



photo & video

This photo of a humpback whale mother and calf in Japan was taken with a Mavic Pro drone camera

Text and photos by Don Silcock

One of the things I learnt quickly when I first started writing for *X-Ray Mag* was that it is often the images that *were not* taken underwater that can make an article about a specific location really stand out. As was pointed out to me, one ornate ghost pipefish looks pretty much the same as another. As proud as you may be of the images from your last trip, are they *that much* different from those of the one before?

Maybe yes, maybe no... does it even matter? Well, I think it really does if you are trying to get your stuff published or even just "liked" on social media. People enjoy context around the images they

like. Building that up by showing more about the destination is a great way to engage. One of the very best ways to do that is an aerial image of the location, which, just a few years ago, was way beyond the reach of most of us, but drones have changed that dramatically.

DJI
I have been involved with China for over 16 years now—travelling there regularly and living in Shanghai for a couple of years. In that time, I have seen the country grow and emerge as the factory of the world, on a scale that is simply incred-

ible. The Chinese were able to achieve this scale with a combination of working hard and some risk-taking, plus a lot of copying. And if you had asked my opinion on the future of Chinese technology just three years ago, I would have said they were stuck in that "copy" mode and

were simply not innovating. But that is changing dramatically, and in the last couple of years, we are seeing several Chinese companies emerging as true innovators, with the drone company Dà-Jiang Innovations (DJI) high on that list. I am now on my third DJI drone and



Drones & Underwater Photography





Mavic Pro drone in flight (above); Panorama shot of Japan (top)

love it. I bought them all myself, by the way.

My current one, a Mavic Pro, has tremendous functionality, great technology, is small, takes good photos and video, is incredibly stable and is great fun. Simply stated, it allows me to take significantly different images when I am on a dive trip, which really lets me put where I have been into context.

The Mavic Pro

DJI is based in Shenzhen, just north of Hong Kong, in southeast China. Shenzhen was one of the first Special Economic Zones (SEZs) created by Deng Xiaoping and has become known as China's Silicon Valley. It is a very dynamic place, which looks and feels a lot like Singapore.

DJI seems to model itself on Ap-

ple and has a very structured, systematic and innovative approach to business, which is very impressive. At the consumer end of their technology, they made their name with the Phantom drones, which have basically dominated the market.

My first drone was the Phantom 4, and I was stunned with what it could do. But, like many other people, I did not like the size, which after you include extra batteries, etc, could easily take up half a suitcase—precious space and weight for the travelling diver. But it was worth the extra hassle for the images and video it provided, and besides, there was no alternative.

Then, DJI released the Mavic Pro, a foldable drone that took up less than a quarter of the overall space consumed by the Phantom. Plus, the controller was much smaller, the functionality was better, and the batteries were smaller and stronger. An upgrade was a no-brainer, and I am now on my second Mavic Pro, after the first

one was unfortunately stolen. That said, I did not even look at alternatives, and simply swallowed and bought another Mavic Pro.

What you get

If you buy the standard Mavic Pro, you get the drone with one battery, the controller and a battery charger. That will get you in the air, but only for about 20 minutes or so, because flying a drone is all about the conditions, the location and the battery. The battery is what powers everything, and if you run it flat, the drone will fall out of the sky—possibly not as dramatic as that, because of the built-in safety features, but my most nerve-wracking “drone moments” have been trying to land the Mavic back on a boat in a swell with the battery almost done. A much better package is the More-Fly Combo, which gets you two spare batteries, a charging “hub”, spare propellers and a carrying case that is great for travel.

How it all works

Besides the actual hardware of the drone and its flight controller, there are three other areas of technology you need to be

cognisant of: the firmware, the software, and the GPS. DJI seems to be constantly updating the firmware that controls the drone and controller, which at first was



The Mavic Pro drone's compact size makes it easy to pack for travel.



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very annoying, and then I realised why they were doing it, which I will explain in a minute.

The software is the DJI Go app, which you download to your Ap-

ple or Android phone and GPS. It is what DJI is using to stay ahead of potentially restrictive regulations. As I understand it, what happened a couple of years ago

was that a local guy in the megacity of Chengdu in central China hacked his DJI drone somehow and flew it into the airport area to take some video. That is not something I would do anywhere, but particularly not in China where punishment can be

swift and disproportionate.

DJI saw the danger and responded incredibly quickly to “get ahead of the game” by introducing information on where you can and cannot fly at the app level—enabled by GPS. Basically, you must have the latest updates installed to avoid being grounded. But once you have those updates, the app can stop you flying anywhere you should not.

