

The magazine that doesn't
say anything here





An experience without equal

At Wakatobi, you don't compromise on comfort to get away from it all. Our private air charter brings you directly to this luxuriously remote island, where all the indulgences of a five-star resort and luxury liveaboard await. Our dive team and private guides ensure your in-water experiences are perfectly matched to your abilities and interests. Your underwater encounters will create lasting memories that will remain vivid and rewarding long after the visit to Wakatobi is concluded. While at the resort, or on board the dive yacht Pelagian, you need only ask and we will gladly provide any service or facility within our power. This unmatched combination of world-renowned reefs and first-class luxuries put Wakatobi in a category all its own.



"After years of travelling to the best dive sites in the world and often experiencing poor conditions, we found Wakatobi Dive Resort. They have a perfect balance of luxury with outstanding diving."

~ Kate Pagdget-Koh



www.wakatobi.com

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Underwater Photography 2001 - 2018
© PR Productions
Publisher/Editor Peter Rowlands
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peter@uwpmag.com

Editorial

2001 - 2018

by Peter Rowlands

with guest Editors:

Alex Mustard, Doug Perrine,
Adam Hanlon, Steve Jones,
Dan Bolt and Simon Brown

As is usual with milestones, they present an excuse to stop the clock for a while and look back at what has happened since said milestone began.

UwP's was August 2001 when I was financed by the then Ocean Optics to produce a one off bumped up newsletter harnessing the cost control of desktop publishing, the print free downloadable PDF format and free distribution via the internet. In hindsight, it was the perfect time to start and, as history has since proved, UwP was the very first downloadable PDF magazine designed to look like the conventionally produced product it was replacing.

What was also perfect timing was that it was the time of transition from film to digital photography. The first issue of UwP was a mixture of both; early compact digital cameras had basic sensors, limited capacity memory cards and power hungry electronics. The first very basic DSLR



from Canon wasn't due to arrive until November 2001 in time for Issue UwP2 which contained the shock news that the Nikonos V was to be discontinued after seventeen, yes, I said seventeen years of production since 1984. It was truly a time of seismic change.

With this in mind I thought it would be an interesting idea to write about what has changed in the same seventeen year period since then from 2001 to 2018 when Issue UwP100 is rolling off the imaginary presses and dropping through your theoretical letterbox. In addition I thought it made sense to find out what other leading protagonists felt were

their most important changes so I have enlisted the help of half a dozen leaders in their field. Enjoy.

Polycarbonate housings, Manual White balance and Alex Mustard
by Peter Rowlands

Polycarbonate housings

It might seem a bit quaint now but in 2001 underwater housings were traditionally made from aluminium, cast in hardwood moulds. These were then machined with smooth O ring surfaces to form water and pressure proof enclosures. This production method suited low volume output and had served the market well for decades.

The advent of injection moulded polycarbonate housings was made possible by computer aided design (CAD) software which in turn controlled CNC mills and lathes to make mouldmaking much more economic and capable of producing shapes which traditional human machinists could not match.

I don't think there can be any doubt that these housings were one of the main reasons why digital photography underwater got off to such a fast start, faster even than land photography where it would take digital cameras several years before they could truly claim to be better than their traditional SLR counterpart.



Point and shoot ease of use combined with the instant feedback on the LCD screen produced good results which even a novice could achieve almost straight away. They made underwater photography simple, effective and therefore enjoyable!

The ability of these comparatively inexpensive housed compact cameras, I think, quite literally, revolutionised the appeal of underwater photography to the diving world and divers as a whole.

Manual white balance

As a mostly available light photographer the advent of Manual White Balance brought about a groundbreaking shift in the capability of underwater scenery photography.

Altering the colour of a traditional film involved either adding filters, changing film stock or manipulation of the chemical processing of the film or, believe it or not, all three at once.

I guess it should have come as no surprise to me because prior to 2001 I primarily shot video and these amazing electronic camcorders were able to offer the choice of daylight balance (for outdoors), tungsten (for indoors) or fluorescent (also indoors). In addition they were also able to change the white balance automatically to ensure the correct colours footage regardless of the light source.

This ability lent itself so successfully to the underwater world but the natural cyan colour of even the clearest water gets stronger and stronger the deeper one goes and



usually out of range of the colour presets.

More sophisticated cameras provided Manual White Balance (MWB) where, at the push of a button, the camera sensor evaluated the colour of the light and adjusted the image electronically. It would now be remiss of me not to mention that the invention of the Magic Filter in 2005 designed to work with MWB was a combination made in photographic heaven :-)

The result was much improved colour in available light images and those, for me, have been some of the most important image improvements in the past seventeen years.



Alex Mustard

I'm going to finish my piece not with a product or a capability but a person and I doubt if it surprises you that it is Alex Mustard.

Even in UwP1 the youthful Dr M was describing "Zoom blurring underwater", a way of bringing more eye catching excitement to our shots but what set him apart, even at that early stage, was he was prepared to tell everyone how to do it.

Underwater photography was then, is now and probably always will be, competitive; yet here was someone who was taking images that were really groundbreaking and was prepared to impart his secrets to all and sundry so that is why I am highlighting him.

Like only one other person before him that I had the pleasure of knowing, he combines the perfect blend of marine biological knowledge, photographic control and artistic creativity. His images over the past seventeen years have built into a most impressive body of work and they in turn have inspired others to improve the quality of their work.

As a result I hold him significantly responsible for the very high standard of images that are being produced underwater today.

Peter Rowlands
peter@uwpmag.com



The underwater photography community by Alex Mustard

I am sure others will comment on the huge changes in imaging technology, underwater housings and more during the 100 issues of UWP, but I thought I'd take a different approach and talk about us, well our community.

The arrival of UWP coincided, not coincidentally, with the rise of the internet in underwater photography. A phenomenon that has shared knowledge like nothing before, but has also brought our international community together. It is not far fetched to say that we weren't really a community before it. Societies of underwater photographers have existed since the 1960s, like our much loved BSoUP in the UK, but they

were few and far between resulting in strong local gatherings but nothing international. Photographers could gather at events like the Brighton Festival, the Antibes Festival and still can at DEMA and ADEX, but we're talking about a gathering of 10s of shooters, the biggest max out at 100. Online hundreds of underwater photographers regularly interact, in fact most groups have memberships in the 1000s.

I see the greatest impact of this community when I travel. In this interconnected world of hobbyists suddenly we have friends everywhere. One of the best feelings when you turn up in a country you have never visited is being greeted by local who

shares your interest. Taking you to choice dive spots and more. Fifteen to twenty years ago, BSoUP members would be forever moaning about dive guides, who didn't understand what photographers wanted. Now everyone is interconnected, guides chat and plan with photographers before the trip, share jokes and pictures during and plan for a repeat visit after.

Group trips have really changed too. Previously they were almost always single nationality affairs, now they are multinational, which I think is a huge benefit for workshops because photographers are exposed to peers with different tastes, different home conditions, different gear and everyone's horizons are expanded.

I quite regularly run workshop trips where I am the only the only Brit. My record is 19 different nationalities on a big Lembeh Wetpixel event! On my more typical sized and most recent workshop in December in Ambon, I was joined by two Brits, two Australians, three Americans, as well as a German, an Argentinian, a Chinese, a Polish and a Dutch photographer.

What a great time to be an underwater photographer and part of this interconnected global community.

Alex Mustard
www.amustard.com



Democratisation by Doug Perrine

From my perspective, the sea change since 2001 has been the democratisation of photography in general and underwater photography in particular, due to two massively disruptive technologies: digital photography and the internet.

In the 20th century, nature photography, and underwater photography in particular, were dominated by full-time professionals. Someone that only had a few weeks during the year to go play underwater just didn't have time to master the steep learning curve of using the equipment available at that time, especially considering that they would usually not see any of their results until after their return to home base, by which time they probably didn't remember what they did when they took the picture, and had no opportunity to give it another try.

Digital cameras with instant replay enabled novices to progress to professional quality images within a few weeks, as long as they had an innate eye for composition. But even an amateur with world-class images didn't have access to the world of print publishing. Picture editors dealt with known photographers or stock photo libraries that could supply images of a range of subjects with one submission (that had to be delivered in physical form as slides, with a risk of substantial liability if they were lost or damaged).

When the internet came along, anybody could post pictures for the whole world to see, and an editor might contact you, even if you had only ever photographed one subject. You didn't need a list of publication credits or a recommendation from someone else in the industry.

For picture editors, this meant much easier searches, with a much greater variety of pictures to choose from, and most of the photographers were happy to have them used for free. For amateur photographers, it meant access to the whole world of image users and the possibility to have your name in lights. As a result, we are constantly seeing ever better images of every aspect of the natural world.

On the down side, most print publications have gone out of business, as ad revenue has migrated to the internet. Furthermore almost nobody is able to make a living from photography any more, and especially not underwater photography. So you rarely have photographers taking great risks to accomplish something that's never been done before, unless there is a commercial sponsor involved. Instead you have thousands of photographers taking pictures of the same subjects, inevitably making improvements over time, but rarely breaking new ground. Someone who does gets their 15 minutes of fame before the new image is copied endlessly and everyone forgets who took the first one.

As with any new technology, there are winners and losers. We have more and better pictures than ever before, but they have no value, and are shared freely without reward to the creator. That can be good or bad, depending on your perspective.

The big unanswered question in my mind is: Does it inspire people to make greater efforts to protect nature?



© Doug Perrine

Doug Perrine
www.seapics.com

Behaviour by Adam Hanlon

When I bought my first underwater camera in the 1980's, I was unwittingly part of a small group of people that attempted to capture the underwater beauty of the world's oceans. This was largely due to the relatively low number of people actually diving, combined with the large expense and extreme frustrations involved in trying to take pictures with film underwater. It should be pointed out that at the same time, I didn't own (or know how to use) a computer, cell phones were the size of rucksacks and I had never heard of the internet.

Fifteen or so years later, we see the release of the Nikon D1, arguably the first "serious" digital camera. Digital imaging technology revolutionized underwater imaging, freeing us from the strictures of 36 exposures per dive and allowing us to preview our images as they are shot. Almost simultaneously, the numbers of people enjoying the underwater world exploded too, so the scene was set for a dramatic increase in the numbers of people creating images underwater.

The internet produced a platform for image (and opinion) sharing unlike anything that has gone before. It is now fairly easy to attract relatively large audiences to images. It could be argued that the combination of the increased numbers of image makers, the technology and the ease of sharing has caused an overall improvement in the amount of quality imagery that is readily available to the viewing public. What is undeniably true is that the sheer number of people going underwater and creating imagery has increased exponentially.

Baba Dioum, in his 1968 address to the International Union for the Conservation of Nature

and Natural Resources stated: "In the end we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught." There is no doubt that imagery generates an interest that can help drive a demand for the preservation of the oceans. The increase in the amount of underwater imagery available to the public has helped raise awareness of environmental challenges and given a voice to individuals that seek to conserve our underwater world.

But, this new access and technology has also brought with it challenges. The desire to produce unique (and/or commercial) imagery has led some people to employ dubious ethical techniques. Whilst these practices certainly existed before the digital explosion, this increase in the number of individuals with cameras underwater has increased their frequency. The ease with which these images can be shared can cause unrealistic impressions of animal behavior, particularly among people that have not visited the underwater world and have no way of assessing the accuracy of the events portrayed. We are responsible for ensuring that we faithfully represent what we see, albeit using our creativity and skill to show it in as intrinsically attractive or dramatic fashion.

Whilst the definition of what is "acceptable" will vary from era to era and from individual to individual, I am certain that most people would now agree that anything that harms or stresses a subject unduly is unacceptable. I would also argue that the circumstances around the capture of images that portray strikingly unnatural behaviors should be queried by the wildlife photography community. For example, images captured when an octopus is picked up into the water column and then released to "parachute" back to the sea bed exemplifies



both these criteria. The octopus will be stressed as it is being handled and any resulting images will show a behavior that does not naturally occur. As a community, we should ensure that such images are not accepted.

Conversely, the oceans are a big unpredictable place and their inhabitants sometimes do things that we do not expect. We are fortunate to sometimes document things that are unique and previously undocumented. Seals may seek out physical interaction with divers and this seems to be a mutually enjoyable experience for both parties. Hence, we should be cautious in how we go about raising concerns about images that we suspect may have been captured via methods that we feel are dubious. I would suggest that we at least attempt to communicate directly with the creator of the image in private to hear their account of how they captured it, before we make any judgement.

Adam Hanlon
www.adamhanlon.com
www.wetpixel.com

Deep wreck photography by Steve Jones

Taking a digital camera underwater was one of the most significant recent milestones for many of us who started in the film days, however I'm going to talk about another development that had a profound impact on my image making.

As a photojournalist I have to be an all-round photographer, yet a passion for wrecks has long been a central theme in my work. The lesser-explored ones are often found in deep water, where ambient light levels are very low so in the film days, jumping in with 36 exposures often meant a similar number of unusable images of these difficult subjects unless cumbersome tripods were carried.

Earlier generations of digital cameras simply magnified the number of binned images! All that changed in 2008 when Nikon released the D3 and D700. These cameras had sensors capable of superb image quality at very high ISO's and had autofocus systems to match, opening up a vast new range of subjects for me.

Dark wrecks that I had previously found to be unphotographable now became ripe subject matter and when combined with emerging ultra-powerful LED lamps, I found I could create images



The near-intact wreck of the British submarine HMS Stubborn, which lies at 55 metres depth off the coast of Malta. Nikon D4 in Seacam housing with Nikon RS 13mm. 1/125 F8 ISO 1000. Off camera Orcalight Seawolf

that not only show the full seascape but really capture the atmosphere and eeriness of these deep wrecks.

I wanted to create images that explained without words, why we take such risks in visiting these

unforgiving places and my D700 enabled me to do that. Subsequent cameras such as the D4 and D5 were an evolution, but the D3/D700 were a revolution when it came to deep water wreck photography.

Steve Jones
www.millionfish.com

www.uwpmag.com

Citizen scientists

by Dan Bolt

When Peter's invitation to write this piece came through I had just seen the concluding episode of the BBC's epic TV series: Blue Planet II. So, taking my inspiration from the octopus & shark story and the leatherback turtle protection piece, I thought I would turn the camera back on itself and focus on you, the citizen scientist.

I won't write about the huge leaps in camera & lens tech that we have seen over the past 17 years - but instead, I want to celebrate the growth of localised knowledge gained by dedicated individuals, and how this is adding to our knowledge of the marine environment and, ultimately, to its protection.

In 30 years of diving the same sites most local to me, I've witnessed the spread of warm-water species, recorded unique intra-species behaviour, mapped new colonies of rare animals and helped to re-classify species.

Only by dedicating this in-water time can we record seasonal changes, observe behaviours and, ultimately, recognise the unusual and noteworthy that can truly make a difference to the 'value' of your local eco-system.

The latest camera equipment we have to hand certainly makes it easier

to record everything we see and want to document, but surely it is you, the every-day underwater photographer that we owe the greatest deal of thanks to.

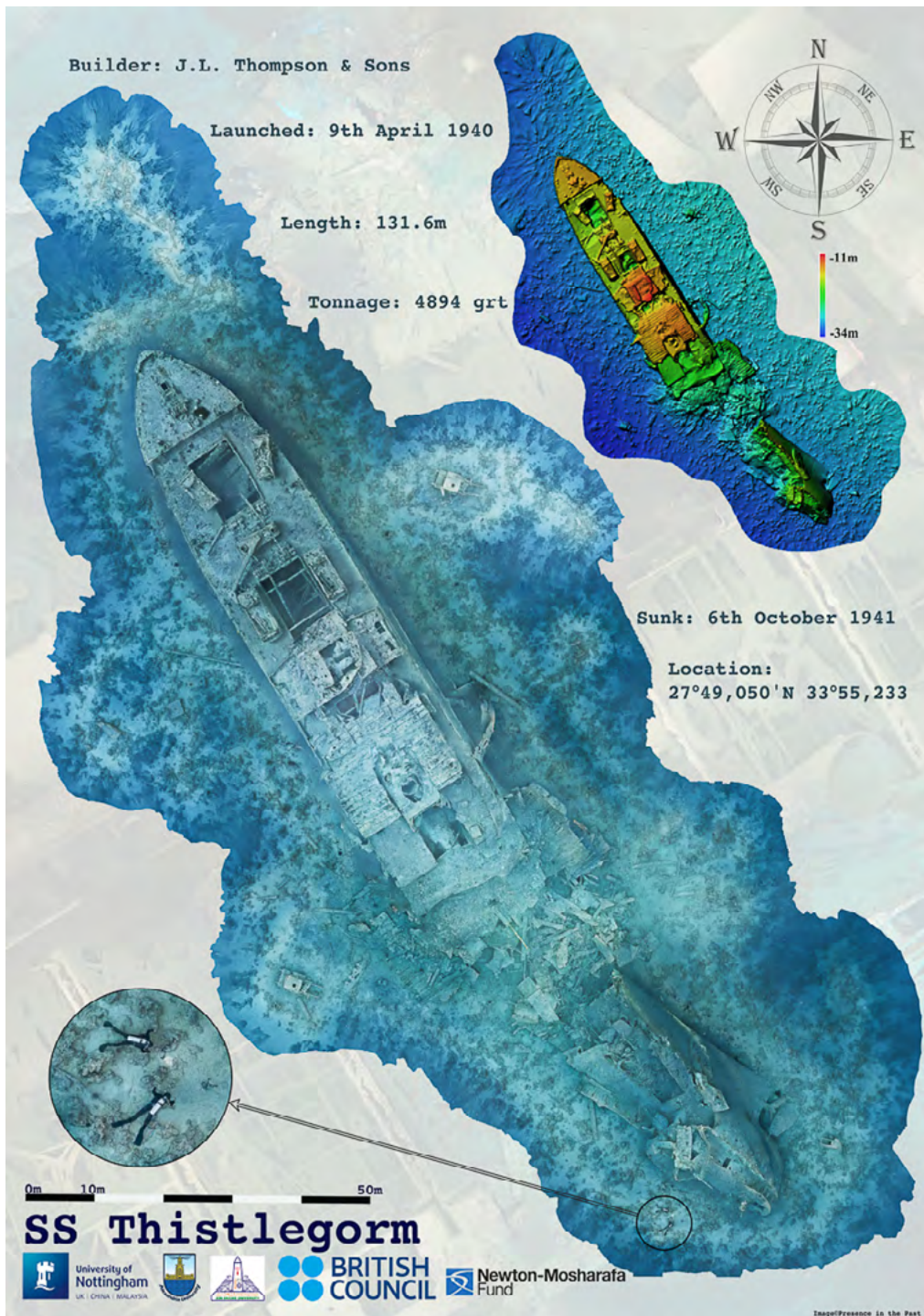
Over the past 17 years you have contributed hugely to the collective wealth of information about our most precious places... and who knows, perhaps now, your dedication can finally make a difference.?

Here's to you; your time, your efforts, your knowledge and with your continued efforts, a brighter future for our oceans :)

Dan Bolt

www.underwaterpics.co.uk





Photogrammetry by Simon Brown

What has changed over the 100 issues? Working as an editorial photographer I would shoot a series of images to tell the story, then edit them down to a small selection. I was selectively choosing how the story was to be interpreted and the viewer had no choice.

With photogrammetry, I now shoot hundreds or thousands of overlapping images, build a 3D model and then let the viewer choose their own viewpoint. The public can choose where and how they see what I have captured, and are at liberty to wander around the scene as they see fit. This has surprising benefits; after diving a recently uncovered cannon site on Chesil Beach we were all confident

Derived from the 3D model of the SS Thistlegorm, the image (known as an ortho photo) is a 'divers-eye-view' of the wreck and was created from 15,000 separate images. The wreck is geo referenced and scaled, and a Digital Elevation Model (DEM) in the top right corner shows relative depths over the wreck. Two divers were scanned alongside the stern to show the scale of the area covered - 7 acres in total. This image is available as a poster or fine art print.

<http://deep3d.co.uk/store/>

we had seven iron guns. After the model was published a non-diving team member announced there were in fact 8 guns. They had found the cascable of another gun amongst the cobbles from the comfort of their desk.

None of this would be possible without the advent of some very clever software (www.agisoft.com) exploiting high-resolution digital images with embedded EXIF data, massive storage capacity and – thanks in part to the gaming industry – graphics processing power.

What else has changed? I used to shoot 5~10k images a year, now I regularly shoot 2000~4000 on a single dive. And for me at least 2D imagery died the very day I created my first 3D model.

Simon Brown
www.deep3d.co.uk

I hope you have enjoyed and been enlightened by the thoughts and images of the above underwater photographers and I look forward to producing the follow up article in another seventeen years time in UwP200 :-)

Peter Rowlands
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www.uwpmag.com



ACQUAPAZZA
PRODUCTS

Underwater Camera Housing for Panasonic LUMIX GH5 APPA-GH5



News, Travel & Events

Snorkel with Humpback Whales Kingdom of Tonga Sept. 26-Oct 5 and Oct. 6-16, 2018

Following a sold-out and highly successful trip in 2017, marine wildlife photographer and biologist Doug Perrine will lead two tours in 2018 for Oceanic Society Expeditions to swim with humpback whales in the Vava'u Islands of Tonga.

Guests will stay at a comfortable beachfront resort, and enjoy 6 days of seeking out humpback whales on a small boat during the latter part of the reproductive season when most calves have developed to the point that mothers are more confident letting them satisfy their curiosity about humans.

An additional boat day will be spent learning about and assisting with Tongan ecosystems and environmental challenges in partnership with a local environmental group, plus there will be a free day for snorkeling, paddling, or relaxing around the resort.

The guide and naturalist for



this trip, Doug Perrine, has a master's degree in marine biology and over 20 years experience as a volunteer data collector with the Hawaii Whale Research Foundation in addition to years of experience photographing many species of whales around the world. A winner of the grand prize in the Wildlife Photographer of the Year competition, with photos published in National Geographic, BBC Wildlife, and hundreds of other magazines, he will



be available throughout the trip to offer personal advice on photography, as well as to share his knowledge of whale behavior. Space is limited. Details on the expedition can be found on the Oceanic Society website at

<http://www.oceanicsociety.org/expeditions/tonga-snorkeling-with-humpback-whales--72>

Martyn Guess Anilao workshop
May 2018



Join Martyn Guess on this dedicated photo workshop in the heart of Anilao at Aiyandar Beach & Dive Resort with world class critter diving.

There will be a 1:2 guide: diver ratio. Martyn Guess will be running his much loved macro workshop throughout the trip.

www.scubatravel.com

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Peak tour season July-August
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Lembeh Photo Workshop 2018

28th July - 4th August 2018



We are happy to announce our 6th annual Underwater Tribe/NAD Lembeh Photo Fun Week with Doug Sloss for July and August 2018.

Our 2017 Lembeh Photo Workshop was a resounding success once again with 16 happy attendees who joined us for a week full of fun.

We have scheduled our Lembeh Photo Workshop 2018 starting on the 28th of July until the 4th of August for 7 nights and 17 dives total. The package includes return airport transfer, full board meals at the resort, 2 to 1 guest to dive guide ratio, digital copies of the outlines, and of course daily photo tuition.

We will be limiting the numbers

of participants during the week in order to give everyone as much personal attention as possible. We will have up to 3 photography instructors on hand during the event and everyone will have a chance to dive with each of them.

What sets an Underwater Tribe photo workshop apart from the others is the fact that our instructors are “hands on” teaching while underwater. We don’t take our cameras underwater, we use slates only and dive with each student to help them achieve the best results possible.

www.underwatertribe.com



GregorySweeney.com Photography Adventures

Swim with Whale Sharks

Isla Mujeres, Mexico



4 days on a private, small group charter

July 19- 24 2018
Aug 30 - Aug 4 2018

A Note from Captain Paul Watson



Forty years ago in August 1977, I established the Sea Shepherd Conservation Society. Today, thanks to supporters like you, we are an international movement. We have hundreds of dedicated volunteers that participate in ground campaigns all over the world, crew our ten ships on sea campaigns, and work to spread awareness about our organization in their local communities.

Our Neptune's Navy is actively stopping poachers on the land and in the waters of Mexico, Liberia, Gabon, the Baltic, Panama, Galapagos, Australia, the Mediterranean, the Caribbean, the Southern Ocean, and the North Atlantic. Our organization is saving lives and upholding international conservation law. Our important work is only possible because of our supporters - individuals who care about biodiversity in the sea and the protection of our oceans.

I'd like to extend my deepest



thanks to you for your generosity in supporting our life-saving efforts. As you know, if the oceans die, we all die. I am thankful that you are helping us save the oceans and the wildlife that call the oceans home.

www.seashepherd.org

[Donate](#)

Bali Photo Workshop July 2018 with Doug Sloss, Mike Veitch and Luca Vaime July 21 - 26 2018

Once again we are offering a Bali Photo Workshop that will take place immediately before our Lembah Photo Workshop in July 2018.

