Great Pictures Made Easy
with SeaLife DC1400 UW Camera


Photo by Annie Crawley

Capture the Magic

As a scuba diver, you have encountered coral reefs teaming with strange creatures and vibrant colors that appear as if they were from another planet. You know what it's like to float effortlessly without gravity. You have learned to use your eyes to see and experience the underwater world, one of the greatest miracles on earth.

You capture these treasured moments with your underwater camera to relive the adventure and share your experiences with friends and family. Of course, there is no better way to tell your story than with pictures and videos

As the manufacturers of SeaLife, we believe that an easy to use underwater camera will help millions of divers and non-divers to experience and see a part of our world which is essential to our survival. And we hope that you will enrich and enlighten your life by capturing valuable impressions in the underwater world with your SeaLife Camera.

Over the last 20+ years of developing underwater cameras and lighting systems, we have received countless pictures - some great ones that we post on the SeaLife website Photo/Video Gallery, and some not-so-great pictures along with your request for help and advice.

While underwater photography certainly has its challenges, we found that most "bad" pictures are the result of not following a few simple and basic principles. When you understand and apply these basic principles, your results will greatly improve.


Photo by Karl Lauderback

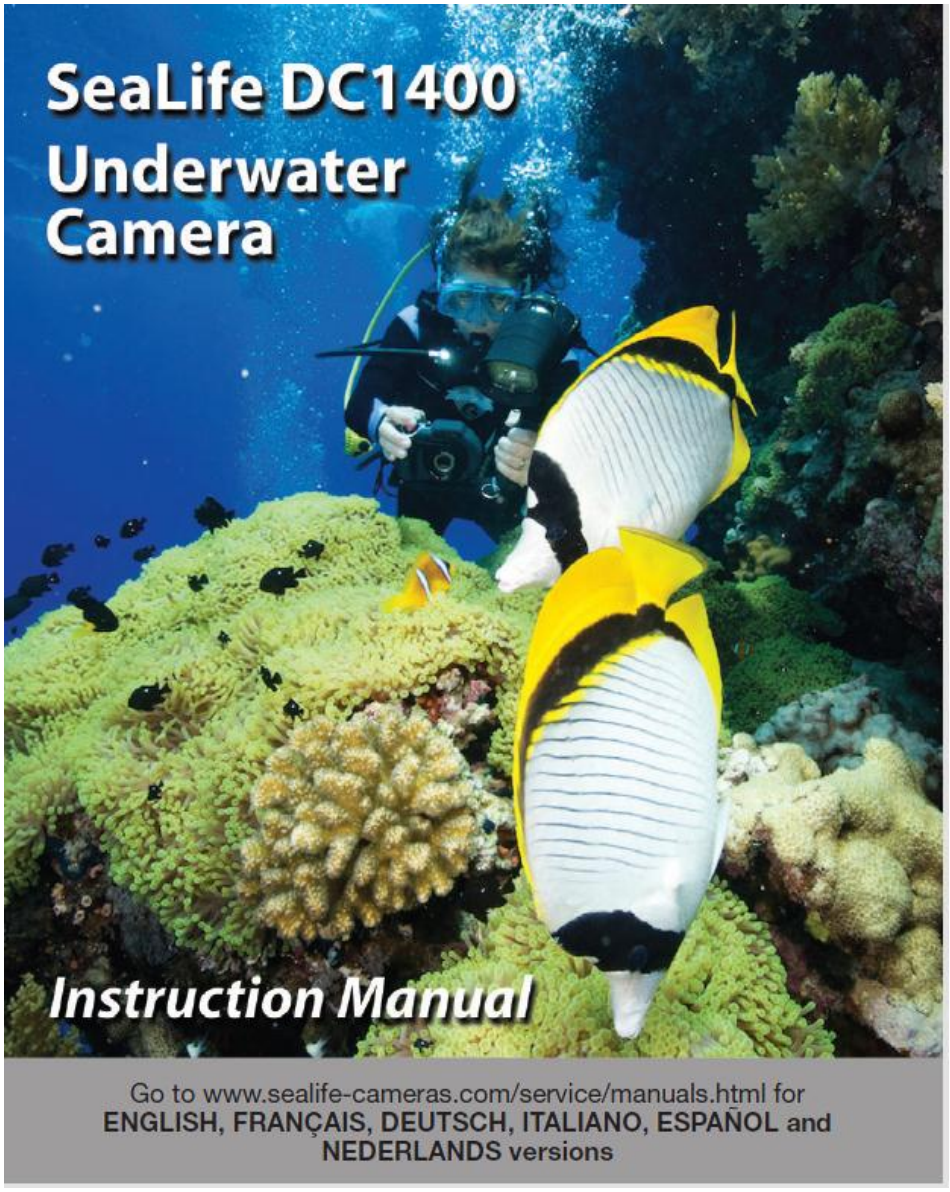

Photo by Nadia Aly

Contents

I. Know your basic camera settings

This guide will teach you the basic principles of underwater photography and how to take great underwater pictures with your SeaLife camera. Before you start, you should read through the camera's instruction manual and become familiar with the basic camera settings and button controls.

