

Sea Level Rise Research in South Florida National Parks

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With Sea Level Rise, Why Restore the Everglades?

1. Many species may be able to adapt* if given time. Restoration provides freshwater head to offset sea level rise saline transgressions.

2. The Everglades ecosystems will change, but abrupt changes are likely to be less stable and diverse than gradual change.

- *Adapt:
1. change or phenotypic plasticity
 2. Protect or create corridors & stepping stone habitat
 3. Assisted propagation and adaptive breeding
 4. Assisted Migration
 5. Seed Banks & captive populations

Leonard Pearlstine
Archbold Sea Level Rise Workshop, Jan. 18-20, 2009

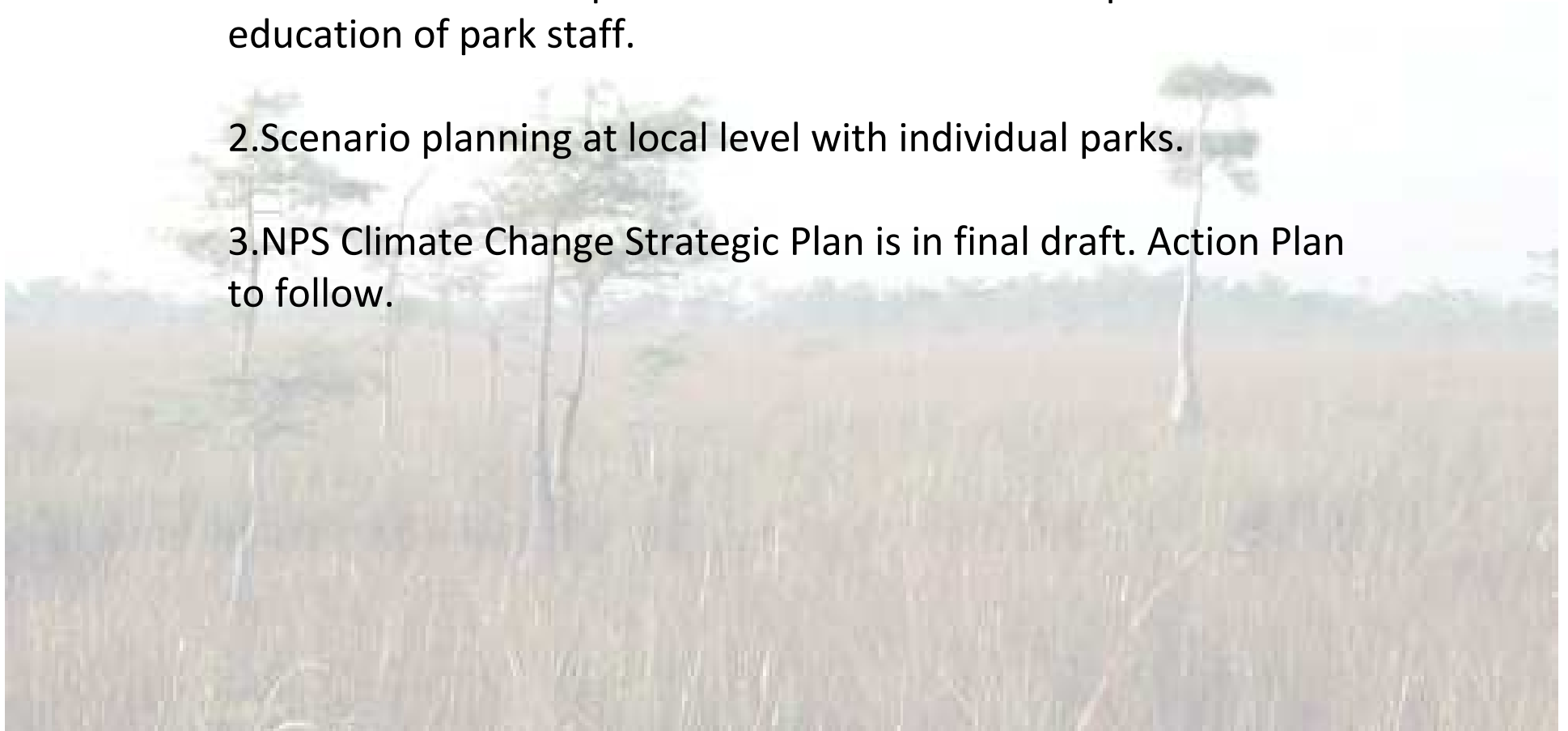
NPS National Activities

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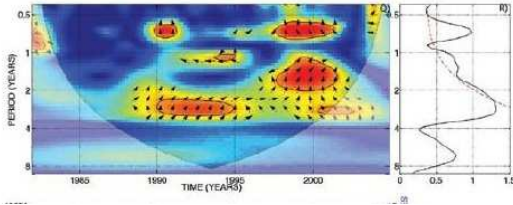
National priority areas are high elevation, high latitude, arid, and coastal communities

1. National Parks are public face to natural landscapes. Start with education of park staff.
