



Polar Diving
Antarctica

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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-



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

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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)

Antarctica



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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.

Aicho Island is home to three different spe-

Humpback whale at Hovegaard Island (above); Antarctica at sunrise (top left); Gentoo penguin feeding chick, Aicho 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



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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)





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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



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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



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Diving near ice was a novel concept, overloading the senses with new sights, sounds and textures. Below water, the iceberg looks like a colossal dimpled golf ball, its pattern produced through a combination of melting freshwater and salt-water corrosion. Swimming deeper, we began navigating the gullies, steep columns and sculptured pillars

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



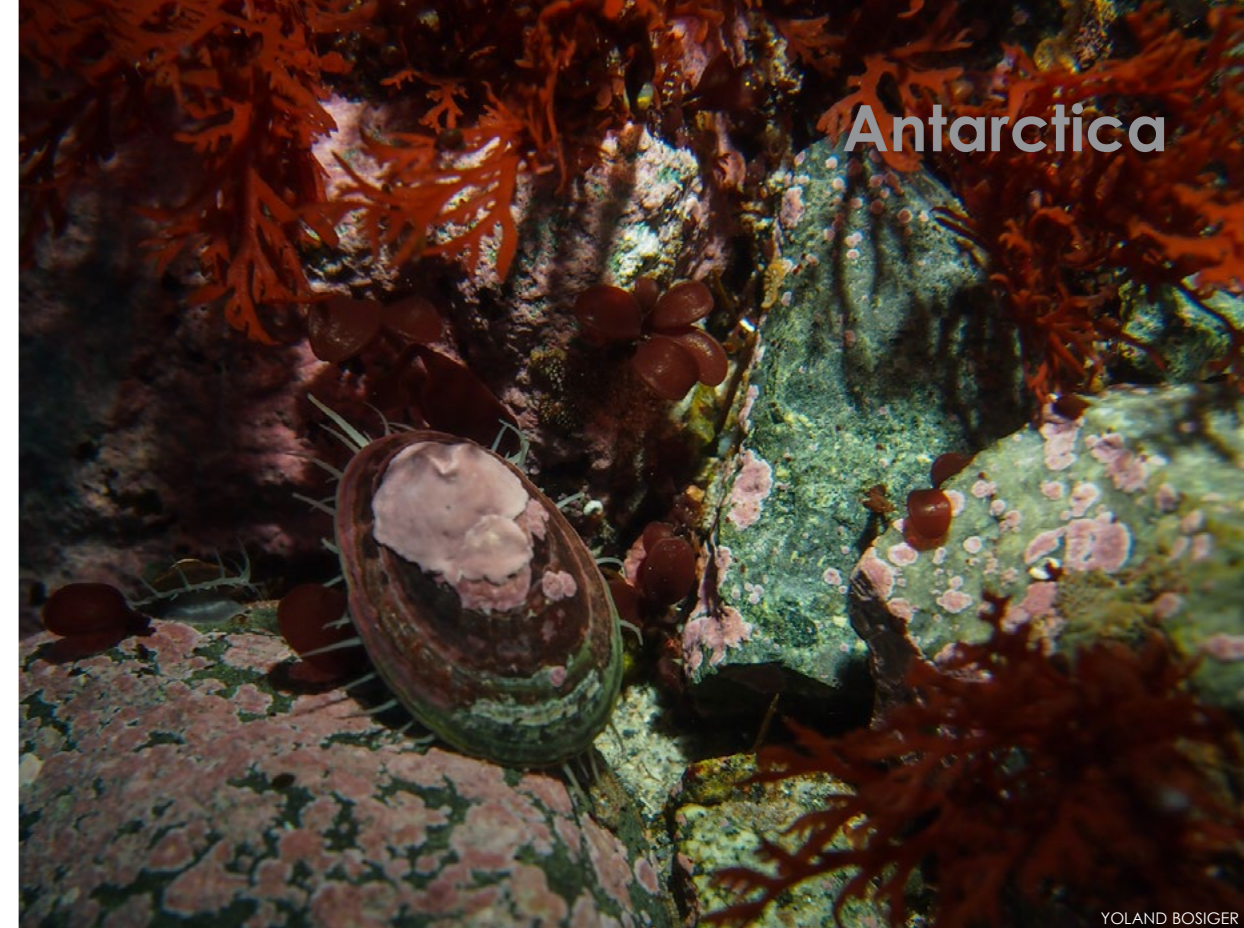
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in 1916. This was the first time any divers on our vessel (including the divemaster), had dived a wreck in Antarctica, and we were super excited about what surprises

might lie ahead.

