

# MY COMMUNITY, OUR EARTH

## MIAMI

# Friends of the Environment: Seagrass Beds

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**Problem Statement:** How is the freshwater output, from the canal system, affecting the sea grass beds of Biscayne Bay?

This project was to create the “Friends of the Environment” group, students ranging from 5 to 18 years old and adults, and to teach them about the natural habitats that exist around us, in South Florida. Also, by learning about these environments, this would encourage each person to be advocates for these habitats and become environmental stewards in general. The students visited a variety of local parks and sites around South Florida to learn about each of the local habitats.

### Community Characteristics

<b>Soil:</b>	marine and/or brackish waters
<b>Hydrology:</b>	Underwater, completely; affected by salinity-changing floods and storms
<b>Historic Area:</b>	over 48,100 km <sup>2</sup>
<b>Current Area:</b>	~26700 km <sup>2</sup> and declining
<b>Major areas:</b>	North Atlantic, Philippines, Gulf of Mexico, all coastal areas of the world except the Antarctic shores
<b>Elevation:</b>	48m to 10m
<b>Threats:</b>	grazing, storms, eutrophication, overfishing, excessive input of nutrients such as nitrogen, motor boats, habitat destruction



### What Did Ponce de Leon Really Find??



Directions: Color each section the color of the letter provided  
R=Red O=Orange Y=Yellow G=Green B=Blue

## Background

Sea grass fossils dating back more than 100 million years, have been found. As humans have populated the coast lines, they began to unknowingly destroy these seagrass beds. Slowly, humans have become more aware and have begun to take responsible for our effects on the earth and have begun to attempt to restore these beds. Laws protecting certain areas of seagrass have been instated, but we still have a long way to go in restoring the sea grass meadows.

## Ecology

Seagrass Beds are a crucial environment to the plant and animal species of both Florida and Biscayne Bay in South Florida. Dominant communities in the south Florida area are *Thalassia testudium* (turtle grass), *Halodule wrightii* (shoal grass) and *Syringodium filiforme* (manatee grass). The seagrass beds are critical, as a sanctuary for numerous invertebrate and fish species to lay their eggs, and also as a safe haven from large predators as the young grow and develop.

## Threats

One of the main factors affecting the seagrass beds in Miami Dade County of South Florida, is the canal system. Historically, freshwater gradually

flowed into the bay, over a large expanse of land. Early in the 1900's the canal system was created for drainage, flood protection and water storage purposes. Once the canal system was implemented, freshwater was collected here and this essentially eliminated the slow, natural flow. The canal water is released in very large quantities into the bay in a very narrow area, which concentrates this freshwater output significantly. Over time, this "controlled" freshwater flow has changed the natural salinity gradient along the shoreline of the bay, which has resulted in a decrease in continuous seagrass beds along the shoreline. The map at the end shows the patchy, discontinuous areas of seagrass along the shoreline in yellow. The blue lines represent the canal system, and in many cases, where the canal releases into the bay, the seagrass is patchy. The continuous seagrass beds are dominant offshore where the effect on the freshwater from the canals is less significant.

Many other forces are working together to destroy our valuable sea grass communities as well. Human sewage overflows into inadequate septic tanks and seeps into the sea, flows into rivers during rainy periods and sometimes it is even emptied directly into the sea through pipes! Another problem is motor boats and pollution. Humans drive through the seagrass beds unknowingly and destroy large areas.

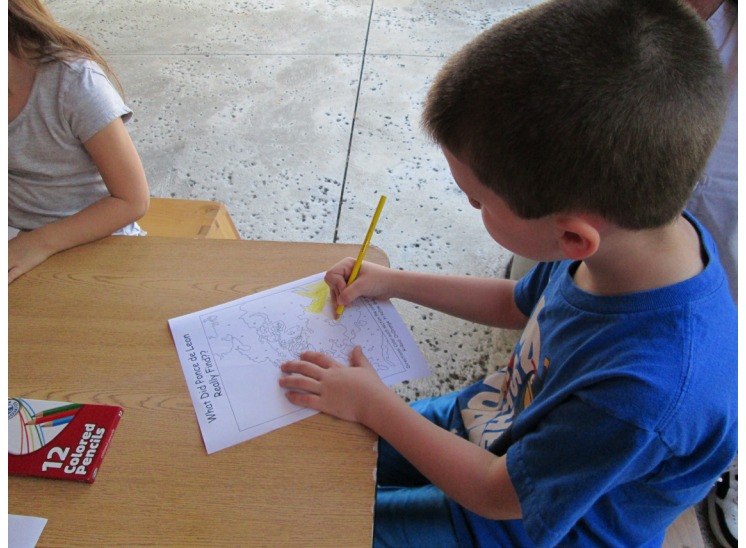


## Results & Conclusion

“Friends of the Environment” team members visited Biscayne National Park, Everglades National Park and Deering Estate to learn more about these sea grass beds and more about Biscayne Bay in general. In order to learn more about the Bay and its history, the “Friends of the Environment” group specifically attended Biscayne National Park’s Fun Fest for the theme day of “500 Years in the Sunshine State”. Biscayne National Park’s description of this day is as follows:

Biscayne National Park contains evidence of nearly 10,000 years of human history, but the name Florida doesn’t come onto the scene until the spring of 1513. Retrace Florida’s first 500 years through Ponce De Leon’s discovery of the Gulf Stream, a Tequesta archaeological dig, shipwrecks from the great European powers, and more.

As the students moved around the 5 stations, they learned about the last 500 years in and around Biscayne National Park. To start, they learned how Ponce DeLeon traveled to Florida (Picture on the above), but had to deal with the ocean currents, as he was traveling by boat. Everyone got to color a map to see how the ocean currents flow within the bay and ocean and also how the temperature changes as well. (Picture on the right)





At the next station, they were introduced to different Florida lighthouses (picture on the above) and taught that each has its own unique series of blinks, which identifies one lighthouse from another. They watched the light patterns on 6 model lighthouses, and using the sequence of blinks, identified which Florida lighthouse it represented. In the picture on the right, you can see Nicole, a high school student, helping, Halley, Jake, Brandon, Drew, Brian and Zoey, time the seconds between flashes on the lighthouse.

At another station, the students learned about archeology in Biscayne Bay. They got to sort materials found in the bay and then identified what bones and rocks they had found

After our history lesson on Biscayne Bay, the “Friends of the Environment” group discussed how sea grass has historically always been a part of the Bay and how important it is to the animal species that depend on it. We talked about how over the last 100 years, the canal system has been built and changed the flow of natural freshwater, but also how the human population has increased drastically and inhabited more and more of the Biscayne Bay shoreline. Through all of this, humans have had an extremely negative impact on the Bay and the seagrass communities there. We discussed how the pollution of the bay and freshwater from the canals has affected the sea grass beds and how if the beds are destroyed, it could have an effect on numerous animal species.





Map of Biscayne Bay

