



LINKING ECOLOGICAL AND HYDROLOGIC MODELS

JOINT ECOSYSTEM MODELING

MAY 2012

Joint Ecosystem Modeling (JEM)

- Ecological model practitioners in Greater Everglades
- Agencies: USGS, NPS, USFWS, USACE, SFWMD
- Cooperators: UF, Audubon of FL, FAU, UWF
- Mission: *'Get Ecological Models Into The Hands Of Users'*
- JEM participants include ecologists, hydrologists, modelers, & computer programmers



Role of JEM

- Link ecological models with hydrologic models
- Make ecological models accessible for the decision process in a timely manner
- Develop desktop tools to make models, data and outputs accessible, user friendly, and easily understood



What I told you in December 2010...

A summary of recent progress (at that time):

- ONE: Standard data formatting system, and model development & review protocols
- TWO: Ecological models are available and have been used in projects
- THREE: Several additional models are in the development and review process
- FOUR: Tools have been developed and are available for data manipulation and visualization

Things have changed and we've kept up

Projects are now using the Regional Simulation Model (RSM) to simulate the region's hydrology

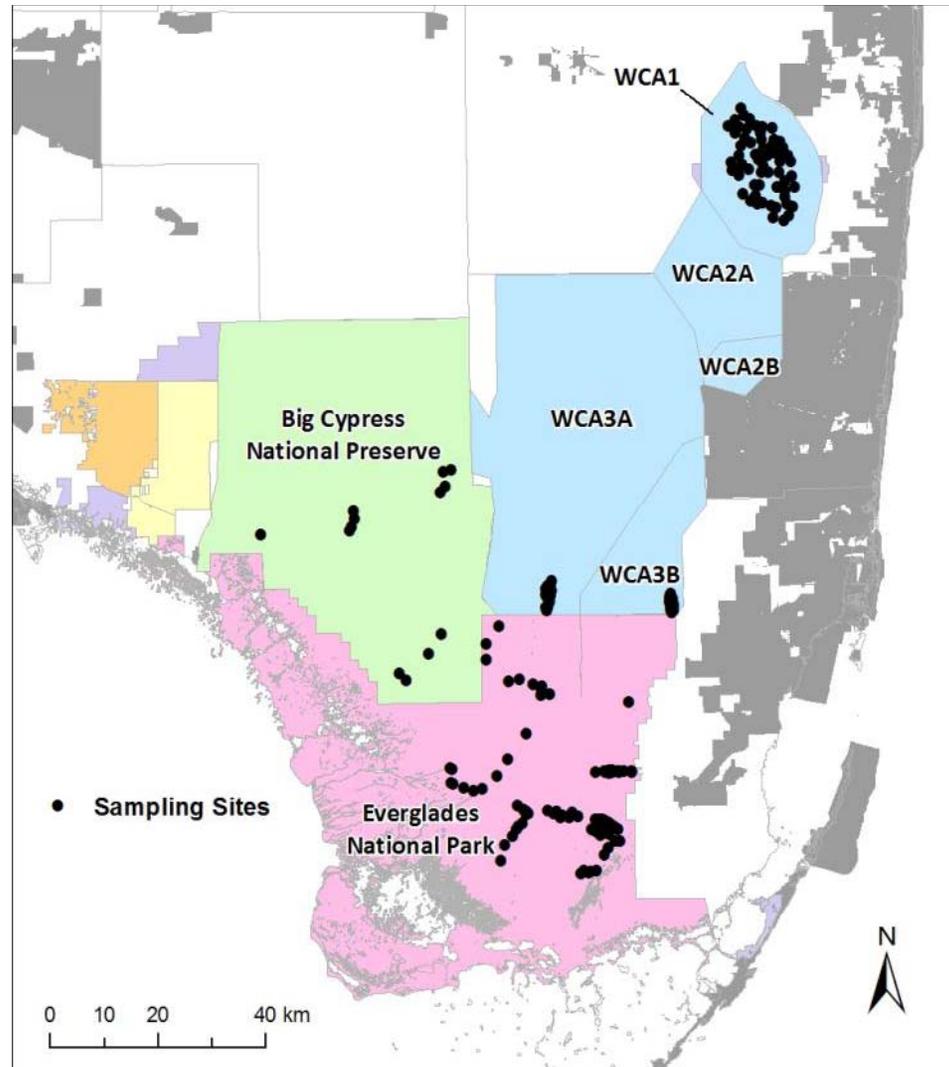
So...

