



AUTOMATED ONLINE ECOLOGICAL MODELING AND EVALUATION FOR EVERGLADES MANAGEMENT AND RESTORATION

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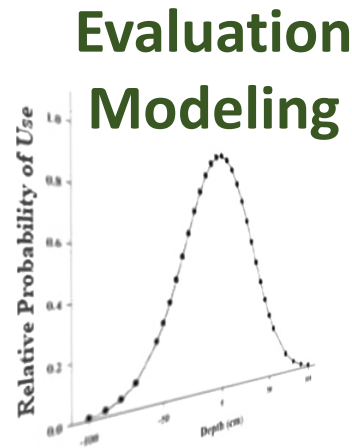
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Automated Online Ecological Modeling

External
Data Acquisition



Web-based
Spatio-temporal
Results and Reports

Flexibility that encourages use as a standard framework for future additional evaluations of ecological modeling.

Automated Online Ecological Modeling

Facilitate integrated understanding of hydrologic conditions and ecological responses

- Spatial and temporal variability
- Ecosystem connectivity
- Rapid access via web
- Linkage from planning to implementation

Automated Online Ecological Modeling

Pilot implementation integrates a wood stork evaluation module



- Wading birds are high priority indicators
- Well-established and analyzed datasets linked tightly to surface water hydrology
- Hydrology readily available online from Everglades Depth Estimation Network (EDEN)
 - ✓ daily, interpolated water-level
 - ✓ Entire greater Everglades
 - ✓ Updated online every few days
 - ✓ 1991 - present

Automated Online Ecological Modeling

Decision support in Everglades water management and restoration

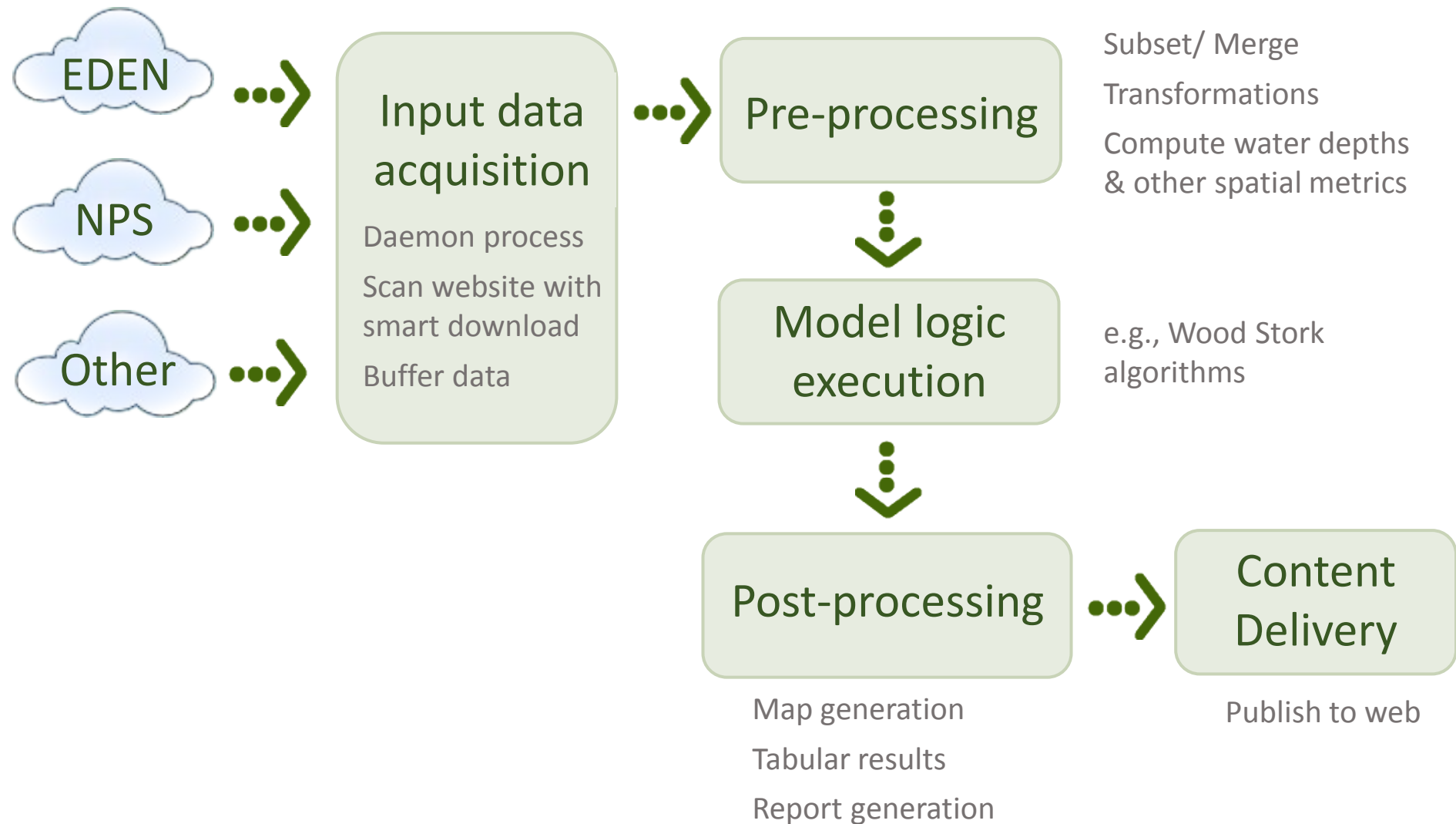
- | | |
|---|----------------|
| 1. Periodic Scientists Call | ~every 3 weeks |
| 2. Tuesday Biologists Call | weekly |
| 3. Multi-Species Recovery Plan | 3x per year |
| 4. Multi-Species Water Management Meeting | weekly |

