

**LINKING ECOLOGICAL AND  
HYDROLOGIC MODELS**

**SUMMARY OF RECENT PROGRESS**

**DECEMBER 2010**

# JOINT ECOSYSTEM MODELING (JEM)

- Established in 2004 as an umbrella group of ecological model practitioners in the Everglades
- Agencies currently participating: USGS, NPS, USFWS, SFWMD, USACE
- Cooperators: UF, Audubon of FL, FAU, UWF, UT
- Mission: “*Get Ecological Models Into The Hands Of Users*”
- JEM participants include ecologists, hydrologists, modelers, & computer programmers



## ROLE OF JEM

- Conceived in response to need for ecological models to be accessible in the decision process in a timely manner
- Link ecological models with hydrologic models
- Develop desktop tools to make models, data and outputs accessible, user friendly, and easily understood
- Use interagency collaboration as a mechanism to meet needs

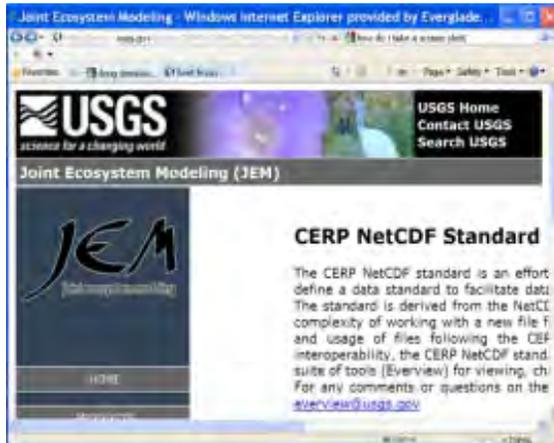


## PROGRESS DURING THE LAST TWO YEARS

- 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

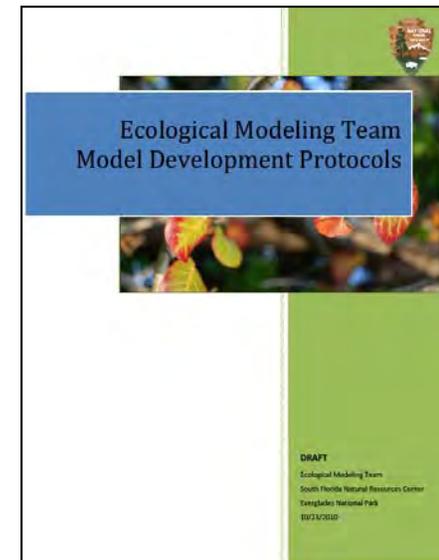


# ONE: STANDARD DATA FORMATS & PROTOCOLS



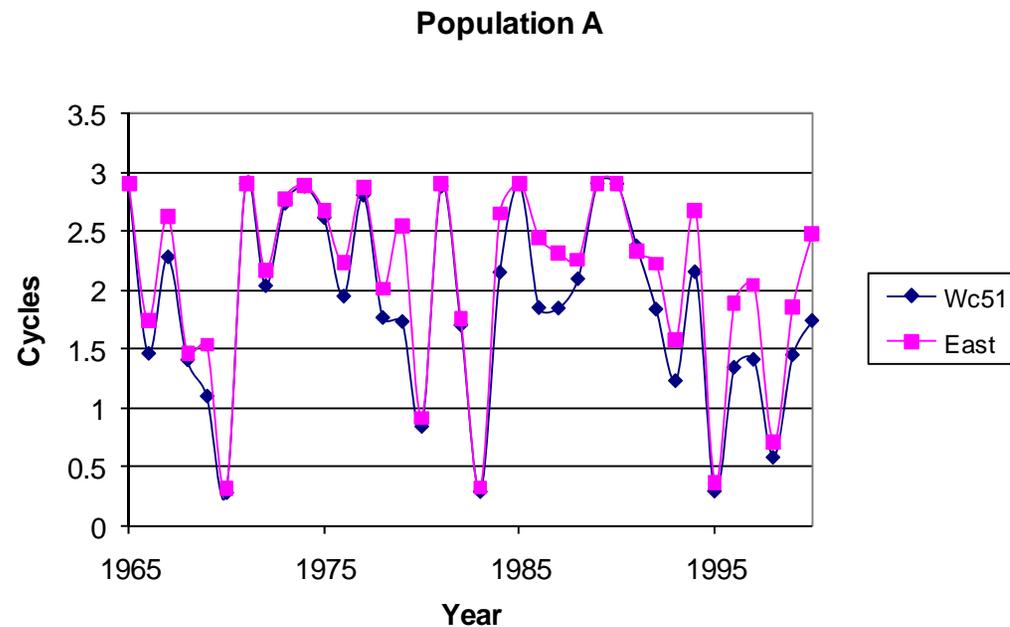
- Multi-agency effort to develop ‘CERP standard’
- Standard format for sharing data, model inputs & outputs
- Reduces duplication of efforts; allows shared suite of tools to be used for visualization