2. Scenario planning at local level with individual parks.
3. NPS Climate Change Strategic Plan is in final draft. Action Plan to follow.



Coastal Monitoring & Research

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Sea Level Rise Modeling
(with Columbia U. and SFWMD)

Probabilistic projections of sea level rise for the Everglades

Impacts of sea level variability and rise on S Florida coastal groundwater systems



Dry Tortugas

Ground nesting sea turtles and terns are susceptible to sea level rise

Climate and SLR impacts to sea-grasses and coral reefs affect critical fish habitat.

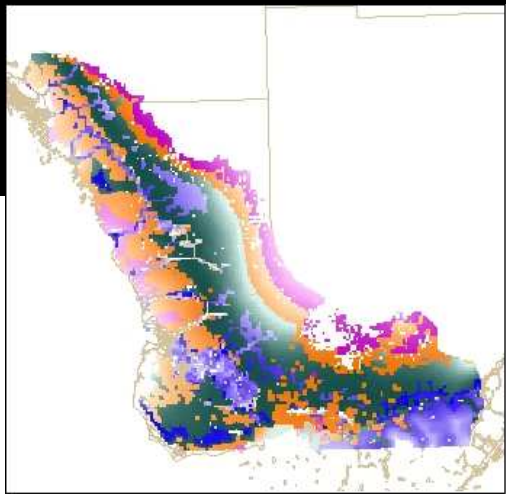


Mangrove Meteorological Instrumentation
CO₂ flux monitoring



Ecological Modeling

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Florida Bay Habitat Modeling

Demonstrates linkage of habitat models with hydrologic models of sea level rise

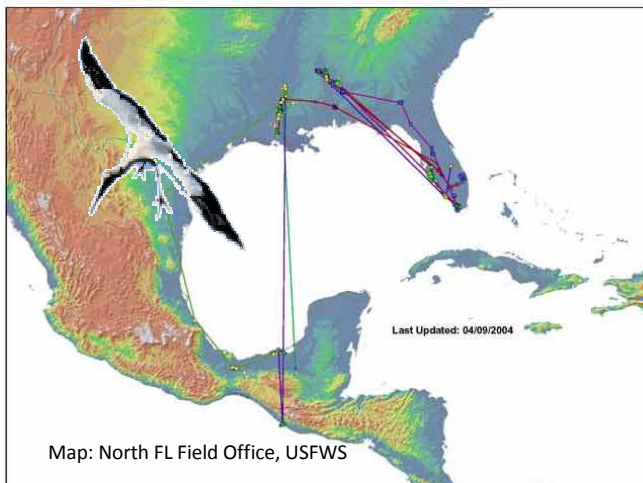
- Spotted Sea Trout
- Blue Crab
- Seagrass

Climate Envelope Models

(with USGS, FWS and UF)