- Ecological modeling process adapted to be able to accept RSM as hydro input
- Developed data standards for unstructured grid (such as RSM) to allow participating agencies to collaborate effectively
- Models are being used as Ecological Planning Tools as part of the Central Everglades Planning Process (CEPP)
- Developed many tools to help display information from ecological model results to help in decision making

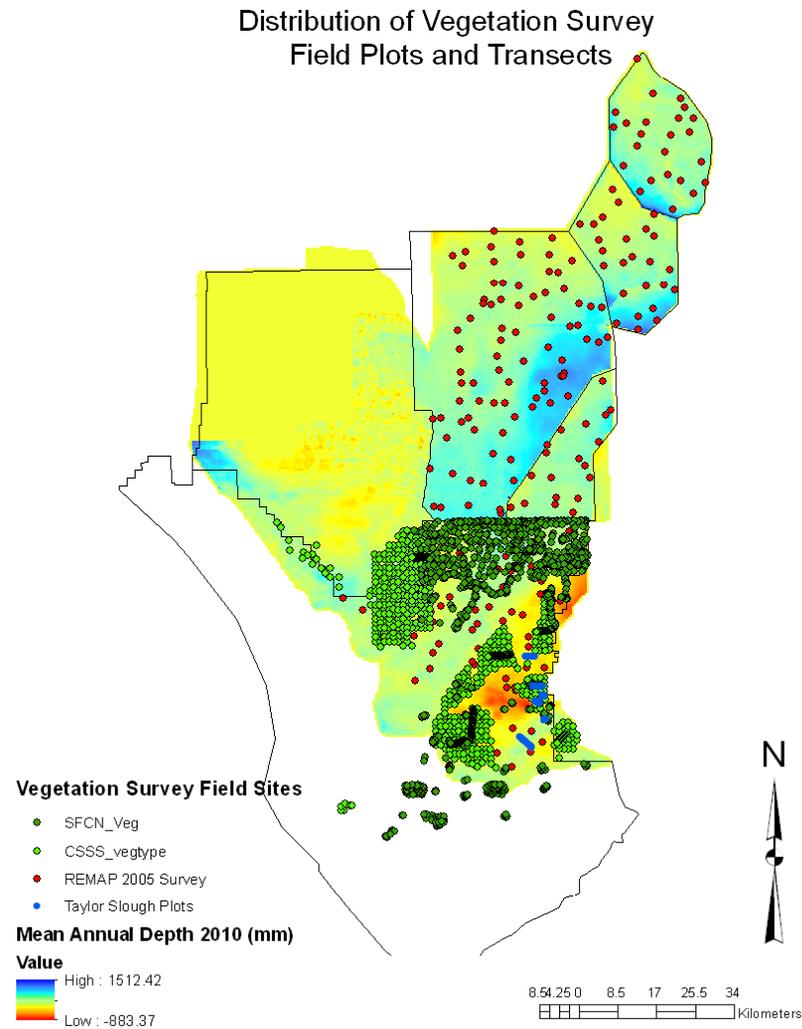
The models being used in CEPP

- Amphibian Community Species Richness
- Everglades Landscape Vegetation Succession
- American Alligator HSI
- Small Sized Freshwater Fish Density
- Wood Stork Model
- Cape Sable Seaside Sparrow Model
- Apple Snail Population Model

