

MY COMMUNITY, OUR EARTH

MIAMI

Friends of the Environment: Mangroves

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Problem Statement: What affect have humans had on mangrove populations?

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 habitat.





Community Characteristics

- Soil:** Salty soil with many organic minerals. Soils in marshy wetlands.
- Hydrology:** Periodically flooded. Frequency and magnitude of flooding determined by local topography combined with tidal action, river flow, and other environmental factors. Mangroves can survive in a wide range of salinity and freshwater. Differ in their ability to tolerate flooding
- Current Area:** 2,700km²
- Major areas:** Along the Atlantic coast from Florida to Argentina. Also, the Everglades, the Charles Deering Estate, Big Cypress Swamp, north of Cape Canaveral, and north of Cedar Key.
- Elevation:** 2.9 to 20.8 m
- Topography:** Low-lying, intertidal zone, with some extensive to irregularly flooded to fringe areas.
- Dominate plants:** Red mangroves, black mangroves, white mangroves.
- Common fauna:** Valuable habitat for wide range of invertebrates and vertebrates, including 220 fish, and 181 bird species; habitat of endangered American crocodiles and Florida manatees.
- Invasive:** Nutria, Brazilian pepper, Australian pine.
- Threats:** Human development, illegal dumping, oil spill, run-off that contains herbicides, pesticides wastes. Man-made canal systems, changing salinity levels and lowering the water table.