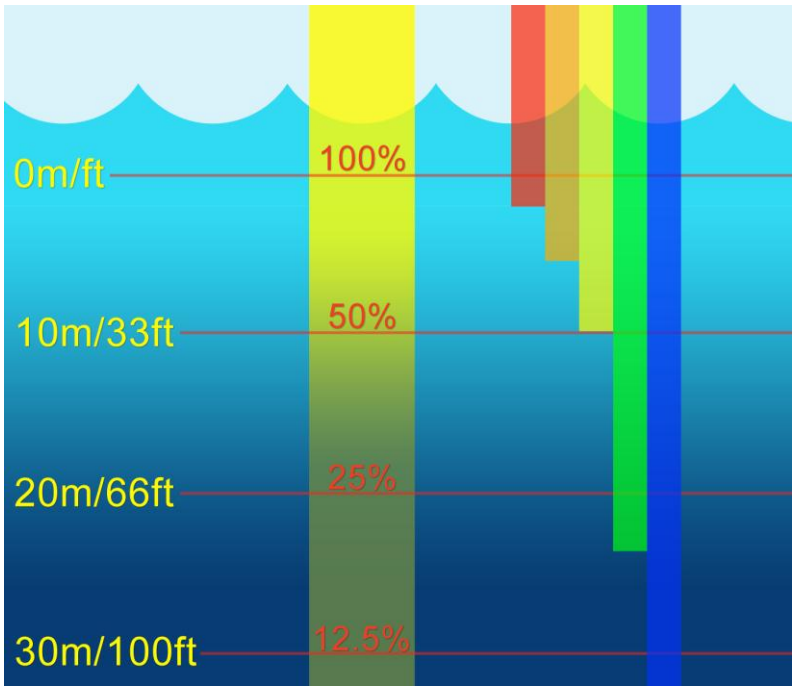
Download the Instruction Manuals here



II. Underwater basics

There are a few important differences between underwater and land photography that you should know.

a. **Light and Color** – Water is about 800 times denser than air. As you descend deeper into the water, the light conditions become darker. The water absorbs red, orange and yellow color, which makes everything look blue.



The above diagram demonstrates the effect water has on light and color as depth increases. That is why many underwater pictures turn out blue. There are a couple of ways to restore lost colors, which are explained later in this guide.

Coral, sponges and most other underwater sea creatures are bursting with colors. Brilliant reds, vivid orange and bright yellows highlight the underwater world. These intense colors help to camouflage the sea creatures. Since red and yellow colors are absorbed by the water, the sea creatures appear colorless unless you bring a light with you and uncover the hidden treasure of colors.

b. **Effects of water refraction** –Water has a magnifying effect. Objects underwater appear 33% larger and closer than they actually are. It tricks you into underestimating your shooting distance. One important rule for achieving colorful and sharp underwater pictures is to keep your shooting distance within 6ft/2m.

