Inspiring People to Care About our Oceans Since 1995

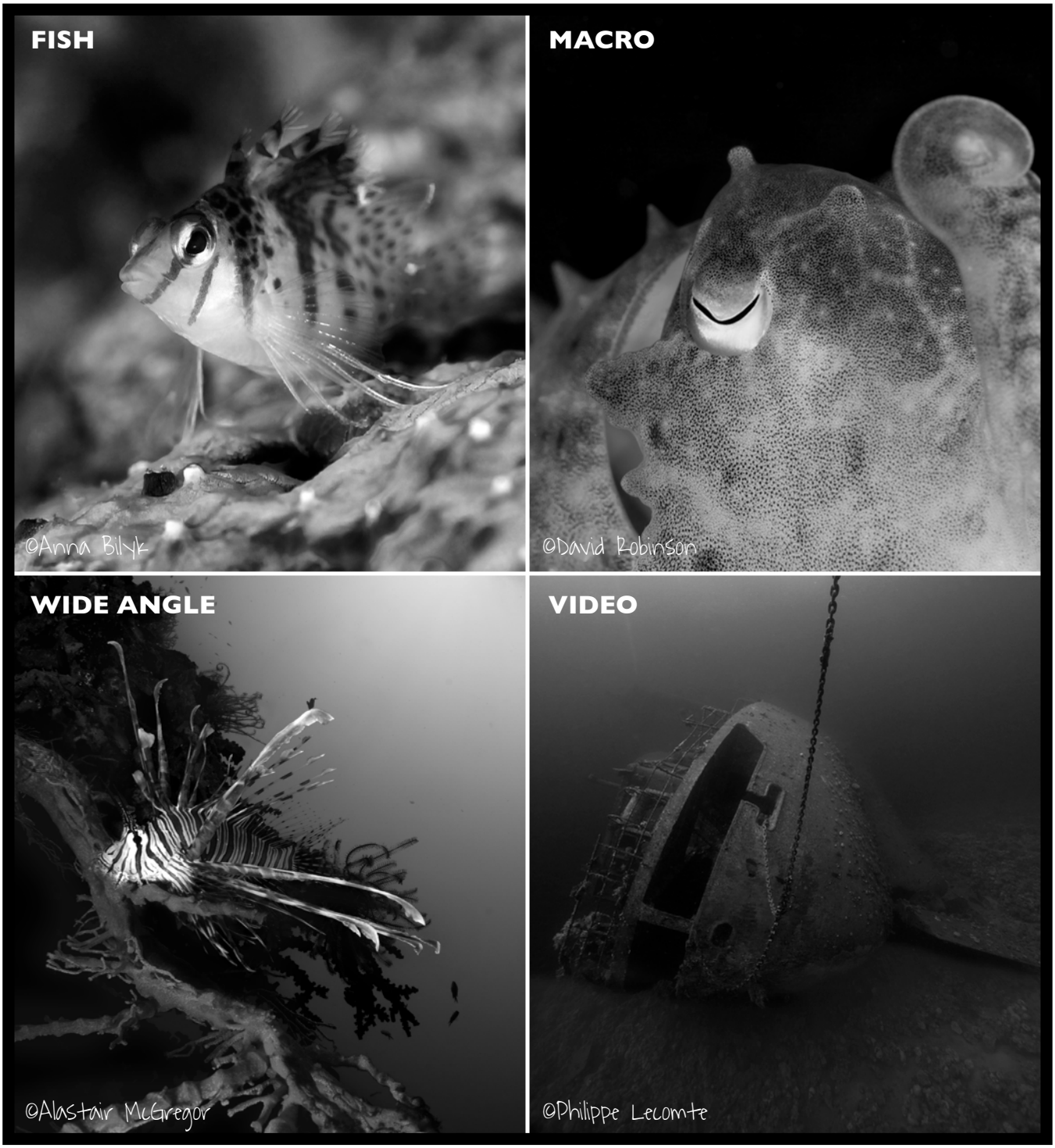
DIVERS FOR THE ENVIRONMENT

WWW.EMIRATESDIVING.COM | MAGAZINE | DECEMBER 2012 | VOLUME 8 | ISSUE 4

INTRODUCING THE SHARKS OF BEQA LAGOON

SHARKTASTIC FIJI

DIVED AND EXPERIENCED BY EDA MEMBERS



ENTER DIGITAL ONLINE 2013

EDA'S UNDERWATER PHOTOGRAPHY AND FILM COMPETITION

COMPETITION OPENS:
Tuesday, 1st January 2013

COMPETITION ENDS:
Tuesday, 30th April 2013 @ Midnight

THE EXHIBITION AND AWARD CEREMONY:
Wednesday, 29th May 2013 | 19:00-22:00 | Venue: TBA

DIGITAL ONLINE
EMIRATES DIVING ASSOCIATION
PHOTOGRAPHY AND FILM COMPETITION

EMIRATES DIVING ASSOCIATION
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Email: photo@emiratesdiving.com
www.emiratesdiving.com

EDA is a non-profit voluntary federal organization and is accredited by UNEP as an International Environmental Organization.

EDA
جمعية الإمارات للغوص
Emirates Diving Association

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DIVERS FOR THE ENVIRONMENT

Please note that EDA's magazine, "Divers for the Environment" includes articles written by individuals whose opinions, whilst valid, may or may not represent that of EDA. It is hoped that the magazine can become a platform for individuals to voice their opinion on marine and diving related issues. You are welcome to submit an article for the next issue of "Divers for the Environment" released in March 2013. Send all articles, feedback or comments to: **magazine@emiratesdiving.com**

EDA COVER

PHOTO BY SIMONE CAPRODOSSI

REDUCE REUSE RECYCLE

Please recycle this magazine after you have read it.

CONTENTS

ANOTHER YEAR ANOTHER GOOD DEED

IBRAHIM N. AL-ZU'BI
EDA Executive Director

As we celebrate the 41st UAE National Day, we reflect on the spirit that ties us all together, the Spirit of the Union that enables millions of people to coexist and build lives together. The Spirit of the Union is derived from the vision and leadership of the late Sheikh Zayed Bin Sultan Al Nahyan, EDA's founder, and now lives on through His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the UAE and his fellow leaders of the nation's Emirates who are shaping the UAE's future.

It is the spirit that binds the cosmopolitan community of the UAE, connecting us under one banner, one flag. It is the spirit of the union that celebrates our culture and heritage, and yet also shapes our future. The spirit needs to be celebrated and shared by all citizens and residents of the UAE.

Welcome to the final issue of 'Divers for the Environment' of 2012. The magazine has been running for 8 years and continuously gets richer in articles and photography! Thank you to everyone who participates in writing and taking photographs for the different sections for all our readers worldwide. Closing on yet another fast paced year, we reflect on all that we have done and achieved.

Our youngest writer, 10 year old Caitlin Tolliday first appeared in our June issue after recently being certified as a PADI Scuba Diver and has proven to be our inspiration member for 2012! She has taken on her responsibility as today's youth towards protecting our environment and is becoming a young environmental ambassador in her own right. Our movie screening, 'Bag It' which we held in September, really did have an impact on our viewers. Keep an eye out for Caitlin in future issues as she will be one to watch.

Clean Up Arabia 2012 was our final event of the year and we had another very successful outcome! His Highness Sheikh Yas Bin Hamdan Bin Zayed Al Nahyan represented his brother, His Highness Sheikh Hazza Bin Hamdan Bin Zayed Al Nahyan this year and played a large role in the Abu Dhabi Clean Up Arabia organized by EDA's Abu Dhabi Committee in collaboration with the Environment Agency - Abu Dhabi, GASCO, CNIA and Al Mahara Diving Center.

We thank our sponsors for making these events possible! Our thanks go to Coca Cola our main partner and supporter and Dubai Duty Free again this year as our Platinum Sponsors, Stanford Marine Group joined us this year as our Gold Sponsor and AkzoNobel joined us as our Silver Sponsor. Thank you to our supporting partners, Le Méridien Al Aqah and Dibba Municipality and to our Clean Up partners, UNEP, Clean Up the World and the Ocean Conservancy. And last but not least, thank you to all the dive centres for all their work and organisation and to the members, friends and families who volunteered their time to take care of cleaning up our little bit of Arabia. CUA was concentrated in the UAE and the Musandam only this year due to the political situations going on in the rest of the region. We send safe wishes to them all.

The Dive Middle East Exhibition 2012 held on the 13-17 March was the biggest event ever since its launch in 2007. We are really looking forward to seeing everyone in DMEX on the 5-9 March 2013. Don't forget to stop by and say hello at the EDA booth, we love meeting all our members and catching up with old friends visiting the event!

Digital Online 2013, EDA's Underwater Photography and Film Competition is going to be a very exciting affair. We have now prepped you for the new categories and cannot wait to see the entries start coming in, in January! We will reveal the jury, sponsors, prizes and venue for the exhibition and award ceremony in our March issue. We are already well on the way of planning it all for you, so start looking forward to Round 5 of Digital Online. We know we are! Safe snapping and filming to all our competitors, good luck and enjoy yourselves!

Our Diving Destinations section since the start of the year has become quite fantastic for all those in search of new and experienced diving destinations. So much so, that it now seems difficult to decide on which destination to prioritise! We've had members diving in Burma, the British Virgin Islands, Philippines, Cyprus, Thailand, Canada, Seychelles, France, Malaysia, Egypt and in this issue we're taken to the wonders of Fiji, Maldives, Mozambique, Indonesia and Mexico!

We hope you all have a wonderful time off during the UAE's 41st National Day and for those of you celebrating the festive season, we wish you all a very Merry Christmas and to one and all, a very Happy New Year! See you all in 2013! We look forward to hearing all your stories for next year's first issue.

"On land and in the sea, our fore-fathers lived and survived in this environment. They were able to do so because they recognised the need to conserve it, to take from it only what they needed to live, and to preserve it for succeeding generations."
The late Sheikh Zayed Bin Sultan Al Nahyan

Happy reading and safe Eco Diving!

Ibrahim Al-Zu'bi

EDA & COCA COLA'S WOMEN'S LINC GROUP CLEAN UP ON JBR BEACH

EDA organised a clean up on JBR Beach for 20 ladies from The Coca Cola Women's Linc group.

The ladies gathered around the shaded area which was set up prior to their arrival, and after a short briefing, they were given clean up bags and gloves and started combing the length of the beach in search of trash. After approximately 45 mins the groups started making their way back to the meeting area with their collection bags. The International Coastal Clean Up (ICC) cards were filled out by groups of 4.

The main trash culprit was the thousands of cigarette butts. They were everywhere! Everyone was absolutely shocked at the amount collected. It seems that smokers think its ok to just throw away their ciggarettes once done with them. This needs to stop, and clean ups like this really highlight the main problems we face with some people still not being fully aware of what happens to trash once its dumped in a public area, especially a beach where things usually make their way into the sea and affect the marine life. These points were discussed amongst the group and they were very enthusiastic about spreading the word and learning more on how long certain items take to break down. The ladies did a great job! Well done to all that participated.

STATISTICS ON THE TRASH COLLECTED:

- Total trash items collected – 2,407 items
- The highest single item collected was cigarette butts – 1,985 items
- The team that collected the most trash was Laurice, Lamia, April and Sofia – 667 items

ABOUT COCA COLA'S WOMEN'S LINC

The Coca Cola Women's Linc Group meeting focuses on engaging, inspiring and developing the women of the Coca Cola system to drive total business performance and establish a strong reputation as a great place to work for women.

EDA MOVIE SCREENING: BAG IT

EDA held a movie screening at VOX Cinemas at Mall of the Emirates on the 26th of September for all its members. Bag It has been one of our most popular and informative movie screenings to date and we look forward to our next one.

WHAT IT WAS ALL ABOUT:

Try going a day without plastic. Plastic is everywhere and infiltrates our lives in unimaginable and frightening ways. In this touching and often flat-out-funny film, we follow "everyman" Jeb Berrier, who is admittedly not a tree hugger, as he embarks on a global tour to unravel the complexities of our plastic world. What starts as a film about plastic bags evolves into a wholesale investigation into plastic and its affect on our waterways, oceans, and even our own bodies. We see how our crazy-for-plastic world has finally caught up to us and what we can do about it. Today. Right now.

FEDERAL LAW NO.23
EXPLOITATION, PROTECTION AND DEVELOPMENT OF THE LIVING AQUATIC RESOURCES OF THE UAE

Relevant articles from the Federal Law No. 23 of the year 1999 regarding the Exploitation, Protection and Development of the Living Aquatic Resources in the waters of the state of the United Arab Emirates.

We have received several phone calls and e-mails at EDA from our members enquiring about what is, or what is not allowed by law in the UAE in regards to diving. Some of our members have also voiced concern about the legal protection the marine life has and if some of the events we each witness happening out there, are a lack of legal protection or just a lack of patrolling.

In this issue, we have decided to print the most significant articles from the Federal Law No. 23 that concern diving and the protection and conservation of the marine environment. The remaining articles, not mentioned here, are more focused on the fishing trade, which we do not promote at EDA. If you are interested in knowing more about it, we can send you the full legislation via e-mail.

CHAPTER ONE
Organization of the Fishing Trade

Article (2)
Any person may not practice the fishing trade in the fishing waters unless licensed by the Competent Authority and his name entered into the Register. The conditions and procedures of the fishing license will be determined with a decision by the competent authority.

Article (25)
The following activities may not be carried out unless after obtaining special written permission from the Competent Authority:
1. Diving for catching ornamental fish.

Article (27)
Artificial coral reefs may not be set up unless for scientific research purposes or for developing certain species of the living Aquatic Wealth and after obtaining a license from the Ministry and the Competent Authority.

Article (28)
It is impermissible to capture sea turtles of all species, sizes and ages, or collecting their eggs or tampering with their habitat and reproduction places in the fishing waters. It is also impermissible to fish for whales, sea cows (Alatwam) and other sea mammals of all species and sizes or extraction of oysters, sponges or coral reefs except for purposes of scientific research and after obtaining a written permission from the Ministry and the Competent Authority.

CHAPTER FOUR
Protection and Development

Article (29)
To exercise diving with gas cylinders, compressed air, pipes or any other means for fishing purposes, it is compelling to obtain a written license from the competent authority provided that the following conditions are to be fulfilled:

1. The scientific research has to prove that the species intended for fishing is found abundantly and no fear of being extinguished or it stock affected as a result of fishing.
2. The purpose of fishing shall be for conducting scientific research and experiments, preservation in governmental aquatic museums or those belonging to local governments or selling aquatic organisms for growers of such organisms.
3. Whoever desires to conduct thereof shall be a citizen or a corporate body owned by citizens.
4.

a) The applicant for license shall have settled the approved fees thereon.
b) The license period shall not exceed fifteen days and renewed under essential cases for only one similar period.
c) On giving out the license according to the provisions herein, provision shall be taken to determine the numbers, sizes and species to be caught.

Article (37)
It is prohibited to establish artificial coral reefs made of any material in any ground of the fishing waters unless after the approval of the fishing regulations committee and obtaining a license from the competent authority as well as from the ministry to achieve any one of the following two purposes:
a) Conduct Scientific research
b) Development and enhancing certain species of the living aquatic wealth (releasing larvae, setting up reserves…etc.)

Article (40)
a) It is forbidden to catch marine turtles of whatever species, age or size and in any area of the fishing waters or the sea shores of islands and land.
b) The fishermen who fortuitously caught sea turtles in their fishing equipment shall on seeing them, release them seeking enough care for their safety.
c) It is prohibited to collect, sell or trade with the eggs of turtles or tamper with their nests or the places of their reproduction on land or sea shores of islands.

Article (41)
It is forbidden to catch the different marine mammals of whale species, dugongs (Al Atwaml), dolphins and any other marine mammals. The fisherman who had got any of the aforesaid aquatic mammals in his fishing equipment shall manage to release them into the sea, seeking enough care for their safety.

Article (42)
It is absolutely forbidden to extract oysters, sponges and coral reefs from the bottom of the sea by diving or by using any other means.

Article (44)
It is forbidden to catch the living aquatic creatures to extract their eggs, skins, fins and any other parts thereof.

Article (51)
Whoever exercises the diving hobby shall:
a) Hold an approved diving license
b) Abide by the rules, regulations and orders issued by the competent bodies.
c) Clarify the diving place with the international banner (Alfa) for determining the diving area.
d) Guarantee the devices fitness he uses for exercising diving.
e) Hold a navigation license from the competent authority.

Article (52)
It is forbidden for diving hobbyists to:
1. Pick off coral reefs
2. Pick off ruins and dispose of them personally.
3. Pick off ship wreckages or dispose of them for personal purposes.
4. Dive individually.
5. Use fishing guns while using diving equipment (compressed oxygen).
6. Dive in banned waters, prohibited areas, near military constructions or vivid marine constructions and castles.

Article (53)
Fishing and voyaging hobbyists shall:
a) Hold a navigation license for fishing and voyaging.
b) Not practice the sports fishing hobby for trading and marketing.
c) Not using nets, gargoors, gears and other forbidden equipment.
d) Not approach the prohibited areas, vivid military premises, and palaces.
e) Provide the Ministry with the information it requires about the live marine wealth.

EDA JOINED THE NYUAD WORKSHOP
"THE BIOLOGY OF CORAL REEFS IN EXTREME ENVIRONMENTS"

From the 16th to the 22nd of September, EDA was given the opportunity to join the workshop, "The Biology of Coral Reefs in Extreme Environments", organized by NYU Abu Dhabi (NYUAD) Institute. This workshop brought together leading international scientists from the USA, Australia, UK, Saudi Arabia, and the UAE and had the participation and support of the Ministry of Environment and Water – Marine Environment Research Centre, Environment Agency Abu Dhabi, and the Fujairah Municipality.

The workshop addressed some of the unsolved puzzles previously discussed in the January conference, "Coral Reefs of the Gulf", also organized by NYUAD. How coral reef fauna counter and adapt to the harsh conditions of the Arabian Gulf, and how reef fauna may adapt to future climate change worldwide, were a few of the interesting topics that scientists were trying to understand. Participants collected coral and fish samples for molecular and genetic analysis, with the intention to answer different research questions on the impact of extreme temperatures in coral and fish growth rates, on feeding behaviour of fish, and on coral energy reserves.

See below for more information about one of these works compiled by Cornelia Roder and Christian Voolstra from King Abdullah University of Science and Technology – Saudi Arabia.

After a full week of diving and intensive data collection, researchers went back with their bags replete with key data that will help them put together some of the puzzle pieces.

ZOOXANTHELLAE DIVERSITY AROUND THE ARABIAN PENINSULA

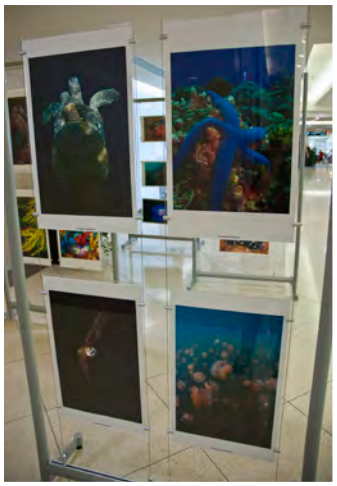
FEATURE **CORNELIA RODER & CHRISTIAN VOOLSTRA**

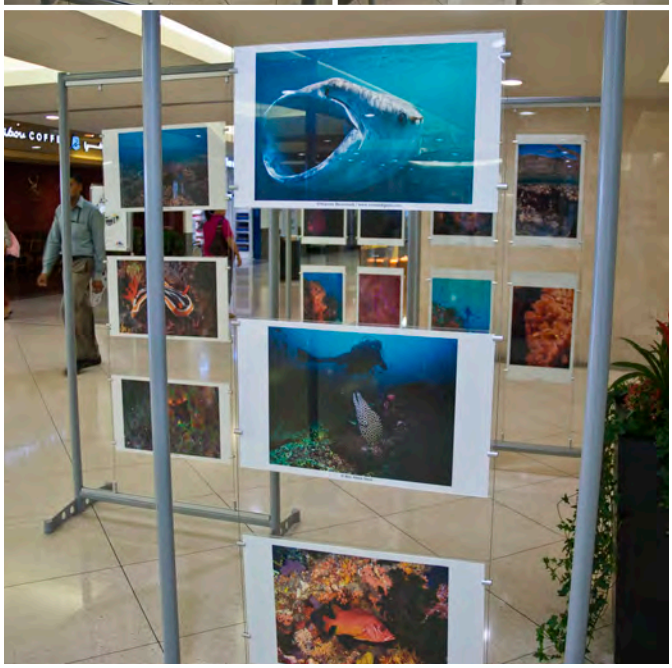
There is much to learn about the biology of reef-building corals and the resiliency of these organisms to climate warming. Our current understanding presumes that there is the possibility these symbioses will respond to climate warming through ecological and evolutionary change. Comparative physiological investigations have shown that certain host-symbiont combinations are more resilient to environmental disturbance. Indeed there are a number of symbiont species identified from large surveys of biodiversity that appear to convey greater tolerance of thermal stress to the host colony. The Arabian Gulf represents one of the most extreme environments (e.g. wide annual range in temperature and turbidity) in the world where coral communities live successfully. Only little is known about the diversity of coral symbionts from this unique region. Examining the coral-algal symbioses at just a few locations in the area will provide critical insight into the capacity of corals to develop symbioses that may allow them to persist and recover from rapid shifts in climate.

We biopsied coral colonies and several other symbiotic cnidarians from all locations/habitats visited in the Arabian Gulf. These samples will be analyzed genetically to determine the identity of the resident algal symbiont and then compared with other regions previously analyzed throughout the Indo-Pacific and the Red Sea. Ultimately, the results of these initial investigations will contribute vital missing information and help to provide a broad perspective of how coral-algal symbioses change across coral communities living in different environments and reef systems throughout the region.

LOVE ART

Deira City Centre has a number of underwater-themed events appealing to both children with a curiosity for marine life and those who appreciate nature's beauty. From October 18th to November 3rd, the Metro Link area, had LOVE Art, (the creative arts space dedicated to photography, local artists and new talent) featuring 70 underwater photographs provided by Emirates Diving Association (EDA). With the aim to protect the UAE's marine environment. EDA leveraged LOVE Art to raise awareness of some of the natural underwater beauty, and add a vibrancy for shoppers during Eid.





FACING MY FEARS

FEATURE **SAFA ALABEDY**

If you had told me five years ago, that I would jump into a tank full of sharks willingly for my birthday, one of two things would have happened:

1. I would have laughed at you and said that you were crazy.
2. I would have had a panic attack at the mere mention of the word "sharks".

I think it all started when I was a young girl sitting in front of the TV watching Spielberg's 'Jaws'. Those terrifying visuals of this incredibly powerful animal, hunting down humans and ripping through them with its razor sharp teeth traumatized me. And it didn't stop there. Every movie that included sharks conveyed the same image – they were ruthless, insane, unstoppable, killing machines.

As these images were etched deeper into my mind, my fear grew stronger. In fact, it got so bad that the mere mention of the word shark would send chills down my spine. This fear did not go unexploited; my sister would play pranks on me by changing my laptop's wallpaper image to a shark and I would be so terrified of the image, that I wouldn't be able to touch the laptop or look at it, never mind trying to change the image to end the cruel prank.

It was when I accidently came across a documentary while flipping through the TV channels, about a great white shark and her journey across the oceans that things began to change for me. Something gripped me when I saw this awfully dangerous creature go through life threatening situations and I then felt fear of another kind; fear for her life. I found myself holding my breath as she crossed shark-hunting waters and before I realized it, here I was, sitting in front of the TV watching an entire movie about a shark without flinching once. Not one flinch, not one scream and I didn't look away for a second.

Soon after, I started reading more about sharks, watching more documentaries and educating myself about these creatures in an effort to differentiate between the myths and the facts.

Then came Dubai Mall and its aquarium. I knew I had to go. I had to look at a real shark and face my fears. I was very nervous, I didn't know what to expect. I still remember the walk to the aquarium, my heart beating in my ears and then there they were. I stood watching them for 30 minutes and I couldn't get over how magnificent they were. I was in awe. I knew that the second step would be to swim with them, but I didn't know when or how.

It was the 4th October 2012 when that decision was made. I picked up the phone and called The Dubai Mall Aquarium and booked a dive with Al Boom Diving for my birthday on the 8th.

As the day arrived, my dive was turning into a reality. I knew these sharks were used to divers and it is somewhat safe, but a shark is still a wild creature and can never be tamed. I felt my heart beating faster as I entered the aquarium and was engulfed by waters. Soon, I thought, very soon I would come face to face with my greatest fear.

Here I was, 11 meters under water, when I saw my first shark. I remember my diving instructor/buddy giving me the "OK?" sign. I looked back at him and wished I had words to say "An 'OK' sign isn't enough to convey what I am feeling!" Everything I ever feared was a few meters away swimming, unaware of my thoughts, of my misconceptions, even perhaps my existence. It was beautiful. I felt my fear being replaced with respect and love for these magnificent creatures.

I came out of the water 37 minutes later, exhausted and a bit nauseous, but the only fear I experienced was the fear of running out of air and NOT of being mangled by an insane man-eating shark. I now look forward to more dives. I still fear sharks, but it's a natural fear, not an exaggerated phobia. Sharks should be feared, but they should also be respected and protected. When asked recently of which animal I would like to be, I thought for a second, smiled and said: a shark.

If you had told me five years ago, that I would jump into a tank full of sharks willingly, I would have called your bluff and I would have lost.

For your chance to get up-close-and-personal with the residents of one of the world's largest Aquariums, contact Al Boom Diving on **(+971) 04 342 2993** or email **abdiving@emirates.net.ae**.

MORE THAN JUST A GADGET

FEATURE **LEANNE KING, BSC – AL BOOM DIVING**

Working in a dive centre, I have the pleasure of meeting many newly qualified divers, a lot of whom ask us, "If I'm going to buy just ONE piece of equipment, what should I get?" My answer? Without doubt or hesitation – A DIVE COMPUTER!

Every student new to diving gets taught the importance of dive planning and diving within your limits. However, despite the focus that dive courses have on planning for time and depth limits, I've seen too many divers become complacent as they become "experienced".

An example of this came one day during my Divemaster training. I was heading out to guide a dive in Al Aqah, Fujairah. Along with another team member, I was leading a group of 4 divers all of which were at least advanced or above. We were heading out to Inchcape 1 and due to the varying levels of diver qualifications in the group, our boat crew explained it would be a no penetration dive. One guest piped up, "then why have I got my wreck specialty?" After the general briefing was finished, I had a chat with this guest and his buddy – the 2 divers I was personally set to guide. I found out that, although this particular guest had wreck specialty training, his buddy didn't and nor did anybody else on the boat. The diver seemed perturbed that he wouldn't be able to penetrate the wreck, seemingly unable to comprehend that he couldn't do it by himself. Further conversation between me and the 2 guests established that, even though we were set to do a 30 metre dive, neither had dive computers nor dive tables with them. I was surprised at this, to say the least. Both were experienced divers, having specialty training certifications, they clearly enjoyed their diving and took it seriously. Then why did neither have what many consider to be an essential piece of equipment? We continued to plan our dive and I explained to them that both were to stay above me for the length of the dive since we would have to use my computer to set our limits. When I said "surface", they were to surface.

We started our descent and everything seemed to be going well. My guests were observant of me, where I was, where I was heading and I kept a close eye on them. On reaching the end of our descent, we started to navigate the wreck, with my instructor and the other 2 guests close by. As the dive continued, the guest with the wreck specialty started to become more and more independent of the group. He regularly dropped lower than me, forcing me to descend in order to keep him within the limits of my computer. It was far from an ideal way to be leading a group. After 20 minutes, I signalled to my guests that it was time to ascend. The wreck spec diver was resistant, hanging at the bottom of the group as we traversed the ascent line, staying just a few seconds longer to get that last view of the wreck.

When we surfaced and returned to the boat, I had a chat with the diver in question. I asked him about his dive history, how long he'd been diving and how come he didn't have a computer or tables with him. He didn't really have any specific reason, it was just something he'd never really considered.

I've seen other examples, with similar attitudes from experienced divers. Too many people head out on guided dives and DON'T plan their own dive. They seem to think that they can leave it to their guide. I'm sure I'm not the only one in the dive industry who sees this all too often and wants to stress the importance of planning YOUR dive and knowing YOUR limits. A dive computer is the easiest way to keep an eye on your limits, to visualise your dive and it also indicates when to end your dive so that you stay well within safety limits. It allows you to have more flexibility on your dive as it works off your actual dive profile, rather than stricter theoretical profiles. A computer allows you to safely extend your dive, decreasing the risk of slipping in to no decompression limits when diving deep. It's not recommended to dive using someone else's computer. A computer is a personal item, it stores all your dives and works off your history. There are reasons that dive centres around the world recommend you have your own computer. Renting theirs is certainly better than having nothing, but every year, with the development of the technology, computers get more and more affordable. You can get a simple computer that stores and logs all the vital information of your dive for as little as 1,350 AED these days – not a massive amount for increased piece of mind and safer diving.

STOCKING FILLERS

FEATURE **KATRINA KING**

Like it or not, Christmas is approaching fast. So what do you get the diver who's got it all? Maybe you've picked out the office scuba diver in Secret Santa and you're at a bit of a loss where to even start looking? Well, here's a run-down of some of the most popular dive accessories, all at stocking-filler prices to help you make it through this festive period!

50 AED OR LESS

- **Divers Underwater Slate, Innovative Scuba Concepts** – This slate is portable in size and gives space to write all the vital information you need to save, for up to 3 dives at a time – no need to take the log book on board and risk it getting washed away! The back is blank, allowing you to note down any interesting critters or facts about the dive. It comes with its own stainless steel carabineer and a pencil holder on the back.

- **Mouthpiece, various manufacturers** – mouthpieces are always welcome accessories for any diver with their own regs. They're a useful but compact piece of equipment. A wrecked mouthpiece can ruin a dive, making it awkward and difficult to breathe. A replacement mouthpiece is discreet, easy to carry and easy to replace when on a boat

- **Hosewraps, Innovative Scuba Concepts** – make their equipment easy to spot amongst the other divers. With 5 fluorescent colours available, hosewraps are one of the best ways of making your equipment stand out.

- **Tank banger, Innovative Scuba Concepts** – Underwater signalling devices are essential. If you want to stop and take a photo, even if just for a second, you need to let your buddy know. Tankbangers are highly durable and easily heard. The good thing about them is that, unlike rattles, you can't drop them on a dive and lose them!

- **Strapwrappers, Innovative Scuba Concepts** – let's face it, mask straps are hardly the most comfortable equipment. If you're a female with long hair (or even a male with long hair!) it's so easy for it to end up tangled and caught around the silicone strap. Strap wrappers remove that inconvenience, meaning you don't have to tug and pull at your hair when you get back to the boat. They also make it easier to get the mask on and off both in and out of the water.

100 AED OR LESS

- **Safe Signal Mirror, Trident** – Having a variety of surface signalling devices is highly recommended and good practice among the diving industry. The Trident Safe Signal Mirror is compact enough to sit inside a BCD pocket and hard wearing enough to stay there until it's needed.

- **Wrist Slates, Innovative Scuba Concepts** – A popular item among many instructors, these glow-in-the-dark slates are designed to sit on the contours of the wrist, allowing you to conveniently take any notes you need. With three slates and an elasticated coil for your pencil, they're ideal for taking notes in many diving situations, including at night!

- **Admiral II Gloves, Aqualung** – The chillier months are certainly setting in and gloves are an ideal way to stave off the chill under water. Just like heads and feet, hands are responsible for losing a lot of your body heat. These neoprene gloves have velcro wrists and almara palms, making them flexible but protective.

- **Save-A-Dive Kit, Innovative Scuba Concepts** – We all dread the moment when something small ruins our dive: perhaps it will be a split mask strap, a snapped fin strap or a split mouthpiece. Innovative Scuba Concepts has created the ultimate saviour kit. With a mouthpiece, mask strap, fin strap, snorkel keeper, O-rings and tie wraps all contained inside a handy tube, you need never fear having to cancel a dive for those annoying little inconveniences again. Best thing? If you use something, you can just replace it when you're back on land!

- **Snappy Coils, Innovative Scuba Concepts** – I find this the ideal way of securing my video camera. The lanyard allows the strap to be secured to equipment, while the buckle keeps the camera close but allows it to stretch to arms length when necessary.

200 AED OR LESS

- **Lycra Rash Guard, Aqualung** – like a pair of socks for the diving industry. Rash guards are popular clothing items among many, many divers. They are particularly useful in this climate as they can be used to add layers in the winter and can be used on their own in the summer. They help prevent irritation from wetsuits as well as providing coverage back at the DC when it's time to rinse your equipment.

- **Flexar Fins, Aqualung** – These lightweight fins are ideal for snorkelling. They're small but powerful. They're light enough to be thrown in to the luggage when you go on holiday. The strap is made from durable thermorubber, making it able to stretch but it' also been designed to have three different positions to ensure a good fit.

- **Arrival Mesh Bag, Aqualung** – Got a new diver in the family who's starting to gather their own pieces of equipment now? Help them keep it all safe and secure when they head out for a dive, without having to take the expensive roller bag on board, exposing it to the elements.

