



MarineLab

Marine Resources Development Foundation

Marine Science education in the Florida Keys

Citizen Science Programs

We offer an array of program that offer citizen science opportunities for our students- all of the programs listed below have a data collection aspect. Some of the programs are half day while others are one or two hour long labs; most are flexible in terms of timing and level of flexibility is noted below. If you don't have time in your schedule to incorporate one of the citizen science programs, you can always incorporate a cleanup or water sampling into any of our core mangrove or coral reef trips (these options are listed at the bottom).

Half Day Programs:

Advanced Seagrass Ecology: Seagrass Surveys

The seagrass ecology program is a part of MarineLab's core curriculum. The seagrass survey program was created to give students experience with in-water data collection. Students will learn about the importance of the seagrass habitat, how to identify seagrass and algae species, and what animals they can be looking for during the seagrass survey. Seagrass survey protocols and techniques will be discussed in the classroom before students practice on land. Once confident, we will go to the survey site where students will have time to conduct survey and enjoy a seagrass snorkel. Student data will be analyzed and discussed before being entered into MarineLab's database. Experimental design and the importance of baseline data will be reviewed.

Grade Level: 9th and Above

Timing: 3 hours (1 hour in classroom, 30 minutes on land practice, 1.5 hours on/in water)

Advanced Coral Reef Ecology: Coral Bleaching and Disease Monitoring

The coral reef ecology program is a part of MarineLab's core curriculum. Corals are the key component to the Florida Keys' marine ecosystem. Students discuss coral reef ecology with a MarineLab instructor before boarding the boats to snorkel the coral reefs off of Key Largo. While in the classroom, protocols for observing coral bleaching and disease will be reviewed and practiced. While always dependent on conditions, we generally snorkel two sites. MarineLab staff will be in the water and on the boat to lifeguard, point out marine life, and discuss observations. Students will discuss data once on the boat and data will be entered into an online database used by scientists at Mote Marine Lab.

Grade Level: 9th Grade and Above

Timing: Class is one hour and field trip is 3 hours (field trip can be shortened)

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Advanced Fish ID: REEF Fish Survey Program

The fish identification program is a part of MarineLab's core curriculum. This advanced version gives students the opportunity to participate in citizen science. As with our basic Fish ID program, students will learn the best field marks to use to identify a fish, behavioral characteristics of fish families, and how to identify fish species that we commonly see on Key Largo's reefs. For this particular program, students will learn the "roving diver" technique employed by REEF survey volunteers. Once in the water, the students will be equipped with underwater slates and REEF fish survey sheets in order to record all fish they can identify and count. Students can take his/her data sheet home, register at reef.org and enter his/her data.

Grade Level: 7th grade or above

Timing: Class is 1 hour. Field trip is 3 hours (can be shortened, if necessary). Optional quiz (see "Extensions" below) is additional time.

Advanced Fish ID: Parrotfish Feeding Surveys

The fish identification program is a part of MarineLab's core curriculum. This advanced version gives students the opportunity to participate in data collection as part of a greater research study. As with our basic Fish ID program, students will learn the best field marks to use to identify a fish, behavioral characteristics of fish families, and how to identify fish species that we commonly see on Key Largo's reefs. For this particular program, students will also be taught the proper protocols for data collection for the study they will be participating in and the reasoning behind the study. The students are then taken out to a reef to put what they learned into practice! During the snorkel, each pair of students will spend 6 minutes recording parrotfish feeding data. All data is submitted to Dr. Deron Burkepile and entered into MarineLab's database.

Grade Level: 9th Grade and Above

Timing: Class is 1 hour, field trip is 3 hours (field trip can be shortened, if necessary)

Florida Bay Survey Program

The Florida Bay survey program is a citizen science based field trip that builds on the snorkeling expertise gained during the seagrass/mangrove ecology core programs. This is a 3 hour program where students will collect water quality data and work in buddy pairs to conduct underwater surveys. Students will record the abundance of seagrass, macroalgae and Florida Bay animals they learned to identify during the seagrass/mangrove ecology programs. Once back on the boat, data is discussed. All data is entered into MarineLab's long term database.

All students must have already participated in our seagrass and mangrove ecology core programs.

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Grade Level: All

Timing: 2 – 3 hours ** we can shorten this program to 2 hours if you are interested in incorporating another lab/discussion **

Marine Debris Program

Marine debris is one of the most widespread pollution problems facing the world's oceans and waterways. This is a half day program that encompasses a classroom discussion, mangrove cleanup and data analysis. In the classroom, marine debris is defined and impacts and solutions to the issue are discussed. Students participate in a cleanup and return to MarineLab to collect and analyze data. All data will be submitted to Mote Marine Lab and entered into MarineLab's in house database.

