

OZDIVER

AUSTRALIA'S PREMIER DIVE MAGAZINE

**THE
WHALES
OF
AUSTRALIA**

**BERMUDA
TRIANGLE**

**SCHOOL IS
OUT**

**BACKUP
DIVERS**

**AM I
BENT**

DRAAGONS OF KOMODO



FREE Online Diving Magazine - www.ozdiver.com.au



Editor's Deco stop



This time last year I publish the first OZDiver magazine here in Australia. I am very excited to say that the magazine has done much better than I thought it would, it has a huge amount of readers from all over the world, but mostly from Australia. As the magazine is now available online at www.ozdiver.com.au and through apps for both Apple and Android devices, it is really easy for readers to access: now you can read it anywhere! The team that developed our smart apps for devices did a great job and the final apps are now available for you to download. If you search through OZDiver you will see that the magazine is full of

interesting stories and articles for the diving community of Australia and for divers all over the world. This edition is once more full of articles for everyone, from the beginner diver to the more advanced. I am really excited to attend my first dive show in Australia: The AIDE 2015 Dive Expo, which is happening in Sydney 12 – 13 September. We will have a stand there and I will also be doing a talk about finding a living Dinosaur. Most people thought that the Coelacanth had been extinct for many years, but when a few divers started to look for them and found them deeper than 100 meters, it changed the history books. I was part of many Coelacanth expeditions and swam with this living Dinosaur in its natural habitat. This is just one of the talks that will be on at the show. There are many speakers from all over the world that will come to the show to share their experiences with you on many different topics, so we all hope to see you there. If you want to publish your articles or photos in OZDiver magazine do not hesitate to contact me. I hope that you enjoy this edition of OZDiver.

The Editor & Publisher

Johan Boshoff



-it is all about the journey and not the destination

Genesis 1

1 In the beginning God created the heaven and the earth. 2 And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.

OZDIVER

Editor-in-chief

Johan Boshoff
johan@ozdiver.com.au

Marketing

info@ozdiver.com.au
+ 61 (00) 44 887 9903

Photographer

David Caravias

Contributing Editor

Libby Straughan

Proof Readers

Libby Straughan
Irene Groenewald
Charlene Nieuwoudt
Izak Nieuwoudt

Administration

Amilda Boshoff
amilda@ozdiver.com.au

Creative Director

TheDiveSpot-OZDiver

Web Master

Triangular X

Publisher

Johan Boshoff
TheDiveSpot-OZDiver

Distribution

In GOD I trust.

Contributors

Christopher Bartlett, Nuno Gomes, David Caravias, R Bester, JBeulah & Roland Mauz, Pieter Smith, Dr Jean Vorster, Pieter Venter, Jill Holloway, David Holloway, Quintin de Boer, Neil Wiltshire, Pieter Herbs, Barry Coleman, Don Shirley, Andre Crone.



Johan Boshoff



Libby Straughan



Amilda Boshoff



Available on the
Android Market



Available on the
App Store



it's FREE and it's online

WWW.OZDIVER.COM.AU

Important note:

OZDIVER Magazine / The Editor / The Publisher / TheDiveSpot-Ozdiver. The views expressed herein are those of the authors and contributors exclusively. Editorial and photo contributions are welcome and can be sent to us. All due care will be taken with material, photos, information submitted. BUT OZDIVER Magazine / The Editor / The Publisher / TheDiveSpot-Ozdiver cannot be held responsible for loss or damage. OZDIVER Magazine / The Editor / The Publisher / TheDiveSpot-Ozdiver assumes NO responsibility to return unsolicited editorial, graphic or other material. All rights in letters, e-mails and unsolicited and graphic material will be treated as unconditionally assigned for publication and copyright purposes, and material will be subject to OZDIVER Magazine / The Editor / The Publisher / TheDiveSpot-Ozdiver's unrestricted right to edit and comment editorially. OZDIVER Magazine / The Editor / The Publisher / TheDiveSpot-Ozdiver is fully protected by copyright and nothing will be reprinted in whole or in part without written permission from the publisher. OZDIVER Magazine / The Editor / The Publisher / TheDiveSpot-Ozdiver retains the right to publish your material in all media, including and without limitation, the internet. Some of the activities covered in this magazine carry a significant risk of injury or death. Undertake them only with proper instruction, training or equipment. While reasonable precautions have been taken to ensure the accuracy of advice and information given to readers, the writers, editor, publisher and proprietor cannot accept responsibility for any damages or inconvenience that will arise therefrom.

Primary Contributors



Peter Pinnock



Andre Crone



Nuno Gomes



Fiona McIntoch



David Caravias



Barry Coleman



Christopher Bartlett



Gerrit Maritz

CONTENTS

Regulars

3 - Editor's Deco

4 - The Team

Letters

7 - Log Book

Dive the Continent

9 - OZ News

15 - The Whales in Australia

Weird and Wonders

31 - Turtles

33 - Bermuda Triangle

37 - Garbage Patches

Dive Med

39 - Medical Devices

Dive the Globe

41 - Global News

47 - Papua New Guinea

61 - Komodo

73 - Sakatia Lodge

Wreck Explorations

77 - The Oceanos

COVER PHOTO

Peter Pinnock
www.peterpinnock.com



Peter Pinnock

Through the Lens

87 - Photo Competition

91 - Photo School

93 - Editing School

Giant Stride

97 - School is Out

III - Am I Bent

Technically Speaking

119 - Deep Safety Stops

123 - Q&A - Backup Divers

Instructor Diaries

127 - Log

Gear Talk

129 - Kitting Up

135 - Reviews

Safety Stop

139 - Funnies

Dive Operators

141 - Listings

Whales in Australia - Pg15

FEATURE



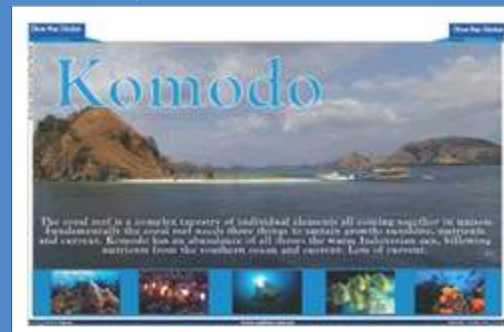
Papua New Guinea - Pg647

FEATURE



Komodo- Pg61

FEATURE



Oceanos Pg77

FEATURE





10 Things that Change when you start Scuba Diving

Not everyone who starts scuba diving falls in love with the sport. However, if you are one of the lucky people who finds release, peace, and excitement in scuba diving, you will probably pick up a few of the habits and behaviors listed below. Perhaps you don't exhibit all of these traits, but if you are addicted to scuba diving, I am willing to bet that more than a few of them apply to you!

1 . You Use Scuba Diving Hand Signals in Everyday Situations

Since it is nearly impossible to communicate verbally underwater (unless you are diving a rebreather), scuba divers use hand signals for basic communication. Dive buddies who dive together regularly will often develop additional hand signals for common communications. So what happens when the buddies go to the supermarket? Attend a concert? Caravan on a road trip? The hand signals come out. Scuba diving hand



signals work well to communicate not only in noisy places, but also over great distances. A scuba diving couple grocery shopping together? She flashes the question hand signal across the supermarket, and then holds up an eggplant. He signals back using the okay sign. Car trouble on the road? The driver hangs his hand out the window, and signals "not okay" and "slow down" to his buddy in the car behind him. I have even observed divers use fish identification hand signals to secretly comment on the personality traits of people around them. This habit becomes even more pronounced with technical scuba divers, who have a much larger set of standard hand signals for communication. Admit it tech divers, you have used the "hold" sign in daily life before, and your dive buddy responded appropriately by giving the same signal back. You were pleased.

2 . You Obsess About the Condition of Your Ears

The ability to equalize your ears for scuba diving is absolutely essential, and congestion and allergies can make equalization impossible. Days before a dive trip or excursion, it is not uncommon to find a scuba diver wandering around the office periodically pinching his nose and breathing out to check if his ears are working. Air conditioning in the hotel room or car? No! It messes up my ears, and nothing so trivial as climate control is worth missing a day of diving. Going to dinner at a cat lover's house when you have a cat allergy? Not before a dive trip. Does your friend have a cold? Cancel the coffee date until you are back from diving. Similarly, divers who have

experienced equalization problems in the past will often travel with an apothecary of their favorite decongestants, ear drops, and anti-inflammatories, even if it makes passing through airport security a little more difficult.

3 . Dive Gear Begins to Accumulate in the Spare Bedroom

Somewhere between year two and three of obsessive scuba diving, your dive gear begins to multiply. It's the exact opposite of socks in the dryer. While a diver who gives it a little thought may be able track the origin of each item, it still seems that dive gear sneakily accumulates. Where did the three masks come from? How come I have four regulators, but only one works? Six snorkels? Some of the gear probably comes from underwater scavenging, some may be hand-me-downs, some is probably non-functional, and most of it is unusable. All the dive gear is hoarded in a stash most commonly to be found in the spare bedroom (or alternatively the garage if a spare bedroom is not present). Have you ever worried about cleaning the dive gear out of the spare bedroom because your parents were coming to visit? Yup. Enough said.

4 . You Become a Conservationist

Whether you have been scuba diving for six months or six years, it is hard to deny that the health of many underwater ecosystems, most visibly coral reefs, is in danger. Those with long dive careers will invariably have observed a decline in the number of fish and the amount of living coral at their favorite dive destinations. Pollution, overfishing, warming



oceans, invasive species, and poor diver practices are all contributing to the decline of coral reefs. It is easier to ignore the problem when you haven't actually seen the difference between a healthy coral reef and a damaged one. Once a diver falls in love with the underwater world, however, he starts to have an invested emotional interest in preserving it. Serious scuba divers are likely to choose sustainable fish on menus, pick up trash from the beach, and remove fishing line and other debris from the reef. Most importantly, scuba divers often share their concerns with non-diving friends. There are many actions non-divers can take to protect coral reefs. While the declining health of underwater ecosystems is heartbreaking, a diver's concern for the underwater world, particularly when communicated to others in a positive and constructive way, is an unexpected and wonderful consequence of taking up diving.

5 . Your Vacation and Weekend Plans Change


Those who have fallen in love with scuba diving will find that the sport begins to take up more and more of their free time. Trips begin to revolve around the availability of scuba diving at the destination, often to the abandonment of previous vacation plans. Why would you go to Rome when you can stay in a remote hut in Fiji and dive every day for six times the price? Despite the possible mosquitos, seasickness, and food poisoning, remote locations and pristine dive sites start to take priority in vacation plans.

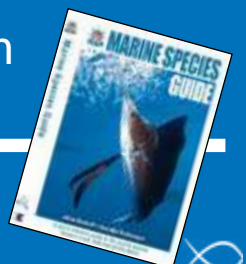
For serious dive addicts, this phenomenon extends to evening and weekend plans. Why would you have a fancy dinner when you can rush from work, brave traffic, and get to the shore at dusk to meet your dive buddies for a night dive? You might arrive home at eleven at night, shivering, exhausted, and salty, but the mental relaxation from the dive makes it worth a little tiredness at work the next day. Getting trashed at the bar Friday night sounds a lot less appealing when you have the option to get up at five a.m., drive to the lake, and brave three-foot visibility for a weekend dive. This might sound crazy, but it's not. Trust me.

by Natalie Gibb - View the original article on www.about.com

WIN

Send your letter to us and win a Marine Life Species Guide

Here is a chance to be heard! If you have anything that you would like to share with OZDiver Magazine and other divers, send an email to Log Book at johan@ozdiver.com.au. Remember that letters have more impact when they are short and sweet. We have the right to edit and shorten letters. In every issue, the winning letter will receive a Marine Life Species Guide. 



OZ News



AIDE RETURNS TO SYDNEY IN SEPTEMBER 2015

Following the inaugural debut at Sydney's Royal Hall of Industries in Feb 2014, the Australia International Dive Expo will return even bigger and better in 2015 from 12-13 September. This second installment will feature pool dive try-outs, a stunning photographic and film presentation of the marine world, a line up of speakers and even bigger children's corner, a series of prizes to be won over the weekend event.

This year, AIDE welcomes more than 50 exhibitors to share their passion for the sport including knowledge of new and existing dive destinations, trends and gear with the growing Australian dive community. Exhibitors include dive certifiers, tourism boards, dive resorts, operators, equipment providers, marine conversationalists, photographers and many more.

Pavilion for photography, conservation and free diving will be set up to welcome diving enthusiasts to share their passion, expertise and knowledge with the public through presentation.

Non-divers interested in learning more about diving can also sign-up to join other newbies for a taste of the sport at the on-site pool. For the try-outs, participants would get an introduction to scuba diving and learn about the basic dive equipment required before getting geared up to experience a shallow introductory dive themselves.

For business on diving, explore trade opportunity, networking and new market through B2B session on 11 September 2015 at the venue.

Visitors will be offered exclusive dive holiday deals, a range of dive courses to suit their requirements, special offers on the latest scuba diving and camera gear, expert tips on underwater photography, information on ongoing marine conservation practices and a host of other engaging activities. And while the adults are kept occupied, children will be kept entertained in a large kids section where they can let their creativity run free, while learning new skills in arts and craft. Visitors will get to watch short films on documentary which will be screened for the 2 days.

Interested visitors will also be able to enter competitions to win:

- Dive gear worth \$4,000 - pool dive try for non-divers;
- Four (4) diving holiday prizes.
- Three (3) prizes for the Facebook competition.

Join us to be part of the show or meet us to SEE, FIND & HEAR everything about the world of scuba diving.

For more information, visit www.australiadiveexpo.com.



Speakers at Main stage

Scott Portelli

Topic: "Photography in Antarctica"

Scott Portelli is an award-winning professional wildlife and underwater photographer. With a passion for the ocean and an affinity with cetaceans including whales, Scott has spent the last decade working with humpbacks, photographing and filming their behaviour both above and below the waves.

Based in Sydney, Scott had travelled the world extensively photographing in some of the most remote destinations, including The Arctic, Antarctica, Galapagos, Azores, Africa and the South Pacific.

He is very passionate about all wildlife from the smallest to the largest and he is always in pursuit of those unique one on one experiences.

Heather Sutton

Topic: "Beginner's 5+ stages of Underwater Photography & associated images"

Upcoming underwater photographer, Heather Sutton was qualified as an open water diver in 2011 and now a dive master. Heather lives couple of hours drive from the coast and knew that she needed another reason to dive other than just getting wet. She jumped into underwater photography early with a Sealife compact camera in 2012 and after an trip to Timor Leste in October of that year, upgraded to a Olympus Micro 4/3rds rig. She is still shooting with a 4/3rds rig but with a few extra toys and working on learning snoot shooting at the moment.

Heather has done about 400 dives and some of these would have been done without a camera for Training dives for Wreck, DM, Rescue and others. She loves diving in Sydney and her images are from Sydney, East Timor (Timor Leste), Fiji and the Philippines.

Heather works as full time Firefighter for Fire & Rescue NSW and diving is definitely her mental decompression space and time.

Adam Thomas Stern

Topic: "Why Free Diving Is For Everyone and How to Do It Safely"

Adam Stern is an Australian free diver, national record holder and free-diving instructor. When traveling Thailand years ago he discovered - diving and since that moment he hasn't looked back. Now, when he is not training for international competitions he runs free-diving courses all over Australia.

Personal Bests-

Constant Weight With Fins: -93 m

Constant Weight No Fins: -64 m

Free Immersion: -85 m (Current Australian Record)

Albert Li

Topic: "Scuba For Change - A unique social enterprise in the diving industry"

Founder Scuba for Change. Albert has over 15 years of private and corporate experience. Albert is Head of Overseas Portfolio for Medibank Private, Australia's largest Health Insurance Company. Apart from SGC, in 2007, Albert co-founded Project New Dawn with The Salvation Army, a homeless-employment and housing initiative, the first project of its kind in Australia.

Since 2007, the Project New Dawn has evolved to a national initiative enrolling major Australian companies and brands as partners and sponsors.

Phil Enright & Lucas Handley

Topic: "Scuba For Change - A unique social enterprise in the diving industry"

Phil Enright is a Health & Safety professional with over 25 years' experience in 'high hazard' operational

and leadership roles. Demonstrated skills mastered in the military and the oil and gas sector as a Health, Safety, Security & Environmental (HSSE) Leader, Crisis Manager and Senior Incident Investigator.

He works nationally and internationally undertaking post incident investigations and training organizations how to identify, prepare for and manage incidents. Phil is also an experience Scuba Diver with over 1000 dives and a PADI Dive Master qualification.

Tunc Yavuzdogan

Topic: "Community Development Projects We Are Running (And Tie This to the Overall Marine Conservation Efforts)"

Tunc Yavuzdogan started diving at the age of 17 and he started his own dive school in 1996 when he was still a student. He founded his travel agency in 1997 and started taking his students all around the world for diving. He relocated to Indonesia in 2008 and decided to settle in Raja Ampat where he had his best dives. He built Papua Explorers Dive Resort in 2012 and he has been actively working on conservation and community development projects since then. He has taught underwater photography in various universities in Istanbul and has many photos published in international publications

Selen Yavuzdogan

Topic: "Endemic Species of Raja Ampat"

Selen Yavuzdogan started diving in 1998. She has travelled and dived around the world with Tunc. She is educated as a textile engineer and has been in the corporate life for 20 years. She quit her job in 2015 to join living the dream with Tunc at Papua Explorers.

Linda Cash

Topic: "Christmas Island is one of nature's most impressive feats, full of natural wonder, including spectacular diving, and the Cocos Keeling Islands are Australia's last unspoilt paradise."

Linda has lived on Christmas Island for 10 years with responsibility for the destination marketing of Christmas Island as a nature based and dive tourism destination through her role as Marketing Manager with the Christmas Island Tourism Association. She also works closely with the Cocos (Keeling) Islands Tourism Association through the joint marketing brand of "Australia's Indian Ocean Islands".

Linda is a Professional PADI Dive Instructor, avid recreational diver and underwater photographer, with a strong understanding of dive tourism marketing in small island destinations. Her personal diving pursuits have included visits to many small island dive destinations including Palau and Sipidan, providing her with the perspective of a dive visitor, as well as a dive tourism professional. However, despite extensive dive travel, her heart belongs to the extraordinary diving opportunities on Christmas Island.

Dr. Kay Dimmock

Topic: TBA

Kay teaches and researches within the School of Tourism and Hospitality Management at Southern Cross University. She has published in numerous peer reviewed journals, individually and collaboratively written book chapters and contributed to technical reports - including management competencies in tourism education, tourism business challenges, international tourism trends and risk management in outdoor adventure.

Her PhD developed a conceptual model applicable to adventure leisure and marine tourism experiences. She has guest edited a special edition of the journal Tourism in Marine Environments and supervised student research programs on interpretive signage in National Parks, and tourism managers adaptation approaches to climate change. She has written the School's first marine based tourism unit for undergraduate studies and works with several post graduate students on their doctoral programs.

Juliette Myers

Topic: Wakatobi: 20 Years Making a Difference

Through our 20 years in operation we have refined and enhanced the Wakatobi experience for you. Learn about our world-class diving, five-star service, resort and Pelagian liveaboard, and how your participation

as a guest at Wakatobi continues to further endow the preservation of our marine sanctuary.

Johan Boshoff – Editor & Publisher of Ozdiver

Topic: "Finding a living Dinosaur"

The dictionary defines 'adventurer' as 'one that seeks adventure' or 'a soldier of fortune'. Johan has been a slave of adrenalin since he can remember. However, his main passion has always been scuba diving and photography. As he always say 'You can't get a better job than getting paid for something you really love.' He started writing freelance as a journalist and after 12 years he still works as a dive specialist and love everything about it"

Being the adventurer that he is, Johan was always pushing the limits and sharks and dives passed the three digits meters were his favorite specialties. Johan also published a number of books, marine slates, educational programmes and smart phone aps for the diving industry.

To relay the whole story of this underwater adventurer will be impossible. As we finish one chapter, Johan experiences something else new. Today he continues to seek opportunities and keep searching for those dive spots that are yet to be discovered.

If it is wet, you will find Johan diving there and these days it is around Perth where he is the editor and publisher of OZDiver Magazine

Debbie Ferguson

Topic: "Swimming with Whale sharks: Diving and Snorkelling on the Ningaloo Reef"

Exmouth Dive Centre offers a gateway to the unique combination of outback Australia & the turquoise waters of Ningaloo Reef. Fulfill the dream of swimming with the worlds largest Fish, the Whaleshark with the best 100% guarantee. EDC is you one stop shop for all Scuba & Snorkelling tours & courses, also offering Free-diving & Mini golf.

With 2 whaleshark licences & 4 boats servicing the Ningaloo Reef, we have plenty of scope for individuals & groups for the best holiday experience.

Jon Shaw - Founder of Ginclearfilm

Topic: "The Wild Frontier of South Western Australia" Film Shot Off Bremer Canyon...A Place With Orca, Sperm Whales, Great Whites ,etc.

Jon Shaw, founder of ginclearfilm, became a certified diver at 13, commercially trained at 19 and gained his instructor rating at 21.

Jon holds a BSc (Hons) Degree in Marine Biology from the University of Plymouth and gained extensive technical knowledge and experience working in broadcasting whilst working for ONdigital in the UK.

Jon has shot for all the major networks both here in Australia and also internationally including National Geographic and has won multiple awards including a Silver ACS Award for Wildlife and Nature. He also has developed and lectures underwater cinematography at the Australia Film Television and Radio School (AFTRS) at Fox Studios.

Jon has shot on multiple formats including, HDCAM, VariCam, XDCAM Ex, HDV and currently us shooting underwater with a Gates Deep Epic and Red Epic / Dragon.

Jon has lead diving expeditions right throughout Australia, The Cocos Islands in Costa Rica, Papua New Guinea, Fiji, Hawaii, Indonesia and South Africa.

Dive Schools / Operators / Organisers / Instructors

Do you have any interesting, newsworthy info to share with the industry? If so, we would like to invite you to send us your OZ News section for possible inclusion in the magazine (please note that inclusion is FREE of charge).

Here's what we need:

- Newsworthy stories (promotional material will not be accepted)
- Word limit: 100 words
- Text prepared in a Word document
- Accompanying high-resolution image(s) are welcome (please supply caption and image credit)

Please send to info@ozdiver.com.au



AUSTRALIA INTERNATIONAL DIVE EXPO (AIDE) 2015

12-13 SEPTEMBER 2015 | ROYAL HALL OF INDUSTRIES, MOORE PARK SYDNEY

SEE
PRODUCTS FIRST-HAND

FIND
NEW IDEAS AND INNOVATIONS

HEAR
FROM INDUSTRY EXPERTS

EVENTS HIGHLIGHTS

- Main Stage Presentation
- Workshop on Free-diving
- Short Documentary Video
- Pool Try Dive for Non-divers
- Photo Comp-Underwater Project
- B2B Meeting for Trade
- Exciting Holiday Prizes to be Won
- Facebook Contest for Visitors
- Kids Zone
- And many more...

SPEAKERS



Scott Portelli



Phil Enright



Albert Li



Lucas Handley



Linda Cash



Madison Stewart
(Shark Girl)



Dr. Kay Dimmock (SCU)



Debbie Ferguson



Heather Sutton



Johan Boshoff



Adam Stern
Freediver



Associate Professor
Michael Bennett (UNSW)



George Manolis

**&
Many More...**

Short Documentary Video "STORIES OF THE OCEAN" contributors



Dr Richard Smith



Michael Aw



Scott Portelli



Madison Stewart
(Shark Girl)



Silke De Vos

Admission Fee

- Online: AUD 4
(Get a free AIDE Luggage Tag)
- Onsite: AUD 5
- PADI Members: AUD 3

Free Admission

- Children below 17 years old
- Trade Visitors & Media
- Senior Divers above 60
- Disabled Divers
- Pool Try Dive Sign Up For Non-Divers



FOR ONLY \$20 YOU WILL GET

- A Free Pool Try Dive
- A Free Hand Towel
- A Free Dive Magazine
- Free Entrance to AIDE2015
- Be In The Running To Win
ScubaPro Dive Equipment
(Worth AUD4,000)



GET YOUR AIDE MERCHANDISE ITEM:

- *T-SHIRT
- *DIVE TANK
PENDANT

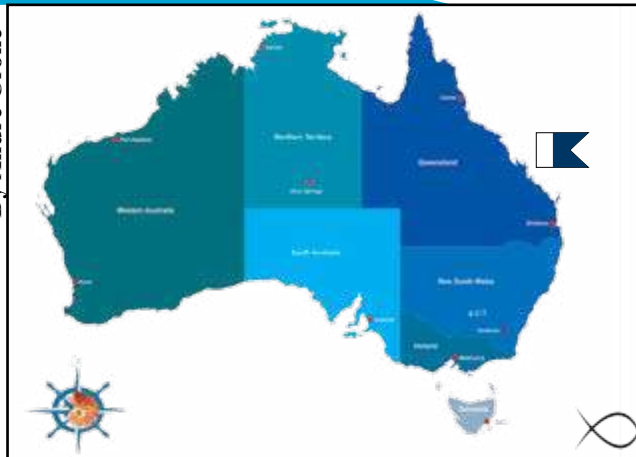


www.australiadiveexpo.com

Whales in Australia

For many divers it is a dream to have the possibility to dive with whales. So when we heard that each year in the months of June and July a large number of dwarf minke whales swim along the Great Barrier Reef in Australia our interest was raised. We decided that we would go and examine this phenomenon with our own eyes and went off to Australia.