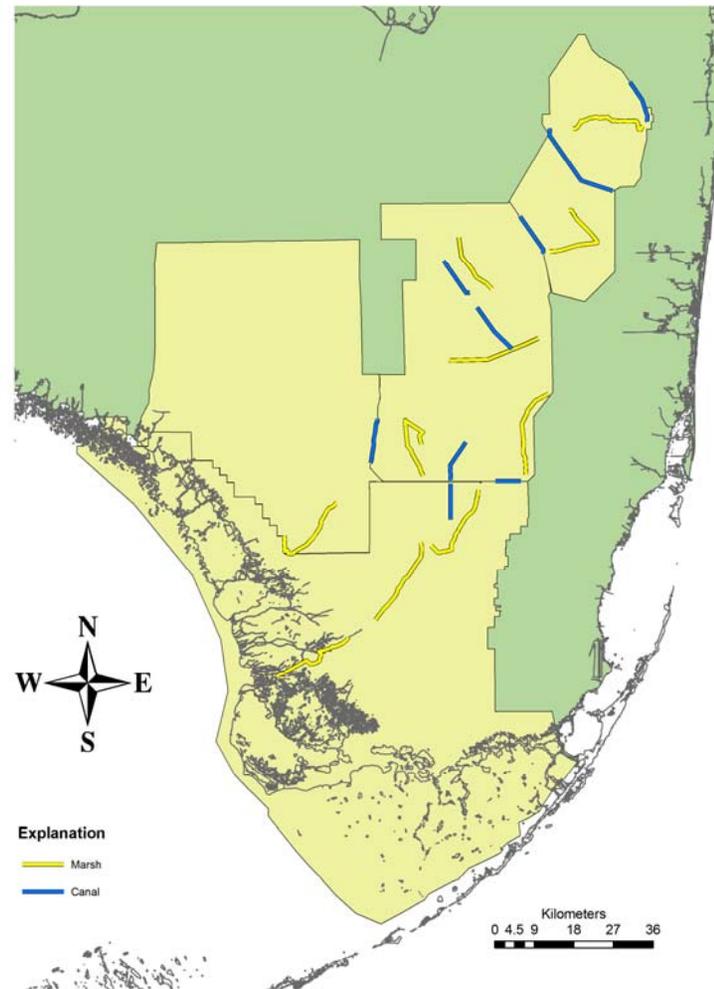
Amphibians: 205 sampling sites



ELVeS uses data from 3,006 field sites

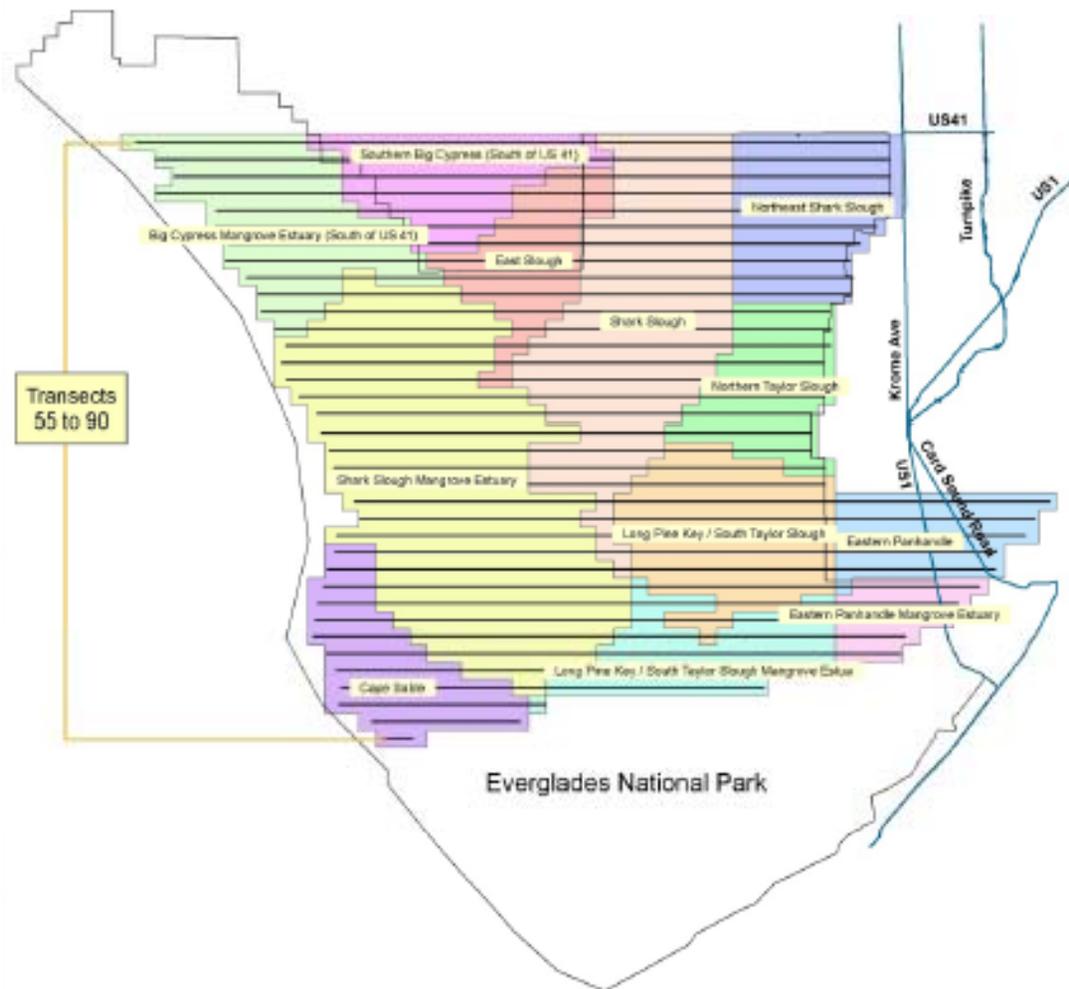


Alligator survey routes



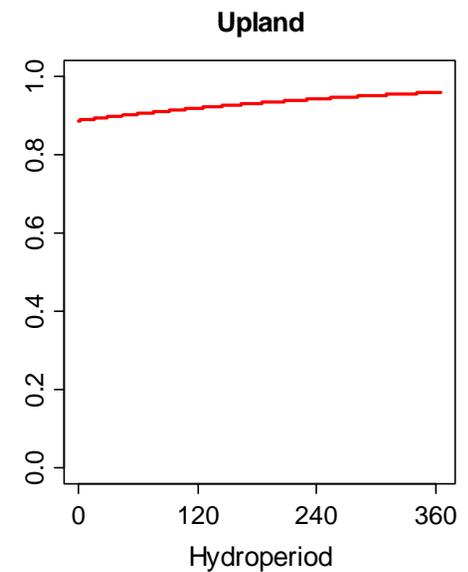
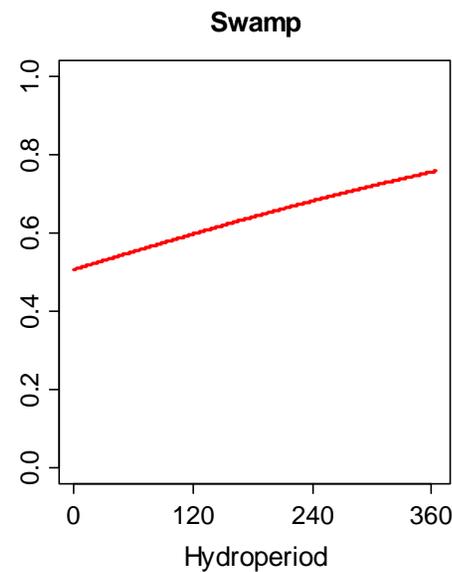
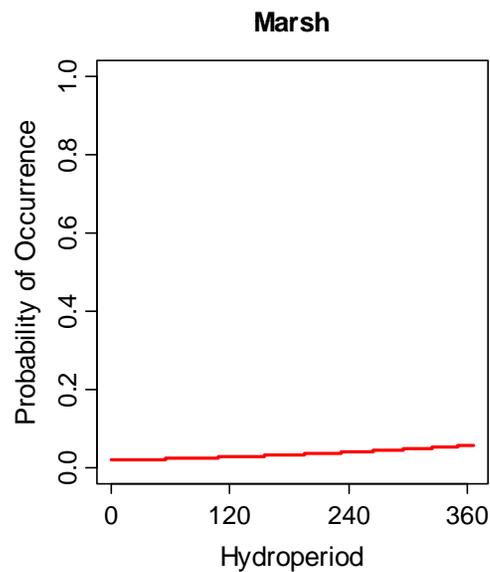
“Validation” of wood stork foraging index

