

The Antarctic Dive Guide

Third Edition
Fully revised
and updated



Lisa Eareckson Kelley



WILDGuides

The Antarctic Dive Guide

Third Edition
Fully Revised
and Updated

Lisa Eareckson Kelley



For Dennis

Published by Princeton University Press,
41 William Street, Princeton, New Jersey 08540
In the United Kingdom: Princeton University Press, 6 Oxford Street,
Woodstock, Oxfordshire OX20 1TW
nathist.press.princeton.edu

Requests for permission to reproduce material from this work should be sent to
Permissions, Princeton University Press

Copyright © 2006, 2008, 2015 Lisa Eareckson Kelley
Robert Still (maps)

First published 2006 by **WILD***Guides* Ltd.
Second Edition 2008 by **WILD***Guides* Ltd.
Third Edition 2015

Copyright in the photographs remains with the individual photographers.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval
system, or transmitted, in any form or by any means, electronic, mechanical, photocopying,
recording, or otherwise, without the prior permission of the publishers.

British Library Cataloging-in-Publication Data is available

Library of Congress Control Number 2014949506
ISBN 978-0-691-16344-4

Production and design by **WILD***Guides* Ltd., Old Basing, Hampshire UK.

Printed in China

10 9 8 7 6 5 4 3 2 1

CONTENTS

Acknowledgements	5
A brief history of diving in Antarctica	6
The continent of Antarctica	9
Diving in Antarctica	
Planning your visit	12
The practicalities	17
What to expect	23
Leopard Seals	
– a scientific perspective	26
– a diver's perspective	32
The Sea Leopard Project	34
Underwater photography and videography in Antarctica	35
Other ways to capture the underwater realm of Antarctica	42
Common benthic life of the Antarctic Peninsula & South Georgia	44
Echinoderms (including sea stars, sea cucumbers, brittle stars and sea urchins)	44
Gastropods (including limpets and nudibranchs)	45
Ascidians (including tunicates and salps)	46
Worms	47
Fishes (including notothenids)	47
Cnidarians (including anemones, hydroids, jellyfish and soft corals)	50
Sponges	51
Algae	51
Sea spiders	52
Natural product chemistry from Antarctic marine organisms	53
THE DIVE SITES (see the following pages for a full list)	58
Guidance for visitors to the Antarctic	124
Marine Wildlife Watching Guidelines	126
Glossary	134
Photo credits	141
Suggested further reading	143
About the author	143
About the other contributors	144

THE DIVE SITES	58
How to use this guide	58
Key to icons used in the guide	58

DIVE SITES OF THE ANTARCTIC PENINSULA

1 Elephant Island, Point Wild	60
2 Tay Head	62
3 Paulet Island	64
4 Bald Head, Crystal Hill	66
5 Cape Well-met	68
6 Cecilia Island and Barrientos Island (Aitcho Islands)	70
Deception Island	72
7 Sewing Machine Needles (Deception Island)	73
8 Neptune's Bellows (Deception Island)	74
9 Whaler's Bay (Deception Island)	75
10 Mikkelsen Harbor	76
11 Hydruga Rocks	78
12 Enterprise Islands – <i>Governøren</i> Wreck	80
13 Orne Harbor	82
14 Cuverville Island	84
15 Neko Harbor	86
16 Paradise Harbor – 'The Shag Wall'	88
17 Port Lockroy (British Base A)	90
18 Janus Island, Arthur Harbor – <i>Bahia Pariso</i>	92
19 Booth Island	96
20 Pléneau Island	98
21 Petermann Island	100
22 Prospect Point (British Base J) – Perch Island	102
23 Détaille Island (British Base W)	104
24 Stonington Island (British Base E)	106

DIVE SITES OF SOUTH GEORGIA

25 Cooper Bay	112
26 Godthul	114
27 Grytviken, Cumberland East Bay	116
28 Hercules Bay	118
29 Prion Island	120
30 Albatross Island	120
31 Elsehul	122

ACKNOWLEDGEMENTS

The Antarctic is a relatively new location for recreational Scuba Diving, and in the few years that it has been a taking place, a few individuals have pioneered the techniques, explored the region for the best sites, and amassed a wealth of knowledge. This guide is an attempt to share this information, allowing more divers to experience this amazing underwater habitat, and would not have been possible without the knowledge and generous contributions of both text and photographs from the following: Dennis Cornejo, David Cothran, Toni Davis, Denise Landau of IAATO, Shona Muir (BAS) and the Kirsty Brown Fund, Göran Ehlmé, Henrik Enckell, Martin Enckell, Debbie Harrison, Kim Heacox, Tony Soper, Oscar Johansson, John Durban and Bob Pitman, Bill Baker, Jen Hayes and David Doubilet, and Paul Nicklen.