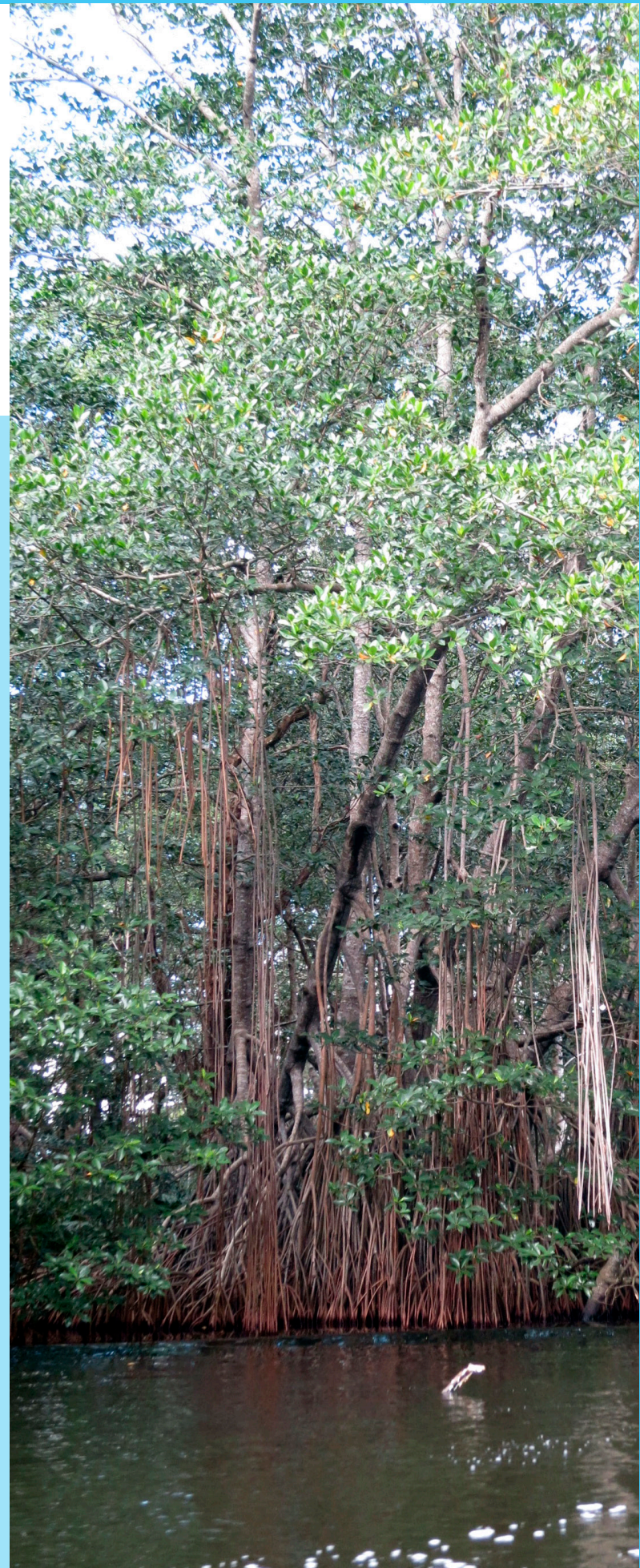
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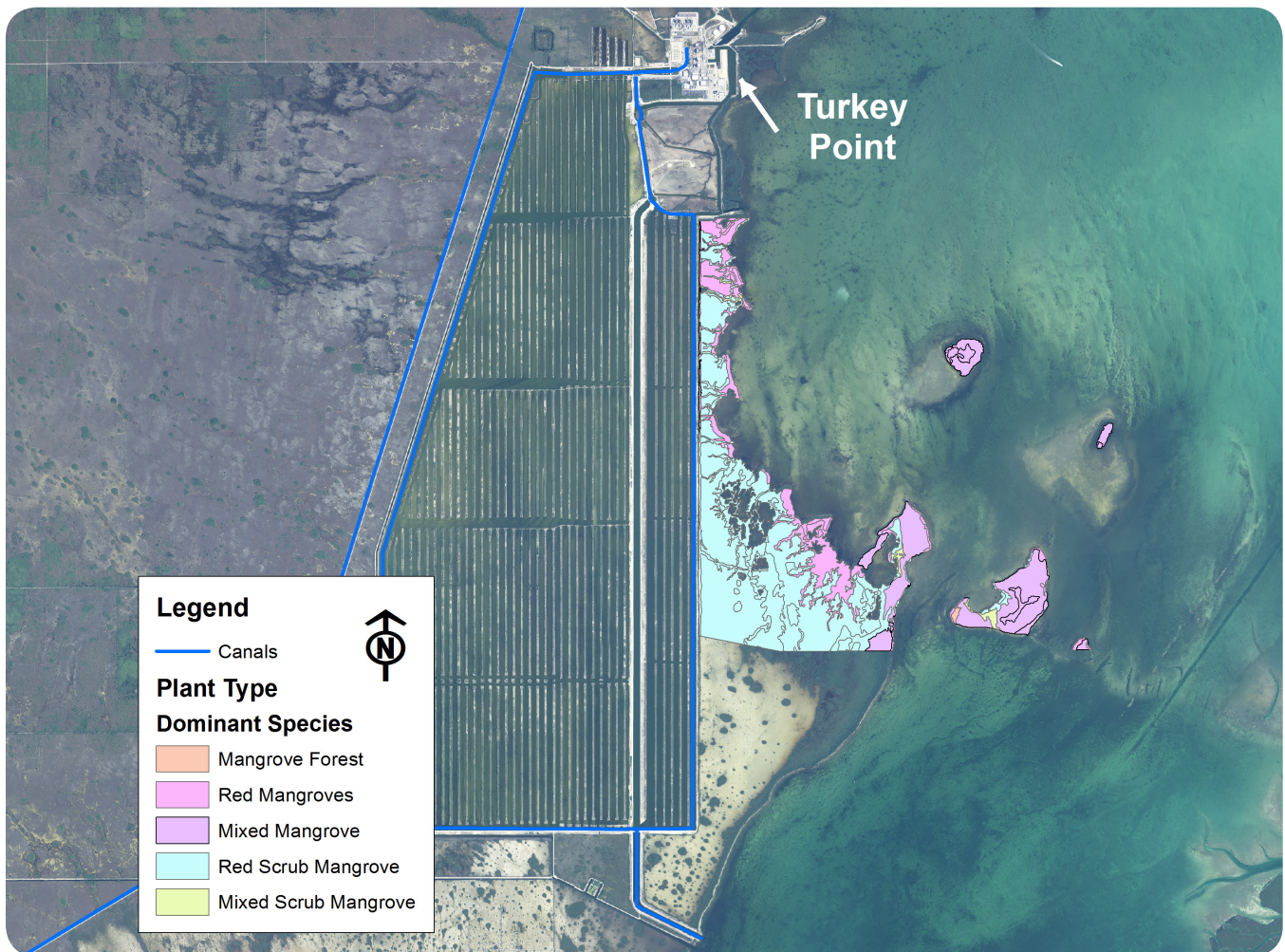
Mangroves are woody plants that grow on the coastlines of saline environments in the tropics and subtropics. They are found in mangrove forest or swamps, like the Everglades. Mangroves filter water by removing toxins and stabilize silt that enters into estuaries from rivers and coastal runoff. Mangroves provide a nursery for a large variety of species from crabs and fishes to alligators.

