# Function, Purpose and Value of Wetland Plants

Chad Washburn
Natural Areas Manager
Naples Botanical Garden

# *Cladium jamaicense*

- Sawgrass (sharp teeth)
- Sedge
- Dominate vegetation in Everglades
- Spreads by rhizomes
- Fire dependant
- Culm dies after flowering

Shirley Denton

# *Spartina* spp.

- 4 species in SWFL
  - *S. alternaflora*
  - *S. patens*
  - *S. bakeri*
  - *S. spartinae*
- Fire dependant
- Tidal marsh ecosystems associated with *Juncus romerianus*

Shirley Denton

# *Juncus roemerianus*

- Black needle rush
- Rush
- Clonial
- Tidal marsh ecosystems
- High NPP
- Fire dependant spreads by rhizomes

Shirley Denton

# *Rhizophora mangle*

- Red Mangrove
- Vivipary
- Excludes Salts
- Arenchymous tissue
- Prop roots (adventitious)
- Grows on open water side of mangrove swamp

# *Avicennia germinans*

- Black Mangrove
- Grow inland from red mangroves
- Pneumatophores
- Vivipary
- Excrete salt through leaves

# *Laguncularia racemosa*

- White Mangrove
- Inland from Black mangroves
- ‘Semi-viviparıious’
- Excretes salts through glands

Shirley Denton

# *Acrostichum* spp.

- *A. danaeifolium*
  - giant leather fern
  - full sun
- *A. aureum*
  - golden leather fern
  - understory
  - State Threatened
- Clonial
- Marshes and mangroves
- Fiddleheads edible

Shirley Denton

# *Taxodium* spp.

- Cypress swamps
- Bald cypress
  - *T. distichum*
- Pond cypress
  - *T. ascendens*
- Deciduous branchlets
- Buttressed trunks
- Cypress knees


Shirley Denton

# *Typha* spp.

- Southern cattail
  - *T. domingensis*
- Broadleaf cattail
  - *T. latifolia*
- Hybridize
- Arenchymous tissue
- Range has been altered