use of systematic reconnaissance flights monitoring data



Inside eco models

Mathematical description of species-habitat relationships based on field data, e.g.,

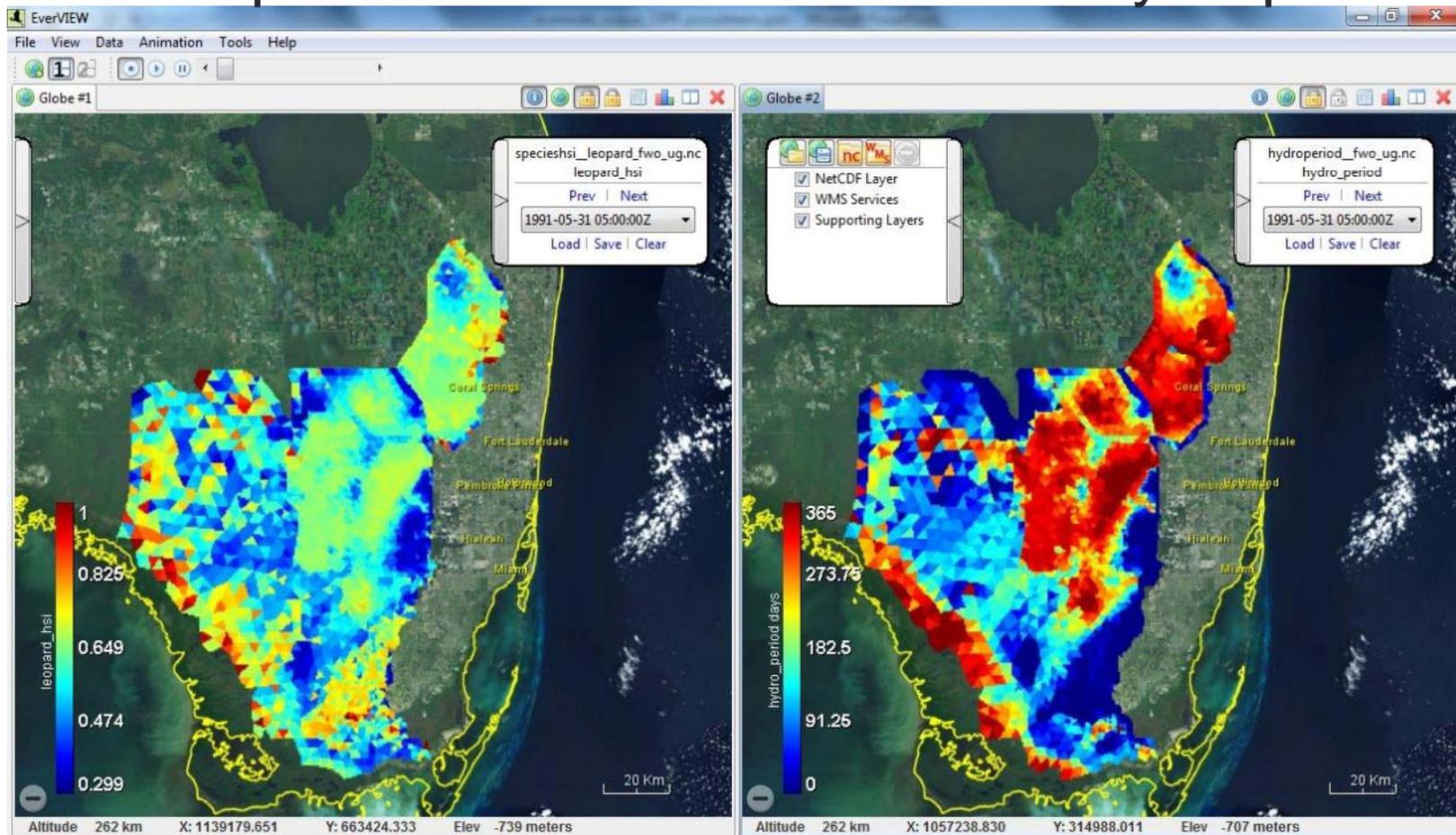


Visualizing model data using EverVIEW

HSI output

vs.

