

UNDERWATER PHOTOGRAPHY

Professional paper

Eva Tapić, Alisa Čaber, Marija Garić

Faculty of Technical Studies, University of Travnik, Bosnia and Herzegovina

Abstract

Underwater photography is an unusual and a specific form of photography. Alongside knowledge about photography, it is necessary to have insight into plant and animal life of the sea bed as well as diving. Being that the scenery is under water, the photographer is greatly limited which makes this type of photography a very challenging task. The paper analyses filming/shooting conditions, various equipment being used, underwater moving, lighting, duration and all other relevant parameters.

Keywords: *Underwater photography, underwater photography equipment, photographic session techniques*

Introduction

Underwater photography is a great challenge. It requires special equipment and provides only a limited time that a photographer has to achieve his goals. It reveals a part of the world that most of us don't have a chance to see. It covers a wide range of photos taken with disposable underwater cameras, waterproof cameras, cameras in waterproof housings, and even cameras in unmanned submarines.

Underwater photography is the artistic representation of the underwater environment that has for years provided curiosity to most people because of the countless forms of marine life in all colors, shapes and sizes. Fortunately, today's diving is more accessible than ever, whether snorkeling or scuba diving. But underwater photographer should always be a diver first.

To record underwater photography is a difficult task. It is necessary to find, feel and wait for the perfect moment under water and react in an instant. People are used to see underwater photos with strong and intense colors, however, the colors of the underwater world are not like they are in terrestrial world. They see the rich, vivid reefs, corals and fish in the split second when the flash lights up the object, but in reality, the object is seen in different shades of blue, green and gray. That's why underwater photographers must train their eyes.

1. History of underwater photography

At the beginning of underwater photography, many

photographers had to devise, develop and improve their underwater equipment to be able to record an unknown underwater world. William Thompson is considered the first underwater photographer, who in 1856., in the UK, recorded the first underwater photograph.

He used a camera in a waterproof box mounted on a pole. After 37 years, Louis Bhutan captures underwater photo using scuba gear. He photographed a diver under water, which is also the first underwater photograph ever published (Figure 1).



Figure 1. The first underwater photographs ever published

The first underwater color photograph was captured by Dr. William Longley and National Geographic photographer Charles Martin in 1917, but was published only in 1926. They used cameras in waterproof cases and flashes for underwater lighting that required large amounts of explosive powder magnesium.

2. Underwater photography equipment

Cameras. Today, the market offers a huge number of cameras, both classic film cameras and digital cameras, where the image is recorded on a disc and which are increasingly flooding the market. There are 3 types of cameras: compact, SLR and D-SLR cameras.

Housings. Underwater housings are waterproof boxes that can help descend cameras into water. There are solid and flexible housings. Solid housings can be submerged to much deeper depths than flexible housings. Those kind of housings will ensure the safety of the cameras by withstanding mechanical stress at certain depths due to increased pressure. They seem safer than flexible housing, but the price is much higher. Flexible housings are made of plastic film, and feel quite uncertain. During the immersion, the volume of a flexible housing is reduced due to increase in pressure.



Figure 2. Solid and flexible housings

Lenses. Quality underwater photo requires quality lenses. A lens is a transmissive optical device that affects the focus of a light beam through refraction onto a sensor. Depending on which lens is chosen, it determines what kind of picture will be recorded. Each lens has its own set of characteristics. There are normal, macro, zoom, fisheye, telephoto and wide angle lenses.

Illumination. Since one part of a light beam is reflected onto water surface, the water below the surface has less light available than above. Therefore, artificial lighting is necessary for displaying colors of marine life, except in shallow water. Due to very

poor lighting conditions, underwater photography requires the use of flash that is positioned further away from the camera itself. Less expensive devices however don't have "extended hands" with flash devices but rather have a flash integrated within the camera itself. For such conditions, a photographer should have in mind that the photo taken will have a part of light reflected back into the sensor due to sediments and planktons in the water, and the photography itself could have big bright white spots on it.