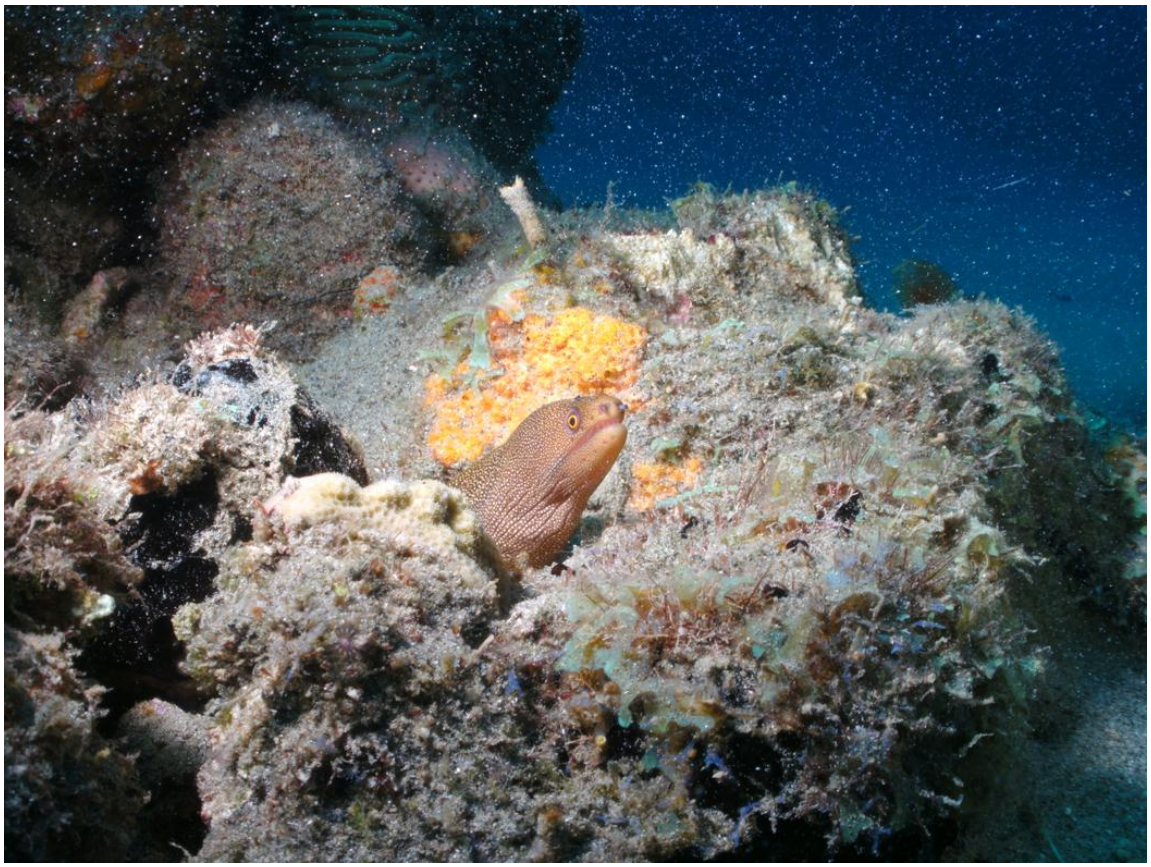
This Angelfish appears 2ft/60cm away but is actually 3ft/1m away

This fish appears inside of 6ft/2m, but is actually 8ft/2.4m away

The SeaLife Fisheye Wide Angle Lens compensates the underwater magnifying effect and allows you to get closer to the subject and still fit everything in the picture.

Photo by Dan Johnson

c. **Backscatter** – No matter how clear it may look underwater, there are always plankton and tiny particles suspended in the water. You may not see the particles with your eyes, until you light them up with a flash or photo-video-dive light. The small white dots that appear in your underwater pictures are called “backscatter” The closer the flash or light is positioned to the camera lens, the more backscatter you will see.



The external flash is positioned very close to the camera lens. Notice all the backscatter in the top of the image

Here the external flash is positioned away from the camera lens. There is practically no backscatter.

The above two pictures demonstrate why you should not use the camera's internal flash unless you are taking close-up macro (within 12"/30cm) pictures in crystal clear waters. The camera's internal flash is not very powerful and positioned too close to the camera's lens, so it's only useful for close-up pictures.

DC1400 shown with Flash Diffuser attached

Underwater photography using an external flash (strobe) or photo-video light results in the brightest, sharpest most colorful pictures, with minimal or no backscatter because the light source is positioned away from the camera lens.

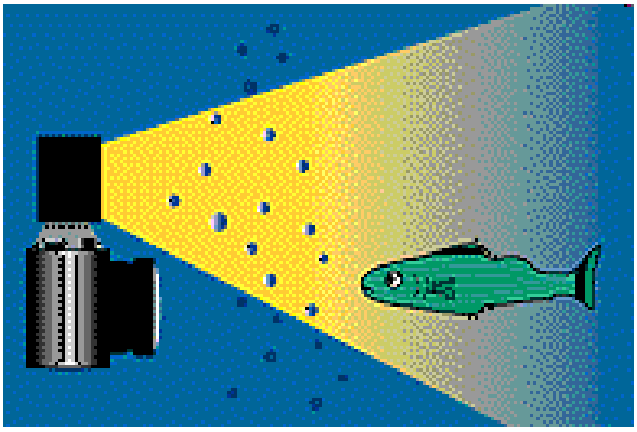


Figure 1

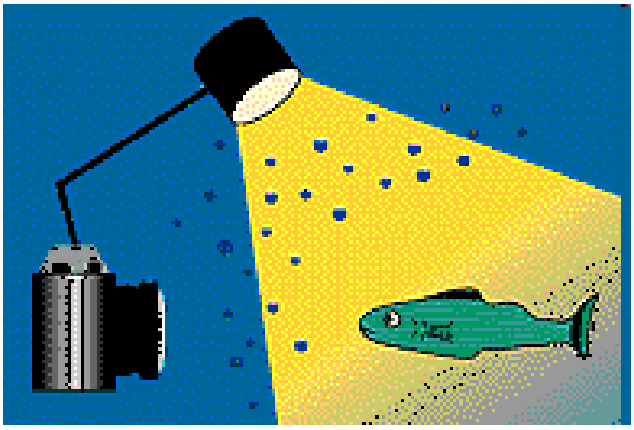


Figure 2

Positioning the flash or light next to the lens (Figure 1) illuminates the front of the particles facing the lens. Positioning strobe away from lens (Figure 2) illuminates the sides of particles not visible to the lens.

