



WETLANDS

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OUTLINE

1. Wetlands Defined
 2. Properties of Wetlands
 3. Societal Value of Wetlands
 4. Threats to Florida Wetlands
 5. Current Wetlands Protection Measurements
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WHAT IS A “WETLAND”?



- Wetlands are ecosystems found at the transition between aquatic systems and terrestrial systems.

TYPES OF WETLANDS



- Inland - southern swamp, freshwater marsh, riparian
 - Coastal - tidal salt marsh and mangrove swamp
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SOUTHERN SWAMP



- Deepwater systems dominated by bald cypress-tupelo and pond cypress-black gum ecosystems.
 - Includes cypress domes, dwarf cypress swamps, lake edge swamps and cypress strands community types.
 - Example: Florida's Big Cypress Swamp (one of the largest cypress swamps in the U.S.)
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FRESHWATER MARSH



- The most diverse group of wetlands
 - Dominated by herbaceous grasses, sedges, broad-leaf monocots, and floating-leaf aquatics.
 - Example: The Florida Everglades
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RIPARIAN



- Occur adjacent to river and stream systems, commonly found throughout south central and southeastern US due to topography and rainfall
 - Unique because they run parallel along rivers while processing large fluxes of energy and minerals from upstream systems.
 - Their position near rivers makes them highly susceptible to flooding.
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TIDAL SALT MARSH



- Found along temperate coastline, dominated by salt-tolerant grasses and rushes.
 - Some of the most productive ecosystems in world.
 - 400,000 to 500,000 acres of salt marsh in northern Florida alone.
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MANGOVE SWAMP



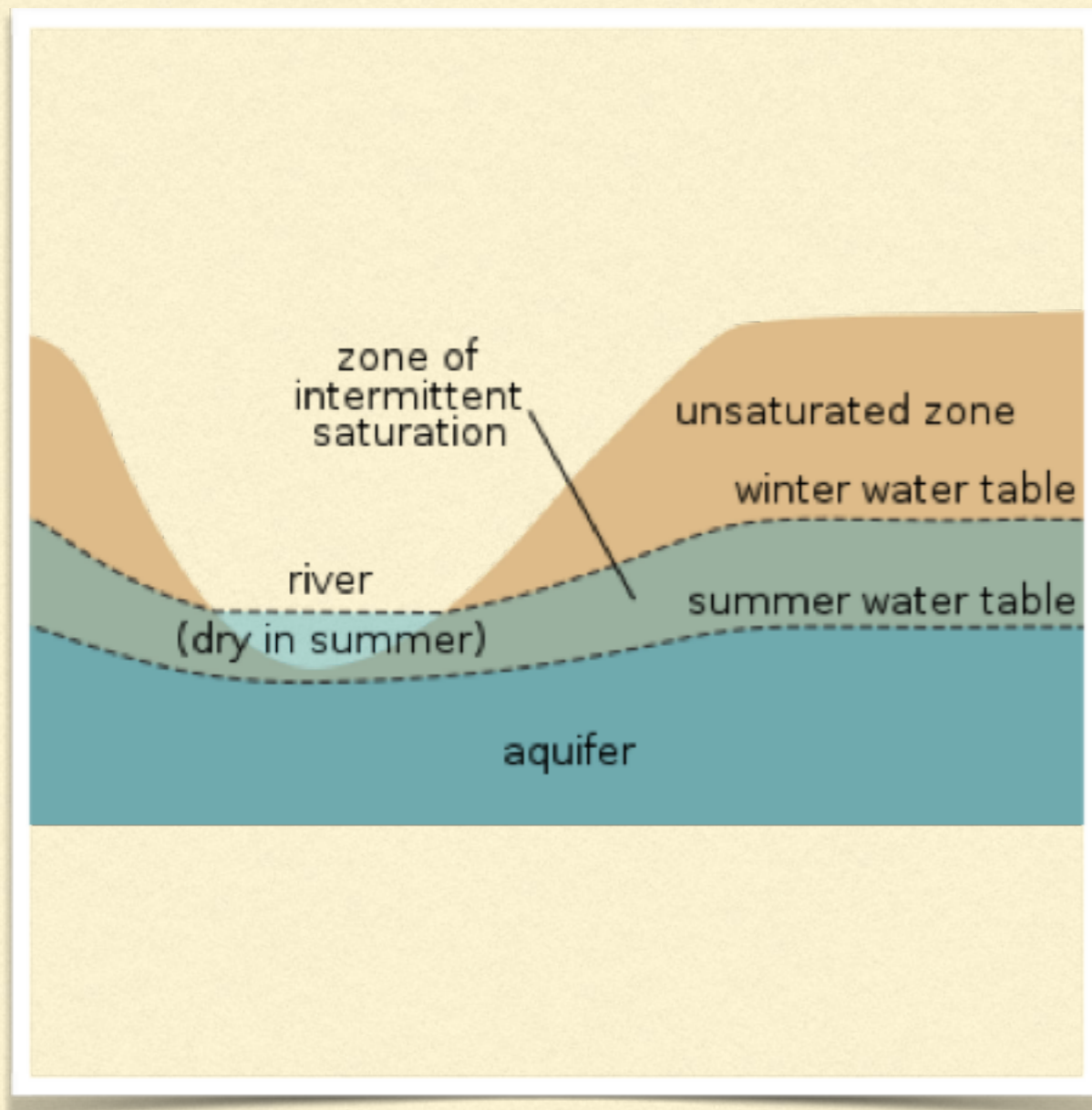
- Sub-tropical communities dominated by red mangrove (*Rhizophora mangle*) or black mangrove (*Avicennia germinans*)
 - Northern locations limited by freeze line
 - Florida is home to approximately 2,700 square kilometers of this dominant subtropical coastal ecosystem.
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PROPERTIES OF WETLANDS



- To be a wetland, an area usually has at least one of the following characteristics:
 - A water table at or near the ground surface during growing season
 - Poorly drained or hydric soils
 - A diversity of wildlife and vegetation adapted to a wet environment

WATER TABLE



- To be a wetland, an area must have water on the ground's surface or in the root zone for at least a portion of the growing season.
- This fluctuation in water is known as the "hydroperiod"
- Even if an area doesn't appear wet, it can still be a wetland because of changing hydroperiods

