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

JEM
joint ecosystem modeling

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

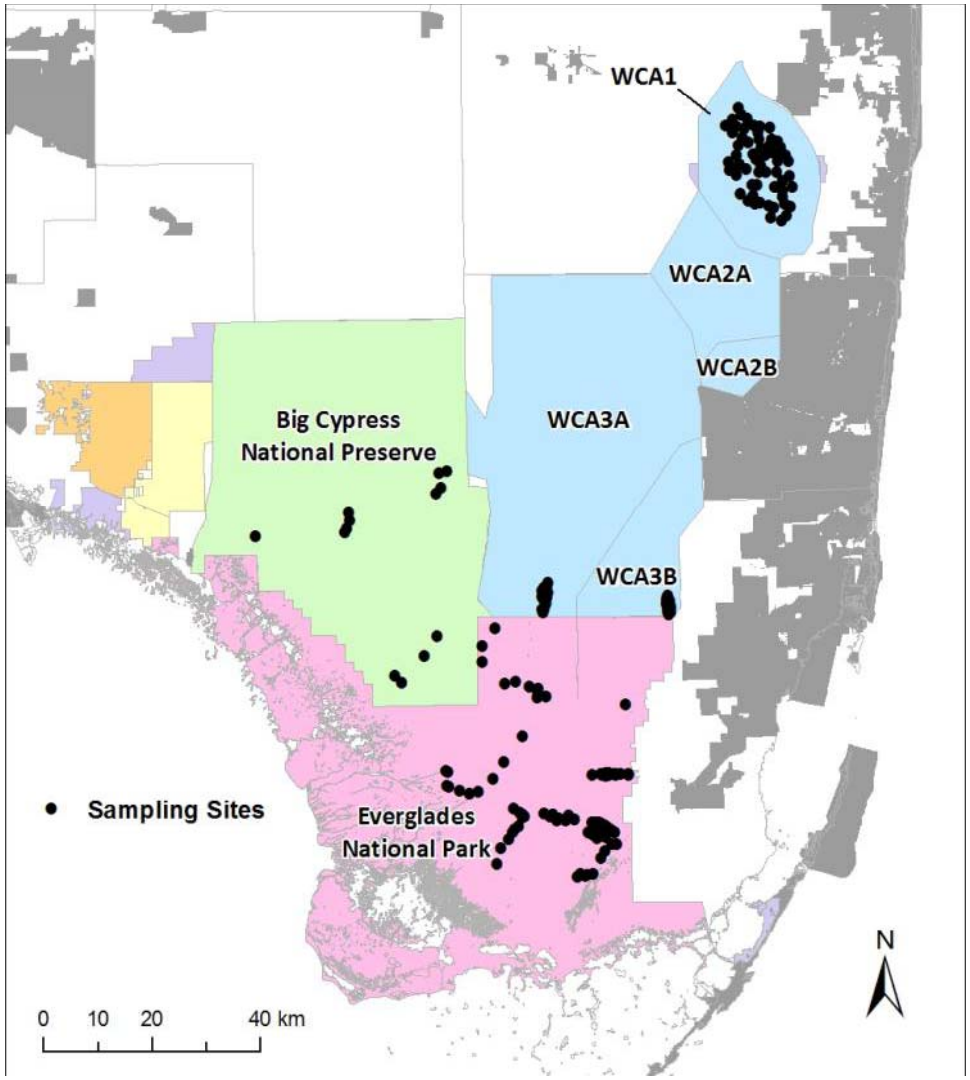
So…