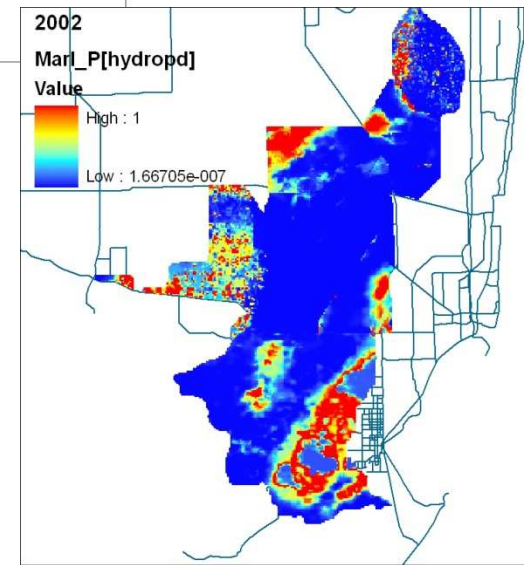
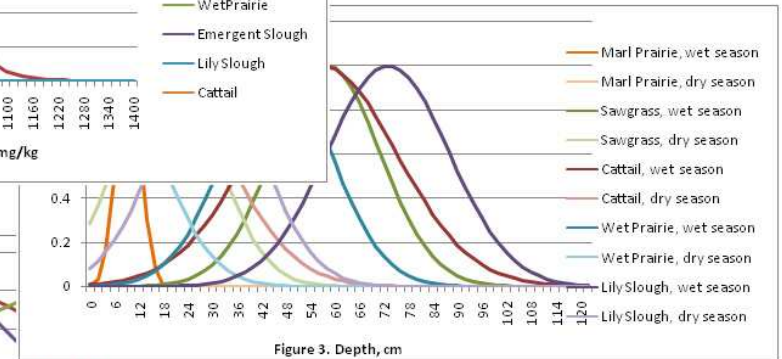
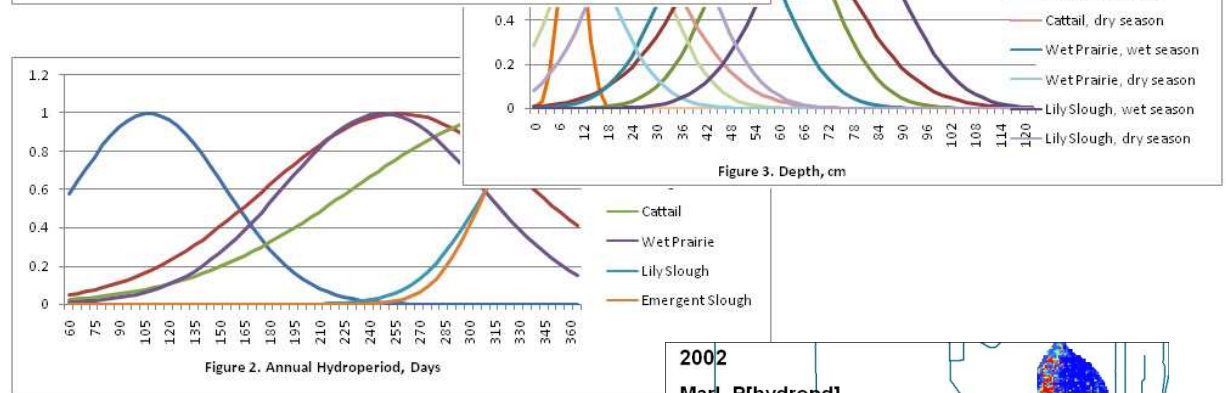
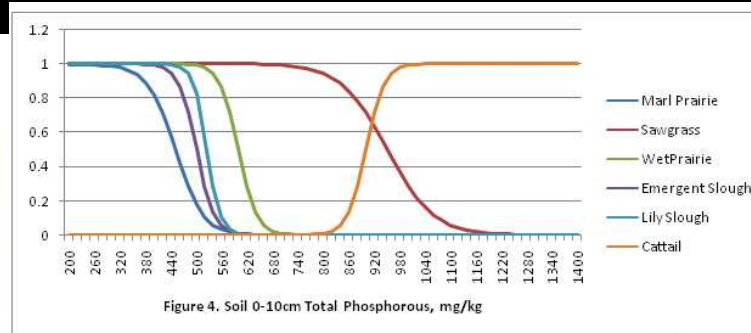