- Model development protocols exist within partner agencies e.g., NPS
- JEM bringing participating agency standards together for use by general community of practice



## TWO: ECOLOGICAL MODELS IN USE

- Cape Sable Seaside Sparrow Hydrologic Impact Evaluator
- Slough Model & Performance Measure
- Fish Density Model

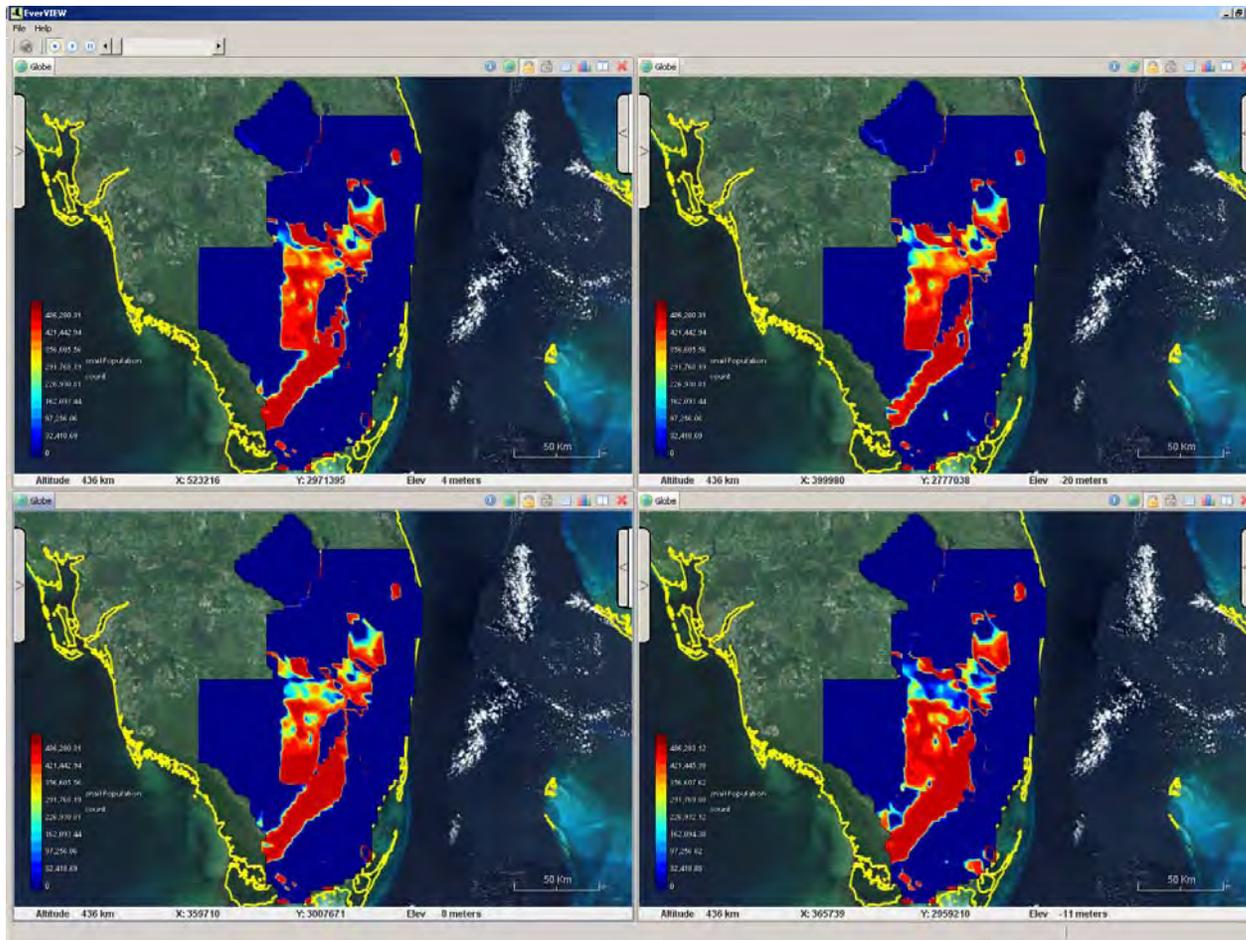


# THREE: ECOLOGICAL MODELS IN DEVELOPMENT



# APPLE SNAIL POPULATION MODEL RUN ON 4 ALTERNATIVES

2015CP



