Adding Luminance to Fluo Photography

by Steve Miller

Among the primary attractions of night diving are the colors. At first, this statement may seem counter intuitive, as the reef is cloaked in darkness. Sunlight may reveal the broader vistas of the underwater realm, but as any underwater photographer can tell you, it does not render the full spectrum of colors, as red, orange and yellow wavelengths are lost even at relatively shallow depths. This changes at night. When we carry high-powered artificial lights, all wavelengths and colors are restored, making the reef look like a different place, this time vibrating with warm colors.

The ability to control the light source opens up a wealth of creative possibilities. A prime example of this is the growing popularity of the phenomenon known as fluo diving, which exposes the unique florescent characteristics of certain animals and corals in glowing, neon-like hues reminiscent of the black light posters of the 60's and 70's. On a recent trip to Indonesia's Wakatobi Resort, I had an opportunity to take fluorescence to a new level by adding additional conventional light sources altered with warming gels. This technique yielded some intriguing results.

Fluo diving as practiced at locations such as Wakatobi Resort is a relatively new phenomenon, and the techniques of fluorescence photography are equally recent, though now well understood. You may remember an article in the July 2015 issue by Phil Rudin that detailed the equipment and techniques necessary for capturing the bright colors of the reef using fluo photography. These techniques remain essentially unchanged.

First, you color your lights blue, either by using a blue LED light designed specifically for this purpose, or by using dichroic filters on your lights and strobes to produce this exclusively blue light. From there,

Fluorescence luminance setup. The colored Gammas above are constantly on for color and for seeing around you. When the flash goes off the light emitted is blue as it passes through a dichroic filter, the first step in Fluorescence shooting.

The green is a result of Fluorescence. The red, however, could be a result of either fluo or a red filter gamma, or both.
Looking through the yellow barrier filter the green is all you see, because that is the only thing fluorescing.

The eye of a crocodile-fish taken on a fluo night dive at Wakatobi Resort using two Ikelite strobes with blue dichroic filters and gamma lights fitted with gels in red, yellow and orange. Surprisingly, crocodile-fish with a rainbow of colors -particularly in their eyes, express no fluorescence (in the six crocodile-fish that I have seen during fluo dives at Wakatobi.

Lizardfish are well known for showing a high tendency to fluoresce, in fact they seem to always fluoresce, and it's quite beautiful.

you place a yellow barrier filter on your camera lens or the housing port. Now your camera will capture only things that are actively fluorescing. To be able to see the effect—and to find subjects—you will also need to place a barrier filter on your mask, Now, like your camera- you will only see things that are fluorescing.... provided there are no white light sources around.

When fluo dives were first offered, they were conducted in a one guest per guide situation, and rarely with cameras involved. Even skilled night divers benefit from a guide when engaged in fluo diving. Although you are seeing wonderful bright-glowing animals, anything that is not fluorescing—which is most of the reef—is almost... well, invisible! This can present issues for the diver, as well as the underwater environment and its inhabitants. Divers are expected to avoid contact with the reef, and if we can't see it there is a better chance of inadvertently bumping to coral or a camouflaged animal.

And even when contact is avoided, navigation and subject identification can remain a challenge. On a recent night dive at Wakatobi Resort, my non-fluo diving buddies signaled to me that they had found something I might want to see. An interesting aspect of the fluo dive experience is the colors are so vivid that they can be seen at greater distances. I swam towards the group

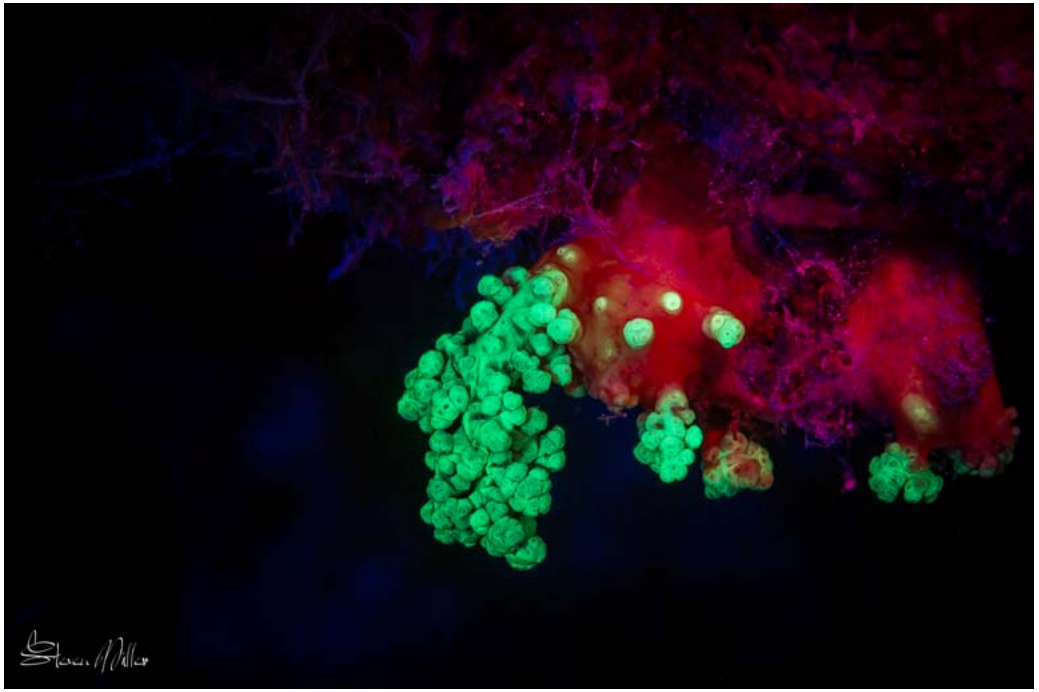
No luminance was used to find this red on the tentacles; both colors in this image are from fluo.