We will be basing ourselves in the Tulamben area at the Mimpri Tulamben Resort and enjoying 14 dives in the Tulamben, Seraya, and Amed areas working on both macro and wide angle techniques.

We will do 3 dives per day on the 22nd to the 25th and 2 dives on the 26th before heading back to Sanur for a final night presentation.

The diving in the Tulamben area is mostly shore diving, we certainly suggest bringing open heel fins with booties. We will be doing a mix of black sand diving for macro as well as a few coral reefs as well as the Liberty shipwreck.

We don't have any night dives scheduled as part of the workshop, however, we can certainly organize those on the day for anyone who is interested. We will be doing 3 day dives each day with the photo instructors talking about photo



techniques on location for each site.

In the evenings we will meet for photo critiquing, one to one discussion, and short presentations.

www.underwatertribe.com



BEHIND EVERY MARINE SHOW
DRAMA UNFOLDS.

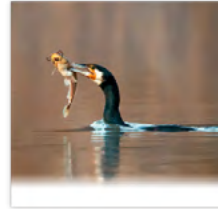
NANUQ WAS RIPPED FROM HIS FAMILY
MEMBERS AND FORCED TO LIVE IN
A TANK WITH TWO CAPTIVE-BORN BELUGAS
WHOM HE DID NOT KNOW.
IN FEBRUARY 2015, NANUQ WAS ATTACKED
BY THESE TWO BELUGAS.
TRAPPED AND UNABLE TO ESCAPE,
NANUQ DIED A SLOW DEATH
FROM HIS INJURIES.

www.seashepherdglobal.org



CAPTIVITY KILLS. STOP SUPPORTING MARINE PARKS.

Nature Photography of the Year



The Nature Photography of the year is hosted by Association of Slovenian Nature Photographers. The Contest is open to amateur as well as professional photographers from around the world.

Categories:

1. Mammals
2. Birds
3. Other (except mammals or birds)
4. Plants (including lichens, mushrooms, etc.)

5. Natural Landscapes

6. Man and Nature

Closing date: January 31, 2018

The total prize value will be higher than 2.000 €

All selected photos will be presented on exhibition traveling across Slovenia and in a high quality hard cover book, which will be received by each participant of the contest. Best photographers in each category will receive a prize money.

www.photonature.si

Nusa Island, Kavieng, PNG August 2018

Join downunderpix for an underwater photography trip to Nusa Island Retreat. Leaving 19 August 2018, this trip has something for everyone. The estimated cost of \$5,076 per person twin share includes:
* Return economy airfares Brisbane to Kavieng (via Port Moresby) flying Air Nuigini. * 11 nights accommodation in a Premium room. * All meals *



2 dives a day for 9 days with Scuba Ventures Kavieng. * 2 residual air dives on plane wrecks. * Free shore dives at Scuba Ventures Jetty.

www.downunderpix.com

www.uwpmag.com



Celebrate the Sea Festival Manado, North Sulawesi 31st March - 5th April 2018

Ocean Geographic is pleased to announce the 13th Celebrate the Sea Festival in Manado, North Sulawesi from 31 March - 5 April 2018. Previously staged in association with the World Festival of Underwater Pictures (Le Festival Mondial de l'Image Sous-Marine – Marseille) from 2002 to 2013, Celebrate the Sea is regarded as one of the most significant underwater photographic events in the world outside Europe. The 2018 festival in Manado will take place in conjunction with the 5th annual 'Ocean Geographic Pictures of the Year' competition.

The principal highlight of the 2018 festival is the international underwater shoot-out competition. With cash and holiday prize monies

valued at around USD 50,000 spread across five categories and the 'Master of the Competition' award.

The festival will open on 31 March 2018 with a full-day keynote conference by a panel of international speakers, together with an opening ceremony hosted by the provincial government of North Sulawesi.

The mission of the 13th Celebrate the Sea Festival is to use the power of pictures to inspire conservation and protection of the ocean environment. The 2018 festival will be used as a platform to call for the ban of shark fins in restaurants, and to work towards eliminating single-use plastic in North Sulawesi.

www.celebratethesea.com

Swim with Whale Sharks & Giant Mantas Small Group on a Private Charter in Isla Mujeres, Mexico July 30 - August 4th 2018 July 19 - August 24th 2018



Photograph hundreds of whale sharks and giant mantas in the warm blue water off the tip of the Yucatan Peninsula as they feed and ather in the largest aggregation in the world. Photographer Gregory Sweeney is your escort for this photography tour on our private 36ft charter that leaves daily from the docks of Isla Mujeres.

We stay all day snorkeling with whale sharks for maximum time in the water photographing and enjoying this incredible encounter. The whale sharks feed at the surface making the photo opportunities spectacular and easy. Only snorkeling gear is required.

As we are in blue water, visits by other pelagic species such as sailfish

and manta rays are possible. Limited to 6 guests only. This is a NON SCUBA and suitable for those who are comfortable with a snorkel in open water.

Trip Fee Includes:

- 4 days on the water in our chartered boat
- 5 nights in a beachside resort (Playa Media Luna) with swimming pool and shared room equipped with tv, free wifi, phone, AC
- Weight belts
- A shared golf cart or taxi to help move equipment to/from the boat
- Light breakfast (at hotel) and Lunch (on boat)

www.gregorysweeney.com

Norway Photo Workshop 16 to 23 September 2018

Wetpixel will be hosting their first temperate water photographic workshop at Gulen Dive Resort, Norway from 16 to 23 September 2018.

Shooting in cooler water has challenges that are unique and this workshop aims to specifically address these.

Normally the biggest problem with temperate water workshops is that it is hard to guarantee acceptable dive conditions. Gulen Dive Resort is uniquely placed to offer guaranteed diving and great visibility.

It has a wide variety of spectacular diving, including kelp forests, soft coral reefs, amazing wrecks and fascinating macro life.

We will be conducting the workshop days aboard their bespoke dive boat MS Vikingfjord.

The plan will be to have formal talks about technique each morning, followed by two dives from the boat. In between the dives, we will be able to conduct image reviews and brainstorming session in the boat's large and comfortable saloon area. Each evening will consist of a more formal image review, which will also cover some post processing ideas.

The workshop will be conducted by Wetpixel Editor Adam Hanlon. Resident in the UK, his staple is diving and shooting in cool water. His temperate water images have received international awards and he runs regular training underwater photography training sessions. He has also co-presented several workshops with Alex Mustard.

Perhaps most valuable will be the opportunity to discuss images and ideas with Adam and the other workshop participants throughout the



workshop. With this in mind, there is deliberately no competitive element to it.

The workshop is suitable for anyone that takes pictures underwater and is comfortable with diving in temperate water.

The package includes:

7 Nights accommodation at Gulen Dive Resort
Full board: Breakfast, lunch and dinner
Wide angle wreck and scenic diving including air filling, tank and weights.
Workshop lectures and presentations. Practical lesson on wrecks sites.

Tips and gratuities

Airport transfers on arrival and departure.

Diving equipment hire (including drysuits) is available. Please contact Gulen for prices and availability.

Prices and payment schedule:

Price per person \$3850. A deposit of \$1500 secures your place. Second payment of \$1000 is due on 01 March 2018, with balances due on 01 August 2018.

<http://wetpixel.com/i.php/gulenws18/>

12th Edition of the Blue Dolphin of Malta International Underwater Competition



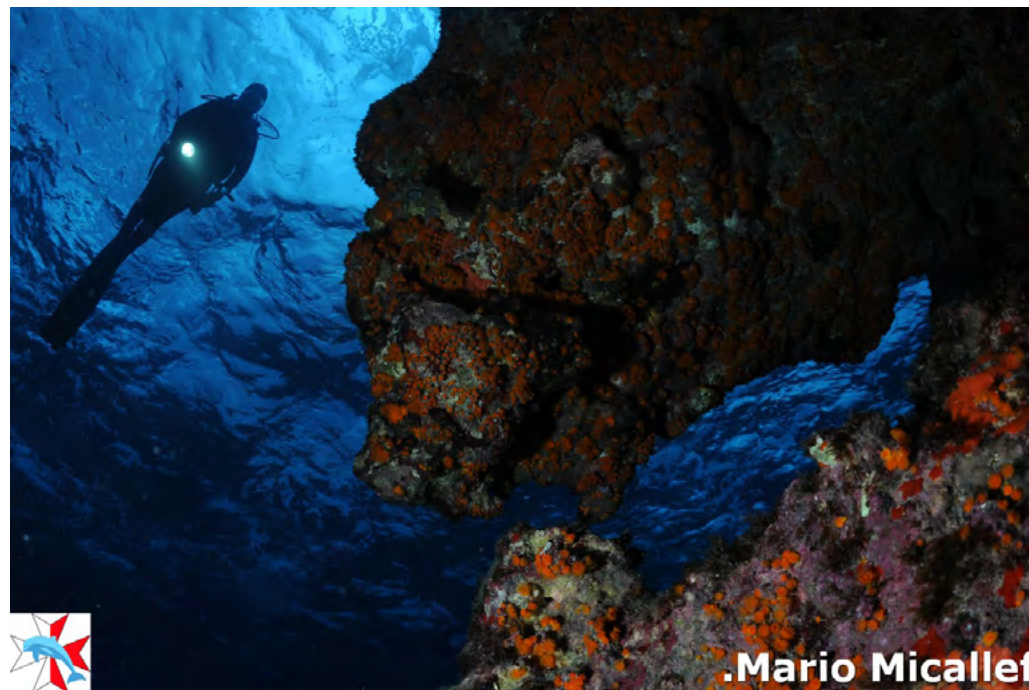
The 12th Edition of the Blue Dolphin of Malta International Underwater Competition was held last weekend in Gozo and was organised by the Federation of Underwater Activities Malta with the assistance of the Ministry for Gozo.

The competition, which has been held since 1987, was organised again after a gap of 13 years. A total of 17 divers participated with 11 of them travelling from Italy to take part specifically in this competition and to enjoy the many scuba diving sites

Gozo and Comino offer.

A panel of judges from UK and Malta judged the competitors' photographs. Unfortunately, the weather only permitted for one dive to be carried out however the results, as remarked by the Head Judge (Christian Llewellyn - UK) still reached a very high level which was remarkable considering the worsening weather conditions.

The shore and seaborne teams from Emergency Response and Rescue Corps (Gozo) provided peace



of mind to the organisers should their assistance have been needed.

An Award ceremony was held in a hotel in Marsalforn on Saturday 11th November 2017, during which competition prizes sponsored by M&A Malta and Salpa Sub and trophies were presented to Alfio Scuderi (Italy – Best Picture), Mario Micallef (Malta – DSLR Camera Category), Loredana Iuranello (Italy - Compact Camera). The Awards were presented by the Hon. Justyne Caruana, Minister for Gozo, Mr. Joe Cassar, MOC Secretary and Mr. Alexander Arena, FUAM President.



www.fuam.org.mt

Why Wakatobi

Wakatobi Resort is consistently ranked as one of the top-rated diving and snorkeling destinations in the world, and it is a special favorite with underwater photographers and videographers. Here are a dozen reasons why.

1. Proactive Protection

Wakatobi Resort sits within a private marine reserve created and operated by the resort's founders. Covering more than 20 kilometers of reef line, this sanctuary encompasses some of the most spectacular and biologically-rich underwater landscapes in the region. Since the establishment of the reserve in the 1990s, fish populations have increased, and corals have returned to near-pristine status.

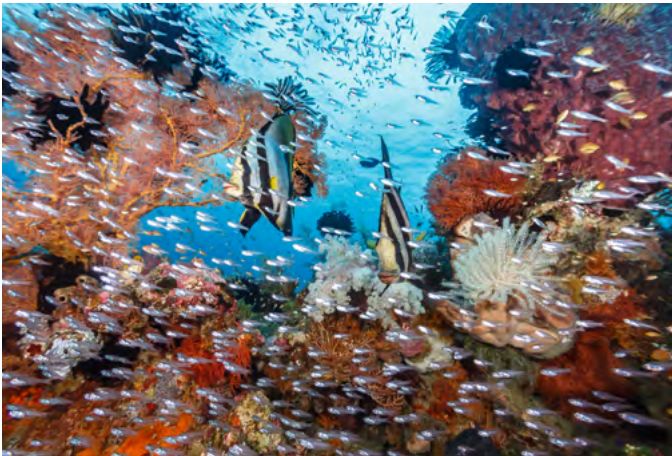
2. High Critter Counts

Wakatobi Resort is located in the heart of the Coral Triangle, which nurtures the planet's highest levels of marine bio-diversity. On the reefs surrounding the resort, underwater photographers will find more than 500 varieties of hard and soft corals, 2,000-plus species of fish life and many thousands more invertebrates.

3. Underwater Diversity

The dive sites surrounding Wakatobi Resort offer a diverse range of underwater scenery. Many begin as shallow reefs that rise to within a meter or two of the surface then transition dramatically to steep slopes or walls. At many sites, the reef topographies are ideally suited to multi-level profiles, and it is quite common for divers to log bottom times of up to 70 minutes while remaining within a no-stop dive profile.

Photos by Didi Lotze, Walt Stearns, Glen Cowans and Mathis Weatherall



4. Roomy Dive Boats

Wakatobi Resort operates a fleet of custom-built 21-meter dive boats. These vessels are designed for passenger comfort, with shaded decks, extra-spacious benches, dedicated gear storage bins, dedicated camera rinse bins and work tables that are out of the way of other divers and snorkelers.

5. Expert Guides

Wakatobi's dive guides are there to assist in image making rather than dictate dive plans. They understand the needs of underwater photographers, and are there to provide appropriate support. They are experts at finding small and cryptic marine life, and can even work as "human tripods," to assist photographers when they are working close to the reef with small subjects.

6. World's Best Shore Dive

Photographers have immediate all-day access to the House Reef, which has been named the world's number one shore dives. Shooters have been known to spend entire days working along small areas of this formation, discovering a wealth of interesting subjects at every turn. In addition, the dive staff operates small taxi boats that ferry divers and snorkelers up current so they can drift leisurely back along the wall.

7. Full Imaging Support

The resort's dive center includes a dedicated, climate controlled camera

room fitted with worktables and numerous charging stations. A full range of pro photography services are available, including one-on-one workshops on image processing, and in-water sessions with Wakatobi's resident photo pro.

8. Pro-Level Equipment

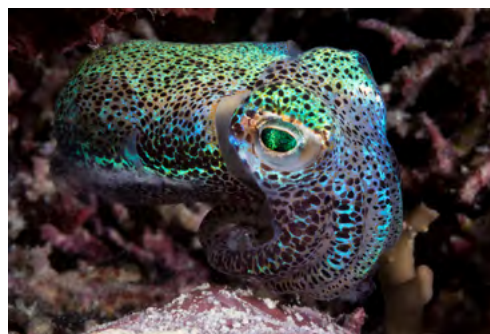
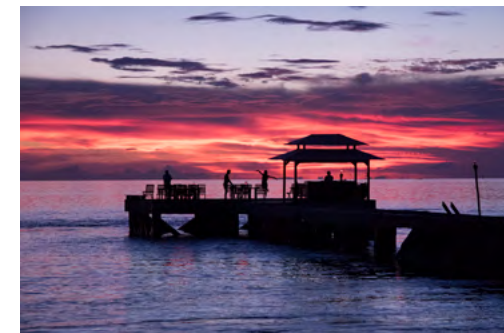
The resort's photo center maintains two complete Seacam housed systems available for rent: one with a Canon 5D Mark II, the second with a Canon 5D Mark III. Each can be fitted with a wide choice of lenses and matching ports, along with Seacam strobes to complement the system. In addition, the center stocks a number of compact camera systems, including the Olympus Tough 3 and Canon G12.

9. Easy Transfers

Direct charter flights from Bali arrive at the resort's own airstrip in just 2.5 hours, and provide ample baggage allowances for camera gear. At all stages of luggage transfer, from airport to dive center to dive boat, Wakatobi's staff takes extra precautions with camera equipment. Wakatobi also maintains an airport concierge staff in Bali to greet arriving passengers, assist with all details of transfer and hotels, transportation and activities for those wishing to make a Bali layover.

10. Shoreside Comforts

After a day on the reefs, guest can relax in a casually elegant setting of charming beachfront bungalows and



private villas perched on the shoreline. Wakatobi is a world-class resort, with spa services, fine dining and attentive personal service.

11. Something for All

Non-diving spouses or family members can enjoy a wide range of additional activities. Water sports include kayaking, stand up paddle boarding, wakeboarding and even kite surfing. Guests can wander the island's nature trail, relax in the library, tour local villages, or sign up for an Indonesian cooking or culture class.

12. The Pelagian Option

In addition to its land-based facilities, Wakatobi Resort operates

Pelagian. This 35-meter luxury dive yacht conducts one-week liveaboard cruises to more remote areas of the Wakatobi archipelago and the southern coast of Buton Island. Carrying a maximum of ten guests, and offering roomy hotel-like cabins, Pelagian combines five-star service and fine dining with unique access to a wide range of dive sites.

There are just some of the reasons why Wakatobi Resort truly is a world-class destination for underwater imaging.

To discover all this idyllic destination has to offer, why not go and experience it for yourself?

www.wakatobi.com



SONY ALPHA A7R III SONY ALPHA A9

Two incredibly powerful cameras, one smart housing. Suitable for scuba, snorkel, surf, pool, and any application in or around the water. Optional TTL circuitry provides lightning fast strobe recycle time and extended camera battery life. A redesigned control set, ultra-durable new ABS-PC blend construction, and the versatile Dry Lock (DL) port system make this system ready for anything you want to throw at it.

Read more at ikelite.com.



New Products

Nauticam NA-G9 housing for Panasonic Lumix G9



Nauticam is pleased to unveil the NA-G9, the latest release in the world's finest line of underwater camera housings. Nauticam is the market leader in ergonomics, build quality, and reliability. Built on a foundation of innovative product design and modern manufacturing technology, NA-G9 is the ultimate accessory for the exciting new Panasonic G9 camera.

Nauticam was the first housing manufacturer to support a Panasonic mirrorless interchangeable lens camera and features current housings for the GX8, GX85, GH4, and GH5 along with a variety of ports for Panasonic lenses. With the Lumix G9 Nauticam is once again at the forefront of innovation and cooperation, getting two prototype housings into the hands of Panasonic pro shooters before the camera

release for field testing! Nauticam & Panasonic - perfect partners.

Key camera controls are placed within an easy reach from the ergonomic, rubberized handles. An incredible amount of design resources go into crafting this layout, but that effort pays off with unmatched ease of use. Controls on the housing are placed exactly where they should be for easiest access in water, regardless of the camera layout. A large, sculpted shutter release lever is placed at the right hand grip for index finger operation, and features a patented geared mechanism that improves sensitivity for tactile feel of half press and full press. To facilitate back-button autofocus, the AF/AE lock button (which can be reassigned to activate AF) is controlled by a thumb lever near the right handle. No other housing comes close to achieving this

kind of ergonomic access to these critical controls.

No system is easier to assemble or break down. The camera drops into the housing with a quick release camera tray. No controls need to be preset, as housing functions for dials and switches align automatically (on/off, still photo/video).

Nauticam build quality is simply unmatched, using cutting edge product design and modern, innovative manufacturing techniques that result in service-free reliability. A bit like a fine Swiss time piece, the complexity under the hood results in a trouble free user experience that just works, and keeps working for years to come.

www.nauticamusa.com

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Nauticam
innovation underwater

DISCOVER A NEW HORIZON OF BEAUTY

NA-G9 Housing for Panasonic G9 Camera

www.nauticam.com

Lume Cube



The Lume Cube's durable casing is built for action. Providing professional quality lighting to your everyday life, the Lume Cube will allow you to revolutionize your photos and videos.

Made to fit your lifestyle, whether you're loyal to Apple or Android, the Lume Cube is ready to pair with your smartphone. Our free app lets you control flash, duration, and brightness of multiple cubes.

Make the most out of your nights with the Lume Cube and our proprietary accessories. Made to pair with any Casual Capture Device™, you can now illuminate your nighttime adventures.

Now your photo studio can be as mobile as you are. With powerful and adjustable light, you can even use the Lume Cube as a slave for your DSLR camera – offering unlimited capabilities for firing multiple cubes to completely light your scene.

www.lumecube.com

Mangrove MVHS-AX700 housing



Aditech unveils the new Mangrove housing MVHS-AX700 for the new 4K HDR (3840x2160) palm-sized camcorders: the XDCAM PXW-Z90, the NXCAM HXR-NX80 and the Handycam FDR-AX700 with an improved AF system.

The new camcorders have a Sony 1-inch stacked Exmor RS CMOS image sensor, and all three support an instant HDR (High Dynamic Range) workflow with HLG (Hybrid Log-Gamma). According to Sony, the most exciting thing about these new camcorders will be the fast Hybrid Autofocus system.

The Mangrove housing is designed for optimal grip operation, it is depth rated to 200 meters (660 feet)

www.aditech-uw.com

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Maximum power of 3000 lumens and can be easily mounted on any 67mm port.

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PACKAGE (WHITE, RED, UV AND AUTO OFF)



It's a Video light, red light, UV light and automatic focus light - all in one!
Maximum power: 2300 lumens.



UWCamerastore is WeeFine distributor for Europe.

Nauticam NA-RX100IV for Sony RX100 IV



“Amazing 4K Compact”

With the ability to shoot stunning 4K video and 20mp stills, this camera and housing package offers image quality approaching that of an SLR system with the size and convenience of a compact. Controls are simple, but well thought out with easy to access push buttons. Dual command dials immediately access frequently used manual settings like Manual Focus, F-Stop, and Shutter Speed. The addition of excellent wet lens options make for one versatile, powerful, compact package.

www.reefphoto.com

Nauticam SMC-2



The new SMC-2 lens builds on the success of the SMC-1 with almost double its magnification. In spite of all this, it maintains exceptionally high image quality, following the examples set by the SMC-1.

There are three key advantages to this internationally patent pending new optical design:

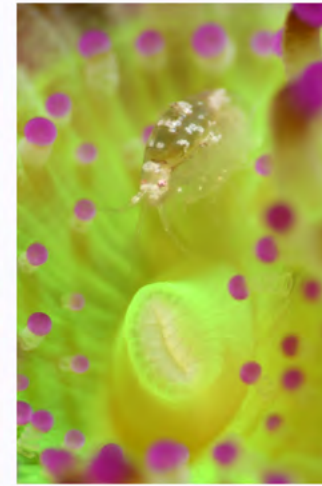
Higher Magnification Than Other Popular Super Macro Tools with Increased Working Distance.

Better Edge to Edge Image Quality, Higher Contrast, and Lower Color Fringing

Edward Lai, Managing Director of Nauticam, has utilized a revolutionary approach in developing the SMC-2. This is a completely new lens design, developed through hundreds of engineering hours utilizing computer software to



105mm lens only



With SMC-2



With SMC-2



model the optical properties of the complete underwater imaging system. Incorporating these factors into the design yields amazing sharpness, contrast, and clarity that isn't available from a simple magnifying lens for use in air sealed in a waterproof enclosure.

By utilizing a specially developed algorithm in the optimization process, the SMC

renders superior image quality over the full focusing range of the camera lens (which becomes ~50 to ~100 mm in front of the SMC). Also benefitting from the high brightness and contrast of the image, the autofocus system of the camera usually works acceptably well within this range.

High resolution was a primary design goal of the SMC project. This has been achieved using computer aided optimization and high grade optical glasses with unique refractive and dispersion properties. Images taken with this new system exhibit very high resolution and quality. Results have exceeded expectations, and these images rival the quality of the macro lens in air.

www.nauticam.com

ADVICE FROM THE UNDERWATER PHOTOGRAPHERS THEMSELVES!

NEW POWERFUL INON STROBE



INON Z-330 STROBE

THE STROBE WE'VE ALL BEEN WAITING FOR!



UW
CAMERA
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COM

Nauticam NA-A7RIII housing for Sony a7R III



The Sony a7R III is the company's latest high-resolution full-frame mirrorless camera. Following hot on the heels of Nikon's recent D850 release, Sony's newest full-frame camera also combines resolution with high speed shooting and fast autofocus capabilities to a degree we've not previously seen.

A professional housing befitting of a top-of-the-line camera, the NA-A7RIII underwater housing provides fingertip access to all key camera controls in a rugged and reliable aluminum underwater housing. Ergonomic camera control access is one of the defining strengths of a Nauticam housing, and the NA-A7RIII continues this tradition. Essential camera parameter changes are made from the handles, without awkward reaches.

The NA-A7RIII housing inherits

the core design elements from the Nauticam pro DSLR range, and bundles them in a more compact package. A patented port locking lever allows lens changes to be made in seconds. Opening the housing for quick battery and media changes is fast and easy with the locking housing latches. All aspects of the system are a seamless extension of the camera.