- 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

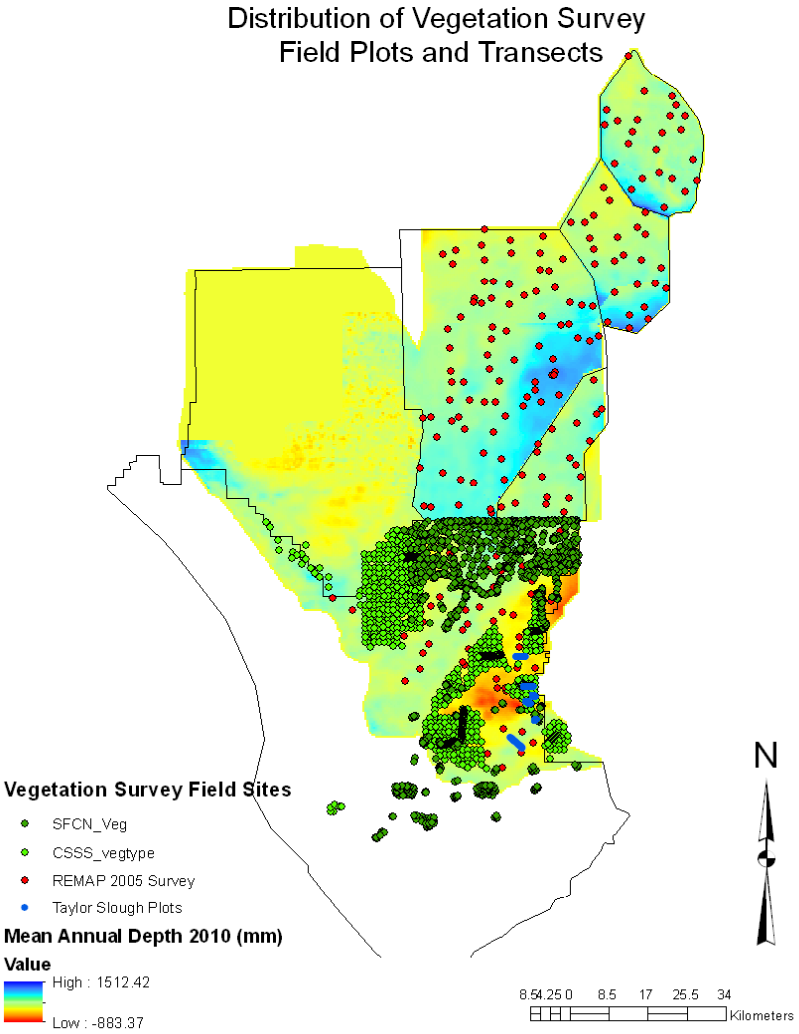
The models being used in CEPP

- 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

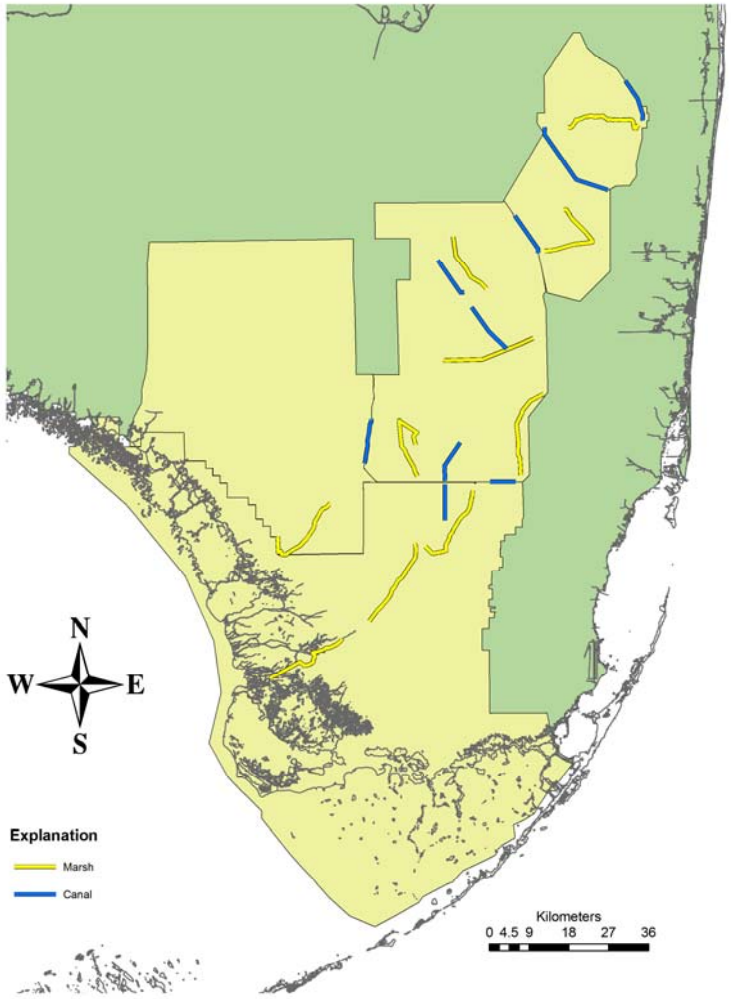