Multi-agency: local, state, regional, and federal scientists, technical staff, and decision-makers.

Regular review of compliance with water release regulations and impacts on ecological, agricultural, urban and cultural priorities.

Flexibility within regulation schedules and structural capacities for modification of water delivery timing and spatial distribution.

Automated Online Ecological Modeling



Automated Online Ecological Modeling

Input Source Data

Real-Time Water Surfaces

sofia.usgs.gov/eden/models/real-time.php

Everglades Depth Estimation Network (EDEN) for Support of Biological and Ecological Assessments

Real-Time Water Surfaces

EDEN real-time water surfaces are created daily using real-time (four-day delay) water level data for the EDEN network. Most data relayed by satellite or other telemetry have received little or no review. Inaccuracies in the data may be present because of instrument malfunctions or physical changes at the measurement site. A threshold comparison program eliminates daily values that appear erroneous (i.e. extremely high or low, extremely different from previous days). **Subsequent review of the data may result in significant revisions to the data.**

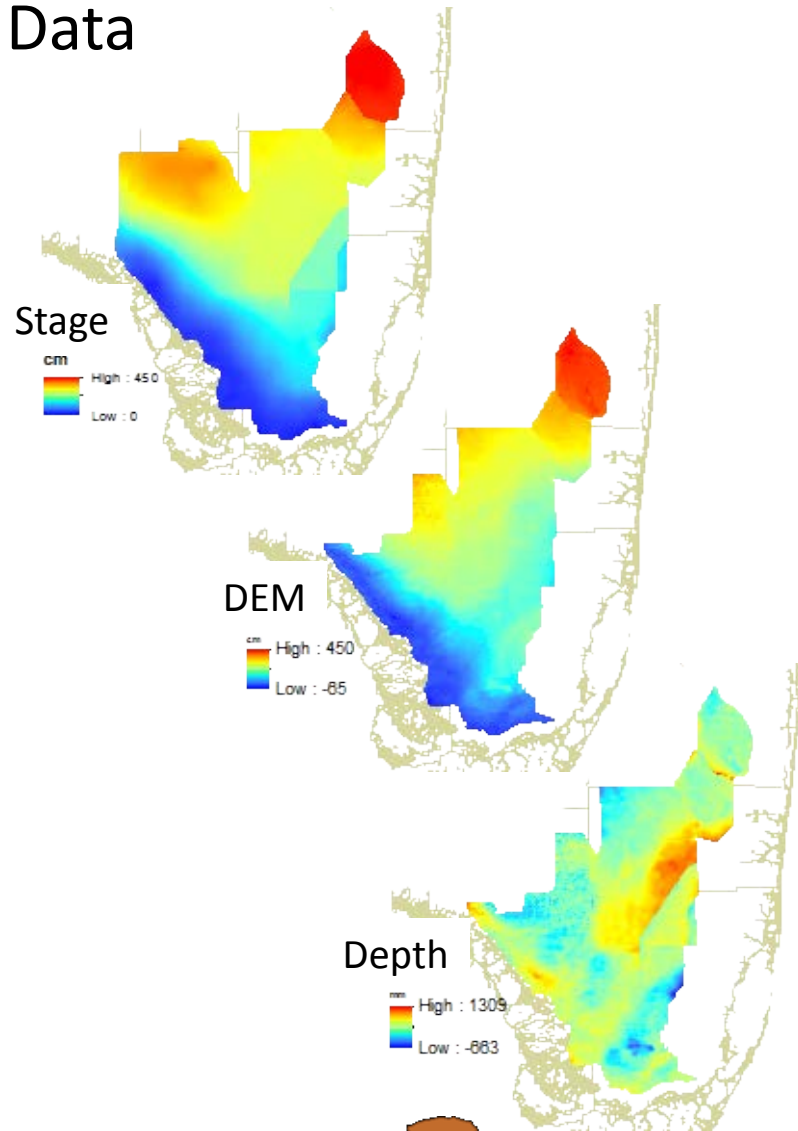
Users are cautioned to consider carefully the provisional nature of the information when using provisional data.