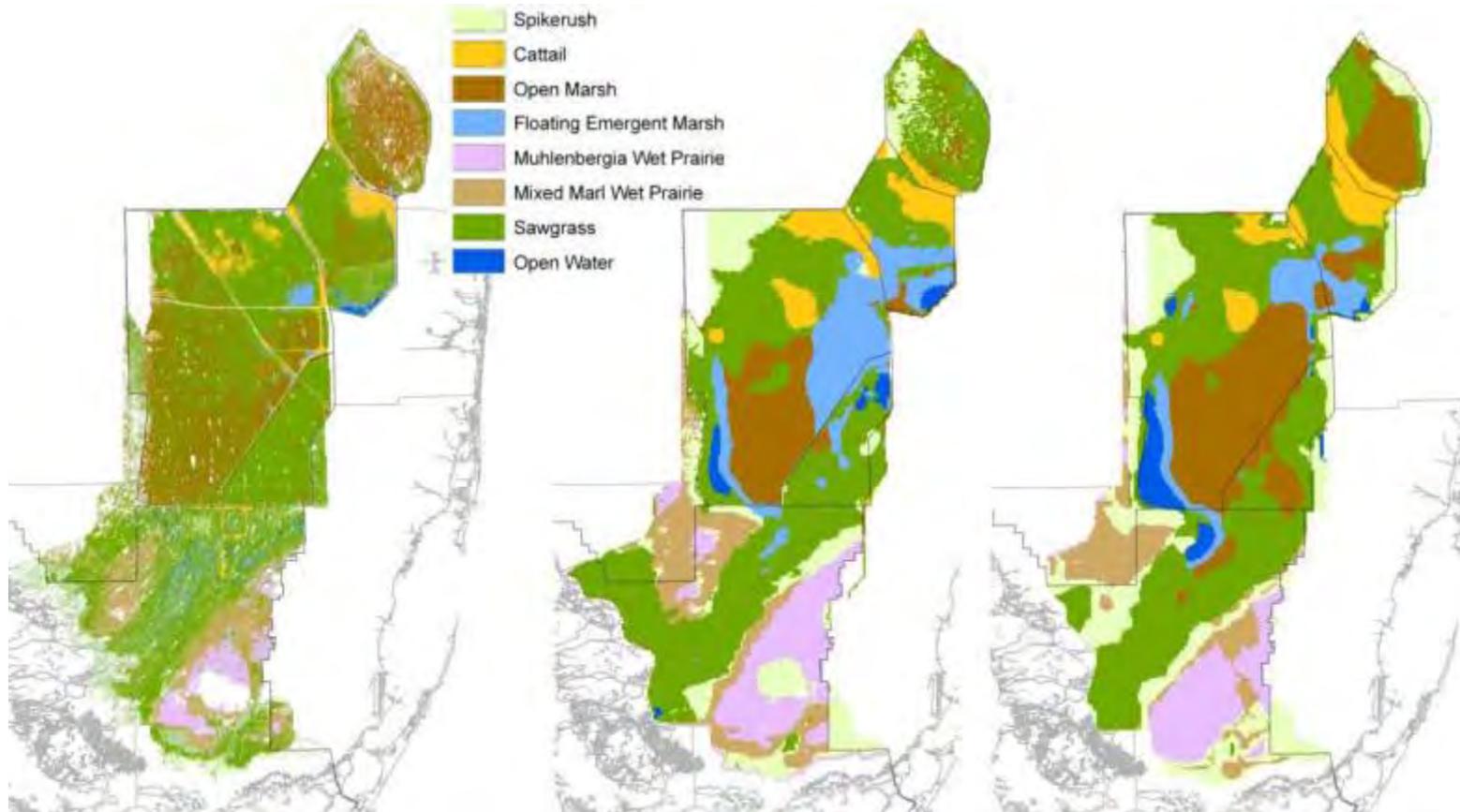
D15BS

CERPO

Alt5r



# VEGETATION SUCCESSION... CURRENT CONDITIONS



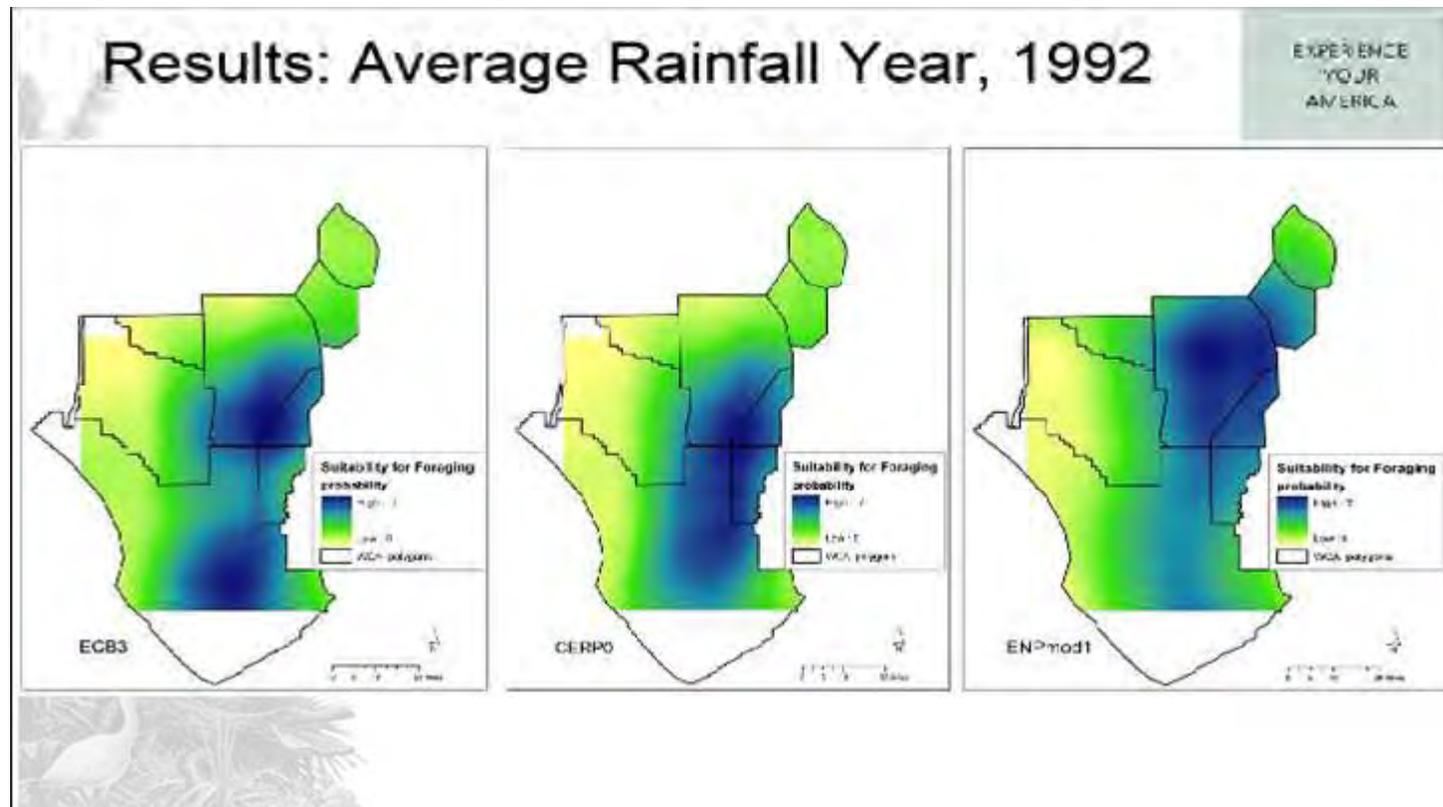
Classification  
at 50 m resolution

Simulation with EDEN  
2003 at 400 m resolution

Simulation with ECB3  