- **Log Binder with Insert, Innovative Scuba Concepts** – These binders are ideal for storing log pages. With several different graphic designs from Amphibious Outfitters, there's one to suit every diver! They come with a set of log pages and have space inside to fit your dive certification cards amongst other essential bits of information. (pictured right)

FOR THE YOUNG ONES

- **Flame Junior Snorkelling Fins, Aqualung** – It's always much more fun when the whole family can get involved in the adventure and getting children snorkelling from a young age is an ideal way to encourage them to dive and be excited by their planet. The Flame fins by Aqualung are ideal for smaller people, with a shorter blade they are very lightweight and easy to use in the water.

- **Peeka Tonga Mask and Snorkel Set, Aqualung** – This set is specially designed for the contours of smaller faces and is brilliantly priced for little people who are still growing. Available in a variety of colours, it's made from polycarbonate and protects from UV rays.

- **Aqua Disc, Aqua Games** – Engineered to travel up to 30 feet underwater, this Aqua Disc can provide a family with hours of fun. The disc has a high visibility, flexible yellow edge making it safe for pool or sea.

- **Mega Fliers, Playful World Products** – These giant inflatable balloons are a lot of fun. They are radio controlled, requiring only 3 batteries for the entire system, it's not heavy on power or the wallet. The balloons can be filled with helium at any Al Boom Diving Centre.

Thank you to Al Boom Diving for providing the products to test. Also thanks to Steve Wood for the inspiration behind this article. Remember, EDA members get up to 20% off selected retail items at Al Boom Diving stores, making Christmas even more affordable!

Al Boom Diving Club

HAVE YOU SEEN
THE BOTTOM OF THE OCEAN LATELY?

FEATURE **CAITLIN TOLLIDAY**

Recently, my daddy and I were invited by EDA to the VOX cinema to see a movie called 'Bag It.' The movie really inspired me. It was about plastic, and showed that although plastic is very important to us it can cause terrible damage to the environment when it is disposed of irresponsibly.

A week or so after the movie, my instructor Francis Uy organised my final open water training dives at the Jumerah Beach Hotel. I was excited to see how it looks 6 metres down in the Arabian Sea; next to a five star hotel. I was expecting to see beautiful corals, sea grasses, shells and lots of animals; I was really disappointed that what I actually saw was very different! Plastic bags, tin cans and even cardboard littered the sea bed…There were very few animals…It was so ugly, not what I expected at all! I could not believe that people would just drop this kind of litter into the sea and onto our beaches.

I learned in the 'Bag It' movie, just what this kind of litter can do, not only to the environment, but to the animals who share our planet… in the film, I saw dead birds and whales with plastic in their stomachs! Beautiful turtles think plastic bags are their food, they eat it and die! Seals, penguins and other creatures get tangled up in plastic products and suffocate! It is very sad! And it's all because we humans are so irresponsible! I am 11 years old…and I plan to make a difference, because of this film. My school, Jebel Ali Primary has an eco-day every year. I am on the school council, and was determined to get the point of the movie across! As part of Eco-Day the school ran a competition for us to write our school Eco-code. Using what I had learned, I wrote a code that included important facts about what we should do to ensure that we reduce our use of plastic, reuse as much as possible, and also dispose of it properly by recycling…I won the competition!

I am determined to do my best to reduce, reuse, recycle, and who knows, one day in the future, if I have a daughter who likes to dive, she might just find something better 6 metres down in the Arabian Sea! I hope that she sees what I'd hoped to see on my first open water dive, beautiful coral, sea grasses, shells and many, many happy sea creatures living happily in a clean and beautiful habitat!

PADI SIDEMOUNT DIVER COURSE

FEATURE **FRANCIS UY** – PADI COURSE DIRECTOR/TEC DEEP/TRIMIX TRAINER/SIDEMOUNT INSTRUCTOR #473237

The much awaited PADI SIDEMOUNT Course is now here. Last year at DMEX 2011, I had a chance to introduce SM (sidemount) diving on one of the exhibits. Back then, it was a distinctive speciality. The demand for this type of diving is positive within all of the diving community and I strongly believe that SM is the future and now it has started.

The history of SM diving began in England where it was originally used in partially submerged caves. It was an easier method of transporting diving gear between totally submerged sections of the cave. Americans began using SM in the mid-seventies for the same purpose. In the early eighties, Wes Skiles and other Florida cave divers began to use SM to explore cave passages that were too low for conventional back mounted tanks. With the improvement of dive equipment and the help from dive manufacturers, the demand for SM diving is slowly being accepted worldwide.

SM is a scuba diving equipment configuration which has diving cylinders mounted alongside the diver, below the shoulders and along the hips, instead of the diver's back. When looking at an SM diver, you generally see someone with two cylinders attached on either side of their body. There is no doubt that this setup is great for technical divers, but what about the recreational diver? Not to worry, SM is more than adaptable to the recreational diver as well, using a single cylinder SM configuration. Similar to conventional backmounted scuba diving, your second stage and alternate air source are still attached to the cylinder's first stage. However, with this unique assembly, you achieve a stream lined effect, creating less drag and improving diver trim, whilst also having easy access to the valve and thus increasing one's safety!

The new PADI Sidemount Diver Speciality course teaches divers how to configure and use one or two cylinders mounted at their sides instead of on their backs. The PADI Sidemount Diver Course is a unique way for buoyancy control and streamlining. PADI Sidemount Diving gives you total freedom in a Side Mount Diving Harness that will reduce drag making finning and moving through the water easier and more efficient. Two tanks are better than one, when placed under each arm.

The benefits of SM diving include:

- Adjustability. Most SM configurations allow a diver to fine tune equipment fit and trim during the dive to enhance streamlining and body position. Using SM cylinders can reduce drag and help better control environmental contact when compared to using backmounted twin cylinders.
- Access. A diver has easy access to the regulator first stage(s) and tank valve(s) during the dive, because they're positioned in front of the diver instead of behind the diver's head.
- Back relief. Divers with back problems may find relief by mounting cylinder(s) on their sides.
- On/off in the water. Divers who have challenges supporting cylinder weight out of the water may find side mounted cylinder(s) simpler to use and easier to put on in the water.
- Maximize time. For divers who run out of gas long before approaching no decompression limits, side mounted cylinders provide a comfortable option to increase air supply and maximize bottom time; especially when using enriched air.
- Redundant gas supply. With two-cylinder SM, a diver can handle a low or out-of-gas problem by switching to the second cylinder.
- Redundant gas delivery system. With two cylinder SM, a diver can handle regulator failure by switching to the second regulator.
- Ease of use topside. Carrying two smaller cylinders can be easier than carrying one large cylinder (or backmounted twin cylinders) to and from the dive site.

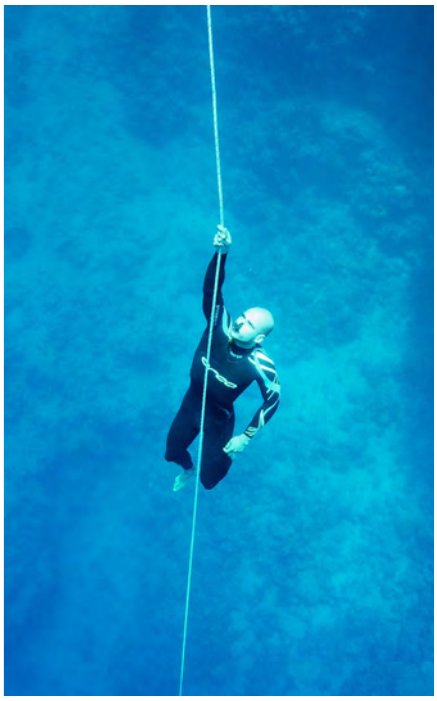
This is not a technical diving course. Sidemount Diving is aimed to show you how recreational diving is a unique diving experience with two independent tanks (Side Mount Tanks) a small buoyancy device. During the course, the student will learn about equipment considerations, the Sidemount Diving Harness, Sidemount diving regulators, air management, attaching cylinders, trim and buoyancy, finning techniques, deployment of an SMB, the different water entries, side mount equipment and harness selection. By the end of this course, you will be completely hooked on Sidemount diving.

This speciality is recreational in scope, including no-stop dives. Maximum depth; 18-30 meters, depending on diver training/experience.

Course Prerequisites: You need to be a PADI Open Water Diver (or equivalent rating) and be at least 15 years old.

What are we waiting for? Let's dive with sidemounts. We lead the future and the rest will follow!

FREEDIVING WORLD CHAMPION
VISITS DUBAI TO TEACH ADVANCED COURSE



DUBAI, 6 DECEMBER: Goran Colak World Champion and world record holder will be visiting the UAE to conduct an advanced freediving course with FreedivingUAE.

In partnership with FreedivingUAE, Goran Colak will be holding an advanced freediving course in Dubai. The course will be held from the 13/12/2012 to 16/12/2012 and is open to intermediate and advanced freedivers and spearos. The cost of the course is 1550 AED.

'After competing in the Fazza competition in Dubai this year, I really wanted to run a course here" said Goran. He added, 'freediving is really taking off in the UAE and I really want to be part of this movement'.

Sid Ahmed who is organizing the course, is looking forward to improving his freediving skills. 'I have been freediving for 12 years and I have been running training sessions with the freediving group in Dubai, but we want to take it to another level and being the World Champion, Goran is the best person to help us.' He added, 'There is also a big community of freediving fishermen in the UAE who want to learn how to freedive deeper and safer'.

Goran won the Fazza competition this year with a breathhold of 8 minutes and 53 seconds – this is the second year that he has won at this competition. The freediving course in Dubai consists of 2 pool sessions at the Hamdan sports complex and 2 open water depth sessions in Fujairah. More information on the course can be found at **http://www.facebook.com/events/364417213646326/**.

GORAN COLAK

Goran Colak was born in 1983 and is a Croatian World Champion free-diver. In 2011, he became the AIDA International World Champion and set a new World Record of 273m in Dynamic Apnea with fins (DYN) were Freedivers compete on how far they can travel horizontally underwater in a swimming pool using fins (usually mono fins) on one breath. At the same event, he produced one of the most astonishing individual free diving performances in history of this sport, with two gold medals, one silver medal and a World Record. This year, Colak was part of the Croatian team that won the 2012 AIDA team world championships.

FREEDIVING

Have you ever dreamed of passively exploring the underwater world free from equipment? Freediving is the ultimate way to free yourself underwater and is one of the fastest growing watersports in the UAE.

Anyone who has held their breath underwater has Freedived. However, freediving is not simply about seeing how long you can hold your breath or how deep you can go on a single breath – it is a bit more zen than that.

'We teach our students the right attitude and attention to their body and mind so that they can dive comfortably holding their breath', says Alex Boulting, AIDA instructor and co-founder of FreedivingUAE. 'The true appeal of Freediving is in the silence and calm it brings to people's lives', he adds.

As well as the perfect way to relax at the weekend, Freediving is an international competitive sport. Professional freedivers exploit the bodies' diving adaptations to go to depths of over 200m on a single breath. These diving reflexes help conserve oxygen by restricting the blood flow to your extremities, conserving it for your vital organs.

SID AHMED

Sid grew up on the Mediterranean coast of Morocco where the tradition of freediving and spearfishing is well established. Passion and respect for the oceans are his guidelines. His passion for freediving grew stronger once he reached the UAE and met many other athletes. In March 2012, Sid created a freediving training group for all keen freedivers in Dubai to improve their performance, fitness and diver safety.

FREEDIVINGUAE

Freediving UAE was co-founded by Adel Abu Haliqa and Alex Boulting in 2009. It is a professional community of free divers who have a passion for passively exploring the underwater world. Freediving UAE is the only company in the UAE specializing in courses and training in Freediving. FreedivingUAE aims to connect the UAE heritage of pearl diving with the modern world of Freediving. FreedivingUAE is continuously working to get Freediving recognized in the UAE and create Freediving as a popular sport. In the future we aim to put the UAE on the international Freediving map by organizing a national team and running Freediving competitions.

DUBAI AQUARIUM VOLUNTEER PROGRAMME

FEATURE **THOMAS D. PELLEGRIN**, PADI DIVEMASTER

We all turn to scuba diving for different reasons. Some of us are attracted by the beauty of the underwater fauna and flora; others find appeal in the introspective nature of an activity that requires a good amount of self-control. Others seek the adrenaline rush from the technicality and gear sophistication of more challenging dives.

The Dubai Aquarium & Underwater Zoo's volunteer programme is a unique opportunity for those who appreciate all facets of diving. The marine life is both diverse and abundant; the aquarium is home to tens of thousands of aquatic animals of 330 species, many of which are hard to come by when diving in open water. Visibility is unlimited – at least up to the acrylic window that separates the divers from the shoppers! And to those who want to test their self-control, the aquarium features one of the world's largest collection of sharks, including the largest collection of sand tiger sharks in the world.

Of course, the volunteer programme is not a free substitute for pleasure diving in the world's largest aquarium, which is otherwise accessible for a fee. There is underwater work to be done each day, tended to primarily by the "aquarists" (the permanent staff) and supplemented by a loyal cohort of volunteers. Daily chores include, among other things: feeding the animals according to a rigorous diet and schedule, vacuuming the bottom to remove marine debris, brushing the artificial reef to remove the fast-growing algae, and wiping the 270° tunnel that takes visitors across the tank. With a stringent schedule of four daily dives (08:30, 10:00, 13:00 & 15:00), aquarists and volunteers will enjoy minimal surface intervals. The work itself is physically demanding, requiring perfect buoyancy, frugal air consumption, constant situational awareness (especially with regards to the dense marine life), and good overall fitness. It is no surprise that most volunteers are at least Rescue Divers or Divemasters; diving proficiency is part of the job description.

In return, volunteers receive a lot of attention from the Dubai Aquarium & Underwater Zoo. Their "first day on the job" takes them through guided orientation dives, during which they learn to manipulate the vacuuming hoses and manifolds, navigate their way through distinct zones, behave around marine life, and get their comfort level to a point where they can operate efficiently in front of a riveted audience of shoppers standing outside the main 32.8m x 8.3m acrylic viewing panel (the world's largest!). The volunteers also quickly get into the habit of waving for the tunnel visitors who are eager to take a picture of this rather unusual encounter. As they log more dives, the volunteers gain "levels", allowing them to take on more sensitive tasks (such as feeding the animals) and get perks, such as complimentary access to the tunnel for themselves and their guests.

Gordon White, General Manager of the Dubai Aquarium & Underwater Zoo said, "We are proud to offer the opportunity for members of the local community to better understand the varied aspects of aquarium management, and the insights in the world of aquatic animals, through our program. All our volunteers are members of EDA and are equally passionate about diving as they are about marine conservation. Their active involvement helps in promoting stronger awareness about aquatic life and their conservation."

And of course, at the end of a long diving day, the volunteers go home with the satisfaction of having contributed to running one of the world's largest aquarium operations that attracts over a million visitors every year and raises their awareness to the beauty of the underwater world.

Here's what some of the Dubai Aquarium & Underwater Zoo volunteers have to say about what attracted them to this programme:

"It is indeed a great experience volunteering in the Dubai Mall Aquarium and diving with sand tiger sharks and thousands of other creatures. I've been doing this for the last 8 months and it has made me more passionate and employable. Staff working here are very friendly and optimistic, and Dive Supervisor Mr. Francis rocks…thanks Dubai Aquarium."
GEORGE D.HENRY
PADI Divemaster/Lifeguard

"I find diving and the underwater world extremely fascinating and beautiful. The Dubai Aquarium is the closest to a perfect environment you can find anywhere. That's why I joined as a volunteer."
CHRISTIAN BARDRUM
PADI Divemaster/Airline Pilot

"Being a dive volunteer in the Dubai Aquarium will enhance my knowledge and skills in the promotion of Underwater Environmental Awareness and Protection to other divers and the public as well."
SOREN DEL CASTILO
PADI Instructor/ Paramedic Nurse

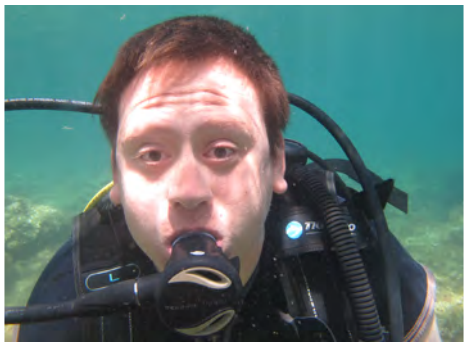
"Volunteering at the Dubai Aquarium is a great way to maintain diving proficiency without travelling, while enjoying one of the most scenic and unusual underwater environments that there is. It is an added motivation that the work serves the educational purpose of raising conservation awareness among visitors, and that my long-time instructor, Francis Uy is in charge of diving operations!"
THOMAS D. PELLEGRIN
PADI Divemaster

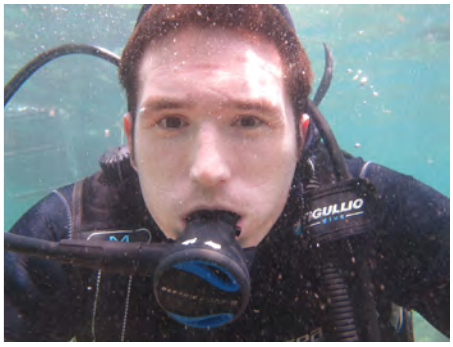
"I chose to be a volunteer to learn more about aquatic creatures and enjoy being amongst them in the water. Since getting involved I've found my dive skills have really improved as I've learnt how to complete new and challenging tasks in the underwater environment."
SIMON NATHAN
PADI Rescue Diver

If you are interested in becoming a diving volunteer at the Dubai Aquarium & Underwater Zoo, please send an email to: **interns@thedubaiaquarium.com** or Email Francis Uy at **fuy@emaar.ae**.

HMS DIAMOND'S ADVENTEROUS TRAINING: DIVING IN FUJAIRAH 1-16 SEP '12

FEATURE **JAMES WALLINGTON-SMITH**





With HMS Diamond deployed on her maiden seven-month deployment, the ship took two weeks to rest man and machine alongside in Dubai at the start of September. Whilst the Ship was getting a fresh coat of Pusser's Grey eleven of her Ship's Company thought this would be an excellent opportunity to take some leave themselves so they headed east to the opposite coast of the UAE and the dazzling lights of the city of Fujairah.

For many who went, the idea of diving sparked earlier in the deployment when they got involved in a try dive, this is an introductory dive normally at about 7m but under the full guidance of a qualified PADI instructor. From there the diving recruits were taken under the care and organised wing of Karin at Divers Down UAE who took care of all our bookings, arranged our transport to and from Dubai and booked us into the 5-star Miramar Beach Resort (albeit at a massively discounted rate!).

On the first day of the course we walked in and everything was ready to go, you noticed the little things that stand out and tell you what a great organization it was: prompt and very helpful staff but without being pushy or grumpy when you didn't understand something, and the DMs were friendly and professional. James, our instructor, was exceptionally knowledgeable; his briefings were clear and based on sound local information. Subash and Reggie, the two boat captains are fantastic and you immediately understand that safety is their top priority but with that covered, they've plenty of time to ensure you get some cold water and fresh orange as soon as you're out of the water. I have no doubt that I will go back and visit the next time I'm in Fujairah.

The dive course started with some theory and revision of what we'd learnt in the PADI Manual. In a flash of an eye, we'd covered the first of the theory and were ready to kit up for the very first time before jumping in the pool for our first wet session. Having completed my try dive, I never imagined that the next time I dived I'd be the one putting together the complicated equipment. The course whizzed by so quickly that it seems a blur, but learning in Fujairah meant that once we'd proved our skills in the pool we could move to the Open Water and learn on dives surrounded by fish and coral reefs.

In total, everyone clocked up four sea (open-water) dives all of which had different assessment serials. All eleven of the ship's company passed the assessment and are now qualified PADI Open Water divers. Everyone thoroughly enjoyed their time at Divers Down and all are keen to build on their diving skills in further port visits.

Our thanks for the trip in all its guises go to Paul and all his team at Divers Down UAE. Thanks also to the RN AT Fund and Sports Lottery without whom the cost would have been prohibitive. I had an amazing time and am now PADI qualified to dive anywhere in the world with a suitable qualified buddy to a maximum depth of 18m.

PADI FACTS

The PADI Open Water Diver course consists of three main phases:

1. Knowledge development, this can be either taken online, or locally in a classroom. This will teach you a lot of the terminology of diving, and deals with how pressure affects the body, and how to look for signs of Nitrogen excess in the body. The theory side is split up in to five parts, and there is a short exam at the end, as well as a final exam testing you on what you have learnt during the course.

2. A Confined Water dive, this allows you to put into practice what you have learned in the classroom, and practice your skills in an enclosed environment. This was done in the pool in the hotel and covered all the basics, and helped give us confidence for our open water dives.

3. Open Water dives, this is the final part of your course, and consists of four open water dives. This was the final part of the course, and we had to demonstrate everything we had learned from the seabed. This included removing, and clearing our mask, recovering our regulators, and sharing our air with each other.

4. On completion of the course we received our PADI Open Water Diver Licence (similar to your driving licence), and are now qualified to dive to 18m or 60ft.

GREED OR LACK OF EDUCATION?

FEATURE AND PHOTOGRAPHY **DIVERS DOWN UAE**

Over the last few months we have noticed a massive increase in fishing on the East Coast, in particular the area stretching from Dibba to Khorfakkan. The quantity of nets and pots placed within the 2 nautical mile limit has increased so much it is virtually impossible to navigate without running into lines or pots.

We have always had an issue with the Gargoor traps, they are randomly placed and have inefficient markers on them (a requirement by law), and some have long lines trailing off them because the fishermen are unable to judge the depth in which the pots sit. Now the biggest hazard not only to marine life but also dive operators, is the Al Hayyal or drift nets that are like the Gargoors randomly placed without sufficient markers.

During October to April you can expect to see these drift nets as this is the season of migratory marine life, but now the drift nets are there all year round. Also, with the new rules that now allow the fishermen to use nets from shore to catch sardines and anchovies, it seems everyone is now a fisherman!

So, as you can tell I am a little baffled by all the ways that the UAE seems to be intent on depleting its fish stock so I looked into a few things that explain why there are so many pots and nets out here.

The general law on fishing is Law 23 of 1999, now this seems to be more of a administrate law rather than a law on regulations, but you can unearth a few facts such as:

- Drift nets are prohibited
- Trawling prohibited
- Bottom setting nets prohibited
- No fishing within 2NM of shore or 3NM of an island (unless fishing for sardines or anchovies)
- Nets no longer than 1000m with 100m of rope on each end (from shore fishing)
- No spear fishing with aqualung for hobbyist divers
- Fishermen who catch turtles by accident must care for their safety when releasing
- No fishing in a marine reserve, marine project area, disused marine project area, in shipping lanes, and next to areas of tourism!
- All fishing boats must have an owner on board
- Enforcement is by the Coast Guard not ministries

So why so many drift nets? Why are the Gargoors not marked correctly? Why are the shore fishermen using longer nets than allowed? Is it that the fishermen simply do not know the regulations, or choose to ignore them for bigger catches and higher income (greed)?

We used to get updates on local and federal laws from the then MAF (Ministry of Fisheries and Agriculture), now it is the Ministry of Environment and Water. Some updates have been that all Gargoors should have dissolvable string incase of the Gargoor becoming lost or snagged, that spear fishing is banned and that no net should be within 2NM of shore (same as the rules that are already in place!)

Now we have no interaction with the ministry which is a shame as having the opportunity to put the dive operator's side of the problem to them would be beneficial to us and I am sure the fishermen.

In places like Khorfakkan, there are co ops for the fishermen and they regulate the number of licenses and fishing practices. If the fishermen could only understand the damage that is being done by their fishing techniques maybe they would understand the importance of the rules that are already in place.

The placing of nets alongside reserves will deplete fish stocks, the random dropping of Gargoors will affect the turtle population and the use of drift nets is so indiscriminate it affects everything from whale sharks to rays.

To give you an idea of the lack of education on marine conservation, I had a phone call recently with a very educated Emirati who owns a fishing boat. In the conversation he was asking me for the location of the sharks that we see during the winter months. I asked why, and he replied that they are fetching really good money for the fins at the moment. I explained that I would not give him the location and why, but he kept on asking. The reason for his persistence was that there was not much tuna around to catch and the sharks would make him more money. Well I replied, maybe if you did not over fish the sardines you may have some tuna to catch!

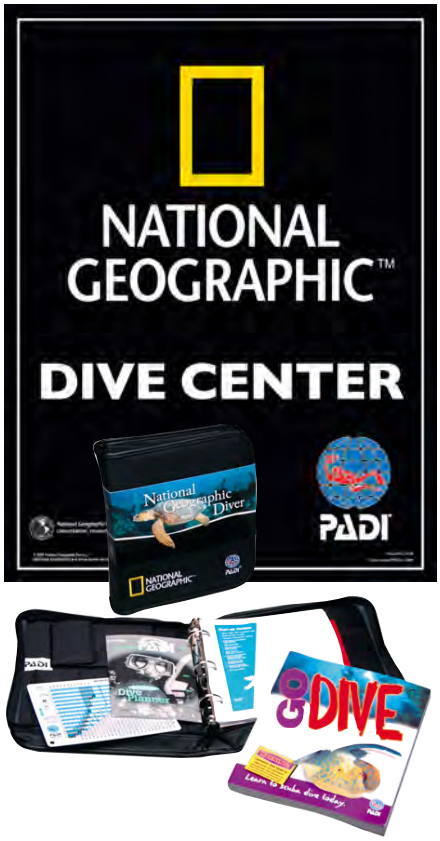
As a company we pay fees to the Ministry of Environment each year for the privilege of diving. The fees are the same for fishermen and shipping companies. I wonder which profession has the least environmental impact and which one is the most educated?

I am sure that the ministries and the fishermen co operative educate the fishermen (boat owners) on how to fish, however it is very rare to see the owner on the boat. For this reason, those people out there fishing are doing so for little salary and no education. Do they care about the local environment; the answer is no, they care about the amount of fish they bring to market so they can be paid.

Maybe the law should be revised and lean towards the conservation and husbandry of fishing stocks. Educate all those that work on the boats, monitor the landed catch (fishing co ops) and ensure the laws are applied (Coast Guard). Unfortunately there are miles of coastal areas to monitor and many fish markets, so the option of monitoring is already a massive hurdle. Education has to be the way forward, show the owners that if this carries on there will be even less tuna, mackerel, sardines and barracuda.

ADVENTURE, EXPLORATION AND CONSERVATION

FEATURE **DIVERS DOWN UAE**



Divers Down is now a National Geographic dive center and will be running this exciting diving program with the UAE's schools and those students that wish to undertake the Nat Geo open water course or Nat Geo specialty.

WHAT IS THE NAT GEO COURSE?

Well it is a designed for those people that want to explore, be adventures and be keen conservationists.

During the standard open water PADI course a diver completes theory, pool and sea sessions. They receive a manual or crew pack and upon completing the basic dives are certified to dive in the open water.

Nat Geo divers complete the same syllabus as the basic open water course and in addition they get to learn more on peak performance buoyancy, navigation and exploration. This means 5 sea dives instead of the normal 4, and additional pool training.

Nat Geo divers also receive the Nat Geo crew pack and almanac, this pack comes with a great log book binder and you receive a unique Nat Geo diver certification card.

If you are already a certified diver you can also join in the adventure and complete the Nat Geo specialty course. This like the open water course, includes an almanac and 2 great sea dives, where you learn buoyancy and exploration or navigation.

Divers Down is in a great location on the East Coast, so adventure is on our door step. Shark dives in the sea, coral reef systems and dive travel trips to amazing worldwide locations all year round.

As a Nat Geo diver you can join us on our special Nat Geo only diver trips worldwide, and join our reef projects and photo club.

TO FIND OUT MORE:

Website: www.diversdown-uae.com
Email: info@diversdown-uae.com
Tel: +971 9 237 0299
Mob: +971 50 553 1688

Divers Down Uae

AN ANNOUNCEMENT MADE ON WORLD FISHERIES DAY: EAD TO STUDY HOW FISHERIES REGULATIONS IMPACT THE COMMUNITY SOCIALLY AND ECONOMICALLY

EAD to study how fisheries regulations impact the community socially and economically.

- **EAD research shows that 71% of Abu Dhabi's demersal (fish that live and feed on or near the sea bottom) fisheries resource base is over-exploited**
- **This socio-economic survey will help EAD and its stakeholders to predict the social and economic impact of regulations required to achieve sustainable resource utilisation**
- **The survey will include a first-of-its-kind in the region model-based simulation tool to estimate the socio-economic impacts of fisheries regulations**

ABU DHABI, NOVEMBER 20, 2012: The Environment Agency-Abu Dhabi (EAD) has announced that it will be launching a Fisheries Socio-Economic survey to allow it to study what social and economic impacts current or future regulations could have on the fisheries sector in the Emirate of Abu Dhabi. The announcement was made in observance of World Fisheries Day, which is celebrated on November 21 each year to highlight the importance of maintaining the world's fisheries.

The survey will provide authorities such as regulators, policy-makers, and fishermen co-operative societies with socio-economic information for better management planning and decision-making purposes. It will also help EAD and its stakeholders to closely evaluate the impact of regulations required to achieve sustainable resource utilisation.

One of the project's deliverables will include an innovative model-based simulation tool to be made available to all stakeholders to estimate the socio-economic impacts of fisheries regulations – which will be the first-of-its-kind in the region. Users can input socio-economic profile parameters which will then estimate the costs or benefits incurred to each fisheries sub-sector associated with different levels of regulation for each fishery.

Another deliverable is the creation of a socio-economic database that covers data such as: total number of individuals/operations employed; mean annual costs/revenue/profit per participant or business/fishing operation; age, nationality and ethnic structure of the workforce etc. Lastly, a workshop will allow EAD to engage its stakeholders, communicate the results of the survey and promote a dialogue among the group. A brief training session on the use of the socio-economic simulation tool will be run on the side-lines of the workshop.

The results of EAD's fish stock assessment over the last decade indicated that the demersal fishery is over-capitalized, with 71% of the fisheries resource base being categorised as over-exploited. Abundance surveys undertaken in 2001/2002 revealed that the stocks of the major commercial species had been reduced to 19% of the levels recorded in a comparable survey undertaken in 1978. Over the years, EAD has responded with a comprehensive suite of fisheries management regulations and initiatives all aimed at re-building stocks such as closing fishing activities in certain areas or at certain timings to allow the fish stock to recover naturally, regulating type of gear that could be used by fishermen and setting a quota on amount of fish that could be caught per day.

H.E Razan Khalifa Al Mubarak, Secretary General of EAD, said: "As Abu Dhabi rapidly moves towards achieving its ambitious developmental goals, the pressure on our resources is increasing. We recognise that our fisheries are an important component of the cultural heritage of coastal communities as they offer a source of employment, recreation and food security. So we are committed to rehabilitating and rebuilding Abu Dhabi's depleted fish stocks together with our stakeholders, and we believe that this requires a solid regulatory framework."

She added: "We have commissioned the socio-economic survey to go hand-in-hand with our existing regulatory efforts with the aim of achieving a more sustainable resource utilisation. Through this survey, we aim to evaluate the impact of current and future regulations and provide our stakeholders with all the necessary information to help them with their decision-making."

Primary data will be collected through site visits and key interviews with stakeholders from each of the areas that deal with fisheries, from Retail and Hospitality, to Commercial Aquaculture. Geographically, the survey will cover the Eastern and Western regions of Abu Dhabi Emirate. The project, as a whole, is expected to be completed by late 2013.

Through this survey, EAD will engage a wide range of its stakeholders including the Abu Dhabi fishing community, UAE Ministry of Environment and Water, the Critical National Infrastructure Authority (CNIA), the Abu Dhabi Fishermen's Cooperative Society, the Delma Fishermen's Cooperative Society, the Fisheries' Organising Committee for Abu Dhabi and the Emirates Wildlife Society in association with the World Wide Fund for Nature (EWS-WWF).

As part of its broader awareness mandate, in 2010, EAD partnered with EWS-WWF on the 'Choose Wisely' campaign to raise awareness among consumers about depleting fish stocks and encourage them to make better purchasing choices.

ABOUT EAD

The Environment Agency – Abu Dhabi (EAD) was established in 1996 to preserve Abu Dhabi's natural heritage, protect our future, and raise awareness about environmental issues. EAD is Abu Dhabi's environmental regulator and advises the government on environmental policy. It works to create sustainable communities, and protect and conserve wildlife and natural resources. EAD also works to ensure integrated and sustainable water resources management, to ensure clean air and minimise climate change and its impacts.

هيئة البيئة - أبوظبي
Environment Agency - ABU DHABI

ADGAS ORGANIZES ITS 3rd ANNUAL ABU DHABI ISLANDS CLEANING CAMPAIGN

FEATURE **KATHLEEN RUSSELL, EDA ABU DHABI COMMITTEE COORDINATOR**

This year is a great year for beach and underwater clean ups and action speaks louder than words sometimes. As part of Abu Dhabi Gas Liquefaction Company Ltd.'s (ADGAS) corporate social responsibility, the company organized its third Abu Dhabi Island's Cleaning Campaign on the 3rd of November 2012. This year's theme, "Keep It Clean and Pristine" saw over 400 volunteers join the beach and underwater clean up at Abu Dhabi International Marine Sports Club and Lulu Island. Volunteers came from all over the UAE including ADGAS employees and their families, corporate participants including OPCO's own GASCO, ADNOC Distribution, Al Hosn Gas, Borouge divers, Al Futtaim Carillion, the Environment Friends Society, Emirates Diving Association and Al Mahara Diving center divers. The event was organized and supported by the following organizations, Environment Agency of Abu Dhabi, Center of Waste Management – Abu Dhabi, CNIA, Emirates Diving Association, Project Aware, Al Mahara Diving Center and Abu Dhabi International Marine Sports Club (ADIMSC) who hosted the venue and provided its boats to assist in transporting the volunteers to Lulu Island.