HYDRIC SOILS



- Hydric soils exist when an area is saturated, flooded, or ponded for so long that the upper soil level is without oxygen.
- There are two types of hydric soils: organic soils and mineral soils
 - Organic soils: dark, oozy, consisting of plant remains; often called peat or muck
 - Mineral soils: have less than 20% organic matter; have gleying and redoximorphic features

NATIVE PLANT DIVERSITY



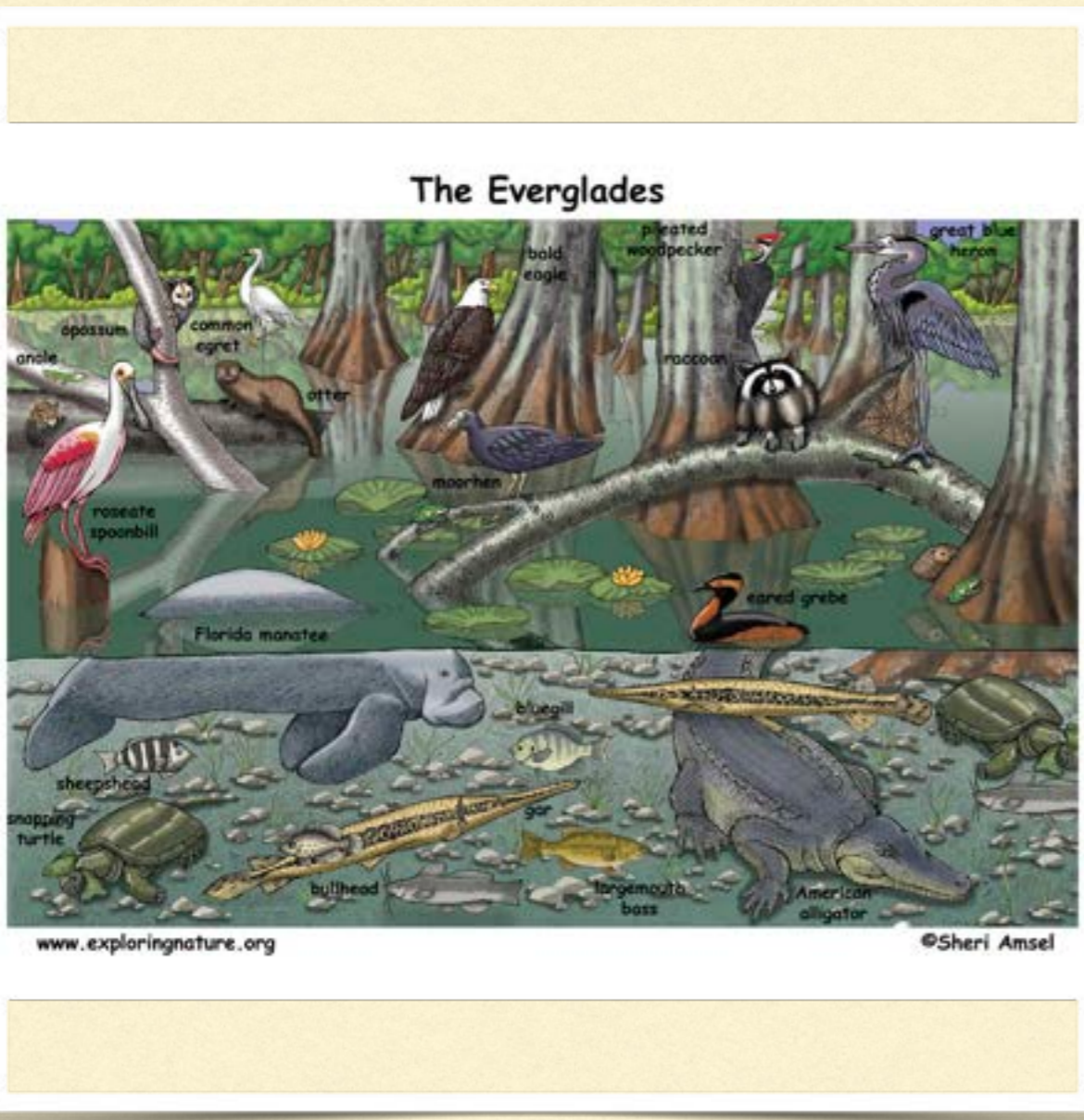
- Common Native Plant Characteristics:
 - Adventitious roots
 - Buttressed trunks
 - Floating leaves and stems
 - Pneumatophores
 - Prolonged seed viability
 - Seed germination with low oxygen
-

NATIVE PLANT DIVERSITY



- Common Native Plants:
 - [Bald cypress](#)
 - [Mangroves](#)
 - [Lily pads](#)
 - [Coastal marsh grass](#)
 - [Cattails](#)

NATIVE ANIMAL DIVERSITY



- Waterfowl and Migrating Birds
- Invertebrates such as snails, insects and spiders
- Mammals such as manatees, deer, panthers
- Fish and other shellfish
- Reptiles and Amphibians such as alligators, snakes and frogs

SOCIETAL VALUE OF WETLANDS



- Harboring Biodiversity
 - Critical Habitat and Nurseries
 - Carbon Sequestration
 - Flood and Erosion Protection
 - Water Quality
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HARBORING BIODIVERSITY



- Biodiversity is the variability among living organisms; this includes diversity within species, between species and of ecosystems
 - Wetlands are as crucial for harboring biodiversity as tropical forests and coral reefs.
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CRITICAL HABITAT AND NURSERIES



- Wetlands provide critical habitat for breeding, migration, and wintering areas for waterfowl and other wildlife.
- Freshwater and marine life including trout, striped bass, pike, sunfish, crappie, crab, and shrimp rely on wetlands for food, cover, spawning, and nursery grounds.
- Between 60% and 90% of U.S. commercial fisheries depend on wetlands.

CARBON SEQUESTRATION



- Certain coastal wetland ecosystems (such as salt marshes and mangroves) can sequester and store large amounts of carbon due to their rapid growth rates and slow decomposition rates.