How to avoid backscatter:

- Avoid using the camera's built-in flash unless shooting close-up macro pictures in clear water.
- Use an external flash or photo-video light positioned away from the lens, which produces the brightest, sharpest and most colorful pictures while minimizing backscatter.
- Keep your shooting distance to 10% of your visibility. If the visibility is 30ft/10m, limit your shooting distance to 3ft/1m.
- Don't stir up the sand and debris on the bottom. Control your buoyancy.

III. Restoring lost colors

Blue pictures are the most common complaint among beginning underwater photographers, but it's easy to improve. Here are two primary methods to bring back the lost colors absorbed by the water:

Method 1: Use the SeaLife Sea Dragon Digital Flash and/or Photo-Video light accessory (sold separately)

Taken without flash - image lacks color

Taken with flash to reveal the vibrant colors

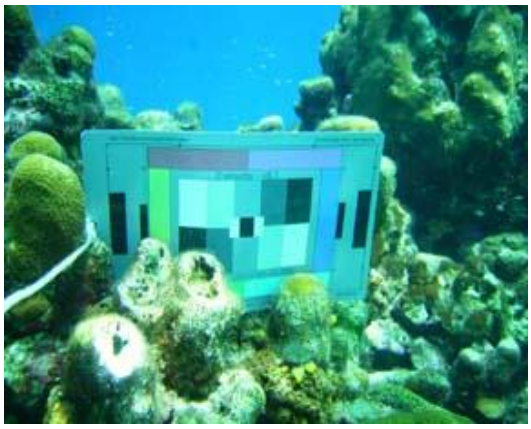
From left to right: SeaLife DC1400 Sea Dragon Pro Set (SL735); SeaLife Sea Dragon 2500 Photo-Video light; SeaLife DC1400 Sea Dragon Pro Duo Set (SL736) with flash and 2000 lumen photo-video mounted on Flex-Connect dual tray.

What's the difference between an external flash and photo-video light?

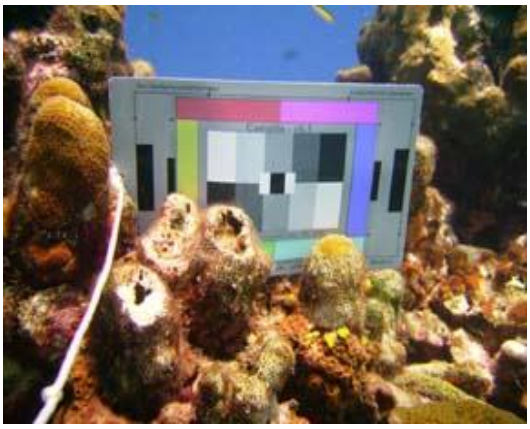
- A flash can only be used for pictures, not video. A photo-video light can be used for pictures and videos.
- An external flash is typically brighter and has longer range than a photo-video light. The Sea Dragon Digital Flash has an effective range of about 6ft, while the Sea Dragon 2500 Photo-Video light is about 3 to 4 ft, depending on visibility and ambient lighting conditions.
- A photo-video light is easier to use than a flash because the camera "sees" the effect of the light and automatically adjusts exposure accordingly. What you see is what you get. With a flash, the camera won't see the light until the flash fires, which typically requires some fine-tuning of the flash brightness to optimize image exposure.
- A photo-video light can also be used as a focusing light to assist the camera's auto focus system.

Method 2: Use SeaLife underwater color-correction modes

If you do not have an external flash or photo-video light, you can use the DC1400 camera's **built in color-correction** filter to restore lost colors. Set the camera to Dive Mode for depths greater than 25ft (8m) or Snorkel mode for shallower water. Dive mode will add a little more red and yellow to the image than Snorkel mode. These color correction modes work well in water depths less than about 60ft, where the ambient light conditions are not so dark. At greater depths, there is a complete absence of reds and yellows, so color correction modes/filters are not so effective. An external flash or photo-video light is the most effective way to restore color at any depth or ambient light condition.



Normal underwater picture at 25ft without Dive Mode



With Dive Mode color correction - restores lost colors

IV. Taking underwater pictures <u>without</u> an external flash or photo-video light

Now that you have learned how water affects underwater pictures and how to restore lost colors, let's learn how to take the best underwater pictures **without** an external light source. You may <u>skip this section if you are using a SeaLife external flash or photo-video light.</u>

a. **Set the camera's scene mode to Dive Mode [or Snorkel Mode]** – When the camera is in Dive Mode, the first thing you will notice is that the viewing image on the LCD display appears red in color. That's the effect of the underwater color correction filter. Underwater, the viewing image will look natural. In Dive Mode, the camera automatically turns the FLASH OFF to help avoid backscatter.