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

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.



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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)



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.



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

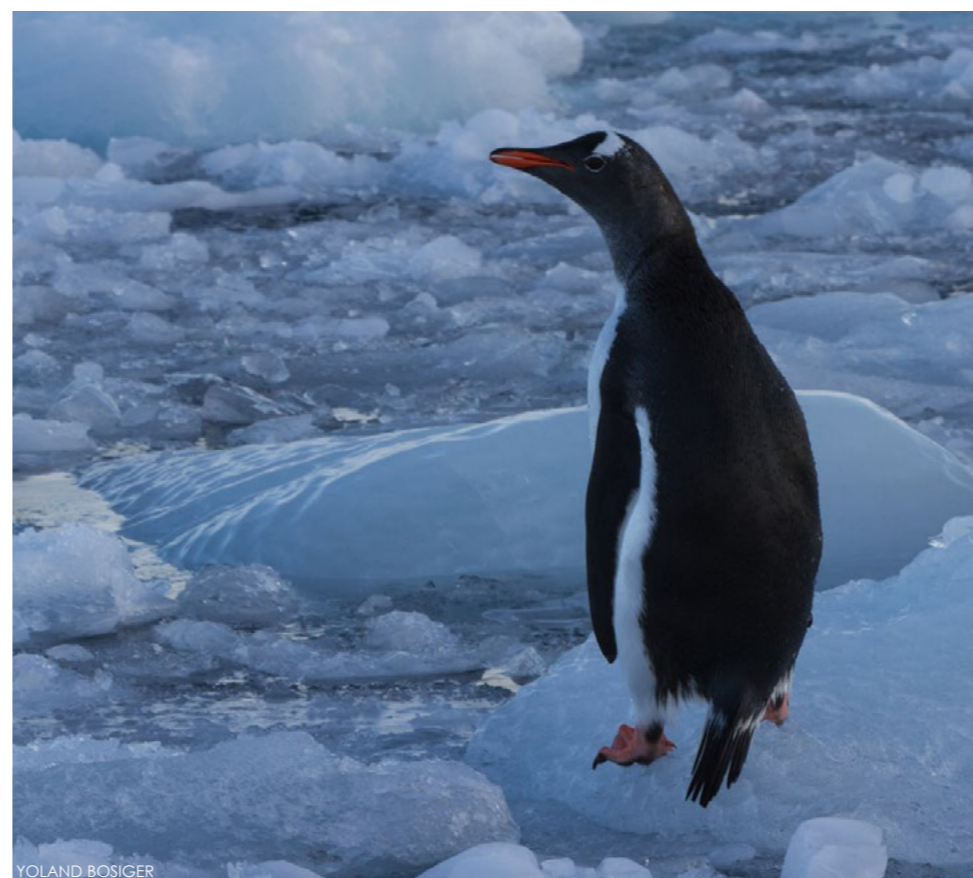
like it was playing a game of catch, triggering a crescendo of squeals and camera snaps. While leopard seals can consume a number of penguins a day in the summer, this extravaganza will not last, and many will be forced back to a diet of krill during the winter.

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



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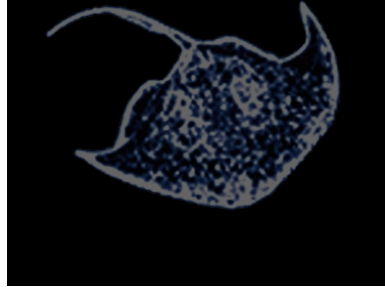
Gentoo penguin alone on the ice; Icy wilderness at sunset (top right)

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. □

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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