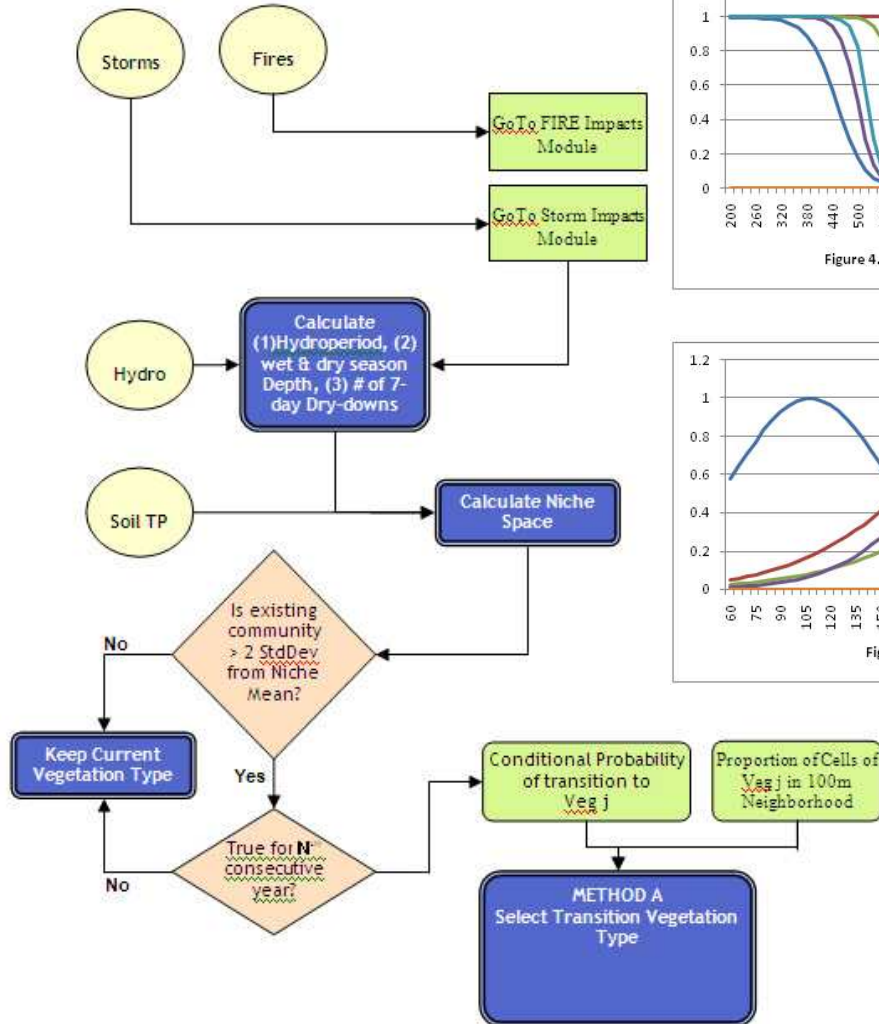
Identify critical limiting factors influenced by climate change for 21 T&E species in South Florida

