

MY COMMUNITY, OUR EARTH

MIAMI

A Comparison of Mangrove Communities: Florida and Nicaragua

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Problem Statement: How do the mangrove communities of South Florida compare to those found in Nicaragua?

Background

A mangrove forest is a forest of a special breed of trees that live on the coastline of tropical and subtropical countries. Mangroves are commonly found in warmer areas between the latitudes of 32 degrees north and 38 degrees south. Along the coastline, the soil is soft, loose, and lacks breathability, and the water is a combination of fresh and salt. Of course, mangroves, unlike other plant life, thrive in those conditions. Mangroves have unique characteristics that help them adapt

to this environment such as the formation of their roots and their ability to absorb and secrete salt. There are 50 species of mangroves found worldwide. The most common are Red mangroves, Black mangroves, White mangroves, Grey mangroves, Mangrove ferns, and Buttonwood. Approximately 224,579 ha (554,515 acres) of mangroves remain in central and South Florida. Since the year 2000, it has been recorded that the mangrove forests of Nicaragua are 214,300 ha. Despite the miles of distance, Florida and Nicaragua share the same breed of mangroves which are Red, Black, White, and Buttonwood mangroves, but Nicaragua has an additional breed called piñuelo mangrove that Florida does not have and is not known in North America.



Nicaragua Mangroves Four Families Five species	Florida Mangroves Three families Four species
Rhizophoraceae <i>Rhizophora Mangle</i>	Rhizophoraceae <i>Rhizophora Mangle</i>
Avicenniaceae <i>Avicennia germinans</i>	Avicenniaceae <i>Avicennia germinans</i>
Cambretaceae <i>Conmocarpus erecta</i> <i>Laguncularia racemosa</i>	Cambretaceae <i>Conmocarpus erecta</i> <i>Laguncularia racemosa</i>
Pellicieraceae <i>Pelliziera rhizophorae</i>	

The Red Mangrove, (*Rhizophora Mangle*) is the easiest to identify. Red mangroves have tangled, reddish roots called prop roots that grow downward and sprout back up forming arcs which you can see extending from the trunk popping above the ground. These mangroves are found closest to the shoreline where the soil is soft and there is where its roots are most useful to support the tree in staying placed.

The Black Mangrove, (*Avicennia germinans*) are easily identified by the numerous short, upright aerating branches called pneumatophores that can be seen around the tree's trunk. The bark is dark in color and its leaves are narrow and dark green above and pale green with itty bitty hairs below. Black mangroves are found more inland than Red mangroves.

The White Mangrove, (*Laguncularia racemosa*) . White mangroves are a bit tricky as to they grow in tree form or shrub form and do not share the aerial roots characteristics of the Red and Black mangroves. To distinguish a White mangrove, you have to look at the leaves and see that they are oval shaped with rounded tips and a pale green color on both sides. Of course, the White mangrove is found highest inland from all the mangroves.

