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
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
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.)
FRESHWATER MARSH

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

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/
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