



**Enhancing NASA's COAST
Online Application for
Agricultural Best
Management Practices
Decision Support**

Florida A&M University



GOMA Priority Issues:

Water quality for healthy beaches and shellfish beds

Habitat conservation and restoration

Environmental education

Nutrients and nutrient impacts

Coastal community resilience

TEAM MEMBERS

Florida A&M PI's

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Thomas Anthony

Collaborators

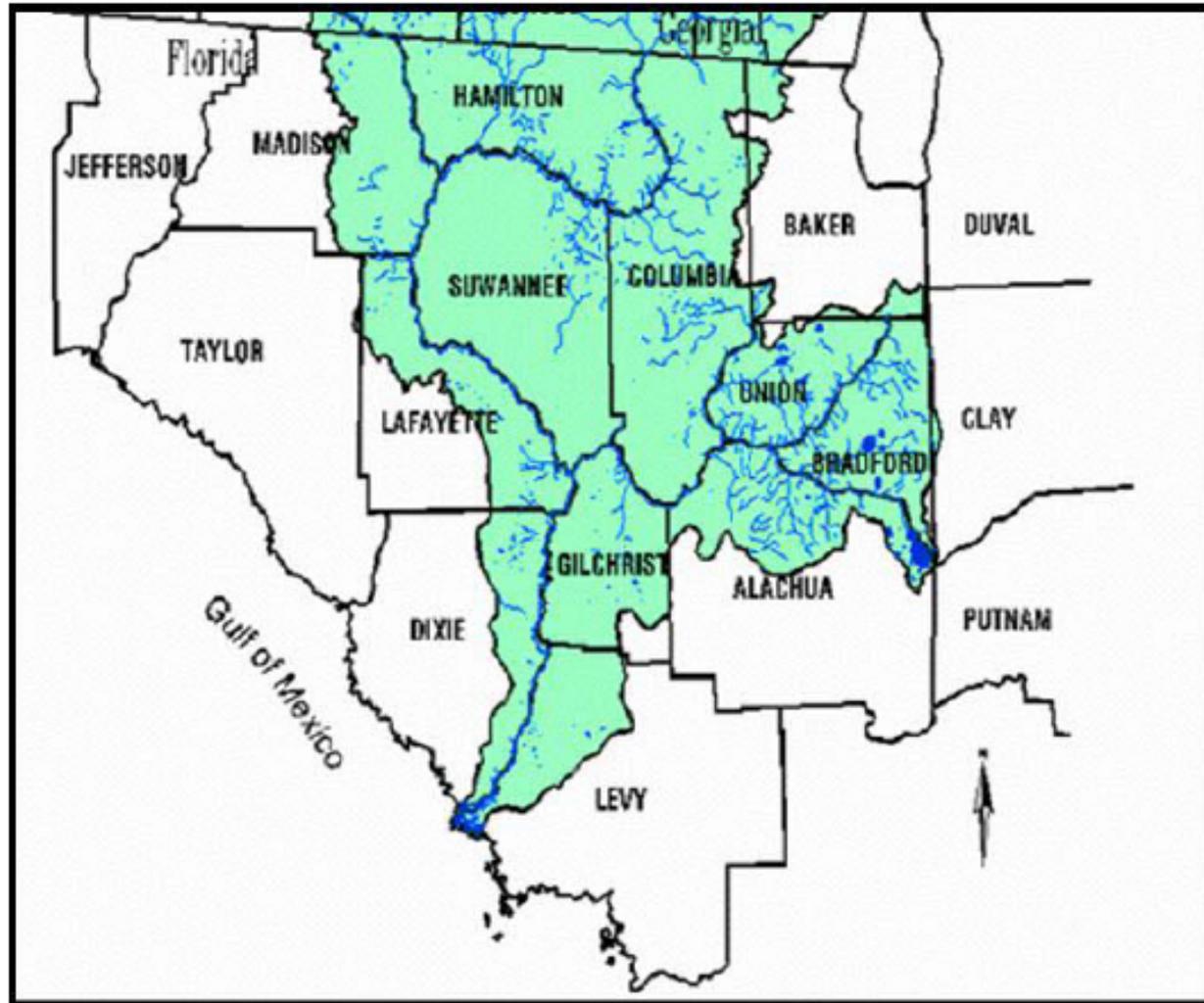
NASA Applied Science Program

Soil and Water Engineering Technology (SWET)