Amphibians: 205 sampling sites



ELVeS uses data from 3,006 field sites

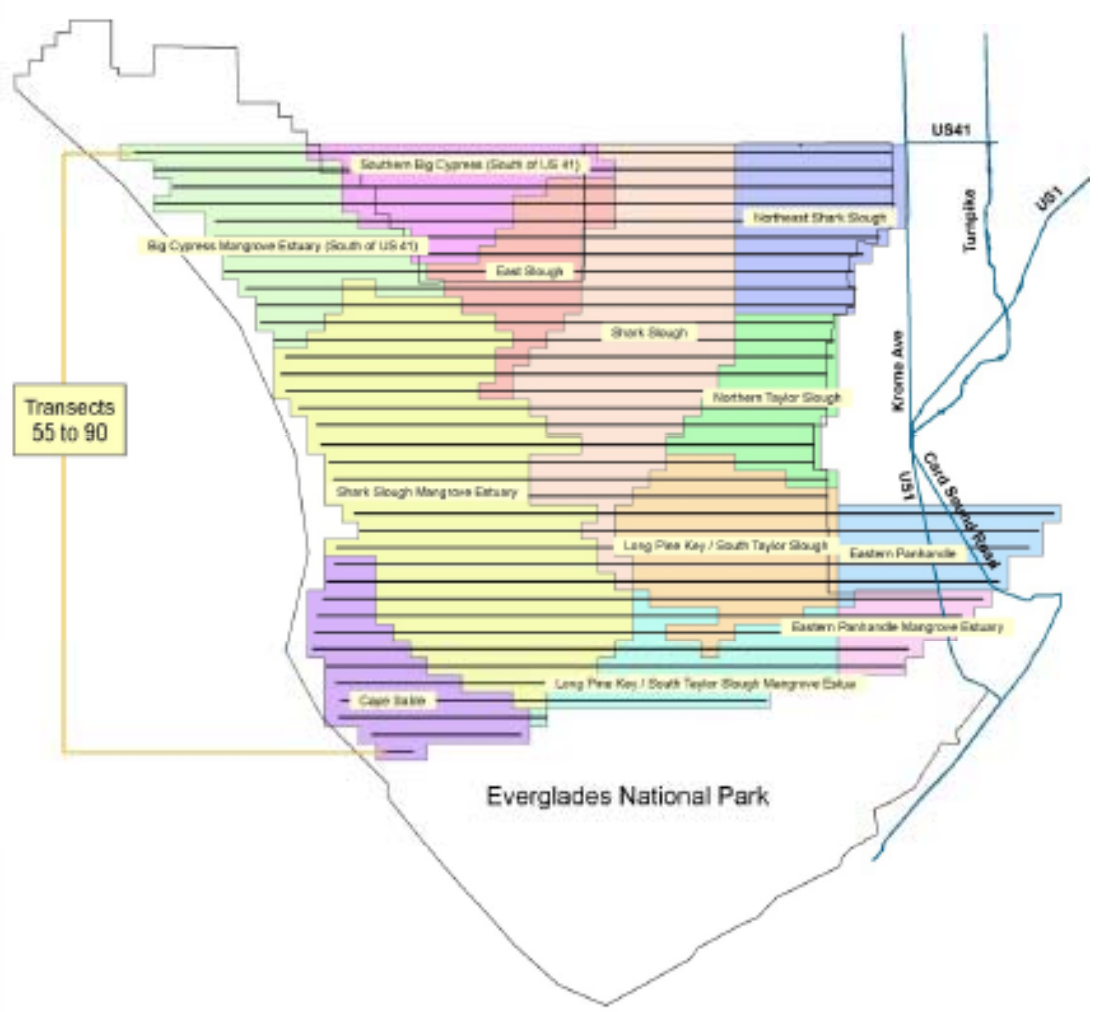


Alligator survey routes



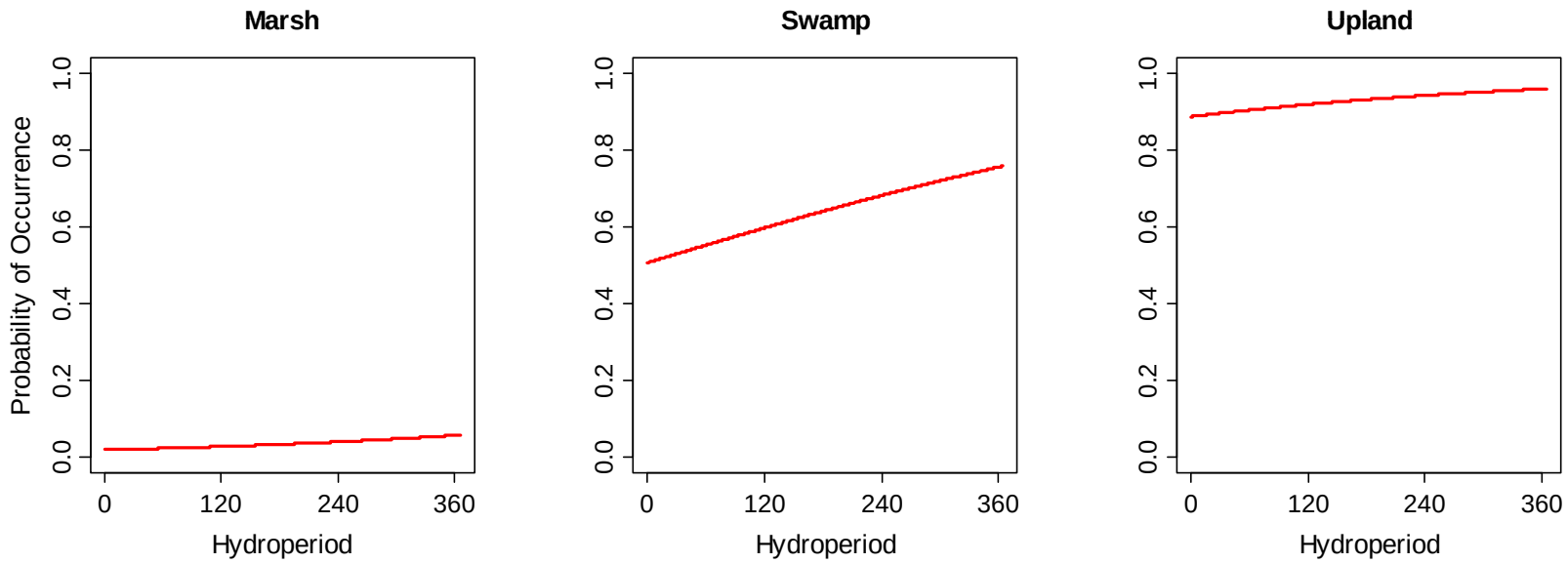
“Validation" of wood stork foraging index