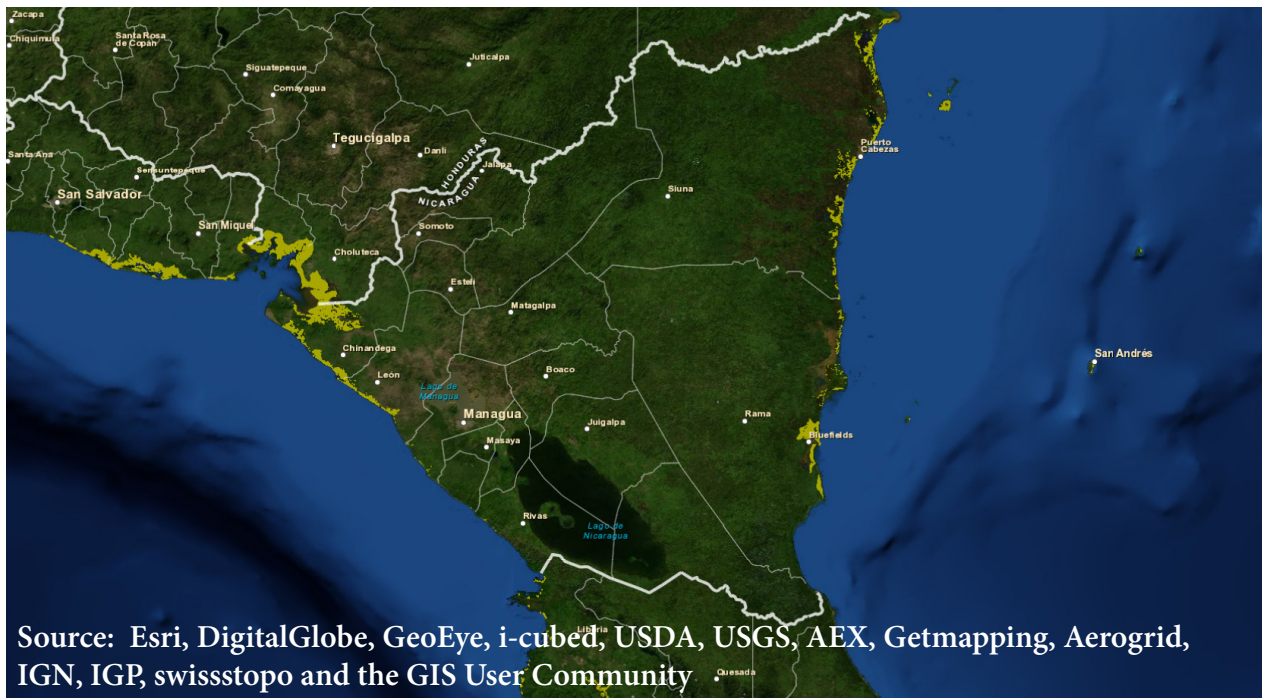
Buttonwood Mangroves, (*Conmocarpus erecta*) also grow in either tree or shrub form. The bark is grey and the leaves are thin and pointed and are shaped broad to narrow. There are two types: the green with medium green leaves found on peninsular Florida and the silver with pale pastel green leaves are limited to the Florida Keys, but are grown in nurseries. Buttonwood mangroves grow tiny brown flowers that produce a seed that is known as the button, thus that mangrove is called

Buttonwood. Buttonwoods are able to grow in areas seldom inundated by tidal waters. The mangrove adapts to the desert of salt water, also buttonwoods adapt to waterless areas of barrier islands and coastal strands.

The richest mangrove communities occur in tropical and sub-tropical areas. One would think, "How do mangroves survive on the sea water if plants live on fresh water?" In mangroves, the roots are a ventilating surface that has respiratory tissue cells called lenticels. Of course the seawater that the mangroves consume has high salinity levels therefore; mangroves have high tolerance for internal salinity. Their leaves contain salt glands that allow the plants to rid of the extra salt in the tissues through an active pump mechanism. Furthermore, mangroves develop special features such as succulence which are water storing tissues in the leaves, sunken stomata which are breathing pores at the back of the leaves, and tiny hair which some leaves possess hair-like trachoma to reduce water loss. Through all of these characteristics that mangroves possess is how they are able to adapt and thrive in their unique environmental conditions.

Mangroves have a significant ecological role as physical habitat and nursery grounds for a wide variety of marine life. The roots of these trees provide protected nurseries for breeding fish and the branches are used as nesting areas for marine birds such as seagulls, pelicans, and spoonbills. If it were not for our mangroves, believe it or not, Florida would have a declining commercial fishing industry. Fish of all kinds are able to breed and raise their guppies in the safety of the mangrove roots and if it weren't for the mangroves, where would the fish breed without having much larger fish

Distribution of mangroves in Florida and Nicaragua



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swissstopo and the GIS User Community