CARBON SEQUESTRATION



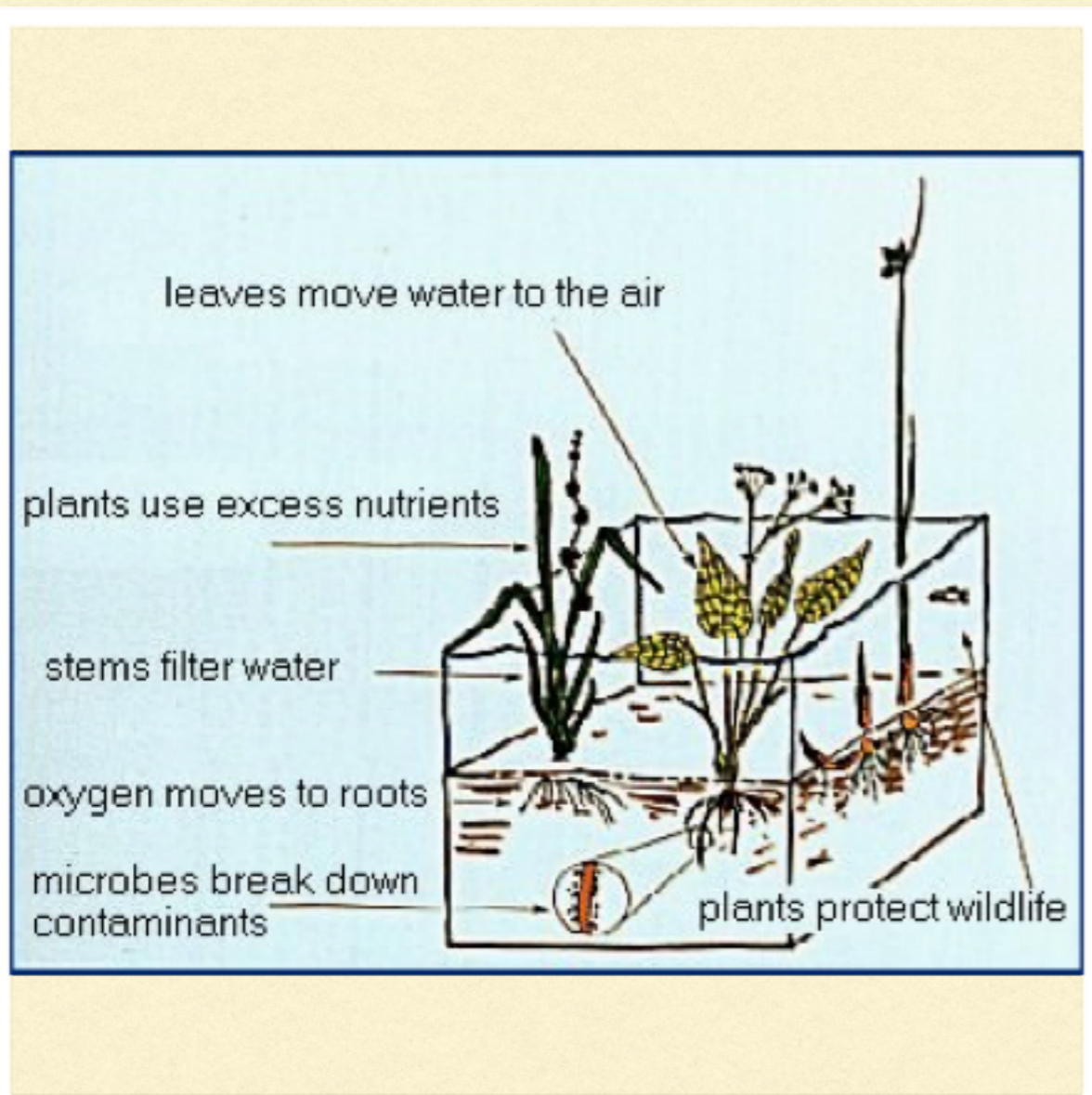
- Climate regulation through carbon (C) sequestration in wetland soils may be one of the most important ecosystem services of wetlands in the long term.
 - C is sequestered in wetlands when C inputs (productivity and/ or sedimentation) surpasses C outputs (decomposition and C exports).
 - The remaining organic material, mostly senesced plant material, is accumulated in the wetland's anaerobic sediment layer as a mat of partially decayed organic material, or peat. (Villa and Mitsch 2015)
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FLOOD AND EROSION PROTECTION



- Protect upland areas, including valuable residential and commercial property, from flooding due to sea level rise and storms.
 - Prevent coastline erosion by absorbing the energy created by ocean currents which would otherwise degrade a shoreline and its development.
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WATER QUALITY



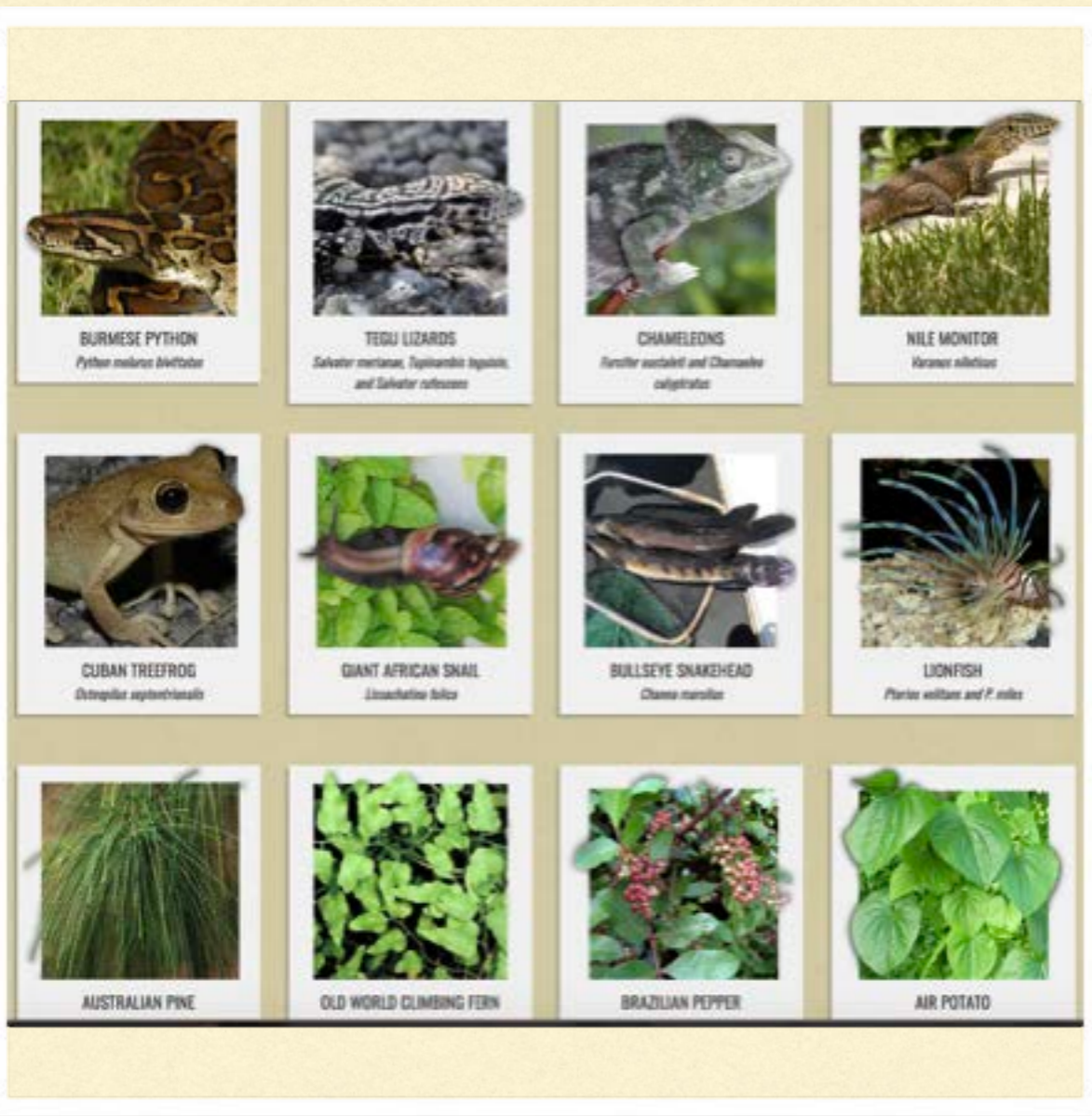
- Wetlands filter chemicals and sediment out of water before it is discharged into the ocean.
- Wetlands in the environment are like livers in our bodies - they remove and filter pollutants.