Within approximately 45 days after the end of each quarter (December 31, March 31, June 30, September 30), finalized and approved water level data are provided by SFWMD and ENP at which time real-time EDEN surfaces will be replaced by provisional surfaces. EDEN surfaces created with final, approved water level data from all agency gages will be available in approximately July of each year for the previous year's water year (October – September).

(Note: NetCDF files contain up to three months worth of files; Geotiff files have been zipped up (.zip) and contain a .tif and .aux file)

It is recommended to always review the daily median file to see which gages were used in the production of the daily surface

Daily Files	Geotiff (Quarterly)	NetCDF (Quarterly)
07/10/2014: Daily Median GeoTiff JPEG Quick View	2014 Quarter 3 GeoTiff (contains the dates for this quarter listed at left)	2014 Quarter 3 NetCDF (contains the dates for this quarter listed at left)
07/09/2014: Daily Median GeoTiff JPEG Quick View		
07/08/2014: Daily Median GeoTiff JPEG Quick View		
07/07/2014: Daily Median GeoTiff JPEG Quick View		
07/06/2014: Daily Median GeoTiff JPEG Quick View		
07/05/2014: Daily Median GeoTiff JPEG Quick View		
07/04/2014: Daily Median GeoTiff JPEG Quick View		
07/03/2014: Daily Median GeoTiff JPEG Quick View	2014 Quarter 2 GeoTiff (contains the dates for this quarter listed at left)	2014 Quarter 2 NetCDF (contains the dates for this quarter listed at left)
07/02/2014: Daily Median GeoTiff JPEG Quick View		
06/29/2014: Daily Median GeoTiff JPEG Quick View		
06/28/2014: Daily Median GeoTiff JPEG Quick View		
06/27/2014: Daily Median GeoTiff JPEG Quick View		
06/26/2014: Daily Median GeoTiff JPEG Quick View		
06/25/2014: Daily Median GeoTiff JPEG Quick View		
06/24/2014: Daily Median GeoTiff JPEG Quick View	2014 Quarter 1 GeoTiff (contains the dates for this quarter listed at left)	2014 Quarter 1 NetCDF (contains the dates for this quarter listed at left)
06/23/2014: Daily Median GeoTiff JPEG Quick View		
06/22/2014: Daily Median GeoTiff JPEG Quick View		
06/21/2014: Daily Median GeoTiff JPEG Quick View		
06/20/2014: Daily Median GeoTiff JPEG Quick View		
06/19/2014: Daily Median GeoTiff JPEG Quick View		
06/18/2014: Daily Median GeoTiff JPEG Quick View		





Everglades National Park Automated Web Modeling

Everglades Wood Stork Foraging Potential Model

A wood stork foraging suitability model developed to predict the relative suitability of foraging conditions for wood storks within Everglades freshwater marshes during the breeding season. This model calculates wood stork foraging probabilities surrounding colonies in Everglades freshwater marshes based on estimated water depth and recession rates.

