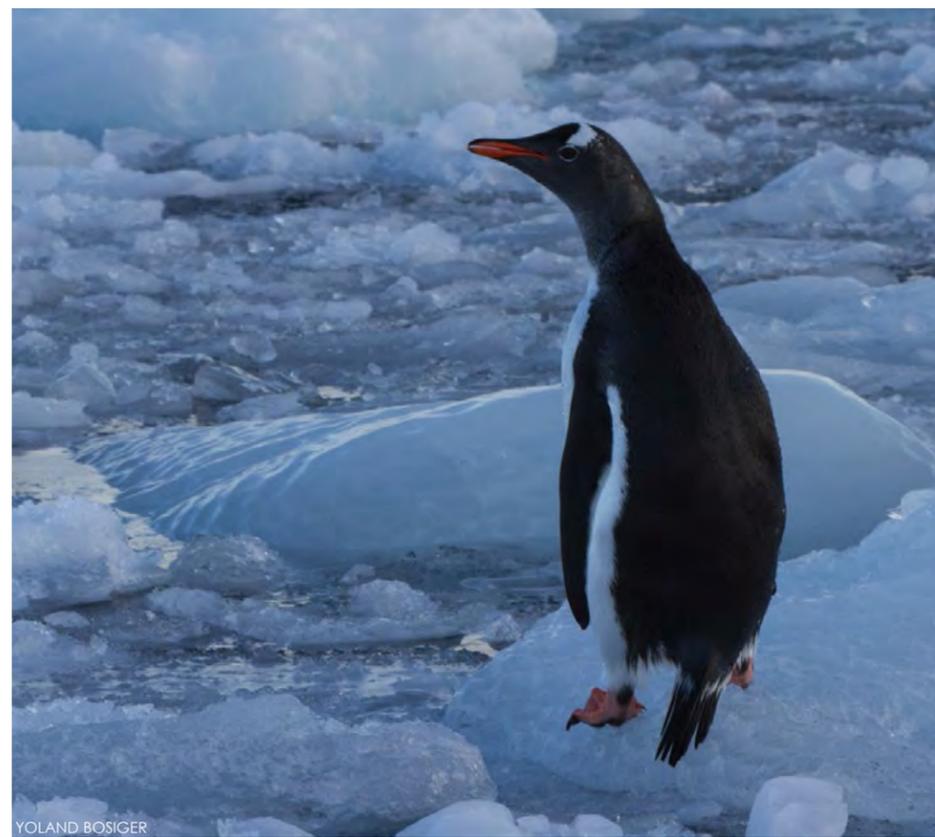
—many of which are found no where else on the planet. Perhaps most importantly though, I had begun to learn firsthand, and from passionate and dedicated Antarctic enthusiasts, about the importance of protecting this vital ecosystem.

Antarctica bursts with life, and for the most part, this is found underwater. Diving in Antarctica revealed an abundance of marine creatures in all shapes and sizes. Even from the comfort of the ship, the importance of the ocean for foraging seabirds and marine mammals, such as killer whales and

leopard seals, was clear. Hopefully with continued protection, this stunning wilderness will continue to be enjoyed by individuals who no longer want to conquer this frontier continent, but rather wish to be inspired by what it is—a truly unique and fragile ecosystem. □

Yoland Bosiger is a marine biologist and avid diver based in North Queensland, Australia. She was the 2012 Our World Underwater Scholarship Society Rolex Scholar. The author extends special thanks to Oceanwide Expeditions (Oceanwide-expeditions.com), Silvertip Expedition and Diving Management (Silvertipworld.com) and the Our World Underwater Scholarship Society (Owuscholarship.org) for making this trip possible.