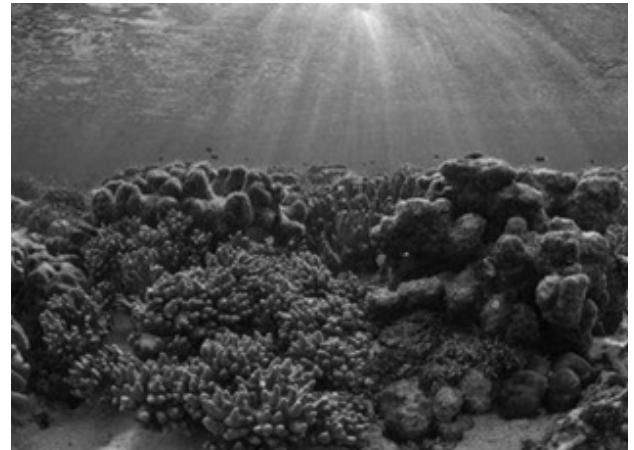


Figure 3. Photograph taken in daylight, Nikon D300

3. Working with human models in underwater photography

Models are used to have a human element filling the blue water void in the background. Not every photographer has the possibility to dive with trained models, but all of them have the opportunity to record their friends while diving. Placing models into underwater photography can be used to increase human interest, drama or an incentive to laugh. Before you start to photographing a model, it is important to agree on some hand signals for mutual understanding and always practice within safe boundaries.



Figure 4. Copyright photo recorded with compact underwater camera

4. Techniques for underwater photography

Macro photography. Macro photography is one of the simplest, but also the most rewarding techniques of underwater photography. It's a technique of taking a photo from a small range. It provides the highest quality images due to fast and accurate auto focus system. This technique can successfully record tiny marine organisms and their representative colors.

Wide angle photography. When using wide angle lenses, the real size of the objects that are near and far are distorted. Objects that are closer, look bigger and closer than they are in reality, and distant objects appear smaller and more remote. Due to the bending properties of straight lines and the ability to see 180 degrees, make this lens artistic and imaginative. This is a way of capturing large objects such as dolphins, sharks or even whales.

Night photography. When the sun is setting, coral reefs are undergoing dramatic changes. The creatures are unreachable during the day because they hide, but at night they are active and wander along the ridge. During recording, the photographer must constantly be on guard against dangerous animals which are hardly noticeable at night.



Figure 5. Night Photography

First of all they should be well informed about the place where they record and about the behavior of nocturnal fish.

Ambient photography. The best opportunity to catch some color and detail with no flash, is shooting in very shallow water where you can increase the amount of sunlight. There is no use of artificial lighting and natural light is simply dominant. The ambient photo is best record in clean waters at a depth of 20 meters or less. Ambient photography is the mostly used when shooting large fish, shipwrecks, silhouette and rocks.

5. Conclusion

Underwater photography is a merger of two very complex disciplines: diving and photography. As much as it seemed difficult and problematic, underwater photography is very pleasurable and rewarding.

The underwater world provides an excellent opportunity for every photographer to free his own creative thoughts. Due to the different possibilities of lighting, the sea is an ideal setting for experimentation. Shallow depths, where the water is still penetrated by enough natural light, are an excellent opportunity for rich and colorful photographs. Diving magazines are flooded with colorful motives of coral reefs, colorful fish and divers in all varieties of colour. If you look closely at the photos, you can see that the majority is taken in shallow waters. Tropical underwater worlds are filled with colorful living beings which live in shallow waters contrary to the Adriatic for instance, where the marine life is much more scarce and at a safe distance from divers.

The biggest obstacle is the lack of time. It all depends on the amount of oxygen in the bottle on the back of a diver. At a depth of 50m, a diver can be carried out for about 20 minutes a day to try and capture the best possible image in the environment that it is extremely dark. This makes it a very challenging technique of photography.

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PODVODNA FOTOGRAFIJA

Sažetak

Podvodna fotografija je jedan neobičan i specifičan vid fotografije. Uz znanje o fotografiji potrebno je i znanje o biljnom i životinjskom svijetu podmorja te ronjenja. Samim time što se odvija ispod površine vode, fotograf je ograničen što podvodnu fotografiju čini još zahtjevnijom. Kroz rad se analiziraju uvjeti snimanja, oprema koja se koristi, kretanje u vodi, osvjetljenje, vremensko trajanje samog snimanja te ostali parametri podvodne fotografije.

Ključne riječi: *Podvodna fotografija, podvodna fotografska oprema, tehnike podvodne fotografije.*

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Correspondence to:

Eva Topić

Faculty of Technical Studies, University of Travnik,

Bosnia and Herzegovina,

E-mail: topeua@gmail.com