1997 at 500 m resolution



# WOOD STORK MODEL: PRESENTED AT GEER 2010

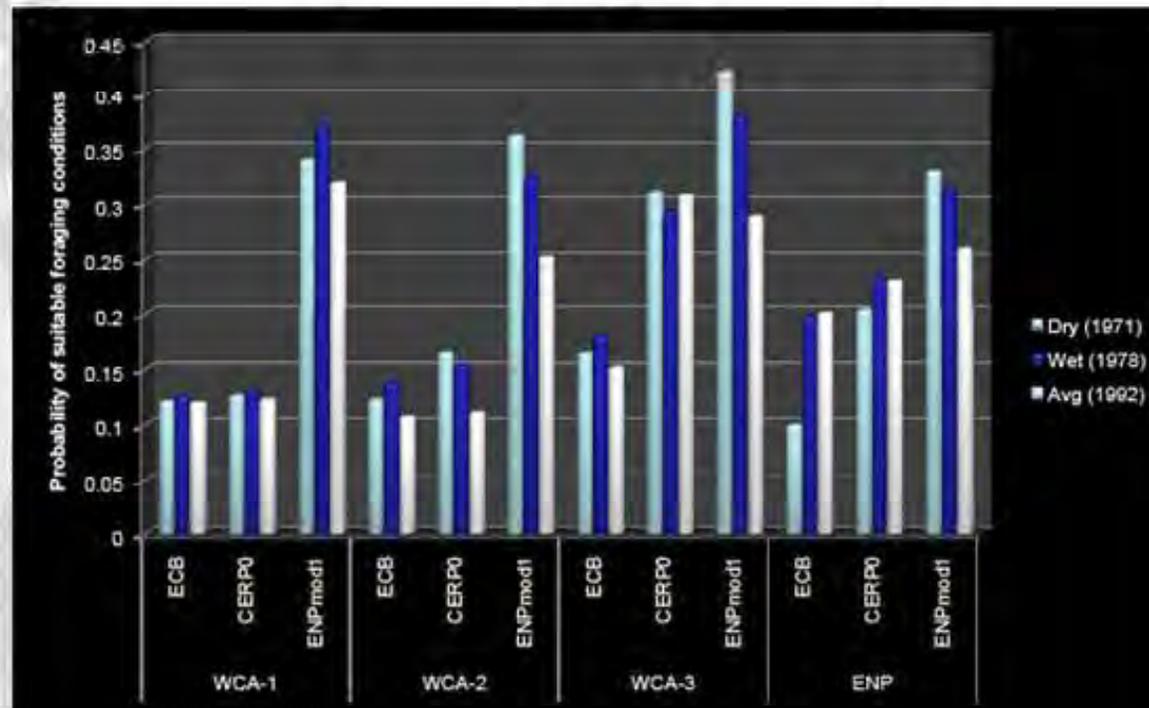


Comparison of ECB3, CERP 0, and a version of NSM



# WOOD STORK MODEL: PRESENTED AT GEER 2010

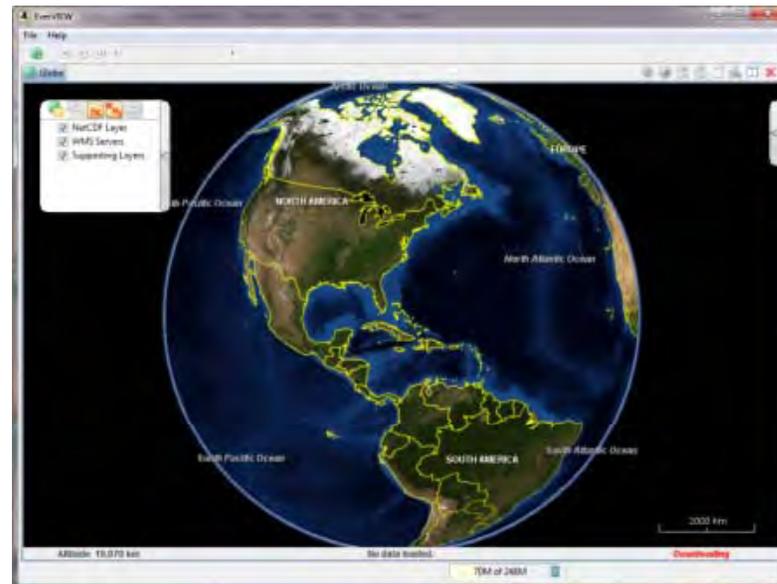