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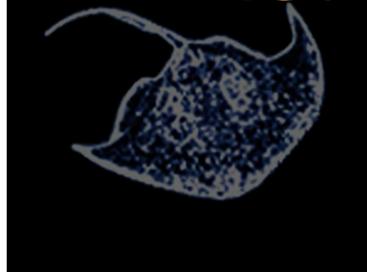


YOLAND BOSIGER

Gentoo penguin alone on the ice; Icy wilderness at sunset (top right)



fact file



Antarctica



SOURCES: U.S. CIA WORLD FACTBOOK, NATIONAL GEOGRAPHIC ANTARCTICA EDUCATION

History Captain James Cook discovered Antarctica in 1772 when he first crossed the Antarctic convergence. Sealers were next to enter the region, and during the mid 1780s the search for virgin seal grounds drove much of the early Antarctic exploration. The Heroic Age of Exploration began in 1895 and is best known for the journeys of Robert Scott, Roald Amundsen, Ernest Shackleton and Douglas Mawson. With the onset of the 20th century, the race was on between Amundsen and Scott to secure the South Pole. The race ended in Amundsen's favour and saw the tragic loss of Scott and

his four comrades on the return journey. Whaling in the Southern Ocean was occurring as early as the 1700s, but improved technologies allowed the industry to flourish in the 20th century. Thousands of whales were slaughtered annually eventually driving whale numbers close to extinction and making the industry nonviable. With the signing of the Antarctic Treaty, Antarctica is now set aside as a place of peace and science. There are currently 42 research stations operated by 17 countries.

Population The population of research scientists varies through-

out the year. The number increases from approximately 1,000 in winter to around 5,000 in summer.

Geography Antarctica is located in the Earth's southern hemisphere and is centered asymmetrically around the South Pole. The continent of Antarctica encompasses an area of over 14 million sq km (5.5 million sq mi) and is surrounded by the Southern Ocean. If ice were removed from Antarctica, it would reveal a single large landmass about the size of Australia (known as Greater Antarctica) and an archipelago of mountainous islands known as lesser Antarctica. Lesser

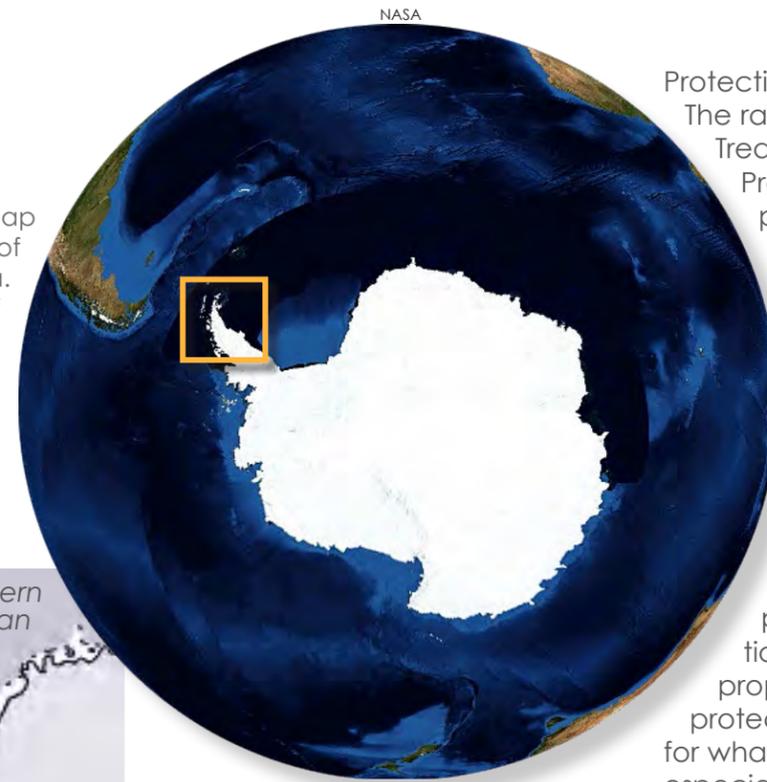
Antarctica is a tectonically active area with active volcanoes such as Mount Erebus (the southern most active volcano on earth). The highest mountain in Antarctica reaches 4,500m (14,764ft).