Examine species' potential geographic range shifts under climate change



Map: North FL Field Office, USFWS

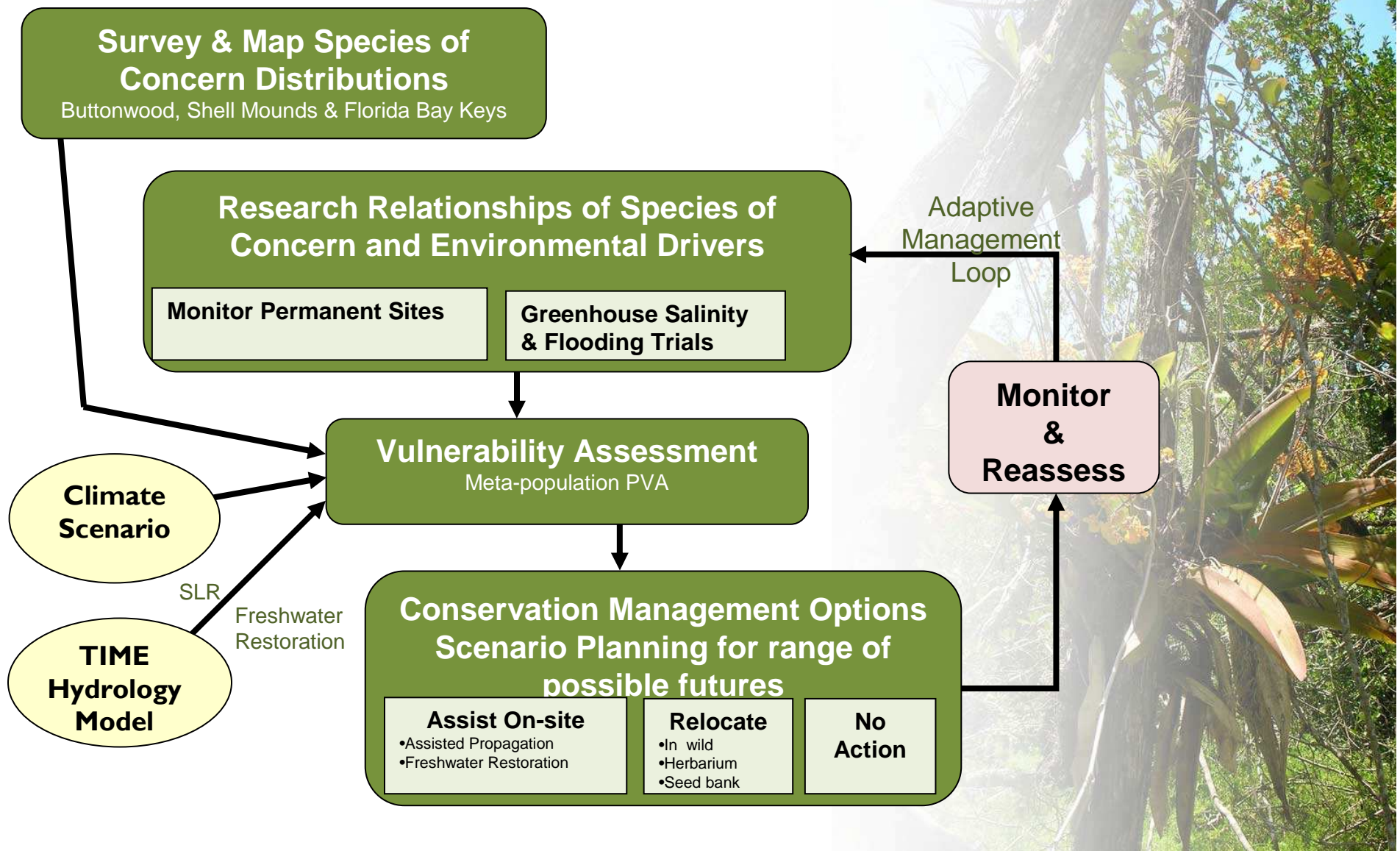