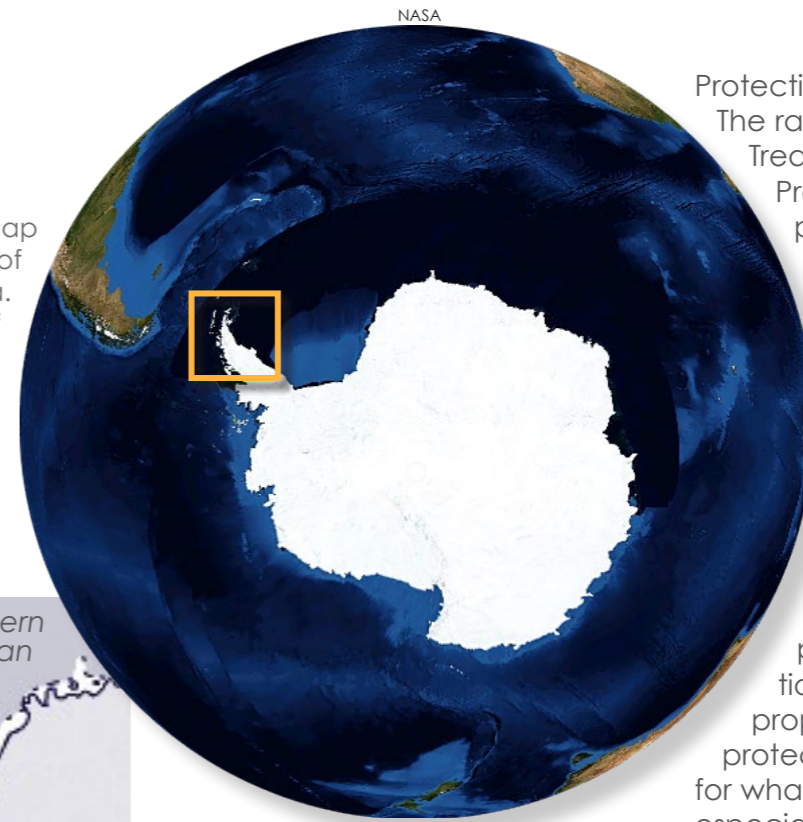
Antarctica is a tectonically active area with active volcanoes such as Mount Erebus (the southern most active volcano on earth). The highest mountain in Antarctica reaches 4,500m (14,764ft).

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

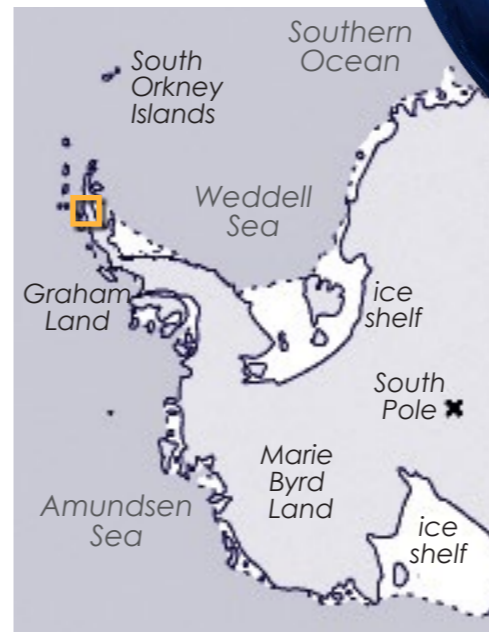
at Vostok Station of -89.2°C. Tourists do not visit Antarctica in winter.

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

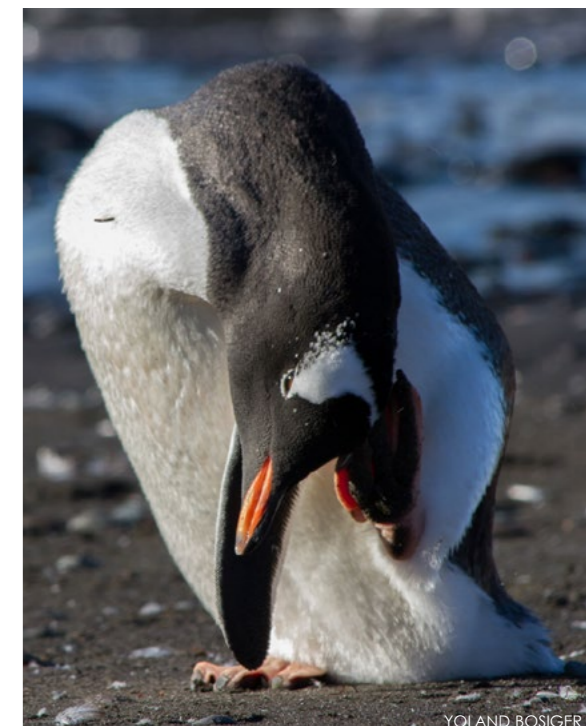
The ratification of the Antarctic Treaty and subsequent Madrid Protocol were intended to provide comprehensive protection of Antarctica. While they were certainly important for protecting Antarctica's terrestrial environment, more progress is needed to protect the Southern Ocean, which drives the cycle 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



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