Climate During the summer months temperatures around the coast of Antarctica are generally close to freezing although temperatures as high as 8°C have been recorded. In 1983 the coldest naturally occurring temperature on earth was recorded

at Vostok Station of -89.2°C. Tourists do not visit Antarctica in winter.

Environmental Issues

Scientists of the British Antarctic Survey first announced the loss of ozone over Antarctica in 1985. These scientists discovered that compounds such as chlorofluorocarbons and halons take part in catalytic reactions that destroy the ozone layer. This discovery led to implementation of the Montreal Protocol, which controls the production and use of chlorofluorocarbons and other ozone depleting chemicals. The protocol is having a clear positive effect, and the amount of ozone destroying substances in the



RIGHT: Global map with location of Antarctica Peninsula. BELOW: Location of Neko Harbour on map of Antarctica Peninsula. BOTTOM RIGHT: Gentoo penguin having a scratch, Aicho Island



atmosphere is gradually declining.

Climate Change

Global warming is having a major impact in Antarctica, particularly the Antarctic Peninsula. In the last 50 years, temperatures have risen by almost 3°C—as much as five times the world average. This temperature increase has correlated with a total loss of 25,000 sq km of ice shelf from the Antarctic Peninsula. The warmer temperatures have resulted in more moisture in the atmosphere resulting in more frequent and heavier snowfalls. Scientists fear for the Adélie penguin because it needs land that is free of snow and ice to raise its young.

Fisheries

Antarctica has long been a site of exploitation for human profit. While commercial whaling and sealing has ceased for the most part, commercial fishing of the long-lived toothfish and all-important krill continues in Antarctic waters and could have devastating impacts if not controlled.

Protection

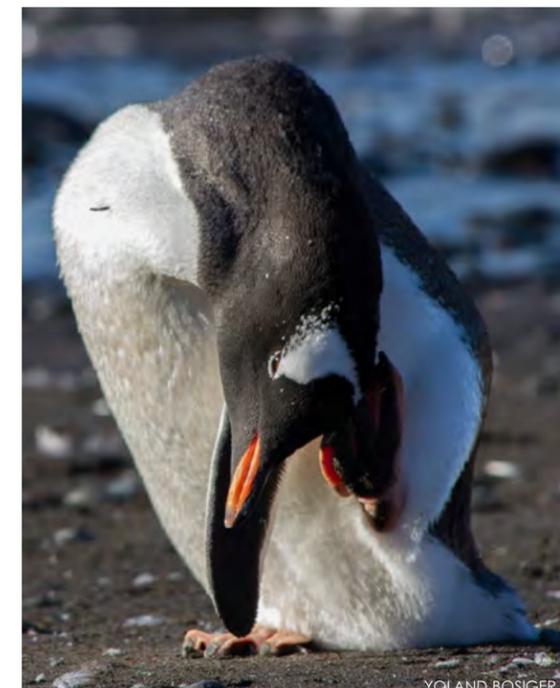
The ratification of the Antarctic Treaty and subsequent Madrid Protocol were intended to provide comprehensive protection of Antarctica. While they were certainly important for protecting Antarctica's terrestrial environment, more progress is needed to protect the Southern Ocean, which drives the cycle of life in the region. The Antarctic Ocean Alliance is supporting greater protection of Antarctic waters by proposing large scale marine protected areas—sanctuaries for whales, seals, penguins and especially fish like the Patagonian toothfish that continue to be hunted by commercial fishing fleets.

How to get there

In 2007-2008, approximately 58 vessels (including 17 yachts) travelled to Antarctica, each catering to a variety of travel needs and vacation expectations. Oceanwide Expeditions is one of the few operators to offer recreational diving in the Antarctic region.