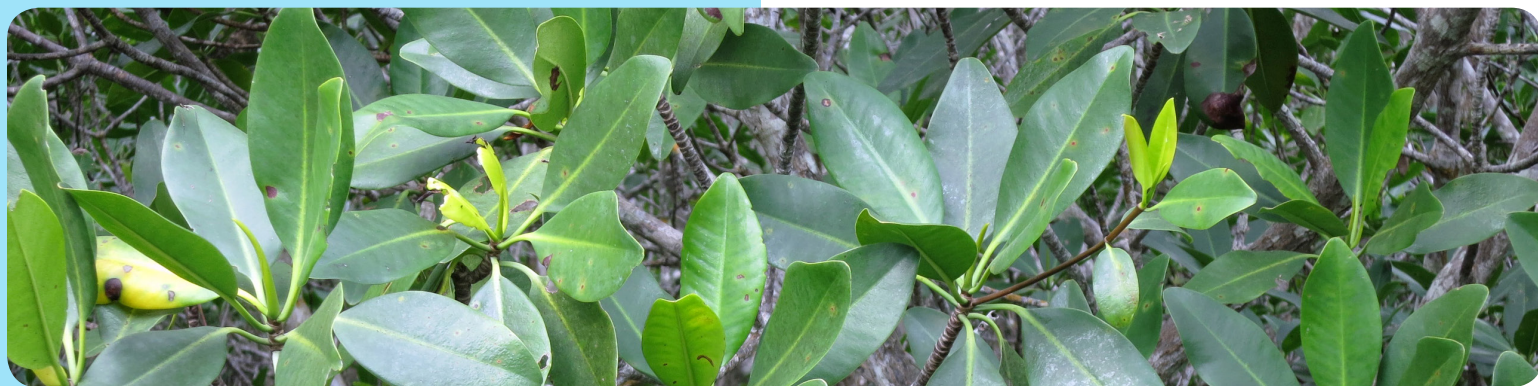
preying on their young? Also, what fish would fisherman fish?

Current Status & Results

In Florida and Nicaragua, the dominance of mangroves along the sea coast is a great advantage to those living inland. Mangroves are a protective barrier from hurricanes and strong tropical storms. Mangroves are able to push back the raging waters flowing inland and soften the harsh winds with their dense network of roots and branches. Over times, contractors have torn

down mangrove populations to build on the beautiful land so that tourist may enjoy the area. Of course, this has a negative effect on the positive outcomes that mangroves provide.

In the year of 1996 the Florida Legislature amended the law regulating the trimming and alteration of mangroves (The Mangrove Trimming and Preservation Act). This legislation replaces all previous state regulations regarding the trimming and alteration of mangroves and it is under the responsibility and direction of the Florida Department of Environmental Protection.



Implications & Conclusions

The preservation of Mangroves is not just important, it is vital to our ecosystem and economy. As a resident of mangrove populated areas, one should take the time to learn about our leafy protectors. The purchases of organic products and produce will aid in the preservation of mangroves. Not only is this just preserving mangrove, but the earth we live on. We as humans have to make an effort and disperse toxins at your local waste dump, use reasonable amounts of water. All of these actions will help mangrove populations stay clean and preserved!

I am truly grateful for having the opportunity to visit the Deering Estate with my peers and my appreciated chemistry teacher. If it were not for this project I would not know as much about mangroves as I do today. In this experience, I have learned to appreciate mangroves for what they do. I have also learned how others do not take the time to respect mangroves. I have witnessed garbage lying in the mangrove floors that were brought in from the tides and it makes me think about how careless we can be. From this experience I have learned how to take my share in preserving these magnificent trees by taking shorter showers, encouraging my friends and family to buy organic produce and household products. Of course, these actions also help other plant life which is multi-beneficial to us and our communities around the globe.