Learning to fly

Most countries have rules about what you can and cannot do with drones, and you really need to check them out for where you live and where you are going. For example, in Australia, where I live



Mavic Pro drone and controller (right); Mavic Pro controller updating (left)

part of the time, there are very specific rules that you have to follow, and you cannot get around them because GPS knows where you are.

In Bali, where I live most of the time, there are also rules, but they seem significantly looser. Then in Morocco, where I am going later

this year, I have just learnt that drones are not allowed at all and will be confiscated if you sneak one in.

With regards to how you learn to fly, you can do a formal course, which is quite expensive, or you can go the YouTube route and watch some of the hundreds of

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Panorama shot of San Benedicto Island, third largest island of the Revillagigedo Islands in Mexico





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videos that are available there, which is what I did.

Camera

DJI seems to be evolving into a camera company as much they are a drone company. In January 2017, they acquired a majority stake in Denmark's Hasselblad—quite ironically really, as Hasselblad first got started by making specialized aerial cameras.

The camera in the Mavic Pro has a fixed 26mm f/2.2 equivalent lens and a 1/2.3" 12.35MP CMOS sensor, which produces nice quality RAW images and 4K 30P video for that size of sensor. My experience with both the still images and the video output from the

Mavic Pro has been very positive, and generally, I am more than happy with the results.

Panoramas

Probably, the thing that most surprised me about the Mavic Pro is its in-air stability and capability to do panoramic shots stitched together in post-processing from a series of images. On land, this technique typically requires stable ground, and at least a tripod, so I really doubted that a drone would be stable enough to replicate that technique. Then, earlier this year on a trip to Socorro—the group of volcanic islands some 470km to the southwest of Mexico's Baja peninsula—I was trying

Mavic Pro More-Fly Combo (right); Aerial shot of Roca Partida (far right), the smallest of the four Revillagigedo Islands in Mexico



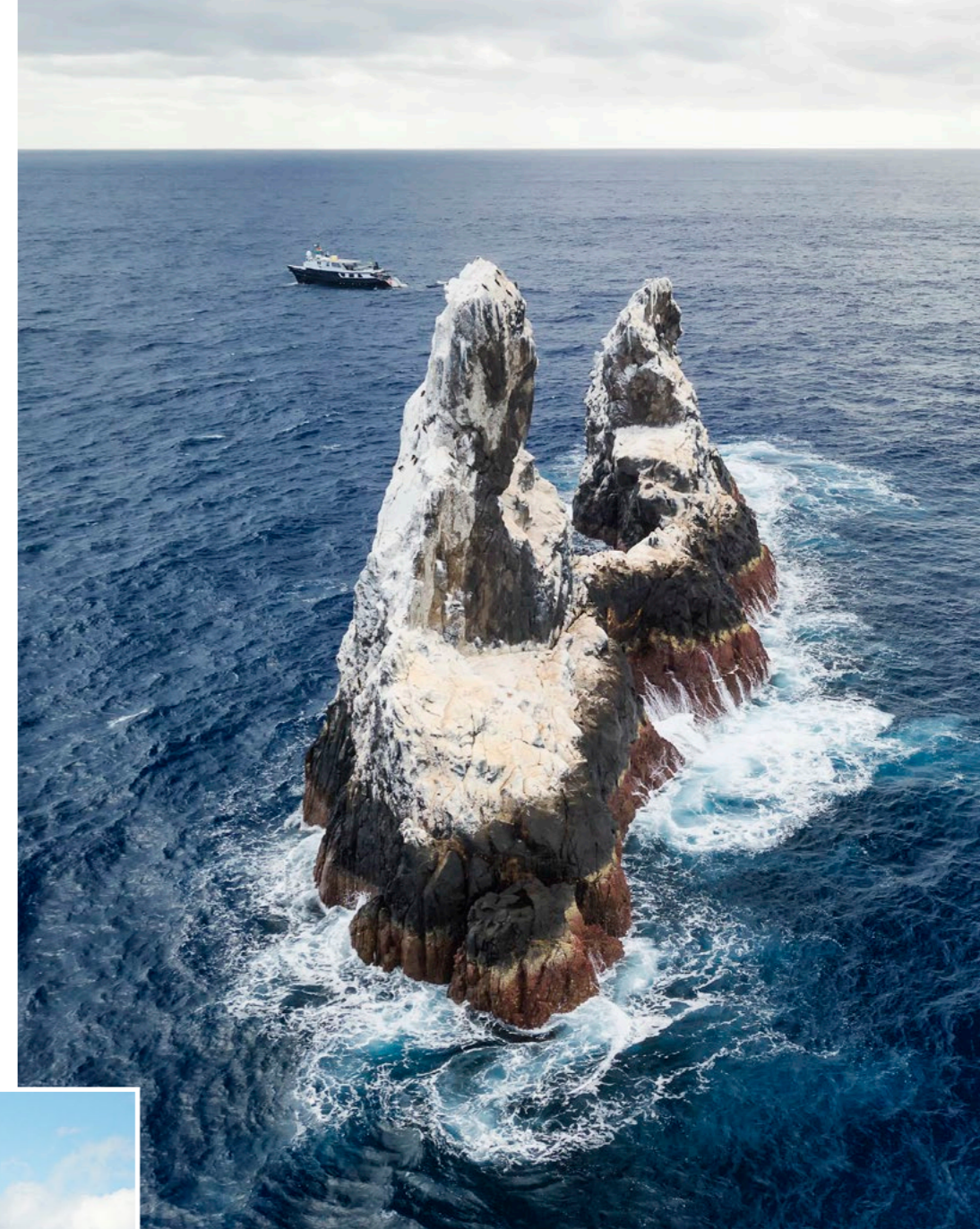
to get an aerial image of the island of San Benidicto.