Mr. Hassan Al Marzooqi, Senior Vice President (Administration) commented on the campaign, "We have made a point of involving our employees and their families in several activities that address environmental and sustainability issues so as to embed such principles in the daily life and lifestyles of our ADGAS family."

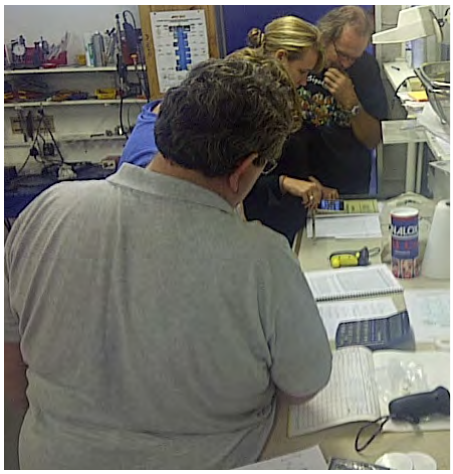
Divers and kayakers took action around the marina of ADIMSC and brought up a variety of marine debris including plenty of beverage aluminum cans, glass bottles, plastic bags, plastic plates and cutlery, a fire extinguisher, construction materials and leisure items including radio and much more. 2 tons (over 2000kg) of marine debris was collected in 1.5 hours by the volunteers from underwater and the beach side of Lulu Island.

We extend a huge thanks to all the volunteers and look forward to continue this successful cleanup campaign with all our partners to fight against marine debris.

"HOW I TRAINED TO BE AN ASSET SCUBA TECHNICIAN"

THE ASSOCIATION OF SCUBA SERVICE ENGINEER AND TECHNICIANS COURSE (ASSET)

FEATURE **ALISTAIR RUSSELL**



In September 2012, instructors from Al Mahara Diving Center in Abu Dhabi went to Morecombe Bay on the North East Coast of England to attend a 14 day intensive technician course. The course was attended by Darren Drewery, Emma Corbett, Alistair Russell and Peter Mainka, all of whom are either working or simply associated with the dive center for training and fun dives. The main aim for us all was to improve and develop upon the knowledge, understanding and the abilities for all aspects related to diving equipment. The course taken was the 'Dive Industry Technician Course' (DITC), including cylinder testing part 1, the Nitrox technician course, the gas blending course and the cylinder testing course part 2 for Hydro and NDT. The course covers all areas of the maintenance activities, provides a benchmark of competence for the main technical activities of equipment maintenance, cylinder testing and oxygen cleaning. The course was taught by Mr C.S. Meinart who is a leading expert in the field having established and written the program for ASSET and is integral with the ASSET overall team in their ability to offer world class training at their UK and Thailand centres.

The intensive course lasted 14 days straight with no breaks from 9am – 5pm each day in the classroom for theory and in the workshop for hands on practical application for stripping and rebuilding regulators, BCDs, inflators, first stages, ultrasonic cleaning, visual tank inspections, eddy current testing, hydraulic testing of tanks, compressor overviews and many other aspects of the modern dive industry. We obtained experience into correct and best practices for workmanship, familiarity with technician's literature and tools to ensure correct tools and part and schematics are always utilized for any repairs made. We became familiar with various testing units such as the ultrasonic wall thickness gauge, maghelic and interstage pressure, A.I.R flow analyser, eddy current test apparatus for tank neck thread defects, digital dial gauges and endoscopes, pressure test chambers and other items all required for comprehensive equipment maintenance work. There were days where Mr Meinart scrutinized our work and gave extensive feedback. One of the highlights for some of us was the gas blending practical where we blended our own enriched air mixture accurately and efficiently. We also gained valuable experience and knowledge in manufacturer warranties and customer care, the industry's best practice code of conduct and standard procedures, how to set up a professional workbench, cylinder testing and of course equipment service and repairs. We now all have a thorough understanding and competence in all aspects of the training having successfully completed the course and received our certifications on final completion. It was an intensive and interesting couple of weeks, but as an industry professional, it is a training not to be missed, learning from industry experts and leading manufacturers.

Al Mahara Diving Center is now gearing up with required industry tools for testing equipment, to offer a wide range of service to our customers and our own in-house equipment for servicing and tank inspections in Abu Dhabi as required. We look forward to sharing our knowledge with the diving community at large. We will grow the service we offer as we develop and are establishing our nitrox blending stations in Abu Dhabi at our Emirates Palace Marina location and our new diving and water sports centre located at Anantara Desert Island Resort on Sir Bani Yas Isand in the western region – so watch our space for further updates.

SHARKWATCH ARABIA: THE END OF THE SEASON

FEATURE **DAVID P. ROBINSON, JONATHAN ALI KHAN & WARREN BAVERSTOCK**

It has been a very productive summer with lots of whale shark sightings from the Arabian Gulf and Gulf of Oman. As the winter is now fast approaching and the waters are cooling, we are seeing a reduction in the number of sharks encountered.

Reflecting on the 2012 season, there have been fewer whale shark encounters in the Musandam compared to 2011 but as I write this, it is only early November and the sharks may still make more appearances. September saw the Daymaniyats become a hotspot for whale shark activity with divers reporting five sharks at once on some days.

There was a stranding of a whale shark North of Sawadi, Oman earlier in November. This shark was unintentionally caught by a fisherman and quickly disposed of by the Omani authorities. There was a also a reported 3m shark in a Jebel Ali port earlier in the month, luckily this small shark managed to find his own way out before action had to be taken.

MANY THANKS

We would like to take this opportunity to thank the following individuals for their support and for sending in sightings to Sharkwatch Arabia: Christophe Chellerpermal – Nomad Ocean Adventures, Julia Herbolsheimer, Matthew Webb – Extra Divers, Micheal Rall, Mark Preece, Rhea Lynn, Wendell Acena, Ali Mac, Nasser Khanjari, Michael Bartyzal, Jan Wenger and Palm Divers.

If you encounter a whale shark in this region, please visit **www.sharkwatcharabia.com** and report your sighting.

PROJECT AWARE BRINGS DIVERS TOGETHER TO TACKLE THE OCEAN'S SILENT KILLER

FEATURE **DOMINO ALBERT – PR & COMMUNICATIONS COORDINATOR**

In a global effort to prevent marine debris issues, Project AWARE is calling on the diving community in all corners of the globe to collect underwater debris and log the data not only during special important events such as Debris Month of Action in September or Clean Up Arabia in November but all year round.

Since the launch of Dive Against Debris thousands of scuba divers took action to tackle the ocean's silent killer and provide a global snapshot of the debris issues plaguing our ocean planet.

Tires, glass bottles, hooks, fishing lines, discarded fishing nets – you name it, divers are removing it from the sea floor and coral reefs one dive at a time, before bringing it to the surface to be sorted and disposed of properly.

Since January 2012, a staggering 36,195 kg/76,796 lbs of marine debris has been removed, and new reports are submitted daily. The data collected from Dive Against Debris events helps illustrate the problem and highlight the need for all of us to work together to find solutions.

Project AWARE uses this underwater data at regional, national and international levels to raise awareness on the impacts of marine litter, to promote measures to reduce it and campaign to prevent it.

DIVE AGAINST DEBRIS HIGHLIGHTS

One of the main highlights of this year's Debris Month of Action was a four-hour cleanup operation during which more than 2.5 tons of debris scattered at a beach resort in Jeddah in Saudi Arabia were removed. Dive Against Debris coordinator, Elmer Fuentes reported the removal of 181 pieces of alloy and metal bars, 45 plastic tables and chairs, 4 bags of plastic bottles and 4 bags of glass bottles. Around 110 Filipino and western expatriates and Saudi scuba divers participated in the event.

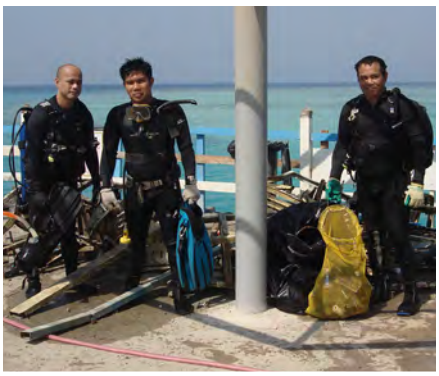
Debris Month of Action 2012 also saw the launch of GO ECO Phuket, a group of eco divers and PADI dive centres in Phuket, Thailand committed to working together to raise awareness and find solutions to local environmental problems. Over 500 divers took part in the biggest Dive Against Debris event held yet. About 15 tons of debris was pulled off the coral reefs around Phuket. Divers spent three dives carefully lifting a 4.5 ton fishing net from the coral reef before the Royal Thai Navy and a local fishing vessel were able to get the net out of the water.

In Montreal Canada, Action Scuba turned their Dive Against Debris event into a successful fundraising event in support of marine conservation and shared their fundraising tips with other dive leaders on 'My Ocean', Project AWARE's online network. The event raised almost US$800 and went a long way to inspire others to run similar events in support of our global efforts to tackle the ocean's silent killer.

The Debris Month of Action Facebook Photo Contest was also a big success. In a bid to show the true extent of the marine debris issue, Project AWARE invited divers to submit photos of their weirdest findings. From teddy bears and toilet seats, to bicycles and prams, more than 145 photos were submitted.

Dive Against Debris events empowers volunteers to survey marine debris all year round. Fight back with Project AWARE and turn your recreational dives into ocean-saving actions by physically removing and recording litter from our seas! Your actions are making a difference and are contributing to protecting the oceans and its inhabitants from harmful debris.

Together we can stop the ocean's silent killer. Visit **www.projectaware.org** to find out more about Diving Against Debris and other programmes you can get involved in to help protect precious underwater habitats.



FEATURE CREATURE
GREEN TURTLE (*CHELONIA MYDAS*)

FEATURE **IUCN RED LIST 2012.2 BY IUCN** PHOTOGRAPHY **CHRIS PINCETICH/MARINE PHOTOBANK**

Local Species in the IUCN Red List 2012.2

RED LIST CATEGORY & CRITERIA: ENDANGERED
Scientific Name: *Chelonia mydas*
Common Name: Green Turtle

Justification: Analysis of historic and recent published accounts indicate extensive subpopulation declines in all major ocean basins over the last three generations as a result of overexploitation of eggs and adult females at nesting beaches, juveniles and adults in foraging areas, and, to a lesser extent, incidental mortality relating to marine fisheries and degradation of marine and nesting habitats. Analyses of subpopulation changes at 32 Index Sites distributed globally show a 48% to 67% decline in the number of mature females nesting annually over the last 3 generations.

Range Description: The Green Turtle has a circumglobal distribution, occurring throughout tropical and, to a lesser extent, subtropical waters (Atlantic Ocean – eastern central, northeast, northwest, southeast, southwest, western central; Indian Ocean – eastern, western; Mediterranean Sea; Pacific Ocean – eastern central, northwest, southwest, western central). Green turtles are highly migratory and they undertake complex movements and migrations through geographically disparate habitats. Nesting occurs in more than 80 countries worldwide. Their movements within the marine environment are less understood but it is believed that green turtles inhabit coastal waters of over 140 countries.

Native: American Samoa (American Samoa); Angola (Angola); Anguilla; Antigua and Barbuda; Australia (Ashmore-Cartier Is., Coral Sea Is. Territory, Northern Territory, Queensland, Western Australia); Bahrain; Bangladesh; Barbados; Belize; Brazil; British Indian Ocean Territory; China; Christmas Island; Cocos (Keeling) Islands; Colombia; Comoros; Cook Islands; Costa Rica; Cuba; Cyprus; Dominica; Dominican Republic; Ecuador (Galápagos); Egypt; Equatorial Guinea (Bioko); Eritrea; Fiji; French Guiana; French Polynesia; French Southern Territories (the) (Mozambique Channel Is.); Grenada; Guam; Guinea; Guinea-Bissau; Guyana; Haiti; India (Andaman Is., Gujarat, Laccadive Is., Nicobar Is.); Indonesia (Bali, Irian Jaya, Jawa, Kalimantan, Lesser Sunda Is., Maluku, Sulawesi, Sumatera); Iran, Islamic Republic of; Jamaica; Japan (Honshu, Nansei-shoto, Ogasawara-shoto); Kenya; Kiribati; Kuwait; Madagascar; Malaysia (Peninsular Malaysia, Sabah, Sarawak); Maldives; Marshall Islands; Martinique; Mauritania; Mayotte; Mexico (Baja California, Campeche, Michoacán, Quintana Roo, Revillagigedo Is., Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz, Yucatán); Micronesia, Federated States of; Mozambique; Myanmar; Netherlands Antilles (Bonaire, Netherlands Leeward Is.); New Caledonia; New Zealand (Kermadec Is., North Is., South Is.); Nicaragua; Niue; Northern Mariana Islands; Oman; Pakistan; Palau; Panama; Papua New Guinea; Peru; Philippines; Puerto Rico; Saint Helena, Ascension and Tristan da Cunha (Ascension); Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Sao Tomé and Principe; Saudi Arabia; Senegal; Seychelles; Sierra Leone; Solomon Islands; Somalia; Sri Lanka; Suriname; Tanzania, United Republic of; Thailand; Timor-Leste; Tokelau; Tonga; Trinidad and Tobago; Turkey; Turks and Caicos Islands; Tuvalu; United Arab Emirates; United States (Florida, Hawaiian Is.); United States Minor Outlying Islands (Midway Is., US Line Is.); Vanuatu; Venezuela (Aves I., Venezuelan Antilles); Viet Nam; Virgin Islands, British; Virgin Islands, U.S.; Yemen.

Regionally Extinct: Cayman Islands; Mauritius (Rodrigues - Native).

Reintroduced: Bermuda.

Population Trend: Decreasing.

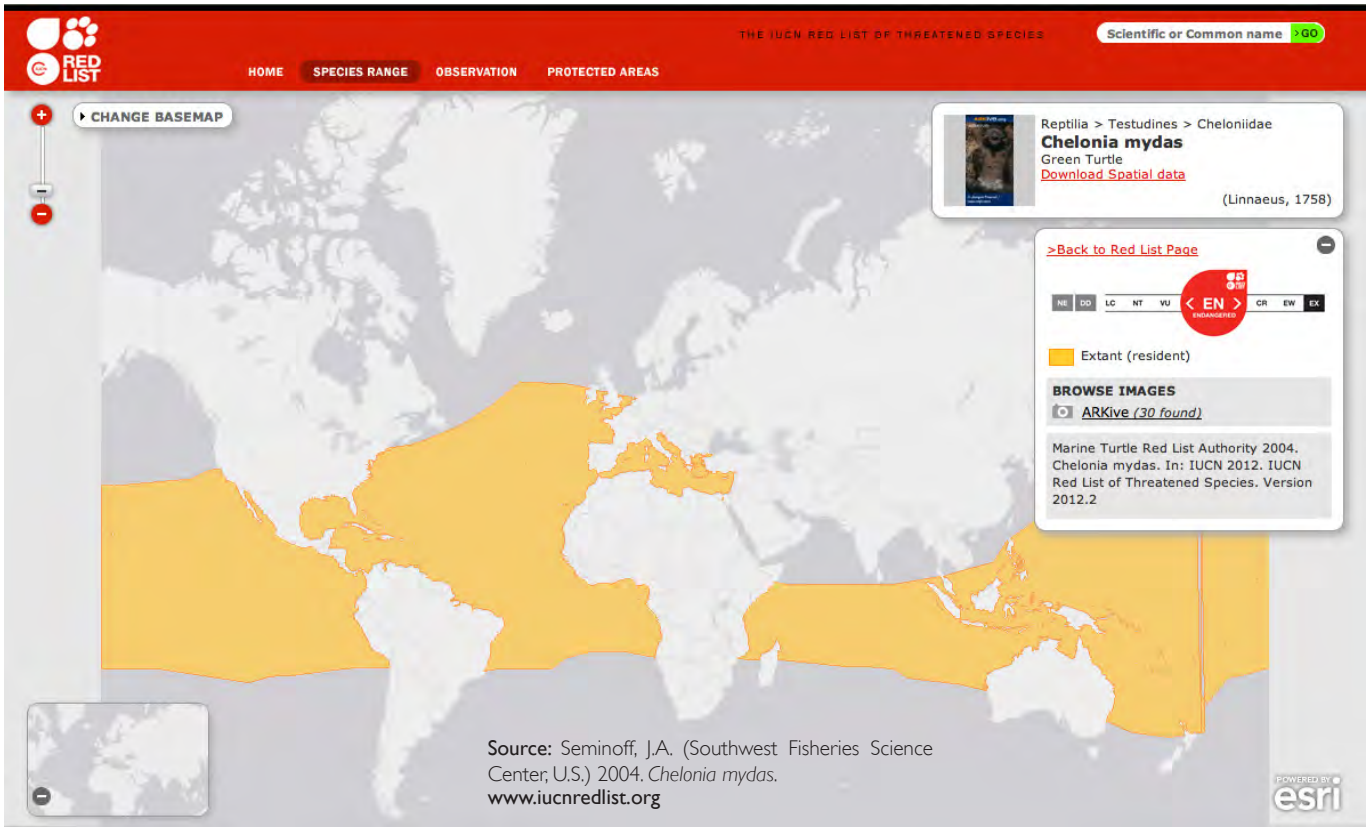
Habitat and Ecology: Like most sea turtles, green turtles are highly migratory and use a wide range of broadly separated localities and

habitats during their lifetimes. Upon leaving the nesting beach, it has been hypothesized that hatchlings begin an oceanic phase, perhaps floating passively in major current systems (gyres) that serve as open-ocean developmental grounds. After a number of years in the oceanic zone, these turtles recruit to neritic developmental areas rich in seagrass and/or marine algae where they forage and grow until maturity. Upon attaining sexual maturity green turtles commence breeding migrations between foraging grounds and nesting areas that are undertaken every few years. Migrations are carried out by both males and females and may traverse oceanic zones, often spanning thousands of kilometers. During non-breeding periods adults reside at coastal neritic feeding areas that sometimes coincide with juvenile developmental habitats.

Major Threat(s): Green turtles, like other sea turtle species, are particularly susceptible to population declines because of their vulnerability to anthropogenic impacts during all life-stages: from eggs to adults. Perhaps the most detrimental human threats to green turtles are the intentional harvests of eggs and adults from nesting beaches and juveniles and adults from foraging grounds. Unfortunately, harvest remains legal in several countries despite substantial subpopulation declines. In addition, a number of incidental threats impact green turtles around the world. These threats affect both terrestrial and marine environments, and include bycatch in marine fisheries, habitat degradation at nesting beaches and feeding areas, and disease. Mortality associated with entanglement in marine fisheries is the primary incidental threat; the responsible fishing techniques include drift netting, shrimp trawling, dynamite fishing, and long-lining. Degradation of both nesting beach habitat and marine habitats also play a role in the decline of many Green Turtle stocks. Nesting habitat degradation results from the construction of buildings, beach armoring and re-nourishment, and/or sand extraction. These factors may directly, through loss of beach habitat, or indirectly, through changing thermal profiles and increasing erosion, serve to decrease the quantity and quality of nesting area available to females, and may evoke a change in the natural behaviors of adults and hatchlings. The presence of lights on or adjacent to nesting beaches alters the behavior of nesting adults and is often fatal to emerging hatchlings as they are attracted to light sources and drawn away from the water. Habitat degradation in the marine environment results from increased effluent and contamination from coastal development, construction of marinas, increased boat traffic, and harvest of nearshore marine algae resources. Combined, these impacts diminish the health of coastal marine ecosystems and may, in turn, adversely affect green turtles. For example, degradation of marine habitats has been implicated in the increasing prevalence of the tumor-causing Fibropapilloma disease.

Conservation Actions: Green turtles have been afforded legislative protection under a number of treaties and laws. Among the more globally relevant designations are those of Endangered by the World Conservation Union; Annex II of the SPAW Protocol to the Cartagena Convention (a protocol concerning specially protected areas and wildlife); Appendix I of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora); and Appendices I and II of the Convention on Migratory Species (CMS). A partial list of the International Instruments that benefit green turtles includes the Inter-American Convention for the Protection and Conservation of Sea Turtles, the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA), the Memorandum of Understanding on ASEAN Sea Turtle Conservation and Protection, the Memorandum of Agreement on the Turtle Islands Heritage Protected Area (TIHPA), and the Memorandum of Understanding Concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa.

As a result of these designations and agreements, many of the intentional impacts directed at sea turtles have been lessened: harvest of eggs and adults has been slowed at several nesting areas through nesting beach conservation efforts and an increasing number of community-based initiatives are in place to slow the take of turtles in foraging areas. In regard to incidental take, the implementation of Turtle Excluder Devices has proved to be beneficial in some areas, primarily in the United States and South and Central America. However, despite these advances, human impacts continue throughout the world. The lack of effective monitoring in pelagic and near-shore fisheries operations still allows substantial direct and indirect mortality, and the uncontrolled development of coastal and marine habitats threatens to destroy the supporting ecosystems of long-lived green turtles.



Source: Seminoff, J.A. (Southwest Fisheries Science Center, U.S.) 2004. *Chelonia mydas.* www.iucnredlist.org

HERBIVOROUS FISH AND SEA URCHINS

FEATURE **RITA BENTO**

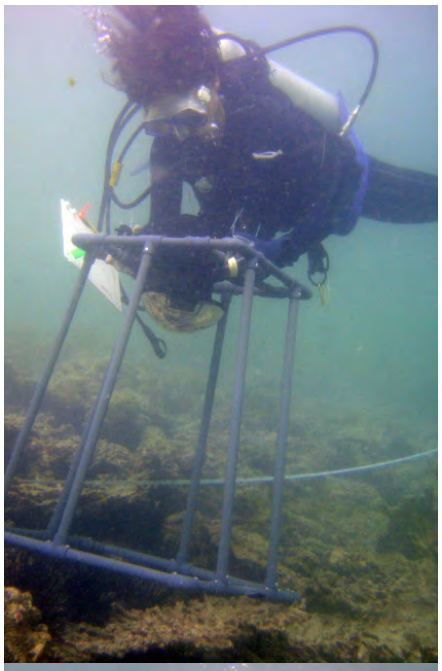
Coral reefs cover less than 0.1% of the marine environment but serve as a home to over a quarter of all marine biodiversity. They also serve as principal spawning, nursery, breeding and feeding areas for a lot of organisms. In addition to their importance to biodiversity, reefs also support local populations with food, coastal protection, building materials, medicines, and economic benefit from tourism and fisheries.

Despite their importance, several human impacts threaten coral reefs: overfishing, pollution, coastal development, destructive tourism activities, and climate change. Recent climate change models predict an increase in the frequency and severity of mass coral bleaching events, an increase in coral mortality, and phase-shifts in the ecosystem structure where competitive algae overtake corals in reef habitats.

One of the key factors that inhibit the transition from coral to algal dominance is the grazing activity of herbivorous fish and sea urchins. Herbivores regulate the competitive relationship between macroalgae and coral communities by removing competitively dominant algae that can inhibit coral growth. Studies conducted on herbivorous fish and sea urchins also showed that elevated grazing activity positively affects the density and diversity of coral recruits settling to reefs, indicating that herbivores play a vital role in the recovery of reefs by opening and maintaining space for coral recruits following disturbance.

It is likely that herbivores will play a vital role in the resilience and recovery of coral reefs amid climate change increases in the degradation of reef habitats. However, it is unclear the magnitude and extent of the impact of herbivores under increasing sea surface temperatures. The physical conditions within the Arabian Gulf make this area an ideal place to study the effects of climate change on oceanic processes, and possible future changes in general coral reefs, due to its strong variation in sea surface temperatures and high salinity.

With this study, EDA tries to understand how herbivorous functional group affects the structure and function of benthic communities in a natural environment with high variations (sea-surface temperatures and salinity). This study will help determine the key herbivorous groups that will possibly play a key role in the resilience and recovery of reefs in future extreme environments. As so, the extrapolation of these results can help in predicting alterations likely to occur in other regions worldwide as a consequence of climate change.



PARROTFISH DECLINES INFLUENCE THE HEALTH OF CORAL REEFS

FEATURE **RITA BENTO**

Overfishing leads to unstable food webs and increasing vulnerability of the ecosystem to critical disturbances (pollution, climate change, cyclones). Although the effect of overfishing in fish population dynamics and sizes is well known, there is still a need to understand the impact these declines take on broader ecosystems.

Herbivory activity has positive effects in the ecosystem as they remove algae and sediment from the substrate, opening space for coral recruitment and maintaining the capacity for reef regeneration. The loss of parrotfish positively relates with macroalgae growth and reduction of coral cover. A study conducted by Bellwood and colleagues [1] used parrotfish population response to fishing pressure to see how these changes in the population affect the resilience and vulnerability of coral reefs.

The results show a strong correlation between human population densities and fish population structure, with greater declines in large fish and, therefore, a direct impact on their functional roles: predation and bioerosion. Although small parrotfish are less targeted, they do not substitute bigger individuals as they may not cope with future changes, and may be unable to reverse future phase shifts (between coral and algae) as they do not eat mature stands of macroalgae. Systems with the prevailing of grazing and sediment removal by small parrotfish may not be stable as they still support artisanal fishing, and unsustainable fishing pressure on larger parrotfish species continues – leading to local extinction. The results from this study show how human population density relates with the loss of large fish and reduction of ecosystem functions.

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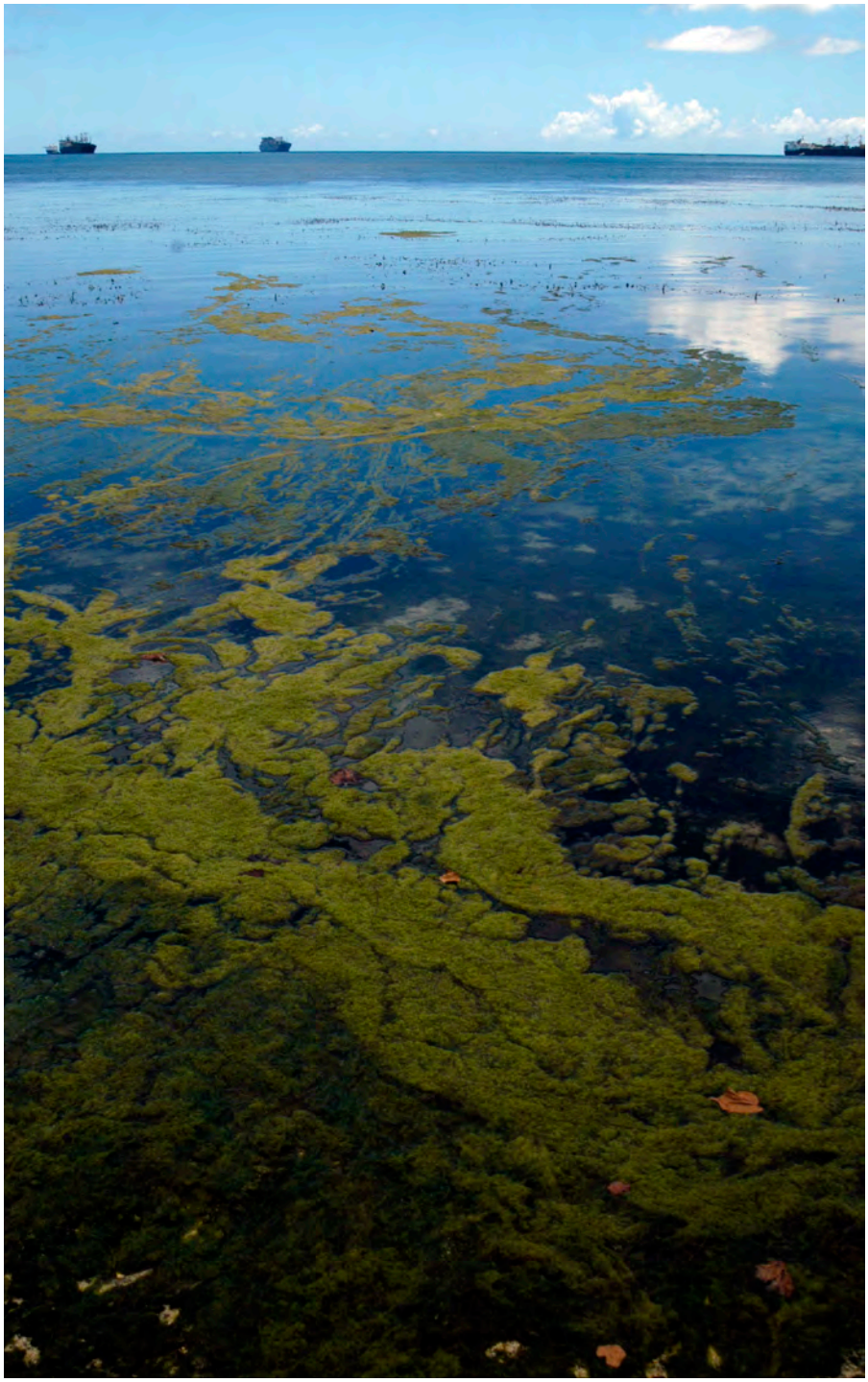
[1] Bellwood, D.R., A.S. Hoey, and T.P. Hughes, Human activity selectively impacts the ecosystem roles of parrotfish on coral reefs. Proceedings of the Royal Society B: Biological Sciences, 2012. 279(1733): p. 1621-1629.

STUDY FINDS THAT OCEAN ACIDIFICATION IS ACCELERATED IN NUTRIENT-RICH AREAS

MARINE RESOURCES, COASTAL ECONOMIES PUT AT RISK

FEATURE **NOAA** PHOTOGRAPHY **JOHN STARMER/MARINE PHOTOBANK**



Carbon dioxide released from decaying algal blooms, combined with ongoing increases in atmospheric carbon emissions, leads to increased levels of ocean acidification, and places additional stress on marine resources and the coastal economies that depend on them, according to a new study published.

Ocean acidification occurs when the ocean absorbs carbon dioxide from the atmosphere or from the breakdown of organic matter, which then causes a chemical reaction to make it more acidic. Species as diverse as scallops and corals are vulnerable to ocean acidification, which can affect the growth of their shells and skeletons.

Research by NOAA's William G. Sunda and Wei-jun Cai of the University of Georgia points to the process of eutrophication – the production of excess algae from increased nutrients, such as, nitrogen and phosphorus – as a large, often overlooked source of CO2 in coastal waters. When combined with increasing CO2 in the atmosphere, the release of CO2 from decaying organic matter is accelerating the acidification of coastal seawater.

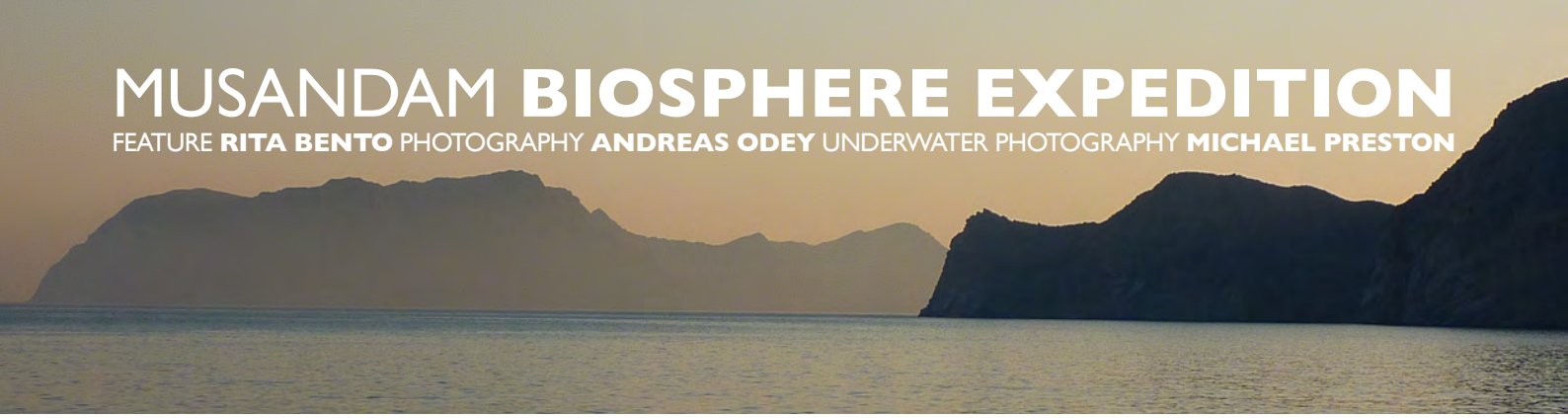
The effects of ocean acidification on the nation's seafood industry are seen in the Pacific Northwest oyster fishery. According to NOAA, ocean acidification is affecting oyster shell growth and reproduction, putting this multi-million dollar industry at risk. Annually, the Pacific Northwest oyster fishery contributes $84 million to $111 million to the West Coast's economy. According to an earlier NOAA study ocean acidification could put more than 3,000 jobs in the region at risk.