Wood Stork Foraging Probability during a dry, wet, and average rainfall year



Comparison of foraging probabilities in the WCAs and ENP

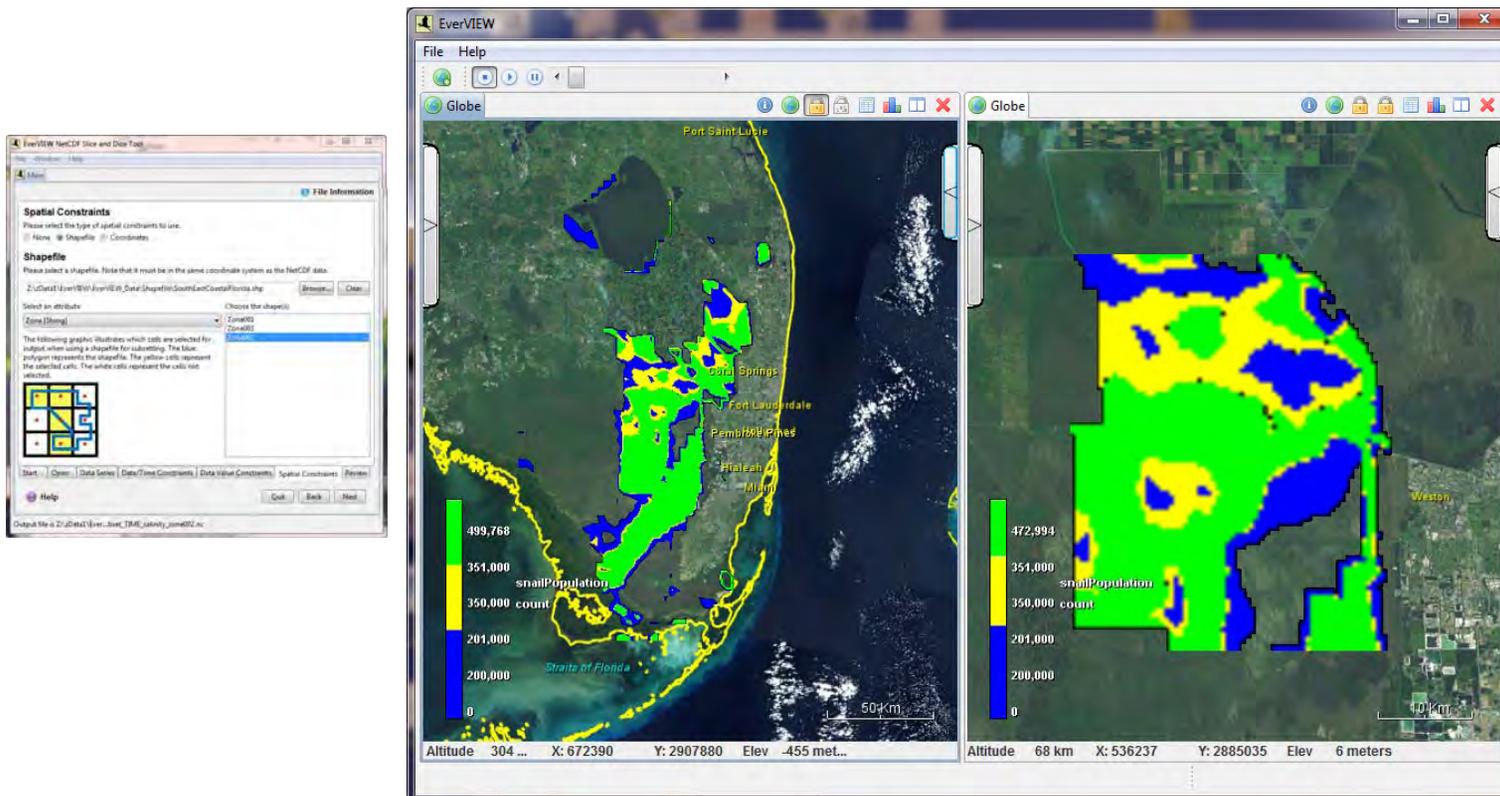
## FOUR: DATA MANIPULATION AND VISUALIZATION