The dwarf minke whales are, after the pygmy right whale, the second smallest baleen whale, and it was only discovered in the 1980s. Of course it is thought that this whale must have been there earlier but probably the animal was mistaken for a type of dolphin. As a result of the fact that the animal is just recently discovered, not much is known about it.

The dwarf minke whale is most closely related to the northern hemisphere minke, the *Balaenoptera acutorostrata*. At this

moment dwarf minke whales are considered to be a subspecies of these *Balaenoptera acutorostrata*. The dwarf minke whale has only been seen in the southern hemisphere –there have been sightings in the waters of South Africa, Australia, New Zealand, New Caledonia, Vanuatu and the east coast of South America. In the months of June and July a large number of dwarf minke whales travel along the northern part of the Great Barrier Reef in Australia.

Not much is known about the maximum age that a dwarf minke whale can reach, although other minke whales live for 50-60 years. At an age of six to eight years, and at a length of approximately 6,5m, the dwarf minke whale reaches maturity. Based on the facts known about other minke whales, it is assumed that dwarf minke whales have one calf each year. Minke whales suckle their young during the first five to six months – compared to other whales this period is very short.

The identification of the dwarf minke whale is done by means of the colour patterns





OZ DIVER



IT's FREE & IT's ONLINE



CONTENTS

Regulars:
3 - Editor's Desk
4 - The Team

Letters
7 - Log Book

Dive the Continent
9 - OZ News
15 - Port Kennedy to
Esperance

Weird and Wonders
31 - Manta Ray
33 - Climate changes
35 - Photographers

Dive Med
39 - Hypertension

Dive the Globe
41 - Global News
47 - Manta Mambo
61 - Ras Muhammad
73 - The Hilton

Wreck Explorations
77 - World War II - Part II

Through the Lens
87 - Photo Competition
91 - Photo School
93 - Editing School

Giant Stride
97 - Shape Up
105 - A last glimpse
115 - Micro infiltration

Technically Speaking
119 - Dive Planning
123 - Q&A - Backup

Instructor Diaries
127 - Log

Gear Talk
129 - Kitting Up
135 - Reviews

Safety Stop
139 - Funnies

Dive Operators
141 - Listings

New Recruit

Manta Mambo - Tyl

Ras Muhammad - Tyl

World War II Wrecks Tyl

A last glimpse of the world Tyl

FEATURE

FEATURE

FEATURE

FEATURE

© 2007 Manta Ray Magazine

www.mantaray.com.au

Issue 1 - April 2007

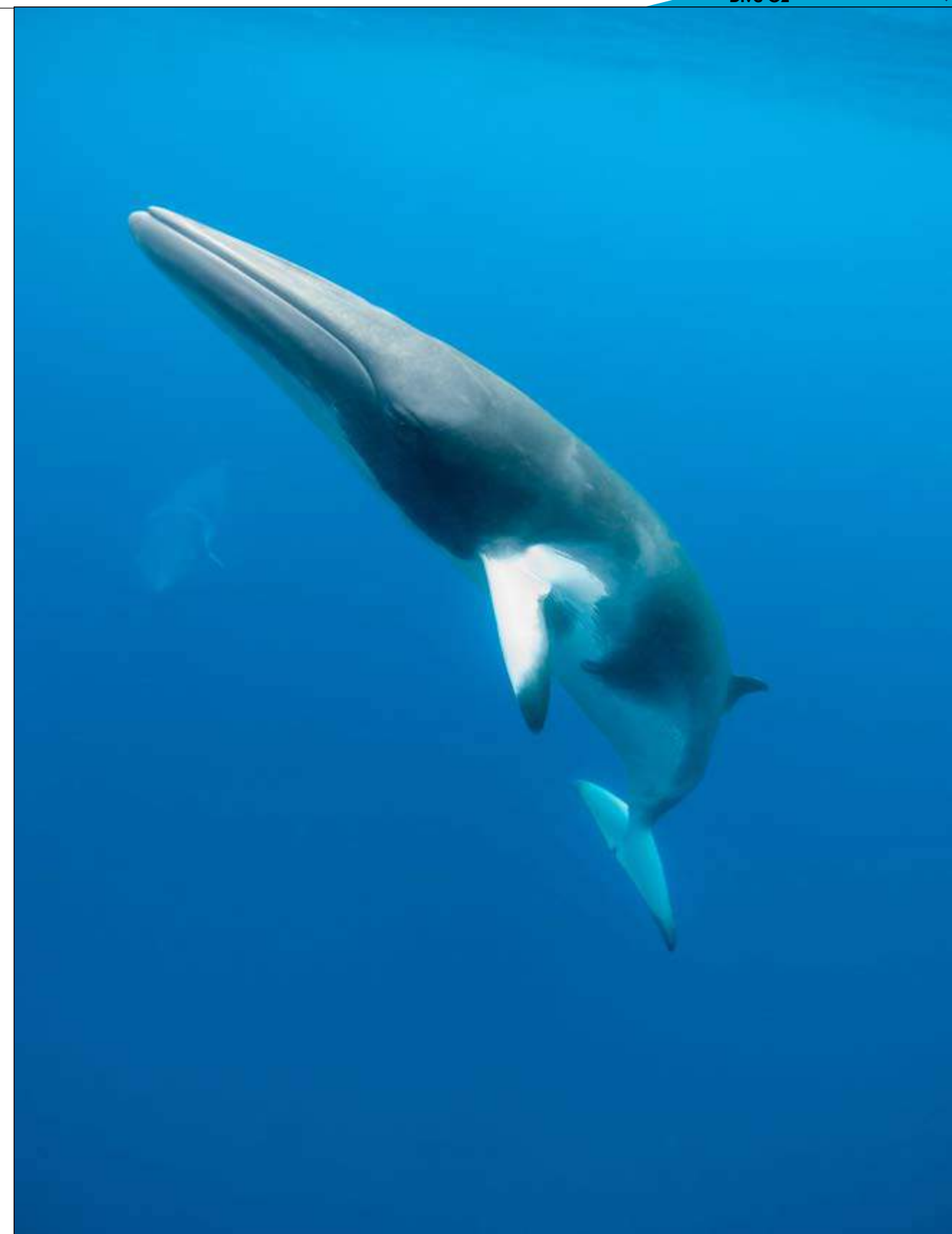


WWW.OZDIVER.COM.AU

on the body. The dwarf minke whale has the most complex colour patterns of all baleen whales. With these characteristics the dwarf minke whale distinguishes itself from the Antarctic minke whale and the northern hemisphere minke whale. The first characteristic is a dark throat and neck patch. From the end of the mouth until the fin, the dwarf minke whale has a dark link. A second characteristic is the colour of the flipper – the tip the flipper is dark but at the base of the flipper it is completely white. A third point on which the dwarf minke whale can be distinguished from other minke whales, and also how individual dwarf minke whales can be identified by, is the colour of the shoulder patch. The shoulder patch is a white area on the side of the minke whale which starts at the upper part of the flipper. With one animal the white shoulder patch could be small whereas other animals have a much large white shoulder patch. Finally, there is also a triangular grey area on the thorax which is unique in colour and size for each individual.

As there is still little known about these amazing baleen whales it is important that more research is done on these animals. Research needs to give us more insight to the maximum age, the migration patterns and the behaviour of the dwarf minke whales. This knowledge is also necessary for us to be able to protect these animals. Since many divers want to see whales close-up, it is important to examine the behaviour of the whales and examine their interaction with divers. In particular, the question of whether the whales are scared of divers is very important for the protection of the animal. On the Great Barrier Reef in Australia they have found a solution where both divers and examining biologists can join together in enjoying the dwarf minke whale.

In order to protect the whales, only a number of vessels have been given authorisation to take their guests in the proximity of the dwarf minke whale. On board every vessel, one or more biologists





travel along to use the opportunity for their research, meaning that diving and the necessary research is combined in a productive manner.

Possibly the most important research vessel is the Undersea Explorer. Leaving from Port Douglas, Queensland, this ship sails in the months of June and July for a seven day trip to the north of the Great Barrier Reef. During the trip two or three dives are done a day to enjoy the reefs of Australia. Yet in between the dives you are on the lookout out to see if there might be dwarf minke whales around.

Besides the divers, up to up to four biologists are on board. They use the trips to collect more data for their research of the whales. Between dives and at night after dinner the biologists give presentations about the whales and other marine life. During the day they are willing to answer any questions you may have.

During our week on the ship we received a lot of information about the dwarf minke whale from the biologists, as well as all the other animals we encountered on the Great Barrier Reef. And while we went off for a dive or relaxed on the ship, there were always a number of biologists on the top deck looking out for a glimpse of the dwarf minke whale.

The first evening of every trip starts with a briefing about the interaction with the dwarf minke whale. The interaction with these animals is subject to strict rules in order to protect these beautiful animals. One of rules was that we would not dive with the whales – as soon as a whale is seen, a pair of lines is dropped into the water from the boat. On each line six to eight people can enter the water. As diving is not allowed we could only wear snorkeling equipment.

A second rule during the interaction with the whales is was that we had to always keep contact with the lines. To make it easier to

keep in contact, a number of loops were attached which we could put around our waist, leaving our hands free to operate our cameras.

At first we thought that these rules were a bit over-the-top, but during the week they appeared to work quite well, especially at times where the ship was not anchored but drifting in the flow it was very pleasant to be attached to the line.

Arnold Mangot and Susan Sobyck, the biologists who joined us on the trip, explained once again the aim of the lines. "Since, at this moment, there is still little known about the influence of divers on the dwarf minke whale, we have chosen to give the whales a choice if they want to come close to the snorkelers."

During our first encounter in the water we were pleasantly surprised by the behaviour of the whales. Directly after it was reported that a dwarf minke whale was in sight the lines were rolled out. At the end of each line one of the biologists was stationed. And of

course a lot of divers were ready in their snorkel gear and camera to get the best place on the line. And what we were about to see exceeded our expectations. At the start of the snorkel session we were told that there were two minke whales around the ship. Once on the line we saw one of these whales in the distance. Very nice, but for a good picture they were still too far away. After some time it was obvious that they really needed some time to get used to us...

At the beginning of the first session the whales swam quite deep below us and under the boat. After some time it appeared that they were swimming in a figure eight form beneath the snorkelers. And after a little bit longer in the water there were more than two whales to see. Our patience was rewarded. As time progressed the whales got used to our presence and became more curious, coming closer and closer.

By the end of the week we realised that




By Andre Crone
this behaviour was repeated during almost every snorkel which we did during our stay on board the Undersea Explorer. The whales needed a bit of time to get used to us, but ultimately they came really close to us.

It was very nice to see how the whales had control in the interaction and to see how curious they were to figure out what exactly we were. The duration of the encounters varied – during some the whales decided that they had enough after about half an hour, yet the longest encounter lasted for more than three hours.

At the end of our impressive trip along the Great Barrier Reef we still had some time to talk to our biologists about their research.

Sobtzick had focused her research primarily on the identification of the individual animals. Thanks to the many pictures she got from the guests during the different trips, and the video she made herself during the encounters, she managed to distinctly identify a number of whales. "What did I

find most particular during my research?", Susan said, "I think the fact that we saw the same whale (which we named Pavlova) in 2006 and again in 2007. And each time when we saw her she presented some great behaviours". Mangott concentrated more on recording different behaviours and sounds from the animals. During the evening sessions he spoke passionately about the jumping whales near the boat and their behaviour underwater, such as belly presentation or coming up to breathe in front of a snorkeler.

After a week with the dwarf minke whales we had fallen in love with these animals. Diving the Great Barrier Reef was very special but our snorkel excursions with the dwarf minke whales will stay with us forever. The gracious movements of these enormous animals are more than impressive. If you are lucky they will not just swim besides you, but they will treat you to some special behaviour, such as showing you their white bellies or breaching. 



BACKED BY METICULOUS WORKMANSHIP
AND SUPERIOR MATERIALS, SUBGEAR'S
TECHNOLOGY AND PERFORMANCE IS WITHIN
THE REACH OF ANY DIVING ENTHUSIAST.



THE ACCENT LT BCD AND THE SG 50 REGULATOR ARE
AVAILABLE IN ALL SUBGEAR AND SCUBAPRO DEALERS

SUBMERSE YOURSELF //

SUBGEAR





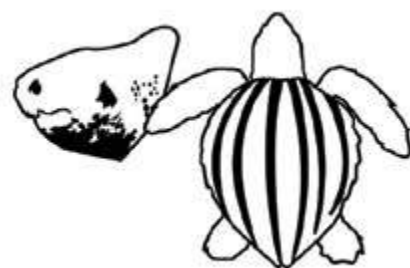
Turtles

Sometimes divers are lucky enough to catch sight of a turtle swimming along our coast.

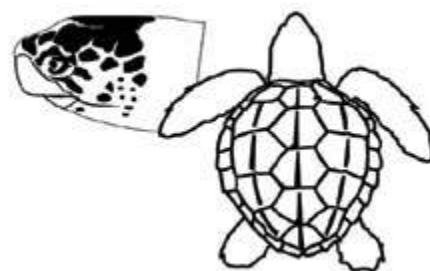
Common family name: Sea turtles

Others in family: Green turtle, Hawksbill turtle, Loggerhead turtle, Leatherback turtle

Scientific name: *Cheloniodea*



Leatherback turtle



Loggerhead turtle

Despite their hard shell turtles are vertebrates and have an internal bony skeleton, unlike crustaceans such as crabs and lobsters that have shells as their external skeleton. The turtle's shell is made from distinctive plates which increase in size as the animal grows. The Leatherback has an unusual shell as the disconnected plates are imbedded in their tough skin. This gives its back the appearance of brown leather and has seven ridges running along it.

Turtles spend their lives in the sea and the females only venture onto land to lay their eggs. Clumsily and slowly they heave themselves across the beach to above the high tide mark. Their flippers are designed for swimming and not for walking. They pant and breathe shallowly as they struggle to row across the sand. Eventually they reach a suitable spot and use their flippers to dig a flask-shaped hole in the sand. The female then hangs her stubby tail in the hole and deposits a number of eggs that look like white ping-pong balls. She carefully covers them with sand and fills in the hole again. The exhausted female then slowly heads back to sea, often stopping to rest along the way. A distinctive track is left on the beach and shows the shuffling of the flippers as well as the marks left in the centre by the dragged shell.

The males wait in the waters just beyond the breakers and immediately mate with the returning females. A female may make six or seven journeys up the beach to lay eggs during a single breeding season. Many a female has been hacked to death while laying her eggs by people who enjoy the flesh. Fortunately these animals are protected in South Africa and are not killed. Some people eat turtle eggs, but the albumen does not congeal and turn white even if boiled

for a long time. This raw look can be off-putting, which is just as well for the conservation of these creatures.

The eggs lie incubating in their sand nests and are warmed by the sun. After three months the babies hatch to face the most hazardous few hours of their lives. When hatching they are less than fifty millimetres in length. They must first dig their way to the surface and then head for the sea. They instinctively know which way to go to reach water's safety, but there are many hungry predators waiting to eat them. During the day gulls swoop down and at night ghost crabs and other animals catch them. Even in the sea waters they aren't entirely safe and sharks scoop them up by the mouthful.

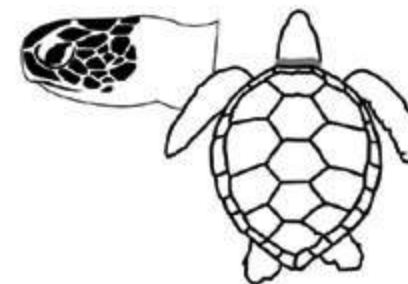
The babies drift around in the open sea and eat tiny animals they find floating on the surface. The older turtles come close in to shore and dive down to catch sea snails, crabs and shrimp. While turtles don't have teeth, they have powerful beaks instead. As they breathe air through their nostrils just above their beak, it's necessary for the turtles to raise their head above the water every so often to get fresh air. The green turtle is a vegetarian and lives on seaweed and is the turtle that is used to make soup.

Hawksbill turtles used to be caught in large numbers because their shells have attractive markings. These markings are not obvious when the animal is alive as the shell is covered with growth. The plates have to be polished before the bright colours emerge. The shells were made into combs, spectacle frames and various other ornaments. The introduction of plastic has saved many a Hawksbill's life. █

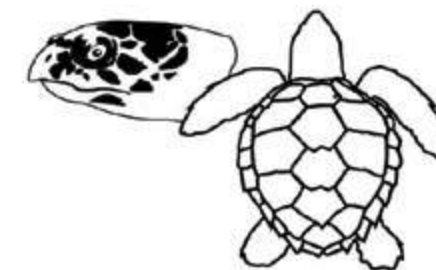
Common family name: Sea turtles

Others in family: Green turtle, Hawksbill turtle, Loggerhead turtle, Leatherback turtle, Olive Ridley turtle

Scientific name: *Cheloniodea*



Green turtle



Hawksbill turtle

Bermuda Triangle

If you are interested in wreck diving, the best place to do so must be the Devil's Triangle. Think about it: planes, schooners, colliers, tankers, and of course the lost city of Atlantis... but some of the deepest trenches also lie here, so that will be diving for another day (or century).

The Bermuda Triangle is a big topic for debate as there are plenty of facts stating that there is nothing paranormal or mysterious about the area, yet in any good debate there are two opposing sides – more than enough questions abound that will make you believe that this is in fact a really strange place.

First things first, where is this place? Well, obviously close to Bermuda... Bermuda forms the most northern part of the triangle (in the North Atlantic Ocean) and from there, a point somewhere on the coast of Miami, Florida and the triangle is closed at San Juan, Puerto Rico. This is the area most authors use, although some authors differ and include the Gulf of Mexico. So already we have two schools of thought and we haven't

even touched on the real mystery yet.

The first strange anomalies happened in the 1400s when the famous Christopher Columbus recorded strange compass bearings in that area. His logbook stated that his crew observed "strange dancing lights on the horizon" and "flames in the sky". And this was not the last strange occurrence. After this plenty more planes and ships 'vanished' into thin air and this is where the real issue starts.

Probably the most famous disappearance in the Bermuda Triangle is that of Flight 19. In 1945, five Avenger torpedo bombers lifted off from Fort Lauderdale Naval Air Station, USA on an advanced over water navigational training flight. The crew,

under the command of Lieutenant Charles Taylor, never returned. On that fateful day, an intercepted radio message was the first sign that the planes were lost. The message was believed to be between the leader of Flight 19 and another pilot indicating that the instructor not sure about his position and the direction of the Florida coast. The aircraft was also experiencing malfunction of its compasses.


Again the mention of compass malfunction. In a lot of the disappearances these two words were also mentioned. There are numerous schools of thought about exactly what happens in the Bermuda Triangle and compass variation is one of them. Some groups believe that unusual local magnetic anomalies may exist in the area. This forms part of the natural thought reasons for the many disappearances in this Devil's Triangle. Hurricanes, the Gulf stream with a surface velocity of 2,5m per second, Methane hydrates (a form of natural gas on the continental shelves) and rogue waves are all more theories for the strange disappearances of vessels – although most of these will not influence aircraft.

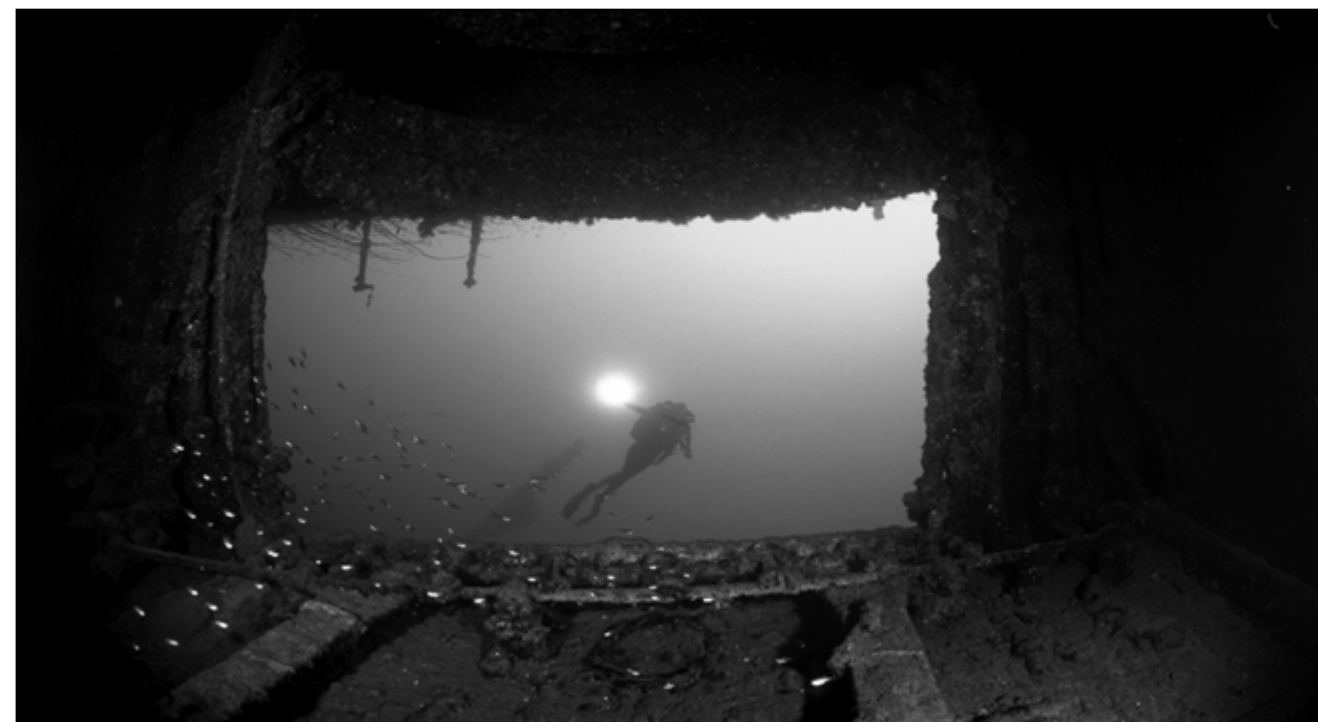
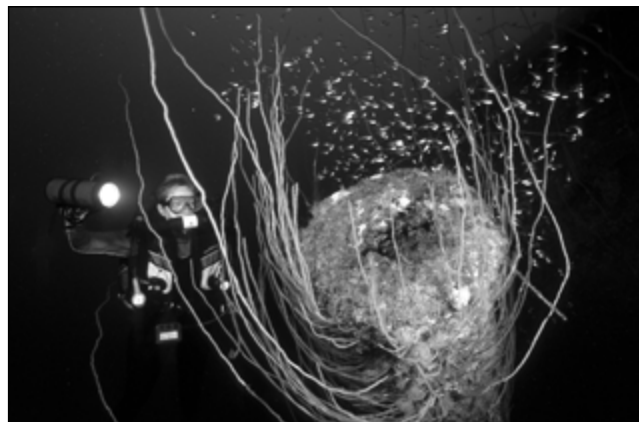
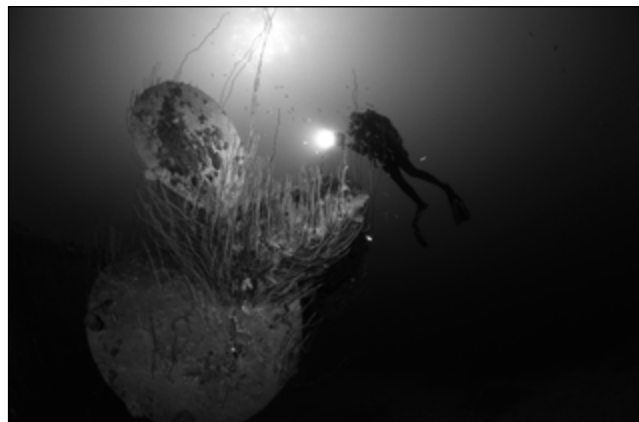
Of course there is the school of thought that believes it is a supernatural phenomena. Some writers believe disappearances happen because of left over technology from the lost continent of Atlantis, which according to them falls partly within the Triangle. Others of the same school of thought attribute the abnormal events to UFO's.

Then of course you have the school of thought that believes that this is all rubbish and that there is nothing sinister about the Bermuda Triangle

disappearances – people such as Lawrence David Kusche, a research librarian from Arizona State University. He concludes that the number of vessels and aircraft to disappear in this part of the world is not significantly more than in other areas. He also mentions that with the disappearances that have happened, writers have not mentioned storms or heavy weather on the day of disappearance. According to the Naval Historical Centre in Washington DC, the five bombers that left US ground under the command of Lieutenant Charles Taylor, experienced stormy weather that day...

Kusche stated in his book, *The Bermuda Triangle Mystery: Solved* (1975), that, "The legend of the Bermuda Triangle is a manufactured mystery... perpetuated by writers who either purposely or unknowingly made use of misconceptions, faulty reasoning and sensationalism."

Hundreds of planes and vessels have been lost here over the past centuries and the opposite is also true. Daily, planes and boats travel this area and they arrive at their destinations unscathed. And no, there is no single theory that everybody feels comfortable with or that can deliver enough evidence to explain the happenings of the mysterious Bermuda Triangle. But one thing is a fact: Spanish treasure fleets used this route to bring various riches from the New World. And many of these Spanish treasure fleets did not make it out of these seas, so maybe it is not a bad idea to get some maps, organise a trip to Bermuda and maybe, just maybe, find some sparkling treasure. 