It is a quite large island, some 4.8km long by 2.4km wide, with an overall area of 10 sq km, and I flew the drone up to 500m altitude and about 1km away but still could not get all of the island in the shot. So, I tried panning the drone to take a series of overlapping images, all with the same f-stop and focus, then stitched them together that evening using PTGui software. To my great surprise, it worked very well—not 100% perfect, but good

none the less—and then again, what is the alternative?

In summary

You could say that I am now a true believer in both drones and DJI. The drones are fun, easy to fly, have great functionality and enable really special images while DJI continue to innovate with the successor to the Mavic Pro about to launch. The Mavic 2 will apparently come in two flavours—the



Mavic 2 Pro and Mavic 2 Zoom. Both will have the same better batteries, improved flight time and overall functionality—plus, a 1-inch CMOS sensor Hasselblad camera. But the Mavic 2 Zoom will have a 24-48mm equivalent optical zoom. These are major steps forward, as the bigger sensor and the zoom lens have

basically what most people own or are interested in acquiring—a drone for which most have been asking. That DJI has been able to move the needle so quickly further establishes the manufacturer as a true innovator. I had better start saving. ■

Asia correspondent Don Silcock is based in Bali, Indonesia. For extensive location guides, articles and images on some of the best diving locations in the Indo-Pacific region, visit his website at: Indopacificimages.com.