Picture taken at 25ft/8m without Dive Mode

Picture taken at 25ft/8m with Dive Mode

b. **Built-in Flash setting** –We recommend keeping the camera's built-in flash OFF when taking underwater pictures. Turning the flash ON will increase the backscatter and **cancel** the Dive Mode color-correction effect.

c. **Fine-tuning the White Balance color-correction Setting** – The White balance (WB) setting will compensate for undesirable color casts, so that white objects appear white in your picture. You can correct for the underwater "blue" effect by selecting the appropriate WB. The White Balance setting is located in the camera's MENU. Here are some common ones you will find in your SeaLife camera:

   - Auto White Balance – The camera will do its best to automatically detect what the correct WB balance should be, but this will not work underwater. Only use the Auto WB for land pictures or in very sunny, bright conditions within depths of 10 feet.

   - <25ft/8m – Most effective for shallow water at depths less than 25 ft/8m.

   - >25ft/8m – Most effective for deeper water at depths greater than 25 ft/8m. Note: In dark conditions or depths greater than about 60ft/18m, the color correction will not be as effective and may result in dark or grainy pictures – consider using an external flash or photo-video light accessory, which works well at any depth.

   - "Green Water" or "Blue Water" – Ocean and fresh water will take on a greenish color if it contains a high concentration of algae. If the water contains little or no algae, it will take on a blue color tone. Just look at the water from the surface and you should be able to see if the color tone of the water is blue or green.

   - Manual white balance – The color tone of water varies depending your depth or local diving conditions. You can achieve near perfect color correction by manually adjusting the camera's white balance. Remember that the color tone will change as you change depth. Your instruction manual will provide detailed instructions. It's really not that difficult once you have done it a few times.

V. Taking underwater pictures with an external flash

Now that you have learned how water affects underwater pictures and how to restore lost colors, let's learn how to take some great pictures. This section covers how to take the best pictures **with** the external flash. If you are not using the optional external flash, read the previous section IV.

a. **Setting the camera's scene mode to Ext Flash Auto**  – The Ext Flash Auto Mode is a SeaLife exclusive exposure program that takes properly exposed pictures when using one or two external strobes.

NOTE: If combining external flash with a photo-video light, select Ext Flash + Light scene mode  and continue on with the following information.

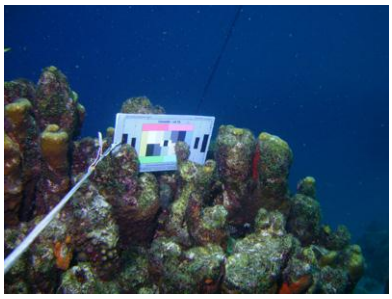
b. **Exposure Control: Adjusting the camera for darker or brighter pictures**

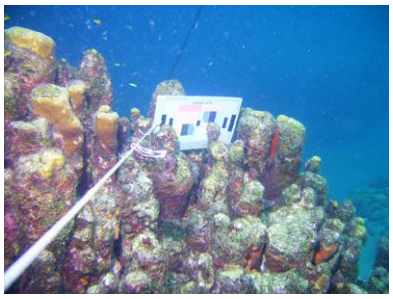
In Ext Flash Mode, push the flash button to select between Far Flash (), Macro Flash () and Normal Flash (no icon). This will adjust the camera's exposure program and produce darker or brighter pictures.

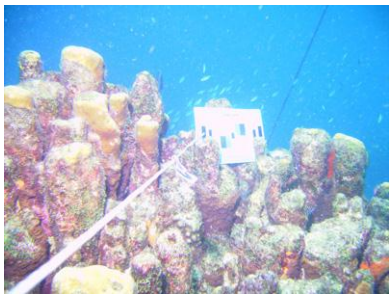
Far Flash - Sets the camera exposure to take brighter pictures. This is ideal for longer shooting distances beyond 6ft / 2m.

Macro Flash - Sets the camera exposure to take darker pictures and prevents over-flashing close-up subjects. This is ideal for close-up distances within 3ft / 1m shooting distance.

Normal Flash [No icon] – Sets the camera exposure for normal brightness. This is ideal for shooting distances from 2ft / 60cm to 6ft / 2m.


Macro Flash


Normal Flash


Far Flash

c. **Exposure control – Adjusting the external flash brightness:** You can make more fine-tune adjustments to the picture brightness (or darkness) by adjusting your flash.

Adjust the brightness control on the back of the strobe head.

Turning the brightness control dial **to a lower setting** will reduce the flash brightness and result in a darker picture. This is very useful to prevent over-flashing the picture.