use of systematic reconnaissance flights monitoring data



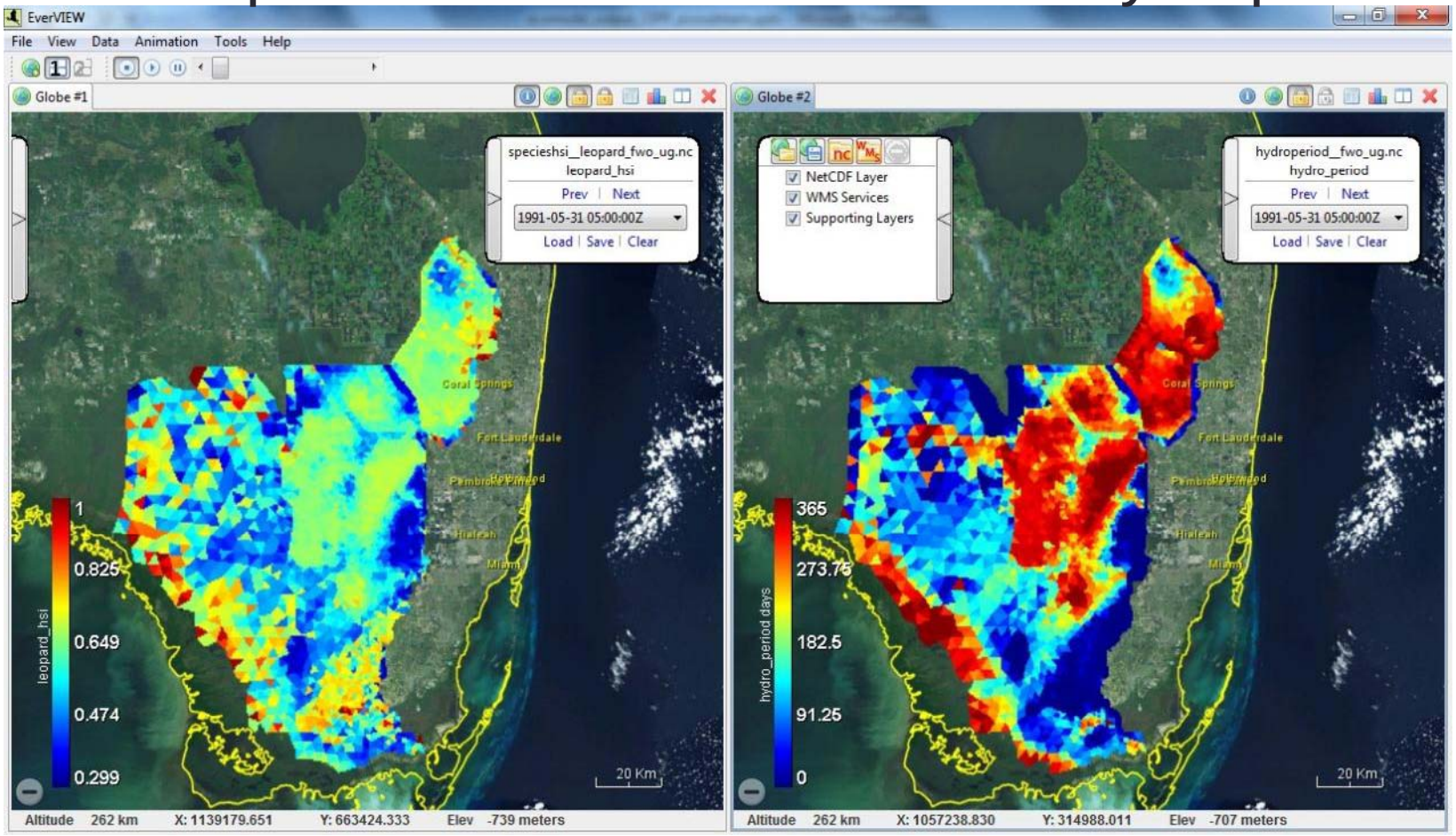
Inside eco models

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