hydroperiod



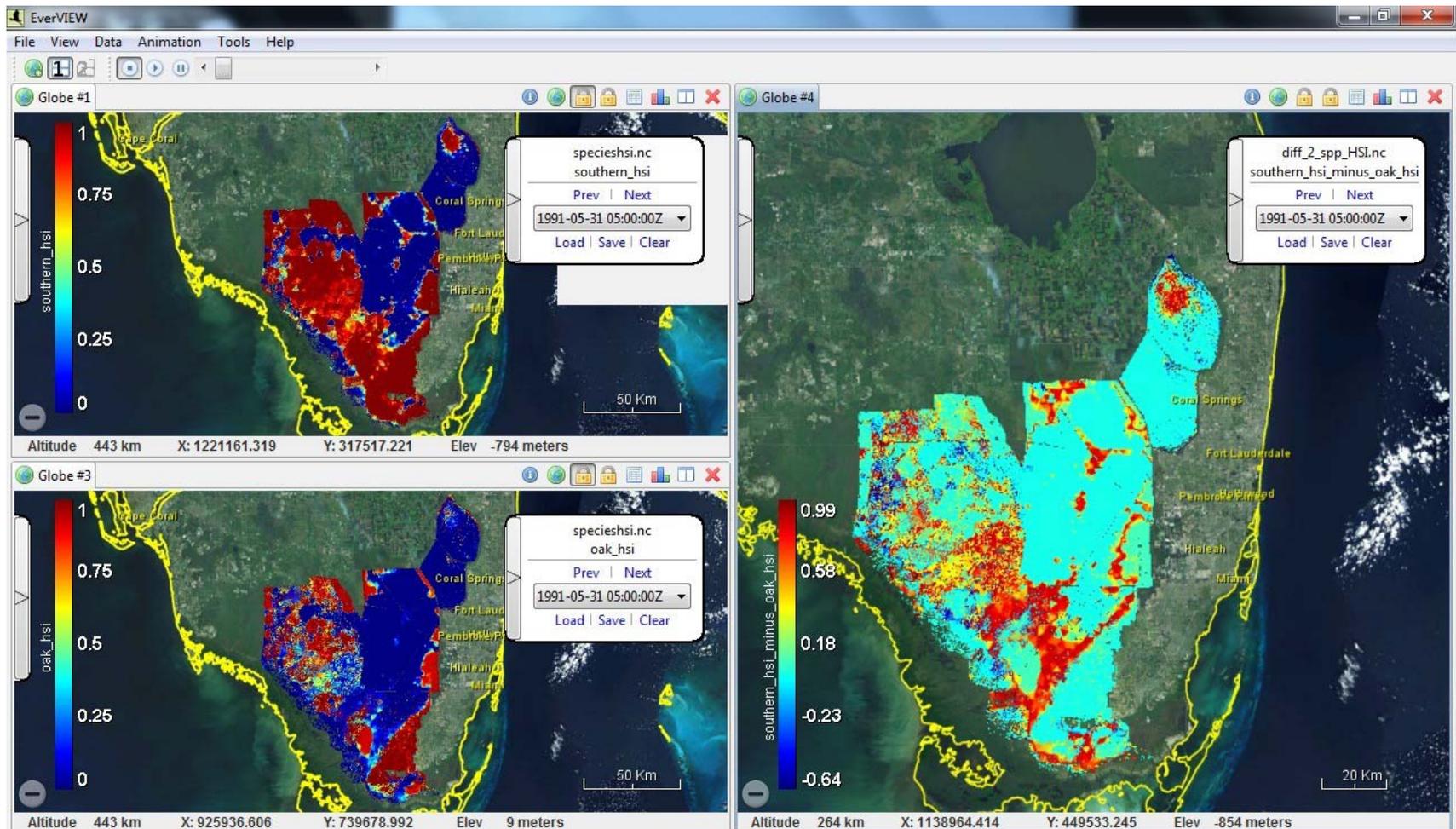
NOTE: FABRICATED DATA FOR ILLUSTRATIVE PURPOSES!