Divers surfacing from a dive at Neko Harbour



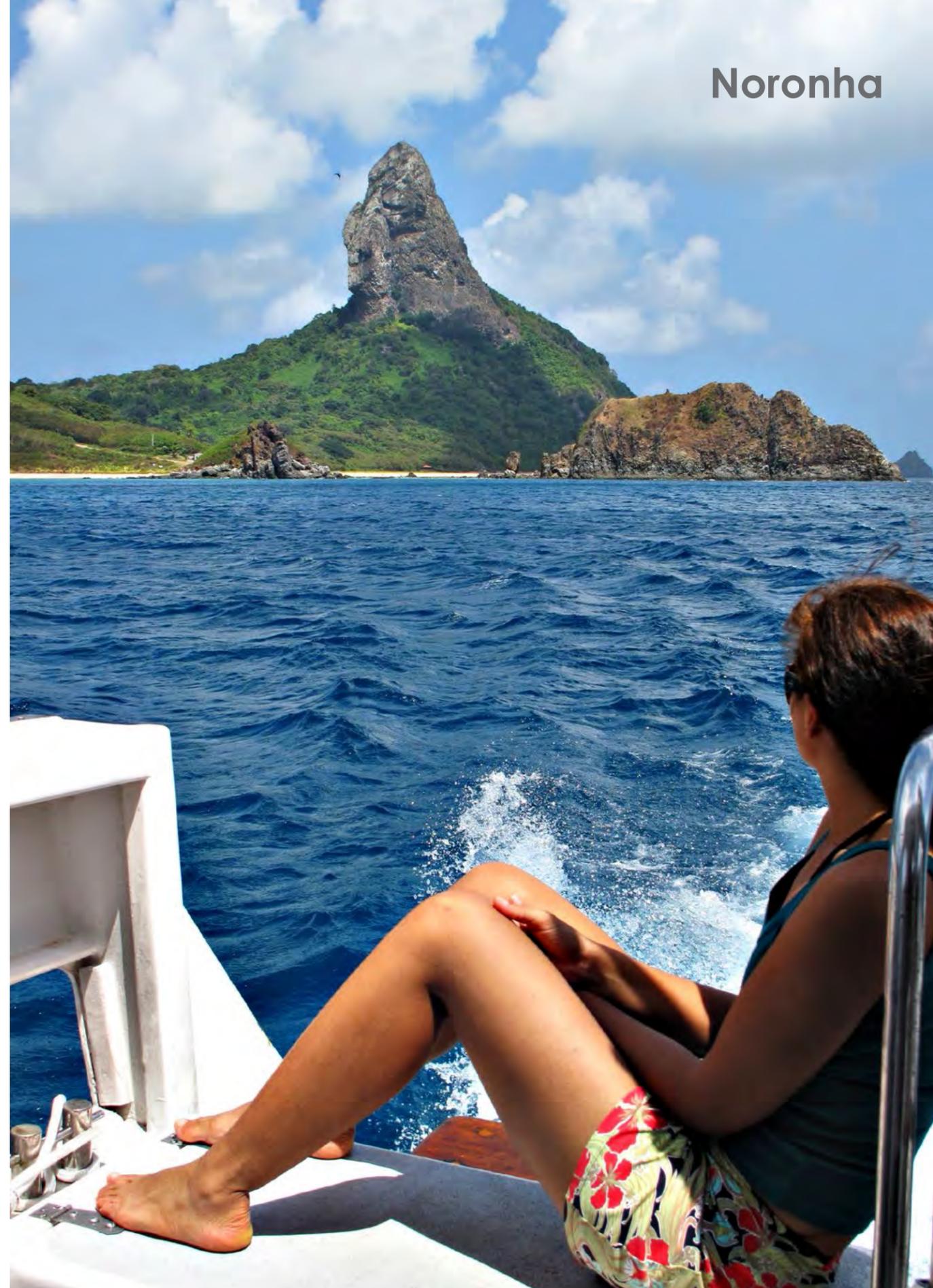
YOLAND BOSIGER



Brazil's
Fernando de Noronha

Text and photos by Michel Braunstien

Jewel of Nature



Employees counting dolphins (left side of photo) at Baia dos Golfinhos

If I were to tell you about a special place where no one locks their doors at night, where crime is virtually nonexistent, where the number of tourists is intentionally restricted to preserve the ecological balance, and where each visitor must pay a daily fee of 15 Euros (approximately US\$20) to protect the environment, would you think about Brazil? Probably not!