Visualizing model data using EverVIEW

HSI output vs. hydroperiod



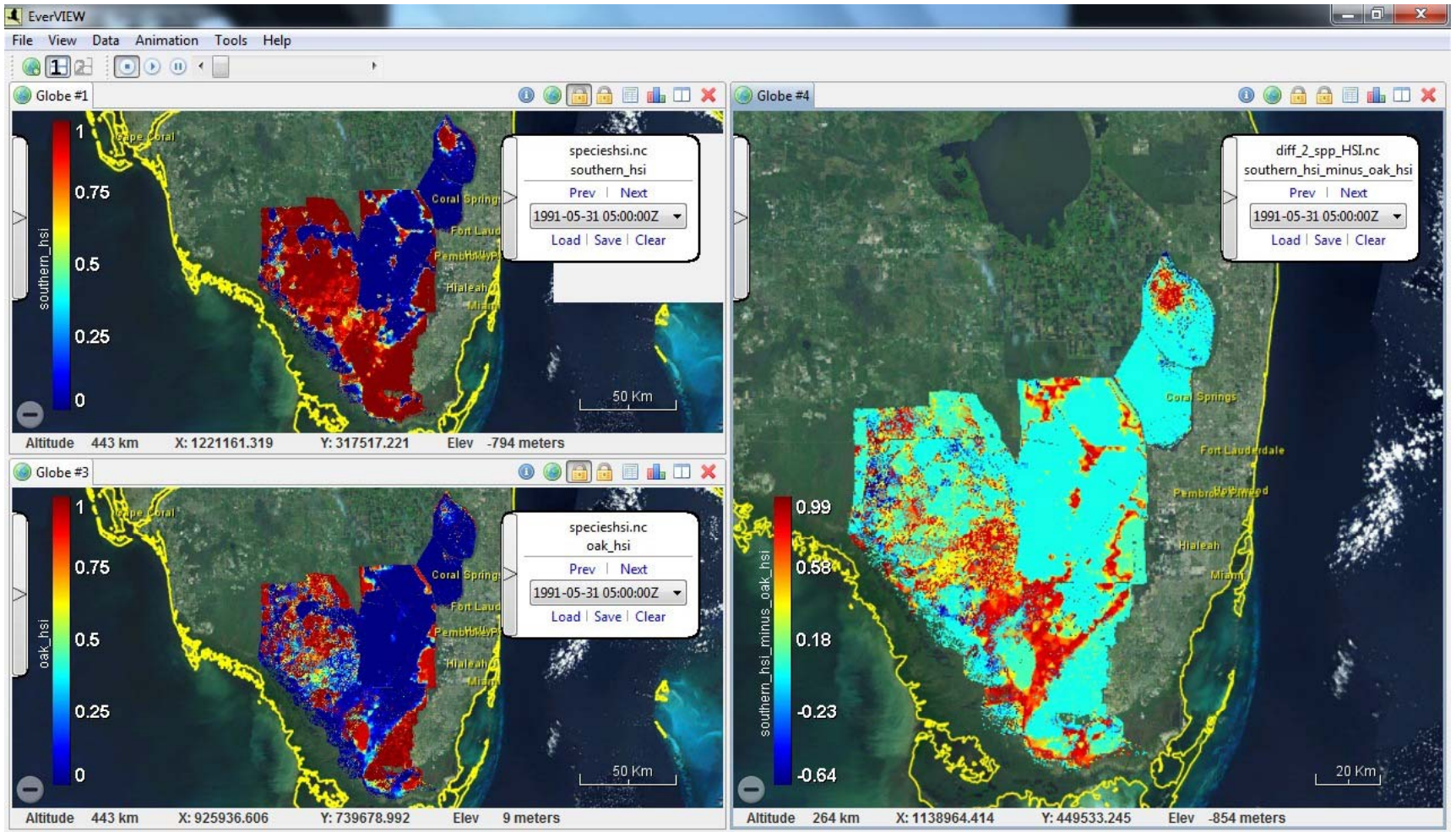
NOTE: FABRICATED DATA FOR ILLUSTRATIVE PURPOSES!