Sharing the same lens port accessories as the Nauticam NA-A9 and NA-A7II housings, a list of thirteen Sony FE mount lenses are currently supported. An adapter allows the entire N120 DSLR lens lineup to be used as well, supporting the popular Canon EF lenses attached



to the a7R III with an EF to Sony E mount lens adapter. Also available is an adapter to attach the water contact UW-Nikkor series lenses originally used on the Nikonos underwater range finder systems. From ultra-wide fisheye lenses to long macros, the Nauticam A7RIII system has all focal lengths covered.

www.nauticam.com

REEF

PHOTO & VIDEO

Nauticam NA-D500 for Nikon D500



“A New Era”

With 153 focus points and 10 fps continuous shooting, there has never been a Nikon DX camera with the level of autofocus and continuous shooting capability as the Nikon D500—not to mention the revolutionary addition of 4K UHD video. This extraordinary camera demands an equally impressive housing, and the Nauticam design team has left no detail overlooked. In addition to the superior ergonomics for which Nauticam is renowned, each NA-D500 comes with an installed manual optical flash trigger—standard!

www.reefphoto.com

Inon Z-330: Available to pre-order



The Wait is Over! The New Flagship Inon Underwater Strobe is Available for Pre-Order

Clearly the wait has been worth it. The new Inon Z-330 appears ready to set new standards for this class of underwater lighting and bristles with new innovations while maintaining the best of the Inon tradition. Here are a few of the highlights worthy of consideration whether you are just starting out in underwater photography or you are a seasoned pro ready to upgrade.

A Guide Number of 33 at 110 Degrees Angle of Coverage with No Diffuser:

The Z-330 provides nearly twice the power of the legendary Z-240 while offering a wider angle of coverage.

An Adjustable Directional Light Shade:

This is not just a clever gimmick,



but a valuable tool that shooters will find many uses for. Imagine rotating your shade to prevent lighting the background behind your macro subject or rotating the shade inwards to minimize backscatter in front of your dome. Doing a shark dive with Tiger Sharks or Hammerheads? Try rotating your shades low to avoid over exposing the white sand. It only takes seconds to remove it when not needed.

At first glance the back of the Inon Z-330 may look familiar to Z-240 users, but the labeling is much improved, less complicated and glows in the dark. The new knobs are extremely ergonomic no matter how thick your gloves are and there are distinctive luminescent directional indicators to assist your settings in low light.

Domed Diffuser Included:

Inon has given the Z-330 strobe



a unique hemispherical domed port for the flash tubes to minimize the need for a diffuser in normal shooting. But when you do need the extra wide coverage, a sophisticated dome diffuser is included that traditionally was an expensive option.

Around the front of the strobe, the Z-330 has a metal heat-sink. The heat generating components are internally mounted directly to this heat sink which rapidly carries the heat to the surrounding water.

The Inon Z-330 may be triggered with either fiber optic cables or electric synch cables. Other than your synch cable, no additional items are required.

www.reefphoto.com

Nauticam
innovation underwater

*Think beyond, unlock
your adventure.*



**NA-D850 Housing for
Nikon D850 Camera**

www.nauticam.com

Ikelite 200DL housing for Canon EOS 6D Mark II



The 200DL Underwater Housing for Canon EOS 6D Mark II DSLR is a full featured and durable waterproof housing for Canon EOS 6D Mark II DSLR cameras. Suitable for scuba, snorkel, surf, pool, and any application in or around the water.

This popular model has been designed from the ground up to include all of our latest improvements.

The single most important upgrade is our long awaited new Dry Lock (DL) port system. This exciting new system is even more robust and even easier to assembly than our time-tested Four Lock (FL) system. The new ports are lighter and more adaptable, and can accommodate extremely large diameter lenses with ease. If you're considering shooting professional quality lenses like the Canon EF 16-35mm Type II/III or the Canon EF 11-24mm, then the DL system is essential.

Most popular zoom lenses and select lens focus rings can be engaged using a simple yet effective gearing system that puts adjustment right at your fingertips. A large, soft-touch lobed knob on the side of the housing makes fine tuned adjustments a breeze.

Zoom and focus gears differ depending on which lens you are using. All are lightweight and affordable.

Our push buttons have been redesigned to reduce weight and salt build-up. The back of the housing features laser engraved control symbols which will never fade or fall off.

www.ikelite.com

www.uwpmag.com

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110° coverage in water

For Professionals Who Know The Difference

www.keldanlights.com

Olympus TG-5 Camera, Housing & RingLight Macro Package

This compact and lightweight package is great for travel and contains everything you need to take the Olympus TG-5 camera diving to capture the small world around you. It includes the Olympus TG-5 camera, a neoprene bag for it, PT-058 underwater housing and the amazing Weefine Ring Light 1000. It makes a great second macro camera that's small, and easy-to-carry!

For the first time in a rugged compact camera, you can shoot in RAW for the highest possible resolution and maximum creative control. With Olympus' advanced 12 Megapixel BSI CMOS Sensor and the TruePic VIII Image Processor, you will capture the smallest details and the brightest colors of every exciting moment.



www.opticaloceansales.com

Dive and See DNC-5A monitor



With the enhanced 450 cd/m² backlight and a 1000:1 color contrast ratio, this monitor produces a crystal clear picture and shows colors vividly even used under sunlight. Forget to have to look through the viewfinder or using your camera's small display.

A large, manufacturer sealed, bright external DNC-5A monitor gives you the ability to frame your shots and focus with great precision, the flexibility to swivel and tilt to any angle (which is convenient for underwater photography), and fits practically any housing, underwater cameras.

The monitor is powered by its own UN/DOT 38.3 Certified Lithium batteries so they do not rob any power from the camera's battery.

www.diveandsee.com

Aquatica housing for the Nikon D850



Aquatica is proud to introduce to you our new AD850 housing for Nikon's next-generation high resolution, full-frame DSLR. Coming in at only \$2,895.00 USD. Reserve your unit now!

We are proud of the lightweight design on our AD850; this being possible because of our new in-house 5 axis machine & our engineers being able to work closely with the machine programmer.

This housing is 12% lighter than our AD800 & AD810 housings, but yet still has the same standard 90m/300ft depth rating and can still be upgraded to 130m/425ft. We then ergonomically placed the vital controls where they are most needed, right at your finger tips.

Even though the D850 is a bigger camera than the D500, the AD850 housing has the same form factor and layout control as our popular AD500 housing.

www.aquatica.ca

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Issue 100/30

Sea & Sea MDX-D850 housing for the Nikon D850



Its superior ergonomic design and stand-out range of optional accessories help you capture those optimal moments with the best image quality.

Using unprecedented precision machining, the dimensions of the housing are similar to those of the camera. In addition, the revised internal design has also helped reduce weight. The MDX-D850 is approximately 11% (350g/12.3oz) lighter than the previous MDX-D810 housing.

Frequently used Main and Sub-Command dials are now located directly on the right side of the housing. ISO, REC and other camera functions can be operated by external levers whilst holding the grips. With the AF lock function, you can fix the focus point as required.

All the dials have a spring (damper) to prevent slip of the controls even if the dimensions of

the cameras are slightly different or even if gears or other parts wear out to some extent.

Compatible with Optical YS Converter/N1 for MDX housing which converts the camera's hot-shoe TTL signal to a light signal. Both TTL and manual strobe modes can be used and controlled from the housing using a Fiber-Optic Cable II.

TECH SPECS

Construction Body: corrosion-resistant aluminium alloy (machined)

Construction Grip: Corrosion-resistant die-cast aluminium alloy

Depth Rating: 100m

Dimensions (WxHxD): 346 x 202 x 140 mm

Weight: Approx. 2,850g (Housing only)

O-Ring Set: 62148

SRP: £3,999.95

UCL-90 M67/UCL-90 LD INON Close-up Lens



INON INC. is pleased to announce official release of powerful yet user-friendly underwater close-up lenses UCL-90 M67 (screw mount type)/UCL-90 LD(28LD compatible bayonet type) on December 27th, 2017.

The UCL-90 series is designed to use solely underwater to acquire high quality image from its compact body thanks to HR glass providing long working distance and widely supports from a macro lens for full frame SLR system to a compact digital camera.

www.sea-sea.com

www.inon.co.jp

www.uwpmag.com

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Acquapazza APSO-A73 housing for the Sony ILCE-7RM3



Japanese housing manufacturer Acquapazza are developing their APSO-A73 housing for the Sony ILCE-7RM3. It is a camera which they use themselves rather than the A9 but they both fit the same housing. The only difference is that the A73 does not have a Submode dial.

As for A7RM3, the thickness of the body became 1 mm thinner.

The height of the lock button of the mode dial is also different and other adjustments are being made as the development progresses.

The APSO-A73 has “Variate grips” which can be adjusted either horizontally or vertically and this is especially useful when shooting video. The handle position can be adjusted for maximum ergonomics

as well as eliminating wrist strain.

The Video ON/OFF lever is pushed when the handle is vertical and pulled when it is horizontal.

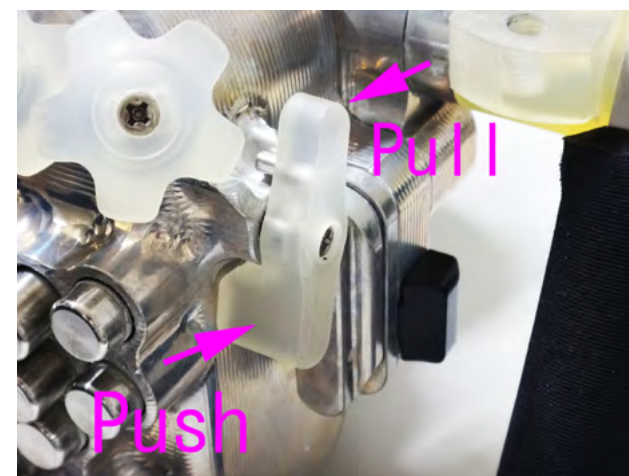
A spacer is also being trialed with a mount base so that the shoe base adapter X2 and T slide base or M10 ball joint can be attached to the handle.

The internal Sony strobe can be turned On and Off by pushing the control down for On and up for Off.

The following extension rings will be available.

- E1224G extension LB
- E1635G extension LB
- E2470G extension LB

The Acquapazza ports and



extension rings are exclusive designs to make sure the lens and dome glass are in the perfect position for maximum optical performance.

The lenses including the fisheye and wide lenses are supported within the dome by a surrounding collar to ensure the correct positioning.

www.acquapazza.jp/en

OLYMPUS TG-5

INCREDIBLE SUPER MACRO
12mp RAW PHOTOS
WATERPROOF
4K VIDEO

Get yours today!



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UNDERWATER VIDEO & PHOTO

Weefine ring light 3000

A ring light with white, blue, red light and flash/strobe function! Perfect for super macro images and videos. The Weefine Ring Light 3000 is compatible with any housing with M67 threaded port. The maximum power output is 1800 lumens continuously or 3000 lumens in flash mode.

The Weefine ring light 3000 is best suited for super-macro, or subjects where the working distance makes it difficult to pull your external strobes or lights close enough for even lighting. The ring light improves these images and videos by producing an even lighting and softens the highlights.

The ring light gives you 1800 lumens (continuously) with 4 different power levels (100%, 75%, 50% and 25%) and 3000 lumens in flash/strobe mode (an optional optical cable is required for the flash mode).

The burn time is around 45 minutes at the highest power level. The power comes from one 26650 battery. It's already supplied in the package and it comes with a small and easy to use charger.

In addition to the white light the



Ring Light 3000 is also equipped with red and UV settings making it a very universal device for the perfect macro shot!

www.uwcamerastore.com



Nauticam NA-A6300 for Sony A6300



“Versatility & Power”

The Sony A6300 is blurring the lines between compact camera, DSLR, and video powerhouse with its 24.2MP APS-C sensor and 4K UHD shooting capability. An ever-expanding selection of lenses allows your pick of the right lens for the job. The 16-50mm PZ kit lens is easily and comfortably controlled in the Nauticam A6300 housing and is expertly complemented by the Nauticam Wet Wide Lens (WWL-1) or Compact Macro Converter (CMC-1) for the ultimate in versatility—all in one dive!

www.reefphoto.com

OPTICAL DOME PORT II 100

FOR FISHEYE LENSES
100mm OPTICAL GLASS DOME



OPTICAL DOME PORT II 165

FOR FISHEYE AND WIDE-ANGLE LENSES
165mm OPTICAL GLASS DOME



OPTICAL DOME PORT II 230

FOR FISHEYE AND WIDE-ANGLE LENSES
IDEAL FOR HALF-IN-HALF-OUT SHOTS
230mm OPTICAL GLASS DOME



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Outex launches clear universal housing

Outex has launched a clear version of its rubber underwater camera 'housing' via Kickstarter, where it is seeking \$35k in funding to bring the product to market and help even more people get into underwater photography without breaking the bank.

This clear version joins the company's original rubber sleeve, which features a solid blueish color with the exception of the lens cover. The clear design, according to Outex, makes it easier to adjust camera settings after putting the camera in the sleeve. And while the Kickstarter doesn't mention it explicitly, we assume this version features the same IP08 rated waterproof design as the blue version, which can withstand depths up to 10 meters or about 33 feet.

Unlike most camera housings, which are made of rigid materials and designed to fit a specific camera, Outex's rubber sleeve stretches to accommodate a variety of camera and lens shapes and sizes. Additionally,



Outex says its new model has an "improved material composition" that makes both installation and removal easier by offering increased malleability and elasticity.

Finally, Outex says the housing covers also have better longevity thanks to a reformulated compound design and better manufacturing process.

The Kickstarter campaign is offering backers one clear cover for pledges of at least \$100. Assuming the funding goal is met and everything goes according to plan (NEVER a guarantee), backers will receive their products in January 2018.

www.kickstarter.com/projects/outex/clear-outex-housing-waterproof-covers-for-cameras/description#

Subal GH5 for Panasonic Lumix GH5



The GH5 housing provides access to all the functions of the Panasonic Lumix GH5 including Live View and Info.

The ergonomic SUBAL housing design and arrangement of all the key controls allows easy camera operation without letting go of the grip. The camera is fitted on a special cradle which enables a precise and faster, more secure mounting. A 4mm O-ring and the SUBAL Quick-Lock closure system prevents accidental crushing of the O-ring and ensures maximum safety.

Material selection, processing, surface protection and finish conform to the usual high-quality that is common to all SUBAL products. SUBAL offers for this housing model the slim standard viewfinder reduces the viewfinder image so that it can be seen fully despite wearing a dive mask.

www.subal.com

www.uwpmag.com

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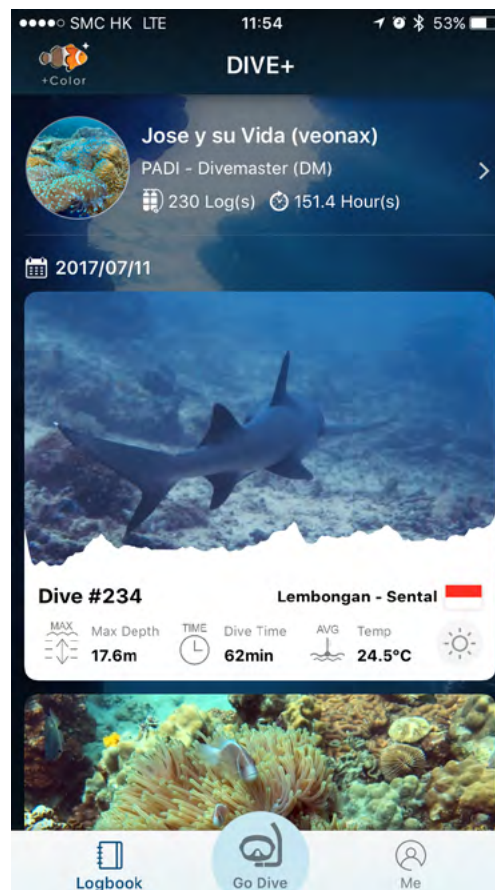


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Dive+ app



The algorithm behind it is based on a combination of high-tech artificial intelligence and sound domain knowledge in underwater photography, thus amazing results are produced in a simple easy way.

The app also combines a diving community, a digital logbook and will provide more features for diving enthusiasts in the future.

Dive+ also partners with Weefine / Kraken to roll out a universal smartphone housing in which a dive computer is integrated, and it can log the dives automatically after coming back to the surface.

The app is now on App Store and Google Play for free download, or get it at:

www.dive.plus

Internet start-up Dive+ has launched its whole new diving app named Dive+

Divers are able to color correct their underwater pictures with only one click for free, instead of hours of retouching and editing in proprietary software like Photoshop and Lightroom. Though adjustments are not supported yet, the results are quite impressive.

www.uwpmag.com

Quickly fix scuba pictures with LAND & SEA SCUBA



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Other imaging software to fix scuba pictures can often times be difficult for a novice user to enhance the colors to the vibrant colors we see in the underwater world. With our tools, anyone can simply apply one of our quick fix scuba pictures tools and have beautiful underwater photos.

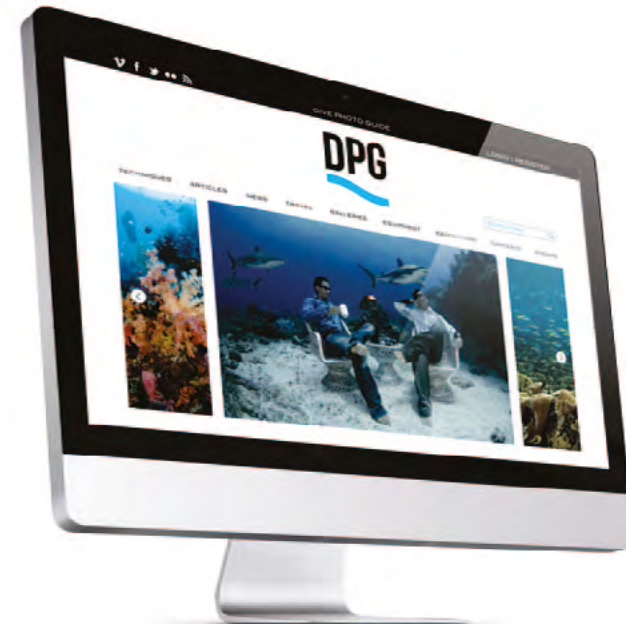
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MIRRORLESS MIRRORLESS ON THE WALL



WHO HAS THE LARGEST SELECTION
OF THEM ALL?



THATS WHO.

Galápagos by Josef Litt

Josef Litt announces his new book, GALÁPAGOS. It is a brand new and unique guide to the islands full of captivating information and first-hand stories – with 288 pages overflowing with more than 300 stunning photographs as well as original illustrations. The book is available for pre-order. Shipping times are expected to be in early February 2018.

GALÁPAGOS will take you on a breath-taking journey through the magic archipelago also from underwater and bird's eye perspectives. It uncovers fascinating behaviour of the unique Galápagos fauna. It is filled with stories of discovery and colonisation but also of exploitation, deceit, mutiny and murder. If you plan to visit Galápagos or would just like to know more about the incredible archipelago, this is the book for you.

“I found the writing crisp, clear and engaging, jam-packed with intriguing theories, eye-opening facts, and attractive illustrations. Here’s



GALÁPAGOS



JOSEF LITT

a book that I – and I hope many others – will use and enjoy for a long time to come.” – Tui De Roy, world-renowned photographer and author of the most acclaimed books about Galápagos.

“A must-read for anyone planning to visit the islands and equally for those that already have a place in their heart for Galápagos.” – Dr Alexander Mustard, internationally awarded underwater photographer and a commended author.

www.mostlyunderwaterbooks.com

www.uwpmag.com

2018 Calendar by Jeremy & Amanda Cuff



Photographers and photojournalists Jeremy and Amanda Cuff have published a new 2018 Calendar titled "Diving Dreams".

Jeremy said, "The Diving Dreams 2018 Calendar features a variety of images, mostly from our dive travels over recent times, and includes destinations such as Bali, Hawaii, Guadalupe, the Turks & Caicos Islands, the Maldives and the UK."

The 2018 Calendar can be obtained from Jeremy & Amanda at a cost of £9.00 including postage (within the UK).

For further information, please visit Jeremy & Amanda's website at

www.ja-universe.com

Basking Shark T-Shirt



Basking Shark T-shirts are medium weight, males with a round neck and the girls have the fitted version with fitted seams and V neckline. Logo on the back and shark on the front as per our hoody.

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Like our hoody they are in stock black with white lettering however we can order custom colours when we place an order (usually 3-4x per year. Add £5 if you want customised name etc (like Dive Team) in the picture, you can your name or your given nickname from the boat or whatever you like!

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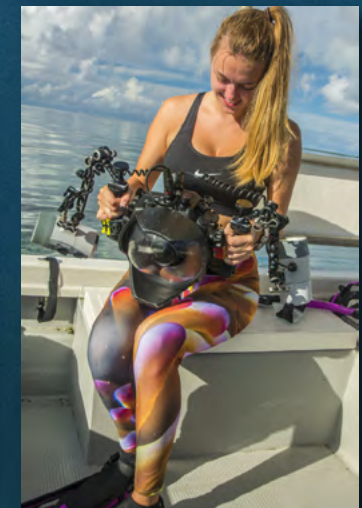
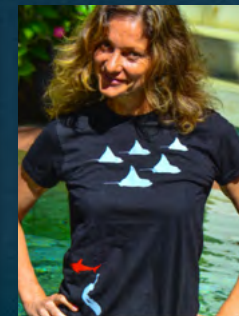
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Dome Free in Mexico

by Alex Mustard

In the last issue of UwPI I wrote about the inherent advantages of using a properly corrected water contact lens for underwater photography, and introduced the Nauticam WACP. As that article explained, while we get excited about the advances of sensors in the latest cameras, the real bottleneck to image quality in underwater photography is the interface between air and water at the port, which, whether flat or curved, introduces significant optical problems. Water contact lenses are specifically designed to work in water, eliminating these issues and recent availability of autofocus underwater corrected lenses is what we should all be getting excited about.

I went on to conclude, in the last issue, that just as dome ports replaced flat ports for wide angle photography from the 1960s onwards, the arrival of the WACP hopefully heralds a new era for housed cameras in which domes are superseded by underwater corrected optics, for certain shots. Water contact optics have been very scarce in the digital age, but that is changing. The aim of this article is to show I practice what I preach, sharing my motivation, experiences and images from two trips that I made to Mexico at either end of 2017. Both trips had a complete focus on wide angle (shooting cenotes and

sea lions, respectively), yet on both trips I happily left my dome port at home and fully committed to water corrected optics.

After last month's tech fest, many will be pleased to hear that this is non-technical article, free from corner sharpness tests and resolution graphs! I should also stress that this is my normal gear, and highlighting these particularly trips is something of an artifice for this article. I am also keen to be honest and objective in highlighting strengths and weakness, as most commentary I see from those who own these rare treats is wholly evangelical.

I am aware that this is currently a niche interest topic. Optics might be the bottleneck for image quality,

Beneath mangrove trees. Although water contact lenses allow us to open the aperture more while still recording high detail to the corners of the frame, there are many occasions where we do not want to open the aperture. Such as when it is very bright, or, as here, we want to ensure sufficient depth of field through an extensive scene. Nikon D5 and Nikonos 13mm, Subal housing. 1/125th @ f/13. ISO 1000.





A diver in the jaws of a cave. With a dome port, f/13 is my magic number for acceptable corner sharpness with a full frame camera. With all three of these water contact lenses f/8, being conservative, gives the same level of detail. Nikon D5 and Nikon 20mm, Zeiss UW Corrector Port, Subal housing. 3 x Inon Z240 strobes. 1/320th @ f/9. ISO 1600.

but they aren't the pinchpoint controlling how many of our photos are truly memorable. If only underwater photography was so straightforward! In addition, these optics can never be a universally recommended investment, when you consider the costs involved. That said, understanding the what, why and how is valuable knowledge for all. Furthermore, part of the pleasure of underwater photography is owning and using quality equipment, and I fully understand anyone wanting to pursue these solutions for that reason alone.

Water contact optics are not new in underwater photography, the best know are certainly the

Nikonos wide angle lenses, but there have been others down the years. When properly designed they give us the truly excellent image quality we'd expect from not having to deal the problems introduced by a port. Others have been poorly designed and cheaply constructed and can be easily outperformed by well setup dome port. These have definitely made some underwater photographers sceptical of the advantages of water contact solutions. As an analogy, think of land telephotos – there are, and have been, lots of lenses capable of giving you 500mm magnification, but there is a massive performance difference between the current, fast

pro prime and a cheap, old, superzoom kit lens. Similarly, not everything marketed as water contact is created with equal optics.

I've carefully chosen the water contact optics I use for the advantages they give me over a dome port setup, while not compromising my ability to get the shot. In other words, they must have AF and an automatic aperture (something old Nikonos V lenses do not offer). The three options I took to Mexico, all providing me with distinct perspectives with my Nikon full frame SLR, were as follows:



The Nauticam WACP and Nikon 28-70mm attached to my Subal housing. With a Nikon FX camera this gives a underwater corrected fisheye with a FOV from 130° to 57°.