THREATS TO FLORIDA WETLANDS



- Natural
 - Invasive Species
 - Anthropogenic
 - Agriculture
 - Development
 - Resource Extraction
 - Destruction/Loss
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INVASIVE SPECIES



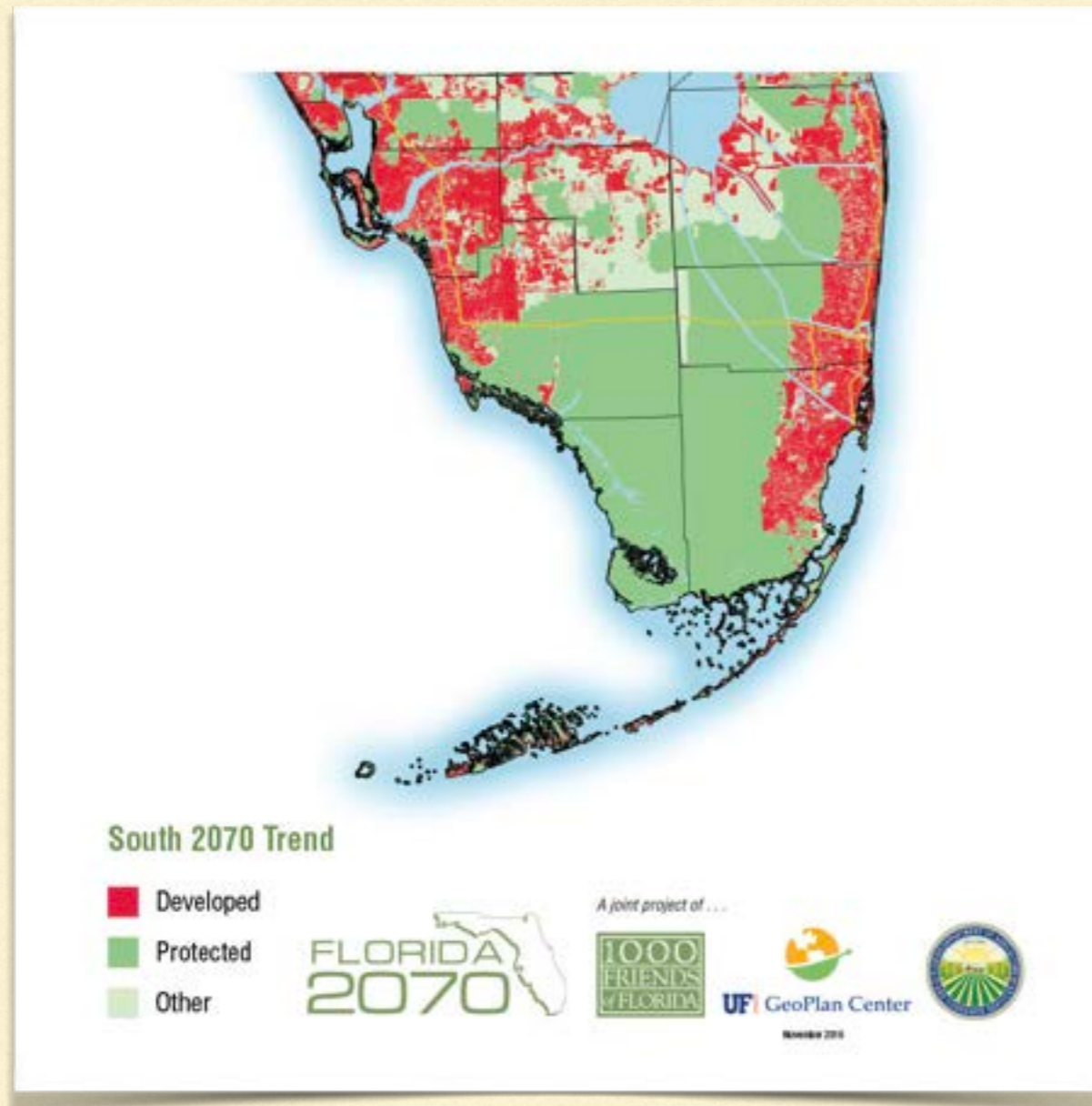
- Invasive species ranging from Lygodium to exotic fishes like the snakehead to reptiles like the burmese pythons are wrecking havoc.
- Invasive species outcompete native species and cause major economic impacts.
- Visit [ECISMA](#) website for more information.