Create a difference map

Difference map

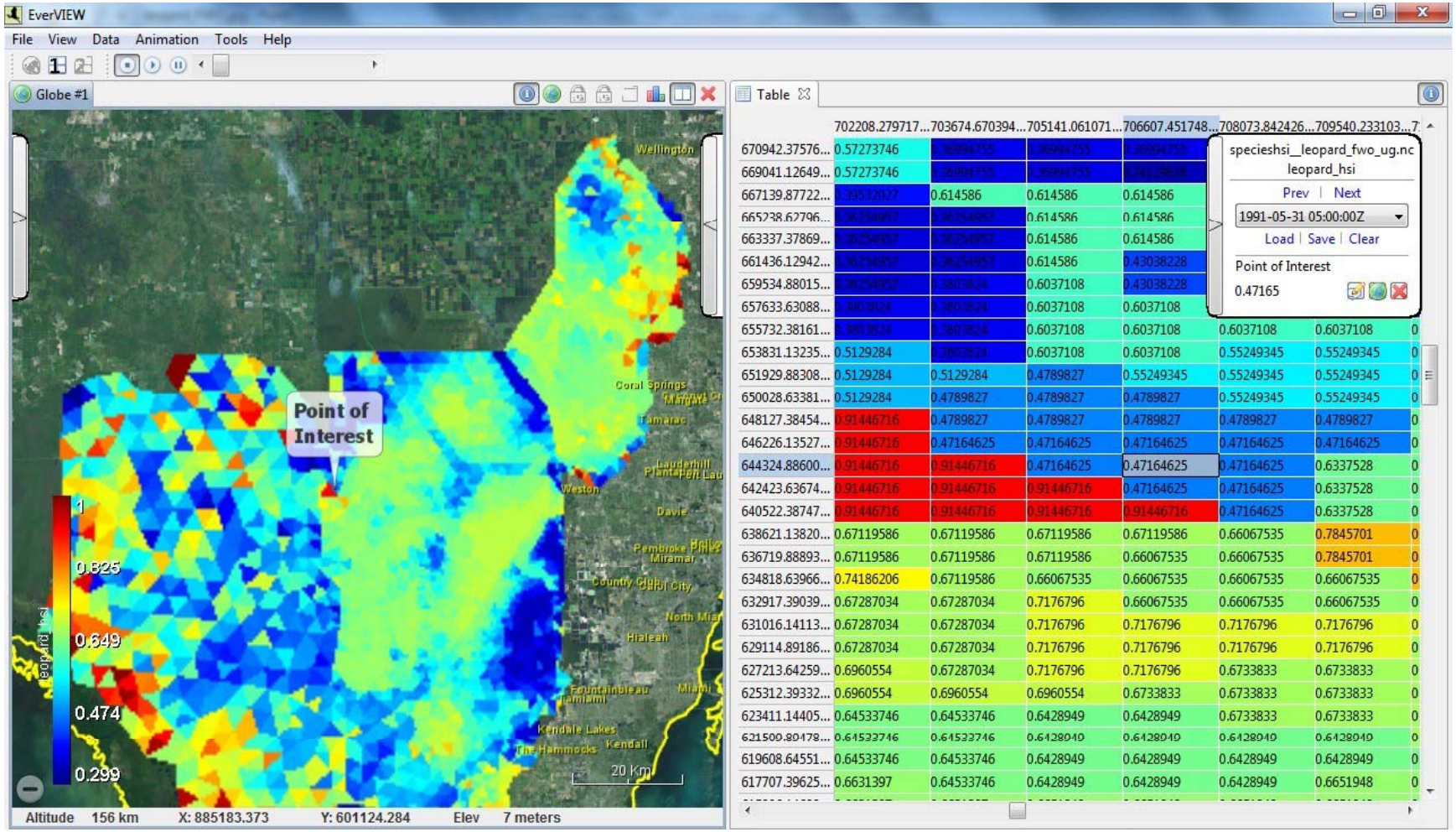
Alt X

Alt Y



NOTE: FABRICATED DATA FOR ILLUSTRATIVE PURPOSES!