EXPERIENCE NEW ADVENTURES & **explore** UNDISCOVERED **worlds**

Have you ever dreamed of swimming like a dolphin or wondered what it feels like to glide through the ocean just holding your breath?

As part of the new digital learning system, SSI now offer:

- **FREEDIVING BASIC / LEVEL 1**
- **FREEDIVING LEVEL 2**
- **FREEDIVING LEVEL 3**

From clear inland lakes, to warm, crystal clear ocean waters, discover a complete new feeling in total silence without breathing noise or heavy equipment.

DISCOVER THE SSI REVOLUTION



Follow our Social
Media network on:



www.diveSSI.com



Garbage patches in our precious oceans

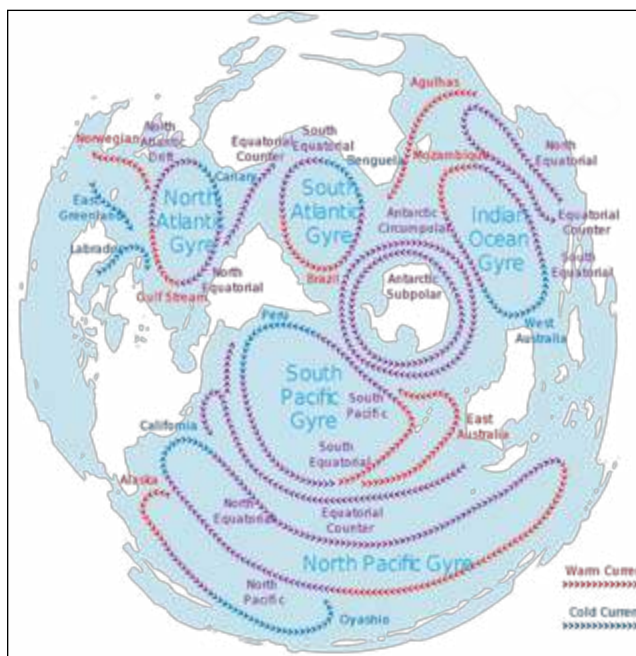
There are five major Gyres in the oceans worldwide, all of which are believed to contain plastic and POPs (persistent organic pollutants), which consist of carbon-containing chemical compounds that, to a varying degree, resist photochemical, biological and chemical breakdown.

Gyres are vortexes of wind and currents that occur naturally in the oceans. They rotate clockwise in the northern hemisphere and counter clockwise in the southern hemisphere, which creates a whirlpool effect where the vortex moves slower at the centre, and that is where a vast amount of plastic and polystyrene debris collects. The one Gyre that we are going to concentrate on is the North Pacific Gyre of which there is more data available. (A similar Gyre is also found in the Atlantic Ocean).

It is estimated that the North Pacific Gyre (also known as the Great Pacific Garbage Patch), is estimated to be double the size of the American state of Texas and it swirls in the Pacific Ocean between the coast of California and Hawaii. The patch is estimated to carry 11 million tons of floating plastic that covers an area of almost five million square miles in the Pacific Ocean, and it is growing day by day.

The Garbage Patch is characterised by a very high concentration of chemical sludge, pelagic plastics and other debris that has been trapped in the currents of the North Pacific Gyre, but despite the magnitude of trapped pollutants, the patch is not visible from satellite photography since it primarily consists of suspended particles in the upper water column. Plastic breaks down to ever smaller polymers and thus these submerged

particles are not visible from space (or they appear as a continuous debris field, making it hard to estimate the exact size). Instead, the size of the patch is determined by various methods of sampling, but how do you determine the boundary between the 'normal' and 'elevated' levels of pollutants of the affected area, as none of these pollutants should be found in the sea in the first place?



The Scripps Institution of Oceanography did a survey mission of the Gyre in August 2009 and found that plastic debris was present in one hundred consecutive samples taken at various depths along a 2 700km path through the Great Pacific Garbage Patch. From the survey, the data showed that although the debris field does contain large pieces, it is on the whole made up of smaller items which increase in concentration towards the Gyre's centre. These confetti-like particles are clearly visible just beneath the water's surface which makes it even more dangerous for marine mammals.

But where does all this garbage come from? One might think that ships are the main polluters of our oceans, but to date no one can surely say that this is the case as many rivers flow into the oceans carrying various amounts of pollutants, with winds and currents sweeping these pollutants away to the Gyres. Pollutants range from old and abandoned fishing nets and plastic bottles to micro-pellets used in abrasive cleaners. Currents can carry debris from the west coast of North America to the Gyre in roughly six years and debris from the east coast of Asia in 12 months, which means more debris carried to the Gyre on a daily basis.

Researchers have studied the effects and impact of plastic photo degradation in the upper water column. Unlike the debris that biodegrades, the photo degraded plastic disintegrates into even smaller pieces down to the molecular level. As the debris disintegrates, the plastic ultimately becomes small enough to be ingested by aquatic organisms which reside near the ocean's surface, upon which the plastics enter the food chain. Some of the long lasting plastics end up in the stomachs of marine birds and animals and their young, such as the sea turtles and Black footed albatross. As if the danger of particles isn't enough, some of the plastics decompose within a year of entering the water, leaching potentially toxic chemicals into the ocean. Floating debris can absorb organic pollutants from sea water, including PCBs, DDT and PAHs. Besides the toxic effect it can have on the body, some of these are mistaken by the endocrine system as estradiol, which can cause hormone disruption in the affected animal.

Let's continue with the effects on the food chain: toxin containing plastic pieces is eaten by jellyfish, which are eaten by larger fish. Many of these fish are consumed by humans, resulting in the ingestion of toxic chemicals that the fish


can't rid its body of. Now if that doesn't give you a reason to start recycling plastics, well I guess nothing will!!

Explanation of abbreviations:

PCB – Not the Pietermaritzburg Chamber of Business, but Polychlorinated biphenyls which are a class of organic compounds with 1-10 chlorine atoms attached to the biphenyl, which is a molecule composed of two benzene rings.

DDT- This was the first synthetic pesticide of the modern age which promised much but caused so much environmental concern because it wasn't biodegradable and continued its path of destruction down the food chain.

PAH – Polycyclic aromatic hydrocarbon, also known as poly-aromatic hydrocarbons, are potent atmospheric pollutants that consist of fused aromatic rings. Napthalene is the simplest example of a PAH.

Estradiol – This is the predominant sex hormone present in females and it plays a major role in the reproductive and sexual functioning, but also affects other organs, including the bones. 



Diving with medical devices

What are the unique implications of scuba diving with a pacemaker?

The heart is a specialised muscle responsible for the pumping of blood to the lungs and various other organs. The walls of the four chambers of the heart are composed of specialised cells, called cardiomyocytes, which contract in a coordinated manner and thereby achieving this vital function. Activation of the cardiomyocytes to contract occurs as a result of electrical impulses. These impulses are generated by a structure located in the roof of the right upper chamber (right atrium) of the heart, called the sinoatrial node. From the sinoatrial node, the activating impulses are conducted to the cardiomyocytes via a network of fibres, called the conduction system.

Several disease processes, such as heart attacks and infiltrative disease of heart, can affect the ability of the sinoatrial node and the conduction system to generate and transport impulses. As a consequence of this the cardiomyocytes are not activated and cardiac contractility fails to occur. This is a condition referred to as heart block. Clinically, heart block can present with tiredness, dizziness and loss of consciousness.

Pacemakers are medical devices implanted to take over the function of the sinoatrial node and the conduction system. These devices are implanted beneath the left or right collarbone and consist of two components. Firstly, the pacemaker unit, responsible for the impulse generation and secondly, the electrodes that connect the pacemaker unit with the heart muscle. Since pacemakers are placed just under the skin, it is subjected to the ambient water pressure when diving. As increased pressure can effect the functionality of certain components of the pacemaker unit, people fitted with a pacemaker are not allowed to dive below 30m.

Dizziness and loss of consciousness while diving can have dire consequences. For this reason, any person experiencing these symptoms should be evaluated before resuming diving activities. In the absence of the above-mentioned symptoms and after careful clinical evaluation by a cardiologist, patients with a fully functional pacemaker are free to dive, taking cognisance of the depth limit. In general, people requiring pacemaker therapy are older, as they are more prone to diseases affecting the sinoatrial node and the conduction system. This is also a group of people more likely to have other associated diseases, such as hypertension and other forms of heart disease.

The need for pacemaker therapy may just be part of a more complex disease/diseases. As a result,

anyone fitted with a pacemaker who wants to start or continue diving, needs regular full clinical assessments by a cardiologist. Watch your depth gauge and check your pacemaker's battery life!



Global News


Study claims ocean fish, seafood could collapse by 2048

According to researchers, the world's fish and seafood populations will collapse by 2048 if current trends in habitat destruction and over-fishing continue, resulting in less food for humans. In an analysis of scientific data going back to the 1960s and historical records over a thousand years, the researchers found that marine biodiversity – the variety of ocean fish, shellfish, birds, plants and micro-organisms – has declined dramatically, with 29% of species already in collapse.

Extending this pattern into the future, the scientists calculated that by 2048 all species would be in collapse, which the researchers defined as having catches decline 90% from the maximum catch. This applies to all species, from mussels and clams to tuna and swordfish, said Boris Worm, lead author of the study, which was published in a recent edition of the journal Science. Ocean mammals, including seals, killer whales and dolphins are also affected. "Whether we looked at tide pools or studies over the entire world's ocean, we saw the same picture emerging," Worm said in a statement. "In losing species we lose the productivity and stability of entire ecosystems. I was shocked and disturbed by how consistent these trends are – beyond anything we suspected."

When ocean species collapse, it makes the ocean itself weaker and less able to recover from shocks like global climate change. The decline in marine biodiversity is largely due to over-fishing and the destruction of habitat, Worm said. He likened a diverse ocean environment to a diversified investment portfolio. With lots of different species in the oceans, just as with lots of different kinds of investments, you spread the risk around. "In the ocean ecosystem, we're losing a lot of the species in our stock portfolio, and by that we're losing productivity and stability."

According to Andrew Sugden, international managing editor of Science, the research shows that we'll have few viable fisheries by 2050. Marine-life reserves and no-fishing zones need to be set up. With marine reserves in place, fishing near the reserves can improve as much as four-fold.

Beyond the economic benefits to coastal communities where fishing is a critical industry, there are environmental benefits to rebuilding marine biodiversity. Depleted coastal ecosystems are vulnerable to invasive species, disease outbreaks, coastal flooding and noxious algae blooms. Certain kinds of aquaculture, such as the traditional Chinese cultivation of carp using vegetable waste, can also be beneficial, according to the scientists. However, farms that aim to raise carnivorous fish are less effective. 

By Deborah Zabarenko



Patagonia's New Plant-Based Wetsuits And Goal To End Neoprene Use Across Surf

By Mike Lewis
Imagine if the back of your truck smelled like Eucalyptus instead of rotting rubber. Now imagine that your petroleum wetsuit was not only an air freshener in your board bag, but was made of plants, was 30% stretchier than your top of the line neoprene suit, dried faster, and kept you warmer. Winter surf trips are sounding better already. In mid-November, Patagonia announced that after a four-year search for a material that would reduce the environmental impact of its wetsuits, it was officially releasing suits made from Yulex, a bio-rubber made from the Guayule plant.

The suits, which are a partnership with Yulex Corporation, are being rolled out on a limited custom basis starting in Japan, but Patagonia has much larger plans for the material. First they're planning to make Yulex suits available in the States next fall, and then they're hoping to make them available in the suits of every other brand across the industry.

"Patagonia doesn't plan on making any money on this initially, it's never been about that but rather it's always been trying to use business to implement and inspire change to the environmental crisis," says Patagonia Surf Director Jason McCaffrey. "We saw an opportunity to do that, and this is just us letting everyone know what is possible. For us a perfect world would be to see everyone switch all or a large part of their wetsuit production to Yulex." We caught up with McCaffrey to learn more about the material and the mission.



How did you connect with Yulex on this project and what properties of the guayule-based substance showed promise?

Our Director of Advanced research and Development [Tetsuya O'Hara] found Yulex, and met with Jeff Martin its CEO. The company produces agricultural-based latex allergy-friendly biomaterials for the manufacturing of medical, consumer, industrial and bioenergy products. Right off the bat the properties of the material showed great promise. It needed very little water and no pesticides to be produced. It also had great stretch, recovery, UV resistance and durability. It also doesn't have the super sensitizing proteins that a lot of people are allergic to in synthetic rubbers. We always knew traditional neoprene was the dirtiest part of what we were making. We added wool to make suits warmer, so we used less neoprene, but it wasn't a solution, it wasn't good enough. In a perfect world we knew the best solution would be a completely different product that replaced neoprene.

The technology involves homogenizing the entire hedged guayule shrub. Rubber is found primarily in the bark and must be released in the processing. Branches are ground, releasing intact rubber particles and creating an aqueous suspension. The suspension is then placed in a centrifuge for separation. The rubber portion of the mixture is culled off the top, much the same way that cream is skimmed off milk, and purified.

We immediately knew the rubber produced from Guayule was good, but it wasn't formulated to perform as far as wetsuits were concerned. We saw potential in the finished product and we knew there would be challenges but we couldn't turn our back on the opportunity to find a material solution to the dirtiest part of every wetsuit on the planet.

Sounds like an amazing substance. Give us a little background on the trials and tribulations of this four-year process.


I lost track of how many trials we went through years ago, I think I would be conservative in saying hundreds? Every time we solved one problem we would find another, but eventually after four long years we got to a place where we were happy with stretch, performance, durability, and warmth. We used our best-selling R2 front-zip suit as the benchmark—we figured if we could match that then we could confidently claim a viable alternative while continuing to improve and innovate on what we had. It turned out that the material performed better than expectations. In fact, lab tests show that it has 30% more stretch than the neoprene we use in our current R2 suit. Needless to say we are pretty happy hence the announcement, but this is just the beginning. Our goal is to continue working until we get a formulation that is 100% Yulex and eliminate neoprene from our wetsuits altogether.

Funny story: Phil Edwards was called the Guayule kid. Apparently the government grew guayule as a rubber alternative during the war in the fields of South Carlsbad where he used to search for surf when he was a grom. I guess it's just like Pipeline, he was on it first!

You guys are rolling this out with suits that contain 60% Yulex. How do the suits compare with neoprene suits as far as fit, performance, and durability?

I've slipped people suits and haven't told them about the Yulex. Some people don't notice anything, some people just say, this suit fits great. What people notice more than anything is the smell, the rubber smells like eucalyptus or to some people pine trees. It's pretty wild. I asked the Yulex guys on our trip to Japan why that was and they said it was from the plant sap. The Yulex rubber is harvested from the bark of the plant, and that sap gets mixed in with it during the conversion process. It's pretty wild because once you notice it the smell stays in your head. Regular wetsuits smell like the floor of a gas station in comparison.

Sounds like a game changer for the back of trucks and garages up and down the coast. Why aren't you making them entirely from Yulex? Is this a proprietary deal with Patagonia?

That's the goal. This is just the first step, hopefully people will see that this is possible and demand to see it from other companies. We're not locking people out on this, we want other companies to embrace this change and incorporate it into their lines. We want to roll this out like we helped roll out organic cotton; we want to prove to the industry that people will pay a little extra for something built responsibly. If people will buy it, then competition takes over with a byproduct being a cleaner truly more environmentally friendly product. 

PROTECT THE WHALE SHARK

Reaching 18m in length, the whale shark is the largest fish in the world. A harmless plankton eater, its slate blue body is painted by a myriad of pale spots and stripes, a pattern unique to each individual. We have very little knowledge of the biology of this relatively rare species, but we do know they roam enormous distances in the world's warmest tropical oceans. Whale shark populations are in decline and we don't want to wait until they face extinction, but without more information we cannot prove just how endangered they are. By contributing your photographs, you can help Project AWARE to protect these magnificent creatures.

Project AWARE, in collaboration with the Shark Trust, developed the whale shark ID project to encourage the public to become involved. Much like tracing human fingerprints, the unique colour "body print" on an individual shark is key to current research. Photographs of specific parts of the shark can be matched against existing records, so that we can understand how these creatures migrate and how their populations are structured. This information is essential for planning the conservation management of the whale shark. If you have been fortunate enough to come across a whale shark whilst diving or snorkelling and have photos you can submit, please visit www.whalesharkproject.org. If you would like to learn more about the whale shark project, you can visit www.projectaware.org. For a brochure, please e-mail info@projectaware.org.uk



Send us your news.

Do you have any interesting, newsworthy info to share with the diving world? If so, we would like to invite you to send us your Global News section for possible inclusion in the magazine (Inclusion is FREE of charge).

Here's what we need:

- Newsworthy stories (promotional material will not be accepted)
- Word limit: 150 words
- Text prepared in a Word document
- Accompanying high-resolution image(s) are welcome (please supply caption and image credit)

Please send to info@ozdiver.com.au





Enjoy pure performance

NEW PRESTIGE 15X

ADVANCED PERFORMANCE AND RELIABILITY

PRE-ORIENTED LP AND HP PORTS
COMPACT AND LIGHTWEIGHT
WIDE PURGE BUTTON

Compact, reliable, and performance are the key words for describing the new Mares first stage. Featuring the DFC system, it meets all divers demands at any depth. The new valve guarantees longevity and advanced performance. A medium-size second stage is made of ultralight techno-polymer. The large purge button is effortless to use while wearing gloves. The VAD system delivers excellent and natural breathing at any depth. The superflex hose is light and flexible for maximum comfort. Available in two stylish colourways.

ULTRALIGHT TECHNOPOLYMER

Abrasion resistant and affordable, ideal for diving in warm and moderate water temperatures



DYNAMIC FLOW CONTROL (D.F.C)

Minimises intermediate pressure drop during inhalation thus maximising gas delivery, especially under extreme conditions



A.C.T. VALVE - ADVANCED COATING TECHNOLOGY

The new valve in the "X" systems increases durability by an astounding 600%, even under the most extreme conditions



V.A.D - VORTEX ASSISTED DESIGN

The air bypass tube delivers air to the mouthpiece creating a swirling vortex with a low pressure area in the centre that keeps the diaphragm down during inhalation, for very sensitive and easy breathing at all depths



FLUID DYNAMIC DEFLECTOR

Receives and properly directs the airflow from the bypass tube to the mouthpiece



SUPERFLEX HOSE

Extreme light weight and exceptional softness guarantee the maximum freedom of movement



mares
just add
water

New Frontiers Papua New Guinea

Papua New Guinea is just waiting to be explored. In 1930 villages were discovered in the highlands whose inhabitants had never seen civilization and had never even heard of the invention of the wheel. There are few roads, no railways and limited air travel. Transport between the 1400 or more islands is by boat, the only affordable ones being hand carved wooden outriggers. It's this lack of development that allows the true beauty of Mother Nature to shine in the many of the coral reefs. ∞



PNG

By Jeanne Liebetrau and Peter Pinnock

The north of New Britain Island is well known for its outstanding dive sites, however from January to March monsoons bring wind and rains that affect the diving conditions. The south of the island is remote, undeveloped, uncharted and protected from these monsoons by huge mountain ranges. Recently the liveaboard dive vessel, Stardancer, made a few trips along the south coast finding some virgin reefs, exotic fish, Bohemian critters, World War II wreckages, extreme walls and challenging channels. Yet there is still more to be discovered.

The 10 day trip aboard Stardancer departs from Rabaul, a town considered the 'Pearl of the Pacific' until 1994, when the 2 volcanoes on the perimeter of Simpson harbour erupted simultaneously smothering her in 5m of ash. Even as we depart from Rabaul volcano Tuvurvur blasts a cloud of ash and rocks into the atmosphere. First stop along the south coast is Waterfall Bay. As the crew set up the mooring

lines outrigger canoes gather to watch, yielding the same fascination that we would have if a spaceship landed in our back yard. They soon become known as the 'staring committee' welcoming us at each new dive site.

The ocean is an unbelievable seductive azure blue that one only reads about. For the dive brief we all peer over the side of the boat as the distinctive features on the bommie below are described. In the shallows stony hard corals grow with confidence. Anemones thrive nestled between coral boulders. There's a variety of anemone fish including the vivaciously coloured clown; the post-box red spine-cheek and even the ambiguous bonnet anemone fish – is it a hybrid or not? Heading into deeper water the classical Pacific Ocean beauty unravels– large gorgonian seafans, huge barrel and leather sponges, colourful crinoids and tunicates, long whip corals and delicate soft corals. The sea is so calm I can hear my bubbles explode as they



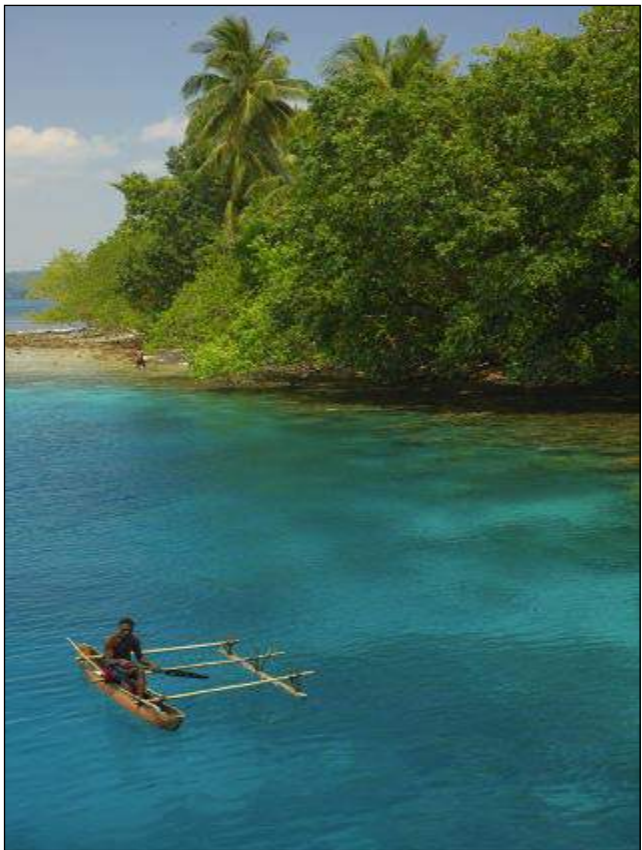
break on the surface. The fish are skittishly wary of our alien presence. Oscar, the dive-guide, tugs on my fins to get my attention. Right in front of me is a brilliant green black rhinopias frondosa more commonly known as lacy scorpionfish. This is not a common fish. In fact the second specimen ever was discovered in PNG in 1980. Here I was seeing one on my first dive in PNG. Despite it's striking colours it is well camouflaged resembling reef debris or algae. Only the mirror-like eyes are a dead giveaway.

Later we explore a boring looking sandy slope inhabited by an astonishing amount of critters. Dozens of shrimp and goby combos are performing earthworks refashioning the slope for community living. Goby heads pop up all over the slope as they survey the landscape while their blind shrimp companions shovel sand and debris from their tunnels. A rotting log forms home for some scribbled pipefish. Nearby, an aesthetically compromised Caledonian devilfish walks on talons instead of fins. His hostile looking spines and fins send me in search of something friendlier but instead I find an aggressive panda anemone fish chasing anything that comes within 5m. I never saw the school of eagle rays that supposedly glided overhead.

Further down the coast is Gasmata Bay, a huge natural bay protected by a fringing reef. Beyond the reef wall lies the Solomon Sea and the Solomon Trench, one of the worlds deepest trenches. Upwellings from the trench bring nutrient rich waters to the coastline and consequently good fish life. Stardancer spends a few days in Gasmata exploring the area. The general dive plan is for 2 outside reef or channel dives in the morning optimizing the good lighting for photographers and then muck dives in the afternoon and night dives inside the bay. Channel dives on an incoming tide are very exciting.

There is plenty of fish action as the fusiliers and anthias planktivores feed in the current and in turn are fed upon by the carnivorous kingfish and jacks. The entrances are patrolled by schools of barracuda, mackerel and tuna. Occasionally a shy reef shark swims by. I can never understand why creatures at the top of the food chain are so wary. A series of bommies in the middle of the channels provides shelter from the currents. In the sand gullies shy garden eels retreat into the

PNG



PNG

By Jeanne Liebetrau and Peter Pinnock



PNG



PNG

By Jeanne Liebetrau and Peter Pinnock



sands as soon as divers approach while the sand anemones, sea cucumbers and seastars can't escape closer scrutiny. One exceptionally large green seapen catches my eye. The stem is the size of my wrist. The central column forms the foundation of an apartment building. Every level is occupied by tiny porcelain crabs while a many-host goby plays caretaker using the main stem as an elevator to all levels. This is communal living at its best.

The water temperature is a balmy 28 degrees. Wonderful, I thought. Alan Raabe, one of the owners, was not so enthusiastic about the temperature. "We need the cold water to bring back the critters". Alan swears that Harlequin Ghost pipefish move on if warm water prevails and this seemed to be true – they were conspicuously absent from their known sites. The frog fish too, were absent from their usual hideouts but there was still an endless supply of unusual critters. For example in Gasmata Bay there are quite a few mandarin lairs. It's only at dusk when the mandarins begin their mating rituals that they can be clearly seen. The male and female rise in unison above their coral rubble home to spawn, their dorsal fins erect



PNG



and colours blazing. Even though the sexual encounter is over in an instant, the lucky male may mate with more than one female per night, but for the females one male a night is enough.