Create a difference map

Difference map

Alt X

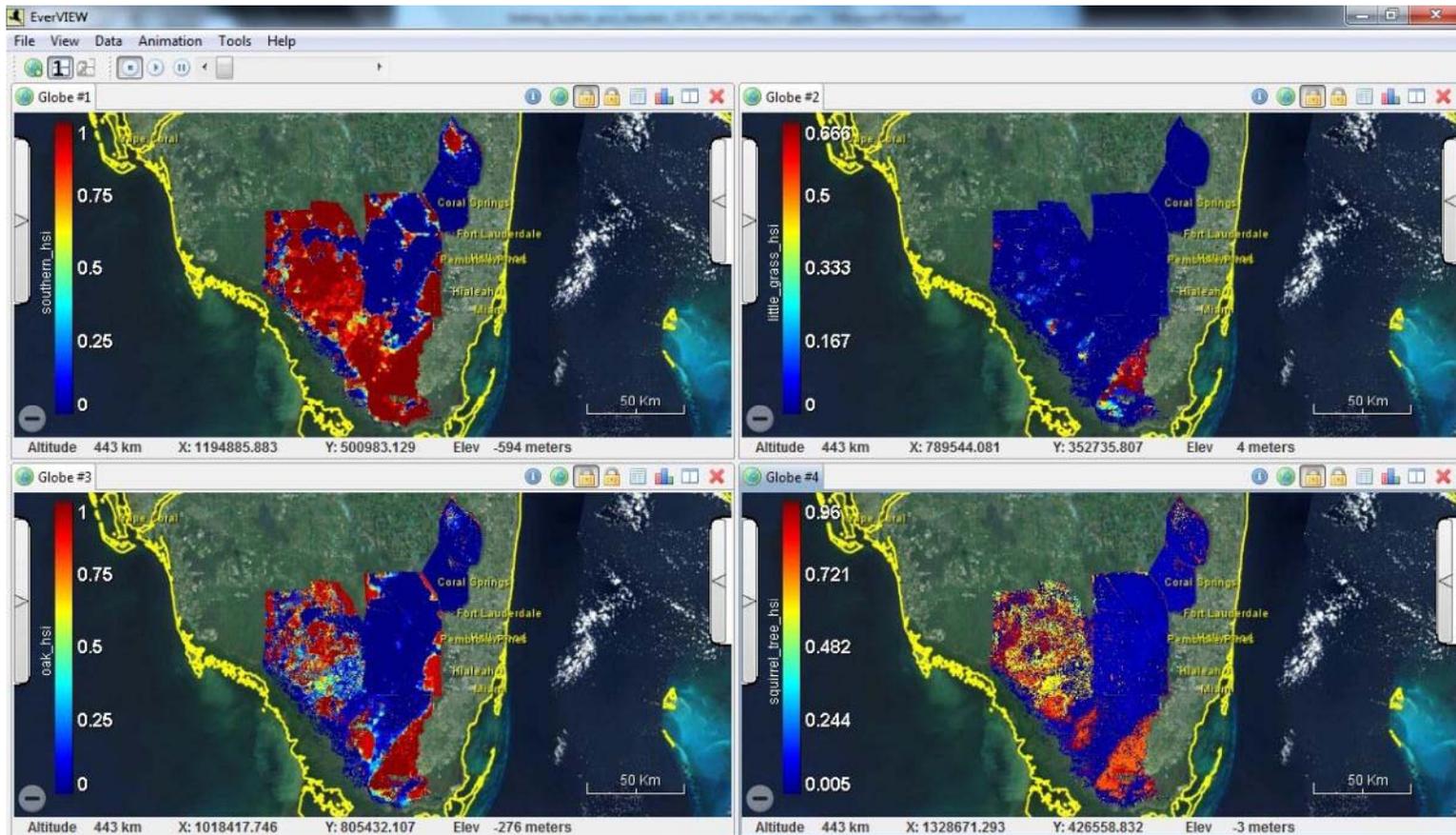
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NOTE: FABRICATED DATA FOR ILLUSTRATIVE PURPOSES!