Sunda and Cai used a new chemical model to predict the increase in acidity of coastal waters over a range of salinities, temperatures and atmospheric CO2 concentrations. They found that the combined interactive effects on acidity from increasing CO2 in the atmosphere and CO2 released from the breakdown of organic matter were quite complex, and varied with water temperature, salinity and with atmospheric CO2.

"These interactions have important biological implications in a warming world with increasing atmospheric CO2," said Sunda. "The combined effects of the two acidification processes, along with increased nutrient loading of nearshore waters, are reducing the time available to coastal managers to adopt approaches to avoid or minimize harmful impacts to critical ecosystem services such as fisheries and tourism."

Sunda and Cai found that, given current atmospheric CO2 concentrations and projected CO2 released from organic matter decay, seawater acidity could nearly double in waters with higher salinity and temperature, and could rise as much as 12 times current levels in waters with lower salinity and lower temperature.

These model predictions were verified with measured acidity data from the northern Gulf of Mexico and the Baltic Sea, two eutrophic coastal systems with large temperature and salinity differences, which experience large-scale algal blooms. The observed and modeled increases in acidity from eutrophication and algal decay are well within the range that can harm marine organisms.



MUSANDAM **BIOSPHERE EXPEDITION**

FEATURE **RITA BENTO** PHOTOGRAPHY **ANDREAS ODEY** UNDERWATER PHOTOGRAPHY **MICHAEL PRESTON**

EDA and Biosphere Expeditions have been studying the reefs of the Musandam Peninsula together since 2008. This year, from the 7th to the 13th of October, together with 10 team members from 8 different nationalities, we returned to the same reef sites for the fourth time. After three days of Reef Check training, the team members were able to survey the different Musandam dive sites and collect enough data to understand the challenges these reefs continue to face, and the threats that have to be urgently addressed.

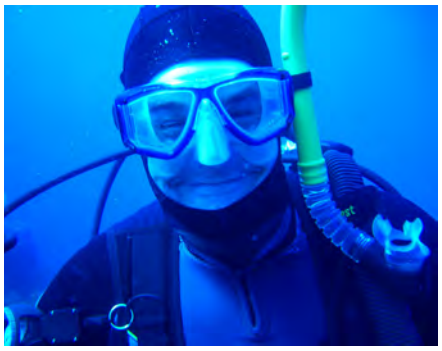
This year's results show how pristine this area is when compared with nearby reefs. Mean coral cover of 57.85% – significantly higher than 2009 – and significantly higher mean soft coral cover than previous years, indicates a healthy reef thriving to survive. Fish results also indicate the need for periodical surveys, and more environmental awareness in the local population. Normal fishing catch is still a concern not only regarding the target species but also regarding species that although not targeted by fishermen are also caught in their nets as bycatch. As an example, in the 2012 expedition, significantly lower numbers of butterflyfish were observed than in 2010, probably due to bycatch. Also, in some reef sites the mean number of groupers ¾ highly priced species in the fish market ¾ is showing some significant decline from 2010 to 2012. If there were areas fully protected in the Musandam, fish populations would be able to recover from the continuing fishing pressure. In the 2012 impacts, only the general classification "others" (including anthropogenic and natural pressures) had a significant decrease from previous years. Human influenced pressures (trash and fishing nets) showed no significant changes.

The continued practice of unsustainable fisheries, even in reefs with high coral cover will lead to changes in fish populations dynamics and sizes. Because fish control the reefs' dynamics, their decline leads to unstable food webs and increases the vulnerability of the ecosystem toward disturbances (pollution, climate change, cyclones). The presence of top fish predators (sharks and groupers) and large herbivores (parrotfish) are critical in a reef resilient context.

To preserve the Musandam reefs, more awareness and protection is needed. This area is not only an important habitat for different organisms, but also a national heritage site and food source for the local population. The Musandam Peninsula, or parts of it, could be established as a Biosphere Reserve under UNESCO's Man and the Biosphere (MAB) Programme. Biosphere Reserves are areas of terrestrial, coastal and marine ecosystems established to promote and demonstrate harmonious and sustainable interactions between biodiversity conservation and socio-economic well-being of people, through research, education, monitoring, capacity building and participatory management. Under this classification, UNESCO can provide advice and occasionally source funds to start local efforts in the Musandam Peninsula; it can also help broker projects or set up durable financial mechanisms.

Please read the testimonials from two team members that took part in the expedition:

BY ANDREAS ODEY



At dawn we were woken up by the Muezzin call in the Bay of Kumzar. The night before, we exchanged the bunk beds in our small but air-conditioned cabin for a bed outside on the deck of the MS Sindbad. There we fell asleep under the infinite and starry sky with a fascinatingly perfect view of the milky way.

On board the MS Sindbad, a traditional dhow, we were set on intensely studying the meaning and life of coral reefs. We learnt how to recognize and distinguish fish, invertebrates, coral disease and bleaching, as well as understand the work and research methods of Reef Check. Rita Bento, our experienced expert marine biologist from Emirates Diving Association (EDA) instructed us diligently with power point presentations. In addition, we received plenty of study materials such as photos, books, hand-outs and even had a final written test to pass.

Our international group of nature loving divers consisted of people from England, Finland, U.S., Australia, New Zealand and Germany. It has been the 2nd time I participated in a Reef Check project. The one week stay on the dhow had me communicate in English only, which is a new challenge in itself and an unforgettable experience all at the same time.

There were just a few steps to pass until our first dives in front of the wonderful backdrop of the rugged Musandam Penisula, with its imposing steep shorelines. After having fixed the 100m long transect line and the buoys, the teams go to work in about 6-8m depths. Snappers, groupers, butterfly fish and parrotfish have to be recorded, countless sea urchins are registered on the underwater slates. We are also focused on sea cucumbers, moray eels and banded coral shrimps as well as the health conditions of hard and soft corals. After we have finally covered the 50cm area of substrates, the coral cover is noted in detail.

Back on board the diving equipment is stowed, the tanks are prepared for the next dive and the team members discuss their under water experiences with a cup of tea and cold soft drinks on the comfortable front deck.

Did anyone see the huge porcupinefish? Anyway wonderful to follow its smooth movements… but it's not part of the fish to be counted. The data and observations are noted after each dive and immediately registered by Rita on the database on her laptop.

Reef Check is also about practical help on the spot. Crabs that are hopelessly entangled in fishing ropes are carefully freed on board with scissors and tweezers and then gently put back again on the reef. With great interest underwater observations and many other related topics are exchanged amongst us. For us laymen and "hobby marine biologists", the standardized Reef Check method can be practiced easily and actively. The excellent preparations of Biosphere Expeditions, the logistics and the always helpful crew on board ensured a smooth process and satisfaction for all people involved.

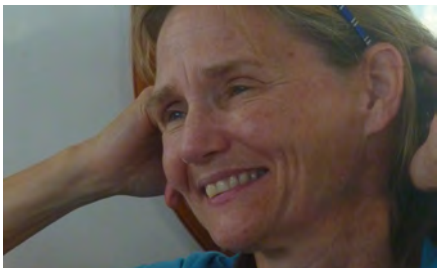
I will remember the evenings where we were able to follow large shoals of fish that were on the run from other nocturnal hunting fish. The rapidly changing swarm formations in conjunction with bioluminescence and the gorgeous sunsets at Eagle Bay, enjoying fun night dives under the moonlight; better than any TV program.

I'm so glad that I participated in this expedition and learned so many things about the beautiful world under the water, but also about the impacts and threats on coral reefs.

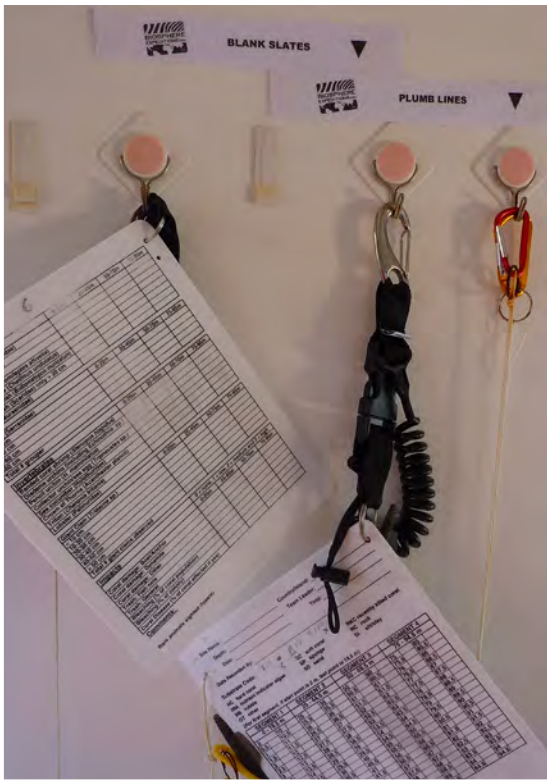
It's so good to know that people all around the world are aware of the must-protection of the reefs at heart. Unity is strength. The lessons learnt will influence my behaviour and care in dealing with the environment and I will try to spread my experience as much as possible in the diving community. Environmental awareness in Germany has a strong reputation, so Reef Check programs are of wide interest and will contribute to help raising awareness.

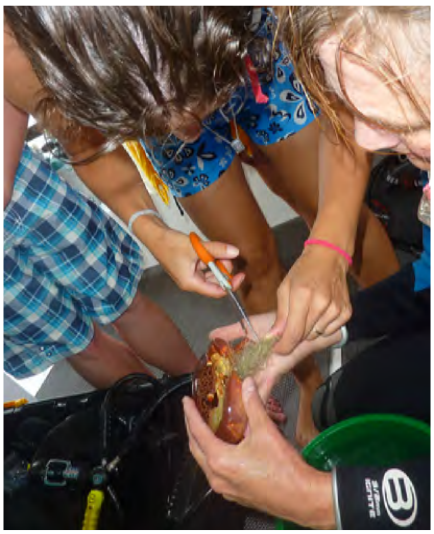
Many thanks to the work and dedication of EDA and all the helping hands and supporters. Thank you for your hospitality in Oman and the UAE and for sure, I would want to visit the Arabian Peninsula again. Let's hope for positive results through all EDA activities and projects. May the underwater world cope with the challenges and threats it's exposed to and may the humans do what they can to help and protect the coral reefs for a common future.

BY KATHLEEN HUMPHREY



The Biosphere Expedition trip to Musandam was an amazing experience. The importance of the Reef Check work became clear when, in our final dive, we saw the damage done to the reef around Telegraph Island through tourism. And even in the much more pristine reefs further offshore, we saw the human impact. We spent a long time detaching a huge fishing net that had been lost and drifted onto the reef, damaging the coral and capturing animals. A highlight of the week for me was releasing the crabs tangled in that net. It was an enjoyable, challenging and eye-opening week – and I hope to be back again next year.





REEF CHECK SPOTLIGHT:
A NEW FISH ON CATALINA ISLAND
FEATURE **REEF CHECK CALIFORNIA DIRECTOR, DR. JAN FREIWALD**


Photo by Dan Gotshall – Whitetail Damselfish (adult)

In October, a fish species never-before recorded in California waters was observed off Catalina Island. Ken Kurtis, a diver from the Los Angeles area, was shooting some underwater photos in the shallow waters off Catalina when he noticed a fish that did not quite belong. What he saw was a small blue damselfish (same family as the *garibaldi* – *Pomacentridae*), with a patch of greenish-yellow extending from its head onto the forward part of its dorsal fin and a translucent white tail. He took video of the fish and reported it to other divers at one of Reef Check's partner organizations, the Long Beach Aquarium of the Pacific. The individual was quickly identified as a juvenile whitetail damselfish (*Stegastes leucorus*) by several experts.

To confirm Ken's first observation of the species in California, Dr. Bill Bushing went out diving to capture more video. He located the individual and corroborated the identity of the species. Dr. Giacomo Bernardi, a Molecular Ecologist at UC Santa Cruz who has collected genetic samples of this and its two closely related sister species from their native range, and has studied their population distributions extensively, states that the three species form the whitetail damselfish species complex that partition between islands. They are interesting because they demonstrate a pattern of speciation (i.e. evolution of a new species) first discovered by Darwin in the Galapagos, but rarely found in fish. *Stegastes beebei* (named after William Beebe, the author of World's End, his narrative of an epic trip to Galapagos) is found in the Galapagos Islands and adjacent areas, *Stegastes baldwini* is restricted to Clipperton Island, a small island due south of Baja California, and then this species *Stegastes leucorus*, that is found at the Revillagigedo Islands, mainland Mexico, Guadalupe Island, and now Catalina!


Photo by Dan Gotshall – Whitetail Damselfish (juvenile)

According to Bernardi, the closest location that this individual could have come from would be Guadalupe Island off the coast of Baja California – a 300 mile journey through the open ocean. Reef fish, such as this damselfish, go through a larval phase after they hatch, during which the tiny organisms swim in the open ocean before returning to settle on a near-shore reef. The whitetail damselfish typically spends about 20 days as pelagic larvae in the open ocean before it needs to find a reef to grow up on. Once it settles onto a reef, a whitetail major may grow to lengths of about 14 centimeters and live up to 19 years. Dr. Bernardi may try to collect a (non-lethal) genetic sample of this individual. He would then compare this to his database of genetic samples from the fish's native range to positively identify where the individual came from. In any case, this fish had to have travelled a great distance, and it is unlikely that only one individual would make this long and unusual journey. Although this is the first known recording of a whitetail damselfish in California waters, we may be seeing more of them around Catalina in the future.

This find demonstrates how the presence of well-trained divers who are familiar with the local species can lead to new discoveries, and how they help keep an eye on our local marine environments and the ways they continuously change. This has been a great find Ken!

REEF CHECK MALAYSIA
HOSTS REGIONAL CORAL REEF MANAGEMENT WORKSHOP
FEATURE **REEF CHECK MALAYSIA**

On September 12-14, 2012, Reef Check Malaysia (RCM) hosted its first regional Coral Reef Management Workshop at the Vistana Hotel in Kuala Lumpur.

The 3-day Workshop included selected Reef Check representatives, scientists and coral reef managers from around the region, all of whom are doing work related to coral reef management and conservation. Participants included representatives from Malaysia, Thailand, Singapore, Indonesia, Philippines, Japan, Vietnam, Hong Kong and Taiwan.

The workshop was meant to be a practical working meeting for a small group of about 30 participants selected based on what they had to share relating to coral reef management.

The goals of the workshop were to:
- Improve networking between Reef Check groups in South East Asia and others engaged in coral reef science and management;
- Learn from each other, focusing on approaches that have worked – and also those that have not;
- Improve ways in which managers work with scientists to use the scientific data available.

The workshop was structured into four themes:
- Monitoring and data sharing within South East Asia;
- Major impacts on coral reefs (e.g. overfishing, destructive fishing, bleaching, diver damage) and ways in which these issues have been addressed;
- Success and failure stories of different coral reef management approaches;

- Fundraising strategies at the local, national and regional levels.

The workshop was successful in many ways. It allowed Reef Check Coordinators and supporters from academia, government and the private sector to interact and learn about fundraising, discuss technical issues, and exchange information on lessons learned. Exchanges were made regarding blast fishing to kids training programs. The group endorsed the idea of pursuing regional level strategies for conservation particularly through simultaneous activities in multiple countries and data sharing. Participants felt that regular regional meetings should be held to help coordination and cooperation.

Thank you for everyone who participated and helped to make the workshop a success!

FIRST JORDANIAN ECODIVER TEAM CERTIFIED


Photo by Dr. Mohammed M. A. Kotb

Dr. Mohammed Kotb, a coordinator for Reef Check Egypt, recently finished an EcoDiver training program in Aqaba, Jordan in which three members of the Aqaba Marine Park Rangers were certified as Reef Check EcoDivers. The Rangers had previously participated in surveys in the Red Sea with Dr. Kotb, but have now officially become the first EcoDiver team in Jordan and will be able to conduct surveys on their own. Congratulations to the new team!

BIOSPHERE EXPEDITIONS TEAMS UP WITH REEF CHECK FOR ECOEXPEDITION IN MALAYSIA

FEATURE **BIOSPHERE EXPEDITIONS**

Tioman Island in Malaysia is a popular tropical holiday destination, due to its clear water and abundant marine life. Fortunately, despite its 200,000 tourists a year, it has remained relatively undeveloped. Although the island was gazzetted as a marine park in the late 1990s, fishing has continued, albeit to a lesser extent, and park rules are poorly enforced. Reef Check Malaysia has been completing surveys on the island for a number of years along with scientists, dive centers and other researchers. However, research has been limited to sites that are easily accessible by the dive centers fringing the north west coast of the 37km long island. Anecdotal evidence has long suggested that the rest of the island suffers from impacts such as Crown of Thorns starfish outbreaks, monsoonal coral-damaging storms and more intense artisanal and small-scale commercial fishing, but until recently, important quantitative information has been missing.

Thanks to a team of volunteers from Biosphere Expeditions, Tioman Dive Centre and Reef Check Malaysia were finally able to survey the reefs of east Tioman and surrounding islands for the first time in March 2012. Marine biologist and Reef Check leader, Katie Yewdall, led three teams of Biosphere Expedition volunteers over a six week period on Araliya, a 45 ft sloop rig sailing yacht during which volunteers lived aboard and completed 2 to 3 research dives a day. 35 surveys were completed at 19 sites in the area, including 12 newly introduced reefs. These reefs were found to be different from already surveyed ones in a number of ways. Some were badly affected by sedimentation originating from the mainland, some were suffering heavily from damaging fishing methods and some were escaping these impacts and remaining healthy and diverse.

The data gathered in these surveys will serve as a baseline upon which future expeditions will build and will be combined with the several years of data already collected from the area. This will allow researchers more fully to understand the impacts on the long-term health of the reef environment and allow managers to adjust plans and ensure their protection. Annual expeditions are now planned- which any interested individual can join- to contribute to the continuation of this valuable, interesting and exciting long-term monitoring program.

The 2013 Malaysia expeditions will run from March 10-22 & March 24 – April 5 2013. Details of these and other expeditions can be found at: **http://reefcheck.org/involved/Expeditions.php**

THE BAHAMAS EXPANDS ITS REEF CHECK ECODIVER NETWORK TO THE EXUMAS

FEATURE **RC ECODIVER TRAINER KRISTA SHERMAN**

Training activities under the Global Environment Facility (GEF) Full Size Project (FSP) pilot demonstration 3 – "Tourism and Coral Reef Health in the Exuma Cays Land and Sea Park", have been selected to provide the local communities in the Exumas with increased skills to pursue or engage in sustainable tourism activities as a means of employment or revenue generation and to promote environmental stewardship. A Reef Check EcoDiver Certification workshop was held at the Staniel Cay All-Age School during the 13-18th of August, 2012 in Staniel Cay, Exuma.

Reef Check EcoDiver surveys were conducted at two locations on North Horseshoe Reef. Substrate surveys were completed by Krista Sherman and Lindy Knowles, fish by Jacob Leese and Keiran Miller and invertebrates and impacts by Juan Antonio Puyol and Susanna Girolamo. Benthic cover was dominated by nutrient indicator algae (54%), rock (31%) and hard corals (8%). On average, grunts were the most abundant indicator fish species observed followed by parrotfish and butterflyfish. Mean abundance of gorgonians were the highest of all indicator invertebrates. No anthropogenic impacts were observed within the vicinity of the 100m transect line. Although The Bahamas is currently under a coral bleaching watch, results indicated that only 4% of the coral populations surveyed were bleached with up to 14% of individual coral colonies showing signs of bleaching. The Reef Check Exuma team has agreed to assemble twice per year to conduct surveys at North Horseshoe Reef.

The Reef Check protocol was adopted by The Bahamas to supplement ongoing coral reef monitoring efforts in the country and in an effort to involve local communities in scientific research. The Bahamas' team of certified Reef Check EcoDivers now welcomes Juan Antonio Puyol, Keiran Miller, Susanna Girolamo and Jacob Leese. The course was led by Krista Sherman (Reef Check EcoDiver Trainer and GEF FSP Coordinator for the Bahamas National Trust) with the assistance of Reef Check EcoDiver Lindy Knowles (Science Officer, Bahamas National Trust). Funding for this workshop was provided by the Waitt Foundation with support from the Bahamas National Trust through the GEF FSP.

GOOD & BAD NEWS FROM THE 12TH INTERNATIONAL CORAL REEF SYMPOSIUM

FEATURE **REEF CHECK EXECUTIVE DIRECTOR DR. GREGOR HODGSON**

Every four years, the world's coral reef scientists gather for a meeting focused on the science of coral reefs. The 12th ICRS was held in Cairns (pronounced "cans") on the northeast coast of Australia during July 9 to 12, 2012 with over 2000 scientists participating. Apparently, the "secret" is out that scientific study of coral reefs is both exciting and rewarding. Reef Check and two long-time partners (Global Coral Reef Monitoring Network and SOCMON) organized a special "mini" symposium to investigate the question: "Does monitoring lead to successful management of coral reefs?" Of course, we knew the answer but we were looking to document examples of how this process has worked in different parts of the world. Some 70 scientists including many Reef Check team scientists and coordinators applied to present papers answering this question so we had to spread the "mini" symposium over two days. The audience often reached several hundred people.

The papers and poster presentations were truly a smorgasbord of examples of how important monitoring is to the process of marine spatial planning, management and ultimately successful conservation. In some examples, it was Reef Check monitoring that spurred an interest in conservation and led to the establishment of a marine protected area. In other examples, Reef Check has been selected as the one of the official monitoring methods for entire countries such as the Bahamas, Brunei and Brazil. In fact, the long-time coordinators of RC Brazil, Drs. Mauro Maida and Beatrice Padovani Ferreira of University Pernambuco presented results showing how their monitoring program eventually led to the establishment of a network of MPAs along the coast of Brazil. Dr. Jean Kenyon of US Fish and Wildlife Service and coauthors showed how the results of monitoring were essential language used to justify establishing the Pacific Remote Islands National Monument, one of the most amazing biodiversity reserves in the world. I reported that with the assistance of Reef Check, Brunei has now set up a no-take MPA network that encompasses about 90% of their coral reefs – probably the highest level in the world.

There were winners and losers at the meeting – the Great Barrier Reef Marine Park Authority noted that the coral cover in the park has declined dramatically in the past few years – almost reaching the level in the Caribbean – about 30%. Korean scientists noted the arrival of tropical coral and fish species at their southernmost island Chejedo, and were making plans to set up a coral reef unit. Global climate change trackers from several countries reported that global warming is occurring much faster than anyone had predicted and that both sea level rise and changes in weather patterns will be more severe and will occur earlier than predicted causing major impacts to cities and towns throughout the world.

For more information, please visit: **www.icrs2012.com/Downloads/ICRS2012_Book_of_Abstracts.pdf**

FISHER-DIVERS AND FIRST GROUP OF WOMEN
GET TRAINED TO ASSESS THE MARINE RESERVES OF ISLA NATIVIDAD

FEATURE **MARY LUNA, REEF CHECK PROGRAM MANAGER, MEXICO**

"A kelp forest on steroids," or so has the Natividad marine environment been described by visiting divers. This comes as no surprise given Natividad's remote location and the conscious management of the marine resources that the local fishing cooperative Buzos y Pescadores (ByP) has implemented over generations. Fishing cooperatives on the Pacific side of the Baja Peninsula are granted fishing concessions that are renewed every 20 years. These are geographically specific areas in the ocean where a cooperative has the exclusive right to harvest invertebrates, such as lobster and abalone.

ByP closed part of their concession to all types of fishing in 2006. They worked with the marine conservation organization Comunidad y Biodiversidad (COBI) to implement a monitoring system that would allow ByP to evaluate the recovery of key commercial species for 6 years. This test period ended this year and after the ByP members assessed the benefits versus the costs they voted to continue implementing the MPAs for 6 more years. It has been an honor for Reef Check (RC) to work with ByP and COBI since 2006, when we were invited to adapt the Reef Check California (RCCA) monitoring protocol to the Natividad conditions and to train their fisher-divers on how to do the underwater surveys.

Colleen Wisniewski, RCCA's Southern California Regional Manager, and I returned this past July to perform the annual recertification of the fisher-divers. During that time of the year the fishers are generally harvesting sea cucumber and wavy turban snail and they had not yet finished their quota when we arrived. We started the training by conducting the classroom sessions in the afternoons when they came back from fishing and the field training was postponed until they finished their quota at the end of the week. We had no complaints though; Natividad is considered a world surfing destination and a healthy south swell fueled our sessions at the local breaks.

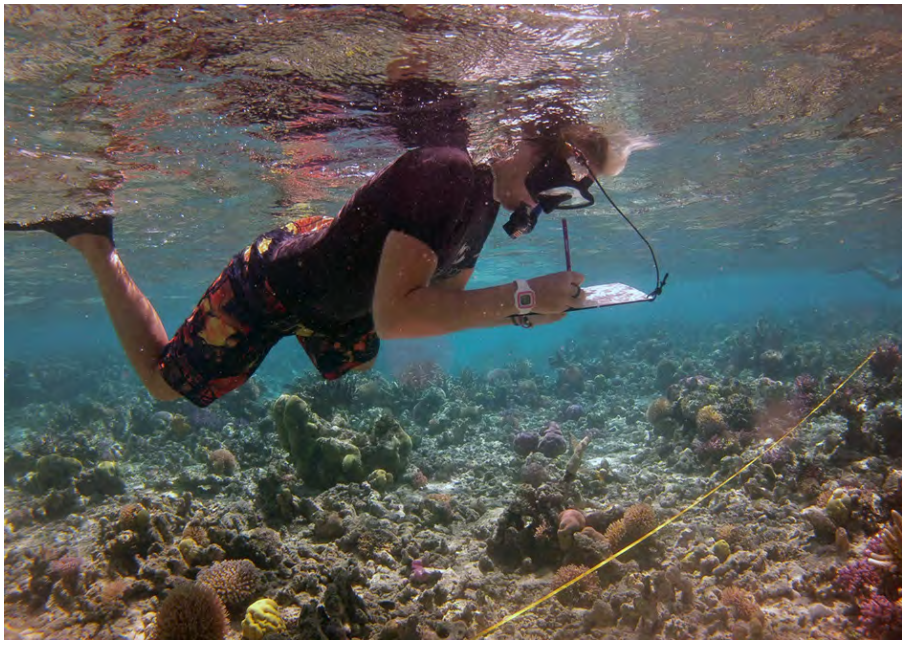
Jhonatan Castro, Jesus Flores, Abraham Mayoral, Sergio Mendoza, Alonzo Murillo and Roberto Carlos Vazquez are the fisher-divers who completed the recertification and collected data in the two reserves after our training was complete. After that, they worked with Arturo Hernandez from COBI to obtain their Dive Master certifications. We are very proud of these men for continuing to dedicate their time and effort to monitoring their MPAs.

We also had the honor to introduce the first two members of the women's dive team from the island to the RC Baja methodology. These divers obtained their scuba diving certification from Arturo Hernandez from COBI last summer and we just wanted to get them familiar with some of the species and survey methods that comprise a Reef Check survey. The offshore winds that characterize the island are a blessing for surfers, but can certainly make an afternoon dive session challenging for new divers. Add to that, the thick kelp canopy and colder water temperatures, which only increase the level of difficulty. Elsa Cuellar and Esmeralda Albañez persevered and did a great job as they completed their first intro RC dives in spite of these conditions. Elsa and Esmeralda, as well as the other scuba certified women on the island are logging more dives to get fully certified next year so they can eventually start collecting data.

I've had the honor and pleasure of working with the fisher-divers of Natividad and of interacting with the local community for several years now. Through them I've learned about discipline, dedication to work and family and the importance of community. After 7 years of working with RC, mainly with projects in Baja, I am leaving to pursue a graduate degree at the Bren School at the University of California, Santa Barbara. My goal is to learn practical business and science skills that will allow me to have a greater positive impact on the sustainable development of coastal communities. Thank you to all the people at Reef Check, COBI, ByP, the Magdalena Island fisher-divers, their families and many others who, by allowing me to work with them all of these years, have taught me more than any formal school will ever be able to teach.

OCEANSWATCH CONTINUES ITS MARINE CONSERVATION WORK IN THE SOLOMON ISLANDS WITH AN EXPANDED RC PROGRAM

FEATURE **GLENN EDNEY, REEF CHECK SOLOMON ISLANDS**
PHOTOGRAPHY **OCEANSWATCH**



OceansWatch, a long-time Reef Check partner and non-profit organization committed to marine conservation and sustainable livelihoods for island coastal communities, has just completed its third expedition to the remote Reef Islands, in the Temotu region of the Solomon Islands. OceansWatch is working with several local communities in the Reef Islands, helping them establish a network of marine protected areas (MPAs) within their customary marine areas.

The Reef Islanders have recognised that the establishment of MPAs, in conjunction with traditional management strategies and other fishing restrictions, are the best way for them to move forward in addressing the declining health of their marine ecosystems. OceansWatch was invited by these communities to assist them in setting up the MPAs, and to develop appropriate monitoring programmes to help them evaluate the effectiveness of their conservation initiatives.

This year, the OceansWatch marine science team was able to build on last year's work by establishing six Reef Check monitoring sites within the MPAs, as well as another four sites outside the MPAs that will provide reliable scientific feedback on the effectiveness of protection measures. The team managed to complete three full replicates at each site, providing the first comprehensive information on reef health from this area. In addition, the team surveyed potential sites for the establishment of further protected areas, as part of the strategy towards developing a network approach to marine protection.

The communities of the Reef Islands rely almost exclusively on their marine environment for survival and as the foundation of their local economy, and are thus very motivated in their efforts to re-establish the sustainable use of marine resources. OceansWatch has developed the 'Reef Guardian' programme, incorporating aspects of the Reef Check protocol as well as qualitative assessment tools, to help such local communities monitor progress for themselves. The Reef Guardian programme combines aspects of traditional ecological knowledge with modern scientific knowledge to produce a unique monitoring programme appropriate to each community. The OceansWatch marine science team will continue to complement this local assessment with ongoing Reef Check surveys on a yearly basis. For more information about the work of OceansWatch visit **www.oceanswatch.org**.

NO FISH BOMBS IS GOOD NEWS FOR PHILIPPINE REEFS

FEATURE **REEF CHECK EXECUTIVE DIRECTOR DR. GREGOR HODGSON**

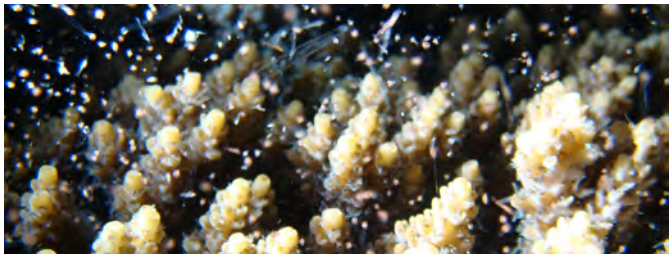
Starting in late July, I had the pleasure to serve as the Reef Check Instructor on the Philippine Siren, the gorgeous liveaboard dive boat run by Worldwide Dive and Sail. What was so special about this trip was that for three years from 1979 to 1982, I was a US Peace Corps Volunteer based at the Cebu City Bureau of Fisheries. My dive buddy Mike Ross and I had the pleasure of surveying coral reefs for the Bureau of Fisheries all over the southern Visayan region as it is called. So what condition are the reefs in now compared to 30 years ago?

The most amazing success story is that during more than a week of diving, I did not hear a single blast-fishing bomb go off. Even just a few years ago, I would have heard 3-4 blasts (or a zinging sound if the blast was a long distance away) per dive. The results can be seen in the high level of coral "cover" and huge schools of small reef fish like Anthias, which are decimated by indiscriminate blast fishing. Many Marine Protected Areas have been established in the southern Philippines – some more than 20 years ago. This has led to another success story – the return of large turtles, mantas and even some whale sharks to the area. Still missing however, and indicating a regular level of poaching are other sharks, large mature groupers, humphead wrasse, bumphead parrots and sweetlips as well as lobsters and giant clams. For those of you familiar with the tropical Reef Check survey protocol, all except sharks are our "indicator species" used to measure human impacts on reefs. Even the famed Apo Island was missing some species and large sized fish – indicating that more attention needs to be paid to reducing poaching.

Everyone on the cruise participated in the Reef Check training and five stalwart volunteers passed their exams with flying colors and were certified as RC EcoDivers. They were so "hard core" they even carried out several RC surveys during the passage of a typhoon to the north. My thanks to the wonderful staff of Worldwide Dive and Sail and the incredibly enthusiastic staff and crew of the Siren for an amazing revisit to a favorite part of the world.

REEF CHECK SPOTLIGHT: SYNCHRONIZED CORAL SPAWNING IN THE RED SEA

FEATURE **DR. MOHAMMED M. A. KOTB**,
ASSOC. PROF. OF CORAL REEF ECOLOGY, MARINE SCIENCE DEPT., SUEZ CANAL UNIVERSITY, EGYPT & REEF CHECK ECODIVER COURSE DIRECTOR



Dr. Mahmoud Hanafy and Dr. Mohammed Kotb (from the scientific research team of the Hurghada Environmental Protection and Conservation Association (HEPCA)), along with two researchers from the Nature Conservation Sector of the Egyptian Environmental Affairs Agency (EEAA), Mr. Tamer Moner and Mr. Islam El Sadek, had the opportunity to study and record a remarkable synchronized spawning involving different species of the branched hard corals Acropora. This event occurred during the first week of May 2012, and is considered the first full scientific observation ever recorded in the Egyptian Red Sea. Mass spawning is an event of synchronized reproduction as described in the mid-1980s, and it aims to maximize chances of fertilization: the coral colonies release their gametes (eggs and sperm) into the water simultaneously in large quantities and over a very limited time interval; the coordination of the release being dependent on environmental, biological and chemical factors.