Panorama shot of Isla Socorro, Revillagigedo Islands, Mexico

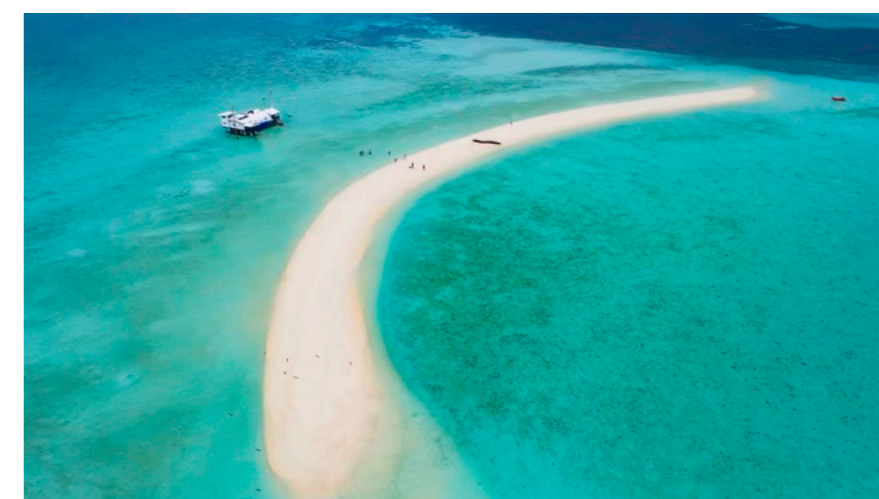
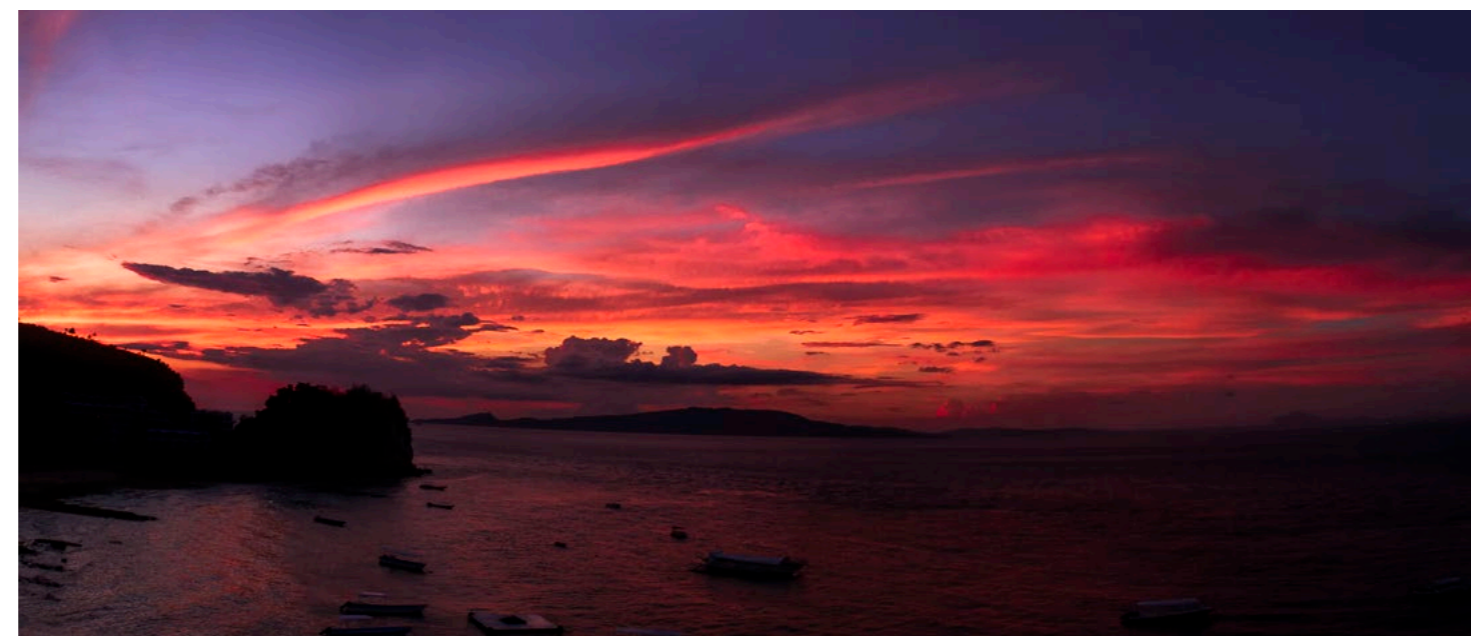
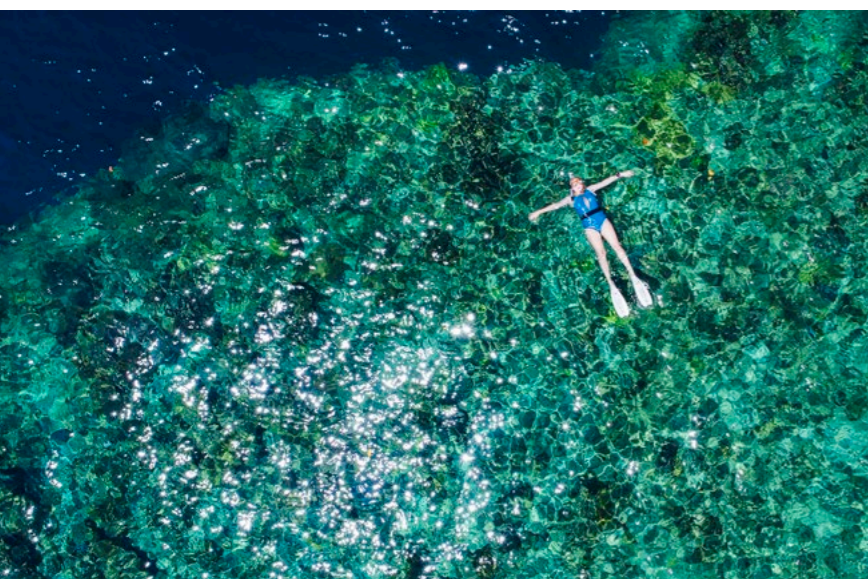
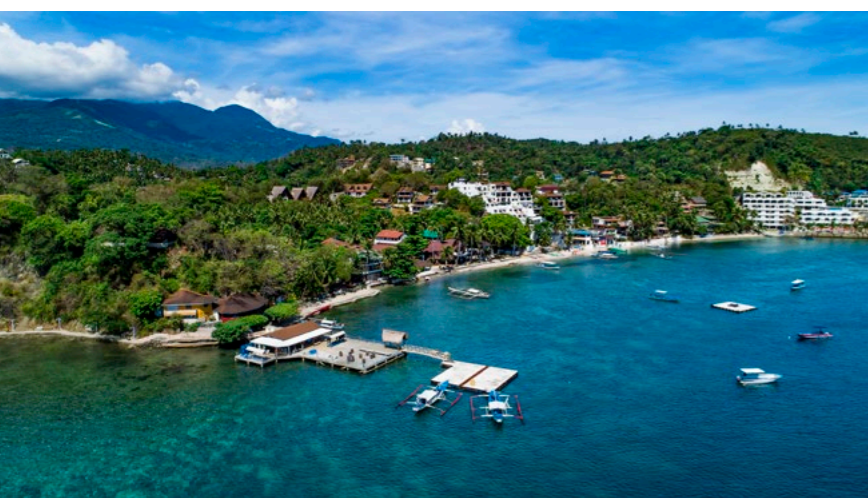