- EverVIEW data viewer
- Available for multiple operating systems
- Plug-in development model
- Spatially enabled -- modeling data at global, regional, local, and site-specific scales



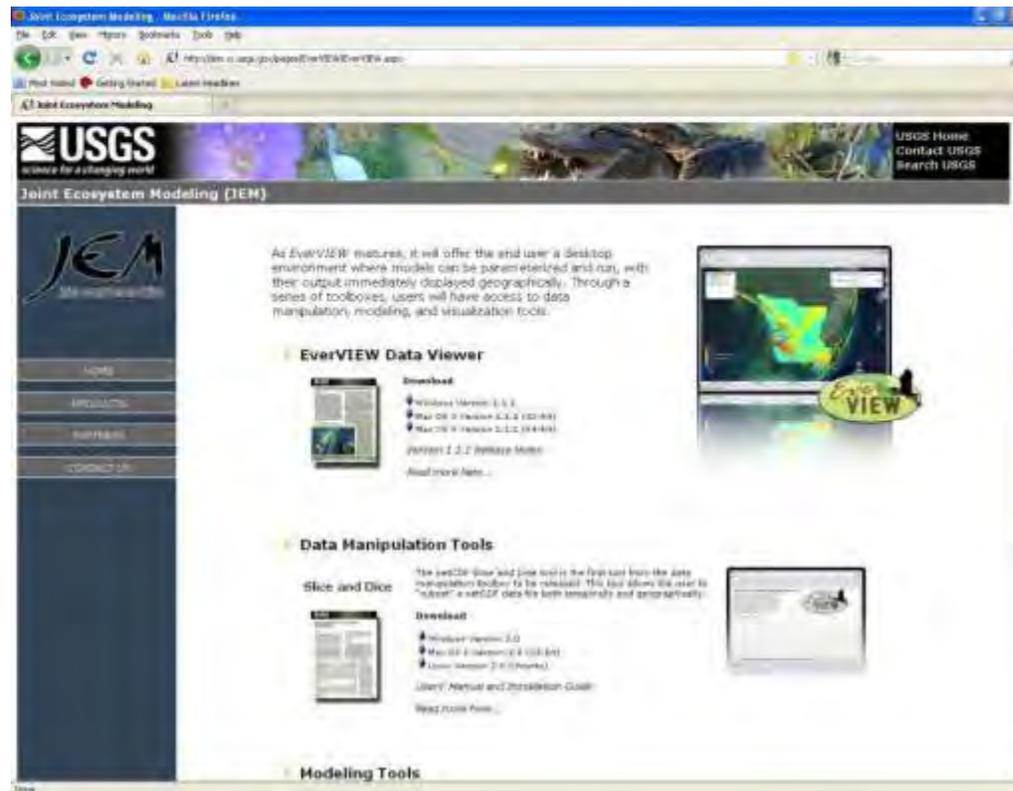
# FOUR: DATA MANIPULATION AND VISUALIZATION

- Allow users to ‘slice and dice’ input (spatially, numerically, temporally)
- E.g., WCA3 for DECOMP



# TRANSPARENCY AND AVAILABILITY

- Download modeling tools, data standard from web
- Currently hosted at: [jem.cr.usgs.gov](http://jem.cr.usgs.gov)



# FUTURE

- Continue to work with IMC and federal & state partners toward meeting modeling needs of user community
- Currently ecological models and linking to hydrology is primarily a federal effort (funding, staff time) with hydrology help from IMC
- We can achieve greater success with help of additional partners – all are welcome!