This event is known to occur only in tropical areas and is usually associated with the full moon. Information on this phenomena available from the Egyptian Red Sea is a result of a decade of studies carried out by various researchers and institutes. This data was collected and analyzed by a HEPCA team, who came to the conclusion that the mass spawning takes place either two days before or after the full moon, usually in the period between the 20th of April and the 6th of May.

Their conclusion was correct: a unique and remarkable mass release of gametes from more than 12 species of the hard corals Acropora took place on Thursday the 3rd and Friday the 4th of May 2012 in the Hurghada area. And there is something more – the HEPCA team's genuine excitement in witnessing this phenomenon can possibly be shared as – and this is the real breakthrough – recorded video.

Besides the undeniable value of disclosing a fascinating ecological process in front of our eyes, the scientific significance of such a record can greatly contribute towards preparing and implementing integrated environmental management plans for the preservation of the marine environment. The sector of coral reef rehabilitation would benefit from it too; perhaps finding new resources to intervene on the deteriorated coral reefs of Hurghada, heavily impacted by unregulated coastal development. Finally, with a close collaboration between environmental organizations, agencies and the tourism sector, our divers could even be among the first to be offered the possibility to observe the event live underwater.

In conclusion, if you were in the area at the time and concerned about the fact that the sea was clouded by an unidentified reddish substance, you now know there was no reason to worry. On the contrary, celebrate the magnificent natural event you had a glimpse of. As usual, we call upon the community to respect coral reefs by adopting proper behaviours and to report to HEPCA any violations to national and regional regulations you may witness at sea.

BIOSPHERE EXPEDITIONS SHOWS REMARKABLE CORAL REEF RECOVERY IN THE MALDIVES

FEATURE **BIOSPHERE EXPEDITIONS & REEF CHECK MALDIVES COORDINATOR, DR. JEAN-LUC SOLANDT**

Scientists who have been surveying reefs around the Maldives in the Indian Ocean say the level of recovery in recent years has left some reefs with more live coral cover than before a catastrophic bleaching event in 1998.

Last month, Biosphere Expeditions, an international conservation non-profit organization and long-time Reef Check partner, sent scientists from the Marine Conservation Society (MCS) and the Maldives Marine Research Centre to the islands to examine previously bleached coral.

Coral bleaching – where corals lose their color and are left white or 'bleached' – can lead to weakened and dead corals. Bleaching is thought to be the result of increased water temperature, leading to coral 'stress'.

Biosphere Expeditions set up a research project on the islands, enlisting the expertise of Dr. Jean-Luc Solandt, MCS Biodiversity Officer, as the project's lead scientist. This year the focus was on undertaking repeat Reef Check surveys at areas first surveyed before and during the bleaching in 1998 that killed most shallow water corals completely.

The project found that unlike the results recently published from The Great Barrier Reef, which found that coral cover there had been reduced by over 50% in the last 27 years, the more isolated, offshore and clean waters of the Maldives appear to offer better conditions for coral recovery.

The Great Barrier Reef report highlighted three main causes of coral death: outbreaks of coral-eating starfish, mass bleaching of corals, and major storms. However, the Maldives has been different in terms of the number and severity of impacts. The Reef Check surveys this September, carried out by volunteers from all over the world, show that many reefs have recovered to populations in excess of 60% live coral, and that at one site the coral cover is greater now than in 1997.

Dr. Jean-Luc Solandt said, "Although our surveys aren't as comprehensive in scale and number as those from the Great Barrier Reef, we have witnessed a promising recovery in the reefs we've visited. The number of chronic impacts to the reefs of the Maldives are fewer than those to the Great Barrier Reef, and that has probably resulted in this more positive response to the initial bleaching event die-off in the sites we visited in Ari Atoll."

However, Dr. Solandt warns conservationists and local managers in the Maldives that they cannot be complacent.

"There is overfishing of large predatory fish and further ocean warming events on the horizon, and some of the reefs nearer to Male' appear not to have recovered as extensively as those further afield."

Dr. Matthias Hammer, Founder and Executive Director of Biosphere Expeditions, says that whatever the state of the Maldives reefs are now, it's the outlook that's important. "Even though the Maldives reefs are generally in waters of excellent purity from man-made pollutants and are seldom hit by coral-damaging storms or attacks by coral eating starfish, the consistently high sea temperatures (averaging 29 degrees Celsius) around the Maldives could lead to bleaching once again if temperatures reach over 30 degrees for any length of time. Without wanting to spread doom and gloom, the prospects of sea-level rise and ocean acidification have the power to remove the Maldives from the map."
Further surveys will be carried out in 2013. Volunteer divers, who do not need any special skills to help with this research, can find out more via **www.biosphere-expeditions.org/maldives**.

As part of this year's expedition, MCS completed the training of 12 new Maldivian Reef Check surveyors, including two who were awarded the highly sought-after scholarship to be aboard the MV Carpe Diem on the trip. The collaboration consisted of four key partners: MCS provided the scientific training; Biosphere Expeditions, who organized the expedition and recruited international volunteers to join; Maldives Marine Research Centre (MRC), who provided the in-country trainees; and Soneva, a conservation-aware local resort who funded the two scholarship awards. At the conclusion of the trip, two individuals from MRC were certified as Reef Check trainers, thus ensuring that the legacy of Reef Check remains strong in the country.

REEF CHECK ITALIA CAMPAIGNS TO PROTECT MEDITERRANEAN GORGONIANS AND RED CORAL

FEATURE **REEF CHECK ITALIA'S GIANFRANCO ROSSI**

Paramuricea clavata is an endemic gorgonian of the Mediterranean Sea. Its presence characterizes some of the very best dive sites. Its role is crucial for maintaining the integrity of one of the areas with the highest rate of biodiversity on the planet: the Mediterranean coralligenous. In this habitat, the wonderful fans of this gorgonian extend from the substrate with upright branches that form true underwater forests. The dark bluish color, due to the reduced brightness of the environment where they grow, creates scenarios that arouse deep admiration in any diver.

Unfortunately very little is known about the biology of Paramuricea clavata; not only by scuba divers but also by researchers to which many aspects of the life of these organisms are still poorly known.

As a result, the Gorgonians Campaign 2012 was launched by Reef Check Italia Onlus. Besides asking volunteers to record information on the distribution and abundance of these organisms, the importance of observations indicating any presence of tiny eggs laid on the branches' surfaces has also been highlighted. Knowing the gorgonian distribution while obtaining information on the period they're breeding could generate data of great scientific relevance. *Paramuricea clavata* belongs to the Octocorals; in this group two different kinds of reproduction are known: the first one consists of broadcast spawning with fertilization and development in the water column, while the second one occurs when fertilization and brooding take place on the adult colony.

Colonies of *P. clavata* have separate sexes, meaning that single individuals are female or male, and the presence of hermaphrodites is very rare. Sperm is released in the form of tiny white-yellowish colored spherules, while the eggs are a purple-bluish color. To be effective, female and male spawning must be synchronous.

The eggs remain aggregated by a thin layer of a mucous material adhered to the surface of the branches of the mother colony. After being fertilized, the eggs ripen through different stages until they produce a planula that detaches from the mother colony to colonize the surrounding territory. Once settled on the substrate, the planula ripens into a single polyp from which begins the asexual reproduction that will create a new colony.

The months of June and July are considered the ideal period for the reproduction of gorgonians, meaning that it is possible to observe this phenomenon. All you have to do is carefully examine the gorgonian's surfaces, and with great care you could spot a myriad of tiny whitish or bluish eggs spread along the various branches. This is what has happened to many divers who have experienced a way of diving characterized by increased awareness of the extraordinary phenomena that often occurs under our eyes but inevitably passes unnoticed because of the lack of appropriate knowledge.

SHARK PRESERVATION

FEATURE AND PHOTOGRAPHY **ANDREW ROUGHTON**

STATISTICS

Seventy-three million sharks are reportedly being killed every year. This staggering statistic means that thirty-two percent of the world's sharks (including Basking Sharks and Great White Sharks) are under threat of extinction. However, Tigers, Giant Pandas, and Asian Elephants (as well as countless other species) are also at a very high risk of extinction. So why should we care so much about sharks? After all they're animals the majority of people never see and the majority of people would never want to see. Well, the answer is twofold.

Firstly, sharks are beautiful creatures that have been in existence for over four hundred million years. They are not the blood-thirsty monsters that the movies, media, and general public perceive them to be. In fact, each year more people are bitten by New Yorkers than are bitten by sharks. And more people are killed by falling coconuts than are killed by sharks. Therefore, it would be an unspeakable crime if this generation were guilty of making a species, which is older than the dinosaurs, extinct forever.

Secondly, our oceans cover seventy-one per cent of the earth. Therefore, as we disrupt this ecosystem, we disrupt our largest carbon-dioxide consuming, oxygen generating source. Thus, if we allow ourselves to upset this ecosystem irreversibly, we risk the survival of all species (including ourselves) and not just sharks.

METHODS

Almost as staggering as the volume of sharks killed each year is the method used to catch them. Invariably sharks are caught using long lines. Long lines are made of monofilament and vary in size from one mile to over one-hundred miles. They are kept at the surface by styrofoam floats with secondary lines attached at thirty metre intervals and baited with fish, squid, and occasionally dolphin meat.

I have personally seen a Green Turtle caught in one of these lines near The Caves in the Musandam and I can assure you it makes harrowing viewing. In most cases the animals' fight to release themselves causes them to tangle themselves further in the line and results in a slow, fatal strangulation.

Moreover, long lines are indiscriminate. They may be set to catch tuna for example, but end-up catching seabirds, turtles, and sharks. As a result twenty-five per cent of long line catches are simply thrown back into the sea – more often than not after the animals have suffered a slow, painful death.

However, the barbarity does not end here. Instead, fishermen across the world drag the sharks on to their boats, carve their fins off (regardless of whether they're dead or alive), and then, more often than not, throw their mutilated bodies back into the ocean. Thereafter, if they weren't already strangled to death by the long line, the sharks are rendered motionless by their missing fins, and left to suffocate to death on the ocean floor.

PROFITS

Thus, not only is this practice barbaric, it is confusingly wasteful. Sharks' fins contribute less than five per cent of their body mass so why do fishermen jettison over ninety-five percent of this particular catch? The answer is simple: money. Shark meat needs to be suitably refrigerated and takes up a lot of space onboard their boats. Conversely, fins can be cut off, bundled-up, and sun-dried without taking-up too much space, time, or effort. Moreover, at hundreds of dollars per pound, the fins provide fishermen with the largest proportional profits.

The reason shark fins are so valuable is because shark fin soup is seen (by some consumers) as a delicacy and is served at weddings, banquets, and high-end restaurants. However, in reality shark fins are virtually tasteless and, as a result, the soup needs to be flavoured with chicken or beef stock.

Shark fin soup is also considered (by some consumers) to have health benefits, such as improving the quality of kidneys, lungs, and bones. There is no scientific proof that this is correct however. Conversely, the US Environmental Protection Agency advises against the consumption of shark fins as they contain an unhealthy proportion of mercury.

Shark fin soup is most popular in East Asia, but it is sold throughout the world. Thankfully, here in the United Arab Emirates it is becoming less popular. Following a decree limiting shark hunting in Emirati waters, the Shangri-La Hotel in Abu Dhabi removed the dish from its menus. However, due to continued customer demand, the Ramada Hotel in Bur Dubai still continues to sell shark fin soup. Therefore, if you are ever dining in this hotel, please make sure to avoid this dish. Until demand for this unappetising appetiser reduces, money-hungry restaurateurs will continue to seek profits from the sale of this unethical, immoral, and tasteless dish.

Sadly, soup is not the only shark product available. Shark cartilage is also in demand by consumers around the world. Shark cartilage is taken largely from hammerhead and dogfish sharks, grounded into a powder, and made into a pill to be taken as a dietary supplement. The reason this bogus pill is in demand is because consumers have been lead to believe

that sharks are immune to cancer and that the consumption of their cartilage will therefore render them immune to the disease as well. This is a falsehood. Sharks can – and do – get cancer and the consumption of their cartilage will not grant humans immunity to the disease at all. Therefore, if you are in any of the shopping malls throughout the Emirates and see these products in Nutrition Centre, Lifestyle Nutrition, or Planet Nutrition, please remember that sharks have needlessly died to make this erroneous drug and that buying shark cartilage is not only a waste of your money, it is a waste of sharks' lives.

In addition to shark fin soup and shark cartilage, global consumers unfortunately also have a penchant for sharks' skin, chum, squalene, meat, teeth, and jaws. Sharks' skin is used as a stronger alternative to cow leather for products such as shoes, belts, and wallets. These products are found more in regions such as the US, Europe, and Japan where shark fishing is a major industry. However, it is worth checking your purchases in the Emirates to ensure they are not made from shark skin. Similarly, chum is not a product much seen in the Emirates. It is more commonly used by diving companies offering encounters with sharks from the safety of a cage in countries such as South Africa, Australia, and the US. However, squalene (shark liver oil) can be found in nutrition centres, shark meat can be found in restaurants, and sharks' teeth and jaws can be found in traditional souks throughout the Emirates. Therefore, if you see any of these products, please avoid purchasing them at all costs.

FUTURE

Sadly, despite all this, sharks are not protected species in many waters. Palau, the Maldives, Honduras, the Bahamas, Tokelau, the Marshall Islands, and parts of Venezuela have closed their exclusive economic zones (EEZ) to commercial shark fishing. However, throughout the Emirates and the GCC a variety of sharks are still caught commercially – Bull Sharks in Oman, Milk Sharks in KSA, and Blacktip Reef Sharks in the UAE for example. Unless countries in the Middle East and the rest of the world join the aforementioned, forward-thinking nations and close their EEZ's to commercial shark fishing, the future looks very bleak for sharks and humans alike.

That is, if we remove sharks from the top of the oceanic food-chain, species below them will go unchecked, some will multiply uncontrollably, others will disappear forever, and we will permanently ruin the entire ecosystem. This is not a simple concept so I will elucidate for purposes of clarity. At the bottom of the aquatic food-chain there is a microscopic organism called phytoplankton. This miniscule life-form uses carbon dioxide and releases oxygen through photosynthesis at a far greater rate than trees on land are able to. Now, phytoplankton is the staple diet of certain fish and mollusc species, which are in turn the staple diet of certain shark species. Therefore, if we remove sharks from the equation, the fish and mollusc species further down the food-chain are left to reproduce uncontrollably and consume endless supplies of the life-giving phytoplankton. If we continue to fish indiscriminately, deplete our oceans of their top predators, and ruin the natural symbiosis of oceanic life irreversibly, we will dismantle the largest carbon-dioxide consuming, oxygen generating source for mankind forever.

So what can we do to avoid this? Well, we can start by vetoing all of the aforementioned shark products available throughout the world. Additionally, we can encourage our friends and relatives to take the same action. Furthermore, we can join, support, and promote the growing number of shark conservationists that are active across the globe. Here are some useful websites to get you on your way:
http://www.sharkwatcharabia.com/
http://www.savingsharks.com/
http://www.sharksavers.org/en/home/
http://www.stopsharkfinning.net/
http://www.sharktrust.org/

Remember, sharks are vital components of life in the sea, our existence on land, and they have a right to exist as much as any other species – humankind included.

PADI SELF RELIANT DIVER COURSE

FEATURE **GORDON T. SMITH**

I recently signed up for the above course not because I want to dive solo, but to give me more confidence in diving solo when the occasion occurs. That might sound a bit strange, but the point of this course is to hone a diver's skills to be able to do self-rescue should an event like that occur.

Throughout my many years of diving (since 1985) I have on occasion been buddied with people whose underwater skills have been questionable and perhaps more of a liability than an aid as a buddy.

I still prefer to dive with a buddy, especially somebody who knows me well and is a good spotter for my addiction of underwater photography. It is also great to share with somebody interesting finds underwater, rather than just posting photographs later on my website.

So when PADI announced that they had set up a course for Self Reliant Diver, the advantages of this course appealed directly to me as a photographer who is probably the worst buddy to have as I am always focused (pardon the pun) on what I am photographing.

I briefly discussed the course with Paul Sant of Divers Down a couple of months previously and he indicated that as soon as he had the course materials he would be willing to take me on as a student, but preferably with another person.

After talking with one of my other photographer friends, Ged, he also appreciated the advantages of this course giving him additional training to be able to handle possible scenarios where a poorly trained "instabuddy" may be more of a liability than help.

So during the first day of Eid Al Fitr in 2012, Ged and I started the course at Divers Down. After the usual paperwork and an inspection of logbooks to prove that we had completed 100 dives, Advanced Open Water certification, and over 18 years of age (not that that was an issue), we then had to go through the equipment requirements.

1. Standard Dive Equipment
2. Surface Marker Buoy (SMB) with 30m of line
3. Redundant gas source e.g. Pony bottle with regulator and SPG
4. Redundant depth gauge and bottom timer or additional dive computer
5. Redundant surface signaling device, both visual and audible
6. Knife/cutting tool
7. Slate and pencil
8. Spare mask

After reviewing the PADI position on self-reliant diving, and advantages of the buddy system for practicality, convenience, safety and enjoyment, we then discussed how self-reliant diving could be done responsibly given the correct training and correct use of their equipment.

We went through some theory of gas usage at depth, which involved some maths of course, (never my strong point and given that I had driven for 2 hours from Dubai to the east coast for an 0800 start, my brain was not happy with this), in order to calculate our SAC (surface air consumption) rates and determine how much gas we would require, not only for the dive, but also to determine how long our pony bottles would last at depth and if they were large enough for the planned dives.

Having the correct mentality and physical fitness are also key requisites in addition to experience, and this was clearly demonstrated when we calculated our SAC rates during the course after our dives. The art of

self-rescue is key too, and as a Rescue Diver since 20 years, it was also good to refresh myself on certain aspects at this point.

So after all of the theoretical section was complete and a couple of cups of tea provided by Paul's wife Karin, it was time to put our kit together for the inspection (Paul is an ex-marine, RN), and our first dive.

DIVE NUMBER 1

After the dive briefing, we boarded the boat for the 5 minute ride out to Inchcape 1, a wreck sunk in 30m of water as a dive site. Plan was for a 20-minute dive on air. This was also my first dive without a camera in my hands in over 500 dives, so I felt a bit strange, but not to worry, we had plenty to do.

On reaching the bottom we had to establish neutral buoyancy in a horizontal position less than a meter from the bottom for more than 2 minutes, after which Paul then tapped our second stage to indicate free flow and we had to change to our redundant air source within 30 seconds and breath from that air source for 2 minutes before changing back to our main air source.

We then went for a bimble around the wreck whilst noting our pressure every 50 bar at that depth in order to calculate our SAC rates, as well as a specific 5-minute swim noting start and finish pressures. At the end of the dive we then deployed our SMBs from 30m, then surfaced.

Back on land we transferred the data from our slates to paper in order to make some calculations later.

DIVE NUMBER 2

Paul had chosen Hole in the Wall for this dive with a maximum depth of 13m. We started with a surface swim for 200m in full equipment, then descended into the murk, visibility was barely a few meters. I had a slight issue equalizing my right ear and had to surface, cleared it and descended in an area where I noted bubbles on the surface only to find another group of divers. I could hear Paul's rattle but could not determine direction. After about 30 secs of looking around, I began to ascend, however Paul found me and we were all together again.

On this dive we were recording our depth and main cylinder pressure every 10 minutes of the dive. We also had to swim without a mask for 2 minutes underwater covering a minimum distance of 18 meters.

Once again we were given a signal for Out of Air (OOA) and change from main tank to redundant air source, and used that source for 5 minutes, taking note of start and finish pressures for more calculations later on.

The next exercise was navigation, blimey this took me back, although I frequently use my compass on Car Cemetery. We took it in turns to swim in a square with one person navigating with compass and the other counting fin kicks.

Once these exercises were complete, we went for a casual swim around continuing to monitor and record our air supply every 10 minutes before deploying our SMBs for ascent.

Back on shore we once again transferred data to paper from slate for later calculations.

DIVE NUMBER 3

On this dive we were recording depth and time every 20 bar of pressure used. The dive was at Three Rocks, visibility was really poor, barely two meters, and we had to navigate using natural references back to the boat, with a time limit based on the rule of thirds for our gas consumption.

We also continued with an OOA scenario at the end of the dive and whilst breathing from our redundant air source, deployed our SMBs and surfaced with a 3-minute safety stop whilst still using the redundant air source.

Back at the dive center, we rinsed our gear and returned to the classroom to do the sums!

What became rather obvious even during the dives was that my pony bottle was rather small for some dive scenarios. A 13 cubic foot bottle equals 1.84L and while fine for shallow dives is unsuitable for dives to 30m. I do have a 30 cubic foot bottle (4.2L) that I have now rigged up for side mount, and additionally one of my 50 cubic foot (7L) bottles will be used for deeper dives on side mount.

Although not a Tec course, one might consider this as pre-Tec, and will certainly be useful as such.

Oh and the SAC rates, well on dive 1, overall 19, on the other dives between my back gas and on redundant gas it varied between 7.69 to 15.4.

On the following day I made two dives on Car Cemetery with adjusted weight and with camera, no drills just photography, SAC rate 10.26 J.

6 MONTHS ON AT THE MANTA TRUST

FEATURE **KATIE BROOKS**

A listing on CITES will help to reduce incidences like this. A giant manta (*Manta birostris*) caught in the Sri Lankan fishery. © Daniel Fernando

What a difference 6 months makes… since our first feature here in Divers for the Environment just 6 months ago, The Manta Trust team has been working incredibly hard and even for us it's almost impossible to believe all that we have achieved since we were registered as a charity at the beginning of the year. The team has been out and about in various places around the world, not just conducting research in the field, but spreading The Manta Trust message from dive shows, to events to celebrate life under the oceans and even a dedicated Manta week! We've talked, provided workshops, screened documentaries and we've found there are thousands of people out there who share our vision and passion for these animals.

As well as letting people know what we're all about, we've been putting our words into action, we've added seven new locations where Manta Trust work is carried out, India, Fiji, the Line Islands, Hawaii, South America, the Marianas Islands and Micronesia and we have some amazing new members on our team. We've photographed, tagged and biopsied around the world, and as another year of work draws to a close, we're finding out more and more about these animals. Our longstanding work in the Maldives for example has identified another 155 mantas within the last 6 months stretching our database for that project to 2,750 individuals!

Maybe most importantly of all, we've taken the first steps to gaining some real international protection for mantas with both species having been proposed for Appendix II of CITES and while the international conservation policy might not be the most awe inspiring part of our work, it's likely that it is the most important. For those of you who have only a small idea of what 'CITES' is or what it means for mantas, read on…

On 4th October 2012, it was announced officially that Brazil, Ecuador and Columbia submitted a proposal to have the Genus Manta listed on Appendix II at the next CITES convention to be held in Bangkok in 2013. CITES stands for the Convention on Trade in Endangered Species and is the only international treaty established to protecting endangered species that are considered binding on member nations. At present there are 176 member nations who are party to this agreement and this body meets every 3 years to vote on species to be protected under the convention.

Working alongside numerous other conservation groups, The Manta Trust is a key member of a coalition formed to collate the evidence required to show CITES that these animals face an uncertain future should the current global rates of fishing of both giant mantas (*Manta birostris*) and reef mantas (*Manta alfredi*) be allowed to continue. Manta rays legal protection is limited to just a few nations globally and even where it does exist, it is not always well enforced. Only the giant manta has protection at an international level on the non-binding Convention of Migratory Species (CMS) Appendix I and II and legal protective measures which prohibit catch or trade in these animals have been passed in a mere 6 countries, not enough for a species which migrates many thousands of kilometres throughout the tropical oceans' of the world…

A listing on Appendix II of CITES will mean that trade in these animals becomes very closely restricted and controlled to avoid over utilisation, it is also a binding agreement, meaning the 176 countries who are party to CITES have to adhere to it. While the initial proposal is a huge leap forward, it is just the first step, next the proposal will be heavily scrutinised by a panel of specialists within the United Nations Fisheries and Agriculture Organization (FAO), before ultimately being voted upon by all CITES member states at the next meeting in Bangkok in 2013. In the meantime, all of us here at The Manta Trust will be continuing to gather evidence, write papers, campaign for support and get the vital proof required to show that these animals both need and deserve this level of protection. In the next issue of Divers for the Environment, we'll update you on the progress we're making with CITES and on the not so glamorous part of our work, the data we collect from manta rays at fish markets, manta rays killed for just a small part of their bodies…their gill plates.

The Manta Trust Team at the Birmingham Dive Show in October 2012

Diana Sciambi, Project Leader in the Maldives using stereo video cameras to measure one of the 2,750 mantas identified in this project.

As always, if you'd like to know more about any of the above, please check our webpage **www.mantatrust.org** and our facebook page **www.facebook.com/MantaTrust** to read more about our new projects, to follow our blogs and to learn more about what we do. Please also feel free to email us at **info@mantatrust.org** if there is anything else you'd like to know, and if you're interested in a Manta event here in the UAE, why not let us know and we'll see what we can do!

Manta TRUST

WILL NUDIBRANCHS PASS THE HEAT TEST?

FEATURE **KIRTI RAMESH, UNIVERSITY OF PLYMOUTH**

Nudibranchs, commonly known as sea slugs, are marine molluscs that shed their shell in the early stages of development and that appear in a variety of habitats, from tropical reefs to the Antarctic ice. Personally, they have always been one of the most fascinating marine animals for me to see on a dive because of their diversity in colour and shape, not to mention their delicate features. They are organisms that present themselves in bright colours, or conversely mimic their surroundings, but are blind to their own beauty.

With over 3,000 species, nudibranchs are a perfect example of "you are what you eat". Some species that feed on jellyfish take in the stinging cells and use them as protection against predators. Other species, like the lettuce sea slug (E. crispata), use the chloroplasts from algae and use it to create their own photosynthetic energy.

Their diverse range of habitats and niches make nudibranchs useful bioindicators of global oceanic temperature rise. However, nudibranchs are different from other bioindicators as they are short lived. They serve as sensitive bioindicators of temperature changes in the oceans as they provide information on short term changes that are taking place all the time.

The European Environmental Agency reports that, the rate of increase sea surface temperature, in all European seas over the last 25 years, has been 10 times faster than the average rate during the past century. This rapid temperature increase is equivalent to those for oceans worldwide. Temperature rise in the worlds' oceans influences the biophysical environment and may lead to changes in oxygen availability, oceanic current patterns, geographic ranges of species, and symbiotic relationships such as the corals' loss of the symbiotic zooxanthellae in the well-known bleaching events.

A few studies on the use of nudibranchs as bioindicators of environmental changes have been conducted, but there is still a gap particularly in the effects of temperature changes. One such research suggests that climate variability has significantly changed nudibranch communities over the last 3 decades in terms of abundance, species richness and community structure off the coast of central California [1]. Human induced and natural climate change not only affects the nudibranch communities, these changes may

Photo by Paul Sant

initiate an ecological cascade where a change in the geographic range of one species could indirectly affect the presence of other species. One well known example is the presence of a large aeolid sea slug, *Phidiana hiltoni*, that resulted in the reduction of other sea slug species either through predation or via direct competition.

A study on the effects of temperature-oxygen interactions suggests that, as a response to an increase in temperature, Antarctic nudibranch embryos show higher oxygen consumption and an increase in body size by almost 32 times [2]. These studies point towards a definite change in biological patterns of dispersal, growth and survival of various nudibranch species, on different parts of the globe. Additionally, they argue that there is the necessity to include climate change and oceanic variability in species management plans.

Biological life cycles of nudibranchs are active because they are short lived. For this reason, not all change in their abundance and development may be an indication of temperature rise. However, continuous data collected by recreational divers can be useful to track changes in species range patterns such as the appearance of new nudibranch species or the disappearance of common species on local coral reefs. This data can also be compared with patterns observed in marine protected areas (MPAs), and help to determine whether the change in species distribution is due to temperature increase or other human impacts such as pollution or shipping.

Nudibranchia is a taxon that has not yet been assessed by the IUCN Red List, so it is difficult to estimate how threatened they are. Future research is necessary and will add to the limited understanding of these creatures whilst also examining their use as bioindicators.

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UNDERWATER NOISE DECREASES WHALE COMMUNICATIONS IN STELLWAGEN BANK SANCTUARY

FEATURE **NOAA**

According to a NOAA-led paper published in the journal Conservation Biology, high levels of background noise, mainly due to ships, have reduced the ability of critically endangered North Atlantic right whales to communicate with each other by about two-thirds.

From 2007 until 2010, scientists from Stellwagen Bank National Marine Sanctuary, Cornell Lab of Ornithology, NOAA Fisheries Northeast Fisheries Science Center, and Marine Acoustics Inc. used an array of acoustic recorders to monitor noise levels, measure levels of sound associated with vessels, and to record distinctive sounds made by multiple species of endangered baleen whales, including "up-calls" made by right whales to maintain contact with each other.

NOAA Fisheries Northeast Fisheries Science Center documented more than 22,000 right whale contact calls as part of the study during April 2008, and software developed by Cornell and Marine Acoustics Inc. of Arlington, Va., aided in modeling ship noise propagation throughout the study area.

Vessel-tracking data from the U.S. Coast Guard's Automatic Identification System was used to calculate noise from vessels inside and outside the sanctuary. By further comparing noise levels from commercial ships today with historically lower noise conditions nearly a half-century ago, the authors estimate that right whales have lost, on average, 63 to 67 percent of their communication space in the sanctuary and surrounding waters.

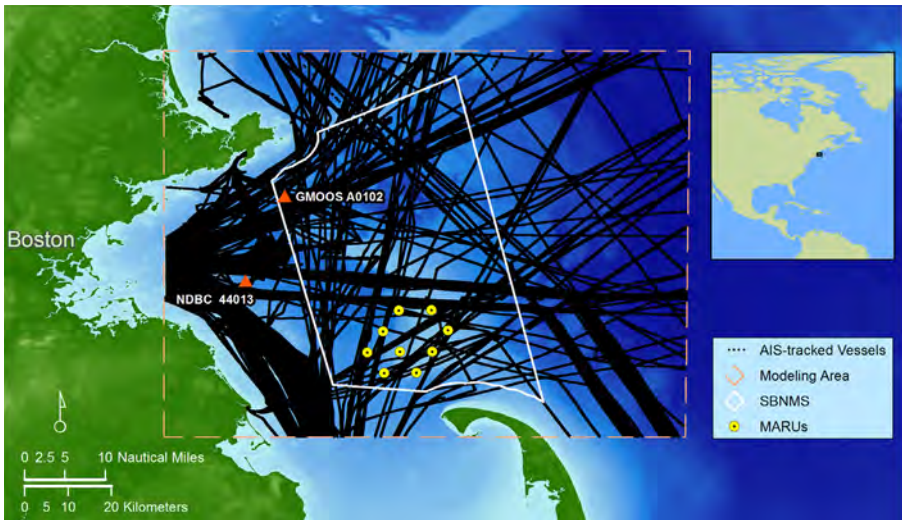
"A good analogy would be a visually impaired person, who relies on hearing to move safely within their community, which is located near a noisy airport," said Leila Hatch, Ph.D., NOAA's Stellwagen Bank National Marine Sanctuary marine ecologist and lead author of the paper. "Large whales, such as right whales, rely on their ability to hear far more than their ability to see. Chronic noise is likely reducing their opportunities to gather and share vital information that helps them find food and mates, navigate, avoid predators and take care of their young."

North Atlantic right whales, which live along North America's east coast from Nova Scotia to Florida, are one of the world's rarest large animals and are on the brink of extinction. Recent estimates put the population of North Atlantic right whales at approximately 350 to 550 animals.

"We had already shown that the noise from an individual ship could make it nearly impossible for a right whale to be heard by other whales," said Christopher Clark, Ph.D., director of Cornell's bioacoustics research program and a co-author of the work. "What we've shown here is that in today's ocean off Boston, compared to 40 or 50 years ago, the cumulative noise from all the shipping traffic is making it difficult for all the right whales in the area to hear each other most of the time, not just once in a while. Basically, the whales off Boston now find themselves living in a world full of our acoustic smog."

The authors suggest that the impacts of chronic and wide-ranging noise should be incorporated into comprehensive plans that seek to manage the cumulative effects of offshore human activities on marine species and their habitats.

"We are starting to quantify the implication of chronic, human-created ocean noise for marine animals," said Holly Bamford, deputy assistant administrator of the National Ocean Service. "Now, we need to ask how we can adapt our management tools to better address these problems."



This image shows the study area in and around NOAA's Stellwagen Bank National Marine Sanctuary (SBNMS), including large commercial vessels tracked and locations of marine acoustic recording units (MARUs) in April 2008.

CLEAN UP ARABIA'S

PLATINUM SPONSORS

GOLD SPONSOR

STANFORD MARINE GROUP

Acting responsibly is at the heart of all we do. We believe that corporate social responsibility (CSR) can have a positive impact on everyone – our employees, our business, our customers and the marine industry. We strive to be a responsible business because it makes us a better business.