Work Cited

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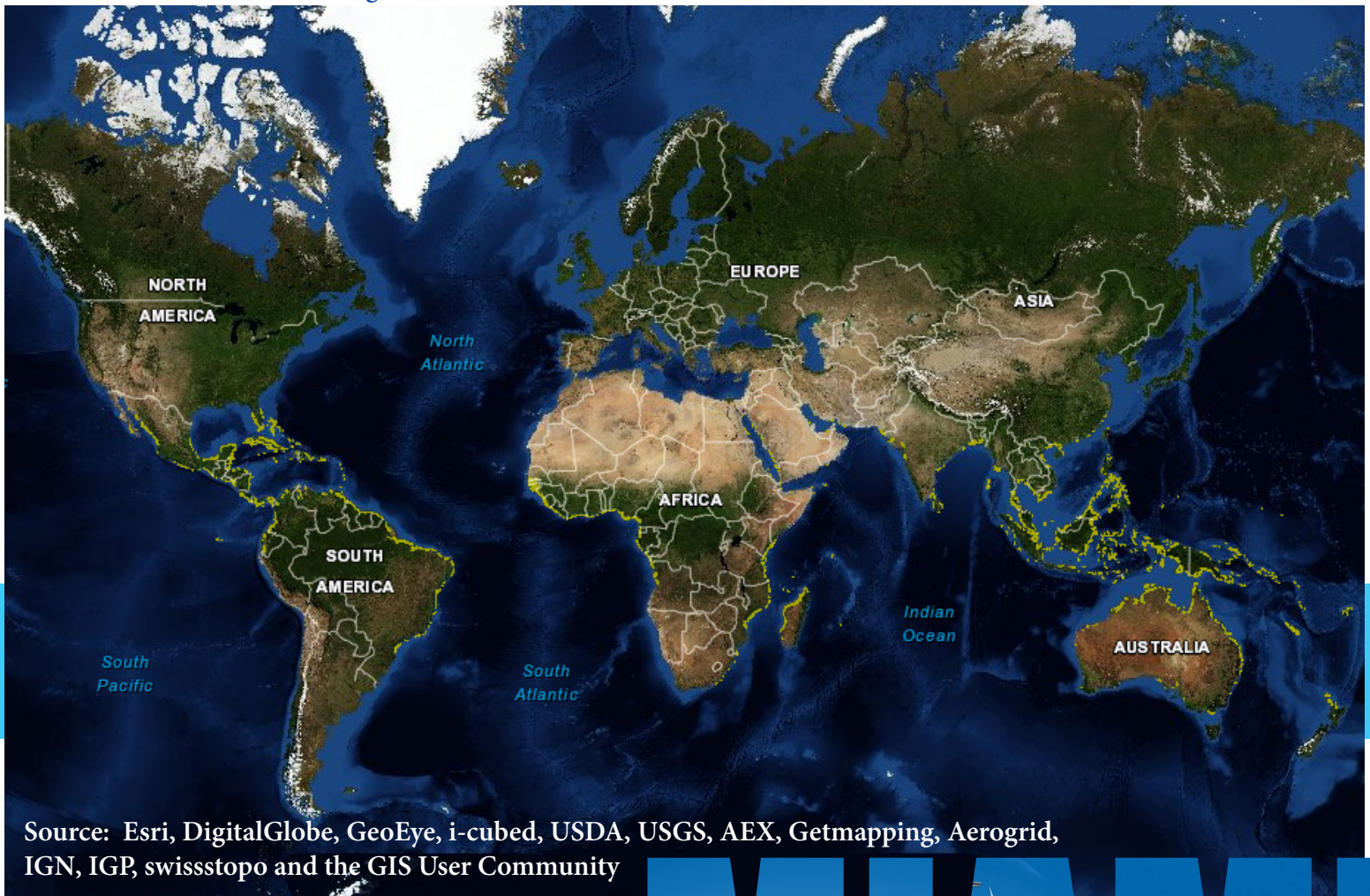
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Worldwide distribution of mangroves.



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo and the GIS User Community