Florida Department of Agriculture

(Office of Agricultural Water Policy)

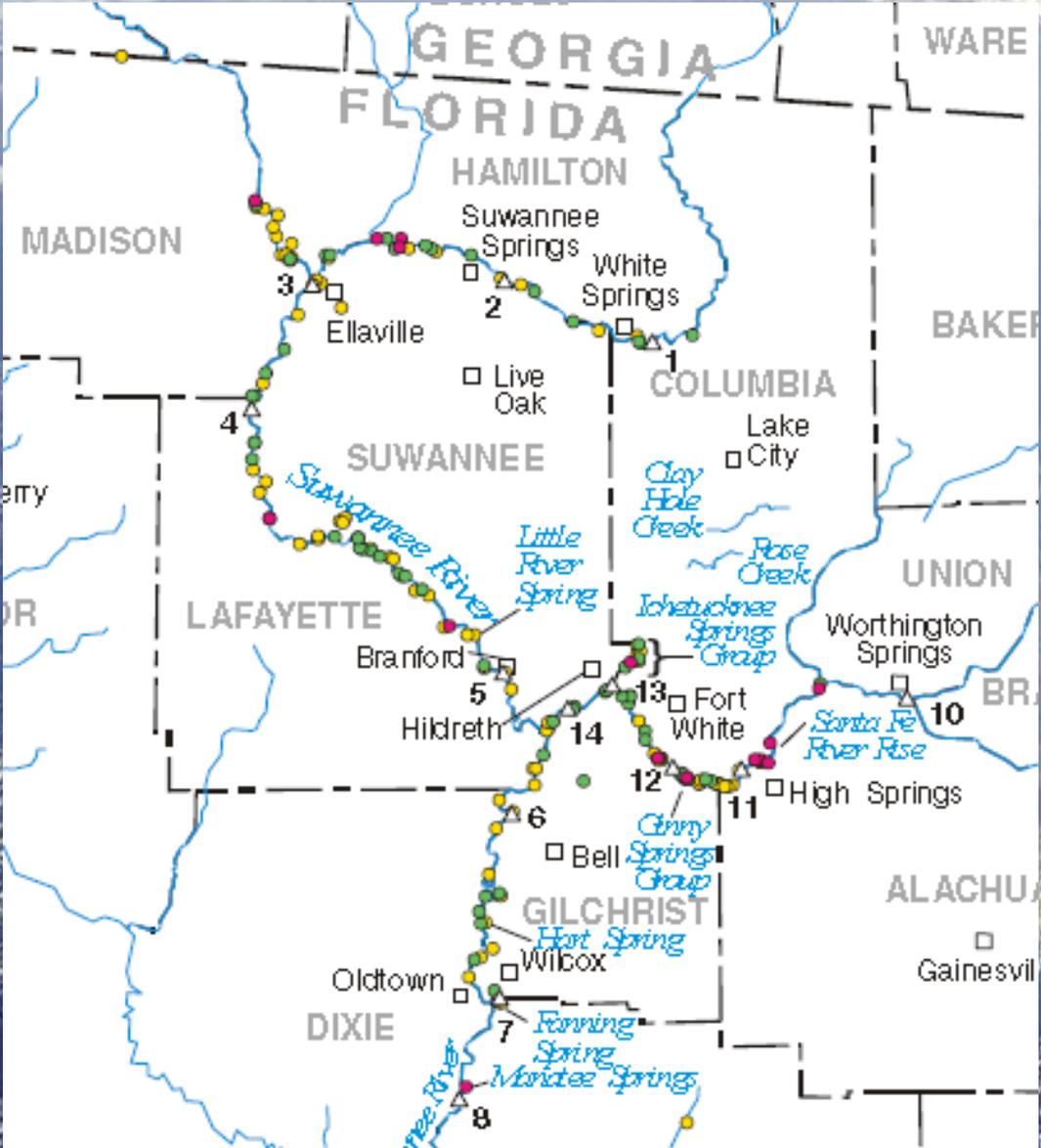
Project Location: Lower Suwannee River Basin, Florida