Aerial view of Raja Ampat, Indonesia, taken with drone camera by underwater photographer Beth Watson

Tips: Drone Photography for Dive Travel Stories

Text and photos by Beth Watson

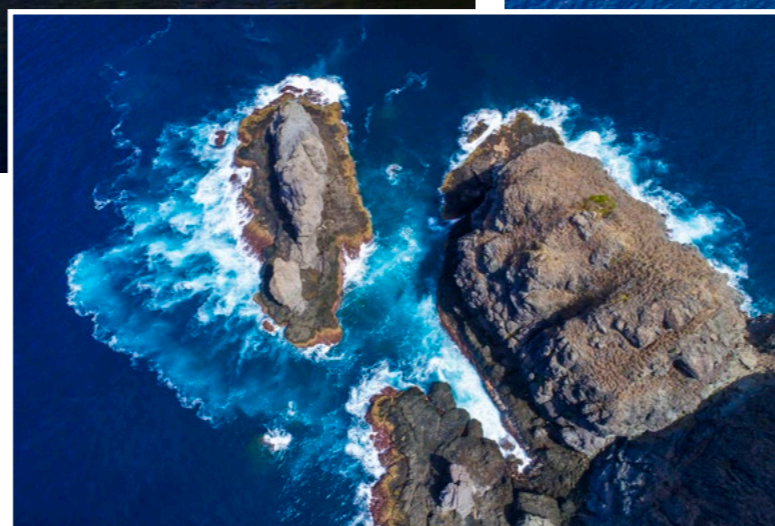
Drone photography can really spice up a dive travel photographer's portfolio. It adds another element, dimension and a unique perspective. Safety is a primary concern with drone photography. Preparation, precaution and planning is very important. Become quite familiar with the aircraft, software and controller before taking it to a travel destination.



Raja Ampat coast and snorkeler at Derawan, Indonesia

Sunset over Puerto Galera, Philippines

Indo Siren in Raja Ampat and Tubbataha Reefs Natural Park



- Plan your still shot as well as video clips. Think ahead. Avoid shooting random images and video clips.
- Capture still images in DNG or RAW format if your system allows.
- Use the grid overlay in the drone app to line up horizons and aid in composing the image.

can be quite challenging to transport. All drone batteries should be taken out of the aircraft and placed into carry-on luggage. Drone batteries are not allowed in the cargo hold of any aircraft.

Gear and accessories

- DJI Phantom 4 Pro
- DJI controller
- Battery charger/cables
- 3 batteries
- Hardshell backpack
- Sun shade hood
- Ipad

Local regulations

Research the rules and regulations of drone usage in the country or municipality you plan to fly. For example, in Tubbataha Natural Marine Park, Philippines, the park requires drone operators to apply for a permit to fly a drone at least two weeks prior to visiting the marine park.