AGRICULTURE



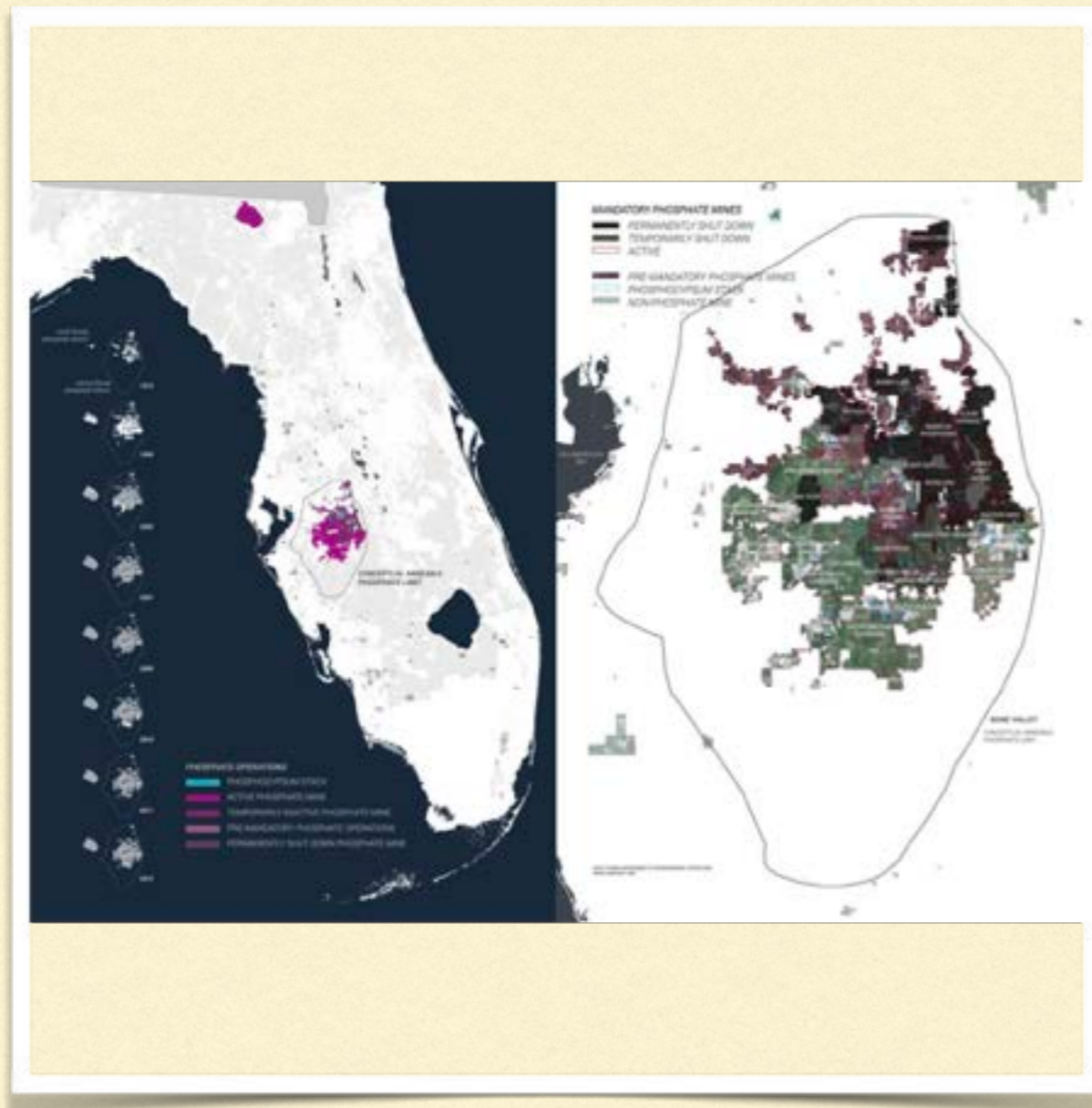
- Agriculture, such as sugar cane, rice, and dairy farms, exists on drained land within the Everglades.
- Additionally, pollution runoff from farming throughout the state is threatening Florida wetlands.

DEVELOPMENT



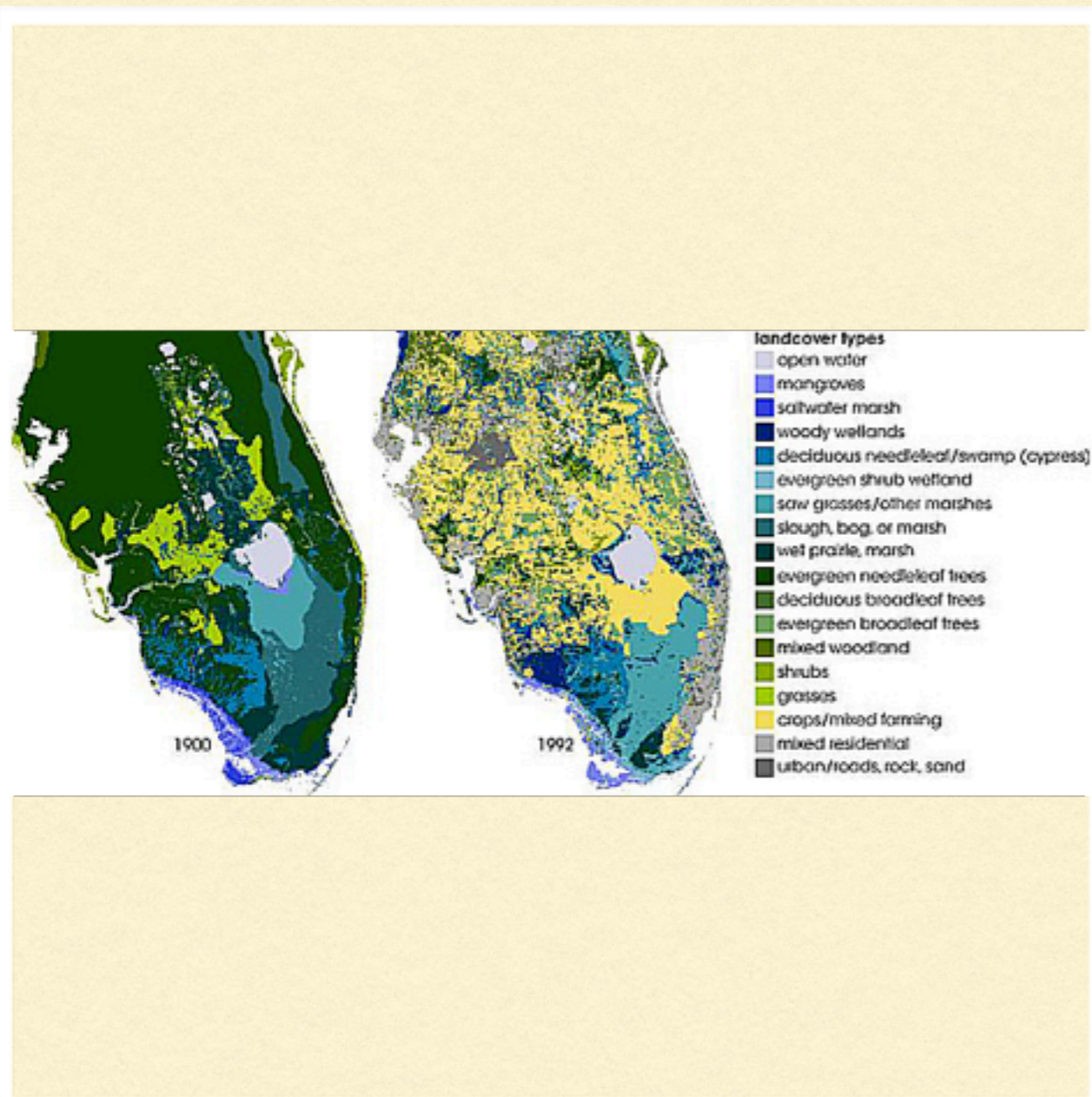
- Development pressures have destroyed over half of the original Everglades.
- Development can also impact nearby wetlands indirectly by altering hydrology