Nauticam WACP

Most familiar to UWP readers (at least after the last issue) is the Nauticam WACP, which when used with Nikon 28-70mm is transformed into a water corrected fisheye lens with a 130-57° FOV (FOV is the field of view of the lens – it is best to talk in these terms because water contact lenses don't have the same focal length to FOV ratio as land lenses). Although designed and built by Nauticam it can be easily adapted to other housings (I use an adaptor made by Saga). The WACP is commercially available, although there is already a sizeable pre-order queue.



The Nikonos 13mm fisheye is a water contact autofocus lens from the Nikonos RS. It can be reprogrammed to work with modern Nikon SLRs – here mounted on Seacam, Subal and Nauticam housings on my La Paz workshop.

Nikonos 13mm

Next, is the lens I use most, the Nikonos 13mm or RS-13, a 170° FOV autofocus fisheye originally built for the Nikonos RS. The RS camera is very different from the other, more numerous Nikonos cameras because it is an SLR and uses lenses with automatic aperture and autofocus. RS lenses use Nikon's classic F-mount, but with the connectors wired up differently. However, they can be rewired to work with modern Nikon SLRs. My lens was converted by Seacam, whose conversion allows the full aperture range to be used, and I use it in with a Nikonos to Subal port mount made by Andrej Belic. This option is commercially available in very limited numbers.



The Carl Zeiss "Unterwasservorsatz" optical corrector port, with a Nikon 20mm AF attached to my Subal housing, giving a rectilinear FOV of 94°.

Carl Zeiss "Unterwasservorsatz"

Third, is a Carl Zeiss Underwater Corrector with a Nikon 20mm lens, which is probably the most valuable because it is rectilinear (keeps straight lines straight, no fisheye distortion) with a 94° FOV. This is an Ivanoff style underwater corrector, originally commissioned by Hasselblad for the underwater use of their dedicated medium format Super Wide camera. I adapted this for my SLR with a Hasselblad to Subal adaptor custom made by Peter Ladell in the UK. The result is pretty much like an autofocus Nikonos 15mm (also 94° FOV)! I have been using this for a few years and it has already produced scores of published images and a winner in the Wildlife Photographer of the Year contest. I am currently the only person using this option, but

other Zeiss correctors do exist (sitting unloved on shelves - although I have not been able to find one).

The paradox of water contact glass is that you invest your hard-earned and it doesn't really look any different through the viewfinder! OK, on land, it won't focus properly, which suggests something different is at play, but it would be nice to have more reassurance of its game-changing ability! We know deep down that we are gaining image quality by not shooting through that extra window - a port. And, with a little faith, we can dial in settings that we know would be compromised with a dome. But none of this is demonstrable when we first pull the camera to our eye.

As soon as we start downloading, we're rewarded by images with finer details, although most of the time they will otherwise be identical to what we would have shot with our existing tech. Once we're adapted to the new possibilities, water corrected lenses allow us to grab images we'd miss or that would be compromised with a dome. Being able to open up the aperture more than usual is certainly valuable in the darkness of subterranean caverns of the Riviera Maya, where I was already teetering on the limits of acceptability of ISO and shutter speed. It was also prized in the Sea of Cortez, where my trip



Sealion pup with starfish toy. Capturing action with dark subjects in dark conditions makes selecting settings a challenge. Water corrected lenses give us more options. This allied to the wide zoom range of this setup, creates a very versatile system. Nikon D5 and Nikon 28-70mm @ 35mm, Nauticam WACP. Subal housing. 2 x Seacam 150 strobes. 1/125th @ f/11. ISO 800.

in early November coincided with the peak of playfulness of that year's sea lion pups, still supercharged by mum's milk. The pups are irresistibly adorable, but much darker than the

adults and like hanging out up against the dark volcanic rocks of the islands. They are the wide angle equivalent of a black, hairy frogfish on Lembeh's basaltic sands and opening the

aperture gets more strobe on them and increases our shutter speed.

Quality water contact lenses will always be sharper than a dome, but the margin of their advantage

increases at wider apertures. Conversely, the gain is much less apparent when the conditions allow for (or demand) shooting at a closed aperture. Shooting at f/8 on a full frame camera, for example, all three options very obviously outperform a dome port setup in corner detail. However, at f/16, the advantage is only visible if you really pixel peek. Three years ago, when first using the Nikonos 13mm on digital, I did back to back shots of a Red Sea reef scene with it against a Sigma 15mm and 230 dome. On showing the owner of the lens the results, he said, “wow isn’t it superb”. Then I told him he was still looking at shots from the Sigma 15mm taken at f/16! The RS-13 lens was a better (and I was motivated to convert mine based on the results), but if you always shoot with closed apertures and fisheyes you are only going from very good to excellent.

Full frame photographers have the most to gain because we struggle more than those working with smaller formats with wide angle image quality behind dome ports. Furthermore, as camera resolutions soar with each generation, so diffraction becomes more of an issue when the aperture is closed, this increases the value of the ability of water corrected optics which deliver at more open apertures.

Happily, all three water corrected optics are physically smaller than a big dome, which streamlines the housing for speed through the water (particularly good for pursuing marine mammals) and more importantly makes it easier to light subjects very close to the lens. All focus almost to the front element, although you definitely don’t want to scratch something that is borderline irreplaceable. Douglas Seifert told me recently that Seacam have said that they can polish scratches out



A diver in sunbeams. Although the sunbeams look bright, this was a very dark scene and the ability to open the lens to f/8 and still produce excellent image quality was beneficial in producing a high quality result. Nikon D5 and Nikonos 13mm, Subal housing. 1/25th @ f/8. ISO 1600.

of the RS-13. A service, I hope, I never need to try.

The other downsides of being domeless? Money. I know dome ports aren’t cheap, but water contact optics are even more expensive. And everyone I know who is using them has already bought a dome! They are an additional purchase, not an either-or. They are also not easy to get hold of. I cannot find a backup for my Zeiss corrector

port. The RS-13 is Nikon only, and Nikon only made a finite number of them, far fewer than the number of D850 shooters already out there. And while Nauticam have been thrilled with the level of orders they have received for the WACP, the production speed is limited by the challenge of obtaining high quality optical glass in the size and quantity required!

A significant downside of water contact is that split levels are not possible (you can still shoot them, but the above water portion doesn't look good). Although this sounds a niche complaint, many pros will attest that their split shots are strong sellers. On my Mexico trips, I was happy to accept this compromise, but on my 2017 trips to Cayman, Cuba and Egypt I travelled with my trusty Zen 230 too. Another black mark is the weight penalty, both in our luggage and in the water from these big chunks of glass. Big dome ports add a lot of buoyancy to housings making them close to neutral, water contact lenses do not, significantly shifting how our rigs handle underwater.

One of the reasons that underwater photography is so enjoyably addictive is that it challenges us in many ways. We need to get lots of things right before we can produce stunning images – ranging from where and how we choose to dive, to the equipment we take in, to making good decisions about lighting, exposure, focus and composition. I can always live with missing a shot because I run out of talent at the moment of shooting. But I do get frustrated when I miss a shot because of poor decisions made ahead of time, free from pressure, such as poor photographic planning or by not using the best equipment possible. This is my main motivation for water corrected optics. I know they exist, I know they are the best, therefore I want them on my camera. On many occasions, they offer only a small advantage over a standard lens and dome, but that advantage is there in every shot we take. At other times the advantage is much more significant and I will have a much better opportunity to bag a shot, that for others gets away.

The way I see it, is that we can only shoot one underwater camera at a time, so it makes sense to



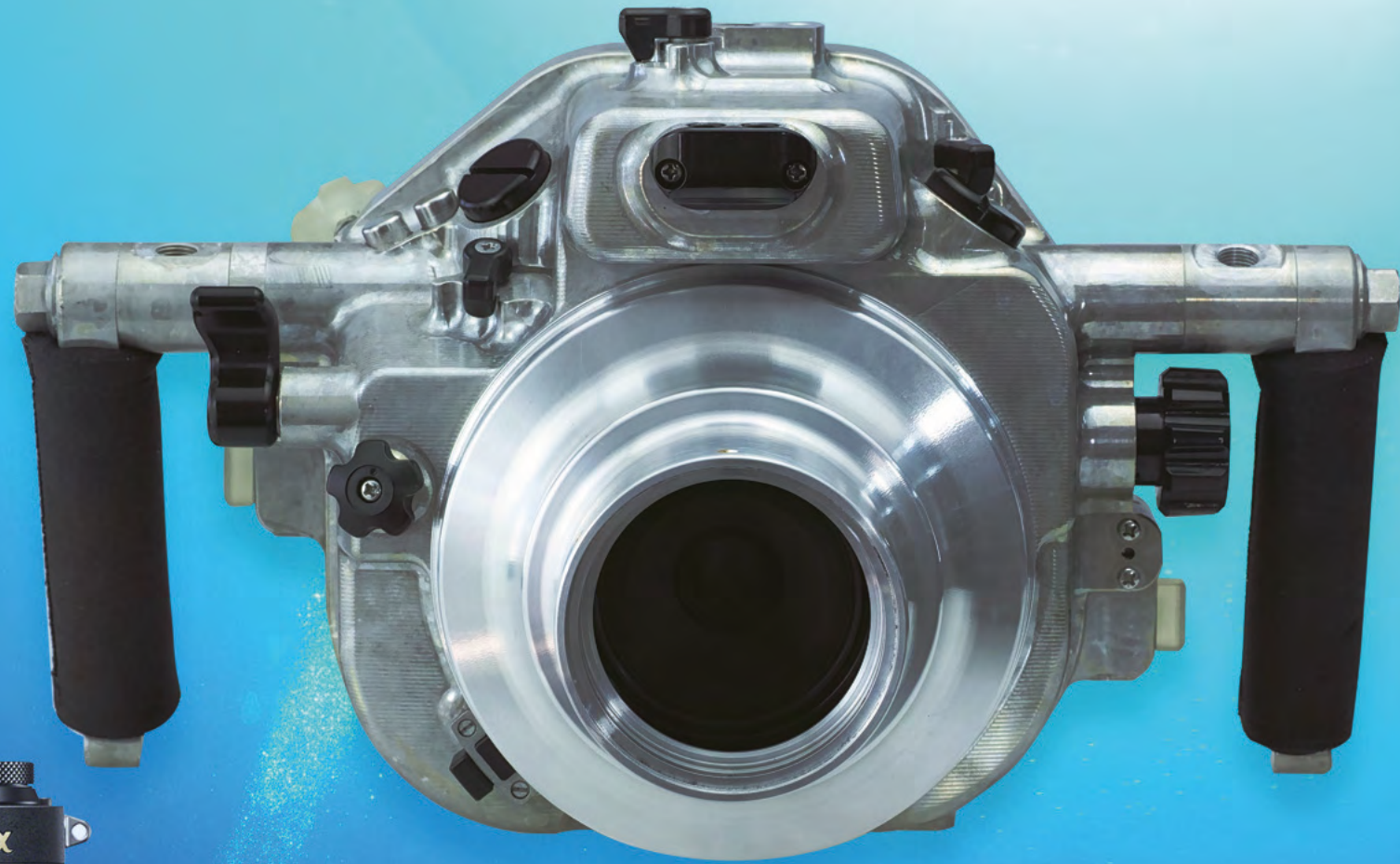
Which way is up? The three lenses I use are very complimentary. I am often asked which one should people get, but in reality the three offer very different perspectives. The RS-13 does not overlap at all on FOV, the WACP covers a huge range of FOV, and the Zeiss CP is rectilinear, without fisheye distortion. That is why I travel with all three. Nikon D5 and Nikon 20mm, Zeiss UW Corrector Port, Subal housing. 2 x Seacam 150 strobes. 1/100th @ f/11. ISO 800.

make it the best available, giving us the best chance of capturing the shot. I am pleased to be able to report, that if you feel water contact optics are right for you, that a dome free future is available right now.

Alex Mustard
www.amustard.com



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Acquapazza APPA-GH5

housing for the Panasonic GH5

by Peter Rowlands

I think it's fair to say that you can judge the popularity of a camera for underwater use by the number of manufacturers making housings for it and a prime example of this is the Panasonic GH5.

The traditional dominance of Nikon and Canon in the pro/semi-pro market is now under threat like never before with serious competition from Sony and Panasonic as they either produce full frame game changers like the Sony A series or the 4/3rds benefits of the Panasonic GH series.

The 2017 DEMA Show saw the wraps being taken off several Panasonic GH5 housings and I was able to spend some time with one in particular from Japanese manufacturer Acquapazza. They first came to my attention at DEMA 2010 when I saw their revolutionary (as far as I'm concerned) Sony NEX-5 housing which incorporated the ability to tilt the rear LCD screen up to 45°. This would make shooting video and low level stills shots much more ergonomic and therefore productive to shoot.

No other manufacturers at the

time were offering that capability and I spent the next three years using their APSO NEX-5 housing. It performed faultlessly with its combination of simple mechanics backed up by double O rings and aluminium strength. The Sony NEX-5 manual white balance was legendarily poor but nothing a simple Magic filter couldn't solve :-)

As a primarily video shooter I got tempted away by Panasonic whose white balance was a breath of fresh air and their video processing was gaining them an enviable reputation in both the professional and semi-pro world. Acquapazza were concentrating on the emerging and impressive Sony RX and 6000 range so our paths drifted apart save for enjoyable conversations at DEMA between owner Toshiki Yamamoto and myself ably assisted by Miki Kurimoto who runs www.scubafreedom.com in the Yucatan Peninsula when she is not translating at DEMA.

Toshiki Yamamoto is an underwater photographer and technical diver who was drawn into





Opening the housing is via two turn key levers with safety locks and the main double O ring seal looks very reassuring and easy to access for maintenance.

The camera is mounted onto a baseplate which slides into the front of the housing and provides secure and precise positioning.

Internally the APPA-GH5 looks positively minimalist but that does not mean there are fewer controls.

The APPA-GH5's push buttons are significantly larger in diameter making them much more comfortable to push.

housing manufacture, like several others have been, because they couldn't find the housing they wanted but, as engineers, they knew how to make a better one. His main market is in Japan but every year for the past eight years he has exhibited his expanding range at DEMA and is gaining a wider reputation with his innovative designs.

The Acquapazza APPA-GH5 is machined from a solid block of aluminium which is then anodised for durability and is available in a choice

of no less than 16 colours. Quite how this affects their stock control I do not know but this offering does set Acquapazza apart from all other manufacturers who only offer their single choice of colour.

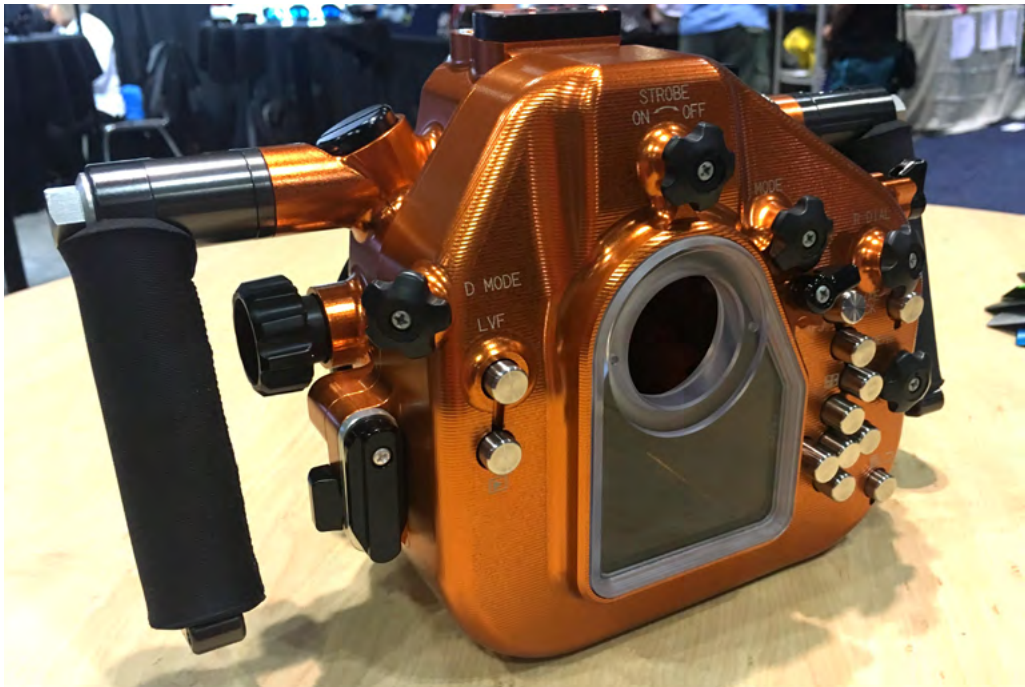
Picking up the APPA-GH5 I was immediately taken by the soft grip handles but also by its light weight. Opening the housing is via two turn key levers with safety locks and the main double O ring seal looks very reassuring and easy to access for maintenance.

The camera is mounted onto a baseplate which slides into the front of the housing and provides secure and precise positioning. Internally the APPA-GH5 looks positively minimalist but that does not mean there are fewer controls. In fact the opposite is true. For example there is a very clever control of the rear menu wheel which some other housings don't offer but the APPA-GH5 still provides push buttons for the four "up, down, left and right" controls.

Speaking of push buttons, the

APPA-GH5's are significantly larger in diameter making them much more comfortable to push especially if you are blessed to be able to dive without gloves in warm water :-). This larger diameter will still be appreciated by those wearing even thick gloves but they don't feel cluttered.

Rotary controls are via Acquapazza's proprietary deep scalloped knobs which are a variation of the traditional 'holed wheel' but with the outer diameter removed. The result is a smaller profile without



Externally the overall look is cleverly uncluttered without cutting back on the number of controls or the ergonomics.

reducing effective control either with two fingers or just one in a rocking motion.

t; speaking of which leads me to one very distinctive feature and this is the ability to adjust the angle of the left and right grips individually to place them exactly to suit your preference. In my case, for example, I can tilt the right handle up towards me to give perfect positioning on the Video Stop/Start lever yet this does not affect access to the shutter release lever should I also want to take a still image for whatever reason. It is details like these that tell me that

the designer is genuinely interested in how the housing feels as well as performs.

The rear perspex window has the provision to fit Inon optical viewfinders to suit all needs. Selfishly as a video shooter I want to look at the LCD screen most of the time so that provision is a visual intrusion I could do without.

Front ports are easily fitted and removed with a single, sprung loaded push button and there are port and extension ring combinations to take the following lenses:

Panasonic's 8mm F3.5,



Front ports are easily fitted and removed with a single, sprung loaded push button

7-14mm F4,
8-18 F2.8-4,
12-60mm F2.8-4,
30mm and 45mm F2.8 as well as Olympus 8mm F1.8 and 7-14mm F2.8. There is also the possible development for the Panasonic 12-35mm F2.8. In addition, the following extensions are under development:

L818 extension SB, L1260 extension SB and O714 extension SB.

Acquapazza are often overshadowed by other high profile housings but if you are in the market for a Panasonic GH5 you would



I can tilt the right handle up towards me to give perfect positioning on the Video Stop/Start lever yet this does not affect access to the shutter release lever.

be well advised to check out this housing. It competes very favourably and in some cases outshines the competition.

Peter Rowlands
peter@uwpmag.com

Ikelite Olympus Tough TG-5

by Phil Rudin

Ikelite Underwater Systems is a USA based company and during its fifty plus years in business Ikelite has expanded its distribution network to cover most areas of the world. Ikelite has a large and loyal customer base founded on excellent customer support and product reliability.

At DEMA 2017 Ikelite debuted a new housing for the Olympus Tough TG-5. Ikelite currently has a line of over fifty housings for compact digital cameras (also called point-and-shoot cameras) for Canon, Leica, Nikon, Olympus, Panasonic and Sony compacts.

Two of the housings the Olympus TG-5 and Sony RX100 Mark V are also sold as “kits” including the camera.

Olympus Tough TG-5

If you are looking for a camera and housing system for under \$1000.00 you should look no further. The Olympus Tough TG-5 is arguably the best value you will find in today's market.

The TG-5 has a 25-100mm F/2 (35mm equivalent) and 4X optical zoom lens which focuses in macro

mode to 1cm. The TG-5 has a new 12 megapixel 1/2.3 inch BSI CMOS backlit sensor and the new TruePic VIII image processor for better low light performance and excellent image quality for its size.

Some of the key features include Raw and JPEG stills, 4k 30p and 1080 120p video, a faster and more accurate auto focus system even in the macro modes, built-in Wi-Fi, GPS, a three inch 460,000 pixel 100% LCD screen, image stabilization, manual flash options with high flash sync speeds to go along with the up to 20 frames burst speed rate and the camera alone has a depth rating of 15 meters (50 feet).

The TG-5 is also freezeproof to temperatures as low as 10° C / 14° F and shockproof for falls from 2.1m/7 feet high. The camera is also dustproof and crushproof making this an ideal all environments camera for many outdoor activities.

The TG-5 also has manual focus with focus peeking which is great for those hard to focus super macro subjects, it even has a backlit compass. The TG-5 still lacks a full manual exposure control mode and custom white balance in movie mode.





Sharptail Eel, Olympus TG-5, Ikelite housing, Two DS-51 strobe with fiber optic converter, macro mode, ISO-100, 18mm, F/14, 1/100th sec.

Schooling Spadefish, Olympus TG-5, Ikelite housing, Two DS-51 strobe with fiber optic converter, W/A mode, ISO-100, 5.5mm, F/6.3, 1/30th sec.

For advanced shooters full manual mode is the norm and I missed that feature during my review. The TG-5 retails for around \$449.00 in the US.

Ikelite TG-5 Housing

The Ikelite housing for the Olympus TG-5 has the same housing design features used in Ikelite's DSLR

and Mirrorless housings. It features an opaque gray ABS-PC polycarbonate material for the front section of the housing with a transparent DSLR/Mirrorless style polycarbonate housing back. This attractive gray housing color matches the current Ikelite DS strobe line and always attracts the attention of other divers and photographers when I am in the



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Batfish, Olympus TG-5, Ikelite housing, Two DS-51 strobe with fiber optic converter, macro mode, ISO-100, 18mm, F/14, 1/100th sec.

Spadefish, Olympus TG-5, Ikelite housing, Two DS-51 strobe with fiber optic converter, macro mode, ISO-100, 18mm, F/14, 1/100th sec.

field. The new housing color shades the camera to provide extra protection from the sun during long boat rides.

The housing is designed with a robust depth rating of 60 meters (200 ft) and is positively buoyant in fresh water without any accessories added. The bottom of the housing has two 1/4-20 mounting points for camera trays, tripod and other accessories.

The glass lens port has the standard 67mm (3 inch) mounting threads for accessories like close-up lenses and wide angle adapters. It also has the Dry Lock style mounting groove for wet lens accessories like the WD-3 wide angle dome I used during this review.

This system allows you to just push the accessory dome port over the



front of the lens mount and then secure it in place with three small screws.

The WD-3 dome has a 0.75X conversion factor to correct for the refractive magnification of the housings flat glass port.

The port is made from optical grade acrylic and is also depth rated to 60 meters. This dome can be removed and installed underwater to allow for a full range of use during any dive. The WD-3 dome ships with a neoprene cover and a lanyard with cord lock. Wide angle lenses like the Inon UWL-H100 and others will also work threaded to the 67mm mounting threads on the front of the housing or by using a bayonet adapter.

The Ikelite TG-5 housings is a clam-shell style with the robust locking system on the left-hand side of

the housing and the hinge on the right. Push controls on the top and bottom of the locking buckle must be depressed before the lock will disengage allowing the housing to be opened.

The camera does not require a tray and simple pushes into the housing where it is held firmly in place. All of the useful push buttons and control wheels on the camera can be accessed from the housing controls.

Since the housing is quite small the controls on the right rear of the housing are very close to each other. Each push button has the function it is assigned on the top of the button but they are difficult to see in many conditions so you should familiarize yourself with the controls you expect to use before entering the water.

The video start/stop button is



placed above the mode control dial and has a red dot so it is out of the way and unlikely to be activated by accident.

Most of Ikelite's compact housings support strobes that are fired using fiber optic cords. These ultra compact housings just don't have room for a sync cord port and the excellent Ikelite TTL converters. The TG-5 housing has the two optical ports on the top left side of the housing. These can be used with a wide verity of strobe brands that are fired by fiber optics or with the Ikelite DS-strobes using the Ikelite fiber optic converter part #4401.1 and fiber optic cord #4501.

The Ikelite converter inserts into

the sync port on the strobe and allows the fiber cords to be used. The Ikelite converter does no allow TTL control of the strobes so remember to set the strobes to one of the manual power setting on your particular DS-strobe. In the unlikely event that water enters the housing the chance of any damage to the camera is remote because of it excellent weather sealing and 15 meter depth rating.

I have witnessed two floods of TG-Tough cameras housings (both pilot error) during my workshops in Cozumel with no damage to the camera.