2014

Click an image to enlarge
Multiple images can be
Click and drag the hea

Apr 1-Apr 7	Apr 8-Apr 14	Apr 15-Apr 21	Apr 22-Apr 28	Apr 29-May 5	May 6-May 12
May 13-May 19	May 20-May 26	May 27-Jun 2	Jun 3-Jun 9	Jun 10-Jun 16	Jun 17-Jun 23
Jun 24-Jun 30	Jul 1-Jul 7				

Jun 3-Jun 9

Ecological Model Results
Wood Stork Foraging Potential
Week of June 03, 2014

STORM ver. 1.0e

Monitored Colonies

Foraging Probability Index

Jul 1-Jul 7

Ecological Model Results
Wood Stork Foraging Potential
Week of July 01, 2014

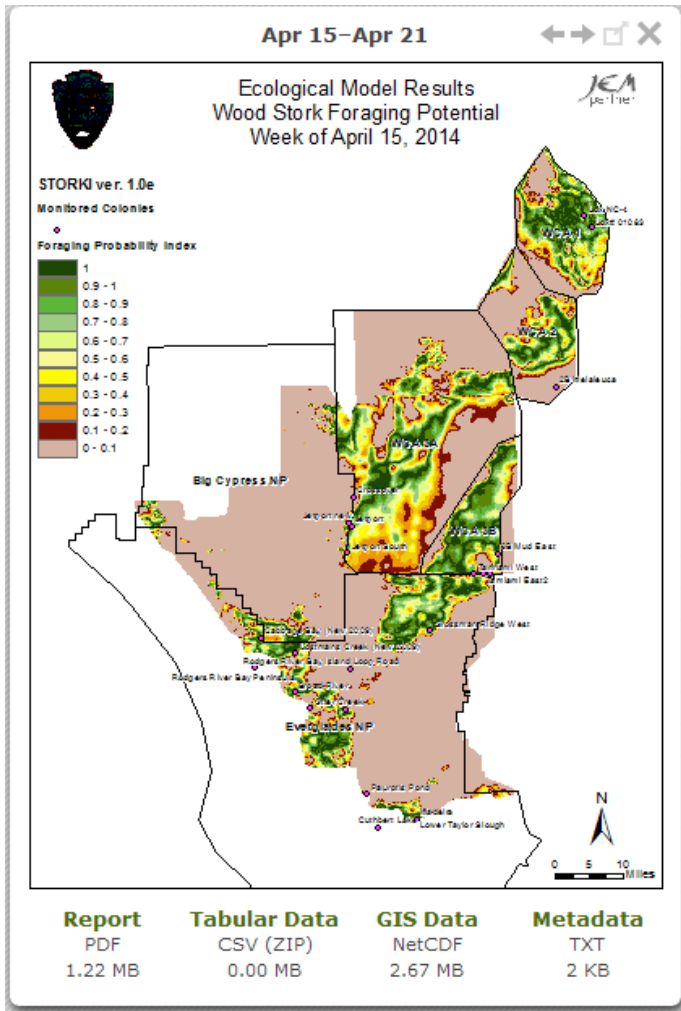
STORM ver. 1.0e

Monitored Colonies

Foraging Probability Index

Report
PDF
1.08 MB

Report PDF 1.36 MB	Tabular Data CSV (ZIP) 0.00 MB	GIS Data NetCDF 2.67 MB	Metadata TXT 2 KB
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Tabular Data

Acreeage by HSI categories for each colony

Acreeage by HSI categories for each colony. A colony area is defined by distance from center of colony point.

Colony	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Lox NC-4	138,891	10,675	7,947	8,619	8,935	7,433	9,252	12,612	16,170	38,034
Lox# 01083	255,445	0	0	0	0	0	0	0	0	0
Jetport	245,442	23,208	28,703	21,943	17,119	14,945	14,984	14,589	14,233	29,494
3B Mud East	424,661	0	0	0	0	0	0	0	0	0
Jetport South	256,038	20,796	27,043	20,164	15,103	13,521	13,798	13,719	14,668	29,810
Jetport new	247,419	23,247	28,822	22,061	17,356	14,866	14,194	14,194	13,561	28,941
Crossover	224,606	26,964	31,550	23,880	18,977	17,356	15,854	15,617	15,419	34,436
2B Melaleuca	354,444	0	0	0	0	0	0	0	0	0
Tamiami West	240,579	19,175	20,005	15,775	10,359	11,307	13,521	17,791	25,027	51,121
Cabbage Bay (New 2009)	424,661	0	0	0	0	0	0	0	0	0
Paurotis Pond	278,771	0	0	0	0	0	0	0	0	0
Lostmans Creek (New 2009)	424,661	0	0	0	0	0	0	0	0	0
Rookery Branch	424,661	0	0	0	0	0	0	0	0	0
Rodgers River Bay Peninsula	424,661	0	0	0	0	0	0	0	0	0
Broad River	424,661	0	0	0	0	0	0	0	0	0
Cuthbert Lake	0	0	0	0	0	0	0	0	0	0
Grossman Ridge West	296,286	16,329	13,877	10,438	6,603	6,919	8,935	11,347	15,736	38,192
Tamiami East1	424,661	0	0	0	0	0	0	0	0	0
Lower Taylor Slough	214,643	0	0	0	0	0	0	0	0	0
Tamiami East2	424,661	0	0	0	0	0	0	0	0	0
Rodgers River Bay Island	424,661	0	0	0	0	0	0	0	0	0