** There are *options*:**

- 1- Take a boat to the mangroves, climb onto mangrove island to pick up trash amongst the roots – we recommend avoiding this option during hottest summer months but perfect for winter months
- 2- Take a boat to a mangrove site to snorkel and pick up trash under water – we recommend this option for the hottest summer months
- 3- Do a land based cleanup near MarineLabs campus – we recommend this options if you are looking to avoid the additional cost of a boat trip

Grade Level: 7th grade and above

Timing: 3 hours (flexible)

Reef Restoration with Citizen Science

Students spend an hour in the classroom discussing the need for reef restoration and various restoration efforts in the Florida Keys. During the field trip, snorkelers will observe one of Coral Restoration Foundation's coral nurseries and then snorkel a restoration site. The citizen science reef restoration program provides students the opportunity to directly participate in local reef restoration efforts. Before leaving the dock, MarineLab instructor will teach the students how to identify outplanted coral and record the necessary data. Students will be taken to one of the Coral Restoration Foundation's coral nurseries for the first site. The students will then collect data on corals that have been outplanted by the Coral Restoration Foundation at a second site. Once back at the dock, data will be submitted via CRF's app.

Grade Level: 7th and above



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Timing: 2-4 hours. Class discussion is 1 hour. Field trip is generally 3 hours but can be compressed to 2-3 hours. The discussion is not a required component of this program. It is suggested 7th and 8th grade students don't participate in the discussion and solely do the field trip portion.

Two Hour Programs:

Diversity Indexing Lab

The lab begins with a discussion relating biodiversity to ecosystem health and stability. Students work in pairs to count and identify every invertebrate he/she can find on a live rock freshly collected from Largo Sound. Each pair calculates a diversity index for their rock. Discussion continues regarding application to true scientific studies and the need for increased sample size. Students use raw data from all rocks in the lab to calculate an "overall" diversity index and numbers are compared and discussed. The lab concludes with a discussion regarding the validity of the study overall. What are the "pros" and cons of utilizing a mathematical measurement of biodiversity? What is the study lacking?

Grade Level: High School or Above

Timing: 2 hours

Phytoplankton Monitoring Lab (HAB Lab)

Phytoplankton play a vital role in the marine ecosystem; changes in diversity and abundance can affect the entire food chain, including humans. The hands on portion of the lab will be preceded by a powerpoint presentation where students will learn about plankton, the importance of phytoplankton in the marine ecosystem, sources and impacts of HABs and how to identify phytoplankton. Students will then participate in data collection for NOAA's Phytoplankton Monitoring Network by filtering and analyzing water samples collected from water adjacent to Key Largo. Each group of students will have a compound microscope with screens to utilize for analysis.

Grade Level: High School and Above

Timing: 2 hours



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One Hour Programs:

Microplastics Lab

While not necessarily visible, microplastics are a global marine debris issue with documented impacts on animals from plankton to whales. Continued research and public education is necessary to create the best solution to this oceanwide problem. Students will have the opportunity to not only learn about the impacts of microplastics but they will see the problem firsthand. Samples collected from a snorkel site will be analyzed. Students will have the opportunity to be a part of the solution by submitting their data to SeaGrant's Florida Microplastics Awareness Project.

Grade Level: 7th and above

Timing: 1 hour

Water Quality Lab

Abiotic water parameters determine the health and the community of any fresh or salt water system. Primary water quality parameters will be discussed as well as the best tools and methods to measure each parameter. Students will have hands on opportunity to use all of the tools in preparation for water quality field collection and analysis. Students will collect water quality data during scheduled snorkel trips at a minimum of two sites.

Grade Level: 7th and above

Timing: 1 hour

Other Service Learning Opportunities:

Coastal Cleanup

We can incorporate a "cleanup" into a mangrove and/or a coral reef program during the field trip component. While it will shorten the time spent in the water it will provide students the chance to physically "give back" to the habitats they are enjoying

Grade Level: All



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Water Sampling Trips

We currently collect water samples and water quality data for FWC (Bayside) and University of Florida (reef). The sampling is done once/month and can be incorporated into a **mangrove ecology field trip (UFsamples)** and **coral reef ecology field trip** (FWC samples).

Grade Level: All



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