The TG-5 housing ships with a wrist strap, port cover, o-ring, silicone lube and in the US a one year



Pipefish, Olympus TG-5, Ikelite housing, One DS-51 strobe with fiber optic converter, macro mode, ISO-100, 18mm, F/14, 1/100th

Sergeant Major Fish Eggs, Olympus TG-5, Ikelite housing, Two DS-51 strobe with fiber optic converter, macro mode, ISO-100, 18mm, F/14, 1/100th sec

Field testing

For my review I used the Ikelite TG-5 kit with the red camera, Ikelite action tray II with action tray II extension and right handle, four inch strobe arms and clamps, WD-3 wide angle dome, two Ikelite DS-51 strobes with fiber optic converters and the strobe defusers which are included with the strobes.

I used a two strobe configuration and a single strobe over the top of the lens port during the review. With the WD-3 wide angle dome I had full coverage of the frame with one or two strobes and would be hard pressed to recommend larger strobes as the DS-51 sized strobe is quite adequate to cover most any scene.

warranty. With the kit in addition to the housing you also get the Red Olympus TG-5 camera and all it is equipped with. The Ikelite instruction manual can be downloaded at ikelite.com.

The Ikelite TG-5 housings retails for \$299.00 and as a kit for \$749.00 in the US. The fiber optic converter retails for \$125.00 and the fiber cord retails for \$80.00US.

Once assembled the system was slightly negative in both fresh water and salt water allowing excellent balanced for single handed operation. In the water the auto focus worked very well for both wide angle and in the macro mode. If you are diving in dark turbid water, low light or night diving a focus light is required to maximize auto focus. I was very impressed with the macro modes which allow you to cover a wide range of subjects from super macro to midsize fish. The wide end of the lens allows you to cover most reef scenes and diver photos. CFWA and larger senes like wrecks require a wide angle adapter. The DS-51 strobes in manual mode at around half power or less were more than

adequate to properly expose most subjects. Keep in mind that consumer compacts have small sensors and as a result greater depth of field even at wider f/ stops.

Image quality from the TG-5 is excellent for a camera of this size, my images have excellent color and sharpness. I was also impressed at the amount of detail that could be recovered from under exposed captures.

If you are just getting started with underwater photography or looking for a backup camera, teaching tool and all weather camera the Olympus TG-5 and Ikelite housing are a great place to start.

Phil Rudin

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Lume Cube light

by Dan Bolt

Another crowd-funded product hit the market this year, and while not specifically aimed at underwater photographers, its specifications tweaked my interest enough to spend £80(ish) on one a couple of months ago.

Touted as a companion light to your modern outdoor lifestyle to go alongside your GoPro/ similar rugged recording device, this small and very well made little light offers pairing with your phone (with up to an additional 4 lights), 10 light levels from 150-1500 lumens (max 150 Lux at 3m), and even a slave sensor allowing it to be remotely triggered by other strobes. The beam spread is a very even 60 degrees, and you can use 3 additional diffusers if required. There is a standard tripod mount on the base.

Obviously the Bluetooth control and pairing functions aren't much use underwater (but may add to your personal reasons for considering one if you do a lot of outdoors photography and want waterproof rugged lights you can control from your phone) but I was intrigued to see if the slave sensor was useful for remote lighting situations while diving, as well as its general efficacy as a light source.

The stated topside burn time at 1500 lumens is a not-very-good 25 minutes. However, that limit is only imposed by the internal thermal cut-out switch and, trust me, in air this thing gets very hot very quickly. But once you submerge one of these lights (even in a warm swimming-pool) you will get almost an hour at full brightness, 2 hours at 50% and many hours at the lower lumen settings.



Adjusting the power output is as simple as clicking one of the two buttons, the other button turns it off (or switches it into slave mode). But with 10 settings to choose from it can be hard to keep track of how many times you've clicked, resulting in you having to go 'round the clock' again if you click once too many times and it drops to the lowest setting.

So back to the slave sensor: technically it



Anemones in poor vis. Olympus OM-D E-M1, Aquatica AE-M1, Olympus 8mm fisheye, 1/60th, f/7.1, iso1600, single Lume Cube on constant



Front-lit anchor at night. Olympus OM-D E-M1, Aquatica AE-M1, Olympus 8mm fisheye, 1/40th, f/5, iso800, single Lume Cube on constant



Lume Cube on tripod. Olympus OM-D E-M1, Aquatica AE-M1, Olympus 8mm fisheye, 1/13th, f/3.5, iso1600, single lume cube on constant

worked well, and was able to detect a low-power flash from my YS-D1. But this is where non 'flash' based technology can't compare with the light-output from a proper strobe/flash. In essence the 'flash' mode of the Lume Cube is just a very short duration constant-light burst from a single LED. And so, even at the max 1500 lumen output, and using the fastest 1/125th duration, the actual amount of light output was so small as to be barely registered on my camera's

sensor. Yes you can lengthen the duration of the 'flash' all the way up to 1 second, but at what point does a 'flash' become a continuous light source? I'll leave that debate and the ensuing lumen/lux/GN over time calculations to others ;)

It sometimes takes a while for a new bit of kit to embed itself into an existing setup, and the same was true for me and the Lume Cube. After a few dives its most useful function became clear; with such a small size, 10 levels of adjustment and great battery life; using it as a focus/spotting light almost seems to be what

it was designed for in the first place. I now do every dive with it (yes wide angle and macro) – I simply turn it on at the start of the dive and totally forget about it.

Being able to re-charge via USB was a bonus for me too, no heavy charger required and it will re-charge from flat in less than 90mins.

Dan Bolt

www.underwaterpics.co.uk

www.lumecube.com

Inon Z-330 review

by Phil Rudin

Founded in 1994 Inon Inc. is a Japanese company which is well respected in the underwater photography world. I am sure many UWPMAG.com readers have already been using Inon strobes, wet lenses, LED lights or any the hundreds of other products Inon offers.

In May 2017 Inon announced the discontinuation of the renowned Inon Z-240 strobe in preparation for a new Inon Flagship strobe. The Z-240 was released in March of 2006 and underwent several upgrades over the years from the original type I to the now discontinued type 4. The Z-240 replaced Inon's first Flagship strobe the Z-220 which was also well received when it was released.

One of the main reasons Inon strobes have become so popular over the years is the very small size verses the power output, the robust design and build quality, the use of nonproprietary AA batteries and the exceptional S-TTL which is comparable with just about any camera and housing.

Many of the early release Z-220 strobes including my own are still being used in the field on a regular basis. Inon has taken a superbly designed light weight strobe platform and dramatically improved on its performance over the years.

The Inon Z-330 is the latest and most technologically advanced of the Inon Z-line of strobes. All of the excellent design features of the Z-220/Z-240 remain with a number of technical advances.

The same light weight Polycarbonate gray resin body for the electronics and batteries remains all



but unchanged. Inon's unique patented T-shape twin flash tube construction is unchanged but the guide number has been significantly increased from the Z-240's 24 meters to a guide number of 33 for the Z-330's.

A somewhat oval shaped plastic fresnel device has been placed in front of each flash tube and stand about 8mm above the flash tubes on four clear legs. The fresnel device helps disperse the light more evenly across the center of the frame while allowing the light heading to the corners of the frame to retain at a higher intensity while traveling over a greater distance.

Inon has replaced the flat acrylic port over the flash tubes and modeling light with a clear dome that widens the beam angle of the Z-330 to 110 degrees without reducing the 33 guide number.

The flash tubes retain the same 5500 kelvin color temperature as previous Z-strobes when not using a filter. The output of the modeling light has also been raised to 220 lm from 180 lm. More importantly the modeling light has been redirected to converge with the center of the lens. This means that if you are using two strobes the modeling lights will meet near the center of the frame rather than



Orange Encrusting Sponge, Olympus EM1 II, Olympus 8mm Fisheye F/2.8, Nauticam NA-EM1 II housing, two Inon Z-330 strobes in manual, ISO-320, F/9, 1/250th sec.

needing to be turned inward to illuminate a subject in the center of the frame.

Another addition to the Z-330 is the removable light shade which threads to the front of the strobe and rotates 360 degrees around the flash tubes. The light shade has click stops all 360 degrees so that it

remains in place once it is set.

The light shade which Inon calls a “light cutter” can be used to reduce light where needed by redirecting light away from areas within the frame. An example would be while shooting close to a light sandy bottom where you would want to prevent blowing out the highlights of the sand. By turning the shade to the bottom of the strobe light output over the sand would be reduced allowing a more even transition from the sand bottom to the strobe lit area in the frame. This is not a new idea many photographers have been using their hands or a slate for this purpose since the film days. The flat black dome shade and 360 rotation will certainly make this process much easier to control.

In early release photos of the Inon Z-330 you may have missed the high thermal conductivity heat dispersing metal ring that surrounds the light emitting section of the strobe. This metal ring is connected directly to the internal circuitry of the strobe unit and allows heat to be effectively released into the water.

While the new circuitry for the Z-330 has improved over past designs higher flash output in a small package will result in more heat. This new heat dispersion design mitigates this issue. Most often heat leads to failure of the flash tubes and several

comments have reached the internet regarding this issue. In many failures the cause was the result of using the strobes for sustained high speed shooting where the strobe is firing several times a second or when using the strobes to shoot high speed out of the water. These are things that are not recommended in most instruction manuals for any underwater strobe.

Missing from the front of the Z-330 is the thread mount used on past Inon Z-series strobes to mount diffusing filters and other Inon accessories. This has been replaced with a bayonet mount for the light softening dome filter which ships with the strobe. This soft dome filter with a color temperature of 5400K protects the dome with only a half stop reduction in power output. The bayonet mount has a positive locking device which allows you to removed and reinstalled the filter underwater.

The dome filter can also be interchanged with the optional 4900K and 4600K color correcting dome filters plus a -4EV ND dome filter for shooting wide open with fast lenses. This new bayonet design does not work with current Inon strobe accessories like snoots and flat color filters. The small red and blue color filters for the modeling light are also gone due to the dome design on the front of the strobe.

The ball mounting point on



the bottom of the Z-330 remains unchanged and will interface with existing Inon mounting balls. The optical cord connection and Nikonos 5-pin cord connections remain unchanged as well. The Z-330 battery compartment is also unchanged and independent from the electronics section of the strobe. It uses the same durable battery contacts, translucent threaded battery cap and yellow O-rings.

Inon’s press release recommends Eneloop and Eneloop Pro AA batteries. At the time of writing this article Inon factory tests produced a minimum 1.8 seconds recycle time for Eneloop, 1.6 seconds for Eneloop Pro batteries with a 2.4 to

3.5 seconds recycle time when using disposable alkaline batteries. Keep in mind that these recycle times are approximate numbers reflecting at FULL POWER dump. Variations may occur depending on the condition and amount of charge on the batteries being used.

Recycle times using Eneloop Pro batteries is identical to the recycled times published for the Inon Z-240 type4 strobes. Total number of flashes from a set of Eneloop Pro batteries in the Inon tests of the Z-330 is 280 full power flashes. Flashes numbers and recycle times improve dramatically with lower flash output which is generally the case in most photography situations. The 220Lm

modeling light remains the same as the Z-240 at 2:30 to 4:00 hours depending on battery choice.

The Inon Z-330 has slightly larger outer dimensions at 102mm diameter, 131mm high and 125mm depth without dome accessories V. 99mm X 131mm X 100mm for the Z-240 including the slave sensor. Land weight for Z-240 is 583g (20.6oz) without filter V. 637g (22.47) for the Z-330 including the shade and soft dome filter.

Depth rating remains the same at 100m (328ft) and operating temperature in water remains the same at 0°C-30°C (32F-86F).

The rear of the Z-330 has also been updated with a phosphorescent control panel for better low light and night dive visibility for settings. Larger and longer flat control knobs replace the small round Z-240 main mode switch (left) and EV control switch (right) making adjustments easier while wearing heavy gloves.

The Inon EV control/S-TTL dimming function has been improved to deliver even more accurate illumination when using different dome filters. The system remains accurate even when the light emitted from the camera side is weak. The 13 stage manual light emitting function features 1/2 EV stops throughout the range allowing precise control of one or more lights. Lights fired off camera can also be easily controlled in manual flash.

Below the EV controller dial is a push switch which is used to disable ACC. Advanced Cancel Circuit also known as the camera pre-flash minimizes the flash from the cameras on-board strobe resulting in faster recycled times thus allowing for longer battery life. Pushing the switch down then rotating clockwise to lock will disable the ACC.

The Z-330's new mode control switch has

five positions, Off, S-TTL, S-TTL- Low, Full and Manual from -0.5 to -6 EV in half stops. The manual setting corresponds to the manual settings on the EV controller dial. The "Auto" setting from the Z-240 strobes was removed because it does about the same thing as the manual settings. Inon S-TTL-Low is used if you are constantly over exposing with S-TTL.

Below the mode control switch is a locking switch for controlling the modeling light. When the switch is depressed and released the modeling light remains on for around eight seconds. When the switch is depressed and turned right or left to the locked position it will remain on only turning off temporarily when the strobe is fired. The modeling light cutout function may not be 100% effective with some cameras so a test with your camera is suggested.

The ready light operates in the same way as past Inon strobes with a green conformation light for proper exposure in S-TTL and red ready to fire light. The sync cap below the Ready light is for connecting the Nikonos V style hard wire sync cords.

Not All Strobes Are Created Equal

I want to take a moment to editorialize here and say that selecting a strobe based solely on it's specs many be disappointing. Many other factors should be taken into consideration such as the track record of the manufacture, build quality, warranty and repair history. Also consider your personal needs like deviations between different manufacture specs and testing methods, total system size for traveling, use of one strobe or more, accessories like filters, snoots, off camera triggering and more.

Regarding the issue of guide numbers/watt seconds and how this value is reached. My best



guess would be that most strobes are rated against each other by reviewers and some manufactures using a light/flash meter. At a given ISO setting (usually ISO-100) the flash meter is used to test output in meters and most often at the center point of the strobes flash pattern. As a result one strobe may have a guide number of say 32 meters while the second strobe has a GN of 24 all things being equal. The problem with this method is that the 32GN strobe may only have a beam angle of say 80 degrees (without a defuser) while the 24GN strobe may have a 100 degree beam angle.

With a 100 degree diffuser added to the 32GN strobe the GN is now reduced to 24. This is not exactly apples to apples for the purpose of a review. While the 32GN strobe may fit the needs of the photographer shooting both macro and wide angle it may not fit the needs of the dedicated hard core

super wide angle photographer. Variations can also be found in light meters some may read a 30 or 40 degree angle of the flash beam while others only read a few degrees.

Calculating recycle times and total number of flashes on a single set of batteries may tend to vary between manufacturers as well. My point here is that you not get too hung up on the numbers and concentrate on how the strobe will work for you in the field.

Field Testing The Inon Z-330

As I am finishing this article new Z-330's strobes are beginning to reach some retailers in the US and I had a very limited amount of time with my test unit. As a result I was not able to do near the number of dives I would normally hope to do with such an impressive new strobe. I hope to revisit the Z-330 in a future issue. My test strobes were shipped without any instruction manual and I assume the manual was still being translated at the time.

For my review I used a verity of strobe configurations including clamping the strobes directly to the balls on the tray handles all the way to dual strobe arms. I used an Olympus EM-1 MkII camera in the Nauticam NA-EM1 II housing with both macro and wide angle lenses. I used two Inon Z-330 strobes with fiber optic cables and the Olympus proprietary on-board flash for S-TTL and the Nauticam manual flash trigger to fire the strobes manually. Both systems worked very well but the on-board Olympus strobe does not recycle nearly as fast as the Nauticam flash trigger. This has noting to do with the Z-330 strobes it is a function of the camera. Set manually at around 1/4 power I can get excellent recycle times and very even illumination



Green Moray Eel, Olympus EM1 II, Olympus 8mm Fisheye F/2.8, Nauticam NA-EM1 II housing, two Inon Z-330 strobes in manual, ISO-320, F/11, 1/250th sec.

at ten frames per second on the EM1 II using the Nauticam flash trigger.

I used the shade for both macro and wide angle with positive results. This will require more testing before I can fully assess the benefits for both reducing backscatter and redirecting light. The additional power of the Z-330 strobes and the even light distribution when using the soft filter was immediately evident compared to my Z-240 type 4 strobes. Quality of light is somewhat subjective so for me the color and quality were excellent. I used new Eneloop Pro batteries for this review and noticed no difference in recycle times or battery life verses the Z-240's.

On the subject of be careful of what you wish for, while I found the new larger controls easier to use they were also easier to bump off the chosen settings if you are not paying attention. I also



Banded Jawfish, Olympus EM1 II, Olympus 60mm macro F/2.8, Nauticam NA-EM1 II housing, two Inon Z-330 strobes in S-TTL, ISO-64, F/22, 1/250th sec.

found that the soft filter was very easy to attach underwater and it remained totally secure. The filter was however harder to remove underwater and it does not have any attachment point to secure it to a clip.

The Inon Z-330 strobes are an excellent choice and a significant move up from the Z-240. The Z-330 will retail in the US for \$698.00 and Reef Photo now has them for pre-order at \$650.00.

I would like to thank Reef Photo and Video in Ft. Lauderdale, Florida for providing the strobes I used for this review.

Phil Rudin

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Switching from Canon to Nikon

by Tony Wu

Yes, the title of this post is a bit linkbait-ish, though it's not meant to be.

I've recently decided to make Nikon my primary camera system (instead of Canon) and wanted to write a little bit about the reasons why, plus share a few potentially helpful hints for anyone who might be considering doing the same, especially for underwater photographers using a Nauticam housing. I couldn't think of a more straightforward post title, so there you have it.

Let me preface by saying that this isn't a technical review. Doing meticulous tests and measuring things isn't my thing. There are plenty of more analytical types who can opine on dynamic range, noise, and the like much better than I can, so please Google if you're looking for information of that nature. This is a "here is my personal experience and opinion, take it or leave it" post.

Also, I don't use my cameras for video, so there is no consideration of video-related things in this post.

Nikon D850 and D500 cameras

I don't often write about gear, except in the general sense (see Thoughts on Evolution of Photography), but I think it's worth making an exception in this instance for a couple of reasons.

First, I am as close to brand-agnostic as photographers get. I started with a beat-up Nikon F2A in 1989 and shot entirely with Nikon film cameras (F90, F90x, F100) until I switched half to Canon in 2001 (Eos-3, Eos-1v), and completely by 2005 (1D MkII). I stuck entirely with Canon until 2012 when I picked up a Nikon D800 for a specific project, then a Sony a7r in 2015 and the a7rII afterward. I've also used an Olympus OM-D EM-5, though only above water. The only thing keeping me from trying equipment from other manufacturers are practical considerations—money, time, and keeping everything straight in my head.

As you can see, I'm not wedded to any brand. I am not a fanboy. I use what I think is best for what I plan to do, and I make optimal use of the kit that I have at hand. (See how I



Frankenstein-ed a photo of whale lice with a mishmash of gear.)

Second, the D850 is a whole new proposition as far as DSLRs go. It is full-frame, has 45.7 MP resolution, and shoots at up to 7fps...meaning high-resolution + fast fps! Prior to this, you got one or the other, high-resolution or high-speed, not both.

From playing with the D850 for a couple of weeks now, I can tell you that the files are great as well. In short, the D850 is a beast of a camera.

Right, so that's the background. Here is what I decided and why.

Since 2012, I have primarily been shooting with a Canon 5D Mark III underwater, sometimes using a

Nikon D800. Both models are full-frame cameras that produce excellent results, with different pros and cons. Without getting sidetracked about the reasons why, my primary usage cases were big animals in the blue for Canon, and macro subjects for Nikon.

Here we are, approaching the end of 2017 though, five+ years later. Both cameras have become a bit dated, and like many other photographers, I was keeping an eye out for a major improvement from both manufacturers, particularly given the impressive leaps in capability that mirrorless options like Sony's top-of-the-line cameras have made.

But here was my quandry. When

Canon released the 5D Mark IV in 2016, I looked at the specs, read the reviews...and yawned. Great camera, no doubt. But not worth the trouble for me to upgrade (keep in mind that upgrading for an underwater photographer entails at the very least getting a new housing, sometimes more stuff too, so it's a bigger decision than for a non-submerged photographer). Then came the 6D Mark II. Total sleeper. In the Nikon universe, the D810 just wasn't enough reason for me to change cameras at the time it was released.

So when the I got home from extended travel in late September and read-up on the D850, I was sold. This was the upgrade I was looking for.

7fps is plenty fast for most things. The buffer (stated as 51 images for 14-bit lossless compressed RAW) is more than sufficient. The AF is fast and accurate. The XQD card reads/writes super-fast. The only minor thing I wasn't happy about was the lack of a built-in flash (my D800 has one), which I know a lot of people frown upon, but I've found built-in flashes to be convenient and useful. I can (very) grudgingly live without.

So, having effectively decided to pass on the Canon 5D Mark IV in favour of the Nikon D850, I am for the first time in a while looking forward to consolidating gear.

Going forward, my plan is to use

the D850 as my primary camera for underwater, and a Nikon D500 for breaching and other things I had relied on the Canon 7D Mark II for, as well as for underwater photos. I have a Nauticam housing for the D850, and a custom-made Zillion housing for the D500.

I'll keep my D800 as a back-up. I know both the camera and the Nauticam housing I use with it inside and out.

Lenses were of course a big consideration in making this decision. Underwater, I primarily use fisheye and macro lenses. I already have the Sigma 15mm fisheye lens for Nikon and both the 60mm and 105mm Nikon macro lenses, so I was set in that department.

To switch from the Canon 7D Mark II to the D500, I had to get a new Nikon 70–200mm lens, which didn't represent too big of an incremental cost once I factored in the resale value of the two Canon 70–200mm lenses I had. I decided to plunk down for the E version instead of the G, given the rave reviews I read about the E lens. I've used it a few times now. Verdict: Definitely a kick-a** lens that shines with both the D500 and the D850.

I'll eventually need to make a decision whether to get the Nikon version of the 10–17mm Tokina fisheye lens or the new Nikon



8–15mm fisheye lens to use with my D500. I have a project in mind for next year when I might need one of those lens combinations, so I can still mull it over for a while.

The only situations I don't have covered with my Nikon equipment are landscapes and focal lengths beyond 200mm. That's why I'm hanging on to my Sony a7rII, for landscape and similar situations when AF isn't an issue, and a Canon 7D Mark II for now, to go with my longer Canon lenses.

If you're up on the latest camera releases, you might be wondering how the Sony a9 and a7rIII fit into my thinking. I had a chance to

handle the a9 recently with the Sony 100–400mm G Master lens. It was impressive, as I'm sure the a7rIII will be.

I'd love to carry lighter mirrorless cameras, but I can't fully commit to Sony for the time being. There aren't enough lenses in the line-up yet. Sony has no native fisheye option, for instance. Using a converter is an option, but not ideal. And Sony is deficient for long lenses, at least for now. I'm sure that will change in the next few years.

I'm also not a fan of the menu system (the least user-friendly among the manufacturers), the lack of lossless compressed RAW, and the

use of SD cards instead of XQD, a format that Sony helped develop. I'm hopeful though that Sony keeps advancing by leaps and bounds as it's been doing in recent years, and addresses these shortcomings.

So that's the lay of the land as far as my gear strategy goes for the foreseeable future. To sum it up...Canon (mostly) out. Nikon in. Sony for some stuff, with hopes the company keeps improving.

For many years, Canon was the clear leader in many respects, but that's so not the case now, at least not for the things I plan to do. I'm not sure how Canon lost its way. I just have to accept that the situation is what it is.

On to more practical things.

It always takes a bit of work and time to get comfortable with a new camera, to gain fluency, so to speak, with the handling of hardware and quirks of software, as well as the layout and functionality of a new underwater housing. Sometimes the changes are small, sometimes substantial.

In this case, the learning/ mistake curve has been relatively steep. Since I mostly used Canon for over decade, my brain is geared toward Canon's architecture and design philosophy. As a result, I've had to invest some time deciphering manuals and experimenting with settings. Painful.

One note...at this point, I haven't spent much time underwater with the D850, so my experience with the entire system while submerged is limited. It's not for lack of trying. I'm working on a project now, but the conditions have been such that I haven't spent any real time in the water yet. Keeping fingers crossed that the situation changes soon, but most of the variables are out of my control. Nature does what she wants to do.

So here are a few practical tips derived from futzing with my new camera and housing that might



be useful to you, especially if you're a Nikon user who plans to shoot underwater with a Nauticam D850 housing.

If you read through this and think there's a better way to do something I've written about or have a useful tip pertaining to something I've missed during my hours of cross-eyed examination of the D850 user manual, do please clue me in!

In Playback Menu, the first menu section, go to Playback display options. I select Focus Point, None (image only), and RGB histogram. This is just what I like to see. Having all the options selected results in too much clutter when reviewing images.

In the Photo Shooting Menu, go to NEF (RAW) recording. I set this to NEF (RAW) compression to ON with lossless compression, and NEF (RAW) bit depth to 14-bit. From what I understand, lossless compression is really lossless. It reduces file size viz. uncompressed, which means quicker file read time and less storage space. I only shoot in RAW, so I don't bother with any of the jpg options.