Vegetation Community Succession



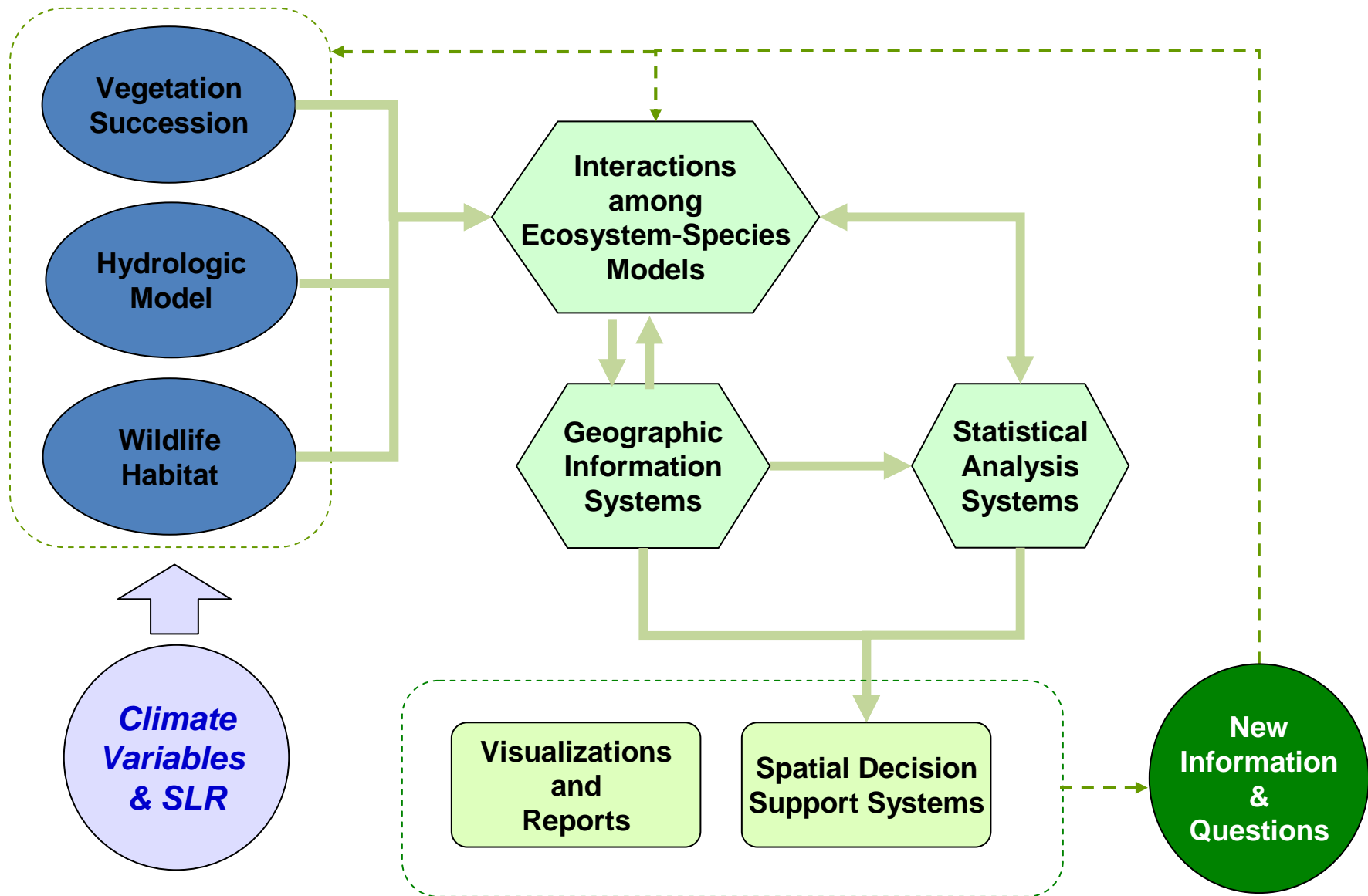
Integrated Science

Impacts of Climate Change & Sea