This gives photographers a second chance. As night descends upon the reef it's time to search for other critters. A bobtail squid smaller than a ping pong ball curls up in a hole; a sand octopus chases after a likely meal; goat fish forage using their chin barbels churning up the sand and leaf rot. I spot a sudden movement - a juvenile lizard fish has taken advantage of my torchlight and grabs a fish momentarily blinded by the light. It looks like the voracious predator has bitten off more than he could chew; the hapless victim is half his size. But he persevered and slowly the still wriggling fish is engulfed.

During WW2 Gasmata Bay was occupied by the Japanese as a seaplane base. The many rivers running into the bay and the dense vegetation created natural hiding places for the planes. One sea plane didn't make it back to base safely and is lying upside down in 22m water. One wing is missing but the two bombs are still intact in the bomb bays. Little is known about its history.



PNG

By Jeanne Liebetrau and Peter Pincock

Almost underneath the wing tip some tiny pygmy seahorses are entwined in a muricella seafan. These days Lindenhafen Fishing Retreat is the only civilization in the area. Operators John and Sharyn Scallan welcome guests ashore for a traditional Papua New Guinean sing-sing. Locals spend days weaving leaves and flowers together to create exotic outfits. The sing-sing is led by men carrying the chief in a sedan chair. They are surrounded by warriors bearing painted wooden swords and spears, some beating kundus drums and women and children dressed in nature's finery. It's a colourful spectacle.

The ambience on board Stardancer belies an energetic diving holiday. There is no limit to dive times. The dive tender 'Magic Bus' is always nearby to pick up divers. The dive guides know their sites well and their trained eyes find critters easily. Chef Andrew has a passion for creating gourmet meals despite the difficulty obtaining supplies. Service is outstanding. Alan refers to Stardancer as a 'floating hotel – sailing only on calm seas'

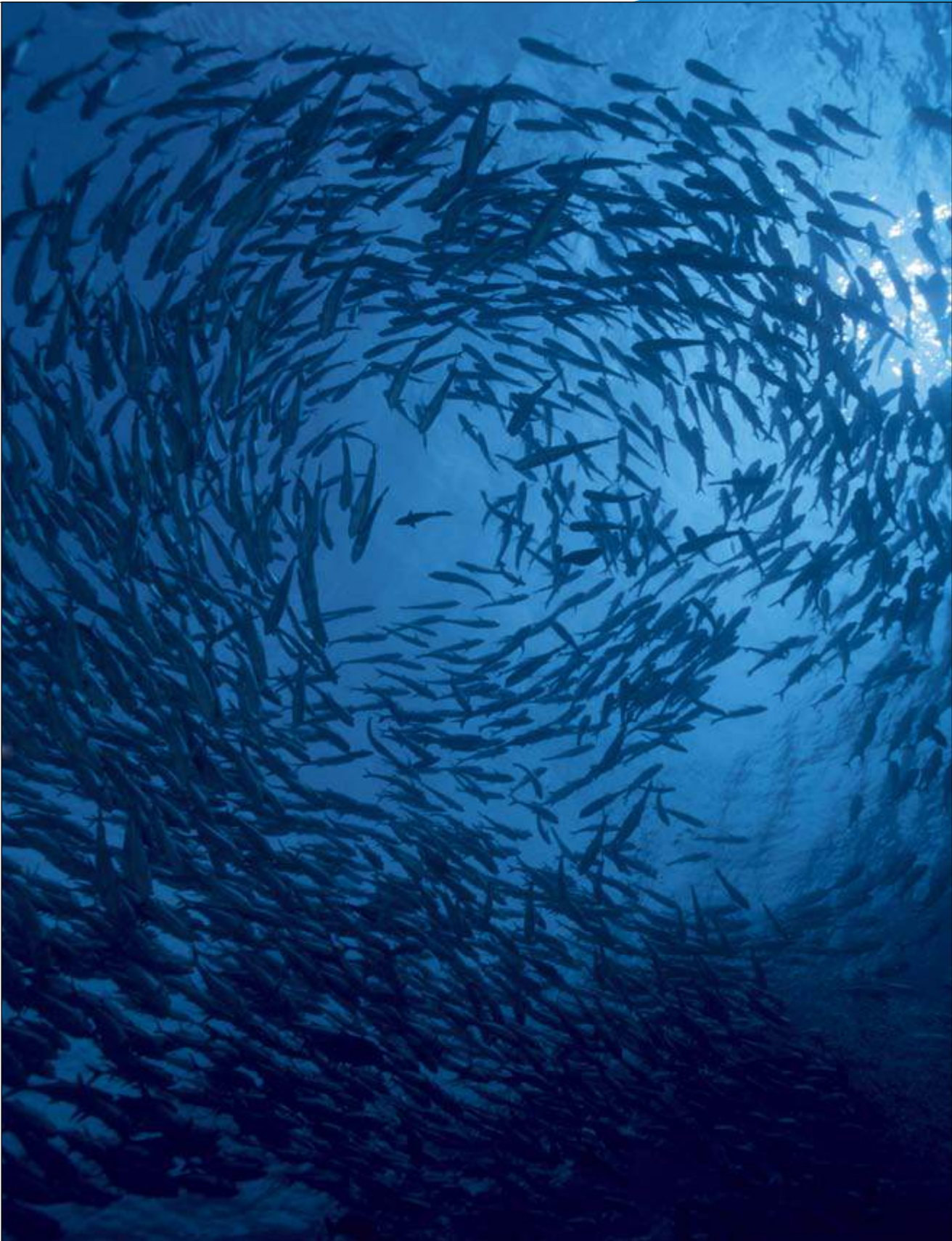
On calm seas Stardancer heads back up the coast stopping at the Duke of York Islands in the channel between New Britain and New

Ireland. The diving here is also superb with rich seamounds rising to a few meters below the surface. The mounds are interspersed by valleys of fans and barrel sponges. Close to an island are 2 Japanese Chi-ha tanks. There is much speculation as to how these came to rest parallel to a cliff face in 4m of water. Word has it that the Japanese were bombed whilst towing them aboard a barge, but the gun turrets are missing and it's more likely they were dumped after the war. The final dive is on the wreck Atune, a fishing wreck purposefully sunk in 1998. A school of batfish have taken up position as the new crew operating from the wheelhouse as they observe the new growth taking place on the wreck.

PNG land right customs are complicated and Alan isn't having an easy time negotiating with locals for dive rites. Luckily he has lived in PNG long enough to know not to give up. Stardancer will continue to find new frontiers in PNG. Perhaps after more exploration the unimaginatively named sites could be renamed. 'Pygmy paradise' sounds better than 'the reef'; 'gold rush' instead of 'the channel' or 'the wall' could become 'way out wall'. I leave that for intrepid new explorers to decide.



PNG



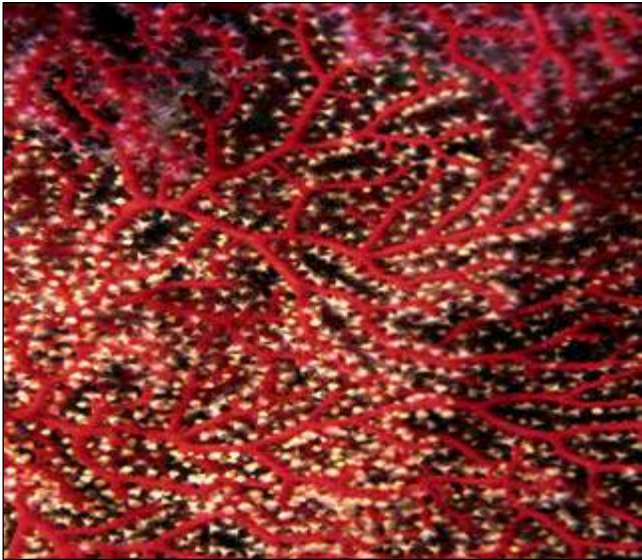
PNG

By Jeanne Liebetrau and Peter Pinnock



FACT FILE

Location: NE of Australia 0 –14 degrees south of the equator
Language: English is widely spoken, as is Pidgin English
Visas: a 30-day visitor’s visa is required
Currency: kina
Water temperature: 24–30 C



PNG



DIVE AUSTRALIA

LOCATE A PADI DIVE SHOP TODAY



PADI

DISCOVER AMAZING REEFS, BEACHES & WRECKS

Boasting incredible diving from the Great Barrier Reef, to pristine dive conditions off the expansive coastline and beaches all around the country, Australia is a destination like no other. Whether you are inviting family and friends to become PADI certified divers or taking your next PADI course, there is no better place than Australia.



Visit padi.com or your local PADI Dive Shop to find out more.

© PADI 2015. All rights reserved.

The ocean
is calling



PADI

PADI eCard™

Visit padi.com to order today

Free Diving Champion/www.estrellanavarro.com
© PADI 2015. All rights reserved.

Komodo

The coral reef is a complex tapestry of individual elements all coming together in unison. Fundamentally the coral reef needs three things to sustain growth: sunshine, nutrients and current. Komodo has an abundance of all three: the warm Indonesian sun, billowing nutrients from the southern ocean and current. Lots of current.



Every 12 hours when the tide turns there is a tidal handshake between the Pacific Ocean in the north and the Indian ocean in the south. Vast quantities of nutrient rich water are sucked and pushed between the Flores and Sumbawa islands by the two oceanic giants. The handshake becomes an arm wrestling match and Komodo is the referee.

My first introduction to the jostle is at a dive site called Lighthouse Point. Converging currents from both sides of Komodo Island meet here. After a slow drift with the current we reach the point and are buffeted from both sides by the surges. I am plucked from the reef and forced into an eddy that pushes me off the reef and deposits me 50m in the deep blue. My exhaled air bubbles swirl around me as if in a glass of champagne. The eddy then gently sucks me back to the reef. What a wonderful joyride. I fin back into the eddy and take the ride again. And again. Then one last time just because it's fun. It is an amazing experience that elevates life above the trivial and mundane. The rest of the dive group are not as enthralled as I am as they cling grimly to the reef.



After the dive I make friends with Bev, an effervescent lady with a robust sense of humour. "Bev, how was the dive?" "Oh no Pete, that current was too much. I think I have developed an allergy toward strong currents." With that I launch into an explanation of the joys of tidal interchange.

The coral reef somehow reminds me of



Singapore. Don't even dream about hitting the streets during the day. They are deserted – mostly because of the oppressive heat. As soon as the sun sets and the conditions are more bearable the city comes to life. It goes through a metamorphosis and changes character completely. Throngs of people hit the streets and open-air markets and the city comes alive. See where I am going with this? Ask any fisherman if they catch fish when there is no current? Not easily. As soon there is a semblance of a current it whips the reef into life. Nutrients in the water column strike the reef and cause upwellings – perfect for the filter feeders and bait fish who dine on plankton. They congregate in large schools at the edge of the reef and in turn attract the large predatory fish. Like a fridge full of beer, it's just too convenient to stay close. Bottom line – current is good, learn to love it.

Back to Komodo. Batu Bolong is a tiny rocky outcrop in the strait off the east coast of Komodo. The reef is pristine and undamaged due to the strong currents that sweep over it. The site is one of the best in the park – a Komodo classic. Timing is of the essence. It can only be dived in the narrow window of opportunity

around slack tide when the current is not too strong. Anything in between and you will only catch a fleeting glimpse of the reef as you are swept past it. The walls of Batu Bolong plummet vertically into the depths below. Every inch of the exposed reef face is covered by hard and soft corals, sponges and invertebrate life. White-tip reef sharks, Napoleon wrasse, sweetlips, dogtooth tuna and rainbow runners patrol the current-facing side of the reef. Clouds of shimmering goldie's and dominoes hover in the shallows. It's a classic Komodo dive. Stunningly beautiful.

If Batu Balong is a classic Komodo dive then Fish Bowl is clearly a memorable dive. In the narrow channel between Gililawalaut and Gililawabarak islands is a narrow canyon. I arrived at the bowl at the turn of the tide. To someone that has not been there before they would have swum straight through the yawning cavity without a second thought. It is empty of fish and forests of yellow soft coral hang limp from the walls. Within minutes the tide started to turn. It's a secret switch for the fish bowl to come alive. A magic switch. As the current grows the snappers





from the surrounding reef start to congregate in the narrow opening feeding on microscopic plankton in the water column. Goldies flutter frantically as tons of water is squeezed through the narrow channel. Slowly the orange soft corals come to life, fed by the current. Kingfish circle at the entrance to the bowl and a manta glides overhead. Leaving the bowl I am greeted by colourful sweetlips, then schools of sergeant majors followed by fusiliers. The metamorphosis of the Fish Bowl is complete.

Nearby is Castle Rock – we dive it is early in the morning when colour starts to leak into the sky from the east. The first long rays of light pierce through the ocean's surface transforming it from grey to cobalt blue. Feeding time... Fish are just like us; when they wake up they like to feast on something. Fusiliers and mackerel swarm in the open water. Giant trevallies move among them. Dogtooth tuna patrol the reef's edge and below them congregate the white-tip sharks. Occasionally the giant trevallies dive into a school of glassies. The entire reef system reacts. All the fish swarm to the cover of the reef to avoid the ensuing chaos. Then, slowly, they all return back into the water column. An underwater ballet of chaos orchestrated by predators.



I call my spousal unit back at home. "Honneybunny. I am having the time of my life, but the current is cranking and the tourists are restless." "Tell them to harden up and get with the programme." "Typical response", I think to myself. Spousal units get grumpy when you go off to frolic in the sea without them.

Next stop is Sangeang, a volcanic island born out of the earth's anger. This island is Komodo's answer for muck diving enthusiasts. Dark volcanic sand spills from the beach. Black corals and bommies dot the underwater landscape. Nudibranchs, ghost pipefish, paperfish and pygmy seahorses are top of the agenda. Tiny bubbles of air trickle from the dark volcanic sand and rise gently towards the surface. I keep myself occupied photographing a juvenile ghost pipefish. Then it was on to a crinoid shrimp cunningly disguised in the same colour as his host.

"That was a dive. I'm speechless, quite emotional," rejoices Bev like a wine connoisseur celebrating a bottle of Saronsburg Shiraz. Yes, that's exactly what she said. The only time I have ever been emotional after a dive was when the boat ran out of beer. "Glad you liked it – are

you coming for the night dive?" "No thanks, I am going to enjoy sun downers." "That's stylish. Treating your allergy with Bombay Sapphire." I smile to myself and go off alone for the night dive.

This turned out to be the most humiliating dive of my life. I've been around for a while and seen lots of cool stuff. I am comfortable that I can find the odd critter. Then along came a dive guide called Irwan. Out of nowhere he finds a Spanish dancer, two double spot lionfish and a pair of frogfish. I start to suspect that he is pulling the critters out from his pocket when I am not looking. For the finale he produces a pair of exquisite harlequin shrimps. Unbelievable. The take-away lesson from this one: stay close to your guide.

From my trip to Komodo three years previously I have vivid memories of sightings of large schools of big pelagics – dogtooth tuna and schools of barracuda. This time around they did not appear to be so abundant. Where are they? Climates change and fish migrate. Perhaps they have moved on. Perhaps they have been caught to feed the growing local population of the Flores islands? I have no scientific evidence to support this... Komodo is a national park and fishing is restricted within its 17 square kilometre area perimeters. The park, however, has not been patrolled for the last two years and it's common to see local fishermen fishing within the perimeter of the park at night. As soon as the dive boats arrive in the morning they move off. This leaves a bad taste in my mouth. I try to wash it away with a Bintang, but it does not help.

No science is required to identify the sound of underwater blast fishing from outside of the park. Water is a magnificent conduit for sound waves and blasts can be heard from miles away. The blast sends a fatal shockwave through the water killing any living animal in close proximity. To the diver it's a crescendo of noise. I heard it a few times at Komodo. It makes me instantly grumpy. Some fellow divers thought it was a volcano erupting – wrong. Blast fishing is illegal in Indonesia, however, the vast ocean expanses are just too large to monitor and patrol. Ignorance rules supreme. Blast fishing is a cheap and easy means to harvest protean – in the short term. I approached one of the Indonesian dive guides and ask him about the increase in blast fishing. He agrees, shrugs his shoulders and changes the topic. I get the impression that he knows it is a problem but there is little an individual can do about it.



The Komodo dragon is unique to this area. It is not fully understood why they only exist on and around the islands of Komodo. The Komodo dragon is a monitor lizard. It has a long and slender neck, powerful jaws, five-clawed toes and a long thick tail. It is the world's largest lizard reaching over 3m and weighing over 100kg. For the most part, dragons are docile, but they need to be treated with respect. Their natural diet includes deer, water buffalo and wild pig which are all found on the islands. The dragon's deadly secret is the venom in its bite. It will send the victim into shock and prevents blood from clotting. A large prey like a water buffalo could take up to two weeks to die. The dragon will wait patiently before tucking in. Mature dragons are also cannibalistic. They will happily feed on their younger offspring. To prevent ending up a tasty treat, small dragons will live for the first five years of their lives up in the safety of trees. Dragons can be spotted in the park during a guided walk, yet they can also be seen roaming on the beach in the south of Rinja Island.

Cannibal Rock is the most southerly dive site in the park. It is a small seamount in the well-protected Loh Dasami Bay, between Rica and Nusa Kode. This is the Indian Ocean whereas further north we are diving in the Pacific Ocean. It feels like home to me. Here there is little current which allows for easy diving. The water temperature is several degrees lower than that found in the northern reaches of the park. Being a warm blooded diver I found it frigid. Visibility is not always perfect. Nutrient rich water bellows in from the southern ocean, stimulating riotous invertebrate growth.

Cannibal Reef was discovered by accident in 1992 by underwater photographer Burt Jones. While taking a dump off the side of a liveaboard he looked down and spotted the reef below. Those were pioneering days. He then watched a Komodo dragon devouring another dragon and the name of the reef followed easily. I picked up my quest to photograph a pair of Coleman shrimp on a sea urchin, a quest that failed on my previous trip. In the dense growth we discovered octopus, frogfish, crinoid shrimps and outrageously colourful sea apples. Still no Coleman shrimp – maybe next time. After 60 minutes I was freezing, shaking uncontrollably. Then I have a Larium moment. One of the dive team drifted past me in baggies! Is this guy for real? Of course he is. He just has a lot more natural insulation than me – one of the

downsides of being the proud owner of a bony-ass.

The Komodo ocean is not a still ocean. It moves. Moody and tempestuous. It breathes with the change of tide. Continually. On the surface the water can bubble and swirl. It charges between islands. The dry barren landscape of the Komodo islands give little hint of the wealth of marine life below the surface. Dives are planned around the turn of the tides. It's quite common to change the direction that you are swimming in a number of times during the course of a dive.

The best way to explore Komodo is from a liveaboard. It offers the flexibility to choose your dive sites more carefully along with exploring the reefs in the southern regions of the park that are not accessible by day-boat. I chose the Seven Seas, a luxury boat that offers four dives a day along with exquisite cuisine. The Seven Seas is recognised as being the best liveaboard operating in Komodo. Not forgetting a favourite with the ladies – the toilets flush!

Komodo supports a wealth of biodiversity – at least 253 species of hard coral, over 1 000 species of fish along with endangered charismatic megafauna like dugongs, whales, dolphins and turtles. There are three distinct ecosystems within the park: coral reefs, sea grass beds and mangroves – the engine room of a complex food web that drives the entire ecosystem.

"Classic, memorable and supremely beautiful. Don't you agree Bev?" "Absolutely. Now would you like to join me with some medication for my allergy?" "I'd love to. I'll take mine with a slice of lime".

How to get there:

Fly to Singapore and then on to Bali. There are daily flights to Komodo.

Minimum requirements:

Because of the strong currents, Komodo is considered an advanced diving destination. Average depth: 10-25m.

Travel advice:

The remote areas of Komodo are best explored from a liveaboard 





Sakatia Lodge

Madagascar



One of the most beautiful and accessible parts of the big Red Island is the small island of Nosy Sakatia, a boat ride away from lively Nosy Be and a place with no roads, only footpaths.

It's a short walk through exotic palms, baobabs and lush, sweet-smelling bush to Sakatia Lodge, set at the foot of the Sacred Mountain. This simple and stunningly beautiful place can accommodate a maximum of 16 guests, so it feels intimate and relaxed, and you'll be welcomed as friends by hosts José and Isabella Viera.


The lodge has four large bungalows with verandas and sea views, plus four smaller bungalows with cold water and loos. The bar/lounge area is stunning – a clever combination of contemporary and Malagasy styles – and it's the perfect place to sit and watch the lemurs play in the trees, or enjoy the last rays as the golden sun sets into the ocean. Chef Isabella conjures up amazing delicacies that reflect both her Italian roots and Malagasy influences. Your meal is enjoyed

in the restaurant while gazing out to sea and over the sacred forest. Once on the island, you lose all sense of time. Sakatia is only 6km long and 2km wide, making it perfect for strolling around. The lodge has its own NAUI-approved dive centre and offers NITROX and the gamut of courses, from snorkelling to instructor. The diving is easy – all dives are boat dives and most sites are just a short distance from the launch pad. Sakatia is fringed by coral reef and there's plenty of fun to be had in the channel between it and Nosy Be. Charlie's Point and La Piscine (the swimming pool), a shallow natural aquarium just off Nosy Sakatia, are perfect sites for novice divers, night dives and dive training. In addition to colourful coral, you are likely to see giant cucumbers, turtles and sponge crabs, while at night you can expect exquisite Spanish dancers. There's also plenty of challenging diving for the adventurous. Huge, extensive reefs surround Sakatia and Nosy Be and at their edges are exciting walls and drop-offs. There are also exciting drift dives and a wreck



Dive the Globe

Sakafia

By Fiona McIntosh and Shaen Adey
off Ambatoloaka, Nosy Be's bustling beach resort. At some point of your trip, you're likely to visit the nearby marine park called Nosy Tanikely. The shallow waters around the picture-perfect island are clear and brim with a vast kaleidoscope of colourful corals, starfish, anemones and tiny fish. Turtles regularly entertain divers and you may even spot an elusive sea horse. Be warned though, this is one of the few places in Madagascar where you won't be diving alone. You can expect hordes of day-trippers on the shallow reefs, armed with masks and snorkels. For non-divers, quad biking, deep-sea fishing, trekking, canoeing and trips to other islands and lemur colonies are just a few of the entertaining activities. I would definitely also recommend a visit to Nosy Be to check out Hell-Ville, the island's lively capital, as well as sundowners on Mount Passot, its highest point. Then, if you're not in a rush, trips to the wilder sites of the Mitsio islands and Greg's Wall in the south can be arranged. Oh, if only I had infinite amounts of time... 



YOUR TANK YOUR WAY

ANYTHING YOU CAN DREAM OF, WE WILL
HELP YOU PUT IT ON YOUR TANK AND
MAKE YOUR TANK UNIQUE TO YOU

YOU WILL
NEVER
LOSE A
TANK
AGAIN!

YOUR
IMAGINATION
IS THE KEY
TO OUR
BUSINESS

SO WHY DON'T YOU CONTACT US AND WE WILL HELP YOU
MAKE YOUR SCUBA TANK DREAM A REALITY

EMAIL: GRAFFITISCUBA@GMAIL.COM WEBSITE: WWW.GRAFFITISCUBA.COM

The Oceanos revisited

On the afternoon of August 3, 1991, the Oceanos sailed from East London bound for Durban. She was on a tight schedule following delays due to maintenance and a bomb threat. Another Captain, Avranias, at late notice, replaced the Captain who had been on the ship for a number of years. Added to all this, the weather up the coast was rough and it would be a bumpy ride for the 580 passengers and crew



The Oceanos first came to South Africa in 1988, where she successfully completed a cruise season. Her return in 1991 was to be the first long-term cruise liner in South African waters since the 1970s. Although she was not young, having been built in France and launched in 1953 as a cargo vessel, she was converted into a passenger liner in the early 70s.

At roughly 9:30pm, there were reports of a muffled explosion and the ship lost power. The events following this are very uncertain – fortunately an SOS was sent and a massive rescue operation was undertaken with no loss of life. Meanwhile, off Port Elizabeth, an oil tanker was also in trouble and the two salvage tugs were steaming flat out to her. From the live footage taken, one of the tugs out of Durban can be seen in the background, stopping by to lend assistance on her way to Port Elizabeth.

The rescue of the passengers was

accomplished mainly by the South African Air force, which flew an incredible 7-hour mission to save 220 people. Other ships in the area rescued the balance of the people. There are disturbing stories about the crew abandoning the ship to save themselves and the Captain being taken off the ship in the early morning. The questions remain: what caused the ship to sink? Was it due to a faulty waste disposal system? What was the muffled explosion? The ship sank bow first, was this due to the anchors that were dropped – seen in the live footage of her sinking? Or did the explosion knock a hole in the bow?

With all these unanswered question, we put together a team which successfully dived the Oceanos. This was not easy and after two years of research on the mighty Agulhas Current, I believed that I found a window period where the current slows down and/or even stops. This current is the largest volume of water movement in



By Barry Coleman

the world, with reports that the mean flow speed is estimated between 1m/s or 1,94 knots to 2m/s or 3,88 knots. There were other matters: from the sheer isolation of the area, to weather problems to overcome, winds and tides, swells and general surf conditions for the launch.

The logistics meant we had to overcome the isolation from medical facilities, a 3-hour helicopter ride, transportation of compressor and equipment, and the many problems a team of 18 people incurs.