There are three native species of true mangrove trees in south Florida: black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and the red mangrove (*Rhizophora mangle*). Mangroves cover about 240,000 km² worldwide. Mangroves have adaptations such as aerial roots and pneumatophores, finger-like structures that serve as a respiratory organ for the plants. Mangroves all around the world make an important contribution to nutrient cycling in coastal waters. National parks like the Everglades and the Charles Deering Estate are constantly striving to preserve Florida's mangroves.

Ecology

Mangroves contribute to soil formation and help stabilize coastlines, which make them extremely important ecologically. This mangrove “barrier” between the land and sea protects shoreline from soil erosion and powerful waves. Mangroves also act as filters for upland runoff, which often contains pesticides. Mangrove systems serve as a habitat for many marine organisms such as fiddler crabs, mudskippers, and many species of birds including many threatened and endangered species. Mangroves also directly benefit humans for recreational purposes such as fishing, bird watching and snorkeling.



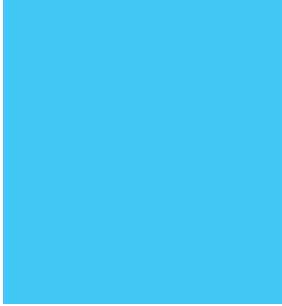


Threats

Due to shoreline development, around sixty percent of mangroves have been lost. Mangroves have been replaced with marinas, channels, airports, commercial and residential construction. Illegal dumping, oil spills, run off of pesticides and other debris is affecting and damaging our mangroves.

Around Turkey Point power plant near Miami, Florida, there is a very dominant area of dwarf mangroves also referred to as scrub mangroves. All species of mangroves can be found as dwarf mangroves, but the dominant dwarf species are primarily the red and black mangroves. Scrub mangroves are usually less than 1.5 meters tall and

cover relatively large areas in the Florida Keys and Everglades. It is not exactly known what causes a scrub mangrove, but it is agreed that it is some type of stress to the plant. Around Turkey Point power plant, salt water encroachment and lack of freshwater flow has had a considerable effect. As shown on the map, the “grid” is the cooling system used by Turkey Point, and an area where freshwater flow is diverted. This lack of freshwater flow allows salt water to move farther and farther inland and thus adds to the scrub mangrove community. Also shown in the map, dwarf mangroves are very prominent near the cooling canals and have essentially replaced the normal size red mangrove communities.



Results & Conclusion

The Friends of the Environment group visited mangroves at many different sites such as Everglades National Park-Main Campus, Everglades National Park-Shark Valley, Deering Estate, and Biscayne National Park. We saw red and black mangroves and also some dwarf mangroves. At Deering Estate we walked along the boardwalk and saw many sites with debris that had washed in from Biscayne Bay. We talked about how the mangroves have been affected by the lack of natural freshwater flow and also pollution from humans.

Worldwide distribution of mangroves.