Compare four alternatives side by side

Alt W



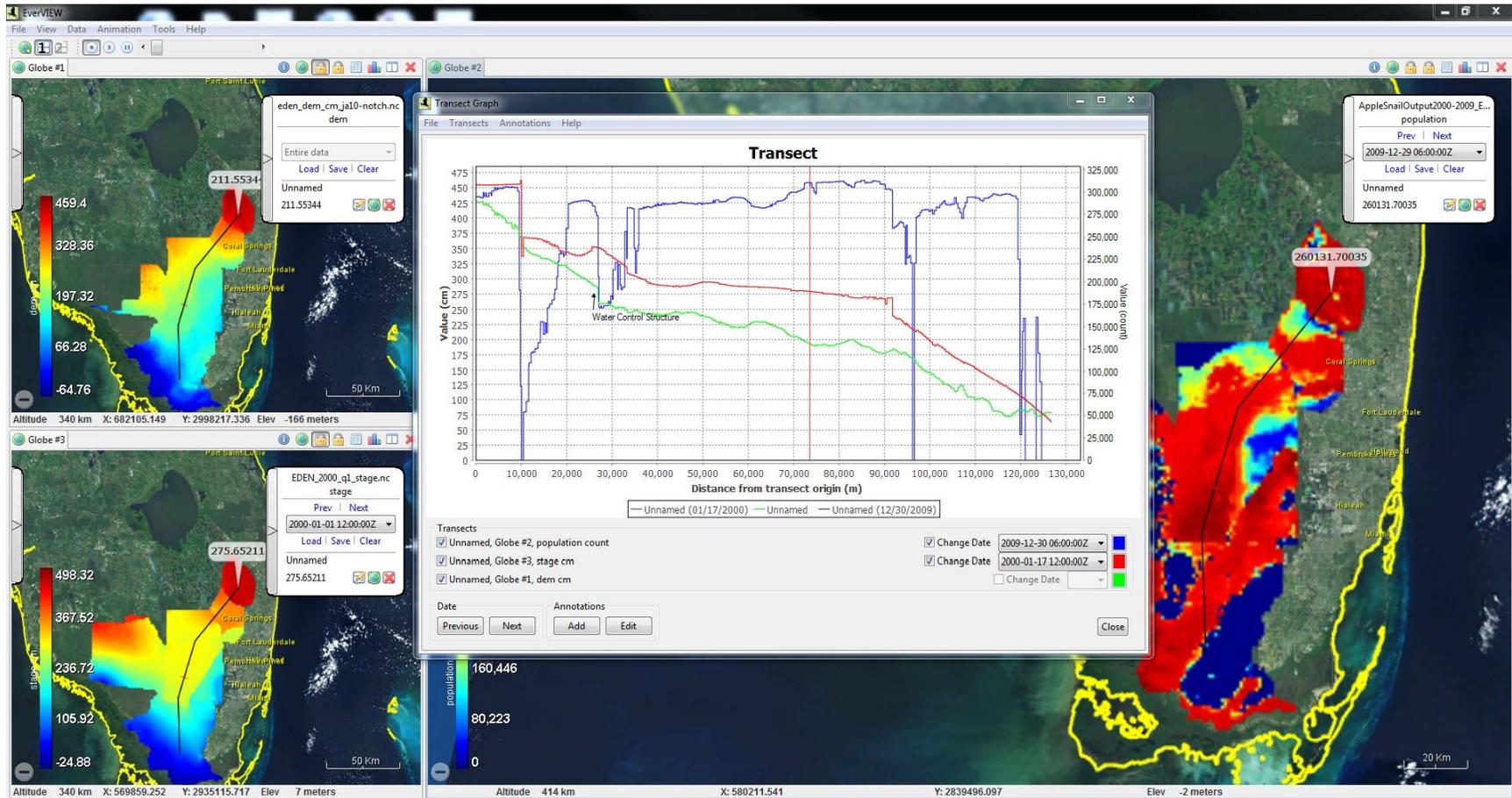
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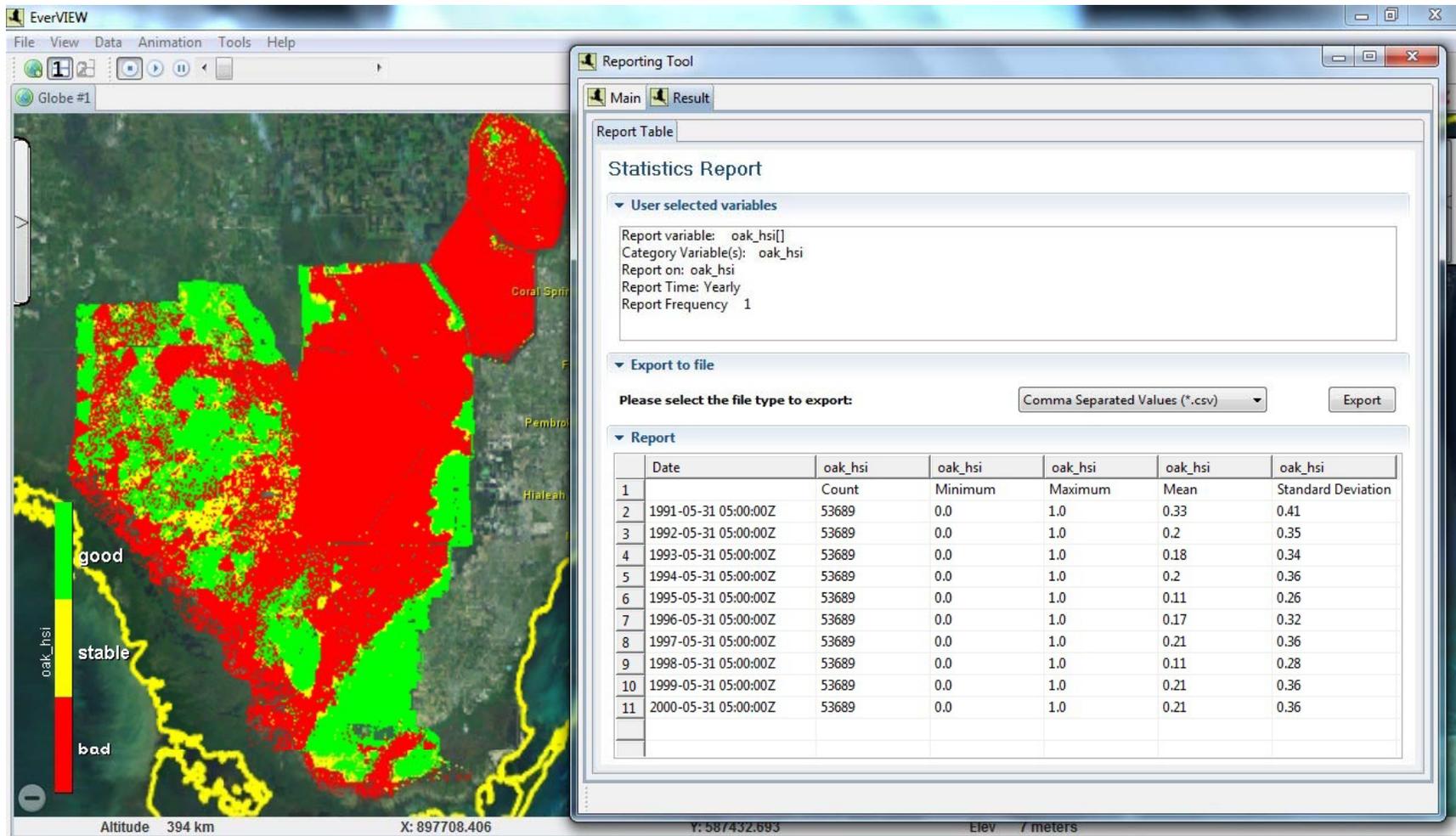
Alt Z

REMINDER: THESE ARE MADE UP DATA!