Level Rise on Rare Plants in Coastal Hammocks

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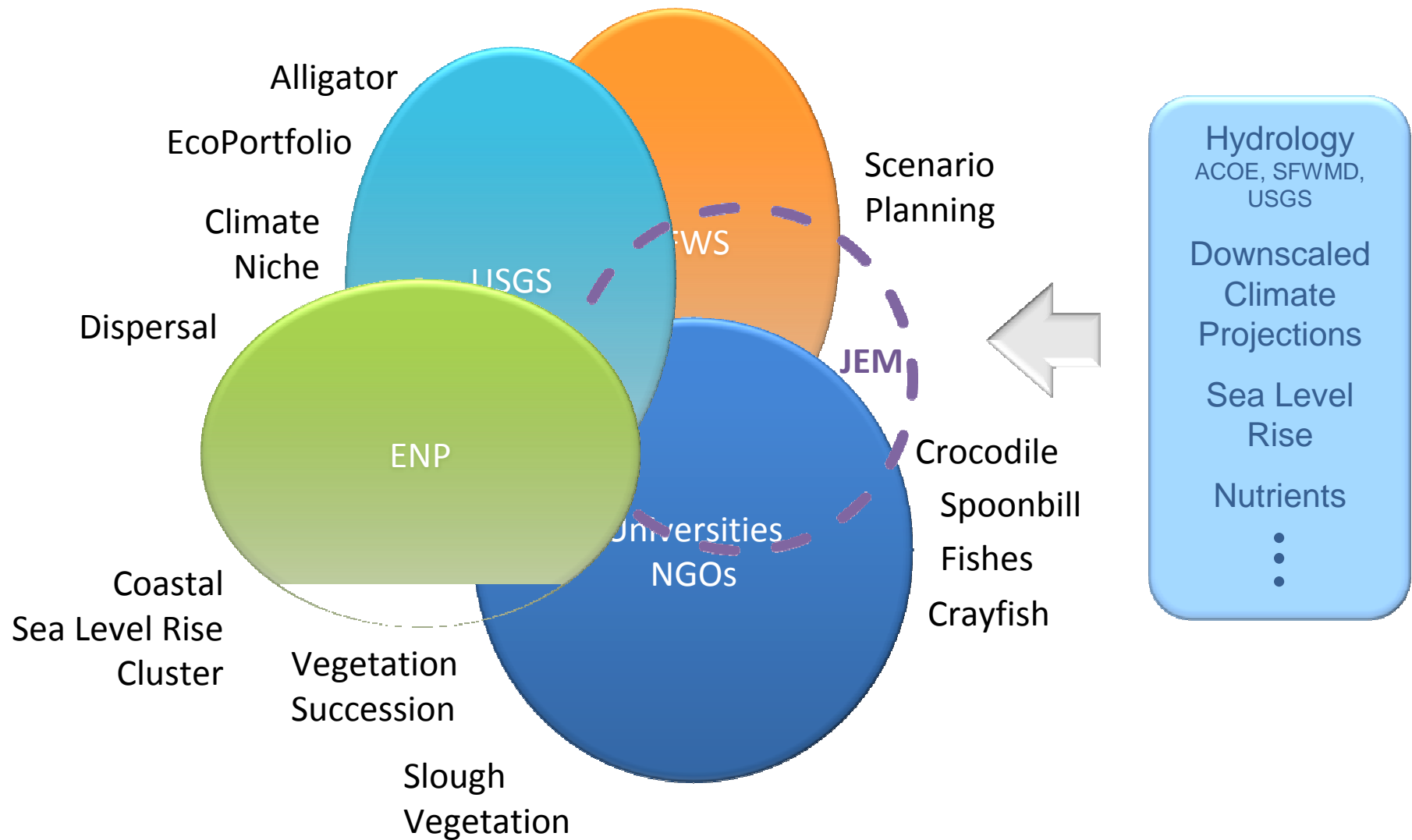