Thanks to those that pushed me to write the book, Rob Still and Andy Swash at **WILD**Guides for taking on such an unusual project, and the following people for never-ending support, advice and even text editing: Henrik Ahlberg, Trey Byus, Kim Crosbie, Matt Drennan, Amanda, and the entire Ellerbeck family, Richard Butler, Marlynda Elstgeest and Waterproof Expeditions, Melanie Heacox, Bob Houston, Brent Houston, Eleanor, Norman, and the entire Murray Family, Ron Naveen, Jack Putnam, Jim and Chris Sanders, Richard Schager, Roff Smith, Hilary Soper, Patrik Svårdmyr and Jason Kelley. A very special thanks to Tim Soper for the hours of assistance and editing he has put into this book.

Diving and photographing in these waters has been made much more comfortable and effective thanks to good advice and equipment from: Backscatter Underwater Video and Photography, Diving Unlimited International (DUI), and the Monterey Bay Dive Center.

I was introduced to this amazing underwater world while working aboard the expedition vessels *National Geographic Endeavour* and *National Geographic Explorer*. Captains Karl Lampe, Leif Skog and Oliver Kruess' enthusiasm and support of the diving operations is hugely appreciated, as are the members of the deck crew who brave whatever weather mother nature throws at them when they sit in Zodiacs as our life lines on the surface. Thanks to the *Endeavour* and *Explorer* diving crew: my instructor Dennis Cornejo and dive buddies David Cothran, Eugen Kanjski, Tommi Kotilainen, Göran Persson, Tove Peterson, Michael Westelius, Anders Von Hofsten, Jesper Westermarck, Max Westman, Magnus Håård, Dino Udović, Mauro Grl and Oscar Johansson.

None of this would have been possible without Lindblad National Geographic Expeditions, which strives to show its guests every possible aspect of Antarctica, including the underwater realm. It was through Sven Lindblad's continuing commitment to undersea exploration and conservation that I was able to learn to dive, and Antarctica's icy realm revealed.

A BRIEF HISTORY OF DIVING IN ANTARCTICA



The first dive in Antarctica was made in 1902 by Willy Heinrich, the carpenter on Drygalski's 1901–03 expedition. He used a large brass Siebe diving helmet, stiff canvas suit, and heavy lead boots, while supplied with air from the surface. Utilizing this elementary diving gear, Heinrich was able to dive under Drygalski's expedition vessel *Gauss* while she was frozen in the ice, carrying out ship repairs such as caulking of the hull. Heinrich was the pioneer of Antarctic diving, and one of the few divers to explore under the sea ice. Most of his diving peers chose the less risky option of staying in open water due to known problems with safely accessing and exploring under the frozen sea.

It was not until 1946 during the US Navy's pioneering visit to Antarctica, 'Operation High Jump,' that diving became widely publicized. During this operation, divers went down to conduct fuel pipeline inspections, and one document even mentions repair of the submarine *Stennet* near the Ross Ice Shelf. However, despite being much more common place, diving still involved the cumbersome affair of suiting up in a heavy dry suit and large brass helmet, supplied by air either from the surface or a primitive re-breather system.

Through the 1950s diving continued to be an awkward project, and although scientists and navy personnel from both the United States and Australia occasionally used diving to collect underwater specimens, it was not the preferred practice. The scientists who did endeavor to dive for specimens, did so from shore, using bulky gear that made conducting the necessary work difficult and exhausting, causing a realization that the actual gain was not worth the effort.

Finally, in 1961 a breakthrough was made: the first open circuit SCUBA (self-contained underwater breathing apparatus) dive was made in McMurdo Sound. In conjunction with a project to test a sea ice eroding device called the 'Aqua Therm,' Jim Thorne and Donald Johnson made one dive. They used the newest advancement in dry suits, moving away from the old stiff suits, and opting for a more flexible version. These new dry suits had rubberized neck seals and allowed compressed air to be pumped into the suit for an extra layer of warmth.

Diving equipment has progressed monumentally from early surface supplied air dives to today's SCUBA

In 1962, Philip Law, director of the Australian National Antarctic Research Expedition (ANARE), brought down the newest generation of dry and wet suits, along with an early version of the standard SCUBA gear that is used today. The large brass helmet was done away with, and newer more comfortable alternatives were tried. For a period of time divers tried using the full face mask to avoid having the frigid water touch their faces, but found that due to flooding, equalization difficulties, and the lack of buddy-breathing capabilities, the regular mask and mouthpiece were the best option.