The Customs Settings Menu presents you with a lot of options for customising how your camera works. It can be a bit overwhelming, especially



when the explanations often don't make a lot of sense. Following are some of the settings I use.

a1: AF-C priority selection: I generally use Focus + Release, which means priority is given to achieving focus for the first frame, then releasing the shutter thereafter. This might slow the fps down a bit, but most of the time I'd prefer to have images with something in focus.

a2: AF-S priority selection: I keep this on Focus. AF-S is something I pick when subjects aren't moving much and I want to be certain to hit focus.

I generally don't use back button AF. I have decades of muscle memory in my index finger for using just the shutter button, so I usually stick to that. I do however use back button focus occasionally. To switch back and forth, I use:

a8: AF activation: I keep this set to Shutter/ AF-ON, meaning I can use the shutter button as I always have. But when I want to switch to back button focus and using the shutter button solely for

the purpose of triggering the shutter, I change this custom setting to AF-ON only. (I describe below how I get to this function super-quick when I need to.)

b4: Easy exposure compensation: I set this to On (Auto reset). This gives me the ability to adjust exposure compensation with Aperture and Shutter priority modes without having to hit the exposure compensation button (one less button to worry about on the housing). I can just use the control dials. This means it's a lot quicker to fine tune exposure, which I like (it's the way I became accustomed to shooting with the Canon system), but it also introduces the risk of your accidentally moving dials around and screwing up your exposure by accident if you're not careful. Set this at your own risk. The (Auto reset) option clears the exposure compensation when you switch off the camera, so you don't accidentally leave exposure comp dialed-in.

f1: Custom control assignment: This gives you the ability to assign a range of functions to specific buttons. The main one I use is the Fn2 button, which I've set to My Menu, which is the last/ bottom icon on the main menu. The My Menu item allows you to pick items from entire/ long menu list and keep the ones you access often in one place, so you can find them

easily, without frantically searching through all the items.

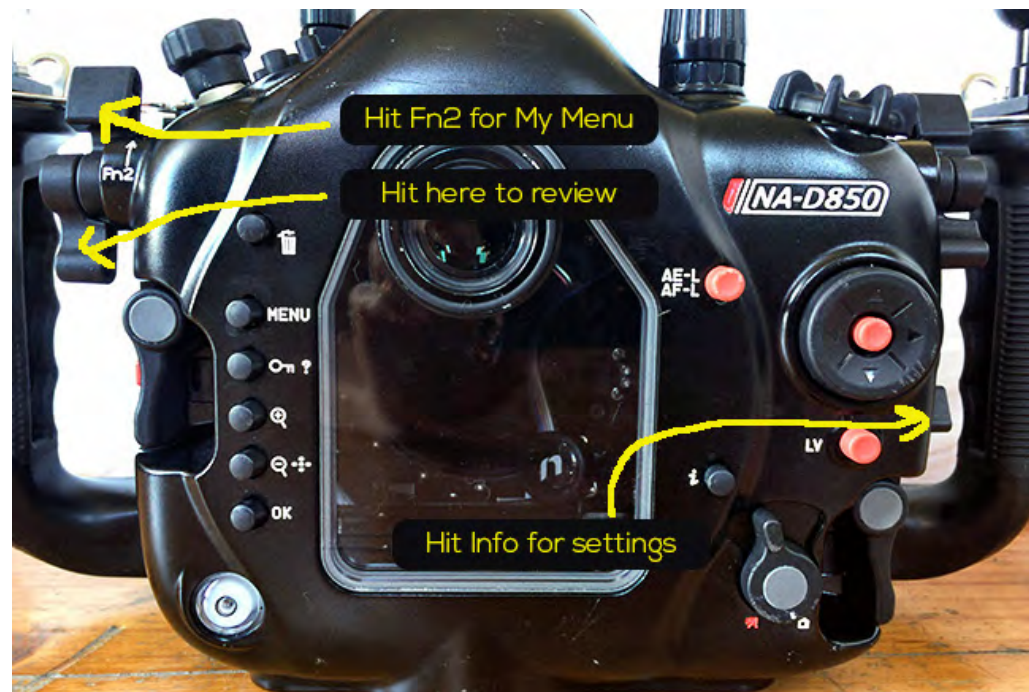
For instance, I keep Format memory card, Time zone and date, and a8: AF activation in My Menu. Format memory card allows me to format easily in the water if I want (like if I've forgotten to format after downloading previous files). Having Time zone and date in My Menu reminds me to set the proper time zone and date each time I travel, important for keeping accurate records of when and where I took a given image. And a8: AF activation gives me quick access to that back button focus option I mentioned above.

The reason I like to use the Fn2 button is because of my housing. The Fn2 button is dead obvious and easily reachable on the upper left of the Nauticam D850 housing, just above the review lever.

By assigning My Menu to Fn2, I have three main levers I use to work the camera underwater: The Info lever on the right side of the housing when I want to check/ change my settings; the Fn2 lever on the top left of the housing when I want quick access to My Menu; the Review lever just below to Fn2 lever when I want to review photos. All accessible with my thumbs.

See the grand plan?

Set Fn2 for My Menu and access



everything you need from three levers

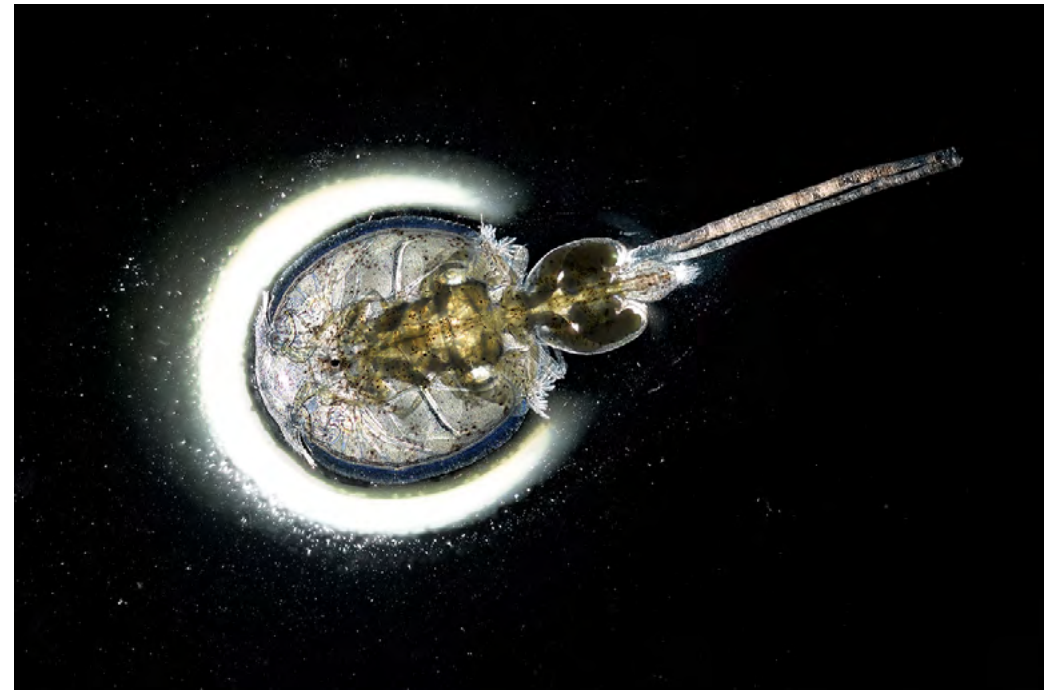
I like to keep things as simple as possible to minimise task-loading on my brain. This is about as simple as it gets. Those three levers give me quick, thought-not-required access to most of things I need to do.

You can of course use f1: Custom control assignment to assign controls to many other buttons, so find what works for you and take advantage of these shortcuts.

If, for example, I anticipate that I am going to need to adjust a particular setting often during a given project/ dive, I may assign it to both Fn1 and Pv. Those buttons are accessible at the front of my housing, depressed

with my right pinky or ring finger.

This may just be me, but I don't have the fine motor control and accuracy with those fingers necessary to select either Fn1 or Pv correctly each time (especially when in cold water with general numbness in extremities and thick gloves on), so I will assign the same function to both. That would mean that I can just slam away with the lower part of my right hand and be pretty sure I'll hit one or the other button to call up the function I want. When I'm done with that particular situation, I'll reset Fn1 and Pv to have no function, so I don't call up a menu item that I don't need by accident. The concept is idiot-proofing my



set-up to protect myself from my own incompetence. I have years of experience doing this.

f6: Release button to use dial. I set this to Yes. What this does is give you the ability to hit a function button once, and change the settings without having to hold that button down while you do it. For example, if you want to change the Exposure Mode and you hit the Mode button, normally you'd have to hold that Mode button down while turning the relevant dial. By setting f6 to Yes, you can hit the Mode button and let go, then turn the control dial as appropriate. Touch the shutter again to exit the adjustment and set whatever you chose.

This isn't as critical on land, but underwater, being able to do this means having maximum freedom of hands.

Here's what you do: Hit the Info lever on the housing to call up the information screen on the back LCD, then hit whatever button you need, and you'll see that you can adjust the relevant setting without holding the button down. Magic!

Finally, a note for anyone using the Nauticam TTL converter.

It's been a long time since I've used TTL, but I decided to give it a try, with the operating assumption that I can choose to use the TTL functionality when convenient, and

switch to manual exposure when that's more appropriate.

I haven't put in enough time with the converter to form an opinion. So far, I am having inconsistent results. Sometimes the converter seems to nail the exposure; at other times it misses by a long shot. But that could just be lack of experience on my part in working out exactly how to use it. I have not had the chance to test the TTL converter in controlled conditions underwater, which is something I'll do at first opportunity.

For what it's worth, I have been using Inon Z-240 strobes, the latest generation, and I've set both TTL converter switches inside the housing

to the off position, both magnets on the Z-240 to up position, and set the D850's flash sync speed to 1/250s (not Auto FP). Use e1: Flash sync speed to set this.

I set the Inon strobes to S-TTL, and use the power level knobs to adjust flash exposure for each individual strobe. You can also use the minus button (the one you use to reduce the magnification when you are reviewing photos you took) on your camera for global flash exposure compensation that affects all attached strobes at the same time.

Switching the strobes to manual mode allows you to shoot them as manual strobes.

A final reality calibration before ending this post. Earlier I wrote about David duChemin's book *The Soul of the Camera*. The overarching message of the book is one that I agree with... that most of the time, gear is not the most important part of photography. The user of the gear is.

The reason I don't write much about gear and settings is my belief that most people devote disproportionate time to thinking about gear and settings, and far too little time to refining personal style and imbuing their images with meaning/ soul.

The ratio of times people have asked me, "What camera do you use?" or "What were your settings?" to "How did you learn about the animal/ conditions and prepare for the project?" is something approaching infinity. Shame, really.

In chatting with a friend a few days ago, I said that the creation of unique, memorable images comprises 10% gear, 90% knowledge, experience, vision, feeling, instinct, emotion, personality. For underwater natural history photos like those that I pursue, add hours and hours of reading, studying, note-taking and contemplation, plus never-ending physical training, eating well and getting sufficient sleep.

Of course, I recognise that the 10% that is gear is a critical

10%. Without it, there would be no photographs.

But think of it this way: A lot of people own expensive, fancy cameras. Relatively few people create lasting images.

See my point?

What I'm saying is this: Read what I wrote above in proper context. My decision to switch from mainly Canon to mainly Nikon has nothing to do with believing that changing cameras or switching manufacturers will somehow bestow magical success upon me. And I am by no means suggesting you need to switch or even agree with my switch or my opinions.

I am simply refining my selection of tools for the projects I see myself pursuing over the next few years, trying to match the tools to the tasks as best possible, and making optimal use of the latest technology whenever I can.

My bet is that Nikon gear is going to be the best fit for me for the time being as I pursue my creative efforts. Whether I succeed or not though, depends on my own vision, creativity, and determination.

And if I'm wrong, I'll switch again.

Tony Wu

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Coral bleaching - causes and prospects of recovery

by Dr Tom Bridge

Senior Curator of Corals,
Queensland Museum and James Cook University

Photos by Dr Tom Bridge and T. E. Roberts

Coral bleaching has long been a 'heated' issue among coral reef scientists, managers, tourist operators and the general public. The issue received worldwide attention in the last 12-18 months as dramatic reports and photographs of large-scale coral mortality have emerged across the world. Unfortunately, many of the media reports on coral bleaching can be misleading - after all, the primary aim of media outlets is to attract readers, and journalists will often look for the most 'dramatic' aspect of a story rather than providing an objective view. This problem of partisan agendas and 'alternative facts' occurs on both sides of the political spectrum. The aim of this article is to provide a clear, factual outline of both the causes of bleaching - in particular the 2016 event on the Great Barrier Reef (GBR) - and what this means for the future of the GBR and reefs more broadly.

As divers and underwater photographers who regularly spend time in the water, we are generally more acutely aware of the effects of overfishing, unfettered coastal

development or climate change can have on marine environments than the broader public. Any of us who has spent time diving in parts of South-East Asia will appreciate the damaging effect that single-use plastic can have on the marine environment. Likewise, anyone who has dived on a reef before and after a hurricane or a severe coral bleaching event will appreciate the dramatic effects these events can have on the ecosystem. While the immediate effects of these disturbances are readily apparent, in my other role as scientists I try to use these observations to understand both the underlying causes of these disturbances, in the hope that we can do something about them, and also

*Healthy reef dominated by hard corals of the genus *Acropora* (top); and a nearby reef where corals have been removed by a recent cyclone and replaced by green slime algae. These photos were taken one day and only a few kilometres apart, but on opposite sides of the reef. Photos Dr Tom Bridge*





Scientist surveying coral diversity at Mantis Reef in the far northern Great Barrier Reef in 2011. Photo Dr Tom Bridge

the prospects for and factors influencing recovery, so that we can implement actions that give reefs the best change for recovery.

Coral reefs are considered among the ecosystems most vulnerable to climate change. This is largely because modern coral reefs are dependent on corals that live in symbiosis with microscopic algae, called zooxanthellae, which the corals with a large proportion of their nutritional requirements. This partnership enables corals that possess zooxanthellae to harness sunlight for energy, making them capable of growing much more rapidly than corals that do not contain zooxanthellae. For corals, having zooxanthellae is like covering yourself with millions of tiny solar panels, and the energy produced by these panels is put towards building the huge limestone reefs that we all enjoy as divers and photographers. This partnership works very well when conditions are suitable, but if conditions become unfit for either partner, the relationship breaks down. Coral bleaching is the breakdown of



Water temperatures in 2016 got so hot that even bleaching-resistant species such as massive Porites were bleached. Photo Dr Tom Bridge

this symbiotic relationship, where the zooxanthellae are no longer providing the coral with the right combination of nutrients and are therefore expelled by the coral.

There are numerous factors that can induce coral bleaching, including unusually high or low



Bleaching Acropora stands on the Mid-Shelf of the GBR off Cairns, April 2016. The colony has begun to die, with brown algae covering the exposed skeleton. ISO:200, F-Stop: 7.1, 1/200 sec, Tokina 10-17 at 10mm. Photo T. E. Roberts

temperatures or changes in seawater salinity due to extreme rainfall events. However, by far the most common cause of coral bleaching in recent years, particularly over large spatial scales, is high water

temperatures. The thresholds that induce bleaching varies considerably among geographic locations, habitats and coral species.

For example, corals that live in cool subtropical latitudes such as Lord Howe Island, the world's southernmost coral reef, bleach at around 28°C. In contrast, some corals in the Persian/Arabian Gulf tolerate waters up to an incredible 35°C, but nonetheless bleach if temperatures reach 36°C.

Corals that live in habitats such as lagoons, where temperatures are typically higher than in the open ocean, can be much more tolerant of high water temperatures than those on the outer-reef slope only a few hundred metres away. Natural variability in temperatures is also important – corals that are regularly exposed to large fluctuations in temperature due to oceanographic phenomena such as upwelling may be more tolerant than those from more stable environments.

Despite this spatial variability, it is clear that exceeding the maximum temperature that corals are used to by just 1-2°C causes considerable stress, which can be measured by looking at coral physiology. If this stress occurs for a prolonged period (i.e. more than 1-2 weeks), corals will start to bleach.

At first corals will appear pale and sometimes fluorescent, but even

at this stage are highly stressed. If temperatures do not return to normal within a few more weeks, the coral will start to die.

Since bleaching thresholds are relative to local thermal histories, increasing sea temperatures due to increased atmospheric carbon dioxide have caused coral bleaching on reefs across the world, from high-latitude subtropical locations such as the Solitary Islands and Abrolhos Islands in Australia to the most warm-adapted reefs in the world in the Persian/Arabian Gulf.

Although sea temperatures have been rising steadily since the Industrial Revolution, mass coral bleaching affecting reefs over thousands of kilometres tends to occur when atmospheric weather events combine with the underlying warming trend to push temperatures beyond the corals' range of tolerance.

There have been suggestions that the 2016 bleaching event to El Nino, and it is true that the two most severe bleaching events globally, in 1997-98 and 2015-16, coincided with strong El Nino events. However, we also know that mass coral bleaching is a recent phenomenon, while El Nino events have been occurring for millenia and did not result in large-scale bleaching events until the 1980s. We know this because as corals lay down their limestone skeletons, they leave



Massive Porites such as this colony are hundreds of years old, and can provide information on environmental conditions going back hundreds of years. Photo Dr Tom Bridge

characteristic annual growth bands much like the growth rings on a tree.

By analyzing the chemistry of the skeleton in different places, we can learn about the seawater conditions at different times in the past.

Bleaching also leaves clearly identifiable signatures in these growth bands, so by examining very old corals we can learn about things such as the frequency of bleaching events or changes in seawater chemistry across hundreds, sometimes thousands, of years. These studies tell

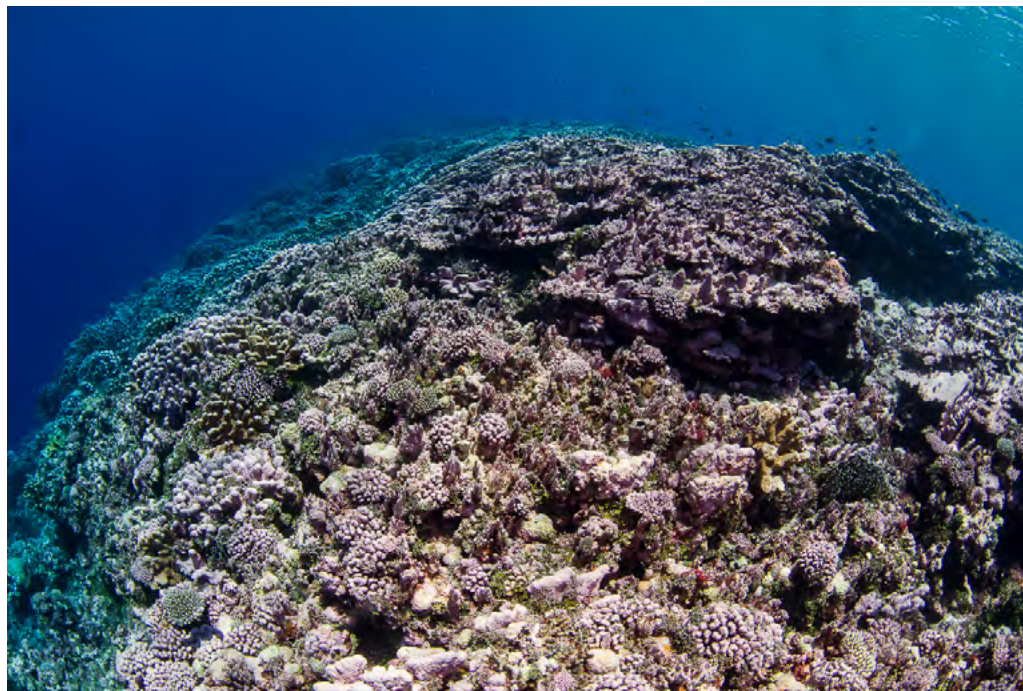
us that although there have always been El Nino events and potentially localized, mild bleaching events, mass bleaching was not seen until the 1980s.

'Background' warming caused by increased carbon dioxide means that every year, corals are closer to their maximum thermal limit; consequently, meteorological or climatic events that result in increased temperatures are now capable of causing mass bleaching when they would not have in the past. Indeed, scientists are increasingly able to

attribute specific weather events to the influence of climate change. In this case, it has been shown that the conditions that caused the bleaching are virtually impossible to replicate without accounting for the influence of climate change, and that the effect of El Nino on temperatures in the Coral Sea was weak.

Furthermore, we are increasingly seeing mass bleaching events during neutral and La Nina cycles of the Southern Oscillation Index, providing further evidence that because warming has pushed corals towards their maximum temperature thresholds, any atmospheric conditions that increase water temperatures above average can cause bleaching. Consequently, bleaching events are becoming much more frequent than they were in the past.

It is clear that mass coral bleaching is a recent phenomenon that can be definitively linked to warming driven by increasing atmospheric carbon dioxide. In addition, thermal stress, even when it is not severe enough to cause bleaching, is linked to increased incidence of coral disease, and disease outbreaks often occurring in surviving corals following a mass bleaching event. Rising sea temperatures also result in more severe cyclones, which also results in considerable coral loss. So, what does this mean for the recovery

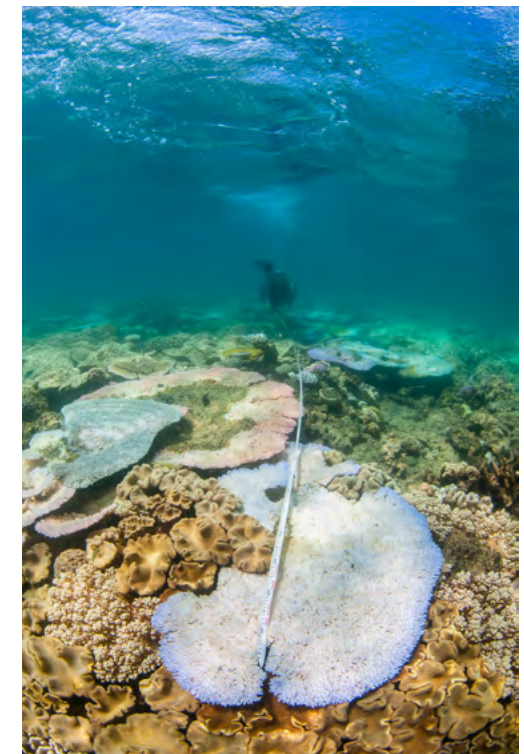


Dead skeletons of corals that died due to elevated water temperatures on a remote atoll in Micronesia in 2016. Photo Dr Tom Bridge

of the GBR and the future of coral reefs more broadly? That is a harder question to answer, but by examining several lines of evidence we can make some informed predictions about how ecosystems may change.

There is no doubt that coral reefs naturally experience a range of disturbances, and that they can recover if given sufficient time. However, the idea that coral reefs have recovered from disturbances in the past and therefore will always recover again represents a form of confirmation bias, like suggesting

that because someone recovered from cancer once they will definitely recover if their cancer re-occurs. For obvious reasons, recovery from more severe disturbances is more challenging than more mild ones: a mild bleaching event that kills 10% of corals may be hardly noticeable to the untrained eye, and recovery is likely to be rapid. In contrast, a severe bleaching event that kills 90% of the corals on a reef will be readily apparent to anyone who sees it. In cases where a reef has lost a substantial proportion of its corals,



Completing surveys of the coral bleaching impact at Hastings Reef, on the GBR off Cairns, April 2016. Using set distances measured by tapes over the substrate allow the influence to be quantified. ISO:200, F-Stop: 13, 1/250 sec, Tokina 10-17 at 10mm. Photo T. E. Roberts

there are numerous factors that can influence reef recovery.

The first factor to consider with regards to reef recovery is time; generally, the more severe the disturbance, the longer a reef will take to recover. The beautiful,



A butterflyfish searches for food around bleached coral colonies. These fish rely on the corals as food sources, and a drastic decline in the living coral, or even the health of the corals will inevitably impact these species as well. ISO:200, F-Stop: 22, 1/320 sec, Nikkor 60mm. Photo T. E. Roberts

diverse coral assemblages we observe underwater are invariably decades old, and even assemblages composed of the fastest-growing corals generally take at least ten years to mature. Consequently, a reef that is hit by a severe storm or bleaching requires a minimum of ten years to recover. In the past, most reefs would have experienced disturbances relatively infrequently, if at all. However, rising sea surface temperatures mean that the time between disturbance events

is decreasing; worldwide the average time between bleaching events, known as the 'return time' is currently 6 years. Furthermore, disturbances do not exist in a vacuum, and a coral assemblage recovering from bleaching can be set back by other disturbances, such as a hurricane, even if they escape bleaching.