There were no luminance lights used to produce this image of dragon-eye zoanthid coral, it is 100% Fluo.

and went directly to what I saw fluorescing- a small patch of hard coral that from 15 feet away glowed bright green. I later learned that on my way to the coral I'd swam past a crocodilefish and a lionfish, and saw neither. Those were the subjects my friends had signaled me over to see, but since these fish were not fluorescing, they were almost invisible to me.

There are several ways to mitigate this issue If you dive around dusk the remaining ambient light will allow you to see the shapes of the reef. Of course, this somewhat defeats the purpose, as the darker it is, the more pronounced the fluo effect becomes. If you are a live-view shooter, or are using live view for video, then you can lose the barrier on your mask, and just look at the camera for things that are fluorescing, although the "fluo experience" suffers a bit with this technique. Another option would be to use an oversized yellow barrier filter on your camera housing's port, positioning the yellow filter material to extend upward enough for you to sight over the housing and look through the barrier to know what is fluorescing. Again, this diminishes the overall fluo experience, but it provides a compromise that allows you to see where you are going.

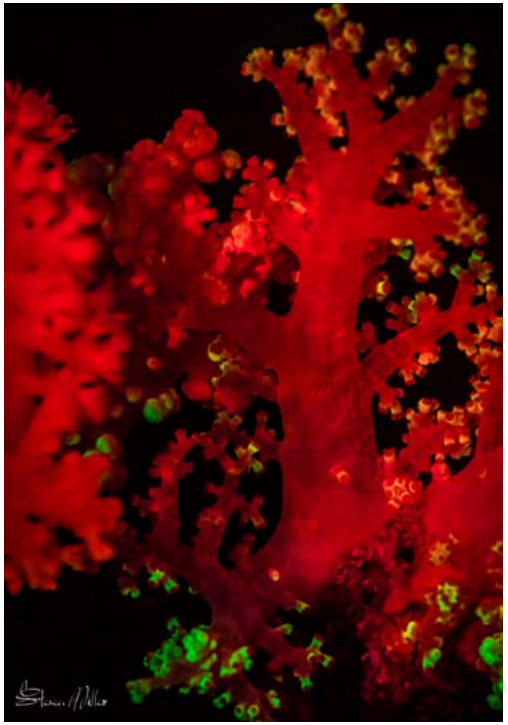
Lastly, and in my opinion the best solution, is to add luminance to the imaging equation. Though I can't put an exact number on the phenomenon, fluorescent colors seem to travel great distances through the water. If I point my blue wavelength light at a fluorescing coral, I see the resulting bright green splash of color from much farther away than I would if a red coral were hit with white light.



Looking through the yellow barrier filter the green is all you see, because that is the only thing fluorescing.

When using fluo lighting alone, this results in images where much of the scene both close and far is missing because there is no fluorescence. By combining light sources, you can restore the lost details of the reef while still showcasing fluorescent effects.

Adding luminance to your fluo kit involves attaching a number of additional light sources to your camera setup, which are typically fitted with various filters. The colors these lights produce will shift and become warmer as they pass through your barrier filter, but will produce the ambient light needed to navigate and find subjects, whether they are fluorescing or not. You can negotiate the reef with your luminance and fluo lights working together, then select a lighting strategy based on the subject. If it is fluorescing, you can turn off the luminance lights and shoot pure fluo. You can also combine the light sources to create new effects, or even shoot pure luminance. Think of your scene as a theatrical stage, and light it with a half dozen or so sources in various colors, each set and tweaked to suit the scene.



The tiny green at the lower portions of this image is actually the fluorescent area of this stand of soft coral, which illuminated a gorgeous brilliant red.

The images presented here were shot during a single night dive at Wakatobi Resort, with two Ikelite DS strobes set with blue Dichroic filters, accompanied by 4 Gamma lights fitted with gels in red, yellow, and orange. There are a wide range of colored gels available to experiment with, and as always, there are no rules, so have fun experimenting.

Wakatobi Resort is considered one of the best places in the world to observe and document marine fluorescence. The resort pioneered the practice now known as Fluo-Diving, and the protected reefs surrounding the resort are rich in the creatures that reveal their hidden nature through fluorescence. Fluo-dive and fluo-snorkel programs are conducted with a private guide as a one-on-one or buddy-diving experience. Following a comprehensive pre-dive briefing, participants are provided with the special dive lights and mask filters used to reveal marine florescence. Dives take place on the House Reef or one of several nearby sites that are rich in fluorescing marine life such as the site known as Zoo. Guides and boat crews are accustomed to working with photographers, and will assist in all aspects of gear management, subject acquisition and in-water assistance.

Steve Miller
www.wakatobi.com