MetaData

metadata.txt - Notepad

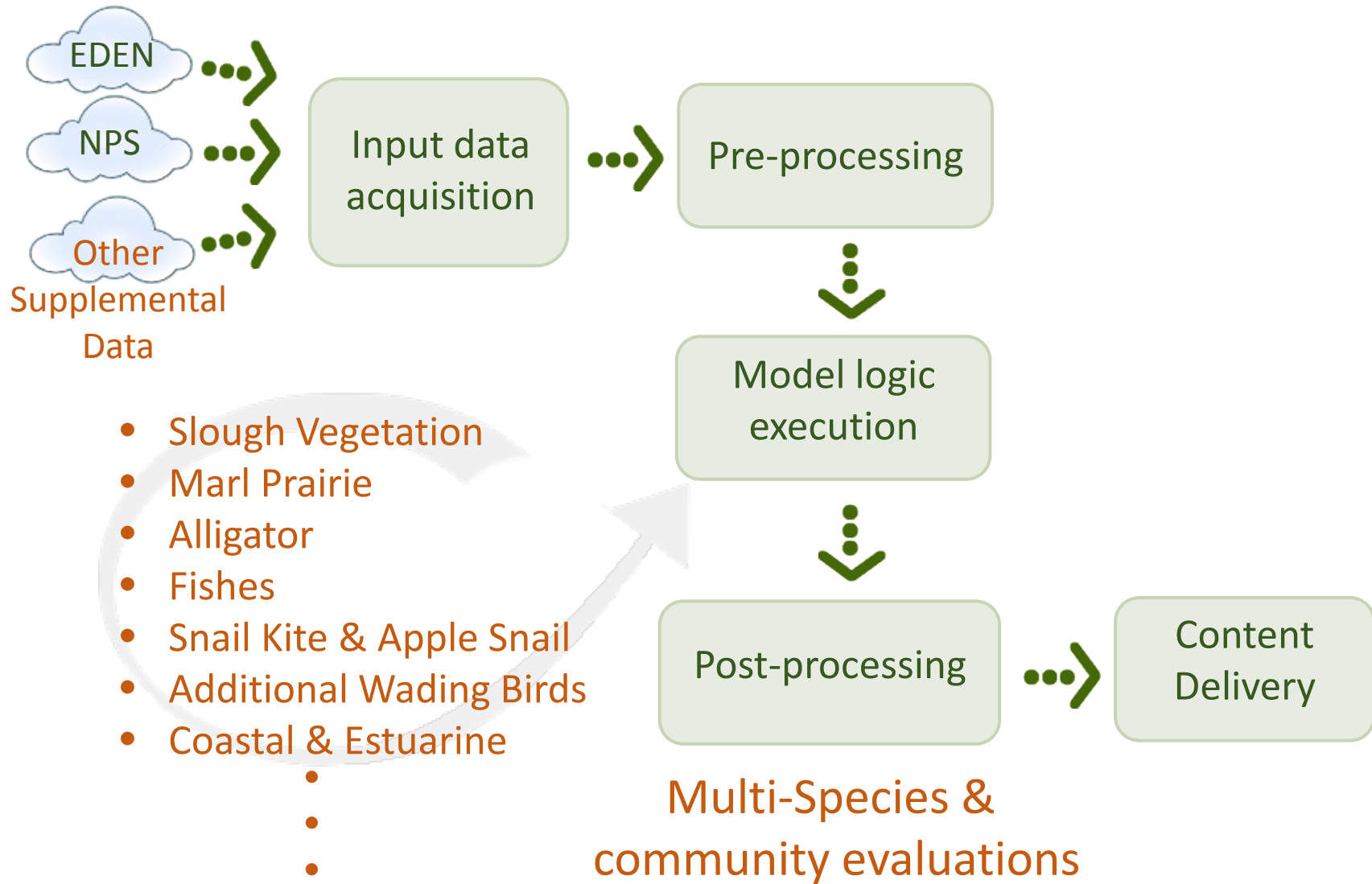
File Edit Format View Help

Version suitability Index values as predicted by the Everglades National Park's Foraging Potential Model" (STORKI ver. 1.0e). Complete documentation can be found at <http://simglades.org>.

