

Bahr Marine Ecology Lab Field Color Protocol

Goal of project: To determine the quality and variety of colors of Caribbean corals to create a coral health reference card.

Required Equipment

- Underwater camera (with .RAW file storage capability and white balance)
- Strobe/Light (for even illumination of the coral)
- A commercial underwater color reference card (for color correction)
 - o DGK Color Tools WDKK Waterproof Color Chart:
<https://www.amazon.com/DGK-Color-Tools-Waterproof-Chart/dp/B00ESE2DD6>
- Slate and datasheet

Protocol

Goal: Capture a well illuminated photograph of each coral specimen while keeping a fixed distance and angle.

1. Set camera to underwater settings.
2. Ensure the camera is recording files in .RAW format.
3. White balance camera or use the auto white balance function (works well at shallow depths).
4. Locate a coral to photograph.
5. Place DGK Color Chart next to coral (preferable on the substrate next to the coral).
6. Take a photograph of the coral at a 90° angle (top down preferred).
7. Record the following information:
 - a. Date
 - b. Time
 - c. Water temperature
 - d. Depth
 - e. Location (Lat long if possible)
 - f. Species (if known)
8. Repeat on as many different types and colors of corals as feasible.
9. Upload data to the shared Google Drive:
 - a. Upload a PDF scan (using CamScanner, OneDrive, or other scanning software) of the field notes and other related files to the shared Google Drive.
 - b. If possible, please name each image their Coral ID from field notes before uploading to the .RAW folder in the Drive.

Site/Image Details

- **Site depth:** Corals in less than 60ft are suggested, but we are not requiring a certain depth as long as it can be recorded for each individual.
- **Number of images per individual:** one clear image of a coral with the color card fully visible next to the individual is all we need.

- For corals in shallow water: sometimes using the flash in shallow water overexposes the images. If this is a concern while in the field, especially during the day in shallow water <15ft, please take one image with flash and one image without flash to compensate for overexposure.
- How many individuals of each species are needed? This project aims to identify the range of colors that Caribbean species can exhibit. Thus, more images of a greater range of colors for each species is ideal. 10 individual images of each species are a suggested starting point, but more or less is acceptable.
- What is the best way to acquire photos? If opportunistically photographing corals during a survey or pre-planned scientific dive is feasible for your team, then that is encouraged. We are not requiring your team to plan a specific dive to just capture coral images; we just need the coral images captured to be easily paired with the written data.
- Are there priority species? Any species that are susceptible to SCTLD are top priority, otherwise reef-building scleractinian coral are desired.

Suggested Camera:

1. Olympus Tough TG.
 - https://www.amazon.com/dp/B07RCM7D36?SubscriptionId=AKIAJO7E5OLQ67NVPFZA&asc_subtag=312468653-2-688020698.1686243653&linkCode=ogi&psc=1&tag=shopperz_origin1-20&th=1
 - a. Housing for TG-6 optional (entire camera is waterproof)
 - https://www.amazon.com/gp/product/B07RJ63JX3/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1
2. Canon G7X [Amazon.com : Canon PowerShot G7X Mark III Digital 4K Vlogging Camera, Vertical 4K Video Support with Wi-Fi, NFC and 3.0-Inch Touch Tilt LCD, Black : Electronics](#)
 - a. Expensive and require underwater housing.
3. Canon G16 [Amazon.com : Canon PowerShot G16 12.1 MP CMOS Digital Camera with 5x Optical Zoom and 1080p Full-HD Video Wi-Fi Enabled : Point And Shoot Digital Cameras : Electronics](#)
 - a. Not nearly as expensive, but older and needs additional housing.
4. SeaLife Micro 3.0 Camera 64GB 16MP 4K Camera [SeaLife Micro 3.0 Camera 64GB 16MP 4K Camera for Sale | Divers Supply \(divers-supply.com\)](#)
 - a. Light can come in a set. [SeaLife Micro 3.0 Pro Dual Beam Set SL554 - Scuba](#)
5. Panasonic LUMIX LX10 4K Digital Camera: [Amazon.com : Panasonic LUMIX LX10 4K Digital Camera, 20.1 Megapixel 1-Inch Sensor, 3X LEICA DC VARIO-SUMMILUX Lens, F1.4-2.8 Aperture, POWER O.I.S. Stabilization, 3-Inch LCD, DMC-LX10K \(Black\) : Electronics](#)
 - a. Needs underwater housing.
6. GoPro Hero 9 [Amazon.com : GoPro HERO9 Black - Waterproof Action Camera with Front LCD and Touch Rear Screens, 5K Ultra HD Video, 20MP Photos, 1080p Live Streaming, Webcam, Stabilization : Electronics](#)
 - a. Waterproof case. [Amazon.com : FitStill 60M Waterproof Case for Go Pro Hero 11 Black/Hero 10 Black/Hero 9 Black, Protective Underwater Dive Housing Shell with Bracket Accessories for Go Pro Hero11 Hero10 Hero9 Action Camera : Electronics](#)
 - b. Dimmable strobe: [Amazon.com: SOONSUN Diving Light High Power Rechargeable Dimmable Waterproof LED Video Light Fill Night Light for GoPro Max Hero](#)

[11/10/9/8/7/5/6/5/4/3+/3/2 Fusion Session SJCAM AKASO Yi DJI OSMO Action Camera : Electronics](#)

- c. Any of the GoPro Hero 8 and up have raw shooting capability, but the upper models are more expensive. Overall far less expensive than other options.
7. Looking into other options, it needs underwater capability and to store in .Raw files.
<https://www.divein.com/diving/underwater-camera/>

Suggested Strobe/Light

1. Sea and Sea YS-03 Solis
https://www.amazon.com/gp/product/B085FVVMJ4/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1
2. Underwater Light (adjustable light capabilities preferred to prevent overexposure)
- will provide some affordable options, have some extra lights on hand as well.