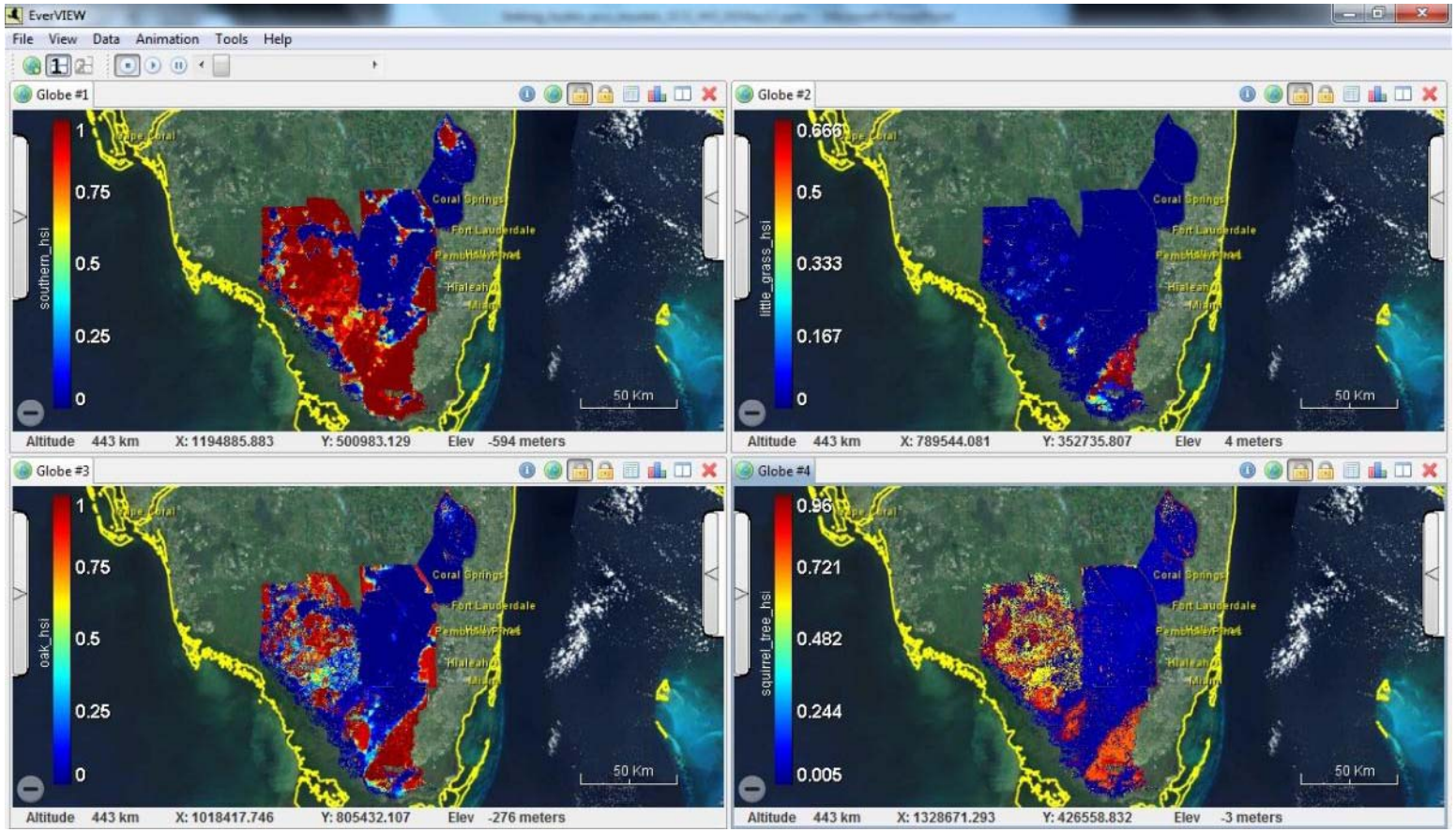
Examine the numbers behind the map



Compare four alternatives side by side

Alt W

Alt Y

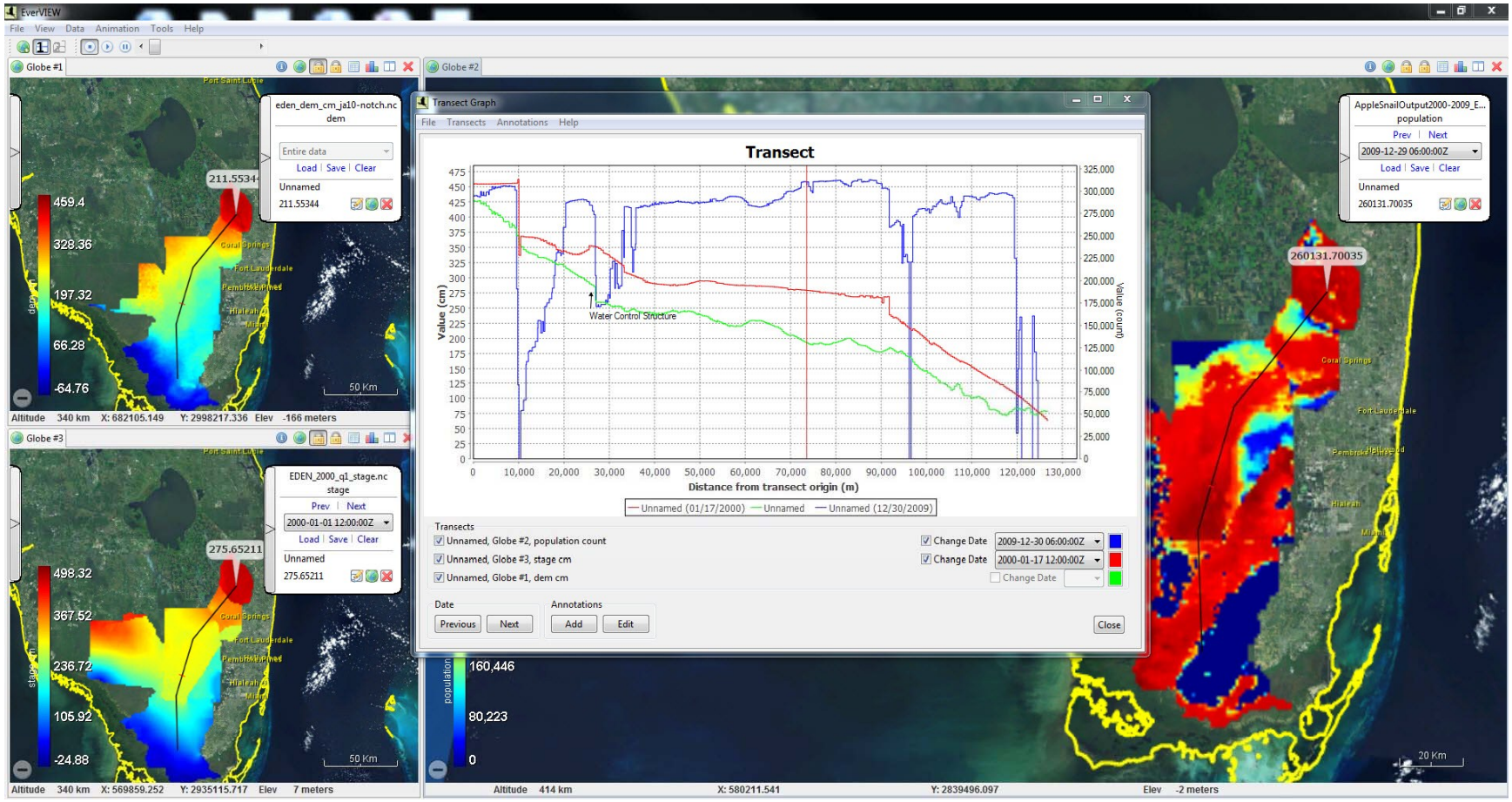


Alt X