Turning the brightness control dial **to a higher setting** will increase the flash brightness and result in a brighter picture.


100% power


75% flash power


50% flash power

d. **Using a diffuser for better close-up pictures**

A diffuser snaps onto the flash head to help soften the light, prevent over-exposure of close-up subjects, and results in richer color balance of pictures. The Digital Pro Flash Diffuser (Item SL9618) is available as an optional accessory for the Digital Pro Flash (Item SL961), and the Sea Dragon Flash (Item SL963) includes a diffuser.

e. **Edge Lighting: Direct flash head slightly away from the subject –** Aim the flash head away from the center of the target so just the outer edge of the flash reaches the subject. You can also point the flash at a nearby object and bounce the light towards the subject.

Strobe aimed at center of picture frame

Strobe aimed at edges of picture frame

f. **Color and White Balance** when using an external flash accessory – There is no need to make any color corrections when the camera is set to Ext Flash Mode. The external flash accessory produces “white” light which produces colors that match sunlight. The default white balance when shooting in Ext Flash modes is also called “Ext Flash”, but it’s also okay to use Daylight white balance depending on your personal preference.

VI. Taking underwater pictures with a Photo-Video Light

When shooting with one or two Sea Dragon Photo-Video lights (i.e. no external flash), set the camera's scene mode to Ext Light .

In this mode, the camera's flash setting will be turned OFF and the white balance setting will be "Ext Flash" to match the color temperature of the light. It's also okay to use Daylight white balance depending on your personal preference. When shooting beyond the effective range of the photo-video light, set the white balance to one of the color-correction modes (See section IV.c)

Controlling the image exposure is easier when using photo-video light(s) because the camera automatically adjusts exposure based on the ambient lighting conditions and amount of illumination emitted by the light. What you see on the LCD display before taking the picture is how the picture exposure will turn out. Just make sure to limit your shooting distance to 3ft to 4ft depending on visibility and ambient lighting. The closer your shooting distance the better the results.

VII. Focusing tips for taking sharp pictures

The second most common cause for "bad" results is out-of-focus or blurred pictures. The camera will automatically focus from 1" (2.5cm) to infinity, provided that the correct focus setting is selected and that there is enough light for the camera to "see" the subject. There are four primary focus settings useful for underwater photography and videos:

- Auto: AUTO
  Camera will automatically focus from 6in / 15cm to infinity.
  At 5X zoom, the focus range increases to 2ft / 60cm to infinity.
  This focus mode is ideal for most underwater applications.

- Macro:
  Camera will automatically focus from 2in / 5cm to 2ft / 60cm.
  At 5X zoom, the focus range increases to 2ft / 60cm to infinity.

This focus mode is ideal for close-up applications and necessary when shooting with SeaLife SL975 Fisheye lens.

- Super Macro: Camera will automatically focus from 1in / 2.5cm to infinity and lock the zoom at 3X. This focus mode is ideal for close-up pictures of tiny sea critters. It may also be used when shooting with SL975 Fisheye lens.

- Infinity: Camera locks focus at infinity, so anything beyond 2ft / 60cm is in focus. The shutter response (lag) time is the fastest when set to Infinity focus. Ideal for shooting larger objects that are farther away. For example, sharks, whales, rays, wrecks, other divers, etc.

Tips on shooting sharp pictures:

1. The camera will focus on the subject located in the center of the picture frame. Align the focusing square located in the center of the LCD over the subject. Subjects outside this square may not be in focus.

2. Before taking a picture or recording video, push and hold the shutter button half way to focus the camera on the subject. The focus frame in the center of the LCD display will disappear for a second and reappear as green or red. A green focus frame means the camera accurately determines the focus. A red focus frame means the camera did not accurately determine the correct focus - make sure focus setting is correct and that there is sufficient lighting.

A green focus frame indicates the auto focus is good.

A red frame indicates the camera is not focused on the subject.

3. In order for the camera to quickly and accurately focus, there must be sufficient light to illuminate the subject. The camera cannot focus on something it does not “see”. In low light conditions, use the SeaLife Sea Dragon Photo-Video Light accessory to help the camera focus in low light conditions and produce brighter, more colorful results.

4. About Quick Shot mode: When Quick Shot is set to ON, the camera takes a picture without using the auto focus. This will speed up the camera’s shutter response time (i.e. shutter lag) to about 0.3 seconds. The focus locks to the shooting distance of the LAST picture taken before turning on Quick Shot. Here’s an example of how to use Quick Shot:

a. With Quick Shot turned OFF, set the camera to normal auto focus and take a picture of something at 3ft/1m shooting distance.
b. Now set the Quick Shot to ON - The camera focus will remain locked a shooting distance of 3ft until Quick Shot is turned off or camera is powered off.
c. **Note:** When powering off the camera, the Quick Shot focus distance is not saved and will be set to infinity focus. When Quick Shot is ON, the focus frame on the camera's LCD display will not turn red or green.