Transporting drones

Drones come in many shapes and sizes. Some are very lightweight and compact, making traveling with them fairly easy. However, larger drones

*Beth Watson is an international, multi-award-winning photographer, a judge for international photo competitions, and invited guest speaker at dive exhibitions. Her images have been published in books, magazines, newspapers, brochures, websites and selected for juried art exhibitions. For more information, visit: **BethWatson-Images.com**.*



THIS PAGE: Drone photography of Atlantis Resort, Dumaguete, Philippines (top left); Bonito Island, Philippines (top right); night shot of Asia Divers/El Galleon Resort, Puerto Galera, Philippines (above); Komodo Island (center); Selfie with drone (left)



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White Balance

Text and photos by Peter Symes

A while back, our good colleague Joe Tepper at DivePhotoGuide.com wrote a good article (below) about setting the white balance when editing underwater photos, which I recommend you check out by following this [link](#) or clicking on the screenshot below. I use the very same technique of looking for something in the image, say an object or an area fish, which I know has a neutral colour.

Unpainted scuba tanks or lead weights with their neutral grey colour work best, as you can never be sure whether the pale underside of a shark, which may appear light grey, is actually neutral. My remedy is to bring my own reference in the shape of a set of small plastic white balance grey cards, which I clip on to a strobe arm or carry in a pocket. Typical price points seen in web stores seem to hover around 10 USD or Euros. In any case, it is a rather minor expense, and they do not weigh or take up much space—and can be used on land too, so what is there not to like?

When I am going on a planned shoot, I just start by taking some test shots wherein I include the cards in the first image. Depth is one factor that affects colour balance but so does the distance to your subject. So, where possible, place the cards at the same distance as your main subject, i.e. you could have your dive buddy or model hold them up. The cards are not needed in the images once we start shooting for real as long as the intensity and quality of ambient light does not change, say if you go deeper or cloud cover moves in. In the image editor, the test shots can then be used to dial in the settings for other images in the same series. ■

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WHITE BALANCE IN EDITING UNDERWATER PHOTOS

© Joseph Tepper

Knowing how to adjust white balance in post-processing is a critical editing tool

By Joseph Tepper

There are lots of reasons to shoot in RAW format: High quality, dramatic dynamic range, and non-destructive editing are just a few. But for underwater photographers, perhaps the greatest advantage of shooting in RAW is the ability to customize white balance during post-processing.

White Balance Makes a Difference

Ideally, white balance achieves realistic color temperatures for your images so that subjects and the background appear natural. However, shooting underwater presents a number of challenges because of the way water absorbs light—too often we see images that have an unnatural blue or green hue caused by improper white balance.

Your camera has a number of white balance settings, depending on the model. However, these are the most common: Auto White Balance, Custom, Tungsten, Fluorescent, Daylight, Flash, Cloudy, and Shade. Each of these situational white balances has a corresponding Kelvin temperature value that determines the hues in the image, ranging from 1000K to 9000K. Typically, underwater photographers keep the camera set to Auto White Balance or Shade, because the latter tends to reproduce colors more accurately when reviewing images underwater.

A good article about setting the white balance when editing underwater photos, by Joe Tepper, DivePhotoGuide.com

Paralenz Dive Camera+

The Paralenz dive camera just got upgraded to a Plus version. The housing has been strengthened to a depth rating of 250m (820ft). Better anodizing has made the surface more corrosion resistant, and screws are changed to titanium.

The design of the selector ring has been improved to make it simpler and exclude any small parts. The new end-cap is CNC-milled from aerospace-grade aluminum, with a scratch resistant glass window.

Paralenz.com



Slave converter

Ever wanted to use a spare flash, perhaps a semi-retired one, as a distant remote to create some interesting lighting? Say, for back-lighting in wrecks or caves?

But what if it doesn't connect because the ambient light is too high and/or the distances between your remote strobe and the primary flash is too large? Try Ikelite's High Sensitivity Optical Slave Converter, which simply attaches to the strobe's electrical bulkhead in place of a sync cord connector. The enlarged slave window provides approximately 90 degrees field of view for remote triggering. The Converter supports manual exposure modes, and TTL exposure mode is not supported. An optional three-foot extension cord may be added for more flexible positioning of the sensor window.

Ikelite.com

NIGEL MARSH PHOTOGRAPHY

Nigel Marsh is an Australian photojournalist, underwater photographer and author. Working with New Holland Publishers, Nigel has produced a number of guide books for divers and snorkellers, and also a series of children's books with marine related themes.

Dive guide books

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- UNDERWATER AUSTRALIA
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- DIVING WITH SHARKS
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