Yet, Brazil's tiny archipelago of Fernando de Noronha still resists the changes and other influences from the continent. The archipelago entails

21 volcanic islands and is located at 360km (224mi) from the closest coast of Brazil (Natal). Spreading over a total area of 26 sq km, it is located in the Atlantic Ocean near the Equator (3° 51' S, 32° 25' W). The main island, the only one which is inhabited, is about 10km long (6m) and up to 3km wide (1.8mi). The archipelago gained international media attention after the terrible accident on 1 June 2009 of Air France Flight 447 flying from Rio to Paris, as searches were conducted by the Brazilian Air Force from the archipelago.'

History

Discovered in 1503 by the Portuguese, the archipelago was named after Fernao de Loronha who received it as a gift in 1504 from his friend, King Manoel I of Portugal. However, Loronha quickly forgot this gift and

The fabulous Baia do Sancho

View of Morro do Pico from dive boat. PREVIOUS PAGE: Splendid arch underwater at Pedras Secas



LEFT TO RIGHT: Fernando de Noronha's church; Atlantis dive club fleet; Location where prisoners were punished in colonial times; Buggies are the ultimate vehicles on Noronha

the U.S. forces as a military base during World War II and again in the late 50s and early 60s during the cold war against Soviet Union. Since 1988, the islands have been open to tourism, 85 percent of which being of Brazilian origin. Over two thirds of the archipelago's total land surface is a marine national park, classified since 2002 as part of the UNESCO world heritage.

Hotels and transportation

There are no hotels on this preserved site but there are living units, or *pousadas*, in private homes. Infrastructure is very basic. A single seven-kilometer paved road crosses the inhabited island. Buggies are commonly used as a means of

transportation and allow driving outside the main axis.

Nature and conservation

The site's nature conservation is exceptional; it has a rich and varied flora and fauna. Non-governmental protection agencies for the study of various species are quite active on the island and entail projects such as the Projeto Golfinho Rotador for the dolphins, the Tamar Project for the turtles, and other projects pertaining to the study of sharks, birds and crustaceans.

Some environmental mistakes made long ago by the Portuguese can still be noticed today. For example, two different lizard species were introduced to eat rats but preferred eggs, chicks and turtles that have just hatched; unfortunately, it is now too late to reverse the process.

Beaches

At sunset, whilst visiting Baia dos porcos, you can admire, the Dois Irmaos, the two renowned tiny sister islands. Morro do Pico, an impressive peak rock, is another one of the local spots.

The main island is surrounded by 16 heavenly beaches that are clean and almost deserted, making it almost impossible not to stop and have a look.

Baia do Sancho is without a doubt the most sumptuous beach and is rated first in the Brazilian beach ratings. The water is crystal clear and the shoreline is bordered by dense vegetation. This is an ideal place for snorkeling. You can often see stingrays, turtles, as well as other species.

Nevertheless, access to the beach



is rather difficult, involving a hike down a steep cliff, 50 meters (164 feet) high, if you wish to swim. Two ladders allow crossing of a narrow opening between the rocks, followed by a large flight of stairs that leads to the beach. This is not easy, but it is well worth the effort for both the experience and the view.



Diver passes through a narrow passageway on the way to Caverna de Sapata

Dolphins' Bay

Baia dos Golfinhos—the Bay of Dolphins—is near Sancho Bay. A large number of spinner dolphins (*Stenella longirostris*) swim together here every morning at dawn. They come to the bay to seek shelter after a night of hunting before returning to their marine odyssey.

These spinner dolphins, commonly named *golfinho rotadores* in Portuguese, are known for their spectacular jumps. They can perform up to seven spins during the same jump. An impressive amount of them can be seen from the observatory at the top of the cliff, some 50 meters above the sea.