The in-water team consisted of three divers (Paul Heinerth, Brett Hawton and myself) to the depth of 95m for 25 minutes actual bottom time, two back-up divers (Pieter Swanepoel and Stuart Donkin) at 50m to exchange open circuit gas, and another two back-up divers (Celia Coleman and Elmarie Swanepoel) at 20m for more open circuit gas exchange. Timing was critical for the open circuit deep diver Brett Hawton. We managed two very successful dives on the wreck with a penetration of 60m into the wreck on the second dive. This was a first for one of the most difficult wreck dives in



the world.

By Barry Coleman
Whilst doing those long deco stops on the first expedition with sometimes 22km drift, I decided there and then that I would do it again, but with a difference, and to prove that the window period of slack water wasn't just luck.

On May 3, 2005, a team of four left Durban for Hole in the Wall, Wild Coast, to attempt the Oceanos again. The difference this time around: only CCR divers would go to the bottom with scooters. All the equipment needed fitted into two vehicles with space to spare. Shane Jackson and myself would dive to the wreck and Celia, my wife, and Russell Paul, would be back-up divers from 20m upwards. Craig Lindhorst, a local skipper, was very helpful and knowledgeable about the launch site. The first two days the current was so strong that an old 44-gallon drum and two 20-litre drums were pulled underwater. On the third day, we found only a slight surface current (for this area) and our scooters were able to make way against it.

The descent had to be quick so that we could use the lee of the wreck without fighting the current all the time. So after 45 seconds, we reached 76m. This type of descent must not be tried without the correct training and procedures on a CCR. At 60m we could see 80% of the wreck, which at 150m long meant our viz was at least 40-50m and the water temperature was a nice cool 12°C which was just right for our dry suits. I felt like a kid with a new toy and inspected the wreck for new entry points and delighted in showing Shane the sights.

After 35 minutes actual bottom time (and awesome video footage) we cut our anchor line free at 90m, indicating to the surface the start of our ascent. This dive was made on objective base and not a time base – we could do this due to the six hours available dive time on our CCR and with dual VR3 dive computers, working out our profiles.

To some, this might sound dangerous, but we had multiple printed dive tables for bail out and plenty of open circuit gas in the unlikely event that our CCR failed. The open circuit gases we planned based on the partial pressure of gases, keeping in mind




the total inert gas tension if one had to bail out to open circuit and avoiding isobaric issues, thus keeping the transition from CCR to open circuit smooth. This meant that if we bailed out to open circuit, a minimum of four open circuit switches were necessary.

In view of this, we carried three 80 cubic foot aluminium cylinders (with powerful scooters this was not a problem), with the back-up divers only having to bring down one mix of gas, should the need arise.

Exploration diving like this certainly reduces the workload and allows one to concentrate more on the dive. The total run time for the dive was 191 minutes from start to finish with 35 minutes bottom time and 166 minutes of deco, with a 5km drift. The CNS calculation required us to do only one air break.

For the second dive, all that was required was to re-fill our scrubber (CO2 absorbent) and change over to new three litre 200 bar oxygen and heli air cylinders and we were ready. On the first dive I used 200 litres of oxygen, (about 66 bar, three litre cylinder),

and about the same from the three litre heli air cylinder. Unfortunately other matters outside the expedition meant we were unable to do the second dive.

At the end of the day, I was pleased that my calculations on the current worked again and that we had a most successful and safe dive. As I left Oceanos on the bottom, I decided that I would be back and let her know that she's not forgotten. May she rest in peace and be as kind to those who follow. 

Oceanos facts:

Built for Messageries Maritimes.

Builders: Forges and Chantiers de la Gironde, Bordeaux, France.

Launched: July 12, 1952

Completed: 1953.

Length: 152m/500 ft., draft 6,7m/22 ft

Engine data: Two B&W two stroke, single acting, ten cylinder diesels.

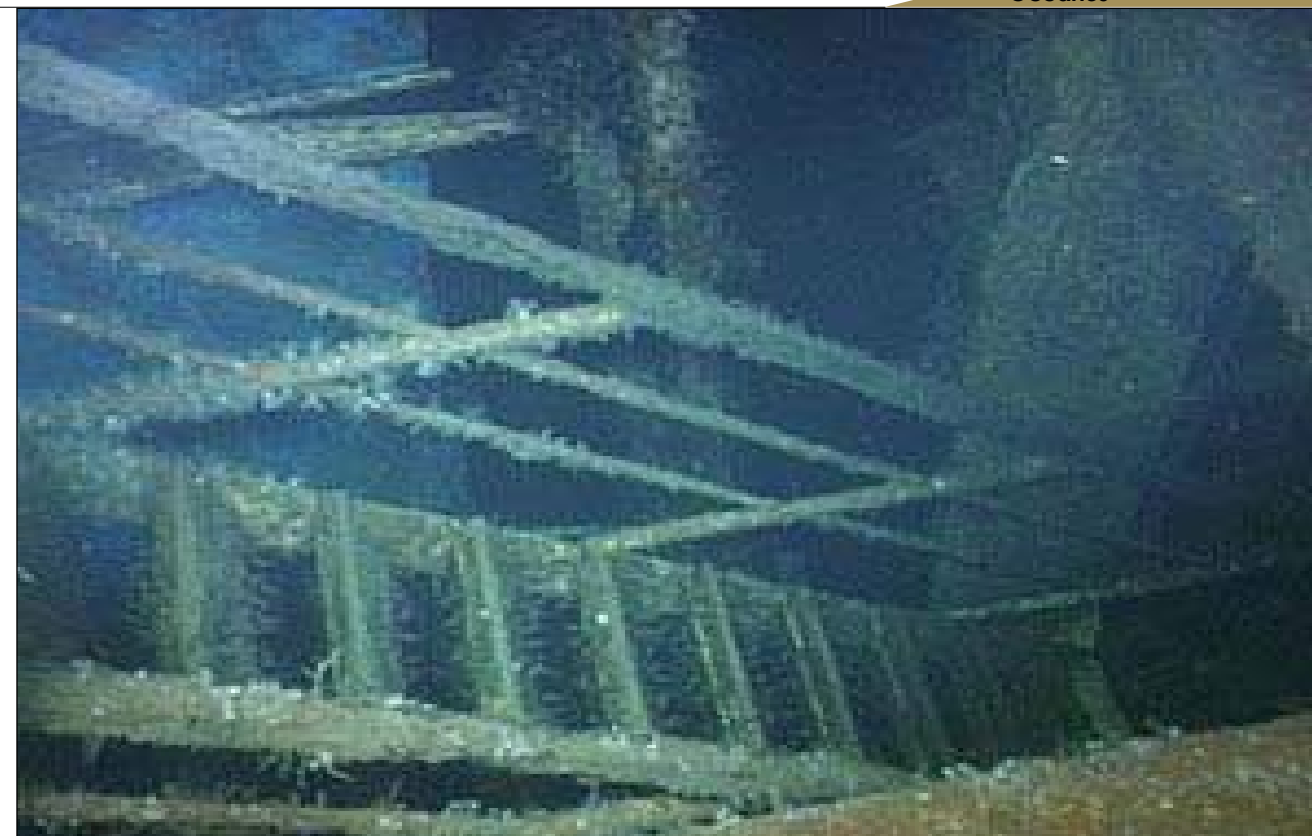
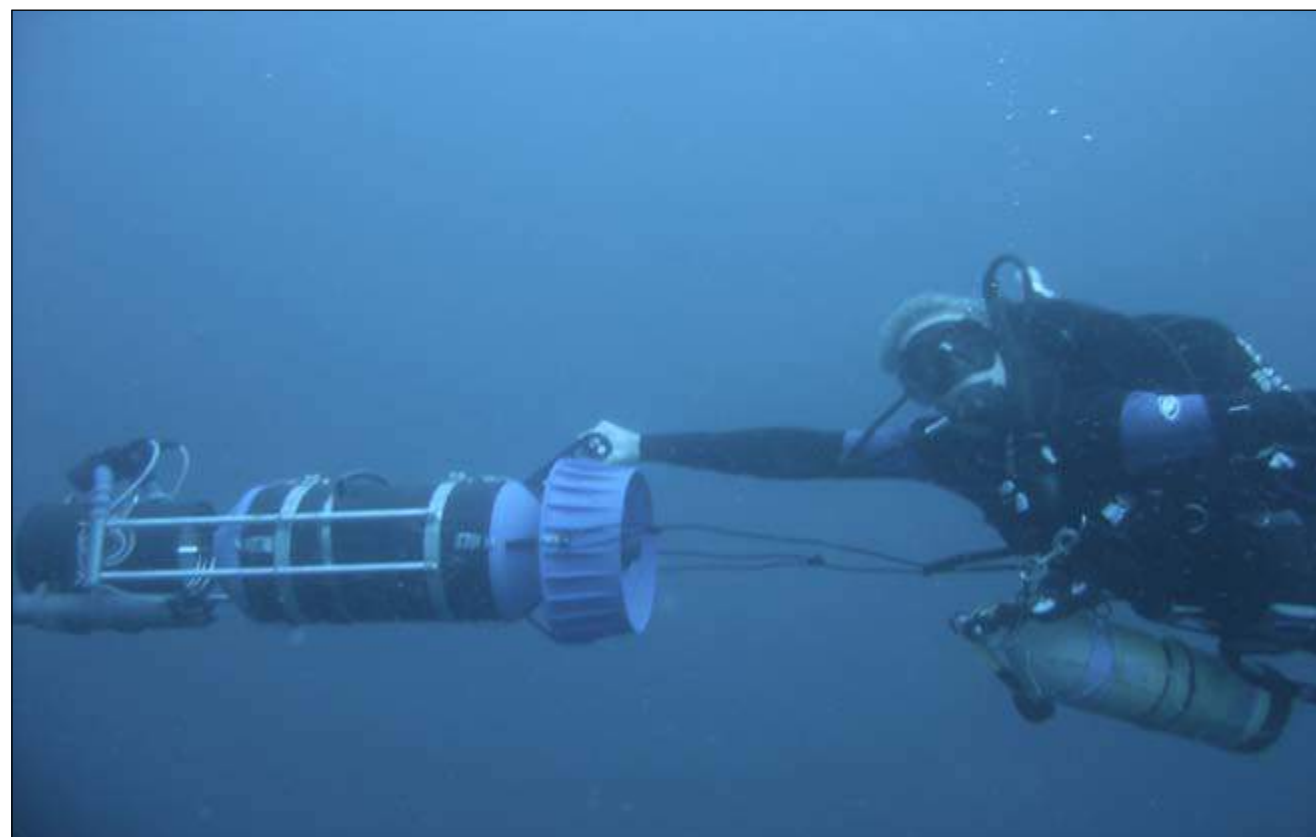
Cruising speed: 16 knots

Capacity: 550 passengers, 250 crew.

Registry: Piraeus, Greece.

Last owner/operators: Epirotiki Lines.

Name sequence: Jean Laborde, Mykinai, Ancona, Eastern Princess, Oceanos.



Photographic Competition



Andrew Kemp



Antoinette de klerk



Amè-Antoinè Bosch



Darren Ninham



Lugene Annandale



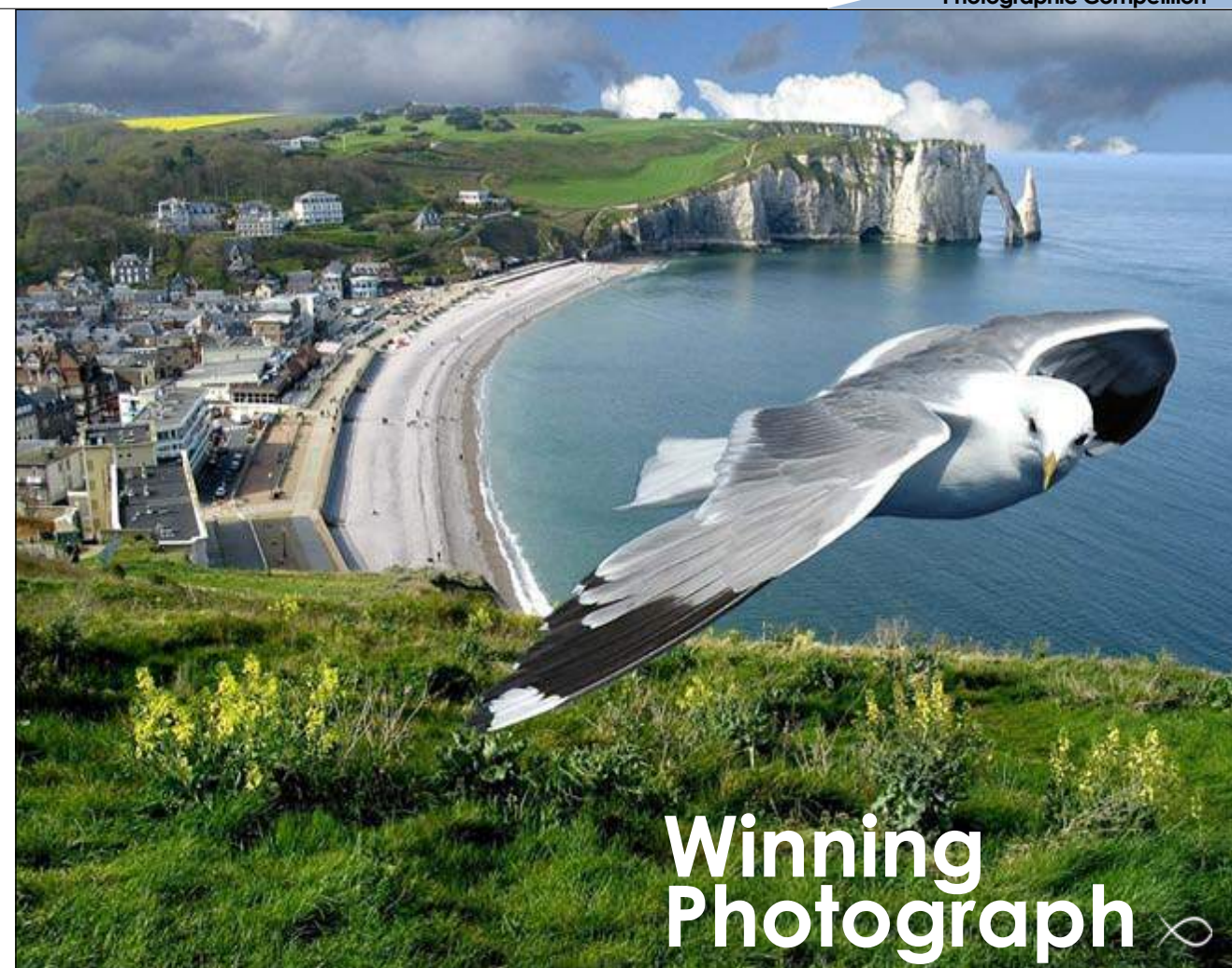
Tim Brown



Caleb Lightening



Trudie Blackett



Winning
Photograph

Tony Brown

How to enter your photograph

Whether you're an amateur or professional photographer, this is a photo competition for all levels of photographers. We're looking for pictures that capture the true experience of scuba diving and the wonders of the underwater world.

Submit your photo!

- Photographs may be taken above or below the water, as long as diving remains the theme.
- The Name of the photograph must be the photographer's name.
- Photographs must not be bigger than 5 MB per photo.
- Submit your snaps in high-resolution (at least 150 dpi) in jpeg format.

Visit www.ozdiver.com.au, click on the "photographic competition" link and follow the steps.



Photo School

Expose it right underwater



In part six of “Expose it right underwater” we will be looking at the TTL function and the strobe as a creative tool.

If you take into consideration how many underwater photographers have some sort of artificial lighting attached to their cameras nowadays, you can safely say that most underwater photographs are captured using a single strobe or more. Light can be a powerful creative element that transforms a boring photograph into one with a ‘wow’ factor. With

today’s technology, a feature known as through-the-lens (TTL) auto exposure can automatically measure and control almost all of the factors that artificial light creates.

Basically, how TTL works is that the camera has a light sensor system that calculates how much power the strobe must use to expose the subject correctly and then measures the light that passes back through the lens onto the CCD for the correct exposure. Once enough light has been received onto the CCD, the TTL system then switches off the



strobe. This all happens in a very short space of time and you won’t even notice it happening. The TTL function works pretty well with close up and macro photography, but there is a slight drawback with the TTL system when it comes to wide-angle underwater photography. The TTL function does not determine ambient background exposure very well, only the strobe exposure for the closest subject being measured, and this is in conjunction with the aperture selected.

One method of dealing with ambient light in the background is by making slight adjustments to the aperture and therefore either under or overexposing your background. Your foreground TTL exposure adjusts automatically in either case. Another limitation of the TTL function is that it cannot provide more light than the maximum power of the strobe, so remember the maximum strobe-to-subject distances you can use. If sunlight dominates the subject then the TTL function becomes pointless and the strobes become a fill-in flash.

A good method of getting the correct exposure when using strobes is ‘bracketing’. Bracketing is when you take three or more photographs of the same subject but you make a slight adjustment to the camera settings, usually the aperture, with each photograph. For example, you would take a correctly exposed photograph and then take one photograph underexposed by one f-stop and then another photograph overexposed by one f-stop. You can then choose the best result.

Finally, there is one element that often becomes a problem when using strobes – and that is ‘backscatter’. Backscatter is caused by small particles that are suspended in mid-water. No matter how clear the water is, this will remain a potential problem. These particles block and reflect light and make your photographs look as though they were taken during a snowstorm. Backscatter generally occurs when your strobes are incorrectly placed. To correct this problem and minimise potential backscatter you can place the strobes ahead of and above the camera or at an angle that will deflect particle-reflected light away from the lens.

Then there is always the question whether is better to use one or two strobes. When starting off in underwater photography, you will probably have one strobe and you will achieve pretty good results. This has its limitations when doing wide-angle photography and with macro photography can cause unwanted shadows. Ultimately, you would want to have two strobes that are identical as this opens up many creative possibilities as they can be used in many different situations.



Photo Editing

With underwater photography, many photographs may tend to look on the blurry side when they are uploaded to the computer. Often this is not the fault of the camera or lens but what is between the lens and the object.

The further away the object is from the lens the more water will be between – a recommended distance to take clear photographs in average visibility would be from 15cm-2m. With most photographs, post editing will make a big difference with your shots and we will show you how to do this.

When taking photographs it is advisable to get as close to the subject as you can to achieve the most detail from your object. Taking photographs randomly when diving without thinking about the end result will most of the time end up in disappointment. If you can, try to take your time and compose yourself. Think 'slow and deliberate' and try to get close to the subject without startling it or causing any interference when moving by stirring up debris. This is difficult to achieve on dives and practice does make perfect – the more you dive the better you will become with your buoyancy and composure underwater.

The main causes of a blurry photograph are:

Slow shutter speed

Make sure that you set the camera to the fastest

shutter speed possible for the conditions. When photographing fish expect them to move rapidly at any time – it will be virtually impossible to achieve a sharp picture of a moving fish without a fast shutter speed. If you can then select a high ISO, for example 400/800 when on a deep dive, which will make the image sensor more sensitive to the light. You will then be able to take a well exposed picture and capture the sharpness of the object in motion with faster shutter speeds. Be careful, however, as the higher the ISO the grainier the picture will become.

Camera zoom

Try to avoid using the zoom on the camera when underwater as the more you zoom in on a subject the more sensitive the camera becomes to movement. Even though you may think that you are holding the camera steady, the smallest of movements will result in motion blur. It is best to set the camera as wide as possible and then get close to the subject to enhance the sharpness and detail of the subject. You will then give the camera a much better chance of taking a good, clear photograph with a faster shutter speed. Some of the best photographs of large animals are taken with fish eye or wide angle lenses that allow the subject to virtually touch the lens, preventing any distortion or noise between the lens and subject. When using a wide angle lens you can get extremely close to the subject and

also manage to fit in the background to enhance the composition and impact of the photograph.

The perfect tool to enhance the sharpness of your photographs

In case you have not read the previous issues, we have decided to show you how to edit your photographs on a free downloadable programme. We have chosen Gimp as this is an excellent free alternative to Photoshop as it shares many of the powerful functions of this industry standard.

Just about every photograph needs to have a little sharpening and you will be surprised at the impact that this has on the shot. This is fortunately easy to do with technology these days and Unsharp Mask is a fantastic tool to help you achieve the best clarity from your photographs. First make sure that your photograph is magnified on the screen in the correct size. To see your whole picture on the screen you will have to zoom out and the standard and most accurate magnification to work in is 50%. This is a uniform size and it will give you the most accurate display to view your changes.



In Gimp select 'Filters' from the top menu, then 'Enhance' and then 'Unsharp Mask'. The Unsharp Mask box will appear and you will have three sliders to work with – Radius, Amount and Threshold.

Radius

The Radius will determine how many pixels the sharpening will affect out from the edge.

Amount

The Amount determines the amount of sharpness that you want to apply to the photograph.

Threshold

This slider allows you to set the minimum difference in pixel values that indicates an edge where the sharpen must be applied. This means that you can protect areas of smooth tonal transition from sharpening and avoid the creation of blemishes on the subject's surface or water surface.

Using all three tools sounds technical and tricky to finetune, but basic playing around with the settings of the three will get you to what you want. Remember that it is your photograph and if you are happy with your settings then that is what matters.



Download Gimp
- www.gimp.org





The world-wide
perpetual photo and
video shootout
with close to
US\$100,000 in prizes!



JOIN THE GLOBAL UNDERWATER SNAPSHOT
underwaterproject.org

 **underwater** australasia
dive in. explore. discover underwater.com.au

School is out!

At Neptune's Academy for Pisces there are no teachers, educators or headmasters, no classrooms or books and no corporal punishment. Yet most of the time there is considerable order with precision control reminiscent of a military parade. The vast ocean is an open classroom where 80% of all fish attend school at some stage of their lives (the other 20% are not considered illiterate – they just prefer their own company and engage in self studies).



Not all who attend school pass the grades – some may stay in school forever, some die along the way and others attend individual short courses where food is plentiful. Some even join school just to do some hanky panky and then they leave!

What do fish learn in school? There are five basic fish school syllabi – life skills, gastronomy, survival strategies, geography and sex education.

Generally a school of fish comprises of fish moving in a co-ordinate manner that are not always of the same species but are roughly similar in size. For example, snappers, fusiliers and surgeons may form large schools. A shoal, on the other hand, is comprised of the same species but not necessarily the same size. Other terminologies used are an 'aggregation' where the members swim in different directions within the group and a 'pack' which refers only to the apex predators that congregate when there is something to feast on. Being the top of the food chain they have no need for order or control. As a result, a pack is a haphazard ensemble with members moving in and out of the group. Most juvenile fish attend 'crèche' and seldom school (juvenile Barracuda are an exception).

In the most popular class – life skills – fish learn the importance of self defense

with an emphasis on safety in numbers. It is imperative to stay with the class at all times as stragglers are easily picked out by predators, which could result in death. It is thought that a large school of fish could possibly resemble one large single species such as a Whale shark from a distance, which could fool predators. Life skills schools often span across depths. Tightly packed together the school effortlessly glides over the reef, constantly on the move and forever changing shape.

The second important lesson learnt in the life skills class is that during an attack it is best to scatter in many directions. This should confuse the predators who have focused on attacking the group as a whole and not singled out an individual. Once committed to the attack it is difficult to adjust focus on a new target while swimming at high speed. There is some belief that those swimming in the middle of the school are safer. This is not necessarily the case as those in the middle cannot see beyond the next fish and rely entirely on feeling the movements of adjacent fish. If the outer fish abruptly scatter and their response is fractionally slower, then they may well be the next target. Typical scholars attending this class are Yellowbanded snappers, glassies and fusiliers.

Nocturnal fish often school during the





By Jeanne Liebetrau and Peter Pinnock

School is Out

day, even though they are half asleep in class. They usually join small classes for the comfort of safety as they recuperate energy levels for night-time hunting. Barracuda, Big eyes and Soldiers are examples of these learners. Squirrelfish, however, don't school but aggregate as if they are on a nearby playground. Slender sweepers tend to school inside secluded classrooms (caves) during the day. As night settles they head out as singles.

Gastronomy is an interesting class specialising in the different dietary requirements of the participants. Plantivores feed on extremely small organisms that are either plant or animal substrate suspended or drifting in the currents. Chocolate dips are often seen schooling in the currents as they rise together, feed quickly on plankton and descend to safety. Also planktivores, Anthias school when the current is running, taking shelter within coral branches as soon as the current drops. Vegetarian fish such as Damselfish and Parrotfish are frequently referred to as herbivores. These schooling fish learn to choose particular sites to farm the herbs, leaving patches untouched so

as not to decimate their food source. Their presence is essential to the health of the reef. Their excreta contain ammonium, nitrogen and phosphorous – essential elements for coral growth.

Omnivores, such as Moorish idols, learn about balanced diets consisting of both plant and animal materials. Corallivores such as certain species of butterflyfish learn which corals are nutritious. Carnivores such as Goatfish learn to use their chin barbels to stir up sand and disturb crustaceans which they are allowed to eat in class. Catfish have an unusual school routine in gastronomy class. They fashion themselves into a tight swirling mass – the front rows of this ball churn the sand, disturbing delectable food, while those fish behind continue swarming, creating confusion to ward off predators. Batfish may assemble for periods in most school subjects – gastronomy, life skills and sex education – while piscevores often don't attend school but follow schools as they find the pupils easy targets.