In addition to time, there are several other factors that can influence reef 'resilience', which is the term used to describe the reef's



The killing fields of the 2016-2017 bleaching event. Shallow reef communities at Michaelmas Reef off Cairns in various stages of bleaching stress, and death. April 2016. Some colonies are still fluorescing, where the iridescent proteins in the tissues show through once the symbiotic algae are lost. This creates a bright neon display of what are essentially death colours, before the corals bleach to white, and die. ISO:200, F-Stop: 11, 1/320 sec, Tokina 10-17 at 10mm. Photo T. E. Roberts

ability to recover from disturbance. One important factor is recruitment of juvenile corals onto the reef. Following spawning, coral larvae are transported by currents away from the parent colony. The amount of time spent in open water depends on the species, but generally varies from a few days to a few weeks. Although many corals settle on the same reef as their parents, some can be carried

large distances to other reefs. For this reason, having a network of reefs can improve the chances of recovery, because it increases the chances that some corals have survived somewhere.

Although the 2016 bleaching event killed a huge number of corals on the GBR, it is a very large reef system and a very large number survived, improving the chances that reefs that were severely impacted will

recover compared to more isolated reef systems such as remote oceanic atolls. Even in the far northern region where bleaching was most severe, there are pockets where the corals remained virtually untouched by bleaching, probably because of unique oceanographic conditions. For example, some parts of the outer-shelf of the GBR are exposed to upwelling of cold waters that can alleviate bleaching. These areas are likely to be very important for recovery of other reefs in the region, and because of their unique oceanography, may represent long-term refuges for corals in the region. Importantly, they also continue to provide dive operators with spectacular dive sites. Identifying these special areas and protecting them from other stressors such as overfishing is critical for enhancing reef recovery.

Even corals that survive bleaching often exhibit signs of stress, such as increased vulnerability to disease and reduced fecundity, which can inhibit reef recovery. In the case of the GBR, many of the colonies that survived the bleaching spawned as they have following previous mass bleaching events. However, there is some indication the proportion of colonies breeding was lower than in non-bleaching years. For example, researchers estimated that a total of 45% of the *Acropora*

colonies at Orpheus Island in the central GBR spawned in 2017. As always, spawning was split over three different months – despite the common misconception that all corals on the GBR spawn simultaneously. At Orpheus in 2017, 1 % of colonies spawned in October, 37 % in November and 7% in December.

For those corals that were able to spawn, the next step in reef recovery is for the larval corals to find a spot on the reef and start to grow into an adult colony. This process, known as ‘settlement’, is influenced by numerous factors including the topography of the reef itself and the amount of algae present. If large, fleshy macroalgae have grown over the reef, juvenile corals fail to settle and the reef may remain in a permanent algal-dominated state. Ensuring a sufficient abundance of algae-eating fish such as surgeonfish, unicornfish and rabbitfish is important for keeping algal abundance low in order to give the corals the best chance to recover.

Topographic complexity also appears important for coral settlement and reef recovery, as well as for other things like providing habitat for reef fish. Since corals provide a lot of the topographic complexity on reefs, disturbances such as bleaching and cyclones cause loss of reef complexity. For many reef fish, the

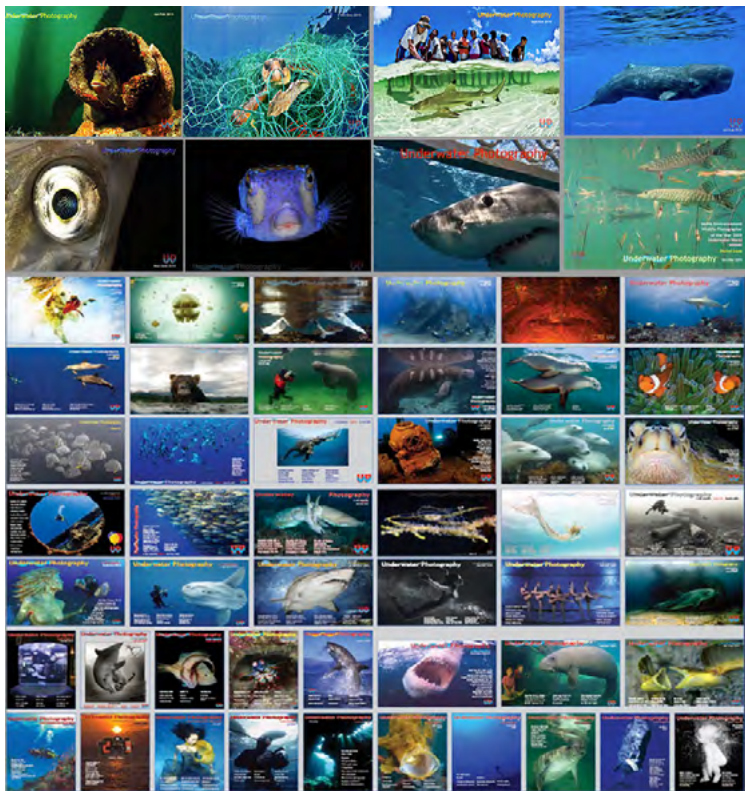


*Corals differ in their susceptibility to disturbances such as bleaching, both among species and habitats. The genus *Porities*, shown here, is generally more resistant to temperature stress than *Acropora*. This photo was taken after the 2016 bleaching event, which killed many of the *Acropora* on this reef. Photo Dr Tom Bridge*

complexity provided by corals is more important than live coral per se. Consequently, loss of corals can lead to a loss of complexity, which in turn leads to declines in fishes which then prevents coral recovery. Since the 1970s, there have been numerous long-term studies that have documented the effects of disturbances on reefs over decadal timescales. Some of the reefs have recovered whereas others have shown little signs of recovery after years or even decades. Others have

shown recovery of corals but a shift in the composition of coral species, particularly a shift from thermally-sensitive *Acropora* towards species that are more tolerant of high temperature, such as *Porites*. In recent years we have learnt a great deal about the factors that influence coral reef recovery, and therefore we should try to do everything we can to give reefs a fighting chance.

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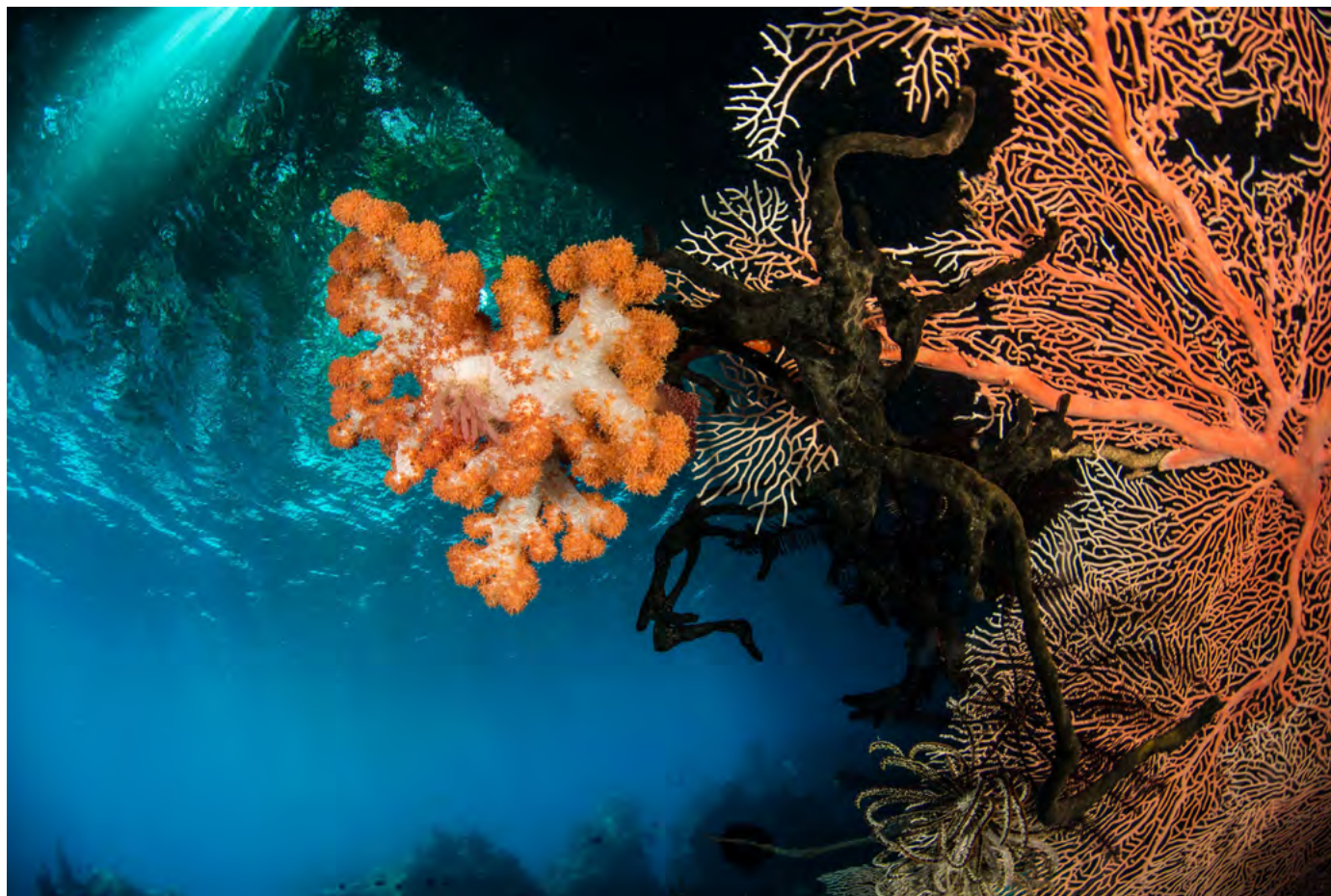
...where would it be?

by Helen Brierley

How often do divers, always in search of exciting new depths to explore, ask each other, “So where’s the best place you’ve ever dived?” The answer might be The Philippines, The Galapagos, Mexico or any number of places with thrilling big animals, great bio-diversity or stunning underwater topography. But is there one site you could see yourself returning to again and again? Somewhere you’d be happy to explore day in, day out? Well I think we just found the place that would fit the bill for us.

Arriving in Papua New Guinea recently, our first stop was Milne Bay. With many different sites to choose from, some nearby and others an hour or two boat ride away, there is plenty to fill a week or two of diving, but once we discovered Lawadi, we were hooked and just wanted to keep going back. It’s no surprise, as we soon discovered, that this was where ‘muck diving’ first began, yet that’s not the only draw, with some beautiful areas of healthy coral serving as seemingly permanent cleaning stations for some of the tamest critters we have ever come across.

The dive sites on the north coast of Milne Bay are accessed by boat as there are few roads and only



Soft Corals and Fans at Deacon’s Reef, 1/125, f11, ISO 320, Tokina 10-17 at 17mm. Nikon D500 in Nauticam Housing with YSD1 strobes

a sparse population. This makes for beautiful views of tree clad slopes right down to the water’s edge. At each end of the black sand beach at Lawadi, there is a small river running down into the sea, bringing nutrients from the forest, but none of the trash that seems to end up in many other well known muck diving destinations. In fact, it was incredible to spend over three weeks diving in a country and find zero man made trash in the waters or on the shore.

Dive boats can pull up very close to shore at Lawadi, making the diving here super easy. From getting into the water, right through to the safety stop, it’s one critter (photo op!) after another here. Stepping off the boat for our first dive, starting in about 5 meters, I turned over a brown leaf and there was a beautiful harlequin shrimp, in no hurry to hide. Lawadi is one of those sites where it is wonderful to have a local guide, especially for the



“Leaf Sheep” Sapsucking Slug, 1/250, f20, ISO 250, 105mm Micro Nikkor. Nikon D500 in Nauticam Housing with YSD1 strobes

tinest finds, but it’s also a fantastic place to take your time, scouring small areas to see what shows up. The first few times diving such a site, I can never resist the urge to discover as many different critters as possible, photographing as I go. And if you are a list keeper, you won’t be disappointed here. We certainly added some new sightings such as Long Nose Rock (or Donald Duck) Shrimp and numerous different nudibranchs.

Lawadi is also the perfect place for the photographer (or videographer) who wants to spend some serious time

with a subject. The water is warm and calm, the depths do not have to be great and the boat is never far away, so it’s easy to use up half the dive on a tiny yawning frogfish or trying to get a shot of a minuscule ‘Leaf Sheep’ sea slug next to an egg cluster as he moves surprisingly quickly across his leaf.

During two dives, I hunted down Melibe, trying to get a shot that showed something more than a brown blob against the dark sand. I even tried waiting for one to make its way across my white dive slate,



Yawning Painted Frogfish 1/160, f22, ISO 250, 105mm Micro Nikkor. Nikon D500 in Nauticam Housing with YSD1 strobes

Halimeda Ghost Pipefish, 1/250, f32, ISO 250, 105mm Micro Nikkor. Nikon D500 in Nauticam Housing with YSD1 strobes





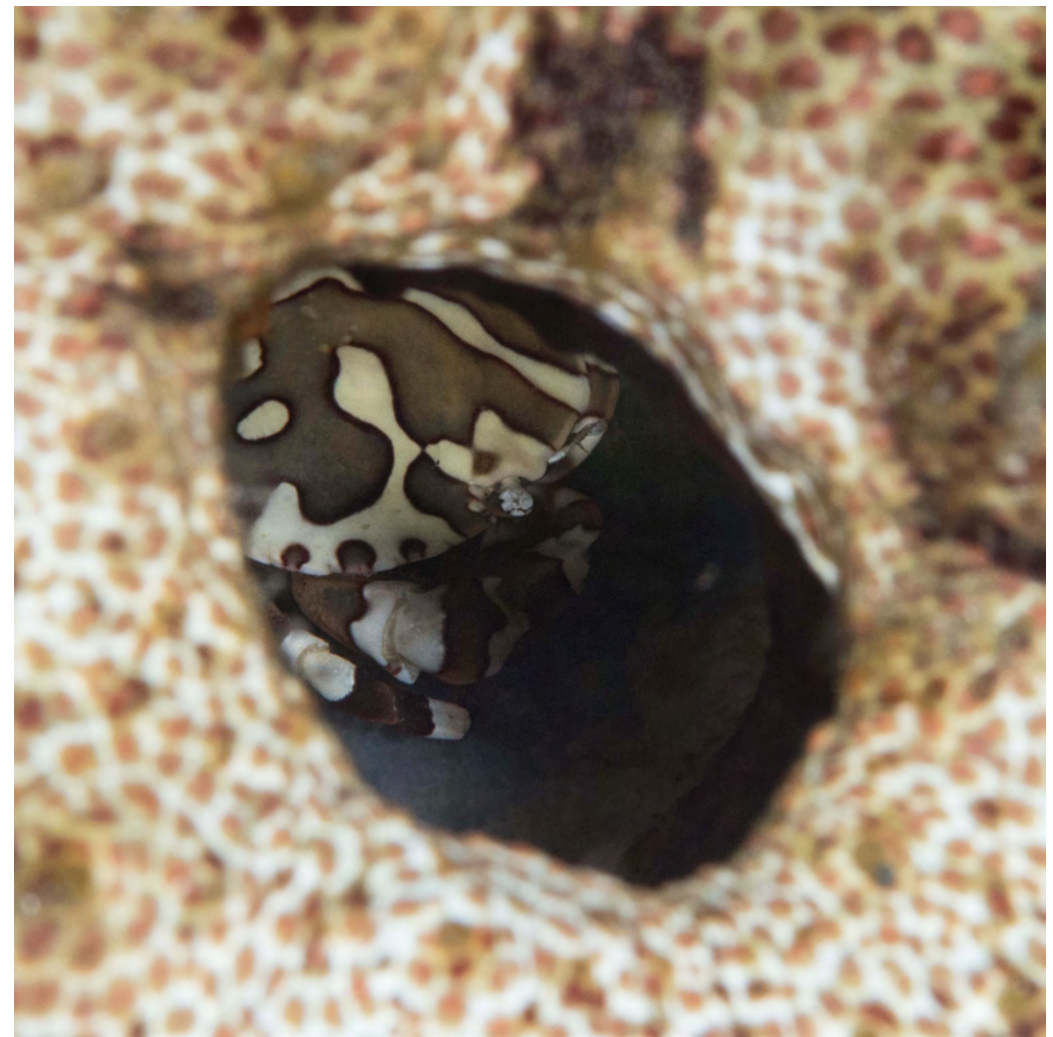
Melibe, 1/200, f22, ISO 320, 105mm Micro Nikkor. Nikon D500 in Nauticam Housing with YSD1 strobes

which kind of worked, but wasn't very natural looking.

I finally came across one on a plant raised slightly off the sand so was able to get below it and shoot at least an identifiable portrait as it spread its mantle for the hunt.

The longest I spent on one subject certainly didn't result in any competition winners, but was a fun challenge. We had been discussing pearl fish, so I was looking rather more closely than usual at the rear end of sea cucumbers. Spotting a rather large specimen, I noticed its

anus was dilating and contracting very obviously, so I moved in for a closer look. I was quite surprised to spot a sea cucumber swimming crab (that looked larger than the opening) hanging out deep inside. I just had to get a photo, but there were a few challenges, not least lighting as well as wondering what the other divers might think of my strange behaviour. In between waiting for each dilation, hoping the crab had moved into a position where the camera could see it, getting the focus right and pressing the shutter, I tried every



Sea Cucumber Swimming Crab inside Sea Cucumber Anus. 1/160, f22, ISO 640, 105mm Micro Nikkor. Nikon D500 in Nauticam Housing with YSD1 strobes

strobe position possible. Next I tried strobes off, flashlight on, but the beam was too wide and over exposed the sea cucumber. But finally, ambient light, new settings and yay, I had a photo worthy of an amateur marine

proctologist as one viewer commented later.

If, however, you or your buddy remain completely unconvinced of the joys of muck diving, this site has another side to it, just a short swim



A shy local watches the divers from the water's edge.

from your boat in the other direction. Incredibly, you will find one of the most beautiful wide angle spots here, at Deacon's Reef. The wall, with huge coral heads and sea fans, is only rivalled by the soft corals nearer to shore. Here the overhanging trees filter the light, especially mid-morning on a sunny day, sending radiating beams to serve as a background for the whips and fans. It's possible to see bigger animals here too, out in the blue off the reef, but we were so spellbound by the light and the corals, that we barely glanced that way.

I know we are not the only divers to be captured by the spell of this magical place, so don't miss it if you

find yourself in Papua New Guinea. But then again, maybe you too have found that one site somewhere else...?

Helen Brierley
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Galapagos Orca Encounter

by Ron Watkins

As I sat poised on the edge of the small inflatable panga anxiously waiting to slip into the ocean, one of my buddies Albert nervously asked, “Is it safe to go in the water with them?” This was the first time I consciously thought about the safety of entering the waters of Darwin Island in the Galapagos with these apex predators, or killer whales (Orcinus orca). I wasn’t sure exactly how to respond to Albert and the others looking at me for affirmation.

Up to this point, we had been cruising around in the pangas watching the orcas from a distance swim near the island and out around the fifty-one foot tall lava structure known as Darwin’s Arch. Then the transient pod of one male, three females and one calf took an interest in us and came in for a closer look. The orcas swam directly under the panga, surfacing within arms’ reach and then slowly circled the small boat. Next to our amazement, there were two spectacular gravity defying tail slaps where the rear half of the orca came completely out of the water before crashing to the surface with a big splash. The pod disappeared for several minutes and we thought the show was over before the large male

surfaced in the distance and thrashed about with a large sea turtle in its mouth. We discussed whether it was just a play toy or a meal, but after we observed an oily slick near where the orca had surfaced, we guessed it was the latter.

Despite having up to four inch teeth and often being referred to as “killer whales,” these marine mammals are actually the largest of the oceanic dolphin family. They may have gotten their deceptively dangerous name from a mistranslation of their Spanish name “asesina de ballenas”, which literally means “killer of whales” because they often feast on whales. A more fitting misinterpretation is the one of Albert’s grandma. In Chinese, killer whales are actually referred to as tiger whales. Albert’s grandma said to him, “Why you call them tiger whales? They look like panda. Why not just call them panda whales?” If I had heard that translation before the trip, it would have made my response to Albert about the safety of entering the water with the orcas much easier. After all, who wouldn’t want to swim with cute playful “panda” whales?

As the trip leader of the fifteen guests cruising the Galapagos, I



carefully thought about my response to Albert because I had no experience in the water with these large mammals. I turned to the group and said, “I am not 100% certain that this is safe, but the pod has been very social around the boat and showing no signs of aggression towards us. There has never been a recorded fatal attack on a human by an orca in the wild and this is an extremely rare opportunity. Each of you have to make your own decision of whether or not to go in, but I cannot live with the regret of not trying.” Soon afterwards, I quietly slipped in the water alone as the others looked on in disbelief from the security of the panga.

The pod of five graceful orcas was a short distance in front of me and slowly approached my position. I took a test shot with my camera, looked at the histograms and made a few minor adjustments. I then looked up to see the large male quickly closing in on me as if to protect the other three females and calf from this strange creature and make sure that I was not a threat. He came within eight to ten feet of me and slowly changed course to pass just below me as I turned around and started swimming until I could no longer keep up. With a rush of adrenaline, I popped up and swam toward the boat and quickly handed up my camera. Immediately the group started asking if the whales were aggressive and what it was like, but with my eyes wide-open and evident state of euphoria, I think they already knew the answer. As I explained the thrill of the interaction, I hit the display on my camera and quickly showed them a few images I had captured and they let out screams of excitement as they each slipped on their fins and masks. Evidently, the fear of a photographer missing a rare photo opportunity is much greater than the fear of getting in the water with one of the worlds’ most

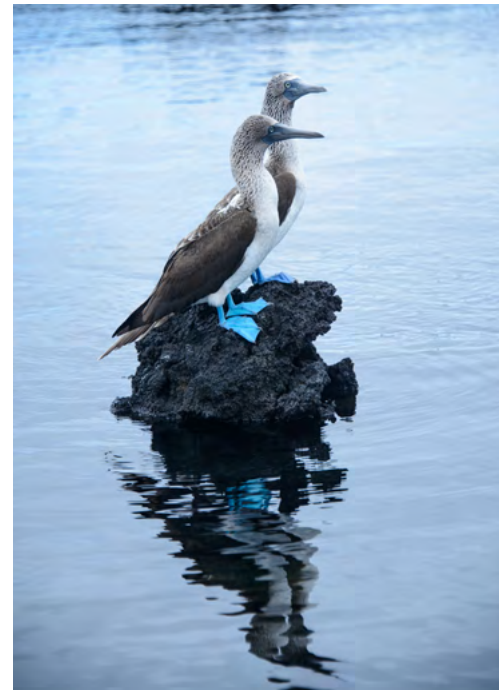


powerful predators.

On the second drop in with the orcas, a few others nervously joined me. This time, one of the females with the calf in tow headed straight towards me and the male was nowhere to be seen. From my shark diving experiences I know you have to keep your head on a swivel because it is not the one that you see that you have to worry about, but rather the one you don't. Orcas are also known as the ‘Wolves of the Sea’ because of their highly sophisticated and cooperative hunting techniques so I was a little

concerned, but quickly shifted my focus to the two approaching orcas. To my surprise, the mature female veered to the left of me and allowed the calf to swim below her and surface a short distance directly in front of me, which appeared to be a sign of trust. I turned and swam with the pair for a bit until they dove deeper.

After the second pass, more people started to enter the water and eventually everyone on the trip joined in the fun. Over a period of forty minutes, the playful pod of killer whales interacted with us



in the clear warm water while we took pictures and video, but they eventually grew tired of us and moved on. As we all surfaced and got back in the pangas with smiles on our faces, I realized that we were sharing something special that few people will ever experience in nature.

After our rare interaction with the orcas, we were all as giddy as school kids and couldn't stop talking about what each of us had experienced and just how fortunate we were to see orcas in the wild – the way they are supposed to be seen. We all came to the Galapagos to experience the raw beauty of nature, but none of us expected an interaction of a

lifetime. For the next several nights, the workshop photo reviews were full of orca pictures and videos and some people became very emotional when reflecting on what it meant to them. For me, it truly was a new high point in my aquatic life and I feel extremely lucky that the orcas allowed us to interact with them. But most of all, it was being able to share this chance encounter with fifteen people from various walks of life who now share an everlasting bond. I will never forget how terrific I felt when Albert approached me and confided: “It has been twenty-two years of diving for me and it is the first time I have spotted wild orcas. If you didn't jump

into the water, I would not have done so myself alone. We may be the first Taiwanese divers to ever swim with orcas. Thank you, so much. Great to share this experience with you.”

A trip to the Galapagos Marine Reserve and UNESCO World Heritage Site is a “bucket list” trip. It is one of the most unique ecosystems in the world and provides rich bio-diversity both above and below the surface. The scuba diving is unparalleled with schooling hammerheads, Galapagos sharks, mola molas, sea lions, turtles and large schools of fish.