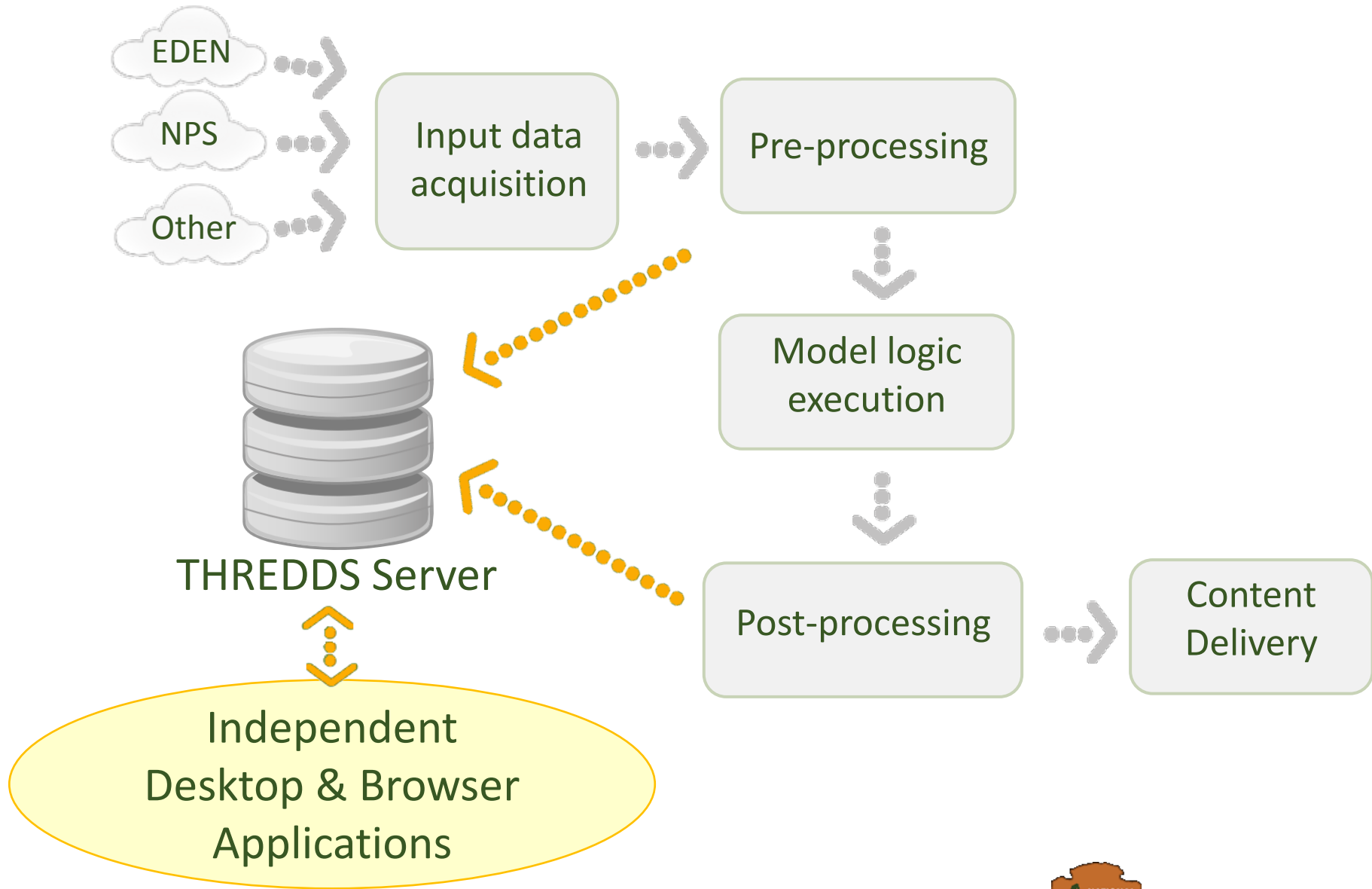
Source Data water depth surfaces are calculated from stage data provided by Everglades South Florida Information Network (<http://sofia.usgs.gov/eden/>). Note: the data utilized for water depth surfaces may be provisional depending on the range of accuracy. This indicates data are captured from live field measurements and have no formal QA/QC by the EDEN team.