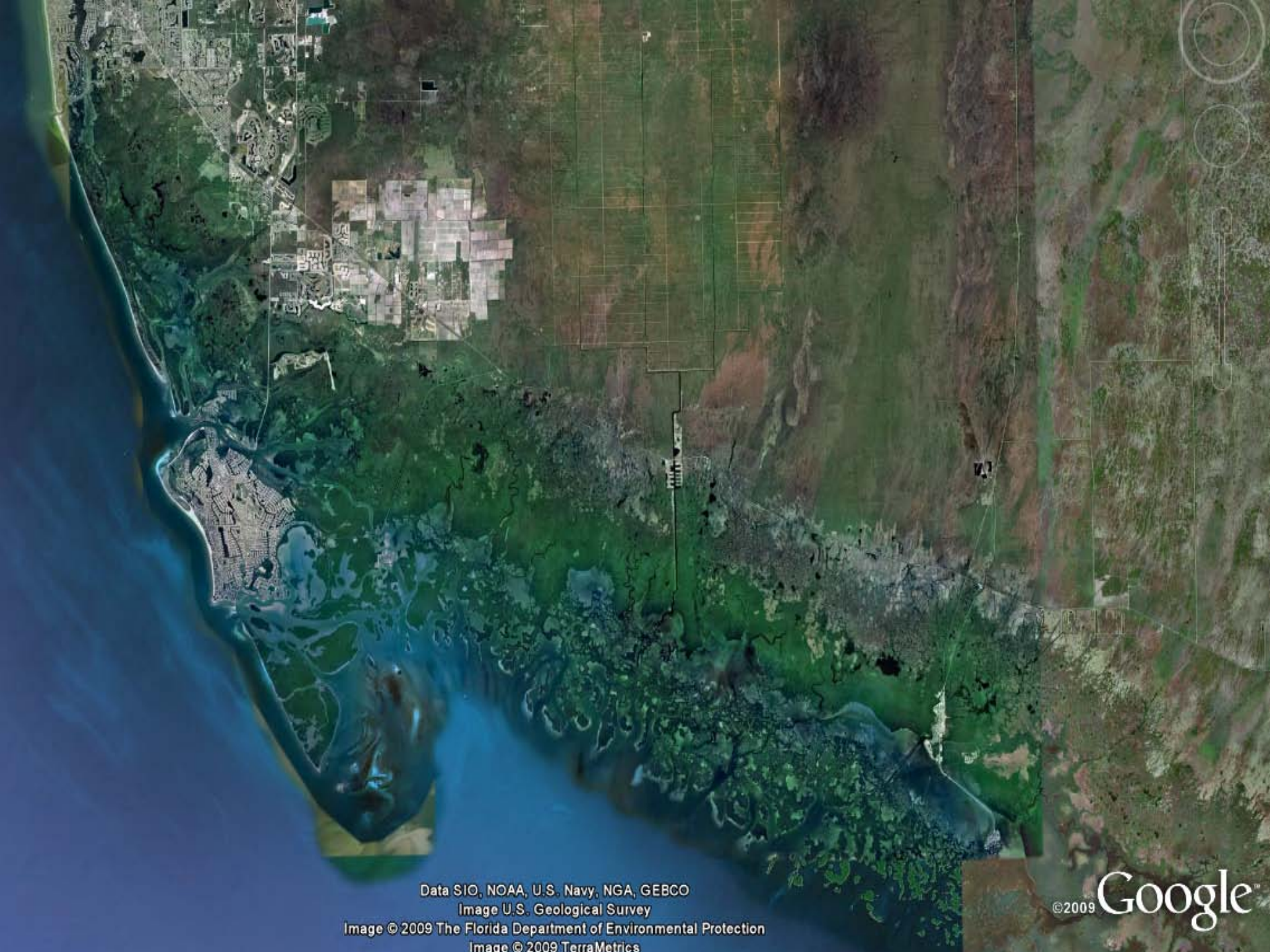

Shirley Denton

# *Panicum repens*

- Torpedo grass
- FLEPPC Category I
- Australian
- Poor habitat/food
- Freshwater wetlands/Lake O
- Rhizomes with torpedo-like shoots

# Schinus terebinthifolius

- Brazilian pepper
- Winged leaf rachis
- Anacardiacea Family
- FLEPPC Category I
- Dioecious
- Resprouts/reseeds quickly after a fire
- Alters fire regimes


Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image U.S. Geological Survey
Image © 2009 The Florida Department of Environmental Protection
Image © 2009 TerraMetrics
©2009 Google

# Freshwater Marsh

- Everglades
- 1.8 in/mi avg slope – sheet flow
- Highly productive ecosystems
- Nutrient sinks
- Highly altered ecosystem
  - Saltwater intrusion
  - Invasive species
  - EAA
  - Altered flow
  - Increase in Nutrients

# Freshwater Marsh

- Cattail Invasion
- 33,589 acres of *Typha*
  - 2 acres/day
- Better able to uptake nutrients, adapted to salinity
- Results
  - > Peat accumulation
  - > E.T (<hydroperiod)
  - < Habitat
  - < Species diversity
  - Change in fire regime
  - < Dissolved oxygen

# Tidal Marsh

- Spartina and Juncus
- Low energy coastlines with tidal influence
- Coastline stabilization
- Low species diversity
- High NPP (36 tons/acre/yr)
- Sink for nutrients, pollutants
- Important wildlife habitat

# Tidal Marsh

- Threatened by sea level rise
- Up to 82 % loss in Louisiana at 1m rise
- 40% loss in Florida at 1m rise

# Mangroves

- Limited to southern FL
- Highly productive ecosystem
- Ten Thousand Islands one of world's largest
  - 300 square miles
- Faunal diversity
  - 220 fish
  - 181 birds
  - 24 reptiles, amphibians
  - 18 mammals
  - Bivalves, crustaceans

# Mangroves

24% loss on Marco Island between 1952 and 1984

Threatened by sea-level rise, development

# Cypress Swamps

- Big Cypress NP
- Mitigate flooding
- High flora diversity
  - Orchids

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2009 TerraMetrics
Image © 2009 DigitalGlobe
Image IBCAO

# Wetland Functions

- Globally wetlands account for 37% of carbon pool (Bolin & Sukamar 2000)
  - Salt marsh 2.2 g C/$m^3$/day
  - Tidal marsh 1.9 g C/$m^3$/day
  - Mangroves 3 g C/$m^3$/day

- 30 mangroves/100$m^3$ can reduce max flow of tsunami by over 90%

# Wetland Functions

- Recharge groundwater
- Mitigate flooding
- Mitigate storm surges
- Mitigate hurricane damage
- Filter nutrients
- Filter sediments
- Provide clean water
- Biogeochemical cycling
- Wildlife corridors
- Erosion control
- Local climate
- Provide fiber
- Provide food

# Wetland Values

- Total global value of goods and services provided by wetlands at $15.5 trillion (Costanza et.al. 1997)
- Equals 46% of estimated global ecosystem value. (Costanza et.al. 1997)
- >95% of commercial fish and shellfish are wetland dependant (Feirabend & Zelazny 1987)
  - 1.9 billion dollars in 1998

# Threats to wetlands

- Sea level rise
- Increased frequency and intensity of storms
- Storm surge
- Alteration of fire regimes
- Alteration of hydrology
- Nutrient input
- Invasive species (flora and fauna)
- Development
- Droughts

# Threats to wetlands

- Between 1780 and 1980 Florida lost an estimated 9 million acres of wetlands (Dahl 1990)

- Nearly half of the Everglades has been lost directly to agriculture (EAA)