Our aim is to have impact on critical issues, such as education, health and wellness, economic development and environmental sustainability. We are constantly looking for ways to focus our resources and expertise to foster genuine change on specific problem areas.

Our commitment to corporate responsibility is manifested in a number of areas such as our constantly increasing focus on sustainability across our businesses; policies that ensure we are conducting business in a responsible manner, in particular with regards to health and safety, the environment and ethics; the commitment to equal opportunity and professional development for our employees; encouraging our people to be responsible citizens, both towards each other and in the wider community; and the support of initiatives in our wider community which address critical issues we strive to impact.

To cite but a few examples, we have equipped our new flagship 87m vessel with a cutting-edge hybrid propulsion system that reduces CO2 emissions; the new Grandweld Shipyard facility we built at Dubai Maritime City has a 'Gold' environmental certification; we are supporting for the 13th consecutive year, the Al Noor Training Centre and have initiated support of the Rashid Paediatric Therapy Centre.

Through the projects we support, we also welcome the opportunity to see our organization's values in action, and to foster a greater sense of common values, cohesion and responsibility within our company.

SILVER SPONSOR

AkzoNobel

Tomorrow's Answers Today

AkzoNobel is the largest global paint and coatings company and a major producer of specialty chemicals. We supply industries and consumers worldwide with innovative products and are passionate about developing sustainable answers for our customers. Our portfolio includes well known brands such as Dulux, Sikkens, International and Eka. Headquartered in Amsterdam, the Netherlands, we are a Global Fortune 500 company and are consistently ranked as one of the leaders in the area of sustainability. With operations in more than 80 countries, our 55,000 people around the world are committed to excellence and delivering Tomorrow's Answers Today™.

In terms of social responsibility, apart from the corporate big initiatives, AkzoNobel has a community program fund which started in 2005 with the aim of encouraging employees involvement in local communities. What is different about this program is that it is all about the employees (they propose their own project with personal hands-on involvement) and then the company supports in terms of finance, products, facilities, and expertise.

Clean Up Arabia was the first initiative for the Dubai site and we really want to keep the ball rolling for similar environmental programs and other community programs.

EVENT ORGANISERS

EDA
جمعية الإمارات للغوص
Emirates Diving Association

SUPPORTING PARTNERS

Le MERIDIEN
AL AQAH BEACH RESORT
FUJAIRAH

PARTNERS

UNEP

Clean Up the World

Ocean Conservancy®
Start a Sea Change

CLEAN UP ARABIA 2012

ABU DHABI, DUBAI, DIBBA, FUJAIRAH, AL AQAH AND OMAN

FEATURES AND PHOTOGRAPHY **EDA, AL MAHARA DIVING CENTER AND PAVILION DIVE CENTRE**

YOU CAN MAKE A DIFFERENCE

CLEAN UP ARABIA

CUA 2012

IN PARTNERSHIP WITH:

Coca-Cola®

Emirates Diving Association has been organizing the annual Clean up Arabia campaign since 1995 as a regional event. Clean Up Arabia is part of the Clean Up the World program that is promoted and managed by the United Nations Environment Program (UNEP).

FOR INFO: http://www.cleanuptheworld.org

EDA organizes Clean Up Arabia in collaboration with the UNEP YouthXchange West Asia (United Nations Environment Programme). It is backed by the Australian's 'Clean Up the World' campaign, the USA-based 'International Coastal Cleanup' and Project AWARE Foundation. All these organizers have years of experience around the world, coordinating groups from all walks of life to join together for the good of the earth.

Clean Up Arabia is an annual voluntary campaign that aims to clean up the dive sites and beaches of the UAE and surrounding regions. Campaign objectives are:

- Engage the community and involve people from all walks of life to make a difference.
- Rid the marine environment from pollution.
- Direct people toward positive attitudes in maintaining a clean and sound environment by practice and participation.
- Supporting continuous clean up activities.

The campaign is regional, covering the UAE, Kuwait, Qatar, Oman and Bahrain which is driven and mobilized by EDA. It is all about making a difference, and spreading awareness.

- Part of the campaign is to record the quantities and types of 'refuse' collected each year and to make comparisons with the previous data collections.
- Data collected is reported to the International Coastal Cleanup (ICC) and used in educating the public, businesses, industries and government officials about the marine debris problem.

CLEAN UP ARABIA FUJAIRAH

Le Méridien Al Aqah, one of Clean Up Arabia's supporting partners for the past 8 years, hosted this year's 17th CUA event on Saturday the 24th of November.

2012 wrapped up another successful year on the East Coast dive site clean ups of Dibba and Fujairah and the Al Aqah beach clean up. 340 participants joined forces to battle out the different debris collections. It was a beautiful day with perfect temperatures for the event to take place. Everyone was armed with the driving force of enthusiasm, bags for beach or diving clean ups, gloves and the all important ICC cards to be filled out per group.

EDA members, partners, families and friends separated into their groups, the divers went off to their assigned boats for the dive clean ups and the others stayed behind to do the beach clean up. Several hours later, everyone came back in time to enjoy some lunch in the garden of Le Méridien and shared some interesting stories of the strange items found.

Thank you to everyone who filled out the ICC cards. This information is vital for the International Coastal Clean Up report which is compiled by the Ocean Conservancy.

To end the day's event, a friendly game of volleyball was played by 4 teams made up by Dubai Duty Free, FSDC (Filipino Scuba Diver Club), EDA Member's Team and Le Méridien. A big congratulations to DDF for winning first place, followed by Le Méridien in close second and EDA falling into third place. Cups and Medals were presented to the winning categories.

A big thank you to our faithful event sponsors and to our newly joined sponsors for all their support and concerns regarding our environment and backing up Clean Up Arabia and all its volunteers! Our Platinum Sponsors – Coca Cola and Dubai Duty Free, our Gold Sponsor – Stanford Marine Group and our Silver Sponsor – AkzoNobel.






حملة النظافة العربية
CLEAN UP
ARABIA
I AM AN EDA VOLUNTEER

EDA



EDA
SMG
MERIDIEN





حملة النظافة العربية
CLEAN UP


















The results shown below are of both the underwater and the beach clean ups and the overall results of both combined from the East Coast. This stage proves how important the ICC card data input is. The information given needs to be as accurate as possible in order to submit the results to the Ocean Conservancy.

From the 118 cards analyzed, we were able to make comparisons between this year's and last year's results. The numbers were quite shocking! The beach collection results show that this year, 6,000 items were gathered in just a few hours compared to 2011 where only 2,500 items had been collected on the exact same beach.

EAST COAST (DIBBA, FUJAIRAH & AL AQAH COLLECTIONS (118 Cards)

ITEMS COLLECTED	UNDERWATER TOTAL	BEACH TOTAL	BOTH TOTAL
Bags (paper)	15	246	261
Bags (plastic)	67	489	556
Balloons	0	10	10
Beverage Bottles (plastic)	**106**	511	617
Beverage Bottles (glass)	11	180	191
Beverage Cans	42	153	195
Caps, Lids	5	387	392
Clothing, Shoes	11	105	116
Cups, Plates, Forks, Knives, Spoons	26	349	375
Food Wrappers/Containers	22	265	287
Pull Tabs	0	60	60
6-Pack Holders	2	18	20
Shotgun Shells/Wadding	0	21	21
Straws, Stirrers	0	156	156
Toys	3	46	49
Bait Container/Packaging	0	17	17
Bleach/Cleaner Bottles	2	4	6
Buoys/Floats	1	16	17
Crab Traps/Lobster Traps/Fish Traps	7	42	49
Crates	0	11	11
Fishing Line	21	38	59
Fishing Lures/Light Sticks	4	4	8
Fishing Nets	6	54	60
Light Bulbs/Tubes	0	24	24
Oil/Lube Bottles	8	7	15
Pallets	2	6	8
Plastic Sheeting/Traps	8	44	52
Rope	35	363	398
Strapping Bands	0	60	60
Cigarettes/Cigarette Filters	5	**1,754**	**1,759**
Cigarette Lighters	6	38	44
Cigar Tips	0	7	7
Tobacco Packaging/Wrappers	1	59	60
Appliances (refrigerators, washers, etc.)	0	0	0
Batteries	3	18	21
Building Materials	45	325	370
Cars/Car Parts	0	5	5
55-Gal. Drums	1	10	11
Tires	2	8	10
Condoms	1	4	5
Diapers	0	12	12
Syringes	0	13	13
Tampons/Tampon Applicators	0	1	1
Extra	3	64	67
TOTAL	471	6,004	6,475

CLEAN UP ARABIA ABU DHABI

Over one hundred and fifty divers and volunteers from all over the Emirates joined together on 23rd November 2012 at Mina Zayed to tackle one of our ocean's biggest challenges, marine debris.

The event's main sponsor was Coca Cola who provided the event with the EDA CUA T-shirts and hydrating beverages. We thank all the organizations who supported the event including the Environment Agency of Abu Dhabi, Project AWARE, the Center of Waste Management Abu Dhabi, CNIA, Abu Dhabi Fishermen's Coop, GASCO, the National Ambulance Services, Lavajet and Al Mahara Diving Center.

The 17th annual EDA Clean Up Arabia campaign kicked off at 9am and was attended by HH Sheikh Yas Bin Hamdan Al Nahyan representing his brother Sheikh Hazza Bin Hamdan Al Nayhan. The young royal donned his scuba diving gear and took the plunge into the slightly turbid waters off the fishermen's wharf. Within 20 minutes, Sheikh Yas and other divers had already brought tens of garbage filled mesh bags up to the surface. Upon descending down to 5-6 meter depths, the visibility was very poor and expert navigation and excellent buoyancy skills were required to avoid stirring up the silt bottom in order to avoid getting lost.

The message of Clean Up Arabia is strong and clear; to keep our oceans, beaches and waterways clean and healthy by retrieving as much harmful debris from our marine environment as possible.

Two weeks ago, divers and beach volunteers brought up over 2,000kgs of trash from another Abu Dhabi site. This year, volunteer kayakers waited on the calm surface to support the divers by supplying them with mesh bags while divers brought up garbage filled bags back up to the paddlers. This surface team support system worked well as the kayakers maneuvered easily around and reduced the risk of divers surfacing under a boat. The main debris brought up was aluminum beverage cans, glass bottles and plastics. Some unusual debris included a petrol motor or generator, old rusted 3-4 meter rebars and paint containers.

The challenge is far from over, but the dedicated volunteer divers and kayakers continue to work tirelessly in the fight against marine debris locally and globally. We look forward to seeing more volunteers and more sites cleaned up as we all stand up and make a difference to fight for our planet's ocean state of health.


CLEAN UP
ARABIA
BE COOL

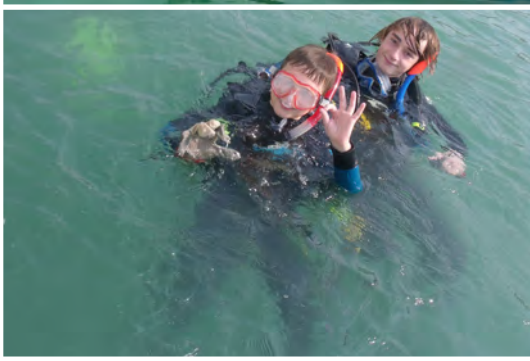
CLEAN UP

CLEAN UP
ARABIA






feelfree




CLEAN UP ARABIA DUBAI

On Friday the 23rd of November, the Pavilion Dive Centre ran CUA's dive clean ups in Dubai with the support from EDA and the Ocean Conservancy.

We received all the materials prior to the event's day from EDA and organized several teams beforehand to cover as much area as possible for the days event.

One group of divers went to the local wrecks – Neptune and Hopper. Another group of school students were split and dived on the Tawasul Reef and North Beach. All the divers descended with their nylon bags and hit their target to collect as much garbage as possible during their dive. Students were appalled by the amount of rubbish they collected and commented that we need to throw our trash in the trash and not in the water.

DIVERS COLLECTED: plastic bags, fishing lines, bottles, food wrappers, etc.

Everything collected during the dives was brought back to the Pavilion Dive Centre, sorted out, counted and the information was logged onto the International Coastal Cleanup Cards and sent back to EDA to forward on to the Ocean Conservancy along with all the other Clean Up Arabia ICC cards for 2012.

Clean Up Arabia brought all the divers together and together, we make an impact on the environment we treasure so much.

DUBAI ITEMS COLLECTED	UNDERWATER TOTAL
Bags (paper)	0
Bags (plastic)	9
Balloons	0
Beverage Bottles (plastic)	3
Beverage Bottles (glass)	0
Beverage Cans	3
Caps, Lids	2
Clothing, Shoes	2
Cups, Plates, Forks, Knives, Spoons	2
Food Wrappers/Containers	5
Pull Tabs	0
6-Pack Holders	0
Shotgun Shells/Wadding	0
Straws, Stirrers	0
Toys	0
Bait Container/Packaging	3
Bleach/Cleaner Bottles	1
Buoys/Floats	0
Crab Traps/Lobster Traps/Fish Traps	0
Crates	0
Fishing Line	3
Fishing Lures/Light Sticks	0
Fishing Nets	0
Light Bulbs/Tubes	0
Oil/Lube Bottles	0
Pallets	2
Plastic Sheeting/Traps	1
Rope	3
Strapping Bands	0
Cigarettes/Cigarette Filters	0
Cigarette Lighters	0
Cigar Tips	0
Tobacco Packaging/Wrappers	0
Appliances (refrigerators, washers, etc.)	1
Batteries	0
Building Materials	**12**
Cars/Car Parts	2
55-Gal. Drums	8
Tires	8
Condoms	0
Diapers	0
Syringes	0
Tampons/Tampon Applicators	0
Extra	0
TOTAL	70

CLIMATE CHANGE – FACT OR FICTION?

FEATURE **LEANNE KING, BSC (HONS)**

Dubai Skyline

The debate has been rife for the last 20 years – are our modern lifestyles causing adverse effects on our environment beyond what would naturally happen?

The Earth has been in a continuous state of change for millions of years. Nothing has ever been constant. 2.4 billion years ago, the earth was just 2 billion years old and home to only unicellular life forms – there was no complex life and the planet was a giant "snow ball", covered in ice from pole to pole. It was the most severe ice age known in natural history. Volcanic activity had been dormant for 250 million years, meaning no greenhouse gas effects keeping the earth warm. Bacteria caused massive amounts of oxygen to be released into the atmosphere. Eventually, this would become the ozone layer that protects our earth today.

Skip forward to 700 million years ago and the earth was halfway through a 200-million year glaciation, possibly triggered by the evolution of large cells and multicellular organisms. When the organisms died, they would have sunk to the seabed, sucking CO2 from the atmosphere, reducing the effect of greenhouse gases and lowering the overall temperature. Ice stretched as far as Miami, Florida and almost every part of the Earth's surfaced was covered. Marine life would have been almost completely destroyed, as snow covered the surface, blocking out the light.

The most recent Ice Age started around 2 million years ago. It only started to retreat 14,000 years ago and is still retreating today. Up until the retreat, vast areas of ice covered much of North America, Europe and Asia – an ice sheet stretched from the Pacific to the Atlantic oceans. At the height of the ice age, 30% of the earth's surface was covered in ice – now, it's just 10%.

Around 5000-3000 years ago, the earth was 1-2 degrees warmer than it is today, showing that even before the onset of man's modern day lifestyles, the earth's temperature rises and falls. Even in the 1950s, the scientific community was worried that earth was about to enter a cooling period. The question is, are the activities of man causing the earth's temperature to rise unnaturally and in a way that does not allow the species of this planet to adapt quickly enough?

INFLUENCES ON THE EARTH'S TEMPERATURE

There are two sources that affect the earth's temperature: natural variations and anthropogenic (man-made) causes. Natural sources include things like:

- Volcanoes that throw out massive amounts of sulphur dioxide, water vapour, dust and ash in to the atmosphere. It was a massive chain of eruptions that is believed to have caused the end of the dinosaurs by blocking out the sunlight, causing the earth's temperature to drop significantly. Volcanoes also release carbon dioxide, but in amounts that are relatively insignificant when compared to the amount produced by human activities.

- Ocean currents are a major contributor to a stable climate and ultimately any change in that climate. Currents move vast amounts of heat around the world – for example, it is thanks to the Gulf Stream originating from Florida that the west side of Britain is a couple of degrees warmer than the east side and considerably warmer than other countries on the same latitude, such as Norway, Sweden and Poland. Oceans are important for determining the concentration of CO2 in the atmosphere. Changes in the circulation of the currents can affect the climate through moving CO2 in or out of the atmosphere.

- The earth's orbit of the sun and tilt of 23.5° towards it helps determine the earth's seasons – more tilt means warmer summers and colder winters. Slow changes in the Earth's orbit lead to climatological changes, which become amplified and can produce ice ages.

- Science shows that solar variations have had an impact on climate change events in past history. It is a decrease in solar energy output that is believed to have caused the "little ice age" between 1650-1850 AD which cut off a lot of Greenland and glaciers advanced in to the Alps. The first half of the 20th Century saw an increase in global warming, many scientists suspect this was in part due to an increase in the output of solar energy, as well as human-induced factors. However, the current trends in global warming cannot be attributed to an increase in solar variations as studies show that the energy output from the sun has been fairly constant since 1750. If solar output had increased, warmer temperatures would be seen through all layers of the atmosphere, not just at the surface and lower parts. There has actually been a cooling in the upper layers of the atmosphere. It is the increase in greenhouse gases in the lower levels that are trapping the heat and causing the warming.

THE IMPACTS OF MAN

Despite the history of the earth's temperature fluctuations and the natural factors that can contribute to the global temperature, an overwhelming majority of scientists still believe that man IS causing climate change. Of 1372, climate researchers surveyed 97-98% agreed that there is ample evidence that human activity is warming the planet. Such a definitive consensus to a common belief is rare in any scientific field, let alone one where there are so many variables, not just at present but also throughout earth's history.

SO WHAT IS IT THAT MAN DOES THAT IS CAUSING SUCH CHANGE TO THE CLIMATE?

The main man-made factors contributing to global warming are greenhouse gases and deforestation. Almost everything modern man does, creates pollution – some of which is worse than others. Fossil fuels, such as coal, oil and natural gas are the main source of energy for most of the world's population. In the USA, up to 90% of greenhouse gas emissions come from the burning of fossil fuels. The burning of fossil fuels produces approximately 21.3 billion tonnes of carbon dioxide, of which only 50% can be absorbed by the natural processes.

Trees are a major carbon sink. When trees are cut down, not only do they stop absorbing carbon but the carbon stored in them is released, increasing the levels in the atmosphere. Forests store up to 100 times the amount of carbon as agricultural fields of the same size. Trees are the earth's most effective carbon-absorbing tool, continuing deforestation at the current rate will undoubtedly cause irreversible effects on the planet's climate. Estimates place the level of carbon dioxide released in to the atmosphere every year from deforestation at 1.5 billion tons – mainly from cutting and burning of forests. Every year, 30 million acres of forests and woodlands are cut down, having major ecological and financial effects on the local population.

WHAT WILL BE THE EFFECTS OF CLIMATE CHANGE AND GLOBAL WARMING?

The Earth reflects some of the heat from the sun, this is known as radiative forcing. It's measured by taking the energy flowing in to the atmosphere and subtracting the amount

reflected. A positive radiated forcing will tend to warm the climate, while a negative outcome will tend to cool the planet. In 2005, levels of anthropogenic (human caused) radiative forcing was positive, established by comparing modern levels to those from 1750, before the industrial revolution.

The climate has a major effect on weather. Increases in global warming look set to increase the frequency of freak weather phenomenon such as hurricanes, typhoons and tsunamis. Studies have shown that the level of precipitation is increasing in intensity, frequency and amount. There have been widespread increases in heavy precipitation, even where average rain fall has fallen. The differences in weather between summer dryness and winter wetness look set to increase, escalating the likelihood of droughts and floods. Much of the world looks set to suffer increasingly dry conditions over the next 30 years, while evidence suggests that, since the 1970s, the intensity and duration of tropical storms and hurricanes has been increasing.

Warmer temperatures will result in the melting of ice sheets and glaciers, causing sea levels to rise. This will decrease the level of salinity of the world's oceans and may actually cause water shortages in areas of the world that rely on glacial melt for fresh water. One effect that many people may not consider is that retreating ice caps can actually cause an increase in volcanism. The size and frequency of volcanic eruptions is likely to increase.

The ocean is a massive sink for carbon, as it absorbs a large percentage of carbon dioxide from the atmosphere. This absorption leads to acidification of the oceans, having serious affects on the life in the water. In addition, as ocean temperatures increase, they actually become less capable of absorbing carbon, making it a less effective sink for our pollution.

Global warming will have regional affects on areas, some of which may be disproportionate to the actual warming as the climate affects other factors, such as ocean currents and weather systems. Regional climates will change in 3 major ways from global warming:

- Melting and forming ice
- Changes to the hydrological cycle
- Changes to the oceans currents

Physical and biological systems on all continents and throughout much of the oceans have been affected by recent changes to the earth's climate, especially from changes in temperature. Many regions now see an earlier Spring where trees and plants are budding and flowering earlier than in previous years. This has a knock on effect throughout the rest of the ecosystems. Species such as chipmunks and squirrels are moving to higher latitudes where the weather is more what they have evolved to tolerate. Bird migrations are changing and fish communities are transgressing from cold- to warm-adapted species.

Global warming is likely to have huge implications for human societies. Food production will be affected by elevated levels of carbon dioxide in the atmosphere, changed precipitation and transpiration, increased temperatures, higher levels of extreme weather as well as pressures from weeds, pests and pathogens.

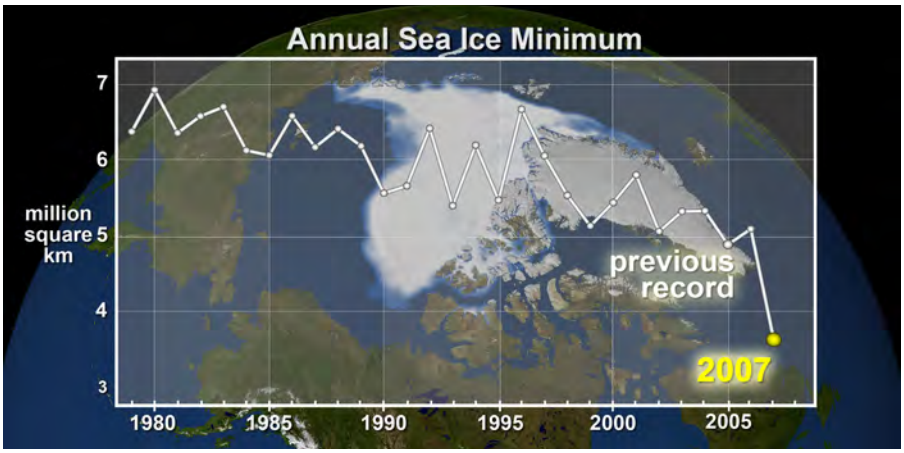
Climate change may also lead to serious human health issues. The World Health Organisation has speculated that any increase in temperature will increase the levels of diseases such as diarrhoea, malaria and dengue fever. The WHO estimated that in 2004, 0.2% of deaths could be directly attributed to the effects of climate change, not including the deaths caused by freak weather events.

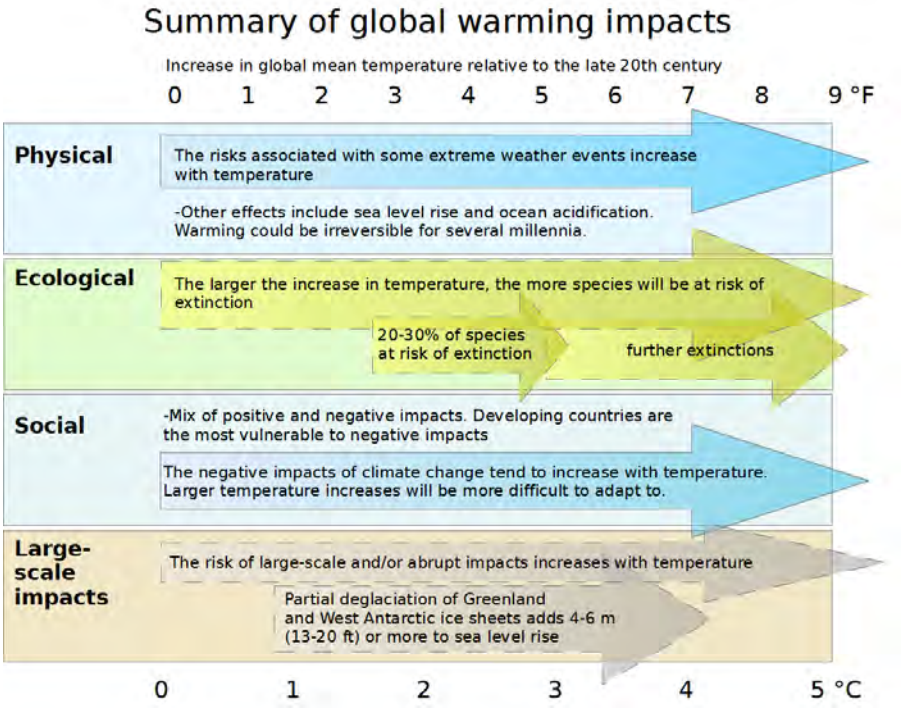
SO WHAT CAN BE DONE?

Once again, while national governments are increasing taxes on big businesses for the pollution they create, everyone must take responsibility for their own carbon footprint. It all boils down to good stewardship of this planet. It's become a well-rehearsed phrase and perhaps so much so that it is starting to lose its impact but things such as switching electrical items completely off rather than putting them on to standby or just turning off the computer's monitor, are small steps that if everybody took would make a big difference. People need to start investing more seriously in to alternative, renewable energy sources. These sources are not without their own faults especially when it comes to production of the equipment needed to harness the energy, but in the long run they will have less of an impact than the current non-renewable usage does – especially when you take in to consideration the process used to access the oil, coal and natural gas sources.

THE DEBATE CONTINUES

The skeptics say that the believers just want to tax big businesses, while the believers say the skeptics get benefits from big, pollution-producing businesses in return for their defence. The argument will continue on and some scientists say that not all the effects of climate change will be bad or that climate change is just a natural cycle in the earth's history but, although we may not see it in our lifetime, do we really want to be sending the earth in to potential catastrophe?





DIGITAL ONLINE 2013 REGULATIONS

EDA'S UNDERWATER PHOTOGRAPHY AND FILM COMPETITION

OPENS: TUESDAY, 1st JANUARY 2013 | **ENDS:** TUESDAY, 30th APRIL 2013 @ MIDNIGHT

THE EXHIBITION & AWARD CEREMONY: WEDNESDAY, 29th MAY 2013 | 19:00-22.00 | VENUE TBC

DIGITAL ONLINE'S MAIN OBJECTIVES ARE:

- To gather information on the number of underwater photographers in the UAE (both professional and amateur).
- To discover new promising underwater photographers in the UAE.
- To develop the human interaction with the underwater environment and highlight the beauty of its fauna and flora.

Digital Online is open to UAE Nationals and all people living in the UAE under a valid Residence Visa and of any diving qualification with valid EDA membership.

DIGITAL ONLINE

Digital Online was realized in 2009 by an underwater photographer new to Dubai who had previously been involved in the organisation and run of underwater photography competitions in his native country of Brazil. As there were no underwater photography competitions existing in the UAE at the time, Digital Online was introduced as an EDA platform for photographer residents and to develop a relationship and human interaction with those unfamiliar with the underwater world and environment.

The competition now heading into its fifth year, has seen a tremendous success in the yearly rise of participation, enthusiasm and passion and it is equally successful within the non diving viewers now acquainted with the yearly event. As the competition grows, so does the event exhibition as well as the sponsored prizes.

The film category was introduced into the competition in 2012. We look forward to watching that category also grow and develop each year, providing us with information and knowledge about the delicate life underwater we strive so desperately to protect and conserve.

THE COMPETITION RULES

- By entering the competition, entrants declare that they own copyright of the submitted photographs and films and it entails an automatic acceptance of all the rules and regulations. EDA reserves the right to publish winning images in both, the 'Divers For The Environment' magazine and on the EDA website. Winning images will also be used in any future promotional material for EDA events and competitions royalty free, but copyright remains with the photographer. Use of images or video will require no additional written or verbal permission from the photographer or videographer.

- Competition organizers will take the utmost care in handling digital files submitted to the competition. However, competition organizers will not be held responsible for any loss of the submitted material at the time of uploading images. No media such as CD's, DVD's, memory cards and sticks will be returned to the participants unless fully stamped and self addressed return envelopes are provided with the submission of the original files.

- Images must not have already been submitted to previous Digital Online Competitions.

- Manipulation is restricted to colour correction, brightness, contrast, sharpening and cropping. The Digital Online judges reserve the right to examine untouched images if requested.

- Removing backscatter is allowed to an extent, this does not include the removal of subjects such as fish or divers or cutting and pasting sections of images from one to another.

- Participants are obligated to follow environmental conservation regulations and to share respect for the underwater world during the process of taking their stills and film. Be advised that any damage to the protected underwater world, including the disruption of the natural habitat of the marine life, provocation through touching, displacing, feeding or annoying, is prohibited and will disqualify the images or the photographer/videographer. Our marine biologist will help us identify images or video where subjects have been 'moved to a better background' etc.

- The final deadline for submitting images and video for the competition categories is Tuesday, 30th April 2013, at midnight.

- The finalists will be announced and their work displayed at the exhibition and award ceremony on Wednesday, 29th May 2013. Participants who do not make it to the evening of the event will be asked to collect their prizes from the EDA offices. Venue and prizes will be announced in March.

- We pledge to run this photography and film competition ethically and with integrity. Our judges have volunteered their time to help and to some it might be important to note that the photographers' details remain hidden to the judges during the judging process.

SECTIONS, THEMES &CATEGORIES

PHOTOGRAPHY SECTIONS

Photographers will be classified into professional and amateur sections.

PROFESSIONAL SECTION: Digital SLR camera users with or without external strobes.

AMATEUR SECTION: Point and shoot photographers only (compact cameras) with built in strobe.

PHOTOGRAPHY THEMES

1. UAE AND MUSANDAM ONLY:
   Photographers can enter their photographs into 3 categories; Fish, Macro and Wide Angle. Entrants may enter one image per category which can only have been taken in the UAE or in the Musandam.

2. INTERNATIONAL IMAGE:
   Photographers can enter one image of their choice of any category.

THE CATEGORIES:

FISH: Photographs of whole fish and/or fish parts as the main visual element (not mammals, crustaceans, molluscs etc.) taken with any lens, portraying its natural behavior and environment.

MACRO: Photographs taken with close up-equipment, portraying underwater flora and/or fauna. The main element not being fish. The photographer may not crop the original more than 20%. The original image may be requested.

WIDE ANGLE: Photographs taken with a wide-angle lens (or adapters that provide an equal field-of-view), with or without human presence, portraying the natural beauty of the underwater environment.

VIDEO THEMES

MARINE LIFE: Show off your creative editing skills showing the local water marine life. Maximum duration including credits: 5 minutes.

WRECK VIDEO: Getting good wreck footage can be a challenge due to the size of most wrecks and the generally limited ambient light. Get creative with those found here. Maximum duration including credits: 5 minutes.

DIGITAL ONLINE

EMIRATES DIVING ASSOCIATION

PHOTOGRAPHY AND FILM COMPETITION

PERSONAL SAFETY

- Participants are responsible for their own safety and for the proper use of their diving and photography/video equipment. Divers must dive within the limits of their own dive certification level and according to the local diving regulations (remember to take your dive certification and diving insurance with you on all your trips).

- Competition organizers and sponsors do not accept responsibility for the safety of participants during their diving activity, nor do they accept responsibility for any damage or loss to personal equipment that may occur as a result of diving activities.

REGISTRATION & IMAGE UPLOAD

- Registration is open from Tuesday, 1st January 2013 and closes on Tuesday, 30th April 2013, at midnight. Registration to Digital Online is free.

- The participant must be a UAE Resident and an active EDA member to enter and send their details and images via email to photo@emiratesdiving.com with the following information:
  - Full Name
  - EDA Membership Number
  - Camera Model

- Images must be submitted by email in JPEG format at a maximum size of 1024 pixels wide (landscape) or 768 pixels high (portrait). Resolution must be 72dpi. File names should comprise the photographers name and the category, eg. JSmithWideAngle.jpg or JSmithMacro.jpg, etc.

  NOTE: High resolution images will be requested at a later date for the exhibition and award ceremony prints.

- Video submissions must be in PAL format on DVD or an MP4 on disc or USB and delivered to the EDA offices, sent via Yousendit or Dropbox.

  MAILING ADDRESS:
  EDA Magazine
  Emirates Diving Association
  P.O. Box 33220
  Dubai, UAE

- You will receive an email to confirm your registration and image/video upload. If you do not receive one within 24 hours, your email may not have come through and you may need to try again unless it has passed the deadline.

HAPPY SNAPPING AND FILMING

We look forward to your entries coming in between January 1st and April 30th, 2013. The venue, judges, sponsors and prizes will be announced in the March 2013 issue of 'Divers for the Environment'. Please keep the date free for the exhibition and awards in May!