Every morning, the employees of the Projeto Golfinho Rotador organization count the dolphins to monitor their progress. Daily, on average, 315 dolphins reach the bay to breed, care for their young, or seek shelter from shark attacks. At times, one can even count up 2,000

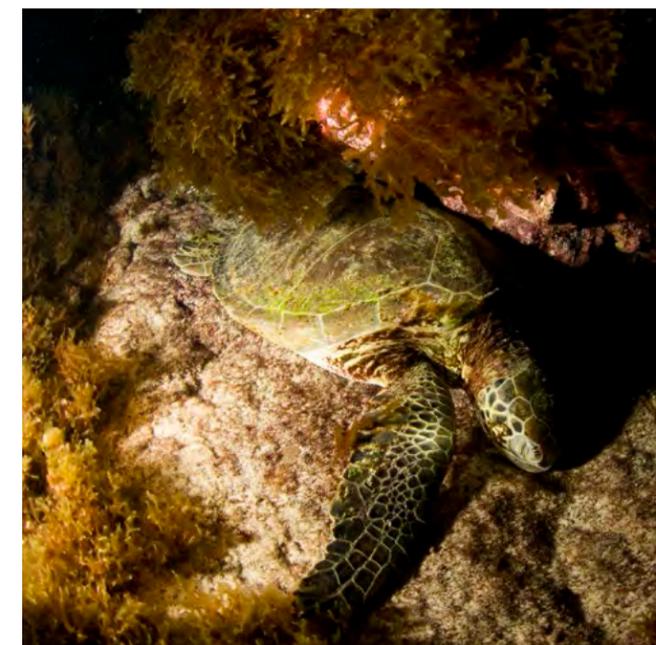
dolphins. Noronha has the largest spinner dolphin count and population density in the world, in a single place.

Turtles beach

Baia do Sueste is at the other end of the island and sea turtles come there to lay their eggs between December and June. Nests are protected by the Tamar Project patrol (Projeto Tamar). You can see turtles here throughout the year if you swim beyond the bay's surf, equipped with a mask, snorkel and fins.

Diving

All year round in Noronha, you can have great quality dives, thought to be some of the most magnificent of the South American continent. The water has a pleasant average temperature of 26°C. The visibility is outstanding, ranging from 25 to 45 meters. During the months of September and October, the visibility



is at its best. Although you won't find coral or macro life here as it exists in the Indian Ocean, the underwater world of Noronha is mainly interesting for its volcanic rock formations, narrow

Diver in narrow passageway; Turtle (right) asleep during night dive, Perdras Secas



passageways, tunnels and caves, making it a very special place. Marine species are generally very large and quite numerous. It is not uncommon to encounter dolphins underwater, and if you miss them there, you can often see them swimming alongside boats.

Sapata Cave

The magnificent Sapata Cave has a very wide entrance with which a little imagination makes you think of a mouth. A large grouper lives within the entrance, and although it still appears to be quite young, it already weighs over a hundred kilograms (220 pounds).

Fauna

During each dive, large stingrays are visible. Barrel sponges are very common. Reef sharks and nurse sharks can be met mainly in the superb reef of Pedras Secas. Sometimes, during a night dive,

you can even come across a turtle sleeping under a rock. There are many schools of fish, and on occasion, you can see manta rays and hammerhead sharks.

Wrecks

The Corvette Ipiranga V17 wreck is that of a Brazilian Navy warship that sank in 1982, after hitting a rock that did not appear on any map. She drifted and sank during an eight-hour stretch, reaching the seabed at 62 meters deep (203 feet) in perfectly straight position. She remains in excellent condition.

Diving into the wreck requires trimix, which can be relatively expensive, and requires very accurate preliminary training. On the wreck's deck, there is still a heavy machine gun.

In Noronha's port, there is another wreck which is accessible by snorkeling as it is only about six meters deep (20

Large barrel sponge (above); Stingray at 42m depth (top left); Diver between huge lava rocks (left)



Huge lava rocks underwater (above); Diver in splendid entrance to Sapata Cave (top left); Divers in swim-through (left); Giant grouper, Sapata Cave (right)

sized planes landing there every day. This place has a unique charm as a result of all these factors, making it a true jewel of nature and a true delight to the eyes.