Pelagics focus on the survival strategies syllabus. Here, hunting as a school gang is



DEEP
DOWN
YOU
WANT
THE
BEST



TECHNOLOGY SETS IT APART.
YOU MAKE IT ONE OF A KIND.

SCUBAPRO.COM



MANTIS

Mantis is packed with all the innovative SCUBAPRO features you've come to know, plus one available nowhere else. You. Using the Human Factor™ approach to product design, it constantly analyzes your biometrics, delivering a custom dive profile that maximizes safety and bottom time. It's everything you expect from the leader in diving—perfectly adapted to the most unique wrist computer available.



DEEP DOWN YOU WANT THE BEST

By Jeanne Liebetrau and Peter Pinnock

a prime practice. Jacks and Kingfish learn to survey a reef scene whilst innocently swimming past. In this process they must identify potential reef hazards, possible reclusion sites, other predators and the intended food source. To gain all this information they may pass the reef a few times. Once they have decided on their target they must muster all their speed and strength to focus on the attack. Pectoral fins need to be tucked away, thus minimising drag, while their head needs to remain steady for full concentration and impeccable vision. Unfortunately those attending survival strategies classes are intent on disrupting the self defense classes – they are typical school bullies.

Geography is a subject few pisces attend. Those that do attend get to travel long distances. For example, sardines travel the whole south coast of Africa. Swimming hundreds of kilometres should be exhausting, but sardines manage this with ease. The reason is that those at the top (front) of the class cause small 'eddies' or vortices to form behind them by the to-fro movement of their tail fins. Fish swimming behind harness the energy from these eddies to move forward with ease. The front position is regularly rotated so that all get a chance to work out or relax. It also helps that fish have scales to slip through the water efficiently, and in the case

of sardines, they also posses oily skin.

How do fish swim in tight formations within a school and never have an accident? Incredibly, even when swimming in tight formation within a school, with sudden swift movements that instantly change direction, fish never bump into each other. The reason for this is the lateral line running down the length of the fish's body. The Latin name, *acoustica lateralis*, aptly translates into 'sound side of body'. Sound waves produce pressure waves which the neuromasts cells on the lateral line are sensitive to. Fish can thus respond to the slightest movement of nearby fish. Add to that ingenious eyes that can see in front, above, below and to the sides, all at the same time.

Strangely, Sex Education is not the most popular subject. Candidates school briefly to participate in sex. This course is not run on a daily basis – it is dependent on the moon, temperature of the water, currents and season. When these factors are in equilibrium, fish, such as Surgeons, school together, performing mass spawning. These may be the only fish to graduate from school. As soon as the class is over they disperse as individuals, ready to live in the real world without the company or safety of classmates. For more underwater images and stories, visit www.peterpinnock.com



AUSTRALIA INTERNATIONAL DIVE EXPO

AIDE 2015 DIVE & DISCOVER

12-13 September 2015
Royal Hall Of Industries
Moore Park, Sydney

Join Us & Explore "Business for Diving" at AIDE 2015

Event Highlights

- Agency Seminars
- Product Knowledge Workshops
- Main Stage Presentations
- Pool Try-Dive For Non-Divers
- Photography & Conservation pavilions
- Photo Comp-Underwater Project
- B2B Meeting for Trade
- Exciting Holiday Prizes to be Won
- Facebook Contest for Visitors
- Fun Kid's Activities

Free Entrance for under 17 years old,
Disable Divers & Senior Divers over
60 Years old



Albert Li



Chris Wachholz



Johan Boshoff



Linda Cash



Lucas Handley



Dr Michael Bennett



Phil Enright



Zainal Ben Rahman

Invited Speakers...
and many more

Photo: "Blinded By The Light" By Matthew J. Scherdt
Picture Courtesy: Underwater Festival

Exhibition
Organizer



Support
Association



Official Media Publication /
Online Media



Official Media Partners



Member of



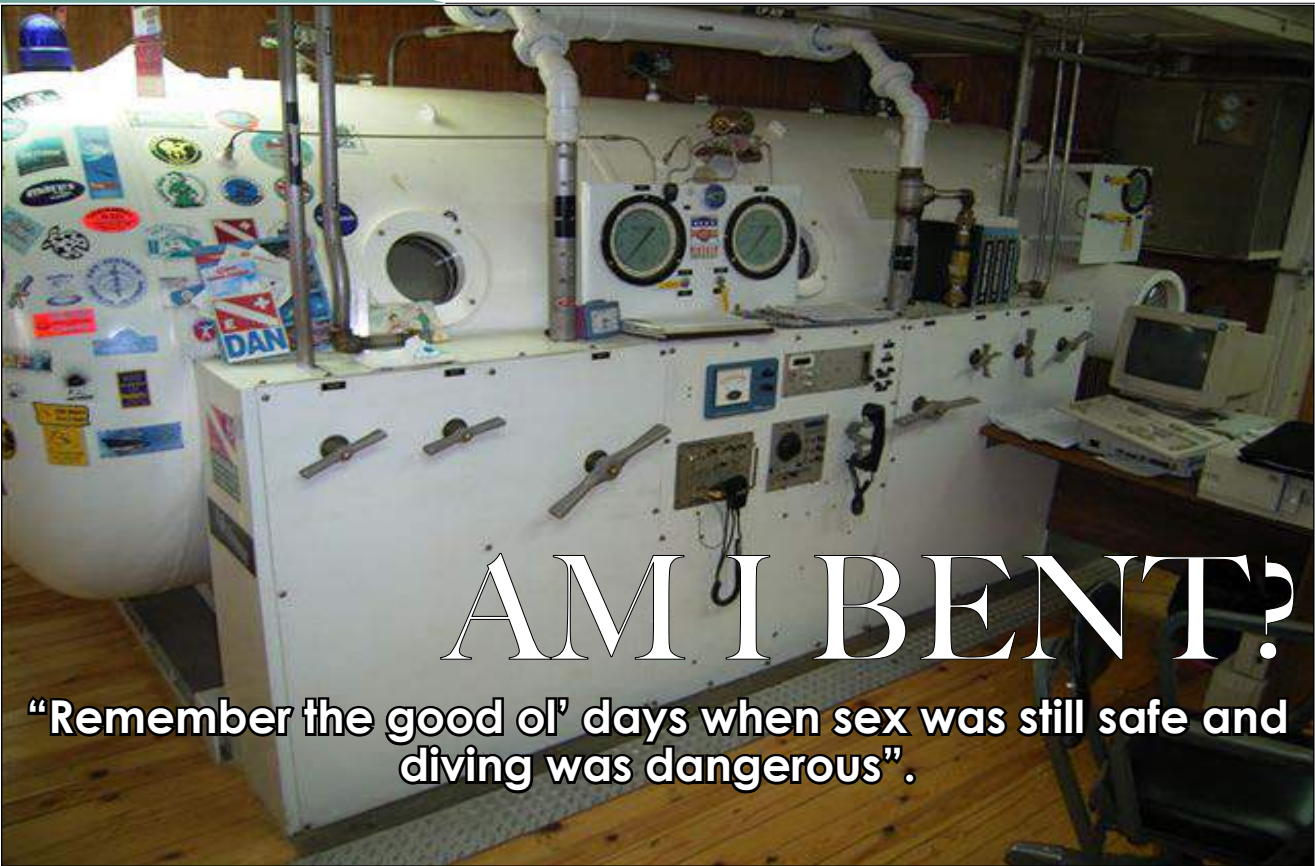
DIVE & DISCOVER



ASIAEVENTS EXSIC PTY LTD
Suite 201/272 Pacific Highway, Crows Nest, NSW 2065.
Email • info@australiadiveexpo.com

www.australiadiveexpo.com

By Sean French



What used to be a curse looming over the divers of old is now regarded as a 'sports injury' – all in the name of trying to remove the stigma from everyone's interpretation of the Bents, DCS, AGE, DCI, bubble trouble, caisson's disease – whatever divers call it based on their knowledge. In addition, because of the varied interpretation of bubble trouble, we no longer talk about the 'Bents'. Instead, arterial gas embolism (AGE) and decompression sickness (DCS) is now collectively referred to as Decompression Illness (DCI). Nowadays, in addition to the drive of removing the stigma, the focus is on Safe Diving or 'Best' Practice. To add practical value to this article, we will be focusing on what you will feel and very importantly, what to do when you do suspect DCI. This all will be incomplete if the prevention and guidelines for 'Safe Practice' weren't also mentioned at the end.

So, whilst down at the coast enjoying a lovely diving trip you experience odd symptoms. At first you dismiss it because you're generally healthy and; you haven't broken any diving rules. Seeing as you're not close to specialized medical care, you shove the

symptoms and your conscience into the 'bin of denial'. For how long can you do this? You might be an instructor with a tight qualifying dive schedule or, a student on course doing your qualifying dives with your friends or family. Maybe the symptoms will go away; maybe it's an old sports injury; maybe pain tablets or anti-inflammatory meds will cure you or – maybe you're not being honest with yourself. If faced with the possible or definite presence of Decompression Illness (DCI), then this article could save your life, occupation or future diving endeavors. This article puts



Body System Involved	Signs & Symptoms	Morbidity	Mortality
Central Nervous System	• Cerebral (Higher Brain function) – change in personality; impaired memory or cognitive function; below usual math capability, loss of consciousness	1-3	2-3
	• Cerebellar (Small Brain) – Impaired balance & coordination	1-2	0
	• Cranial nerves – impaired sight, hearing, speech, sensation or function of facial muscles; weak shoulders	1-2	1-2
	• Spinal cord – weakness of (any) skeletal muscles; loss of sensation; inability to distinguish between sharp & blunt; impaired bladder control; paralysis	1-3	0-1
Lymphatic system	Swollen and tender glands	1	0
Musculo-skeletal	Painful joints (especially when bending an arm etc)	1-2	0
Cutaneous	Patchy & blotchy skin patterns	0	0
Pulmonary	Difficulty in breathing; Coughing up of pink (blood stained) frothy sputum; Tight feeling in chest on one or both sides; Feeling faint; unconsciousness	2-3	2-3
Audio-Vestibular	Vertigo (disorientation, nausea, vomiting, staggering gait)	2-3	0
Non-specific	General unwell feeling (malaise)	1	0

into practical terms and in digestive layman's terms what we learn from the annual accident reports and statistics.

Before we go any further, let us first take a look at what you can expect to feel or, feel like when you experience DCI. To provide some structure to the varied symptoms of DCI, I will allocate them according to the various systems of the human body. To illustrate how bad each of these symptoms really are, a four-point scale (0 – nothing and 3 – worst) will be used to illustrate the following:

- Morbidity scale (long-term omplication rate)
- Mortality scale (can you die from it?)

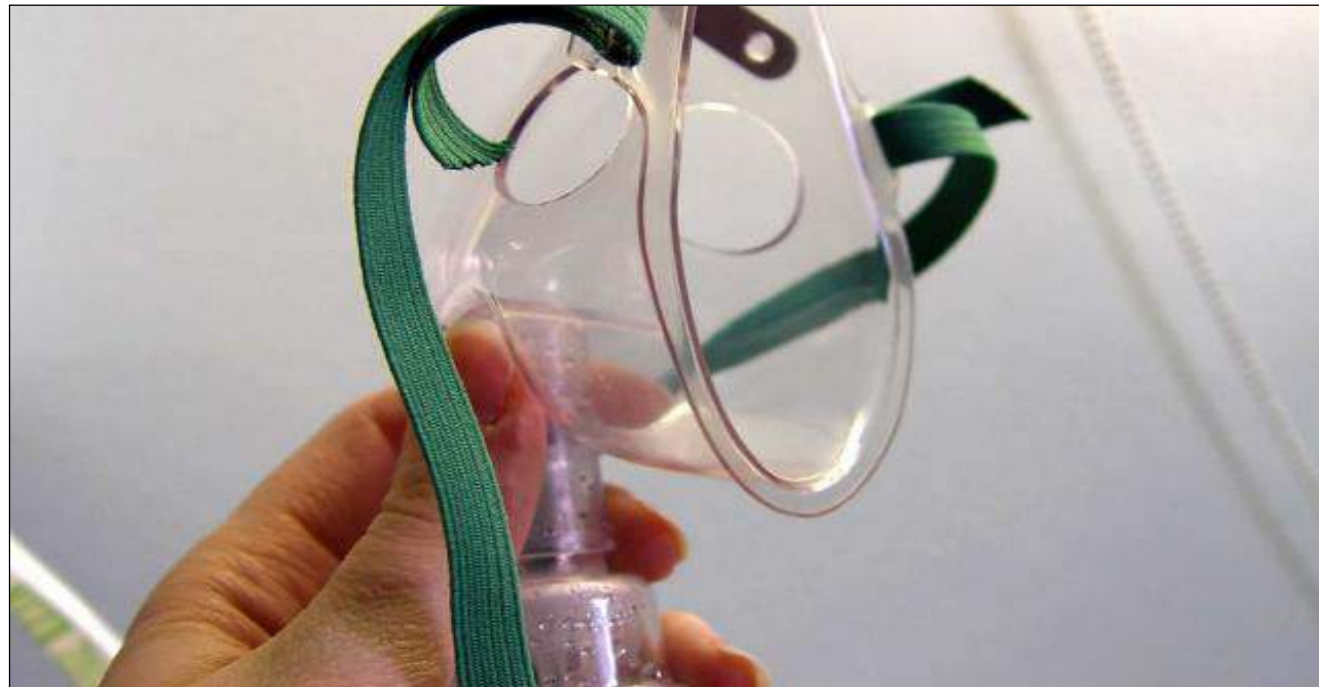
Please take note that these symptoms and signs can mimic a wide variety of medical ailments and despite the impact of having 'a hit' on your diving plans, travel schedule and health, rather be safe and suspect DCI until proven otherwise by someone medically trained and obviously more objective than yourself.

Statistically, what a lot of divers do when experiencing any untoward feelings after a dive is to wait – to their own detriment! Generally, injured divers don't report their symptoms when they first appear, but rather only if the symptoms don't want to resolve. In fact, on average only 35% of divers report their symptoms within 4 hours. This does not include the time taken to still get to a recompression facility.

The statistics clearly illustrate trends of divers with suspected DCI only arriving at recompression facilities between 8 to 20 hours after symptom onset (note that in some cases, the access to remote chambers was a contributing factor). These delays don't bode well for the prognosis of suspected DCI, especially if this happens in a remote diving location.

The sooner a diver 1-- Reports any symptoms of DCI after a dive and 2-- Receives oxygen first aid, 3-- Hydration and ultimately 4-- Presents to a recompression chamber, the better the outcome. Conversely, the longer the delay of implementing these definitive measures, the greater the likelihood of the following:

- More aggressive initial treatment measures being required
- A greater number of chamber sessions (and cost) required for achievement of optimal symptom resolution
- In some unfortunate cases, the likelihood of the diving physician concluding an injured diver's hyperbaric oxygen therapy with some unresolved symptoms due to a diminishing therapeutic response (therapeutic plateau). There are several cases where divers have been sent home with some unresolved symptoms.



One of the most important take-home messages of this article is that a single chamber treatment doesn't necessarily cure you. The average number of chamber treatments for divers with DCI is about 2 to 5. In some more severe cases the maximum number of treatments can exceed 15.

Practically, refractory (resistant to treatment) DCI symptoms could mean any of the following:

- A time period of several weeks to months after conclusion of hyperbaric oxygen therapy to allow natural healing to take place whereafter the return to diving will be determined by a visit to a diving physician and often a specialist consultation i.e. neurologist.
- If you're not so lucky, the much feared "your diving days are over" curse pronounced over you by the diving physician. As a very keen diver myself, this must be devastating news.
- If you are given the go-ahead to dive again but with an endorsement of only doing conservative dives, a cloud will always hang over your head of the pre-disposition to DCI occurring again due to the possibility of having a PFO (a septal defect in the heart causing the mixing of blood and allowing bubbles to go through to the 'wrong side' of the heart).



By Sean French

• Last but not least, one of the worst possible outcomes is that of professional handicap through loss of strength, dexterity or coordination. As an example, losing fine touch could have a poor prospect of retaining your work as a jeweler, architect, fine artist, surgeon etc. As DCI often affects your central nervous system and the direct relation to your senses, this could impact quite significantly to any profession requiring all or most of your senses.

Despite the seriousness of this article portraying a dark cloud, there is a silver lining – Divers Alert Network (DAN). Give yourself the benefit of the doubt and let the diving physician on-call make the assessment and diagnosis. Rather sacrifice the dive trip you're on than forfeit many others in future. Although you might face evacuation and recompression chamber treatment, you are on the best road to optimal recovery as DAN will make ALL the necessary medical and logistic decisions.

All that you, your DM, Instructor, skipper or dive buddy would have to do if ever faced with a diver suspected of having DCI is the following:

- After ensuring the ABC's, position the diver in a comfortable position, preferably in the left-lateral position.
- Administer 100% oxygen via a demand valve or free flow system with an oro-nasal mask as soon as possible for as long as possible
- Give the diver a sports drink (balanced salt solution) or preferably water to drink at regular intervals. Trained individuals can administer intra-venous fluids.
- Call DAN for guidance of any other further first aid measures and also to facilitate evacuation to a definitive treatment facility.
- If you are trained and you have time to kill before handing the injured diver over to the next level of care, perform a basic neurological assessment which is a valuable diagnostic and patient monitoring tool.

In the meantime, until the day that you




have to deal with your first DCI case you can do the following:

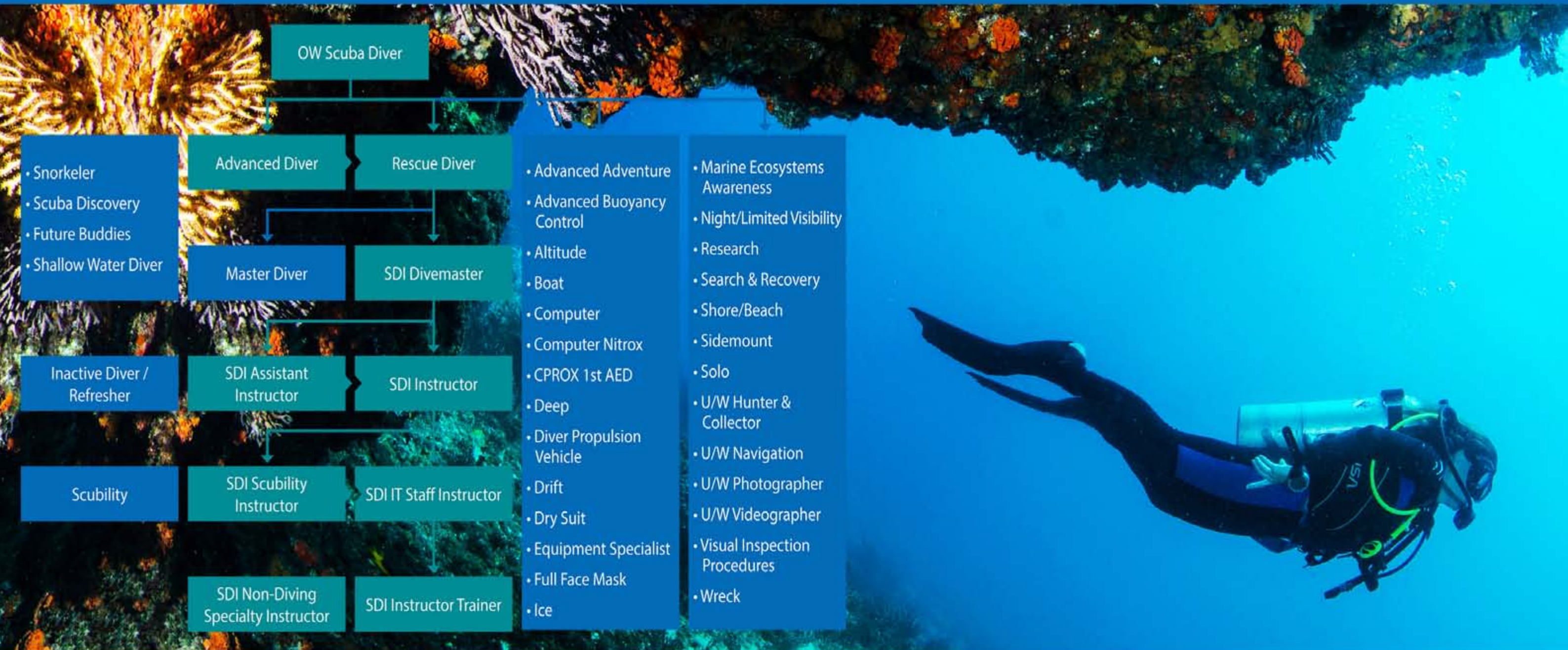
- A good start is to join DAN for ultimate peace of mind for yourself. As an instructor you should sign up your students for the duration of their training and then encourage them to join up after certification. This should be a no-brainer, especially now that DAN offers entry-level students FREE DAN cover for the duration of their course.
- Enroll for the necessary diving safety courses to equip you better to deal with diving emergencies. You can contact DAN for more information on their several training programs. In addition, encourage your dive operator to do the same and/or only dive with charters that do have the training and equipment to deal with these situations.
- Compile an Emergency Evacuation Plan for your planned diving destination or, if you're a dive operator, ensure that all your staff are familiar with the details to prevent confusion (and unnecessary delay) during an emergency.



- Do not place a qualifying dive schedule or diving holiday before your health.
- Last but not least, practice safe diving principles – adopt a zero-defect mindset.

As we know the stigma attached to DCI is deeply entrenched in most divers. There are unfortunately some divers who think they are bulletproof but when it happens, many don't want to face the facts because of their fears and therefore they wait and, as we have seen, often too long. If dealt with early and properly from the first responder to the chamber, DCI is a treatable condition whereafter you should be able to return to your favourite pastime with little or no residual effects. Because of the importance of this "chain of survival", DAN is hard at work doing research and providing cutting edge training for divers, dive operators, the EMS, doctors and hyperbaric facility staff worldwide to ensure that a diver with suspected DCI receives the best care from the dive site to the chamber. 

Scuba Divers Trained Here



Deep Safety Stops

It is a question which is often asked – who should use deep safety stops, all divers or just technical divers?

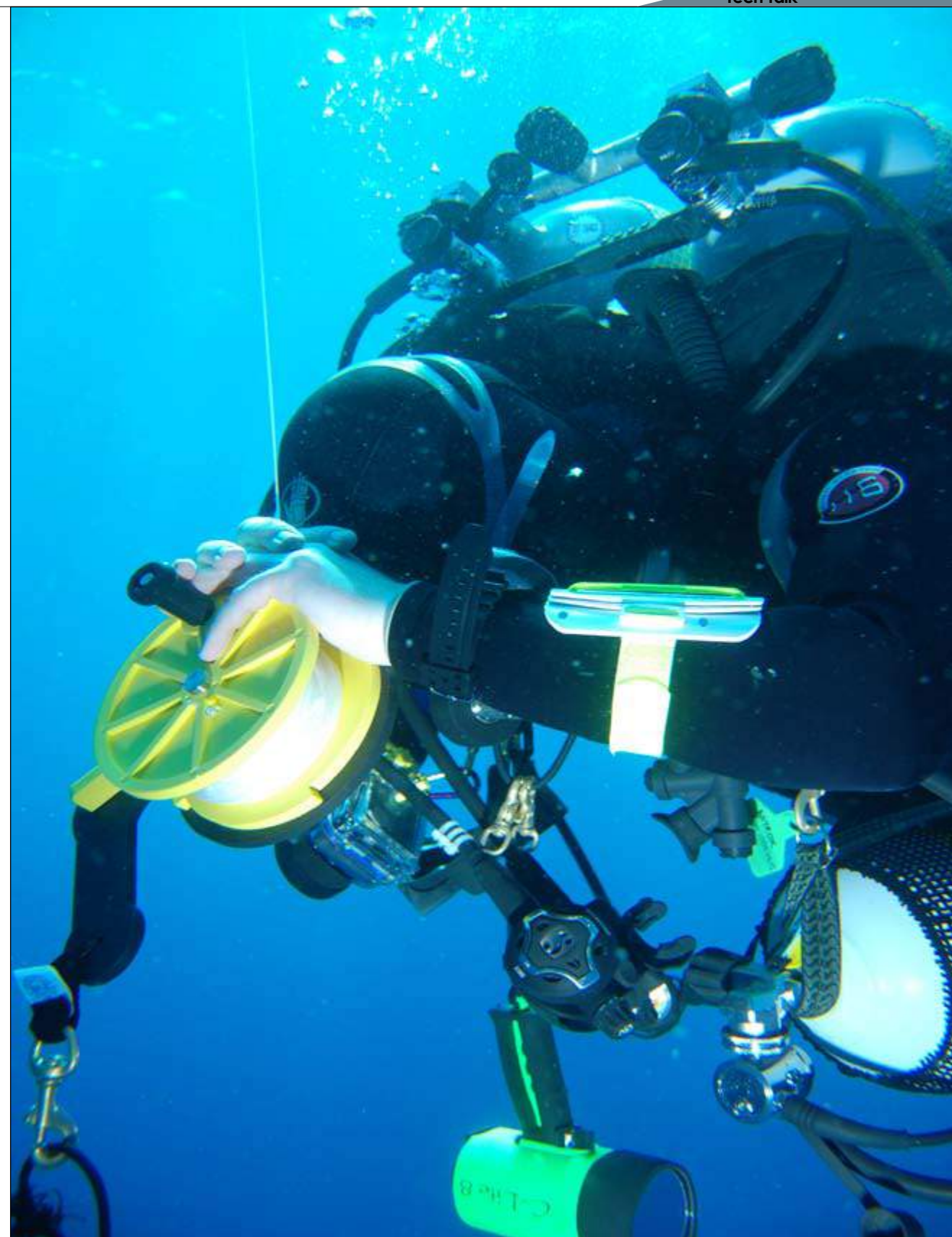
Most divers are aware that the recommended prescribed ascent rate is 10m per minute. That means that a diver will take 60 seconds to make an ascent from a depth of 10m to the surface, excluding the shallow safety stop of 2-3 minutes at 3m. I know of very few divers who ascend that slowly – most divers ascend much faster. Try walking 10m slowly while counting to sixty, it is extremely slow.