SHARKTASTIC FIJI

FEATURE AND PHOTOGRAPHY **SIMONE CAPRODOSSI**

As you google Fiji diving, the Fiji shark dive boasting to be, "the No.1 shark dive in the world" pops up on your first page. Being the crazy shark lover that I am, the claim, as well as the amazing bull shark close up shots shown on the website, have quickly sold it to me and I found myself booking a week of shark diving in Beqa Lagoon in the south of Viti Levu, the main island of Fiji.

"The best shark dive in the world" claim comes from the abundance of sharks, particularly big bulls and the variety of sharks seen at one time, as it is possible to see up to 7 species of sharks in one dive including black and whitetip reef sharks, silvertips, tawny nurse, sicklefin lemon, grey reefs and very occasionally the mighty tiger shark.

Most people stop by the shark dive and do it once, but being on a photography mission, we booked for a full week to get 4 days on the shark dive out of 6 (the other 2 days they don't do it) and maximize chances for a few good shots.

So, we finally made it on the Beqa Adventure Divers boat ready for our first briefing explaining the very structured flow of the first dive. After grouping at the surface we head straight down to the main feeding area called the "arena" and stay there for 17 minutes behind a low coral wall at a safe distance from the peak of the feeding action. This is where we are meant to see the big bull sharks. Strictly after the 17 minutes, to avoid any decompression, we'll all move up to the next stop at about 16 meters where we'll find grey reefs and whitetips. After about 15 more minutes there, we'll move close to the surface at 5 meters to spend the rest of the dive on the top edge of the reef with black and whitetips.

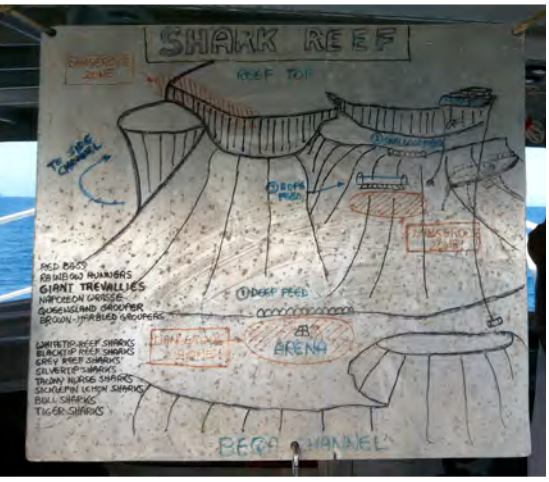
Needless to say, the excitement was mounting and while a couple of fellow divers were getting nervous about being in the water with sharks, I could not wait to get down. So we headed down a rather bare slope and as we got closer to the arena, we started seeing a huge ball of fish, big trevalleys, groupers, schools of surgeon fish and butterflies swimming around like crazy. We were finally placed in the safe viewing spot and from the depth, the bulls suddenly started appearing and circling closer to Rusi, the shark feeder with his unmistakable yellow hoodie who was the epicenter of the big fish ball. We had 6-7 bulls coming in on this first dive and they passed a few times close to us in their majestic beauty. The bulls are the proper portrait of the scary man hunter shark, massive bulky bodies, huge mouths with scary teeth, and yet somehow I felt absolutely no threat from them. Maybe because of the very safe diving setup with the diving team spread out around us at all edges, but also because of the bulls actual smooth and gentle attitude. I expected crazy blood frenzy clashes, but these 2-4 meter bull sharks were extremely shy and gentle, passing by the feeder several times before taking the fish head from the hand quite carefully, with teeth well tucked in the gums.

The 20 minutes on the bottom seemed to last no time at all and suddenly we heard the tank banging signal that we had to ascend to the next level. We sadly left the big sharks behind and placed ourselves up along the reef, closely positioned around the feeder. The rhythm here was totally different, white tips and grey reefs swam very fast above our heads, often bumping into us. I have always loved grey reefs as they are the perfect shark beauty with their proportioned slim muscular bodies and several were coming from the blue and beautifully swimming above my head with the crisp water surface clearly visible behind. These 15 minutes seemed to last even less in the fast paced action and we were called up again for the final stop on top of the reef.

The sun was shining above the surface and beautiful natural light was filtering through, lighting the colorful top of the reef. Here between the hard corals, black tips and white tips swam just a few meters from us, an absolutely fantastic end to a memorable dive.

Back on the surface, everyone was in awe of the experience. I was very relieved to have booked several days as I was able to truly enjoy the first dive without worrying too much about getting pictures. I knew I had some nice shots from the shallower parts as light was good and sharks came very close, but I had gotten no interesting bull shark shots as they did not come particularly close so it left me a little worried about getting the shots I wanted in the future dives.


atlantis



During the surface interval I got chatting and happened to just find myself talking to Mike Neumann, a Swiss-Italian owner and founder of Beqa Divers. With the aid of the Italian language fellowship, he told me how they set this great operation up in 1999 with the original dive team still part of the current team and how they carefully planned and organized the dives for maximum safety and interaction.

In fact they never chum the water or release a lot of fish. They keep the bait fish heads in big wheelie bins with a cover, taking them out one by one. This way if the action gets too animated, they can just stop feeding and slow it down.

He also explained to me how in the last few years it became harder and harder to see nurse, lemon and silvertip sharks as the number of larger bull sharks kept increasing, keeping other smaller sharks at bay. In fact, even the 2-3 female tiger sharks that the team know by name and used to be frequent visitors, have now become an unusual sight as too many bulls discourage a big tiger shark. Although we did not see many on our first dive, during the peak season in the months of May – June they regularly see 50 to 100 sharks!!! Honestly, I cannot picture being surrounded by this crazy number of massive sharks and apparently when the big numbers are in, they also get a bit more frenetic in trying to get the food… must be quite an adrenaline rush.

As I explained to Mike that we were there for the photography and would spend a few days diving with them, he said that they would slowly get us closer to the sharks to maximize the chances for nice images. They normally keep the clients at an extra distance away, especially as they often have inexperienced divers just in to check off the shark diving experience from the bucket list, like a skydive or a bungee jump.

Totally thrilled about the idea of getting closer in future dives, I started listening to the second dive brief and to my best surprise, we learnt that the second dive would be entirely dedicated to the bulls spending about 30 minutes at another shark viewing spot at 16 meters.

We jumped in the water eager to see the big sharks again and this time, as we reached the viewing point, more than 10 sharks were already circling around Rusi. I was later told that the first feeding in the first dive is done to pull the sharks in from the deeper depths so that they would then stay close and be there for the second dive.

This time the sharks came a lot closer and a few gave us some really cool teethy grins, showing their very scary side. At times, a second feeder from the dive team went a few meters above us in the blue throwing out a few heads getting the sharks to swim up above us in the middle of all the smaller fish chasing the leftovers. Another incredible view. The half hour passed over in no time at all and we were called up to complete our dive with a quick stroll over the reef around 8 meters. After the sharks, the rather dull reef was certainly an anticlimax and we quickly ascended having completed one of the most memorable diving days of my life.

Back to my room, I eagerly reviewed my photos and had a few interesting shots from grey reefs and black tips as well as decent memory shots of the bulls, but definitely nothing close to what I was hoping to get. Mikes' promise to get us closer reassured me that more and better opportunities were to come.

And they came. During the following days, a dedicated dive team member took myself and my buddy David, closer and closer to the bulls, making every day more exciting than the next. On the last day, we had about 25 bull sharks around us and I started to imagine what the 50+ could look like.

Being the last and closest da,y we were literally a few meters from the feeder in position for a first hand shot of the sharks coming off picking the fish.

Being very close, it is clear that they have very poor eye sight with extremely small eyes and on a few occasions they came straight at me, getting pushed away at the last minute by my guardian angel from the dive team. It's an incredible feeling to come eye to eye with these majestic creatures.

As the days past and we felt good about having bagged some nice shots of the experience, we started experimenting with the cameras and tried to get some slow motion shots with slow shutter speeds to get movement in the background and try to freeze the shark to get sharpness with the flash. We had some moderate success but it was fun to play.

Unfortunately as you get closer to the hot action area that is ideal for close ups and the more interesting shots, the close movement of sharks and other fish also stirs a lot the sandy bottom up creating a lot of backscatter, so the best shots did not really come from the closest encounters, but my most exciting memories did.

The week passed really fast and after doing the dive four times, we were not in the slightest bit bored of it. Everyday is a totally different day and it is such a thrilling experience that I could have easily stayed another week. I still did not get my dream shots of the bulls and surely plan to repeat the experience, maybe in June with the crazy hundred…

We had 2 days when the shark dives did not run, so we went off on some coral dives. The lagoon has very rich fish life and some really pretty soft coral bummies and wrecks.

Not worth travelling to Beqa just for the coral dives but they were really nice dives to break the shark routine. We swam through beautiful soft coral in great visibility and saw sea snakes, turtles and some interesting macro life including a huge mantis shrimp and lots of nudibranchs.

A special thanks goes to the exceptional team from Beqa Adventure Divers who took amazing care of us and really made an effort to get us to the best spots while keeping us safe. A really great operation with a wonderfully experienced and friendly crew.

PRACTICAL INFO

Dive with Beqa Adventure Divers. You can contact them online via:
www.fijisharkdive.com

Stay at the Pearl Pacific Resort in Pacific Harbour. It is a very nice resort with the huge advantage that Beqa Divers can pick you up on the way to the dive from the resort pier. This saves an hour every morning and gets you back for lunch around 12. The beaches are not that great in the Beqa area, but the resort has a nice pool and green grounds as well as a golf course for non divers.

Fly to Fiji via Australia or Hong Kong or Singapore. It is a long way so worth doing a couple of weeks or combining it with other Pacific destinations or Australia.

YOU HAVE THE CHANCE OF SEEING THE FOLLOWING 8 SPECIES:

1. **WHITETIP REEF SHARK** (*Triaenodon obesus*) http://is.gd/jaXEUY
2. **BLACKTIP REEF SHARK** (*Carcharhinus melanopterus*) http://is.gd/NMQLWb
3. **GREY REEF SHARK** (*Carcharhinus amblyrhinchos*) http://is.gd/oVwuGP
4. **SILVERTIP SHARK** (*Carcharhinus albimarginatus*) http://is.gd/SUgsS1
5. **TAWNY NURSE SHARK** (*Nebrius ferrugineus*) http://is.gd/6eB3IS
6. **SICKLEFIN LEMON SHARK** (*Negaprion acutidens*) http://is.gd/26oqLe
7. **BULL SHARK** (*Carcharhinus leucas*) http://is.gd/Ulow33
8. **TIGER SHARK** (*Galeocerdo cuvier*) http://is.gd/DGNzxZ

MY THERAPY

FEATURE **RAMONA ARENA** PHOTOGRAPHY **MOHAMED SHAFRAZ NAEEM 'SHAFF'**

The beach, the sea, sunshine, scuba diving, friends, good food and a yacht. Add the Republic of the Maldives to it and voilà – life doesn't get better than this. But sadly it's not life, just a tiny little slice of it, which I refer to as my holiday, my escape, my time out.

All thanks to Shaff, a friend who is among many things as well as a scuba diving instructor, I got an invitation to hop aboard Anastasia as she made her first dive safari of the season. Eight days of living on a boat, diving three times a day, meeting different people from all parts of the world, everything taken care of, all I had to do was buy that ticket – and so I did.

Scuba diving to me is so therapeutic. First of all, when you travel alone, you have a lot of time to yourself. When you're surrounded by nothing but the ocean for miles on end, it puts life, problems and everything into perspective. You realize how tiny and relatively insignificant you are in front of the vast and mighty ocean. You reconnect with nature, yourself and get back to your roots. Its so easy to just shed – let go of all the worries, fears, doubts and negativity. You remember what life is all about, what truly matters at the end of the day.

What further enhances this experience, is when you're down under. Looking up at the rays of sun light breaking through the surface of the water above you, you're floating, feeling weightless, breathing slow, deep breaths, in and out, in and out. You're in a whole new world. Sometimes you cannot believe this is a part of the very planet you live on – the colors, the shapes, the life, the beauty, the perfection. All so spectacular, you can't help but marvel.

This to me is the best kind of meditation. Also the easiest three hours of silence, three hours of magic. Every day. This trip in particular was extra special for me. I have always wanted to see manta rays and whale sharks. This trip, after nine years, I finally saw them both. I was also literally nose to nose with a beautiful turtle, had a batfish play with me and on our last day, as we were out swimming, out of nowhere a school of around 100 dolphins passed by us. We jumped in to the little boat and followed them as they kept surrounding us from every direction playing and showing off by spinning, flipping and literally screaming, "Look at me, no look at me, no me…"

If you've never been diving before, this would be a divine place to start. Call Atoll Scuba or Let's Go Maldives and they will sort everything out for you. Just buy that ticket and surrender, there's a whole ocean out there for you. There is nothing to fear, you just have to stay alert, keep your hands to yourself and remember to breathe! You'll thank me for introducing you to the best therapy in the world!

ANASTASIA: www.chartersmaldives.com
ATOLL SCUBA: www.atollscuba.com
LET'S GO MALDIVES: www.letsgomaldives.com

Direct flights
from Dubaï to Port-Sudan
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Inhabited islands, unexplored wrecks, uncharted reefs... Every live-aboard is an expedition like during the pioneer period, back in the 50's.

Photos Gilles Di Raimondo

The adventure No Stress

THE BOAT

A luxury ketch with all comfort and modern technologies on board.
Especially designed and equipped for the practice of diving. Self-governing for long-run trip
Experienced captain and competent dive guide
Sudanese cook.

THE SITES

From the classic ones (Sanganeb, Shaa'b Rumi, wreck of the Umbria...) to the shark heaven of Angarosh, Abington and Merlo, the hardly dive archipelagos of the Suakins or even the virgin spots of the deep south... Sharks (many species including the famous hammerhead), manta rays, dugongs, turtles, dolphins and many more species are to be discovered.

THE DIFFERENCE

No schedule, no group. Just a handful of divers or explorers sailing to visit remote places, **rare spots and pristine reefs full of marine life.**
In total security.

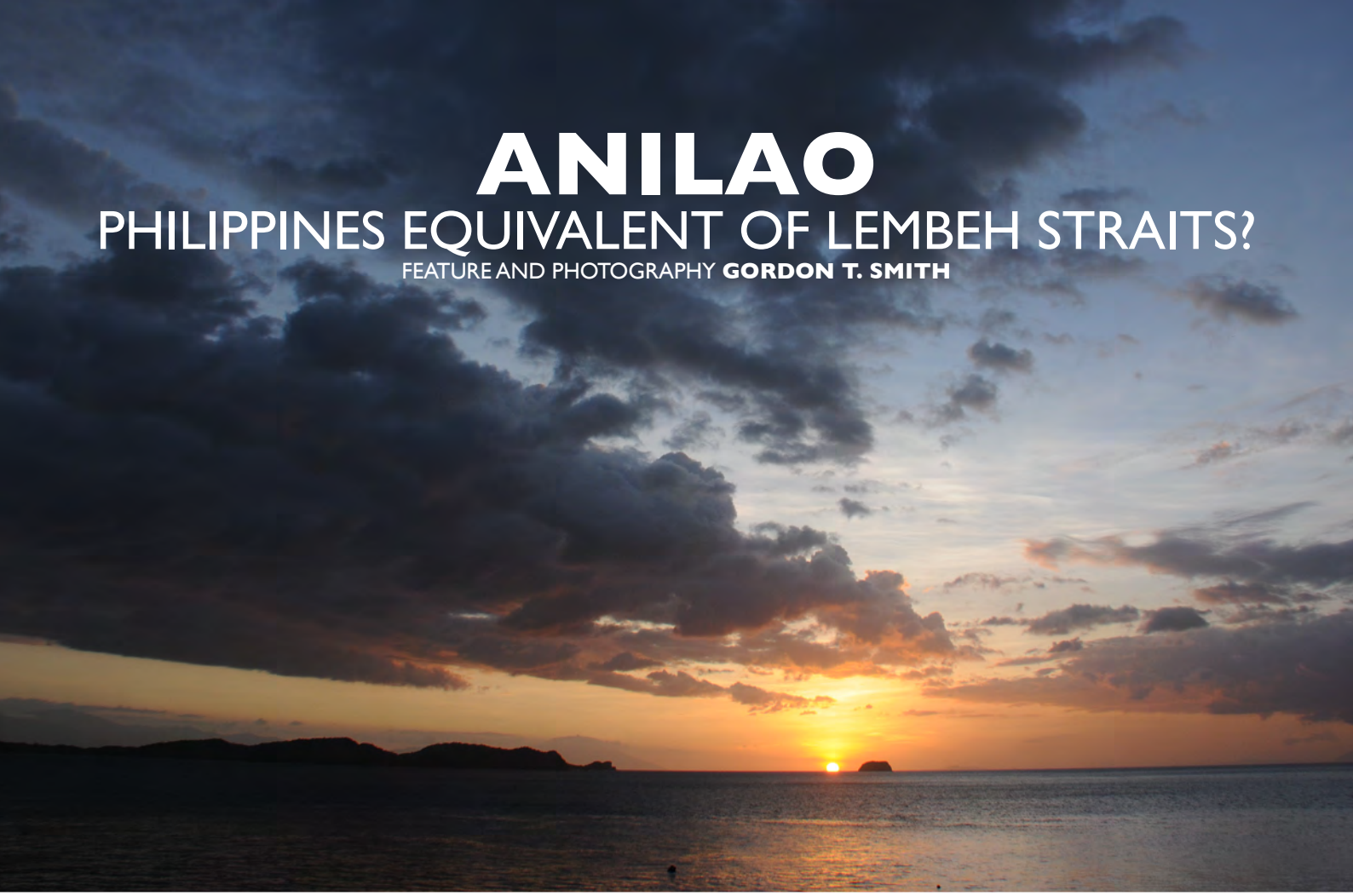
General informations, specifications

- **Web : facebook : NS Exploring Sudan**
- **Mail : contact@divenostress.com**

ANILAO

PHILIPPINES EQUIVALENT OF LEMBEH STRAITS?

FEATURE AND PHOTOGRAPHY **GORDON T. SMITH**



It was already past 10am and our transport had not yet turned up, a quick call to Crystal Blue Resort with a reply through SMS informed us that the van was stuck in traffic and would be at our hotel shortly. I was even given the registration and the driver's name.

Within 15 minutes we were in the van and on our way to Crystal Blue Resort, Anilao. Having arrived the evening before on an Emirates flight direct from Dubai, we were well rested and had managed to purchase some other essential items locally from a pharmacy and supermarket such as isopropyl alcohol and vinegar for post diving ear treatment as well as mosquito repellent.

The journey was quicker than expected, getting out of Manila was obviously easier than getting in on a Saturday morning. And after just over an hour we turned off the main Manila-Batangas road and headed down some smaller roads.

Eventually we were in some really hilly country, with steep climbs and descents. My GPS although not having a Philippines map did show the coast nearby, and there were many signs for dive resorts, some I recognized from my research prior to making the booking four months earlier.

The dive resort I had chosen, Crystal Blue Resort, was one of two that was highly recommended in particular for photographers, by word of mouth and also through scubaboard.com.

Eventually we arrived around 1pm, and the resort guys quickly unloaded the van and we were shown our rooms, followed by a quick tour of the resort itself. Like all the other resorts in Anilao, it is built on a hillside, fortunately our rooms were only at the second level, but with the dive area at minus third level, one soon remembers not to leave anything that is needed for the dive in your room, like a dive computer!

We, Terry, Ged and myself, soon discovered that there was only going to be two more divers coming during the period that we were staying there. I was quite surprised also to find out that they would not be diving with us and that we would have our own boat and dive guide, a major bonus, resulting in no dives less than one hour and in fact most of mine were between 70 and 90 minutes. Something that cannot be matched when diving at Puerto Galera as the dive boats have strict schedules and dives must be kept to 60 minutes maximum.

The week before, a major storm raged through the Verde Passage causing some issues around Batangas and on Mindora, however the leeward side of Anilao managed to escape without any major incident. Diving was as suspected after the storm a bit disappointing visibility wise, but there was still plenty to see in the way of critters.

Once we unpacked our kit, had lunch we then prepared for our afternoon shore dive. My mate Terry had a fair bit of new gear and I

was also using a new Dive Rite travel wing that I had only tested in my swimming pool, so a good idea for a shakedown.

All worked well, stacks of nudis just off the beach as well as shrimps and other macro stuff. We had a great guide too for three days, Edgar, and we seriously missed him over in Puerto Galera at Asia Divers. Nice long dives, he would stay with me after the others had surfaced until I hit 50 bar then we both headed back to the boat.

The diving here is serious muck diving and perhaps not for everyone, as Ged and I were the only photographers, I wondered how Terry might enjoy it, and by the end of our week in the area, he had developed an appreciation for the smaller things in the sea, not just the nudibranchs but also other strange critters that we had come across.

On our second day I recorded seven new nudibranchs that I had not seen before and over the three days we stayed at Anilao, a total of ten new ones for my personal photo collection.

On the fourth day we had arranged a banca to take us to Asia Divers at Puerto Galera, for me no diving that day, giving my ears a rest, although Ged did do a couple of dives, whilst Terry completed his Nitrox course. However after our four days at Puerto Galera, we were all in agreement that the laid back atmosphere at Crystal Blue was better than the crazy life at Sabang Beach in Puerto Galera.

The shore diving at Anilao is also a bonus over Puerto Galera, although it is not quite grab a tank and go. You must have a local guide with you, which costs around USD18/dive (AED66), divide that with the number of divers and you can see that it is really cost effective. Of course tipping the guide at the end of the trip is highly recommended, in particular for finding some great subjects to photograph, our guide was not disappointed, and I can't wait to go back.

THE **DOLPHINS OF PONTO DO OURO**, MOZAMBIQUE

FEATURE AND PHOTOGRAPHY **SIJMON DE WAAL**

At the very southern border of Mozambique and South Africa lies the town of Ponto do Ouro. The area is relatively unspoilt and there are no direct flights to this unique little town. To access Ponto, one needs to fly to Maputo, Mozambique and take a 4hr drive South (4x4 vehicle required over some adventurous terrain). Alternatively, and perhaps easier, one can enter from South Africa through the Kosi Bay border post (lifts can be arranged from the border for the 12km trip to Ponto in which case no 4x4 vehicle is required).

The area boasts a very healthy and diverse marine ecosystem with an abundance of life. During our many visits to Ponto we have been fortunate enough to have seen many different species of sharks, whales, pelagic fish as well as the regular coral reef species. Fortunately the area has now been declared a marine reserve, however it is now threatened by the planned construction of a deep water harbour which will be devastating to this beautiful and pristine section of coastline (for more on the harbour development visit http://is.gd/p28Adn).

Arguably the most endearing memory that anyone (including non divers) can take away from Ponto is swimming with the resident pod of bottlenose dolphins. The estimated number of individual dolphins in the Ponto do Oura area is 280, with the various pods consisting of a few animals up to a maximum of approximately 50-60 animals.

Somente Aqua runs a Dolphin Centre that has conducted guided dolphin swims in Ponto do Ouro for many years. They are very passionate about protecting the dolphins and their aim is to deliver the best possible experience, when swimming with wild dolphins in their natural environment. Their dolphin swim programme combines a comprehensive dolphin behavioural introduction and regulated Swim Code of Conduct, created to ensure a sustainable eco-friendly approach with the best interests of both marine life and yourself being catered for during the excursion.

Dolphin excursions range between 2-2.5 hours, with a pre-launch briefing on boat safety, marine life and responsible interactions. The trip includes snorkelling over one of the shallow coral reefs, in-water swim facilitation with a dolphin guide and the seasonal whale shark and humpback whale sightings. Dolphin in-water observations are not guaranteed, due to sightings and the nature of the dolphins, so we would suggest booking more than one launch to have the opportunity to interact with "our finned friends". The documented success rate of finding dolphins per boat launch is at 90% which almost guarantees seeing them over the course of a few days.

There are a number of types of interactions with the dolphins, depending on their "mood" that day and how one conducts oneself in the water. When the dolphins are in a playful mood (as in the accompanying pictures) the experience is absolutely magical. They swim around you, approaching to within 1m, making excited clicking and whistling sounds while scanning you with their sonar – clearly audible under the water. They will repeatedly swim in tight circles or dive to the bottom and shoot back to the surface. Eventually when they have decided they have played enough they slowly move off leaving you with possibly the biggest smile you have ever had. It's not uncommon to see people crying after this, such is the intensity, power and magic of being able to observe and interact with wild dolphins in their natural habitat. Like all good things, it unfortunately comes to an end and one has to get back on the boat and return to the beach.

Should you ever have the opportunity to travel to South Africa or Mozambique I would recommend getting in touch with Noleen from Somente Aqua (contact details below). She can advise on accommodation and travel arrangements as well as bring you up to date with their dolphin research programs. In short, it's definitely a trip that the whole family can enjoy but be warned, once you have been there all you want to do is go back! Besides the dolphins, sharks, rays, turtles etc, there are endless white beaches to enjoy, but that is a story for another day.

SOMENTE AQUA CONTACT DETAILS:
Dolphin Centre Office: +258 21 901 189
Dolphin Centre Mobile: +258 842 42 9864
Email: info@somenteaqua.com
Web: www.somenteaqua.com
Facebook: http://www.facebook.com/SomenteAquaDolphinCentre
Twitter: https://twitter.com/DolphinCentreMz

THE WAKATOBI EXPERIENCE

FEATURE AND PHOTOGRAPHY **WARREN BAVERSTOCK**

I suspect that like me, many serious underwater photographers dread the rigmarole associated with getting their precious, fragile equipment through foreign airports and land transfers. This wasn't the case, however, during my recent visit to Wakatobi Dive Resort. The resort is located in the remote Tukang Besi Island chain on the edge of Indonesia's Banda Sea. But unlike many other out-of-the-way diving destinations in the region, getting there is easy, because the resort provides direct charter flights from Bali, along with a warm and welcoming staff that is there to help you at every step of the way. As soon as I handed my gear over to the Wakatobi team at Bali's Denpasar International Airport, I felt I was on vacation, even before reaching the island.

Arrival and check in at the resort was equally relaxing, and as I prepared for my first dive, the staff once again took care of every detail. Before long, I was finning out over the shallow sea grass beds that lie inside of Wakatobi's House Reef, catching glimpses of the many tiny creatures that lurk in the shallows. There would be plenty of time to photograph them later, I knew, so I kept swimming toward the edge of the reef. Peering down over the drop off for the first time brought a sense of sheer joy and amazement. The clear water created a panorama of colorful coral gardens populated by lively reef fish. Mesmerized, I followed the reef toward the resort's jetty, taking in the marine life. When it was finally time to get out of the water, I gazed across the sea towards a small tropical island perched on the horizon, and with the warmth of the setting sun on my face I thought, "those blogs were true… Wakatobi is the real deal."

I first learned of Wakatobi by following a link on Facebook. Now, just 12 months later, I felt privileged to be here, walking along the shoreline toward my Villa. I'd just completed one of the most memorable dives of my life, and this was just the first day. With cameras secure and dive equipment taken care of by the dive center, I was free to sit and watch the last rays of light disappear behind the horizon and anticipate what the next day's adventures would bring.

Next morning, I find myself looking up at the surface from a depth of 15 meters, with more than 40 meters of reef visible to the left and right. With so much color and life surrounding me, the choices for photography are almost overwhelming. But it doesn't take me long to settle into a routine. I am accompanied by my personal dive guide, Kaz, who not only leads me to the most interesting subjects, but also carried my second housing! Not wanting to miss out on macro opportunities I brought two housings, and diving with a guide allows me to switch between wide and macro subjects with ease. My primary focus will be to capture Wakatobi's reefs using a compact close focus wide-angle set up, but I also won't miss out on opportunities to capture reef scenes.

Having the support and assistance of a personal guide does come at a price, but it's well worth the investment as Wakatobi's guides are very experienced, and there's a lot of 5-star customer service thrown in for good measure.

Exploring the deeper depths of this dive site, I find large numbers of fan corals sitting on ledges next to the drop off. Complementing these delicate towering structures are colorful forests of whip and soft corals surrounded by swarms of newly hatched fry. For most of the dive I was distracted by the magical array of colors, and by the end I fully understand why the region is considered one of the most bio-diverse ecosystems on the planet.

When I surface and pass my cameras up to the boat crew, I'm pleased to see that they know just how to handle the equipment. By the time I get onto the boat, both housings are rinsed in freshwater and placed safely under towels. During the surface interval, Kaz and I get to know each other. We will be diving together for the next two weeks, and he wants to learn what I am specifically looking for during my stay. With the genuinely friendly guides and the boat crew making sure that I have plenty of cake and coffee, we sail gently to our next dive.

Before I know it, Kaz and I descend down onto our second dive of the day. After another long bottom time (70 minutes plus!) and many more rewarding photo opps, we head for the dive center. With housings safely stowed and batteries charging, I prepare to wash and hang my dive gear, only to find that our boat crew has already taken care of everything. With these chores handled, I'm soon back at my villa to join my wife, who doesn't dive, with plenty of time to enjoy the afternoon sun and take a swim. The select villa offers a luxurious sun lounging jetty with a plunge pool overlooking the water. We sit back, enjoy the amazing sunset, and discover another special part of the Wakatobi Experience.

On our next morning dive, Kaz already knows the animals I want to photograph, and delivers me to the doorstep of an inquisitive cuttlefish that hovers over a lush area of pink and purple sponges. With no other divers competing for photo opportunities or in the shot, I find myself actually relaxing while taking a series of photos of this patient cephalopod. Gazing up from

my subject, I am once more overwhelmed by the pristine topography of the reef; I look for Kaz, who is a few meters ahead pointing at something else he has found. I fin towards him, but am then distracted by a vibrant fan coral surround by fry. Like a candy shop, yellow, pink, purple and orange soft corals compete with each other for space and again I find myself a little confused on which shot I want to take.

When I finally catch up with a very patient Kaz, he points at a pair of pygmy seahorses. But the shot is difficult, and with risk of damaging corals we move onwards in search of the other animals on my wish list. Amazingly, in the course of the dive Kaz manages to find the four types of pygmy seahorse native to Wakatobi (H. pontohi, H. severnsi, H. denise and H. bargibanti). There is a lot to be said about not having to share a perfect wilderness with many people. Back on the surface, there is not a single dive boat on the horizon – only the sound of splashing jacks chasing their prey. In such a magnificent setting, you can't help but be relaxed.

Smiling, Kaz says he knows I'll love the next dive. We enter the water and peer down 18 meters onto an expansive sandy area the size of a football pitch, which is situated on the top of a coral pinnacle. I wonder what he's been going on about. Touching down on the sandy surface, and feeling a bit like the man on the moon, I can see the reef in the distance. As we approach it, I for the first time feel the pull of a strong current.

Arriving at the edge of the pinnacle, which plateaus off to depth, I am presented with an incredible selection of marine life. The strong moving water obviously provides a healthy source of nutrients. Swirling fluidly like a river around the coral reef and sponges, shoals of apagons and sweepers swim effortlessly keeping a tight formation for safety from predators. It is as if the entire scene were composed by an artist, and perfectly placed in the middle of all of this life is a large sea anemone, within which a pair of clowns kept watch over their kingdom.

The best is yet to come. Kaz lures me away, assuring me with his eyes to trust him, I can come back to this spot later. We move on, and I soon find myself kneeling in front of a giant towering sponge, with a tornado of glassfish swirling around it while several groupers sporadically dart into the cloud of movement. Heading to shallower water takes us over a field of hard corals where a large shoal of batfish and snappers cruise. Sadly I'm now low on air, but surprisingly I find I can spend the remaining 5 minutes of my dive along the shallow shoreline, which has changed from coral reef into a lush sea grass environment. It is a nursery for all things small, and I am blown away by the abundance of life in this area. I watch sea snakes weave in and out of the coralline algae-covered coral blocks, searching for easy food.

Kaz signals to remind me that it's time to go. As I reluctantly fin toward our boat, I muse on how amazing this place is. And with the dive sites being so close to the resort, I find that I also have plenty of time to enjoy lunch without worrying about a tight deadline for the next dive, and never need miss freshly cooked food at dinner due to a late return. Instead I find myself unwinding in the most relaxing restaurant environment that I could possibly wish for on a small island. In all of the dive resorts I have visited, which includes some 5-star islands in the Maldives, I can't recall ever having such a choice of well-cooked, top-quality cuisine. With over 20 members to the food and beverage team taking great care of each guest's culinary requirements, I didn't have a single grumble during my two-week stay – other than a need to get back to the gym when I'm back home.

The days begin to merge into a pleasant blur of diving, dining and relaxing. My first week has provided me with some incredible photographic opportunities and memorable vacation experiences. One day, as I watched Kaz draw another of his detailed maps of the next dive site, I am momentarily distracted by thoughts of how many days I have left in Wakatobi. This thought soon passes, and I am quickly drawn back into the moment, and as usual, am excited at what's in store for the next dive.

Upon entering the water, I'm greeted with a magical but now very familiar scene, as the morning sun's rays shimmer over the soft corals that blanket the shallow reef. I can understand why so many snorkelers also visit Wakatobi. As shoals of surgeons, wrasse and butterflies chase each other over the shallow reef, I watch as snorkeling couples follow them effortlessly in the mild current. The profile of this dive site is considerate towards the newcomers that had just arrived on the island, but no less spectacular than some of the deeper sites. At 10 meters, the light creates incredible visibility, and as Kaz explores nearby, searching for large crocodile fish, I find myself composing perfect portraits of clownfish with the lush coral environment as a backdrop.