Dive clubs and tourism info

There are only three dive clubs in the small archipelago. The nicest and most professional one, with the best ships, is Atlantis Divers owned by

because locals do not speak English. You can also get in touch with Adriana Schmidt from Your Way travel agency in Noronha. She's a great guide and perfectly fluent in English. She can help you with any kind of reservation on the island. Email her at: adriana@yourway.com.br.

Michel Braunstein is a Belgian underwater photographer and dive writer based in Israel. For more information, visit: www.michelbraunstein.com



feet). These are the partial remains of a Greek ship named *Eleana Stathatos* that sank in 1929.

Fernando de Noronha is a model

of environmental preservation. The tourist industry remains limited due to the small infrastructure and means of access; there are only two medium

Patrick Muller. The two others are Noronha Divers and Aguas Claras. If you don't speak Portuguese, take a dictionary with you to Noronha,

SOURCES: ¹ EN.WIKIPEDIA.ORG/WIKI/AIR_FRANCE_FLIGHT_447

fact file



Brazil



SOURCES: U.S. CIA WORLD FACTBOOK, RAF.MOD.UK, WIKIPEDIA, WWWNC.CDC.GOV

History After over 300 years of Portuguese rule, Brazil gained its independence in 1822. It maintained a monarchical system of government until 1888 when slavery was abolished and the military subsequently proclaimed the country a republic in 1889. Exporters of Brazilian coffee dominated politics in the country until 1930 when populist leader Getulio Vargas rose to power. Over five decades of populist and military government passed before power was finally peacefully ceded to civilian rulers in 1985. Brazil, being the largest and most populous country in South America, continues to pursue growth in the industrial and agricultural sectors while developing its interior, exploiting its vast natural resources and a large labor pool. Today, it is South America's leading economic power. As a regional leader, Brazil is one of the first in the area to begin economic recovery. However, there is still large inequality in income distribution in the country, and crime remains a pressing issue. Government: Federal republic. Capital: Brasilia.

Geography Brazil is located in Eastern South America and borders the Atlantic Ocean. As the largest country in South America, Brazil shares common boundaries with every South American coun-

try, with the exception of Ecuador and Chile. Coastline: 7,491km. Terrain consists primarily of flat to undulating lowlands in the north, with a few plains, hills and mountains, as well as a belt of narrow coast. Lowest point: Atlantic Ocean 0m. Highest point: Pico da Neblina 2,994m.

Climate Primarily tropical, Brazil does have temperate climate in the south. Natural hazards include floods and sometimes frost in the south as well as periodical droughts in the northeast.

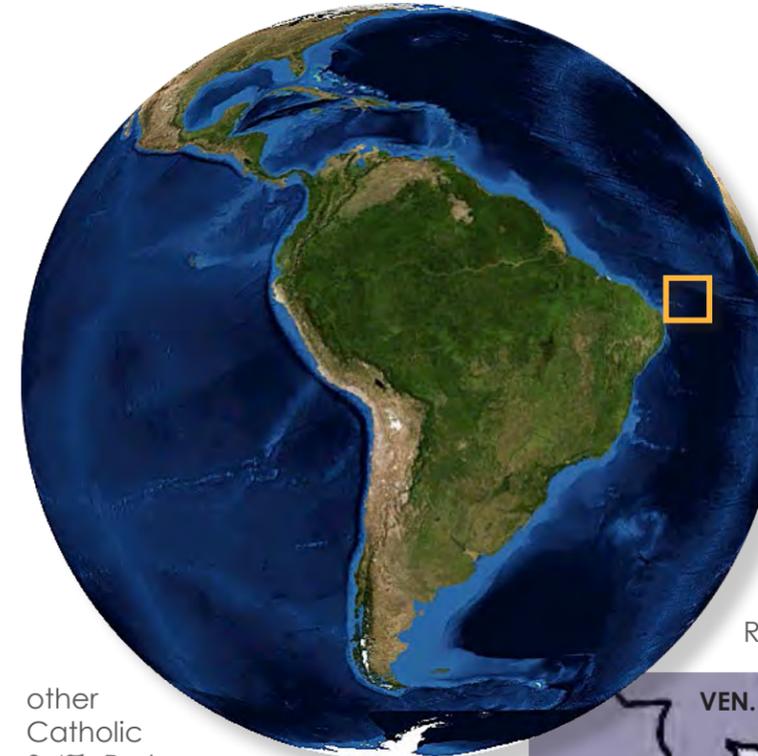
Environmental issues Deforestation in the Amazon Basin is destroying habitat and endangering a myriad of indigenous animal and plant species. A lucrative illegal wildlife trade is also having an adverse effect on indigenous species. Rio de Janeiro, Sao Paulo, and other large cities are plagued with air and water pollution. Improper mining activities is causing land degradation and water pollution. Other challenges include wetland degradation as well as devastating oil spills.