It is important to note that the ascent rate is part of the decompression, therefore in all dives some decompression is carried out, even for those dives for which there is no requirement for decompression stops (other than the shallow safety stops).

In this article we deal with deep safety stops and who should use these deep safety stops. As far as I am concerned, all divers should use deep safety stops, especially those divers who ascend faster than 10m per minute from the bottom and in between decompression stops.

Do deep safety stops apply to divers using any gas mixture? Yes, deep safety stops apply for air diving, nitrox diving, normoxic trimix and trimix diving. They are particularly useful for any dive which involves conventional decompression stops.


The reason for deep safety stops is based on the presence of 'micro nuclei' (tiny bubbles in the blood and tissues). These are always present, even when we are not diving. If we ascend too fast (faster than 10m per minute, and even if we ascend at the correct ascent rate) these



By Nuno Gomes micro nuclei can grow and cause decompression problems, usually in terms of fatigue (this is a mild type of decompression sickness), following a dive.

How do we apply deep safety stops to prevent mild decompression symptoms (and sometimes not so mild)?

- 1 – Calculate a decompression profile using the tables or the software that you normally use.
- 2 – Take your bottom depth and the depth of your first prescribed decompression stop. The mid point between the two depths will be your first deep stop – this stop should be two minutes long.
- 3 – Recalculate the decompression profile taking the deep stop into account. If the distance between the first deep stop and the first required decompression stop is greater than 10m, add a second deep stop of two minutes at the midpoint between the two points.
- 4 – Repeat the procedure until the distance is less than 10m.

For example, a dive to 35m for which the first 'official' deco stop was at 6m, would require deep safety stops at 20,5m and 13,25m of two minutes duration each followed by a recalculation to take further in-gassing into consideration. 



Q & A

What do you as a diver look for in your back-up divers?

Nuno Gomes




Back-up divers are extremely important for any diving team. It is, however, very important to remember that any diving team is only as good as the weakest team member. There is no point in the lead divers, in the team, completing a dive successfully but

some of the back-up divers not making it back.

For me, the minimum qualification that a support diver must have is that of 'Rescue Diver', and included in his/her curriculum should be an 'Oxygen Provider Course'.

The other diving courses required for the back-up diver/divers will be related to the depth from which he/she may have to perform a rescue from. A rescue from

70m would require the back-up diver to be Trimix qualified and experienced at that depth. Ideally, the back-up divers should have done at least 100 dives, even if they are supporting at a depth of only 5m.


It is very important that the team leader evaluates the experience of each support diver individually before he/she is accepted in the team. A daily clarification, by the team leader, should be provided for the support divers in terms of what is required from them, for each dive, according to the dive plan. There may be situations where some of the back-up divers may have more experience than the lead divers. 

Barry Coleman

Back-up divers for deep technical diving need to have a clear understanding of the procedures that have to be followed by all persons in the team, and above all have good buoyancy control. They need to be certified for the depth they will be diving to and have the capability to handle equipment under water, for example,



identifying the correct gasses for the depth, handing off decompression cylinders and taking on cylinders. They also need to have the ability to notice the signs and symptoms of possible problems with the diver and be able to think logically and react accordingly. Back-up divers must also be able to support the preparation and break down following a dive.

It is an all encompassing position and such an important position which can make or break a deep dive. Many deep dives would not have been possible without good support divers and they are unfortunately sometimes forgotten in the celebrations afterwards. 

Pieter Smith

In technical diving, the role of a back-up diver is essential and training, experience, knowledge and equipment should be of equal level as that of the diver. The role




of a back-up diver will differ from dive of dive, for example cave vs. open sea trimix dives. The back-up diver must have the competence to cope with life threatening circumstances. Dive plan, dive team, emergency plan procedures, medical signs and symptoms,

O2 administration and rescue drills all form part of the basic competence a back-up diver must have. Apart from that, the back-up diver must also understand and have knowledge and experience of the type of dive and the specific place or area where of the dive in order to fill his/her role.

In too many cases and due to inexperience back-up divers being used, where the chance of recovering a diver from a

emergency situation successfully, has been lost.

As a technical diver, at times also being a back-up diver, I have directly experienced the success of being able to recover a trimix diver from an uncontrolled emergency ascent situation by understanding the situation and having the correct equipment for the work at hand. 

Pieter Venter




A back-up diver has several essential tasks. He provides psychological support, communicates with the surface, alleviates boredom, sorts out technical problems and most importantly deals with emergencies. Dealing with technical diving

emergencies requires quick thinking and fast reactions and ideally the back-up diver should have the same qualification as the technical diver whom he supports. In addition, the back-up diver should know the dive plan backwards, to the level where they are able to advise the technical diver being supported if there is a deviation.

However, there are not many fully qualified and experienced divers who are prepared to provide back-up and often reliance is placed on training technical divers. Providing back-up is probably one of the best schools available and personally I have learnt a lot from a number of back-up dives involving emergencies.

Training divers should take extra care to know the details of the dive plan and the different emergency procedures to be able to handle an emergency.

In my short diving career, back-up divers have prevented several fatalities and other less serious incidents. 

NITROX IT'S A GAS

© 2014 Institution of Invisible Gas Photographers

PICTURE OF NITROX IN ACTION, TAKEN WITH WIDE ANGLE LENS

START YOUR COURSE ONLINE TODAY!

There was a time when the use of NITROX was viewed as extreme by many in the recreational dive world. Now it is fast becoming the gas of choice for mainstream diving and is available for all divers. Like so many changes to the industry it is driven by the top echelon of the technical diving community. That's one of the things that makes RAID different, the owners are real divers and in fact two of the directors are considered among the best technical divers in the world (see their profiles below). That means RAID training programs are at the cutting edge and in a class all of their own.

So what is NITROX and how does it work? It is essentially oxygen enriched air, it has many benefits over the use of traditional air, including potentially longer bottom times, less risk of decompression sickness and many people report increased energy levels. That's why all RAID dive centres actively promote the use of NITROX.



Paul Toomer

Paul is a force of nature in the diving world and his unique approach to training is legendary. Paul has reached the pinnacle of the world's leading diver training agencies writing the technical programs for a major training agency before becoming a partner in RAID. He is a sort after speaker at technical events and dive shows around the world and an expert in all facets of technical and rebreather diving. Paul is the International Training Director for RAID.



Barry Coleman

Barry is a pioneer in technical diving. Barry conceptualised the design of the world's first recreational rebreather and working closely with the design team at Poseidon, the Mk VI Discovery Rebreather was born. To support the diver training required for Mk VI, Barry wrote the initial training program which ultimately became RAID dive training, clearly demonstrating the power of adapting traditional technical products and training to the recreational market.

An Introduction to Diving with NITROX

Want to Dive on NITROX? - This may be a familiar question

So what exactly is **NITROX** and how may it be of benefit to me diving?

Contrary to what many people believe, NITROX is not a deep-diving gas mixture.

In the SCUBA diving community NITROX refers to any SCUBA diving gas mixture composed of nitrogen less than 78% and oxygen greater than 22% and less than 40%. The trace gases are ignored. As you can see from the picture above, NITROX is a colourless and odourless gas and is available for all divers.

NITROX will extend your allowable no decompression limits or bottom time. It does this simply by reducing the amount of Nitrogen gas you are exposed to under pressure.

These benefits do of course have conditions associated with them and like everything can be abused. You will learn about these conditions and how to safely dive whilst breathing NITROX in RAID's NITROX course.

NITROX is known by many names: Enriched Air NITROX, Oxygen Enriched Air, NITROX, EANx or Safe Air.

If you see "NITROX32" or "NITROX36", the number is referring to the percentage of oxygen content in the gas mixture and in turn the diving cylinder you are using.

So "NITROX32" or "EANx32" or "Oxygen Enriched Air 32" contains 68% nitrogen and 32% oxygen. "EANx36" contains 64% nitrogen and 36% oxygen etc...

The two most popular blends are EANx32 and EANx36, developed by NOAA for scientific diving, and also named NITROX I and NITROX II, respectively.

It is very important that you check the gas mixture in your cylinder before each dive, because you need to know what mixture you have for calculating your dive times and to find out the maximum depth you can dive. You will learn how to do this in your RAID NITROX course.

Oxygen is toxic at depth for us humans! Yes the increased pressure at depth will increase the partial pressure of oxygen (PpO2) and this increased pressure can become toxic. With NITROX diving we have to stay within two limits, the NDL limit which as a diver you already know about and the other is the oxygen toxicity limits.

Staying within these two limits will allow you to dive underwater longer than an equivalent AIR diver at the same depth and more often than an AIR diver to the same depths.

It is all about balance!

When you complete your NITROX course you find how NITROX will be of benefit to you. You will use it as a means to help you diving, not as a macho status!

For example if you are planning 3 or 4 dives a day whilst on holiday then use NITROX, because of the benefits, but if you are doing one dive in the day to a shallow depth, there is little need for NITROX. This is a generalisation, and there are always reasons for and against. The important issue is to understand it and plan for using NITROX if it will be of benefit which you will learn more about on your course.

History

NITROX gas mixture is nothing new and has been in use under differing names since before the Second World War.

The history and development is well known and risks associated with well documented. NOAA is perhaps the best known authority and has developed tables and working parameters that are still in use and followed today.

Myths



- Nitrox does not remove the risk of decompression sickness.
- Nitrox does not remove the risk of pressure related injuries.
- Nitrox does not reduce Nitrogen Narcosis

The RAID Nitrox Diver course is designed to introduce you to the procedures and skills to safely dive Nitrox. There are many benefits of diving Nitrox and the course will give you a good grounding in the use of gas mixtures other than pure air.

This course is also a grounding set of theory and skills that will help you through the rest of your RAID journey. All other levels above the RAID Open Water and Nitrox courses have gas analysing and calculations embedded. This means the information and skills you learn in your RAID NITROX course are valuable through all your RAID training programs.



Sign up for RAID's NITROX course today in just 3 easy steps.

STEP 1 head to www.diveRAID.com and click the button REGISTER at the top right. Then complete the form and wait for an email from RAID. STEP 2 on receipt of your registration confirmation email, open and follow the instructions. Step 3 complete the forms. You are now registered! Once you have completed your online training successfully you will have a great understanding of diving with Nitrox. Your RAID Dive Centre can then complete your training and issue your certification, this may include diving on Nitrox. For more information contact RAID, call 02 4088 0560 or admin@diveRAID.com.



RAID

Dive Training in a Class of its Own

www.diveRAID.com



Just like RAID there are loads of benefits to NITROX, the more you use it the more you'll see it.

Instructor Diaries

Basically it's technical


When people think about technical diving they think about the black depth of the ocean, the black depth of a cave or the black depth of a wreck somewhere, as long as it's deep, dark, ominous and dangerous.

Sure, these scenarios could all be technical diving but this is definitely not all that technical diving has to offer. All technical divers understand why they dive technical – each of them had a goal in mind when they started and this is key to becoming a technical diver. I want, however, to give my view on technical diving within sport or recreational diving guidelines or rules. So let me first state what I see as sport diving. It's usually all the divers you get down at Sodwana or in Mozambique over a long weekend or holiday, 12-14 divers on a single launch, single tank on the back and war stories galore. Sport diving is exactly that – it's sport, it's fun and you enjoy it with all divers, family and friends. Okay, so now that you get the idea of sport diving, what do I mean by technical diving within sport guidelines or rules?

It's very simple – you obey all the normal sport scuba rules, no bending them, no breaking them, nothing... you don't go deeper than 40m and you obey the time at the depth. The thing that I am proposing is staying longer at depth. How? Simple, just add another tank with normal air on your back and have another smaller sling cylinder with a decompression gas. Ah – here we go you say, decompression, I knew it! Now I must stay underwater and decompress for hours! Nope, not at all. You will stay a few extra minutes longer, but not much.

The basic principle remains the same – dive your time out with the air on your back, which with twin cylinders is now extended or actually doubled, and on the ascent make a decompression stop instead of a safety stop switch over to a more enriched oxygen (O2) gas flushing your system, ridding it of the nitrogen (N) gas. The stop itself will not be for hours at all, a few minutes at the most, but that is not the focus, the extended bottom time and experiencing more of the incredible underwater world is the aim and the joy.

The South African coastline offers massive opportunities for those divers willing to stay under for longer. Wrecks and reef life will amaze every single diver but unfortunately most divers will never experience it because most operators and divers want to go close by and relatively shallow to stay down longer. But there is a much safer and more fun way to enjoy those types of dives, and that is doing it technical style with twin tanks, deco sling and safety and awareness as always at the forefront.

If you are remotely interested in technical diving, contact your instructor for more information and get involved with spectacular diving! I am looking forward to seeing more twin tanks on the launches, and as always, have fun and be safe! 



Heat loss while scuba diving

A phenomenon that technical divers have long been exposed to is Heat Loss or Hypothermia during dives. Not all divers will have the same reaction to it and it is dependent on a variety of factors. Due to long-term exposure to harsh conditions and cold water at depths, your body, and especially your core, cools down to such an extent that it starts to become dangerous, or in extreme cases, deadly.

For the recreational diver the danger also exists, even if you dive mostly in tropical waters. In this article we are going to delve deeper into what exactly happens to your body, what causes it, the telltale signs thereof, the consequences and finally how to prevent hypothermia from occurring in the first place.

The technical explanation for hypothermia is that it is the condition in which the body's temperature drops below that which is required for normal metabolism and body functions. When the body is exposed to cold and the heat loss from the body is greater than its heat production, the body cannot replenish the heat being lost from the core through internal mechanisms, and the diver becomes hypothermic.

Let's do a little experiment. When we work with metal in our garages on a grinding wheel, the metal quickly warms up and starts to glow. Common sense tells us that we should not touch it because we will get burned, therefore we submerge it in water to cool it down – fast. Should we leave it in the open air it will take much longer to cool down and much time will have been wasted. This is exactly what happens to us when we scuba dive.

Due to the fact that water is almost 25 times

denser than air, heat is conducted away from the body much faster than would normally be the case if you were standing in an open air environment. When we dive, the water that enters our wetsuits comes into contact with our body, which in turn warms up the water. The water then expands and is carried away from the body, and as a result of this exchange of heat you quickly start to feel the cold.

I am sure that most of us have at one time in our life experienced hypothermia. Remember that summer pool party during which you spent most of the day in the water having fun in the sun? The water started off feeling very warm and soothing and only after a couple of hours you started to feel the cold, or you went to Sodwana, and to escape the heat you entered the water that felt as warm as the outside temperature.

The heat loss is so gradual and slow that your body's defenses may not even be triggered. You don't feel cold, you don't shiver and you don't gasp. Constriction of near-surface blood vessels, your body's main heat conservation mechanism, may not occur, and in this case it would not be particularly dangerous. This is referred to as 'Silent Hypothermia' or 'Warm Water Hypothermia', but should your body be allowed to cool down further it may become much more

serious.

Now I am sure that you will argue with me and tell me that there is hardly anything deadly about it, but you would be dead wrong (pun intended). To understand the dangers regarding hypothermia we must first understand what happens to the body when subjected to cold water.

Cold water immersion

Immersion in cold water causes a complex response in the diver. As your body temperature falls, you first start to feel uncomfortable, and then, as your body tries to increase heat production in the muscles, shivering begins. If cooling continues, your ability to perform tasks becomes more difficult. It will impair your sense of touch, which is dulled, and your hands lose dexterity.

As your shivering becomes more intense, it will start to cause a lack of co-ordination and you may even experience difficulty in keeping your mouthpiece in place. This is already cause for concern due to the possibility of choking or drowning, but you will also soon lose your ability to think clearly and you will find it more and more difficult to concentrate, becoming a danger to yourself and to those around you.

Heat during scuba diving can be lost from many

areas of the body and it is therefore important to consider wearing an exposure suit, even when swimming in relatively warm tropical waters. Studies have shown that the areas where major heat loss occurs are the head, neck, chest and groin. Much of the heat lost during diving is lost from the trunk area due to the fact that heat is transferred only a short distance from the deep organs to the surface of the skin. Feet and hands are, however, not considered major heat loss areas, even though they are the first to feel cold due to the shutting off of the blood supply when exposed to a cold environment.

Another cause of heat loss during diving is the simple act of breathing. Breathing is said to account for a quarter of your body's heat loss in the form of exhaled warm air. Due to the prohibitive expense of re-breathers, most of us use open circuit scuba gear. As air is released into our second stage regulators the drop in pressure results in the cooling of the air mixture that we breathe. This cold air is warmed in our lungs and expelled into the water, and so heat is lost. Diving with re-breathers does not have the same problem as most of the heat in the exhaled air is retained within the closed system of the re-breather. The deeper we dive, the denser the air that we inhale becomes. At a depth of 10m the air we breathe in and exhale is twice as dense as on the surface, which means that the heat loss from exhaling is twice as large as well.



When you are exposed to extreme cold the body automatically reduces the flow of blood to the extremities and top layers of the skin to minimise heat loss and to protect the body's core heat supply (vasoconstrictive regulation). This, however, only provides a narrow range of protection to the body, because even though the body is combating the cold by increased shivering, the temperature of the body will still steadily decrease further and heat loss will reach a point at which death will occur.

There are various stages of hypothermia, from mild cases to serious and life threatening, and these types are classified according to the amount of heat lost:

Stage 1 Hypothermia: Body temperature drops by 1-2°C below normal temperature (down to 35-37°C). Mild to strong shivering occurs. The diver is unable to perform complex tasks, extremities such as hands become numb and breathing becomes quick and shallow.

Stage 1 of hypothermia can be treated through first aid and by keeping the affected person warm.

Stage 2 Hypothermia: Body temperature drops by 2-4°C below normal temperature (33-35°C). Shivering becomes more violent and the diver becomes disoriented or un-coordinated. The body becomes pale, lips, ear, toes and fingers become blue as the body diverts blood to the vital organs.

Stage 3 Hypothermia: Body temperature drops below approximately 32°C. The body's metabolic processes shut down as organs begin to fail. The patient's co-ordination is impaired and he/she will have difficulty speaking and organ failure will eventually lead to cardiac arrest and death

NB: Stage 2 and 3 of hypothermia will require immediate hospitaliaation and medical treatment.


It is important for divers to be aware of the symptoms of hypothermia; just because the water is seemingly warm, many divers ignore the symptoms and continue to dive. A person can still fall prey to it. If you or your buddy begins to shiver vigorously during a dive, be on the safe side and terminate the dive to re-warm – even if you are not feeling that cold – to ensure that your symptoms do not worsen. After such a dive ensure that you spend enough time warming up, even if it requires you to extend your SIT (surface interval time) as consecutive dives over a short period in cold

water can lead to hypothermia.

How do you combat the onslaught of cold water on your body? We always seem to think that it is funny when a diver dresses like an Eskimo before a dive, yet there are reasons for it. Some divers are used to warm conditions, and as soon as the conditions change they need to protect themselves against the cold. Some divers carry around their own barrier against the cold in the form of fat, but I hope that after you have read this article you too will think twice before you get too cold during a dive. Here are some basic things that you as a scuba diver can do to keep yourself from getting too cold or losing too much body heat whilst in the water:

1. Stop the flow of water over your bare skin by wearing a full length wetsuit that will trap a thin boundary layer of water between your skin and the neoprene suit, resulting in little loss of heat. Ensure that your suit fits properly as a loose fitting suit will not protect you against excessive heat loss.
2. Wearing a hood in cold conditions will keep you from losing between 20-35% of your total heat loss because the blood vessels on your head do not constrict, allowing heat loss to continue at full speed
3. As mentioned earlier, your torso is one of the areas where you will lose most of your body heat. Wearing a neoprene vest under a full length wetsuit to protect against cold is a good idea and you will not sacrifice the free movement of your arms and legs.

It is also important to stay warm between and after dives. Wearing your wetsuit between dives is not a good idea because it acts as a radiator, cooling you down as it dries. Rather get undressed and put on a jacket or a windbreaker. Drying your hair and wearing a hat will also stop you from losing heat through head. Lastly, keeping yourself warm by wearing long sleeve T-shirts and pants, even in warm conditions, will conserve heat and energy and make your diving experience more enjoyable and safe.

Hypothermia is a very real danger during diving and care should be taken to not get exposed to excessively cold conditions. Rather terminate the dive when the cold gets the better of you or take precautions against the cold – it will make for a more enjoyable dive and a more memorable diving experience. Remember that the colder you get the more you become a danger to yourself and those around you. Rather be safe than sorry and remember that there is no shame in aborting a dive, only respect. 





**The Quality Difference in Training
For Over **50** Years...**

**Inspire others.
Become a NAUI Leader**



www.nauipacific.com

OZDiver Apps available



Available on the
App Store

Available on the
Google play



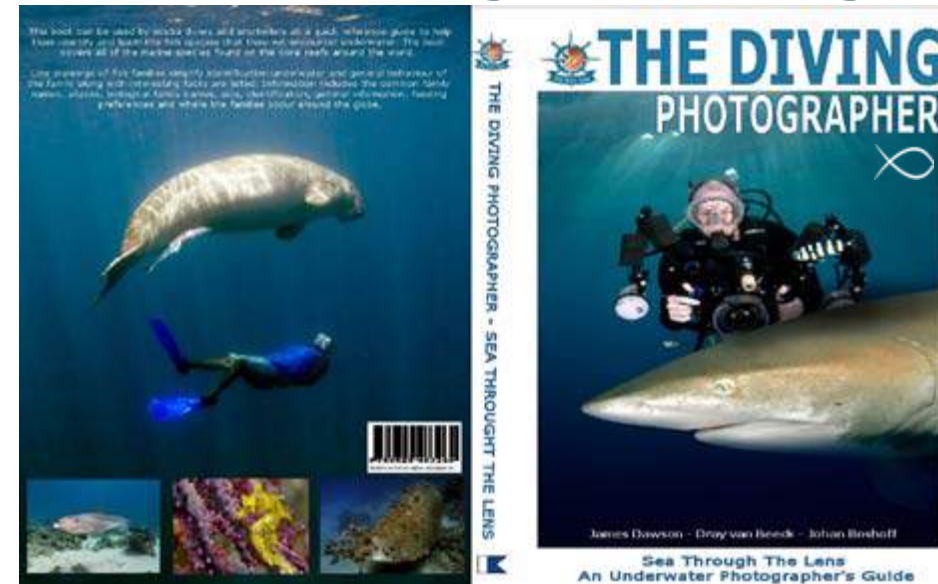
The Dive Spots of Western Australia

The Dive Spots of Western Australia is an indispensable guide for all levels of divers and snorkelers, broadening their horizons on places to visit and dive/snorkel in Western Australia. The book has more than 175 dive spots in Western Australia. Important guidelines on each coastal dive destination include accommodation, facilities, travelling tips and dive conditions. Complete with photographs and more than 100 illustrated maps of each dive site, all reefs are star rated to cover depths, marine life and other essential information for the diving and snorkelling community.

For more information visit www.thedivespot.com.au



The Diving Photographer –



As scuba divers, we are not always the best photographers, but we do learn very quickly. And if we have a handy guide book, the time spent with our cameras underwater will increase rapidly.

This easy-to-use guide book for the diving photographer can be used by all levels of photographers. It helps you with choosing the right type of camera for your ability – although with all the information presented you will learn

so quickly that you will have to buy a better camera after working through the book! Preparing and setting up your equipment becomes a breeze with easy pointers on how to check and replace o-rings, quick tips on keeping your housing dry and other small things we usually forget to check.

The technical advice on how to perform manual camera settings, lighting techniques and editing the not-so-perfect shot was a great help. One of the main things I took from this book was learning to back up my photographs and then trying anything and everything with them in the photo editing programmes until it looks like the professionally taken shot that you have been aiming for the whole time. Some other topics covered are strobe positioning, ambient light, photographing wrecks, long exposures and equipment maintenance.