Transect tool

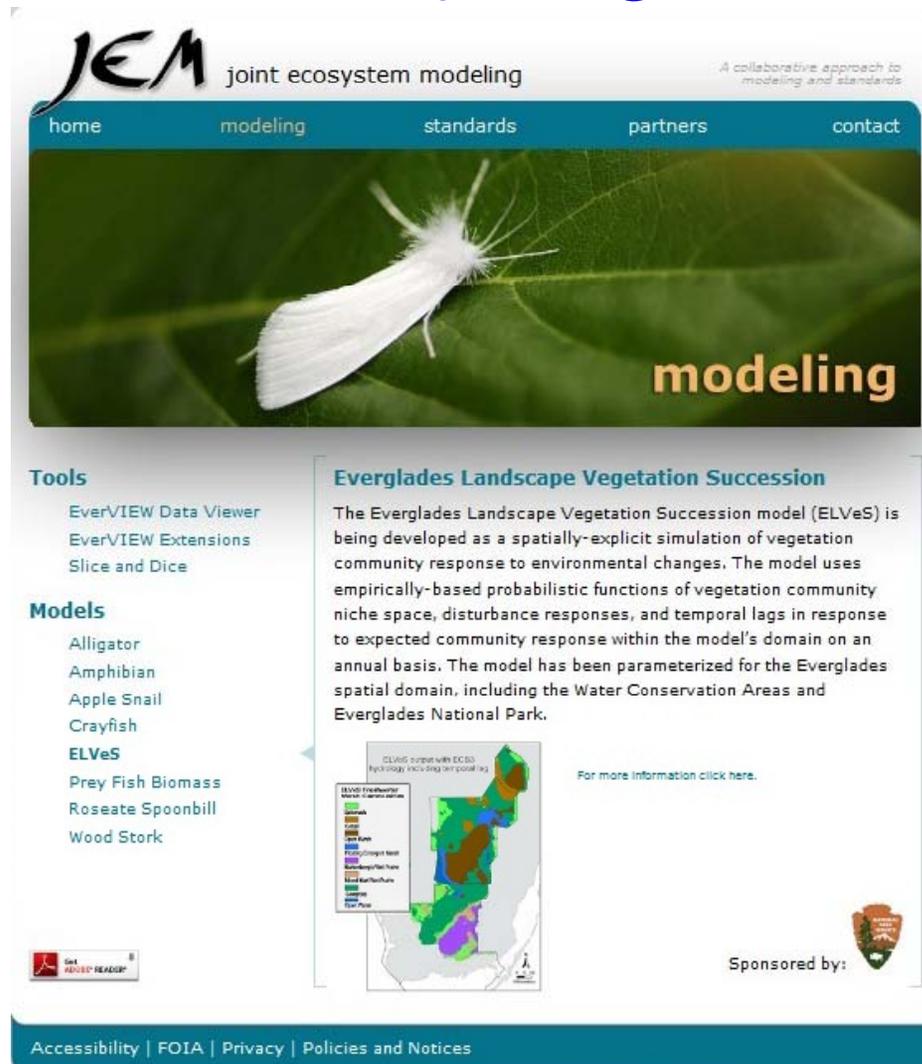


Statistical reporting



Where to find the models, standards, tools

www.jem.gov



The screenshot shows the homepage of the Joint Ecosystem Modeling (JEM) website. At the top left is the JEM logo with the tagline "joint ecosystem modeling" and the subtitle "A collaborative approach to modeling and standards". A navigation bar contains links for "home", "modeling", "standards", "partners", and "contact". The main banner features a photograph of a white moth on a green leaf with the word "modeling" in orange text. Below the banner, there are sections for "Tools" (EverVIEW Data Viewer, EverVIEW Extensions, Slice and Dice) and "Models" (Alligator, Amphibian, Apple Snail, Crayfish, ELVeS, Prey Fish Biomass, Roseate Spoonbill, Wood Stork). A featured article titled "Everglades Landscape Vegetation Succession" describes the ELVeS model. To the right of the article is a map of the Everglades region with a legend for various vegetation types. A "Sponsored by:" logo for the Florida Department of Environmental Protection is visible in the bottom right corner. The footer contains links for "Accessibility | FOIA | Privacy | Policies and Notices".

JEM joint ecosystem modeling
A collaborative approach to modeling and standards

home modeling standards partners contact

modeling

Tools

- EverVIEW Data Viewer
- EverVIEW Extensions
- Slice and Dice

Models

- Alligator
- Amphibian
- Apple Snail
- Crayfish
- ELVeS**
- Prey Fish Biomass
- Roseate Spoonbill
- Wood Stork

Everglades Landscape Vegetation Succession

The Everglades Landscape Vegetation Succession model (ELVeS) is being developed as a spatially-explicit simulation of vegetation community response to environmental changes. The model uses empirically-based probabilistic functions of vegetation community niche space, disturbance responses, and temporal lags in response to expected community response within the model's domain on an annual basis. The model has been parameterized for the Everglades spatial domain, including the Water Conservation Areas and Everglades National Park.

CLAS output with ECOS Hydrology, including temporal lag

For more information click here.

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