Our group spent much

of our non-diving time on exciting land excursions and rides along the coastline observing blue-footed boobies, frigate birds, marine iguanas, penguins and the giant Galapagos tortoise. It seemed like every day of our ten day trip introduced us to a new and exciting animal behavior. Although we all seemed to enjoy every new interaction with the same fervor, I believe everyone's most memorable and exhilarating wildlife encounter was during those forty magical moments we spent swimming with wild orcas.

Ron Watkins
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Guam's Special Marine Preserves

by Tim Rock

Surrounded by an azure sea, the island of Guam in Western Micronesia is blessed with one of the world's richest coral reef marine environments. It thrives with more than 700 fish species and nearly 400 kinds of corals. This great natural biodiversity attracts divers from all over Asia and other parts of the world. Combined with its historic past that includes shipwrecks and remnants from WWII, WWI and even the gold bearing Manila Galleon trading days and Guam is a real treasure chest for undersea explorers.

For people living on Guam, this bonanza has made divers of many. It is Micronesia's most developed and populated island with 150,000 people and a million Japanese and Asian tourists annually. Not surprisingly, locals and tourists head to the 236 square miles of reefs found surrounding Guam.

Add to this the fact that consistently warm and clear water make year 'round diving possible. Dive training on the island is also the most advanced and readily available of anywhere in the Pacific.

There are some areas that are really worth checking out as many can be done by both boat and shore and are protected from fishing. Thus, the marine life is more abundant in these areas.

The betterment of Guam's diverse underwater world has been the thrust behind a series of nature preserve set up around the island. What these areas do is keep fishing to a minimum, allowing breeding stocks to prosper and make more fish.

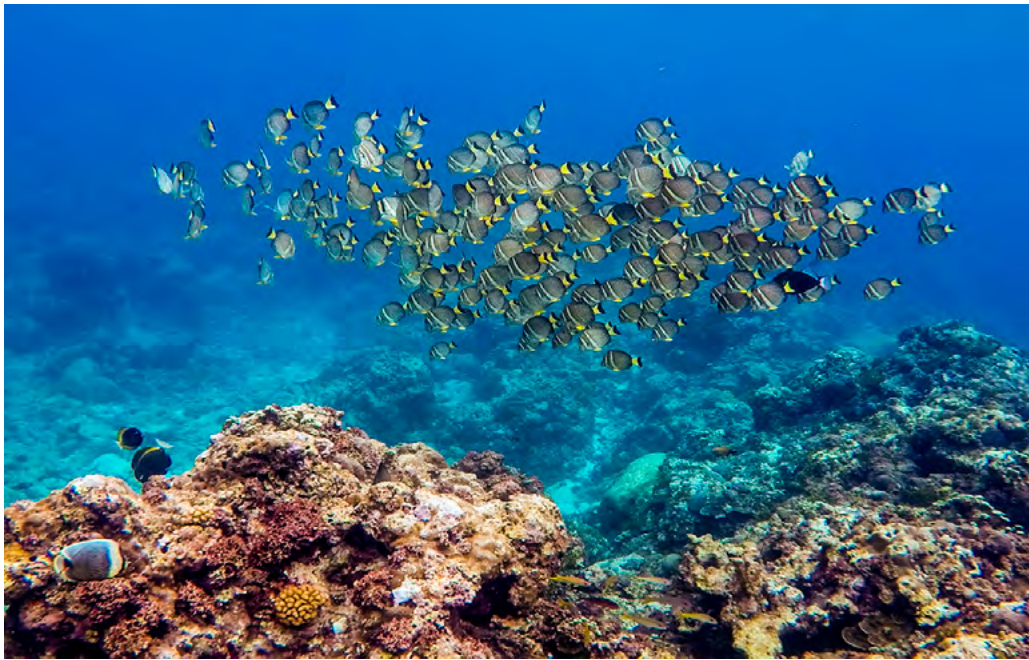


The island has seen a sharp decline in the last 20 years in its breeding fish; that is, the larger fish that make offspring. This is due to a number of factors including unrestricted fishing around the entire island, reef damage from poor building practices and natural causes, like typhoon damage.

The preserves include the Achang Reef Flat in southern Guam, south east of Cocos Island. This area is a prime spot for young fish to grow, as there

are many mangroves and other natural protections for the juveniles. The Sasa Bay is another mangrove area in the eastern part of Apra Harbor. This has long been a breeding ground for fish including hammerhead sharks.

The Piti Bomb Holes, which actually includes most of Piti Bay including Camel Rock, Fish Eye Marine Park and the Piti Channel, is another prime site for fish with over 200 species in this compact



area inside the reef. This is one of Guam's most accessible sites that is a favorite of introductory scuba divers and snorkelers.

Tumon Bay including the areas around Gun Beach and Two Lover's Point is the next site set aside for protection. The inner reef at Tumon is like a miniature aquarium, with many colorful reef tropicals. Ocean currents, making the sea full of nutrients and thus, a good site for young fish to prosper, constantly flush these protected waters.

The final area is known as Pati Point in northern Guam. This site was set aside a while ago by the military and the results are refreshing. There are schooling fish, sea turtles and

lots of other signs that preserves do work at the Pati site. The corals here are also quite healthy and the view of Guam's coastline makes this a fine place to visit. Waves and strong currents make it hard to come here on a consistent basis, which is probably good for the fish.

The preserves are trying to reduce fishing pressure. For over a decade, biologists studied Guam's reefs and decided that the increased population on the island meant more fishermen. Local tastes seem to lean toward the full-grown and juvenile fish, which made it hard for some fish to repopulate reefs once most of them were caught. The preserves have been called egg banks, places where fish

can lay and hatch youngsters without predation from man.

Overall, the addition of these new preserves up and down the coast means that fish from these protected sites should also move into the unprotected regions. This means fishermen will be able actually show better catches in a short period of time. This also means people like divers should see more and bigger fish on the reefs. Overall, Guam's reefs should indeed prosper from these new preservation areas.

One of Guam's most popular dive sites is the north end of the Piti Bay. Sometimes called the Bomb Holes, it is really an area of collapsed reef flat. It has been dubbed Fish

Eye Marine Park due to the fact that there is Fish Eye underwater observatory there. This walk-in site has more than 200 fish species, as it is a marine park and incubator for fish and invertebrates. This place is so special, as recently as last year, a new butterflyfish unknown to science was found there. Divers can see the healthy reef on the south side of the observatory, feed the fish and even snorkel around the observatory itself. A visit to the unique observatory can also be done before or after diving. This is also a great place to snorkel.

The entire Piti Bay is a preserve and there are many off and unusual critters to see at the bay's south end including juvenile



crocodilefish, a slew of nudibranchs, decorator corals, boxer crabs and even the occasional harlequin shrimp.

And one area not many think of as a dive site is in the hotel district. An easy walk-in snorkel or dive is at Ypao Beach Park next to The Hilton Resort and Spa at the south end of Tumon Bay. The clear waters and brilliant white sand make this a great place to enjoy the many corals and fishes. It is, of course, an excellent place for snorkeling. Set next to one of Guam's nicest public parks, one can have lunch before or after the dive at beach side.

North of here at Gun Beach, this site is considered a fun boat dive or beach dive. Named for the WWII gun emplacement near the cliffline that sits on its shore, this sloping reef has a lot of fish life and is great for fish photography. This is a favorite snorkeling site stopover for some dolphin tours.

One can dive deep or shallow here. Healthy coral gardens are found to the right. Manta rays have been known to come here to feed on the outgoing tide at the major cut in the reef. Look for tiny creatures like coral hermit crabs and colorful



Christmas tree worms that hide when touched but then unfold into a treelike formation of appendages. In a shallow haloclimate area, one can seasonally see baby blacktip sharks who like the protection of the limestone caves in the upper reef area at the bay's north end. Both Tumon and Sasa Bay near the harbor are juvenile shark nurseries.

The preserves seem to be doing as well as can be in the face of what is happening worldwide to the oceans. Guam's reefs have had a tough go of it in the past five years. That's because Guam and other Mariana and Micronesian islands have been



affected by the longest global coral bleaching event on record. The western Pacific is not alone. It has been impacting reefs around the world for three years. In 2017, there is hope it is finally coming to an end. However, Guam is not in the clear yet. Warm waters once again hit the reefs and preserves in August through October.

"For 2017, we are holding our breath (to see the recovery)" says Laurie Raymundo, PhD, from Guam's UOG Marine Lab. She and her colleagues have been monitoring the corals around the island for the duration of this bleaching and she says



Guam has definitely lost some coral cover as a result. Both hard and soft corals have been affected as well as sea anemones and other coral-related creatures.

Coral bleaching occurs when ocean temperatures increase. When the waters get too warm, corals spit out the algae that live inside. Normally, these algae provide corals with most of the energy they need to live. Corals that have lost their algae are sick and are white-looking or “bleached” because the algae give healthy corals their bright colors. Soft corals sometimes turn a brilliant yellow, which is pretty to see but a real sign they are fighting for their

lives. Sea anemone tentacles also turn white as they struggle to live.

Raymundo says Guam’s corals have had certain degrees of damage. Some colonies, especially in the staghorn family, have totally died out in some spots. While fish may still be living in the dead coral structures, sooner or later these stands will collapse and fish will move elsewhere. Other have exhibited the “Phoenix Effect” where some, but not all, of the colony dies. The remaining corals regrow and try to take hold again. This can be seen in many areas in Guam’s Tumon Bay Marine Preserve, especially at the south end. Affected soft corals can be

seen farther north near the Westin Cut. And, while beautiful to photograph, the sea anemones have also bleached white but as of the last week of December 2017, most anemones are now regaining color as trade winds have brought cooler waters back to the reefs and preserves.

The preserves have also meant an uptick in the sea turtle populations it seems. Many greens and hawksbills are found in the Tumon and Piti waters. Some tour operators have even started turtle viewing tours for snorkelers.

But Guam also faces a commitment issue. The island only has 8 rangers to protect and enforce

conservation laws on land and sea and 4 are scheduled for retirement soon. Compared to Palau, which has 120-plus conservation rangers, Guam is stretched pretty thin as the most populous island in Micronesia.

For the diver, these preserves mean Guam’s beautiful reefs should have more and bigger fish in the years to come. As Guam is one of the richest ocean areas on earth, with the preserves, it can only get richer.

Tim Rock

<https://timrock.photoshelter.com>

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Digital cameras have opened up new possibilities to underwater photographers. For available light photography manual white balance is an invaluable tool for restoring colours. But when you use it without a filter you are not making the most of the technique. You're doing all the hard work without reaping the full rewards. These three photos are all taken of the same wreck in the Red Sea. The left hand image was taken on slide film, which rendered the scene completely blue. The middle image is taken with a digital SLR without a filter, using manual white balance. The white balance has brought out some of the colour of the wreck, but it has also sucked all the blue out of the water behind the wreck, making it almost grey. The right hand image is taken with the same digital camera and lens, but this time using an original Magic Filter. The filter attenuates blue light meaning that the colours of the wreck are brought out and it stands out from the background water, which is recorded as an accurate blue.

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South West Ramblings 23

with Mark Webster

This will be my first ramble of 2017/8 as a number of other life priorities have impinged on my diving this year. Despite fewer dives I have still managed to collect some pleasing images and as the next issue of UWP is number 100 I thought it was a good prompt to review the events of the year.

If you have followed any of my previous ramblings you will know that I have a bit of a penchant, possibly an obsession, for UK nudibranchs. I always look forward to the first few months of the year when the breeding season commences and these little critters begin to appear in abundance. Often we are seeing the same species each year, but I am always hopeful of finding something unusual and if you look hard enough then usually at least one instance will occur. Finding a rare species is of course the pinnacle, and I was lucky with one this year, but the other approach can be simply to explore different habitats to create an unusual or striking image. So to begin with I will recount the tale of three locations and the nudibranch encounters at each!

One of my favourite dive sites in Falmouth are the maerl beds in the Fal estuary. Maerl is a calcified seaweed which looks a little like pink coral nodules and we are fortunate to have large healthy beds of maerl, particularly on the east side of the river under St. Mawes castle. The maerl and the tidal estuary provides a very nutrient rich environment for a wide range of species and a dive here is rarely a



Sea lemon nudibranch (Archidoris pseudoargus) is perhaps the most common species found on the maerl beds and is not a particularly attractive species. It often has very good colour match to the maerl or food source and so is a challenge to photograph well. Nikon D7100, Subal ND7100 housing, 10-17mm FE zoom, Inon Z240 flash guns, ISO 320 f13 1/25.

disappointment especially with a macro lens.

The most common nudibranchs here are the sea lemons, in a variety of colours and camouflaged patterns, which feed mostly on the top of the maerl and so are relatively easy to find. However, they are not exactly a pretty species and it is hard work producing an image which does anything but illustrate the species and habitat.

There are many other small nudibranch species here, but they are often hidden in the maerl feeding and so you have to spend quite some time in a small area searching and waiting for signs of movement. When you have success and your target climbs out over the maerl to feed in a new area you often have an excellent contrast between a pretty and delicate nudibranch and the deep pink colour of the maerl.



Nudibranch Facelina annlicornis is a spectacular looking nudibranch but not often seen as it spends much of the time within the maerl feeding. The fine white markings looks like it has been spattered radomly with paint! Nikon D7100, Subal ND7100 housing, 105mm micro, Inon Quad flash, ISO 100 f22 1/100.

So with some patience the first pleasing find of the season was a very striking example of *Facelina annlicornis* which I have only seen two or three times before and always in a reef environment. This one emerged slowly from the maerl and appeared to be “sniffing” the current by raising its head in search of the next meal. The current here can be very strong, but a little is a benefit as it will take away any disturbed estuarine silt, so it is best to time

your dives for just before or just after high or low water slack. The nudibranch moved perhaps 30cm over the maerl at a reasonable pace (for a nudibranch) which gave me time to shoot a variety of angles and wait for the silt to clear that I kicked up with each move. It then disappeared back into the maerl making me realise why these critters are not often seen here and that you will only get lucky if you have enough patience.

Later in the year I was exploring



Nudibranch Facelina bostoniensis feeding on a blade of eel grass in the Helford river. These nudibranchs are very small and need patient search to find them. Nikon D7100, Subal ND7100 housing, 105mm micro, Inon Quad flash, ISO 100 f29 1/200.

search would turn up some interesting subjects.

The estuary is inevitably quite silty and this tends to settle on the eel grass and is easily disturbed. So my usual method is to stick to the edge of the beds and try to resist the temptation of getting amongst the grass as this not only disturbs the visibility but also damages the habitat.

The nudibranchs here lay their eggs and feed on the blades of grass, so the first thing to look for are egg spirals and once found that narrows your initial search area. Next step is to examine the grass blades in the immediate vicinity and look carefully on the undersides in particular. If the UWP gods are smiling on you will eventually find some subjects and begin to look for angles to capture some images.

When working with a big housing and a macro port it is easy to get too close and disturb the silt on adjacent grass which will then take time to clear in the gentle current, so I like to use my venerable Inon quad

in another nearby estuary of the Helford river which boasts some very healthy eel grass beds.

The winter of 2016/17 was relatively mild in Cornwall, so the usual die back of the eel grass was limited and the vibrant spring growth has led to the area of the eel grass beds to expand significantly beyond the “no anchoring” area marked by a string of buoys at Durgan. But more eel grass equals more habitat of course and so I was hopeful that my



Nudibranch Eubranchus farrani feeding on a blade of eel grass in the Helford river. This orange/yellow colour is less common than the white variety. This subject looks like it is re-growing cerata perhaps after an attack from a predator. Nikon D7100, Subal ND7100 housing, 105mm micro, Inon Quad flash, ISO 100 f22 1/30.

flash here which allows me to work a little closer than with a pair of flash guns.

This year I found many of the usual suspects and a couple of less common species at this location, a *Facelina bostoniensis* (I think!) which was slowly spiralling around a blade of grass, and a *Eubranchus farrani* in an unusual orange hue. As your subject is elevated from the seabed on the eel grass you may also be able

to get a low enough angle to collect some natural light behind the subject. Bumping up the ISO for these shots will also help.

The third significant nudibranch encounter occurred at Porthkerris on the Lizard, which is a favourite beach dive location for me.

The dive here is a classic reef system where you can quickly reach a reasonable depth of 18m and more at high water and there are several



Nudibranch Hypselodoris valenciennesi is extremely rare in the UK and would more likely be seen in the Mediterranean or on the Atlantic coast of Portugal and Spain. This example seemed to be all on its own, so hopefully will find another to mate with before Spring! Nikon D7100, Subal ND7100 housing, 105mm micro, Inon Z240 flash guns, ISO 100 f22 1/30.

small walls which are exposed to the tide and support a variety of healthy colonies of hydroids which are a favourite nudibranch snack. So this is a good hunting ground especially in the spring time when you can see lots of mating activity.

The nudibranch season here continues all through the summer and into autumn with different species and if the summer is warm then there is often the chance of seeing

something rare. On a dive here in late October I thought I had done well in finding a *Doto fragilis* feeding in the open on red seaweed as they are normally buried at the base of feather hydroids where they can be awkward to photograph. As I began my return something colourful caught my eye on the wall which at first glance I thought was a strangely coloured jewel anemone. I almost ignored it, but on closer inspection was amazed to find



Opisthobranchs Colpoldaspis pusilla were another species seen frequently in 2017 at Porthkerris and are easily missed due to their very small size. Normally seen singly there is possibly three in this image. Nikon D7100, Subal ND7100 housing, 105mm micro, Inon Quad flash, ISO 100 f29 1/250.

a stunning nudibranch *Hypselerodis valenciennesi* (well I think it is!) in a deep purple colour with yellow stripes and spots.

This nudibranch would look at home in Bali or Lembah, but in fact is a Mediterranean species that can be found on the Atlantic coasts of Portugal, Spain and as far north as the French coast.

From what I have gleaned in my research it is rarely seen on the UK coast so I felt extremely lucky to have spotted it. It was slow moving over a small area of reef nibbling on hydroids so I had plenty of time to shoot a large number of frames and it was only the needle falling on my pressure gauge that brought the encounter to an end. I looked hard for another in the same area, but this seems to be a solo example, so who knows what will happen when the breeding season starts during the winter



Nudibranch Doto fragilis is usually seen feeding on feather hydroids which can make it an awkward species to photograph well. Finding one out in the open feeding on seaweed is unusual and an opportunity not to be missed. Nikon D7100, Subal ND7100 housing, 105mm micro, Inon Quad flash, ISO 100 f29 1/250.

months.

As I was getting ready to head back to shore I had a feeling I was being watched, turned my head and just a few inches away sat a small octopus watching intently, perhaps it had been there all the time! Even though I had a 105mm macro lens I had to take a few shots of this very co-operative subject before heading back now doubly pleased with the dive.

I have not seen many common octopus in the south west, but those I have seen have been at Porthkerris. There have been sightings reported all around Falmouth bay this year, so they seem to be making a comeback locally. Nikon D7100, Subal ND7100 housing, 105mm micro, Inon Z240 flash guns, ISO 100 f18 1/40.





Local divers have been reporting increased sightings of octopus, so it seems they are making a comeback at a number of dive sites and are generally very inquisitive and willing to pose. The other species not seen with any regularity since the late 1970's is the crawfish and these are also being seen in increasing numbers. Most are small, but occasionally larger examples are seen, so this is a very good sign but we have to hope that the fishing industry does not decimate the population again. So



European crawfish are making a comeback in the south west having been fished out in the late 1970's. So far of those seen most are quite small and we hope that the fishing industry will let them establish and thrive this time. Nikon D7100, Subal ND7100 housing, 10-17mm FE zoom, Inon Z240 flash guns, ISO 200 f14 1/40.

Compass jellyfish were the dominant species in 2017 and very few of the usual much larger Rhizostoma were in evidence. Shallow water and a fish eye lens will produce a Snell's window to frame your subject. Nikon D7100, Subal ND7100 housing, 10-17mm FE zoom, Inon Z240 flash guns, ISO 200 f14 1/250.

if you dive in the south west you may encounter one or more, but don't tell the fishermen!

I have also noticed that there seemed to be many more of the false cowries (*Simnia patula*) on both soft corals (dead men's fingers) and on gorgonia fan corals. Although I would expect to see several during a season there seemed to be dozens around this year and on one dive site there were one or more on almost every soft coral cluster I looked at, often in pairs. The remaining encounters



False cowrie Simnia patula on a gorgonia fan corals have been seen in large numbers this year. Nikon D7100, Subal ND7100 housing, 105mm micro, Inon Quad flash, ISO 100 f25 1/250.

of the year were pretty much what you would expect in terms of species. There were a lot of compass jellyfish to be seen until quite late in the year, but very few *Rhizostoma* which have been in abundance in the previous two years. No doubt these changes will be reversed next season and another species will appear to be abundant.

So now autumn has arrived and although the weather is quite mellow at the moment it will not be long before the first of the winters gales sidelines any thoughts of diving. But at least we have *Blue Planet 2* now on the BBC to enthuse and inspire us to greater imaging achievements!

Mark Webster

Guidelines for contributors

The response to UwP has been nothing short of fantastic. We are looking for interesting, well illustrated articles about underwater photography. We are looking for work from existing names but would also like to discover some of the new talent out there and that could be you! UwP is the perfect publication for you to increase your profile in the underwater photography community.

The type of articles we're looking for fall into five main categories:

Uw photo techniques - Balanced light, composition, etc

Locations - Photo friendly dive sites, countries or liveaboards,

Subjects -, Anything from whale sharks to nudibranchs in full detail

Equipment reviews - Detailed appraisals of the latest equipment

Personalities - Interviews/features about leading underwater photographers

**If you have an idea for an article,
contact me first before putting pen to paper.**

[E mail peter@uwpmag.com](mailto:peter@uwpmag.com)

How to submit articles

To keep UwP simple and financially viable, we can only accept submissions by e mail and they need to be done in the following way:

1. The text should be saved as a TEXT file and attached to the e mail

2. Images must be attached to the e mail and they need to be 150dpi

Size - Maximum length 20cm i.e. horizontal pictures would be 20 cm wide and verticals would be 20cm high.

File type - Save your image as a JPG file and set the compression to "Medium" quality. This should result in images no larger than about 120k which can be transmitted quickly. If we want larger sizes we will contact you.

3. Captions - **Each and every image MUST have full photographic details** including camera, housing, lens, lighting, film, aperture, shutter speed and exposure mode. These must also be copied and pasted into the body of the e mail.

Parting Shot

For many of us, coral reefs are the reason we dive. There is nothing more mesmerising than watching the fast, colourful interplay of relationships in shallow tropical waters. I often think of them as nature's own beautiful, bustling cities, teeming with creatures going about their day to day lives.

The astounding diversity of wildlife found here thrives exclusively thanks to the most extraordinary piece of living architecture: a network of corals offering food, protection and other vital services. From the smallest to the largest ocean dwellers, so many rely upon these megalopolises at some point in their lives.

Take manta rays for example: these gentle giants are cleaned by tiny reef-dwelling fishes, allowing them to stay healthy and parasite-free. Now imagine what would happen if you removed the fundamental building blocks of the reef, the coral. No coral means no habitat, no food and no services. From there it's easy to see how the city could quickly fall into disrepair.

Unfortunately, this is exactly what I've witnessed whilst working in the Maldives. The unusually long 2014-2016 El Niño devastated coral coverage worldwide, with more

than 60% of Maldivian reefs hit by bleaching. Our house reef, for example, has less than 5% live coral coverage. It was a huge shock to see the corals in this condition, but it made me realise that you really have to see bleaching to appreciate its effect, as it relates poorly on paper.

Taking compelling photos of dead, algae-covered corals is no easy feat however, as they just look so dull! It needed a photo which showed that even though everything may seem perfect at the surface, it can be a very different story just below. After waiting weeks for the right conditions, we headed out early one morning to catch a stunning sunrise and get a shot which I feel puts into perspective what's happening out of sight and out of mind.

I also hope it emits a positive message that the tide can still be turned and that the reefs are worth fighting for, as there is still so much beauty out there. There is no doubt that our climate is changing quickly and that bleaching events will become more regular, but by removing other pressures from the reef we can give them a fighting chance of recovery.

Reducing fish consumption, plastic waste and pushing for sustainable coastal development are



After weeks of waiting, the conditions were perfect to tell this story properly. Nikon D7000, Nauticam Housing, Tokina 10-17mm Fisheye at 10mm, 2x Sea and Sea YS-D1, f22, 1/125th, ISO 640

just a few ways we can help. For the sake of all marine life, hopefully the reefs can return to their former glory and the photos we're able to take in the years to come will be much more vibrant than this.

Finally, for those of you who haven't already seen it, I would highly recommend watching "Chasing

Corals", a fantastic documentary which is informative, visually creative and great inspiration of how as underwater artists we can help tell important stories.

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**Do you have a shot which has a story within a story?
If so e mail it with up to 500 words of text
and yours could be the next Parting Shot.**

peter@uwpmag.com
and yours could be in UWP101