Linked Modeling & Decision Support



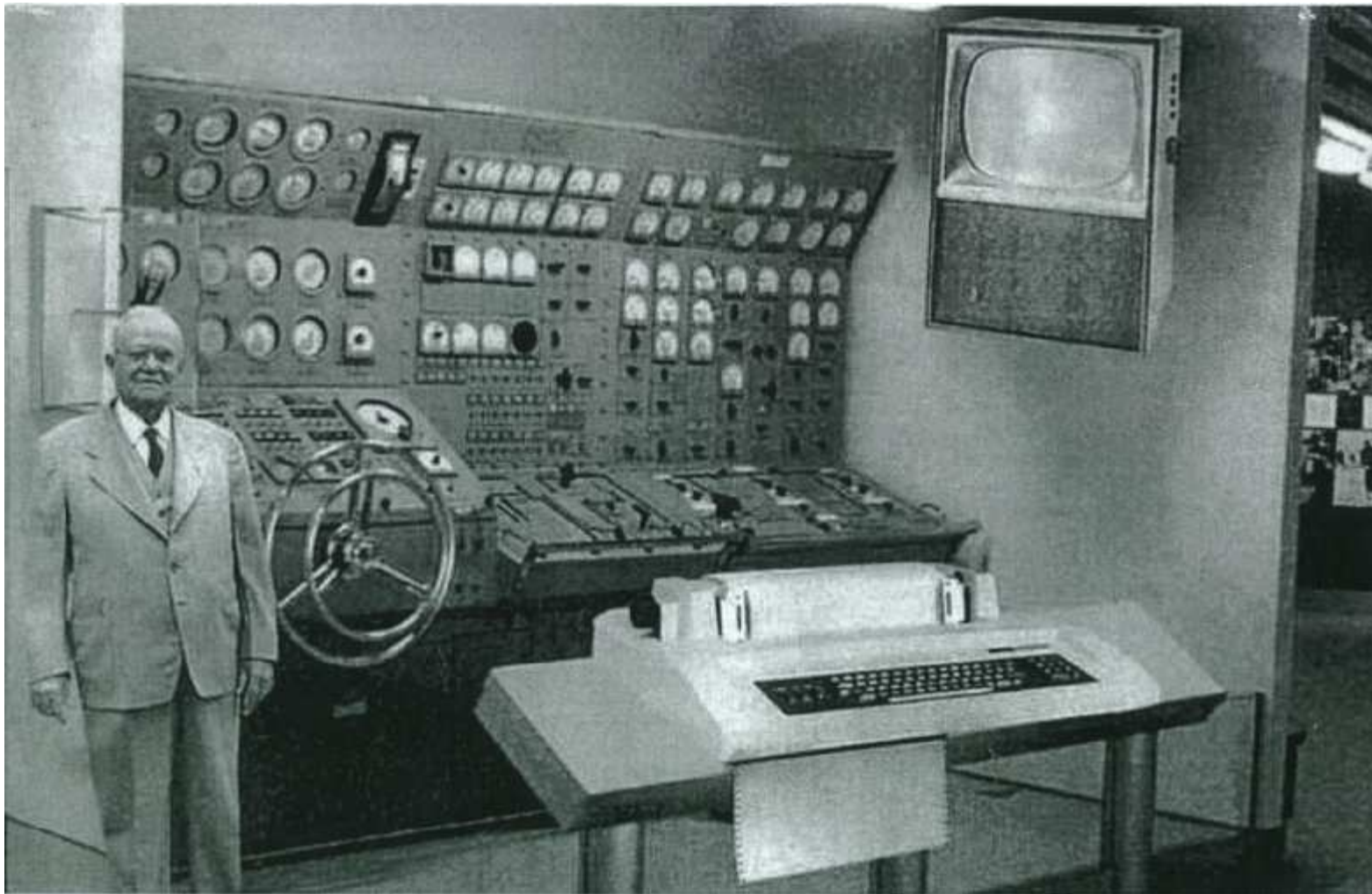
Cooperative Model Development

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Models are Wrong: Remain Adaptive

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1954 RAND Corp. prediction for home computers in 2004
"Not affordable in the average home"