



## 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:** 9<sup>th</sup> and Above

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

### Concepts Covered:

- ecology and the abiotic factors controlling the geographic distribution of seagrass
- function of the seagrass habitat in the overall keys ecosystem
- seagrass and algae identification
- threats to seagrasses and restoration efforts
- unique Florida Bay habitat
- common marine phyla, the characteristics of each phylum and examples of species of each phylum
- long term ecological monitoring
- ecological sampling
- importance of baseline data
- seagrass survey techniques
- replicate sites and experimental repeatability
- citizen science

**Vocabulary:** ecology, estuary, calcareous, substrate, vascular, obligate halophyte, autotroph, heterotroph, biotic, abiotic, sessile, prop scar, rhizome, salinity, evisceration, regeneration, seagrass monitoring, transect, quadrat, standard deviation, citizen science, systematic sampling, stratified sampling, random sampling

**Extensions:** long term data collected by MarineLab staff and students is available for analysis before or after your MarineLab seagrass program

**Resources:** [www.seagrasswatch.org](http://www.seagrasswatch.org), <http://seagrass.fiu.edu/>, <http://floridakeys.noaa.gov/plants/seagrass.html>



## **Standards Supported:**

### ***Next Generation Sunshine State Standards***

SC.5.L.17.1: Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.

SC.6.L.15.1: Analyze and describe how and why organisms are classified according to shared characteristics with emphasis on the Linnaean system combined with the concept of Domains.

SC.912.N.1.5: Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.

SC.912.N.1.7: Recognize the role of creativity in constructing scientific questions, methods and explanations.

SC.912.N.4.1: Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.

SC.912.L.15.4: Describe how and why organisms are hierarchically classified and based on evolutionary relationships.

SC.912.L.15.7: Discuss distinguishing characteristics of vertebrate and representative invertebrate phyla, and chordate classes using typical examples.

SC.912.L.17.2: Explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature.

SC.912.L.17.4: Describe changes in ecosystems resulting from seasonal variations, climate change and succession.

SC.912.L.17.8: Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.

SC.912.L.17.13: Discuss the need for adequate monitoring of environmental parameters when making policy decisions.

### ***Ocean Literacy Principles***

#### **Principle 3. The ocean is a major influence on weather and climate.**

f. The ocean has had, and will continue to have, a significant influence on climate change by absorbing, storing, and moving heat, carbon and water. Changes in the ocean's circulation have produced large, abrupt changes in climate during the last 50,000 years.



# MarineLab

Marine Resources Development Foundation

*Marine Science education in the Florida Keys*

**Principle 5. The ocean supports a great diversity of life and ecosystems.**

f. Ocean ecosystems are defined by environmental factors and the community of organisms living there. Ocean life is not evenly distributed through time or space due to differences in abiotic factors such as oxygen, salinity, temperature, pH, light, nutrients, pressure, substrate and circulation. A few regions of the ocean support the most abundant life on Earth, while most of the ocean does not support much life.

i. Estuaries provide important and productive nursery areas for many marine and aquatic species.

**Principle 6. The ocean and humans are inextricably interconnected.**

d. Humans affect the ocean in a variety of ways. Laws, regulations and resource management affect what is taken out and put into the ocean. Human development and activity leads to pollution (point source, non-point source, and noise pollution), changes to ocean chemistry (ocean acidification) and physical modifications (changes to beaches, shores and rivers). In addition, humans have removed most of the large vertebrates from the ocean.