RESOURCE EXTRACTION



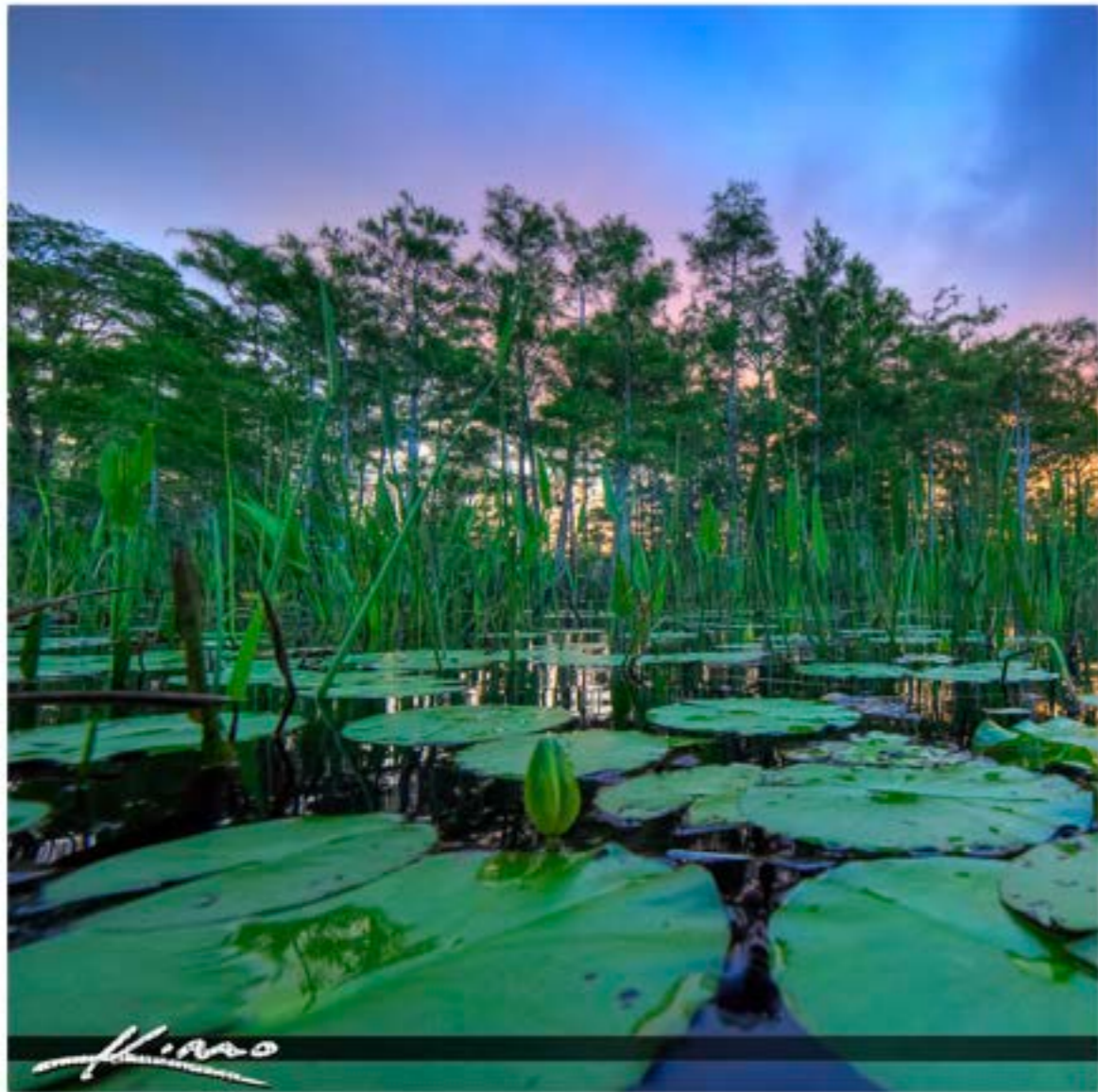
- Mining (phosphate, sand and limestone) leaves a scarred and altered landscape as wetlands receive runoff.
- Sabal Trail Pipeline in North Florida poses risks to wildlife and wetlands.

DESTRUCTION / LOSS



- Twenty-two states have lost at least 50 percent of their original wetlands (USEPA 1995).
- Since the 1970's, the most extensive losses of wetland acreages have occurred in Louisiana, Mississippi, Arkansas, Florida, South Carolina, and North Carolina (Dahl and Johnson 1991).
- Between the mid-1970's and the mid-1980's, approximately 4.4 million acres of inland freshwater wetlands (-4%) and 71,000 acres (-1.5%) of coastal wetlands were destroyed (Dahl and Johnson 1991).