Quick Shot mode is useful when taking a series of pictures at the same shooting distance and shutter response time is an important factor. Remember to turn Quick Shot OFF if you want to resume using the camera's auto focus.

Quick Shot mode is also very useful when shooting with the SeaLife Fisheye wide angle lens accessory (SL975) because the lens has an extremely wide depth of field. Set the camera to macro focus and take a picture of something at 3ft/1m shooting distance, which represent "infinity" focus distance. Now, turn Quick Shot mode ON. The camera's auto focus is now locked to "Infinity" focus range. All subsequent pictures taken at shooting distance of 18"/45cm to infinity will be in focus. Without the fisheye lens, the focus range would be 2ft to infinity.

When shooting close-up pictures using the macro focus, the depth field is very narrow. For example, when the camera focuses on a subject 5" / 10cm, other objects positioned behind or in front of the subject will be out of focus. You can use the optional wide angle lens accessory to increase your depth of field at close-up shooting distance.

Always take several pictures of subjects, particularly when shooting close-up, to make sure you get a sharp picture.

For more details, refer to the instruction manual of the camera you're using or of the flash or light you have.

VIII. Basic tips on taking great pictures

Now that you know the major effects of water on shooting underwater pictures and how to adjust the camera controls, let's learn some basic tips on taking great pictures.

a. **Control you buoyancy –** Be very calm and patient, and let that curious fish get closer and closer. Get up-current from a good spot and just drift motionless along with your camera in ready position. To stay in a camera-ready waiting position, approach your subject facing the current.

Photo by Stephen Frink

b. **Crystal clear water –** No matter what equipment you use, good underwater pictures require crystal clear water. Keep your shooting distance to 1/10 of the visibility. For example, if the visibility is 40ft / 12m, keep your shooting distance inside of 4ft / 1.2m.

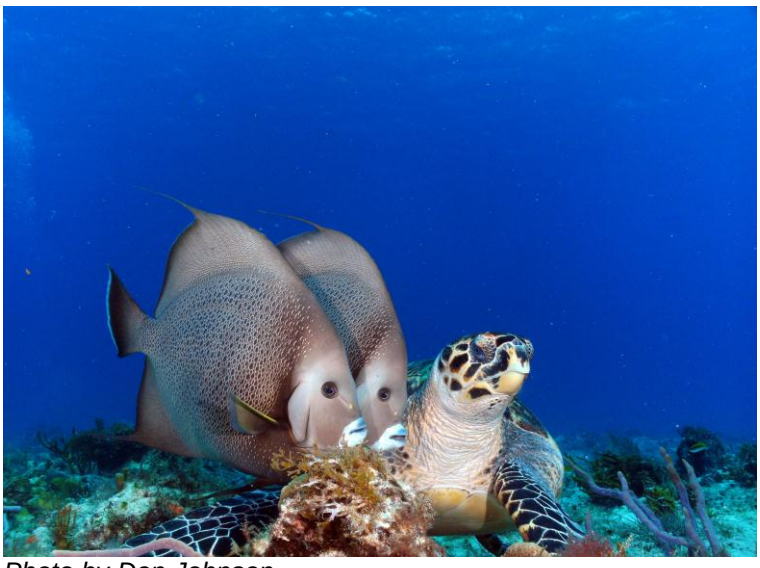


Photo by Dan Johnson

c. **Avoid backscatter -** Don't stir up the sand and debris on the bottom. Avoid using the camera's built-in flash. The built-in flash is very close to the camera lens and illuminates all the particles in front of the lens. If using an external flash accessory, aim the flash towards the outer edge of the picture from, not towards, the center of the image.

Photo by Bjorn Harms

d. **Shoot up, not down.** Get some of the blue water in the picture. Colorful coral in the foreground will stand out against a mystic **blue background**. These color contrasts will add depth to your pictures. Shooting down normally results in poor contrast between the subject and background.

Photo by Kurt Amsler (Aiming up)

Photo by Liz Logan (Aiming down)

Tip: Try and capture rising air bubbles to indicate motion.

e. When taking **pictures of your buddy**, he or she should be no more than 6ft / 2m away for a good picture. Use the wide-angle lens accessory for group shots, so you can get everyone in the picture and still keep your shooting distance within 6ft / 2m.