Disclaimer The National Park Service gives no warranty expressed or implied for the accuracy, reliability or completeness of these data. This information is for informational purposes only and is not intended for use in the process of being finalized by the EDEN team, for more information updates visit <http://sofia.usgs.gov/eden/models/real-time.php>. One issue to note is that during dry conditions surfaces may not be as reliable as they are during wet conditions as fewer gages are available for geospatial analysis.

Automated Online Ecological Modeling – NEXT STEPS

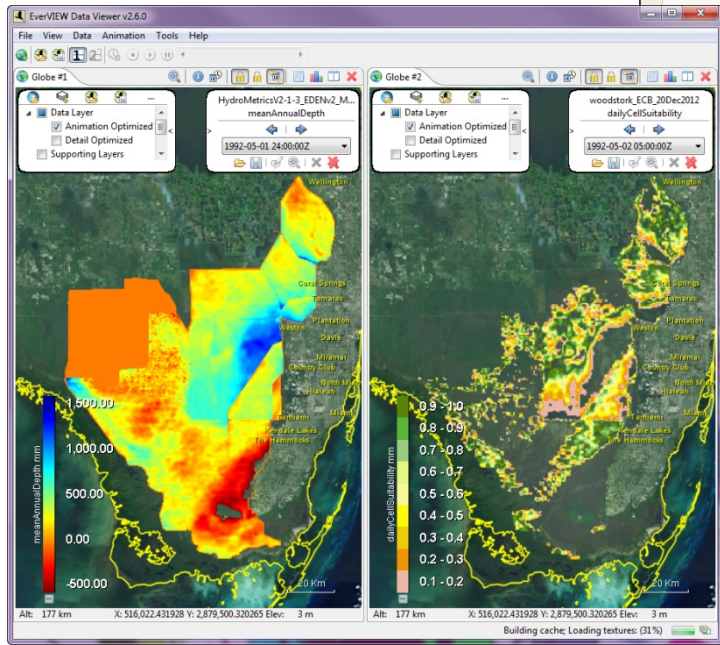


Automated Online Ecological Modeling – NEXT STEPS



Automated Online Ecological Modeling – NEXT STEPS

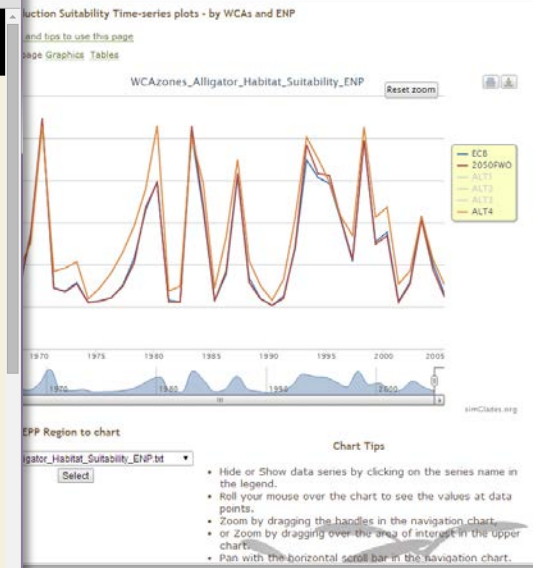
THREDDS-served Desktop & Web Apps



JEM EverVIEW data viewer



Live updates for public communication (mock-up)



Interactive Charts

Automated Online Ecological Modeling Challenges

- Develop automated system using input data from resource that are not designed to support machine readable format
- Build a heterogeneous system with a long chain of actions to work coherently
HTTP reading, NetCDF modification, biological modeling, ArcMap communication , Java coding & python scripting
- Create tools to meet the needs of resource managers for rapid ecological evaluations under changing environmental conditions

Automated Online Ecological Modeling

Recommendations of Real-Time Performance Measures

- Additional performance measure to provide ecosystem approach to natural resource management
- Increased focus on ecosystem spatial conditions to maximize system-wide benefits to natural resources
- Improved integration between water management operators and natural resource managers
- Additional flexibility in water management to implement recommendations by natural resource managers