CURRENT WETLANDS PROTECTION MEASURES



- Clean Water Act
 - National Estuarine Research Reserves
 - Wetlands Creation
 - Mitigation Banking
 - Sea Level Rise, Barrier Island Recession
 - Local Initiatives
-

CLEAN WATER ACT



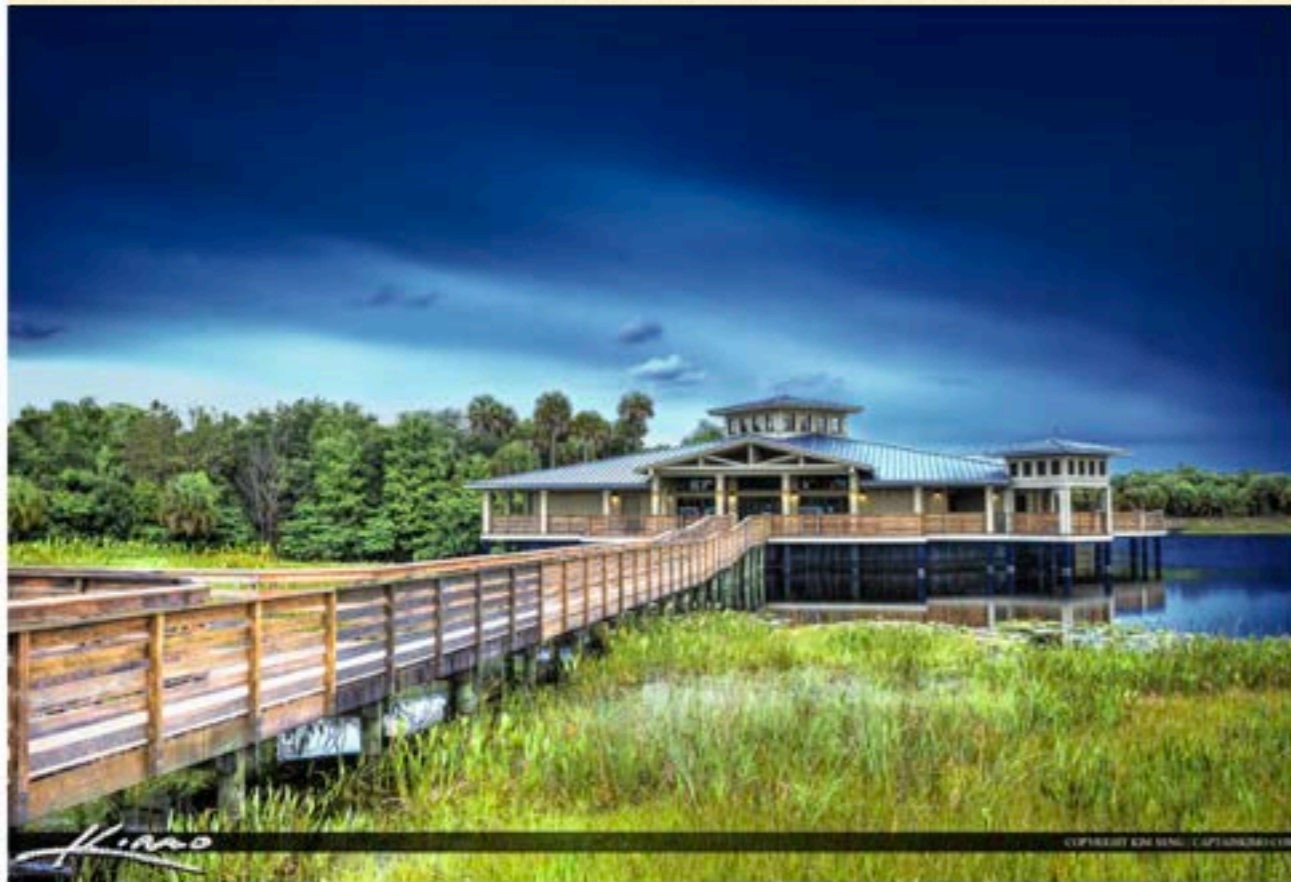
- Established in 1972, the Clean Water Act defines the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.
 - Florida has state-specific standards in sections of the Florida Administrative Code
 - Section 62-303: Identification of Impaired Surface Waters
 - Section 62-302: Surface Water Quality Standards
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NATURAL ESTUARINE RESEARCH RESERVES



- The National Estuarine Research Reserve System is a network of 29 estuarine areas established across the nation for long-term research, education, and coastal stewardship.
- The reserves are a partnership between NOAA and the coastal states and territories.
- They present science to management officials, implement a system wide monitoring program, provide education and training, and encourage stewardship.

WETLANDS CREATION



- The construction of a wetland on a site that never was a wetland.
 - This can be done only on a site where conditions exist that can produce and sustain a wetland.
 - More difficult than restoring a wetland.
 - Successful Example: Green Cay Wetlands
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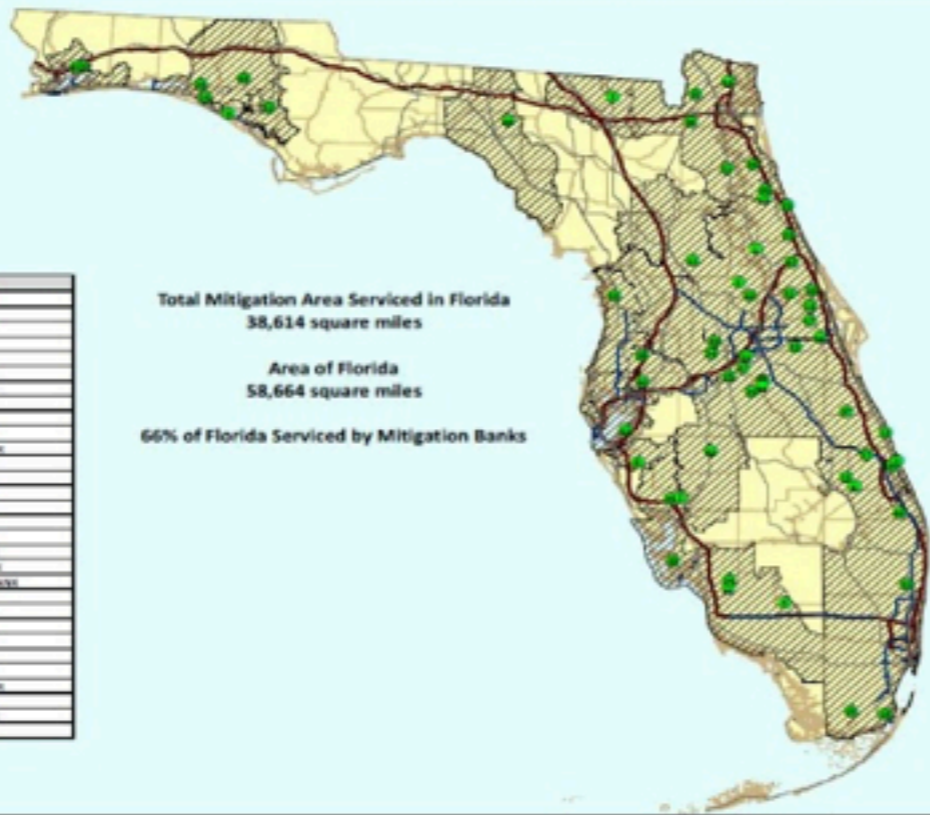
MITIGATION BANKING

- A practice in which an environmental enhancement and preservation project is conducted by a public agency or private entity (“banker”) to provide mitigation for unavoidable wetland impacts within a defined region.
- Florida has over 70 approved mitigation areas.