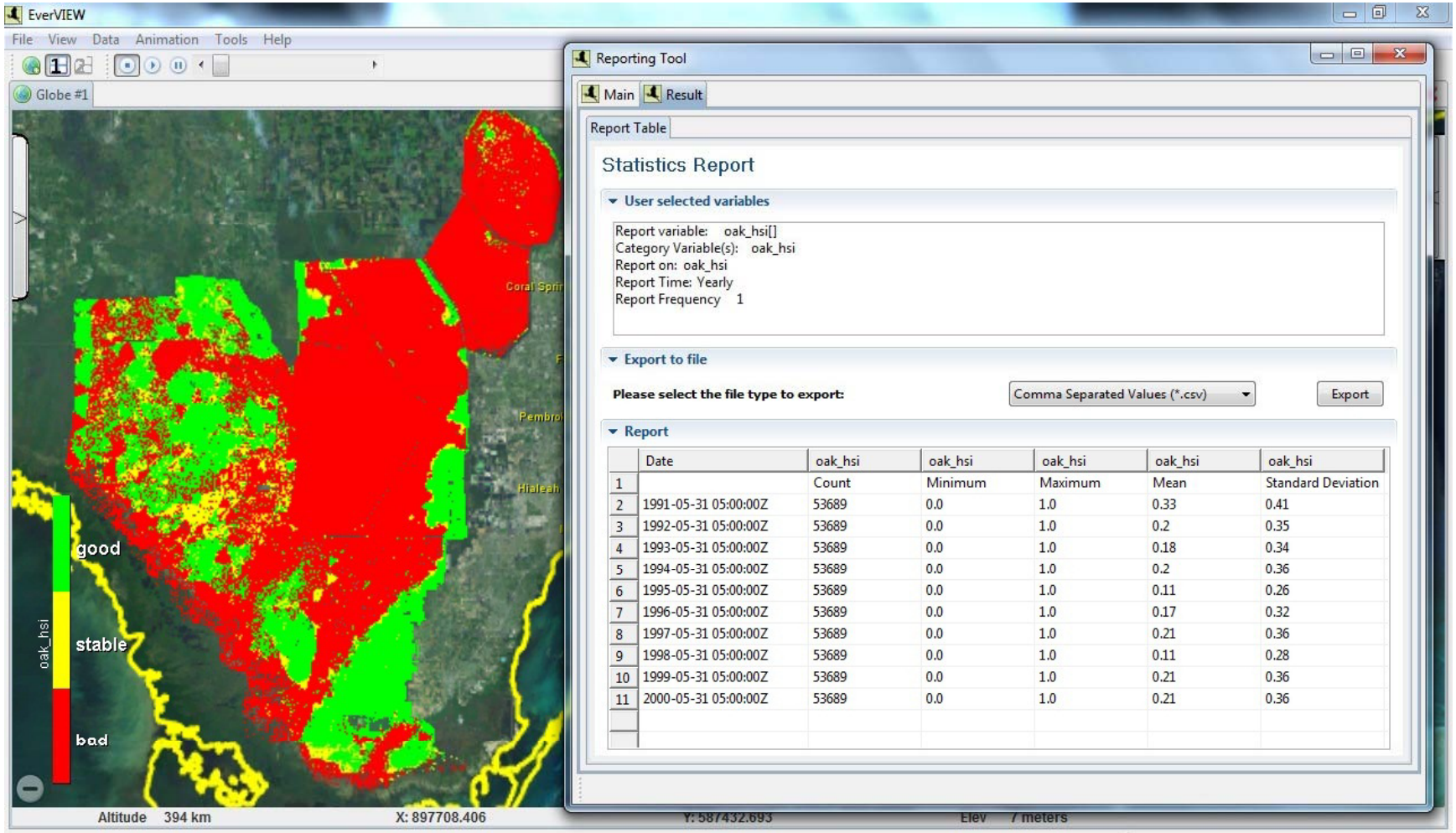
Alt Z

REMINDER: THESE ARE MADE UP DATA!

Transect tool



Statistical reporting



Where to find the models, standards, tools

www.jem.gov