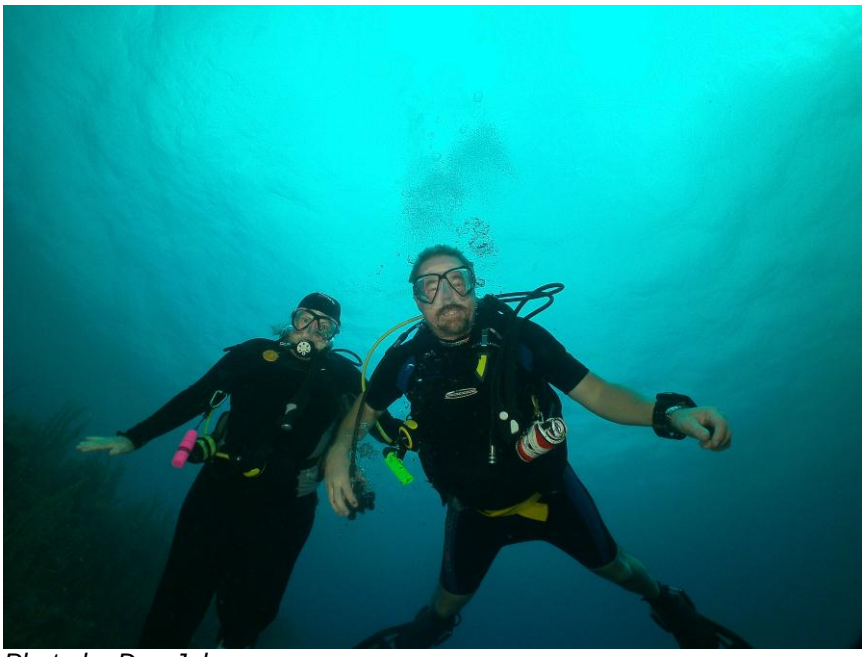


Photo by Dan Johnson

f. A photo without much color, such as a **silhouette against the blue water background,** can make a dramatic image..

Photo by Mathias Koch

IX. Underwater video

Taking video with your SeaLife digital camera adds the element of motion and action to your underwater adventure.

DC1400 Camera with Sea Dragon 2000 Underwater Photo/Video/Dive Light.

Here are some tips to shooting great video:

a. **Hold the camera steady**. Hold the video camera steady on a particular scene. Avoid panning left, right, up and down unless you are following a subject. If you must move the camera, do it very slowly. Moving the camera around can make you feel sea sick when viewing the video on your computer or TV. Take note of how Hollywood movie productions rarely move the camera. They normally stop recording, move the camera to another angle and start recording. Later you can splice the two videos together.

b. **Push the shutter button half way down** until the green square appears and the camera is focused. Then push the shutter button the rest of the way down to begin shooting video. Once the video begins, the focusing remains locked, so maintain your shooting distance to the subject.

c. **Take short video clips**. 10 to 15 seconds per video clip is plenty. It's better to shoot a series of shorter video clips than one long one. You can splice the video clips together on your computer.

d. There is a lot of **video editing** software available. Before you go out and buy anything, check your computer for video editing software that you may already own. Windows Movie Maker or Apple iMovie are two very good video editing tools that are easy to learn.

X. Take your photography to the next level

Every time you take underwater pictures, you learn and improve from the experience. Take advantage of some of the other great resources available that can add a new dimension to underwater photography.

A great place to start is the free *Underwater Photography Made Easy* iBook from SeaLife that covers positioning, macro, wide angle, video, buoyancy and more with easy to apply instructions. You can download the iBook or a PDF version on the SeaLife website.

An U/W photo course can be very enjoyable - Check with your local dive shop about underwater photography course they offer. The major certification agencies, like PADI, NAUI and SSI offer underwater photography courses and teaching materials through your local dive shop.

Photo trips - Ask your dive instructor about special photo trips and guided tours. Many offer "Underwater Photo Safaris" to the world's most beautiful reefs in good company and with a knowledgeable guide.

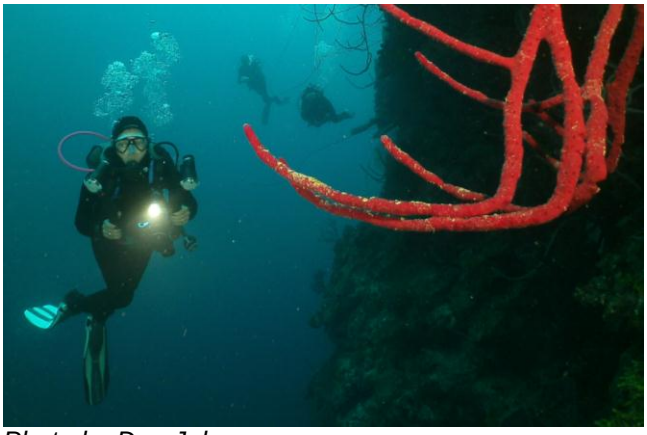


Photo by Dan Johnson

We hope this information has been helpful. Please feel free to contact us at info@sealife-cameras.com if you have any feedback or suggestions on how we can improve this guide.