PERMITTED MITIGATION BANKS AND SERVICE AREAS

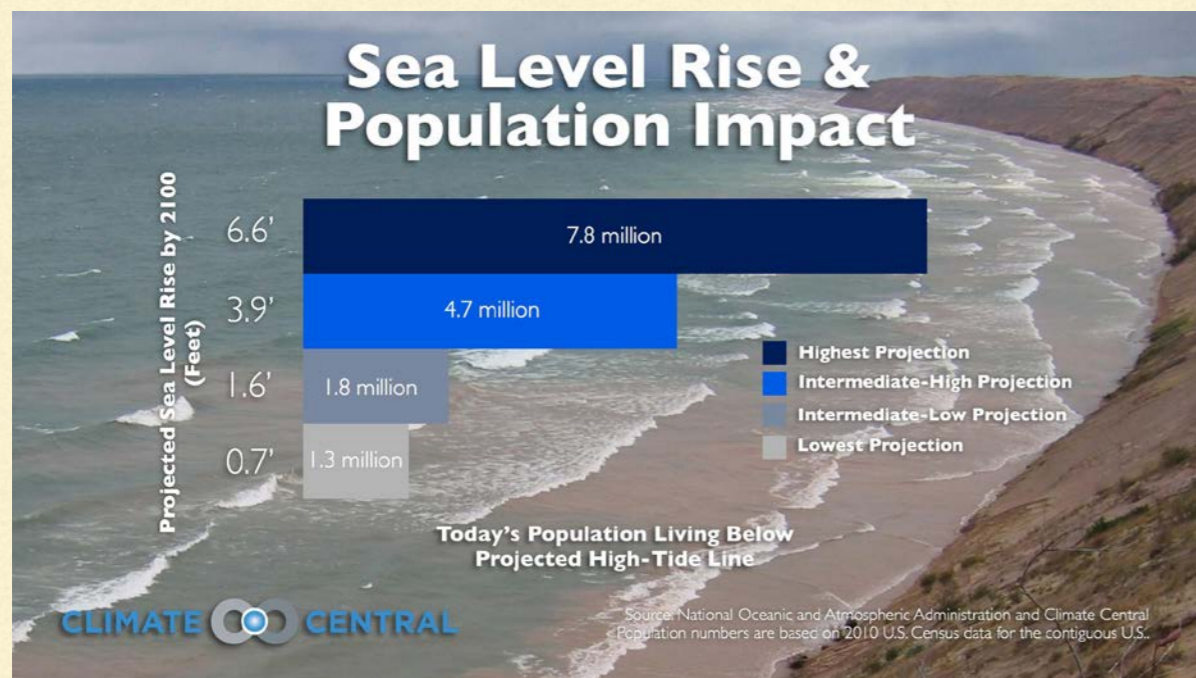
Legend
 ● Permitted Mitigation Banks (as of 03-05-2011)
 ▨ Permitted Mitigation Bank Service Areas (as of 03-05-2011)

ID	BANK NAME	ID	BANK NAME
1	BARNEVELLE MITIGATION BANK	51	BAWA MOUND MITIGATION BANK
2	BATHURST MITIGATION BANK	52	BAWA MOUND MITIGATION BANK
3	BEAUFORT MITIGATION BANK	53	BEAUFORT MITIGATION BANK
4	BELLEVILLE MITIGATION BANK	54	BELLEVILLE MITIGATION BANK
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50	BELLEVILLE MITIGATION BANK	100	BELLEVILLE MITIGATION BANK



Total Mitigation Area Serviced in Florida
 38,614 square miles
 Area of Florida
 58,664 square miles
 66% of Florida Serviced by Mitigation Banks

SEA LEVEL RISE, BARRIER ISLAND RECESSION



- While sea level rise and barrier island recession are threats to Florida wetlands, the attention these issues are drawing will also help draw attention to wetland issues.
- A more holistic approach to restoration and conservation of wetlands.

LOCAL INITIATIVES



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 Fax: (850) 222-1117
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 Fax: (561) 833-1441
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 P.O. Box 2199, LaBelle, FL 33975
www.caloosahatchee.org



Clean Water Action
 7300 North Federal Highway, Suite 200
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 Phone: (561) 672-7637
www.cleanwateraction.org



Center for Biological Diversity
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Defenders of Wildlife
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Ding Darling Wildlife Society



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 Fax: (954) 985-8047
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National Wildlife Federation
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National Wildlife Refuge Association
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 Fax: (202) 292-2435
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Natural Resources Defense Council (NRDC)
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Florida Native Plant Society
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www.sccf.org



Save It Now, Glades!
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www.florida.sierraclub.org/broward/



Sierra Club Calusa Group
www.florida.sierraclub.org/calusa/



Sierra Club Central Florida Group
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Sierra Club Loxahatchee Group
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 Fax (305) 532-8727
www.uel.org

Examples in South Florida Alone

REFERENCES

- <https://soils.ifas.ufl.edu/wetlandextension/about.htm>
 - <https://www.evergladescoalition.org/membership>
 - <https://floridadep.gov/water/submerged-lands-environmental-resources-coordination/content/submitting-erp>
 - <https://coast.noaa.gov/nerrs/>
 - <https://www.epa.gov/laws-regulations/summary-clean-water-act>
 - <http://myfwc.com/conservation/freshwater/wetland-habitat/>
 - <https://www.theodysseyonline.com/why-nodapl-matters-floridians>
 - <https://healthygulf.org/our-work/coasts-communities/floridas-nature-coast/floridas-nature-coast-resource-extraction>
 - <https://www.floridamuseum.ufl.edu/southflorida/regions/everglades/threats/>
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