It was during the 1961–62 season that Verne E. Peckham became the first person to dive extensively under the Antarctic ice. Peckham set the standards for today's under ice diving by using a chainsaw to cut a hole into the ice, then covering it with a hut to provide



The first SCUBA diving in Antarctica took place below the ice in McMurdo Sound during the 1960s

shelter when entering and exiting the water. He used a dry suit with integrated gloves, and was tethered to the surface while moving beneath the ice. Also the first person to conduct scientific diving, Peckham studied the benthic ecology, which included collecting specimens for terrestrial tank observation and creating marked underwater observational sites for long-term research.

From this point onward, dives in Antarctica became more frequent for both scientific and governmental agencies. It was also during this time that the first formal diving rules were set in place by the United States Antarctic Program (USAP). James Stewart drafted the first scientific diving rules in 1967, which included always diving with a buddy, and having a dive tender on the surface.

It is through the trial and error of our Antarctic diving forefathers, such as Willy Heinrich, that we have made such technological advancements in diving. Today we dive with dry suits that offer as much mobility as our everyday clothing, and have developed communication devices that allow us to talk to the surface while underwater.

Seeing the progress that has been made in the last 100 years, not to mention the last 40, leads me to believe that in another 40 years it will be we who look as though we are diving in the stone ages.



Diving in Antarctica has developed from a rare and sensational project, to an everyday occurrence during the austral summer.

THE CONTINENT OF ANTARCTICA

Overview

Around 200 million years ago Antarctica was joined with Australia, Africa, South America, India, and New Zealand, as part of the supercontinent of Gondwana. As tectonic plates groaned and shifted across the globe, Gondwana began to break apart, its pieces creating the continents and islands we know today. Settling into its south polar position, Antarctica began to cool rapidly. The world's fifth largest continent, Antarctica's 13.9 million square kilometers feature massive mountain ranges, hills, valleys, and plains. The continent's present shape has been best described as a 'stingray,' the tail pointing towards South America's Tierra Del Fuego, and the head towards the Indian Ocean. Antarctica's most remarkable feature however, is that 98% of its landmass is covered in ice, measuring 4,775 m thick in some places. Additionally, the continent effectively doubles in size as sea ice extends up to 1,000 km from the coast during the Antarctic winter.

Although Antarctica's political boundary encompasses everything below 60°S, the environmental boundary of the Antarctic Convergence is considered the true start of Antarctic ecology. The convergence occurs as the cooler southern ocean waters meet those of the warmer northern oceans. Here this interface acts as a mixing agent, bringing an upwelling of nutrients to the surface. Although the water surrounding the Antarctic rarely gets above the freezing point, it is some of the most nutrient rich in the world, creating a thriving environment for creatures large and small.

History

Like many lands in ancient history, Antarctica was hypothesized to exist before it was actually discovered, and reports dating back as far as 650AD proclaimed a great area of frozen land in the south. Exploration exploded in the 1400s, as explorers began to investigate the most southerly latitudes, searching for new routes to India and South America. During this time, incredible revelations were made about the size, shape, and diversity of our planet. Alas, due to the extreme weather conditions of our southern oceans and unreliable navigation techniques, the great southern continent, known then as *Terra Australis Incognita*, continued to elude explorers for many centuries.

Sailors and explorers continued the search for the great white continent without success, a prime example being Captain James Cook in 1773, who despite pushing well below the Antarctic circle to 70°S, was stopped by a barrier of sea ice and never sighted land. On the other hand, when Bellinghausen became the first person to glimpse land in 1820, his splendid efforts in conquering this southern enigma went largely unnoticed by the industrial world. It was not until the advent of commercial sealing and whaling in the late 1700s that exploration became a sustainable business. As the sealers and whalers devoured the marine mammal populations and looked further into the most southern reaches of the ocean for more viable resources, they also made the first surveys and charts of Antarctica.

Having thoroughly investigated the accessible shoreline, by the early 1900s many expeditions were being sent to explore the interior of the white continent. The first overwintering ashore took place on Cape Adare in the Ross Sea, as part of the British Southern Cross Expedition of 1898–1900, led by Carsten Borchgrevink. Explorers and entrepreneurs flocked to Antarctica in the following years, and the more they learned, the more intriguing this last continent became. They were attracted to the continent for personal, nationalistic, and monetary gain, often creating disputes over the sovereignty of a location. These explorations of the heroic era were rife with tragedy and triumph, and many lives were lost between the glories of discovery.