Economy With vast and well-developed agricultural, manufacturing, mining and service sectors, Brazil has the largest economy of all the South American countries. Expanding its presence in

world markets, Brazil has, since 2003, improved its macroeconomic stability. Economic measures have seen the country's foreign reserves rise and its debt profile fall. Strong growth prior to the 2008 global financial crisis was followed by two quarters of recession but then the country was one of the first emerging markets to begin a recovery. Growth increased leading to rising inflation in 2010, so the government took measures to slow the economy in the following years. Unemployment is at an all time low while the gap in income inequality has steadily decreased. High interest rates attract foreign investors, but the large inflow of capital in recent years has hurt manufacturing, so government intervention in foreign exchange and taxation was necessary. The current administration is committed to fiscal restraint, combatting inflation and maintaining a floating exchange rate.

Currency Reals (BRL)
Exchange rates: 1EUR=3.05BRL;
1USD= 2.21BRL; 1GBP=3.70BRL;
1AUD= 2.08BRL; 1SGD= 1.78BRL

Population 202,656,788 (July 2014 est.) Ethnic groups: white 47.7%, mulatto (white and black mix) 43.1%, black 7.6%, Asian 1.1%, indigenous 0.4% (2010 est.) Religions: Roman Catholic 64.6%,



RIGHT: Global map with location of Noronha. LOWER RIGHT: Location of Noronha on map of Brazil

other Catholic 0.4%, Protestant 22.2%, other Christian 0.7%, Spiritist 2.2%, other religions 1.4% (2010 est.) Internet users: 75.982 million (2009)

Language Portuguese is the official language and most widely spoken. Other, less common languages include Spanish, German, Italian, Japanese, English, and several Amerindian languages

Health There is a risk of hepatitis A and typhoid through food and water contamination; dengue, leishmaniasis and Chagas disease from bug bites; as well as malaria, rabies and yellow fever in some remote areas. Check with your doctor 4-6 weeks before your trip for details and updates on vaccination requirements and health risks. For helpful tips for travelers to Brazil, visit <http://wwwnc.cdc.gov/travel/destinations/traveler/none/brazil>

Decompression chamber Fernando de Noronha is remote. There are several chambers in private and military hospital facilities in Brazil's larger cities of Sao

Paulo and Rio de Janeiro as well as naval facilities along the coast, but the closest facility is around 545m (338mi) away in Recife, so please

Hospital UNIAD
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Recife, PE Brazil 52010-030
Phone: +55 81 3423-4431

Travel/Visa/Security
Travellers from North America, most of Africa, Middle East, Asia and Australia are required to



check with your dive operator for more details.

Hospital Sao Marcos
Rua Domingos Ferreira,
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apply for tourist visas from their local Brazilian embassy for tourist travel to Brazil. Tourist visas are valid for up to 90 days.

Web sites
Brazil Tourism
www.visitbrasil.com