As we navigate the reef, I recognize the familiar behavior of a small shoal of Convict blennies in the distance. I had seen many during my stay but as I approach this group, the behavior of the shoal evolves into something much bigger. Quadrupling in size, and hovering like a swarm of bees over the reef, the shoal begins to morph its shape, changing from a beehive into a teardrop, then a magnificent tornado. With no other photographers waiting eagerly their turn for an image, I capture 20 minutes of this incredible behavior before a large trevally dives into the shoal disbursing them into the safe confines of the coral reef. Back on the boat, there is a buzz of excitement from the snorkelers who have had their first taste of the Wakatobi experience.

Approaching the end of my second week, I have put many of Wakatobi's best sites into my logbook, but there is one that I have yet to experience. I had seen the more distant sections of the house reef from the surface on the day that I had arrived, during daily departures and returns, but had yet to experience it from below. Taking into consideration I had witnessed some pretty incredible marine environments in the past days, I'm unsure if this closer-to-home dive experience will match my expectations.

Stepping off the jetty onto the dive boat, our group kits up, and within five minutes we arrive at the entry point. With a fairly strong current, this drift dive on the house reef proves to be one of the best experiences of the trip. Incredibly, the house reef is in great condition, offering large shoals of fish and turtles, topped off by fabulous coral coverage. Prior to entering the water, Kaz and I had agreed that I should get at least a few pygmy seahorse photographs. Knowing the sites extremely well, he's assured me he'll have no problem finding a pair of Bargibanti seahorses in an area that will not be difficult to photograph.

As always, Kaz did not disappoint, and a few minutes later, with a nice male and female photograph under my belt, we continue with our dive. Incredibly, it just seems to get better and as we approach the resort, the abundance of fish continues to increase. Like all of my dives, the safety stop at five meters offers some special photographic encounters, and a chance to recall all of the wonderful moments I've just experienced and captured in photos. It is a fitting finale to an incredible and productive two weeks of diving at a place that truly deserves to be called "a diver's paradise."

GUADALUPE ISLAND,
AN ENCOUNTER WITH THE GREAT WHITE SHARK

FEATURE AND PHOTOGRAPHY **PHILIPPE LECOMTE**

Last October 2012, one of my dreams came true. Since February 2012, my friend Nicolas and myself prepared ourselves for the longest trip of our lives in order to see one the most amazing creatures, the Great White Shark. Fascinated by sharks in general, approaching and observing this species was one of my much anticipated goals. We carefully planned this trip by choosing the best spot in the world in order to see the Great White in the best conditions possible.

My choice came down to Guadalupe Island (Mexico). Guadalupe Island is the top destination for great white shark encounters. This small volcanic island stretches 30kms in length and 9kms wide located in the Pacific Ocean, 240kms (150 miles) off the west coast of Mexico's Baja California peninsula, it is rated to outperform both South Africa and Australia with shark-seeing consistency and viewing conditions. With more than 3000m depth all around the island, Guadalupe Island can boast shark sightings in beautiful clear blue water with 20m to 40m visibility and on top of that, scientists boast that it's a guarantee to encounter them at this destination.

In 1975, the island was declared a marine sanctuary and a Biosphere Reserve in 2005 as well as being a sanctuary for several other species of mammals, plants and fish. The natural beauty of Guadalupe Island combined with its magnificent animal and plant life makes this Mexican Biosphere Reserve both a wonderful and important place worth protecting.

My trip started from Abu Dhabi (UAE), direction toward San Diego (USA) via a stop in Chicago. It took us 25 hours door to door to reach our hotel in San Diego, the Dolphin Motel.

SOME FACTS:

San Diego is the eighth-largest city in the USA and the second-largest city in California. The city is located on the coast of the Pacific Ocean in Southern California, immediately adjacent to the Mexican border. The birthplace of California, San Diego is known for its mild year-round climate, natural deep-water harbor, extensive beaches, and recent emergence as a healthcare and biotechnology enclave. The population is about 1,301,617 people. Well known for a big fish destination, it has become the best stopover to start a trip on to Guadalupe Island.

The day after we arrived, we only had the half day to visit a bit of the harbor and areas close around it before putting our dive bags on the Islander, a boat of 27m long that took us to our final destination. We departed at 10pm with a priority stop in Ensenada (Mexico) in order to proceed on to the Mexican immigration border and check point to get our permits for Guadalupe island.

It only took 30 minutes for the police check and then we were off and headed southwest for a further 140 miles, toward Guadalupe Island. The sea conditions and first night on board were both good.

During the day we got to see whales, flying fish and sometimes groups of dolphins would play with the boat. On board, the two cooks were always busy preparing delicious meals even if the sea got a little choppy.

During the night, the scenery was splendid. The sunrise lapped the clouds with an orange light and the twilight slowly covered the rocky side of the mysterious Guadalupe Island. We had reached our final destination.

As soon as the captain had released the anchor, the crew prepared the cage that would allow us to safely observe the amazing Great White Shark.

The boat stopped in a bay where the sharks are usually seen. These creatures stay here during a period of 4 months (August to November). The sea temperature is around 22 to 23 degrees and the visibility is up to 35 meters. Four tuna heads are attached at the rear of the boat in order to keep the sharks around. Sardines and yellow fin tuna are already under the boat and after about 10 to 15 minutes, one of the dive masters of the crew spots our first Great White. This shark is beautiful. My first vision of a Great White was amazing. He swam so gently and slowly. They do try to catch the bait but the crew try to avoid losing the tuna heads in order to preserve some as bait is counted on board and they want the sharks to stay close to the cages.

In the movies and other documentaries where they portray the sharks' aggressive behavior constantly biting and eating everything in sight, now becomes so unreal. With 16 people on the boat, we each took turns in groups of four with 30 minutes per group in the cage at a time. When everyone had finished preparing their gear and cameras, the first group would jump into the cage. Being out of the cage can also be rewarding because, sometimes, the

Great White breaks the surface with its huge fin and dives back again into the deep blue. One of the guides told us that this creature spends most of its time deep in the blue, waiting for pray to swim on the surface such as seals, dolphins or whales. On the beach, we can hear and see some Northern Elephant Seals (*Mirounga angustirostris*) and Guadalupe Fur Seals (*Arctocephalus townsendi*) sunbathing on the warm rocks and stone beach. This is one of the reasons this kind of predator is around. Food and maybe mating. Biologists from Mexico are trying to study this shark, especially here around Guadalupe. They tag them and follow their movement with a receiver that is on the bottom along the bay. Mauricio Hoyos, one of the GWS specialists collects the data every year and translates it to his database. They have collected data from more than 120 Great Whites since 2009 that regularly come to the island.

We had planned to stay 6 full days in the bay in total, but due to bad weather coming from the west, the captain of the boat advised us to leave the island before the end of our time. Wind had already picked up and staying longer would have been very dangerous to go back to Ensenada. We ended up deciding to leave at the end of the fourth day. We were very sad to leave sooner than expected and to leave this amazing creature so soon. Spending time in the cage in order to observe and see this shark was definitely my best souvenir to date. Sometimes dreams do come true.

PATENT FORAMEN OVALE – IS IT IMPORTANT TO DIVERS?

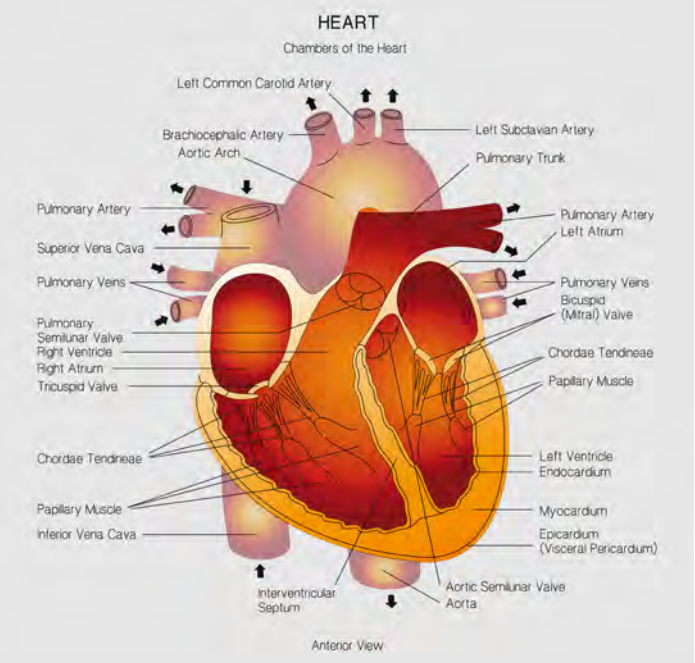
FEATURE **DR. ALFRED A. BOVÈ AND DR. RICHARD E. MOON**

WHAT IS A PFO?

The upper chambers of the heart (the atria) are separated into a right chamber that conveys blood from the veins to the right ventricle, then to the lungs, and a left atrium that conveys blood from the lungs to the left ventricle and then to the whole body.

In the unborn fetus, the lungs do not function, and to provide oxygen to the fetal circulation, an opening is present (the foramen ovale) in the wall between the two atria (the atrial septum). The foramen ovale allows blood coming from the placenta to flow through the right atrium directly into the left atrium and then into the body, providing the oxygen needed for growth and development.

At birth, when the baby begins to breathe, a flap valve closes over the opening in the atrial septum and eventually becomes part of the atrial septum from the growth of tissue sealing the opening. However, in about 30 percent of all people, the closure of the foramen ovale is incomplete, and the persistent foramen ovale (patent foramen ovale, or PFO; see figure) becomes a potential route for blood from the veins to flow directly into the arterial circulation, thus allowing bubbles to enter the arteries and bypass the lung filter.



In a small number of people, the flap valve is missing completely, and a persistent opening occurs in the atrial septum (atrial septal defect, or ASD). Concern for bubbles reaching the brain by this pathway seem to be validated by several reports in the medical literature of unexpected or unexplained decompression sickness (DCS), particularly involving the brain in divers who were subsequently found to have a PFO. A medical report in 1986 suggested that neurological DCS after a 15-minute dive to 125 feet (38 meters) in a recreational scuba diver with an ASD was caused by venous gas emboli (VGE) passing through an undiagnosed ASD.

BELIEFS ABOUT PFO AND OCCLUDERS

Embolization through a PFO has been described for more than 50 years. The concept of venous-to-arterial embolization led to the notion that venous gas bubbles, common after recreational dives but usually silent due to filtration by the pulmonary vasculature or system of blood vessels, could cross through the PFO and cause injury to the brain and spinal cord. Since these initial observations, several other medical reports have suggested an association between PFO and cerebral, spinal cord, certain types of skin bends and possibly, inner ear DCS.

Divers have enthusiastically latched onto this concept. During fitness-to-dive evaluations, questions about PFO are always near the top of divers' lists. Also, DAN is bombarded with PFO queries.

With the development of devices that can be implanted without surgery to close the PFO called occluders, this interest has gained momentum. In Europe, these devices are commercially available and approved for closure of ASD and PFO. In the United States, these occluders are still undergoing experimental studies. They are soon to be approved by the U.S. Food and Drug Administration (FDA) for treatment of certain forms of stroke caused by blood clots, which are thought to come from the veins, then flow to the right atrium and cross a PFO.

To reduce the risk of DCI, some professional divers have received the occluder devices. During a follow-up period of three to 12 months, these divers experienced no further neurological decompression episodes. However, it is difficult to be sure that this represents a true reduction in risk. More information is needed about their diving patterns before and after the procedure.

SHOULD YOU DIVE WITH A PFO?

While there is thought to be an association between PFO and severe neurological bends, causation is unproven. Indeed, important logical links between the purported mechanism and many of the facts are missing. Venous bubbles are very common in recreational divers. In a DAN study of repetitive multilevel dives, published in 2002, venous bubbles were observed by Doppler in 91 percent of recreational divers (Dunford RG, Vann RD, Gerth WA, Pieper CF, Huggins K, Wachholz C, Bennett PB. The incidence of venous gas emboli in recreational diving. Undersea & Hyperbaric Medicine 29: 247-59, 2002).

While 20-30 percent of divers might be expected to have a PFO, decompression illness (DCI) in recreational divers occurs after only 0.005-0.08 percent of dives, clearly much lower than the one in five or six that might be expected if every diver with a PFO and venous bubbles developed DCI. Based on current experience, the estimated risk of a DCI incident characteristic of those correlated with PFO is between 0.002-0.03 percent of dives.

For DCI to occur, there must therefore be other factors, such as bubble load or some other susceptibility factor as yet unknown, possibly involving body tissues. It is also conceivable that a PFO represents a marker for susceptibility (such as red hair and sunburn) but is not involved directly in DCI.

Clinical observations to date have focused on the correlation of PFO with neurological injuries, particularly serious ones, but these represent only a third of DCI incidents. Most DCI cases in recreational diving consists of pain or sensory abnormalities, and no one has yet shown that PFO is related to these cases. The exception is skin bends, but this is uncommon. Only around one third of cases of DCI in recreational divers are considered severe. If 60 percent of these have a PFO, and 25 percent of the remainder have one, then it can be estimated that most bends cases must occur in divers without a PFO.

Associating a common finding (PFO) with an uncommon disease (DCI) is a common mistake, and this often mistaken relationship is likely to be involved in the data regarding DCI and PFO.

SHOULD YOU HAVE A PFO CLOSED?

Those who undertake or sign up for such a procedure should be aware of several issues: Insertion of an occluder has some risk.

According to data submitted to the FDA by the manufacturer of the AMPLATZER(r) PFO Occluder, in 442 insertions, seven major adverse events occurred, including cardiac arrhythmia requiring major treatment; device embolization (the device breaking free from its position in the atria of the heart and being carried away by the bloodstream), requiring either percutaneous or surgical removal; and failure of the system by which the device is inserted (**www.fda.gov**).

More recent articles in medical journals have continued to report complications such as device malposition, device embolization, changes in heart rhythm, perforation of the heart, vein damage, bleeding and both right and left atrial blood clot formation. Late complications have included sudden death.

One of the purposes for which these occluder devices will be marketed is to prevent blood clots from passing through a PFO and into the left side of the heart, from which they could travel to the brain and cause a stroke. However, even for prevention of recurrent blood clots, the effectiveness of transcatheter devices has not been proven. Regarding closure of a PFO to prevent DCI, scientific evidence does not exist at present.

IN CONCLUSION

In short, having a PFO is not necessarily a contraindication for diving. If it is proven with certainty that a PFO in a diver with VGE predisposes to DCI by providing a route through which bubbles can pass into the arterial circulation, then the safest strategy would be to reduce the venous bubble load by developing different decompression procedures, limiting bottom time or by the appropriate use of oxygen-enriched breathing mixes.

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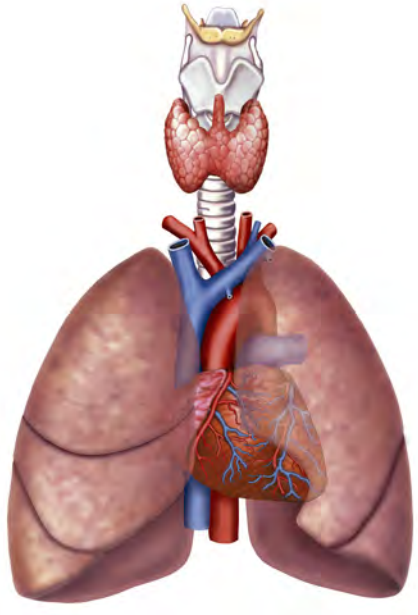

YOUNG DIVERS

DAN OFFERS AN ASSESSMENT OF MEDICAL ISSUES ASSOCIATED WITH CHILDREN AND DIVING

FEATURE **DAN MEDICAL STAFF**

Families should carefully consider the decision to allow their pre-teens to dive. Do they have the physical stamina? Do they have the skills to cope in a diving emergency? Will they be safe dive buddies?

These are just a few of the considerations responsible divers want answers to before they make the decision to let their kids learn to dive.

This statement has been developed in consultation with the DAN staff physicians and other medical specialists at the Duke University Medical Center.

A search of the Medline database (a part of the U.S. National Library of Medicine that contains references and abstracts from 4,600 biomedical journals) since 1966 revealed no papers dealing with the issue of how the physiological differences between adults and otherwise healthy children would alter the child's capability and risks associated with diving. Therefore, any recommendations made would be based on theoretical considerations taking into account what is known about normal growth and development, and the empirical evidence that exists where children younger than age 12 have scuba dived.

In addressing the question of children and diving, we have considered what we feel are the main issues that must be addressed in considering children and scuba diving. These are:

- Since a patent foramen ovale is a risk factor in developing decompression sickness, we looked for evidence that there is an increased incidence of patent foramen ovale (PFO) in children.
- Because of differences in the central nervous system (CNS) development, is there evidence that children are more susceptible to oxygen toxicity?
- Are growing bones in pre-pubertal children more susceptible to injury from decompression sickness or silent bubbles?
- Is there any difference in the lung tissue or chest wall of children compared to adults, which might make children more susceptible to pulmonary barotraumas?
- Given that young children have an increased incidence of asthma compared to adults, is diving more likely to trigger an asthmatic attack?
- Do children have an increased propensity for ear barotraumas?
- Are there special considerations needed to determine whether a child's thermal protection is adequate?
- Because large amounts of venous gas emboli (VGE) are thought to be associated with the development of decompression sickness, is there evidence that children have a higher propensity to form VGE than adults?
- Are children, whose CNS is still developing, more susceptible in general to decompression sickness than adults?
- If children do get decompression sickness, will an immature CNS result in an increased severity compared to an adults?
- Do children have the strength and endurance to cope with emergencies?

The above are felt to be the most important medical and physiological considerations in assessing the medical issues associated with children and diving. They do not, however, address behavioral or psychological issues, which may be equally, if not more important than any medical and physiological considerations and should be addressed when considering the involvement of children in scuba diving.

Is there any evidence of increased incidences of patent foramen ovale (PFO) in children? One paper has looked at the age distribution of PFO (Fawcett E, Blanchford JV. The frequency of an opening between the right and left auricles at the seat of the fetal foramen ovale. Journal of Anatomy and Physiology, 35:67-76, 1901). This paper looked at the incidence of PFO in cadavers down to age 10. They found an increased incidence of PFO in the 10 to 20-year-old group compared to other groups. They did not specify the actual ages of the cases. However, this incidence was based only on six cases (three with a patent PFO) out of a total of 705, and the true binomial incidence could be between 11 percent and 88 percent. Thus, there is a suggestion of an increased incidence of PFO as age decreases below 20.

Are children more susceptible to oxygen toxicity? Clinical experience here at Duke shows no particular difference in susceptibility of children down to age 8 to either pulmonary or CNS oxygen toxicity. Only a single paper was found which attempted to address the subject (Bland RD. American review of Respiratory Disease. 122(5 pt 2) 45-54, 1980).

They were only able to cite animal data that showed that the effect of age on susceptibility to pulmonary oxygen toxicity was species- specific. In some instances immaturity was protective, in others it was not.

Are growing bones more susceptible to injury from decompression sickness or silent bubbles? In growing children up to the age of 18, bones continue to grow from a region called the physis, which in log bones (arms and legs) is near each end. This area consists of mostly cartilage and has no blood supply, it depends on the diffusion of substances to and from adjacent tissues which has a blood supply.

If this area is injured, then abnormal bone growth will result, such as one leg being longer that the other. The main causes of injury to this region are weight-bearing sports activities such as skiing, rollerblading, ice skating, football, etc. Accidental fractures are also common causes of injury to the physis.

Joints are affected in musculoskeletal decompression sickness, and osteonecrosis has been associated with divers who have done many near-saturation dives, such as tunnel workers. We do not know the exact anatomical site of joint involvement, and there is no published evidence suggesting that the physis is more susceptible to decompression sickness in children compared to adults.

Children are unlikely to be exposed to the conditions most often associated with osteonecrosis in adults, but sports divers do occasionally develop osteonecrosis. Thus, we support time and depth restrictions for children. Restrictions have been imposed by certification organizations such as SSI, PADI and CMAS for children in confined and open-water environments.

Is there any difference in the lung tissue or chest wall that might make children more susceptible to pulmonary barotraumas?

Up to about age 8, the pulmonary alveoli are still multiplying, pulmonary elasticity is decreased, and chest wall compliance increased. This puts children 8 and younger at a theoretical increased risk of pulmonary barotrauma, although we have found nothing published in the literature addressing this possibility.

Based on this consideration, CMAS, PADI, SDI and SSI have recommended that children younger than age 8 not scuba dive, and we concur. Given the variation in rates of growth and maturity, it would even seem prudent to raise the minimum age to closer to puberty (not less than 10 years old) to exclude any chance of children with immature lungs from diving. Organizations including SSI, SDI and PADI have all agreed.

Are children more likely to have an asthma episode while diving? Risk factors that might provoke an asthma attack, such as cold or exercise, are present in the dry environment as well as underwater. However, the possibility of salt-water aspiration adds an additional risk factor. In addition, a child's reaction to an asthma attack underwater may involve a higher panic component than in an adult, putting them at increased risk of injury. Unfortunately, there is no controlled study data to accept or refute these hypotheses.

Do children have an increased propensity for ear barotraumas? Up to age 8, the Eustachian tube, which is responsible for equalizing the middle ear, is more tortuous, compared to adults. This is why ear infections are more common in children than adults. Dr. Guy Vandenhoven reported on his experience with 234 children, ages 6-12, in a Belgian diving club from 1985-1992 and found barotraumas and ear infections to be the most common medical sequelae to diving.

Are there special considerations needed to determine whether thermal protection is adequate? Children have a higher surface area/volume ratio and smaller body mass, which means under similar conditions with similar thermal protection they will cool faster. Special attention must be paid to ensure that children do not become hypothermic during diving. Exposure protection designed for children's sizes is recommended where warranted.

Do children have a higher propensity to form venous gas emboli (VGE) than adults? No studies have been done comparing post-dive VGE incidences in children compared to adults.

Are children more susceptible to decompression sickness than adults? There is no published data which could be used to answer this question. However, organizations including PADI, SSI and TDI have all imposed depth and time restrictions to address this.

If children do get decompression sickness, is it likely to be of increased severity compared to adults? There is no published data which could be

used to answer this question.

Do children have the strength and endurance to cope with emergencies? Children have less strength and endurance than adults. Whether it is sufficient to cope with emergencies, swim against currents, or board a boat under less than ideal conditions is unknown, since the appropriate human factor studies have not been carried out.

SUMMARY

Based on the above considerations, the only data available that could be used to establish a minimum age for diving are based on pulmonary developments. This suggests the possibility of and increased susceptibility to pulmonary barotraumas for pre-pubertal children, especially those younger than 10 years old. There is no other data available that would assist in making this determination.

It should also be noted that the empirical data and collective experience with children scuba diving seems to be based on shallow-water, protected diving. There is insufficient information available to make any evidence-based medical judgment for or against involving children in scuba diving.

As more children under the age of 12 dive, additional empirical data will gradually accumulate. However, in order for this data to be useful in making medically based decisions regarding children in diving, it will have to be carefully collected, vetted and analyzed.

While the above represents the fruit of DAN's best effort at looking at the problem, we realize there may be quality data available that has not yet been published. For as wide a perspective as possible, we invite anyone with substantive comments either on DAN's assessment or the issues pertinent to children in diving in general to forward them to DAN. We realize that this issue will generate a lot of personal opinion, and while these are useful, conclusions backed up by actual data or records are the most useful.

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SCUBA DIVING NOSEBLEEDS

WHAT ARE "MASK SQUEEZE" AND "SINUS SQUEEZE"?

FEATURE **SAŠA JANJANIN, MD** AND **BARBARA KARIN VELA, MD**

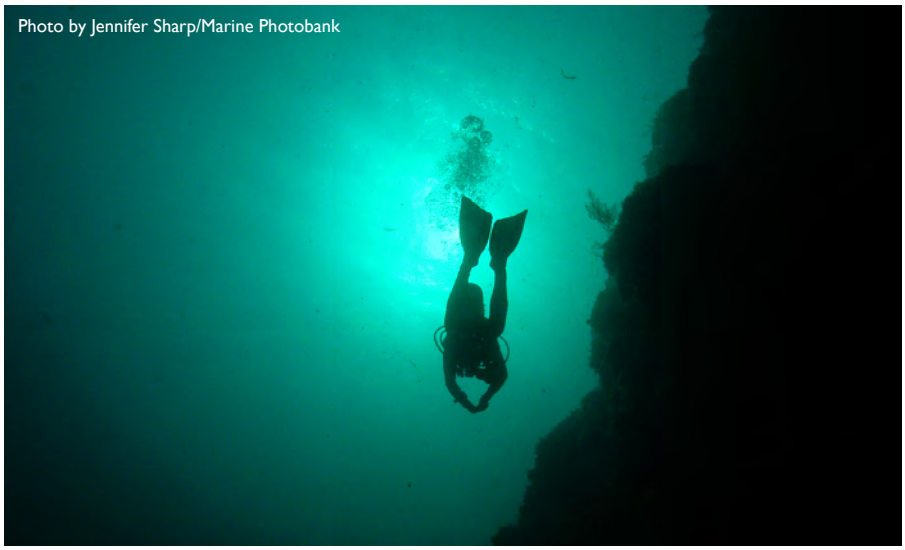

Photo by Jennifer Sharp/Marine Photobank

Having a nosebleed while scuba diving is not an uncommon experience – especially with novice divers. The sight of blood in a dive mask may look terrifying, but divers should know that nosebleeds are mostly not a severe problem as long as they spontaneously stop. Blood from the nose is often mixed with mucus and tears, so the amount of blood loss is usually less than it seems (normally less than a tablespoon)!

Nosebleeds are experienced more often with novice divers than with experienced divers simply because of the way a new diver performs the Valsalva maneuver as he/she descends. So – for those who do not know what a Valsalva maneuver is; The Valsalva maneuver is performed by moderately forceful attempted exhalation against a closed airway, usually done by closing one's mouth or pinching one's nose shut while pressing out as if blowing up a balloon. In diving, the Valsalva maneuver is often used on descent to equalize the pressure in the middle ear and sinuses to the ambient pressure.

Barotrauma that is produced by inadequate performance of the Valsalva maneuver is commonly called mask squeeze. Briefly, a mask squeeze results from not equalizing the pressure in the mask to match the water pressure, which creates a vacuum in the mask. This vacuum can directly transfer to the nasal passages. In a mucosa near the front of the nasal septum (1cm away from the nostrils) four nasal arteries connect together and form a very fragile network of vessels. Affected by the vacuum, those very small and weak blood vessels can rupture and cause the nosebleed. Doing a slow descent while frequently performing the Valsalva maneuver can easily prevent the mask squeeze and nosebleeds. A mask squeeze is usually not accompanied by pain. Most of these nosebleeds will stop immediately as the diver comes out of the water and do not need an emergency room visit or medical advice.

The second (and usually more painful!) cause of scuba diving nosebleeds is due to what is known as a sinus squeeze, caused by a cold/allergy-associated blockage of the sinus openings. Sinus squeeze – also known as sinus barotrauma – occurs when a diver cannot equalize sinus pressure due to nasal congestion. In the case of a blocked nose, there is almost always an associated blockage of the sinus openings, and there is no gas flow between the nose and sinuses. The bony structure will not collapse under the pressure changes, but the lower pressure in the blocked sinus will draw blood into it. Blood vessels in sinuses will swell and leak. In more severe cases the squeeze results in a blood-filled sinus, which will drain during ascent when the air in the sinus expands. A sinus squeeze can be recognized as pressure or pain in the forehead or around the teeth, cheeks, or eyes. Sometimes – but not always – a nosebleed may occur. Pressure and pain regularly increase with depth.

The most common reasons for nasal congestion and a sinus squeeze are colds and allergies, and they should be treated by proper medications. In case of a sinus squeeze – until the congestion and sinus problems heal – divers should not be diving!

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UPCOMING **EVENTS**

REEF CHECK TRAINING

5-8 December 2012 in Dubai in Al Boom Diving at the Atlantis

DIGITAL ONLINE

EDA's Underwater Photography & Film Competition Opens: 1 January 2013

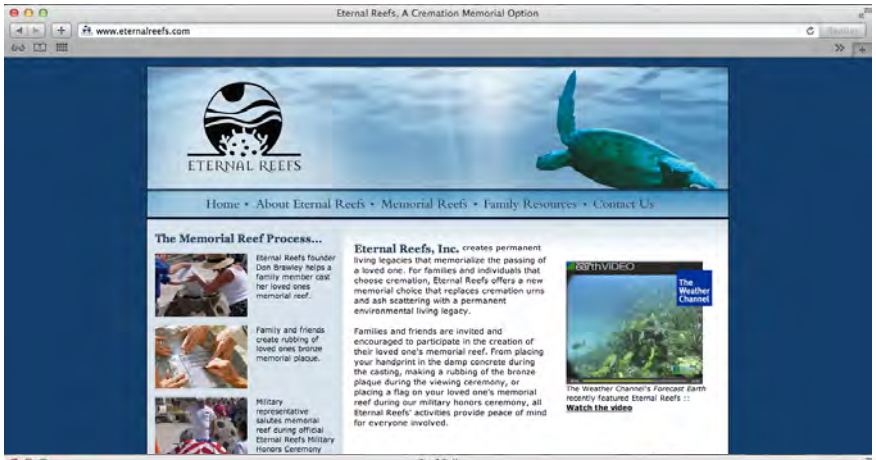
DIVE MIDDLE EAST EXHIBITION (DMEX)

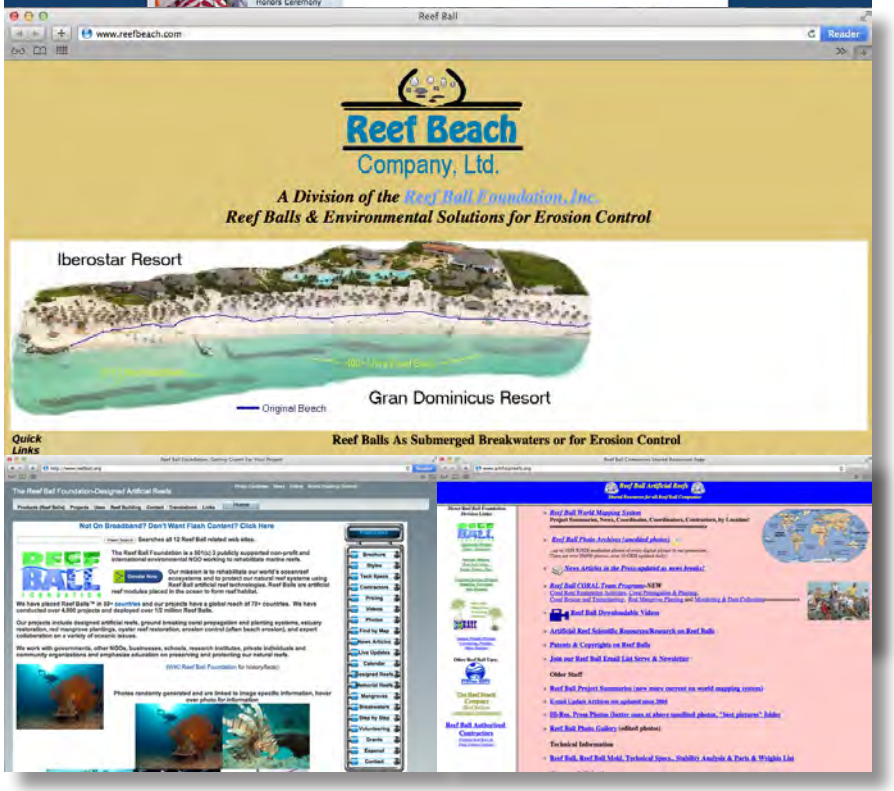
5-9 March 2013 at the Dubai International Marine Club, Mina Seyahi

INTERESTING **LINKS AND RESOURCES**

ARTIFICIAL **REEFS**

- http://www.reefball.org/
- http://www.artificialreefs.org/
- http://www.reefbeach.com/
- http://www.eternalreefs.com/





EDA
جمعية الإمارات للغوص
Emirates Diving Association

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Vice Chairperson Essa Al Ghurair

The Secretary General Jamal Bu Hannad

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MISSION STATEMENT

To conserve, protect and restore the UAE marine resources by understanding and promoting the marine environment and promote environmental diving.

LEGISLATION

Emirates Diving Association (EDA) was established by a Federal Decree, No. (23) for the year 1995 article No. (21) on 23/02/1995 and chose Dubai as its base. The Decree stipulates the following responsibilities for EDA.

- To Legislate and regulate all diving activities in the UAE.
- Ensure environmentally respectful diving practices in all EDA members.
- Promote and support the diving industry within the UAE by coordinating the efforts of the diving community.
- Promote diving safety in the commercial and recreational diving fields through standardization of practices.
- Promote and preserve historical aspects of diving within the gulf region and enhance environmental education to diving and non diving communities through EDA activities.

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5 – 9 MARCH 2013

DUBAI INTERNATIONAL MARINE CLUB, MINA SEYAHI

www.boatshowdubai.com/DMEX

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IN CONJUNCTION WITH

DUBAI INTERNATIONAL BOAT SHOW

ORGANISED BY

DUBAI WORLD TRADE CENTRE

IN ASSOCIATION WITH

EDA Emirates Diving Association

VENUE

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MINA SEYAHI