I must say that this book has proved to be a great help in improving my photographing and editing techniques. Photographer is available in all good scuba diving and book shops or online at www.thedivespot.com.au. Cost: \$20

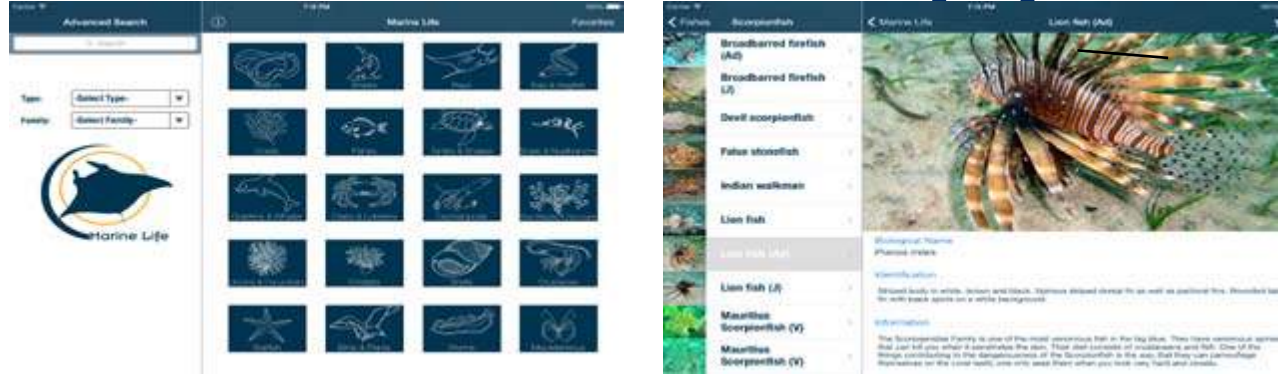


FREE gear, books, software, apps and scuba diving gadget reviews.

Here is a chance for your diving gear, books, software, apps and gadgets to be reviewed. If you have anything that you would like to share with the OZDiver Magazine and other divers, send an email to Log Book at johan@ozdiver.com.au.

OZDIVER

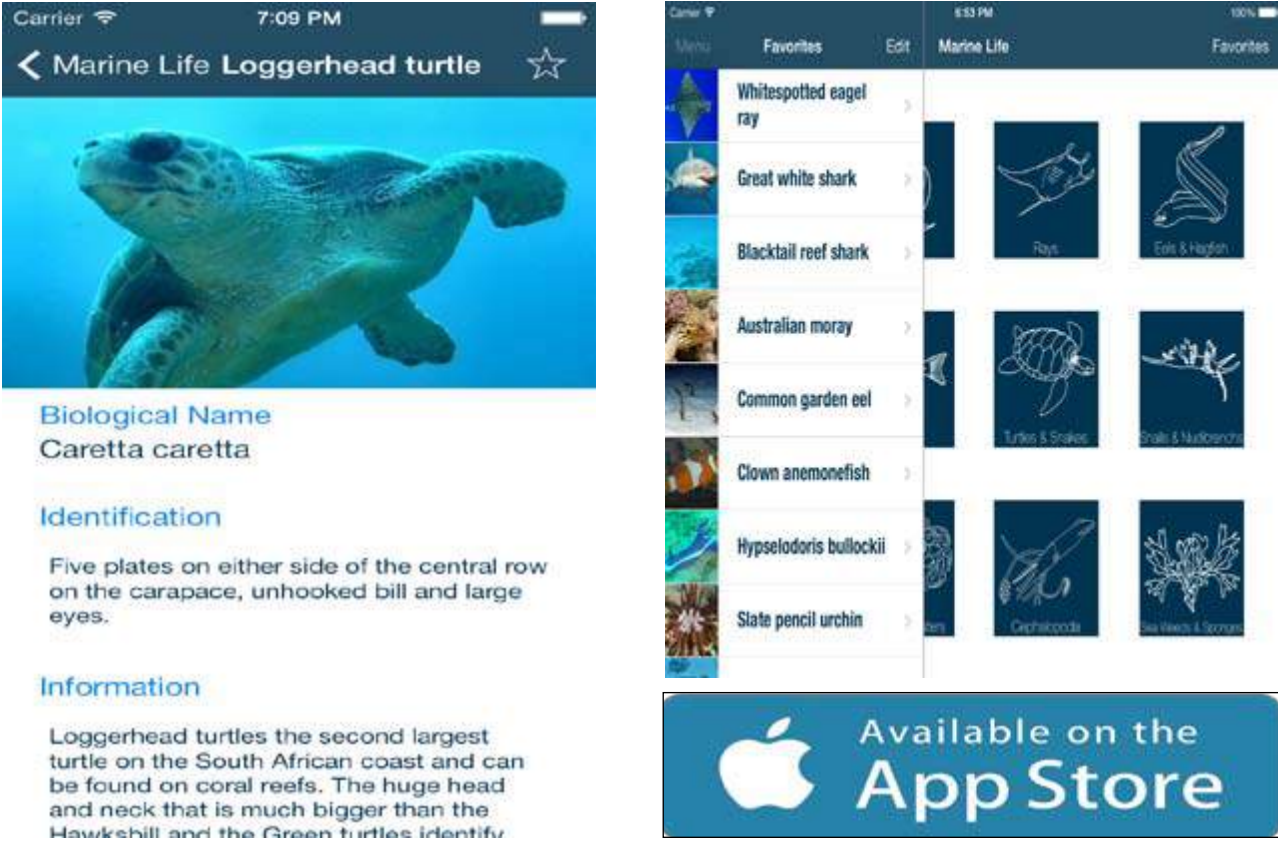
Marine Life app



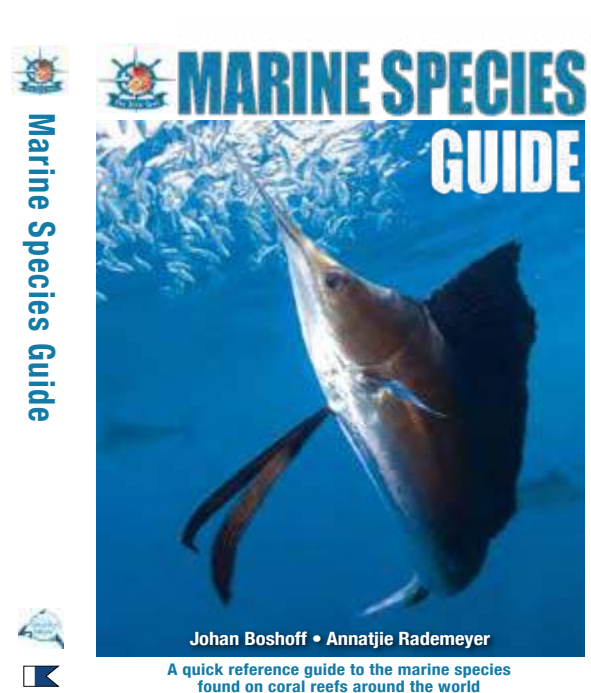
A user friendly app designed to assist divers with marine life identification and at the same time learn more about the fascinating lives of our ocean dwellers.

Learn about your favourite sea animals at the swipe of a finger, with more than 4000 full colour photographs of sharks, rays, eels, nudibranchs, hagfish, snails, crabs, lobsters, sea weeds, sponges, cineraria, turtles, snakes, dolphins, whales, worms, crustaceans, shells, cephalopodan, urchins, sea cucumbers, starfish, birds and many more. Displays information such as common names, aliases, biological names, identification, families, gender, size, life stag and much more.

A leader in marine life identification and used in education programs all over the world, now available to you from Apple App Store for only \$6.



Marine Species Guide -



Yes, it happened...I had to buy a larger bookshelf. The latest book from The Dive Spot has landed on our shores – The Marine Species Guide.

A book for both scuba divers and snorkelers to identify and learn all about the different fish species they will come across under water. The book covers most of the marine species found within coral reefs around the world. Line drawings of fish families simplifies identification underwater, while general behaviour of the family along with other interesting facts are listed.

Information include common family names, aliases, biological family names, size, identification, general information, feeding preferences and where the families occur around the globe. Photographs of the most common of the species found when scuba diving or snorkeling are included and the fish families are organised for easy reference.

The book works very well in accompaniment with the Marine Species Slate, which can be taken underwater to help with fish identification.

To buy your copy for \$ 22, visit www.thedivespot.com.au or email info@thedivespot.com.au



It's not the destination

—

It's the Journey!

WWW.THEDIVESPOT.COM.AU

How good is your instructor?

You know more than your instructor when:

- a. You have to lend him a weight so he can get under.
- b. He keeps calling his scuba cylinder an 'oxygen tank'.
- c. He fills out a dive log entry for every pool session.
- d. He is a victim in your rescue course, and he isn't playing.
- e. His new dive computer is a Palm Pilot.
- f. You ask him about nitrox and he says he doesn't watch wrestling.
- g. If you get hiccups underwater he tells you to hold your breath.
- h. He tells you not to worry about your gauges, "you'll know when you're out of air!"
- i. He tells you to wear gloves so that the coral won't cut you as you drag yourself over the reef.
- j. He tells you to use all your air underwater – "waste not, want not".

~~*~~

Rules of diving

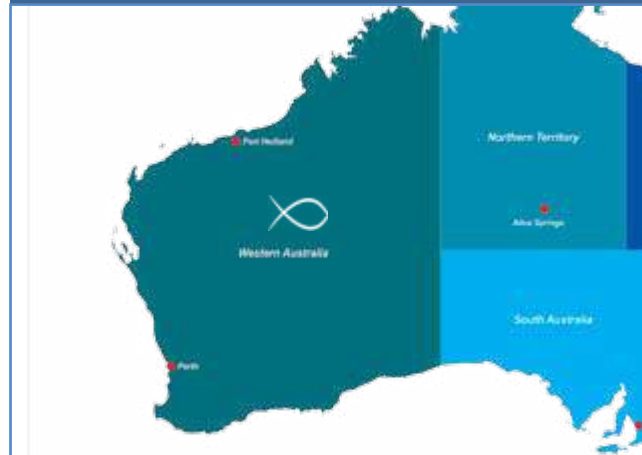
- * Don't take up diving to get a suntan.
- * People who look good with a mask on are usually ugly without one.
- * Inverse Law of Patches: A diver's ability is inversely proportional to the number of patches they wear.
- * Diving unprotected with a stranger is like having unprotected sex with a stranger.
- * Never clear a snorkel near a Japanese trawler.
- * Anyone who says they have never been afraid while diving hasn't been diving or is a bad liar.
- * Never use a sun intensifier lotion within 30 miles of the Equator.
- * People say the funniest things when you shut their air off.
- * Never have sex underwater above a coral reef.
- * Dry suits and beers do not mix.
- * Buddies are never where you need them to be.
- * You will run out of film before the Whale shark swims by.



Send your funnies to
johan@ozdiver.com.au



Western Australia



Perth Region

The Dive Spot - South Perth



We specialise in a wide variety of dive related activities. Our scuba training range from beginners to the more advanced including specialities and professional courses.

Phone: +61 (0) 44 887 9903
Mail: info@thedivespot.com.au
Web: www.thedivespot.com.au

Australasian Diving Academy



Australasian Diving Academy have 2 convenient locations in Nedlands and Rockingham where the water is right on our doorstep. We have a huge range of top quality diving and snorkelling equipment to suit all requirements.

Phone: +61 (0) 95279211
Mail: info@ausdiving.com.au
Web: www.ausdiving.com.au

Perth Scuba - Canning Vale



WA's largest dive shop, best range of snorkelling, free diving and scuba equipment. WA's PADI Career Development Centre offers courses from beginner to professional and TDI technical training. Perth Scuba has a free dive club offering twice weekly guided dives.

Phone: +61 (0) 8 9455 4448
Mail: info@perthscuba.com
Web: www.perthscuba.com

Perth Diving Academy - Hillarys



PDA Hillarys for all of your dive and snorkelling requirements local and friendly staff to help you make the right choices open 7 days come and see us down at the Hillarys Boat Harbour just north of the boat ramp see you there

Phone: +61 (0) 89 448 6343
Mail: troy@perthdiving.com.au
Web: www.perthdiving.com.au

OZDiver Dive Group - Perth



We focus on scuba diving at all levels and explore locations. We welcome any qualification level of divers including snorkel divers wanting to learn more about diving, and get onto club diving events to meet likewise divers.

Phone: +61 (0) 450 800 238
Mail: izak@ozdiver.com.au
Web: www.ozdiver.com.au

Scuba Imports & The DiveTub - Perth



Since 2007 to service the Australian Dive Industry with the best scuba equipment available. We offer high-end gear, including recreational, technical and commercial equipment. Wherever possible we'll price match any online dive store to ensure you get the best deal!

Phone: +61 (0) 8 92400163
Mail: info@scubaimports.com.au
Web: www.scubaimports.com.au

Dolphin Scuba Diving - Welshpool



Perth's friendliest dive shop. Learn to dive in as little as 2 days! Small groups with a flexible schedule. Weekly. FREE Sunday Morning Shore. Providing Instructor training, Rebreather courses and support. Technical diving tuition and trips. Local and international diving holidays.

Phone: +61 (0) 8 9353 2488
Mail: dolphin@dolphinscuba.com.au
Web: www.dolphinscuba.com.au

Scubanautics Diving Academy- Rockingham



Welcome to Scubanautics, where customer service and satisfaction is our main goal. Drop in to say hello, our friendly staff are happy to help. Check out our new "online Store"

Phone: +61 (0) 8 9527 4447
Mail: info@scubanautics.com.au
Web: www.scubanautics.com.au

Wizbang Diving Solutions - Perth



Technical Training for divers. The development of safe and technically competent divers through specialized training. Rebreathers, Mixed Gas or even just Nitrox, we will help you develop the skills and confidence that will carry you into a safe and enjoyable future.

Phone: +61 (0) 41 876 1727
Mail: diving@wizbang.com.au
Web: www.wizbang.com.au

Western Blue Dive Charters- Mindarie



We are the only dive company north of Fremantle that operates seven days offering double dive charters, returning before lunch, and allowing you to catch crayfish if you wish. Being a small company we offer a personalised service at an affordable price

Phone: +61 (0) 40 954 5553
Mail: info@westernbluedive.com.au
Web: www.westernbluedive.com.au

Underwater Explorer's Club of WA



Our club has a 12m purpose-built aluminium dive boat which can take 14 divers comfortably and is equipped with all appropriate safety equipment. We dive almost every weekend and have over 150 recorded dive spots around Rottnest and surroundings.

Phone: +61 (0) 402 310 854
Mail: committee@uecwa.com.au
Web: www.uecwa.com.au



Mandurah

Oceano Sun Sand & Sea



Welcome to Oceano your local dive shop. We have the friendliest staff best price, awesome range and we proud our self's for the excellence in training. We provide full support for all your dive needs!!

Phone: +61 (0) 85 352 047

Mail: info@oceanosunsandsea.com

Web: www.oceanosunsandsea.com

Bunbury

Octopus Garden Dive Charters



Just 1.5 hours south of Perth is Bunbury, home of the Lena Dive Wreck (18 metres) & abundant local & coral reef(0-33 metres), including "Blade Coral"—photographers paradise. Small groups -experienced & personalised service. Comfortable, enclosed diesel powered vessel.

Phone: +61 (0) 43 892 5011

Mail: kimroyce@gateway.net.au

Web: www.octopusgardendivecharters.com.au

Geralton

"A" Team Divers



A - Team Divers offers internationally recognized NAUI and SSI scuba diving courses. Small groups ensure personal attention during your training. We also have an active social club for after course adventures!

Phone: +61 (0) 45 828 5497

Mail: geoff@ateamdivers.com

Web: www.ateamdivers.com

Exmouth

Dive Ningaloo - Exmouth



Dive Ningaloo pride themselves in taking small groups to only the best dives on the Ningaloo Reef, Murion Islands and more. All courses welcome. With over 20 years experience diving in the Ningaloo, we know where the best diving is!

Phone: +61 (0) 4 567 02437

Mail: info@diveningaloo.com.au

Web: www.diveningaloo.com

Snorkel Ningaloo - Exmouth



Take your snorkeling experience to a new level! Using your own Seadoo underwater scooter, you'll be propelled effortlessly through the beautiful Ningaloo, where you'll see the tropical fish and coral that makes Ningaloo one of the world's top snorkeling destinations.

Phone: +61 (0) 45 670 2437

Mail: info@snorkelningaloo.com.au

Web: www.snorkelningaloo.com.au

Albany

Southcoast Diving Supplies



Diving Albany means experiencing anything from Wrecks to Reef. The "Perth and Cheynes 3 are two well known dive wrecks and the spectacular reef dives ranging from 3-50 M plus offers a diverse choice to a wide variety of divers

Phone: +61 (0) 89 8417 176

Mail: whale@divealbany.com.au

Web: www.divealbany.com.au

Esperance

Esperance Diving & Fishing



We operated since 1983 is Esperance's only dive store. Servicing locals and tourists with hire, sales, equip service, training and charters. With over 104 islands the dive sites are endless. Also offering guided dives to view Leafy Sea Dragons.

Phone: +61 (0) 89 071 5111

Mail: jaimen@esperancedivingandfishing.com.au

Web: www.esperancedivingandfishing.com.au

South Australia



Port Lincoln

Calypso Star Charters - Port Lincoln



PDA Hillarys for all of your dive and snorkelling requirements local and friendly staff to help you make the right choices open 7 days come and see us down at the Hillarys Boat Harbour just north of the boat ramp see you there

Phone: +61 (0) 86 82 3939

Mail: info@sharkcagediving.com.au

Web: www.sharkcagediving.com.au

ND Scuba - McLaren Vale



We are a small business that go above and beyond .we pride ourselves on providing safe and fun-filled courses at affordable prices. You get trained on a more personal level through to one on one, or small group tuition.

Phone: +61 (0) 88 323 8275

Mail: barrettn80@hotmail.com

Web: www.nbscuba.com.au

Adelaide

Diving Adelaide



Diving Adelaide is Adelaide's newest PADI 5 Star Dive Centre. We run all PADI courses as well as Leafy Sea Dragon Tours. Diving Adelaide is located next to the tram and bus-stop in Adelaide; easy to reach with public transport.

Phone: +61 (0) 8 73 250 331

Mail: info@divingadelaide.com.au

Web: www.divingadelaide.com.au

Underwater Explorer's Club of SA



The UEC is the oldest recreational scuba diving club in Australia, established in 1954. We do regular dives at locations within metropolitan Adelaide and have frequent trips to regional South Australia. Why not come and join us for a dive.

Phone: +61 (0) 417 838 387

Mail: secretary@uecofsa.org.au

Web: www.uecofsa.org.au



Glengowrie Downunderpix



Downunderpix is an underwater photography business established in South Australia. We provide all things underwater photography to the local, national and international markets. This includes supplying a range of underwater photography services as well as selling underwater camera equipment and scuba diving equipment.
Phone: +61 (0) 41 981 9083
Mail: info@downunderpix.com
Web: www.downunderpix.com

Victoria



Geelong Australian Diving Instruction



Australian Diving Instruction is a PADI 5 Star IDC facility Offering everything for the Diver from Learn to Scuba Dive to Instructor including PADI Tec 40,45,50, Equipment Sales and Service National and International Dive Trips and Dive Holidays also Dive Charter Boat.
Phone: +61 (0) 40 836 5216
Mail: adigeelong@optusnet.com.au
Web: www.ausdivinginstruction.com.au

Bay City Scuba



Bay City Scuba is Geelong's premier dive shop. Offering all levels of training from Freediving through to Technical training and offering a huge selection of equipment to your diving needs. A RAID training facility offering extensive technical OC & CC rebreather training.
Phone: +61 (0) 35 248 1488
Mail: info@baycityscuba.com
Web: www.baycityscuba.com

Extreme Watersport



Extreme Watersport Specialises in all recreational, educational and technical SCUBA diver training, charters and tours. Extreme Watersport is Melbourne's premier 5 Star SDI/TDI Instructor Scuba Diving Training Centre. We are also house a wide range of scuba gear for sale.
Phone: +61 (0) 3 5982 3432
Mail: info@extremewatersport.com.au
Web: www.extremewatersport.com.au

Dive Victoria Group



Our Training, Dive Charter and Group Accommodation services cater for local, interstate and international divers. On our doorstep we have amazing wall dives from 10-100m that we can dive every day and wrecks 8-80m in the Ships Graveyard
Phone: +61 (0) 3 5258 4188
Mail: info@divevictoria.com.au
Web: www.divevictoria.com.au

Rye

The Scuba Doctor Australia



The Scuba Doctor is an online and in-store dive shop stocked with quality brand recreational, technical and commercial diving products. Low prices on scuba, spearfishing, freediving, snorkelling and watersports equipment, plus Air, Nitrox and Trimix fills.
Phone: +61 (0) 3 5985 1700
Mail: diveshop@scubadoctor.com.au
Web: www.scubadoctor.com.au

New South Wales



Sydney

Plunge Diving



We are the only PADI and TDI dive center located on the waters of Sydney Harbour. We teach courses from Open water to Instructor level, and provide technical training. The Plunge dive boat offers dive trips for all certification levels.
Phone: +61 (0) 2 99695733
Mail: info@plungediving.com.au
Web: www.plungediving.com.au

Southern Cross Divers



Southern Cross Divers is best known for rebreathers and "tec" diving - we do nothing else but "tec". We will not stock a unit unless we can offer the customers a complete solution to all their CCR needs. We are Australia's CCR specialist store.
Phone: +61 (0) 2 9969 5072
Mail: barry@southerncrossdivers.com.au
Web: www.southerncrossdivers.com.au

Underwater Research Group of NSW



URG is a not-for-profit scuba diving club with a regular boat & shore dive schedule in Sydney and surrounds. Join our club to explore local dive sites and if you like, get involved in research projects to help marine conservation.
Phone: +61 (0) 418 257 462
Mail: info@urgdiveclub.org.au
Web: www.urgdiveclub.org.au

Killarney Vale

Pro-Dive Central Coast



Located between Sydney and Newcastle with daily boat dives to the ex-HMAS Adelaide artificial reef, only minutes from the local boat ramp. Online booking and dive sales available 24/7. PADI Instructor programs available.
Phone: +61 (0) 2 4389 3483
Mail: info@prodivcentralcoast.com.au
Web: www.prodivcentralcoast.com.au



Dive Operators

Australia

Nelson Bay

Feet First Dive



Jump in FEET FIRST with Nelson Bay's friendliest dive centre. Explore & enjoy the amazement of our Marine Sanctuary from the shore; take our boat to the local Grey Nurse Shark colony; OR Rebreathe our selection of Wrecks

Phone: +61 (0) 2 4984 2092

Mail: enquiries@feetfirstdive.com.au

Web: www.feetfirstdive.com.au

South West Rocks

South West Rocks Dive Centre



Our Training, Dive Charter and Group Accommodation services cater for local, interstate and international divers. On our doorstep we have amazing wall dives from 10-100m that we can dive every day and wrecks 8-80m in the Ships Graveyard

Phone: +61 (0) 2 656 66474

Mail: info@southwestrocksdive.com.au

Web: www.southwestrocksdive.com.au

Queensland



Sunshine Coast

Sunreef Mooloolaba



Sunreef Mooloolaba offers the ultimate water experiences on Queensland's Sunshine Coast. From diving the HMAS Brisbane and local reefs, to Swimming with Humpback Whales from July to November, to stand up paddle boarding, kayaking and bubblemaker kids programs.

Phone: +61 (0) 7 5444 5656

Mail: dive@sunreef.com.au

Web: www.sunreef.com.au

Scuba World



Dive one of Australia's top ten dive sites the Ex-HMAS Brisbane. We are the only operator that comes back to the sheltered waters of Mooloolaba bay for a relaxing morning tea. Enjoy hassle free diving from our private marina berth.

Phone: +61 (0) 7 5444 8595

Mail: rob@scubaworld.com.au

Web: www.scubaworld.com.au

Brisbane

Ozaquatec- Brisbane



Brisbane's largest dedicated scuba service centre, Ozaquatec has all of your servicing needs in one place at competitive rates. Our fast, friendly and professional customer service gives you, the diver, complete peace of mind.

Phone: +61 (0) 404 043 869

Mail: admin@ozaquatec.com

Web: www.ozaquatec.com

Gold Coast

Devocean Dive- Gold Coast



Devocean Dive is South East QLD's Premier PADI 5 star Instructor Development Centre. We offer unsurpassed service is a safe, fun environment with qualified, experienced Instructors. We look forward helping you achieve your SCUBA diving goals.

Phone: +61 (0) 75 528 0655

Mail: admin@devoceandive.com

Web: www.devoceandive.com

Brisbane

Tech Dive Academy- Port Douglas



You deserve the multi-award winning service of the ORIGINAL bespoke private diver training company - Serving Port Douglas since 2003. First for Bespoke Diver Training, the Dive Centre offers all levels of Recreational and Technical Dive courses.

Phone: +61 (0) 422 016 517

Mail: info@tech-dive-academy.com

Web: www.tech-dive-academy.com

List your Dive School or Dive Company here.

For a listing in OZDiver Magazine contact us at info@ozdiver.com.au

Dive Operators

Australia

Tasmania



Bicheno

Bicheno Dive Centre



Tasmanian diving at its best 32 different boat sites 16-40 meters 8 different shore dives with max depth of 20mtrs Boat travel time under 5 mins. Home of the weedy sea dragon.

Phone: +61 (0) 3 6375 1138

Mail: bichenodivecentre@bigpond.com

Web: www.bichenodive.com

DIVE THE WORLD

Africa Dive Safari's



Our company provides international tourist the opportunity to enjoy some truly unbelievable encounter with nature all around the shores of Africa from Great White ,Tiger Sharks , Mantas, Whale Sharks and Sardine Run around the coast of S.A. & Mozambique. Our drive and dive team will get you there safely

Phone: +27 (0) 83 689 1204

Mail: info@africadivesafaris.co.za

Web: www.africadivesafaris.co.za





OZ DIVER

It's FREE and it's ONLINE

WWW.OZDIVER.COM.AU

Peter Pinnock