

Mangrove Ecology Program with Sediment Analysis Lab

Grade Level: High School and Above

Summary: The mangrove ecology is a component of our core program and allows the staff to truly use the outdoors as a classroom. Mangroves provide an important habitat and play a vital role in the ecological functioning of other associated habitats in the keys. Students will learn about mangrove ecology during a discussion on the boat on the way to the mangrove snorkel site. Boat will stop at various locations so instructors can point out any animals to identify (birds!), examples of mangrove adaptations, the identifying characteristics of the three species of mangroves and unique habitats created by the mangroves. Students will collect a sediment core from two different mangrove zones and analyze with instructor. Students will then snorkel and get a hands on lesson with marine invertebrates collected by the instructor.

Program Objectives/Concepts Covered:

Basic Mangrove Ecology Program

- students will be able to identify 3 local mangrove species as well as their identifying characteristics
- students will understand the role of the mangroves habitat in the overall Florida Keys marine ecosystem
- students will experience hands-on introductions to mangrove-dwelling organisms
- students will understand the biogenic and abiogenic limestone making up the Florida Keys and see the biogenous limestone of Key Largo firsthand
- Students will understand and see first hand mangrove adaptations
- Students will be introduced the detritus based food web
- Students will understand the abiotic factors controlling geographical distribution and zonation of mangroves
- Reproductive strategy of mangroves
- Identification of local birds

Sediment Analysis Lab

- students will understand what a sediment core is and how to properly collect a sediment core
- students will have the opportunity to collect a core from two areas to compare/contrast
- students will use background information taught during the mangrove ecology lesson to analyze sediment cores
- students will observe firsthand: Anaerobic mangrove sediment, Sulphur reducing bacteria, tannins, Organic matter accumulation and degradation

Vocabulary: detritus, prop root, propagule, pneumatophore, lenticels, tannin, facultative halophyte, adaptation, aerial root, zonation, vivipary, salt exclusion/excretion, biogenous, terrigenous, exotic species, mutualism, sulfur reducing bacteria, sediment core, denitrification, tannin, peat, cellular respiration, microbes, pore water, geological oceanography

Procedures: The entire program is run from the water. The students will board the boat for a mangrove ecology lesson, using adjacent trees as examples. Sediment cores will be collected from red and black mangrove sediment. Sediment cores will be analyzed looking at grain size, percent organic material, sulfuric smell and pore water analysis. Lab will be followed by a mangrove snorkel to view prop root community. The program includes collection, identification and discussion of representative organisms from mangrove root habitat.

Extensions: If interested mangrove restoration, talk to the staff! We have a long term restoration effort adjacent to MarineLab's campus we would be happy to discuss. <https://www.cbd.int/doc/case-studies/ttc/ttc-00159-en.pdf>

Resources: <http://floridakeys.noaa.gov/plants/mangroves.html>, <http://mangroveactionproject.org/>



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