Tourism

Tourism in Antarctica dates back as early as Thomas Cook (1910) and J.R. Stenhouse (1929), its early roots beginning with the Falkland Island Dependencies Government using a mail steamer to take a limited number of passengers annually from the Falkland Islands to South Georgia, as well as the South Orkney and South Shetland Islands. The first dedicated tourist operation occurred on 22 December 1956, when a Douglas DC 6B aircraft of Argentina's Linea Aérea Nacional took 66 passengers on a four-hour scenic flight over the Antarctic Peninsula and adjacent islands.

Antarctica's harsh environment is sure to conjure up ideas of intrepid explorers weathering blistering snowstorms, so it is not surprising that early tourism to the continent was completely expeditionary in nature. With few opportunities, and requiring long and sometimes difficult travel, it remained an adventure that few took the opportunity to enjoy. This all changed in 1966 when Lars Eric Lindblad pioneered the first regular Antarctic expedition cruises. Suddenly, an everyday person could travel to the bottom of the world, experiencing at first-hand what once had only been seen on television, or read about in books and magazines. Using the purpose-built expedition ship, *Lindblad Explorer*, equipped with small inflatable boats called Zodiacs, visitors were transported to the Antarctic Peninsula on voyages lasting about two weeks. Such voyages took place several times during the summer season.

This small venture started an explosive trend; currently (2014) there are 42 ships or yachts that visit the white continent each summer season, and as many as 35,000 tourists call on the continent each year on yachts, ships, planes and inland expeditions. Today, as tourism in Antarctica becomes more commonplace, expedition activities have diversified from traditional Zodiac landings to more extreme adventures such as camping, kayaking, and diving. Although the type and style of travel has evolved, what drives those who visit has changed little from the days of Shackleton, the desire to investigate the unknown.

The Antarctic tourist season is short, only four months between November and March. This is the austral summer, breeding season, and the ideal time of year to catch the wildlife at its peak, while enjoying up to 20 hours of daylight. Every person has different reasons for going to Antarctica; for some it may be the chance to set foot on the 7th continent, others wish to see penguins in their natural habitat, and, for those of you reading this book, the desire to dive or otherwise experience the underwater realm is the attraction.

Underwater

Underwater benthos in Antarctica remains similar throughout the year. However, the underwater visibility varies drastically both during and between the seasons; the best visibility is found in the winter and early spring before the ice breaks up, releasing trapped plankton and nutrients. Currently tourist diving in the Antarctic is limited to the summer months only, when increasing sunlight and warming waters result in plankton blooms. Although this limits visibility, and despite at times not being able to see more than three meters ahead, a diver can still enjoy spectacular benthos.

The Lemaire Channel – one of the most scenic passages in Antarctica



DIVING IN ANTARCTICA: PLANNING YOUR VISIT

Recreational Scuba diving in Antarctica is a very specialized form of tourist travel, only becoming available in the last two decades. Before this, diving in the Antarctic was the exclusive realm of scientific programs and journalists. Of the 35,000 people who currently visit the continent each year, divers make up a very small percentage. However, Antarctica is fast becoming the world's number one extreme dive destination, and each year the number of divers grows. Organized dive travel to Antarctica is currently limited to a few expedition companies and charter boats, but this is enough to give you several choices for planning your perfect trip. Getting to Antarctica for diving is not the simplest nor the cheapest vacation to choose, so it is important to plan carefully, asking yourself certain questions before you invest in this once in a lifetime experience: What means of travel – ship or yacht? Do I want to enjoy land activities as well as diving? How many people do I want to travel with? How much money can I afford to spend? How long can I be on vacation? The section below aims to give you some insight into your options, and help you make a more informed choice.

Choosing your dive expedition

The majority of tourism takes place in two distinct regions of Antarctica. The Ross Sea sector, south of New Zealand and Australia, is the least visited of the two, with as few as 500 passengers traveling there a year. A much longer sea journey is required to reach this coast and sea ice conditions are more challenging. Therefore few companies run voyages here.

The South American sector is by far the most visited, and where the majority of tourist dive activities take place. South of Argentina and Chile, this sector encompasses the Antarctic Peninsula, South Shetland, and South Sandwich Islands.

Antarctic tourism is ever evolving, and travelers now have a wide variety of means to get to the continent, as well as options of what to do there, choosing from scenic overflights, inland expeditions, or travel by ship. Over 95% of all tourist travel to Antarctica is by sea, and all diving trips use this mode of transportation. Voyages to the Antarctic Peninsula generally take 10–21 days, and the longer voyages may also include South Georgia and the Falkland Islands. The two main ports of departure are Ushuaia in Argentina and Punta Arenas in Chile, although trips may also leave from Stanley, Falkland Islands.

With over 80 operators and 42 ships to choose from, deciding which company to travel with can be a mind-boggling experience. The majority of these companies are members of the International Association of Antarctic Tour Operators (IAATO). IAATO is a member organization founded in 1991 to advocate, promote, and practice safe and environmentally responsible private-sector travel to the Antarctic. Beginning as a assembly of 7 companies, IAATO now has 69 members encompassing ship-operators, land-based operators, ship agents, travel agents, one governmental office, and travel companies that charter planes and ships. Through extensive procedures and guidelines, IAATO has helped to ensure safe environmental practice, appropriate numbers of passengers on shore, site-specific guidelines, and documentation of activities in Antarctica. The member companies have a continued commitment to education through exploration of Antarctica, and recognize the potential

environmental impacts that the increasing numbers of tourists to Antarctica can have. Each have endeavored to set the highest possible industry standards. I recommend researching anyone who is not an IAATO member diligently, but ultimately the company and ship you choose largely depends on what kind of activities they offer, the level of service and comfort you are looking for, as well as personal preference.

Ships sailing to Antarctica are split into four categories:

LARGE CRUISE SHIPS (SIGHTSEEING ONLY)

The largest ships, carrying up to 2,000 passengers, merely cruise to Antarctica, spending one or two days sailing through some of the more scenic areas before heading north again, usually to continue along the coast of South America. These ships make no landings, and offer the more traditional cruise ship experience, with food available around-the-clock, casinos, and shows. There are, however, usually one or two guest lectures who travel on these ships to talk about different aspects of Antarctica.

SMALL CRUISE SHIPS

This category encompasses smaller vessels that have a limit of 500 passengers. Three or four landings are usually made at specific sites during a voyage, but since a maximum of 100 passengers is allowed onshore at any given time, each group is only able to spend a short period ashore during each landing.

EXPEDITION SHIPS

Small vessels carrying fewer than 200 passengers are known as expedition ships. Their small size allows their itinerary to be more flexible, making many landings throughout the trip, sometimes as many as 3 a day. As with all ships in the Antarctic, only 100 passengers are allowed ashore at one time, but even with 200 people aboard, there is plenty of time to explore and enjoy Antarctica. These are the only ships to offer diving to their passengers.

Voyages to the Antarctic Peninsula usually last between 8 and 13 days, with 3–10 days actually spent around the peninsula. Two days down and two days back will be spent in the Drake Passage. This crossing is dreaded by many people, as they may have heard stories of tumultuous seas. Often these accounts are exaggerated, but nevertheless this body of water can certainly cause even the largest ship to move side to side and up and down, so be prepared. All ships will try and make the crossing as smooth as possible, but if you are prone to sea-sickness be sure to bring whatever medication works best for you to avoid being ill.

Although expeditionary in name and nature, these ships tend to offer many comforts, such as *à la carte* meals, cabin service, and naturalist ‘expedition staff’ who are your guides during landings, and are always on hand to answer questions. Inflatable boats called Zodiacs are the main mode of transportation off the vessel, although a special circumstance may allow the ship to drop the gangway and let passengers walk out onto steady sea ice.

Most expedition ship operators offering a dive program do so in conjunction with a program for non-divers. Generally there are only 8 to 12 divers with 1 or 2 dive masters onboard, so activities are arranged with the land-oriented passengers in mind. On a journey



Divers being assisted after surfacing from a dive.

like this, divers usually have the opportunity to dive once a day during the voyage, allowing them to experience the best of the underwater world as well terrestrial Antarctica.

YACHTS

The last option, and one commonly catering to divers, is a sailing yacht carrying between 8 and 40 passengers. In many cases, especially with the smaller vessel (8–12 people), an entire voyage may be dedicated to diving, but on occasion divers may be on board with land-oriented tourists. Because these trips are in small vessels, jointly wind and motor powered, the trips are longer, lasting between 21 and 37 days. Often a passenger will be part of the working crew, learning how to sail, taking turns cooking, and doing various other jobs around the boat. The number of dives offered will depend on weather and ice conditions.

Additionally, there are also private yachts for charter, usually taking a maximum of 12 passengers. This will probably be your most expensive option, but chartering a whole boat, particularly if with a group of divers, will give you more flexibility in your timings and choice of destinations.

For both of the sailing options, it is most important that you have a good skipper, experienced in Antarctic waters, so plan carefully and look for recommendation from others. The smaller and private yachts are often booked far in advance, and many are not available through traditional travel agents.