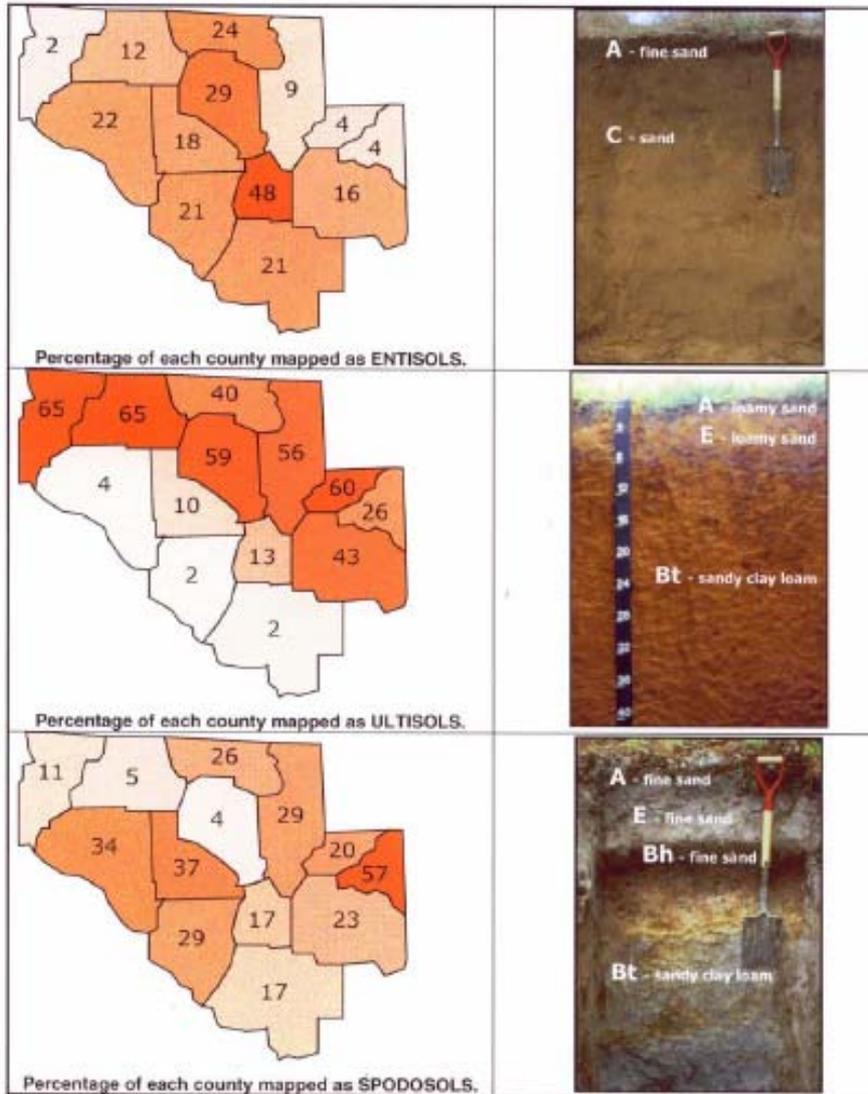


Map of Agricultural Land Use in the Suwannee River Basin



Springs in the Suwannee River





Soils in the Lower Suwannee Basin are generally sands and loamy sands with low water and nutrient holding capacities.

Figure 5. Distribution of three major soil orders used for agricultural production in north Florida, and examples of their profiles.

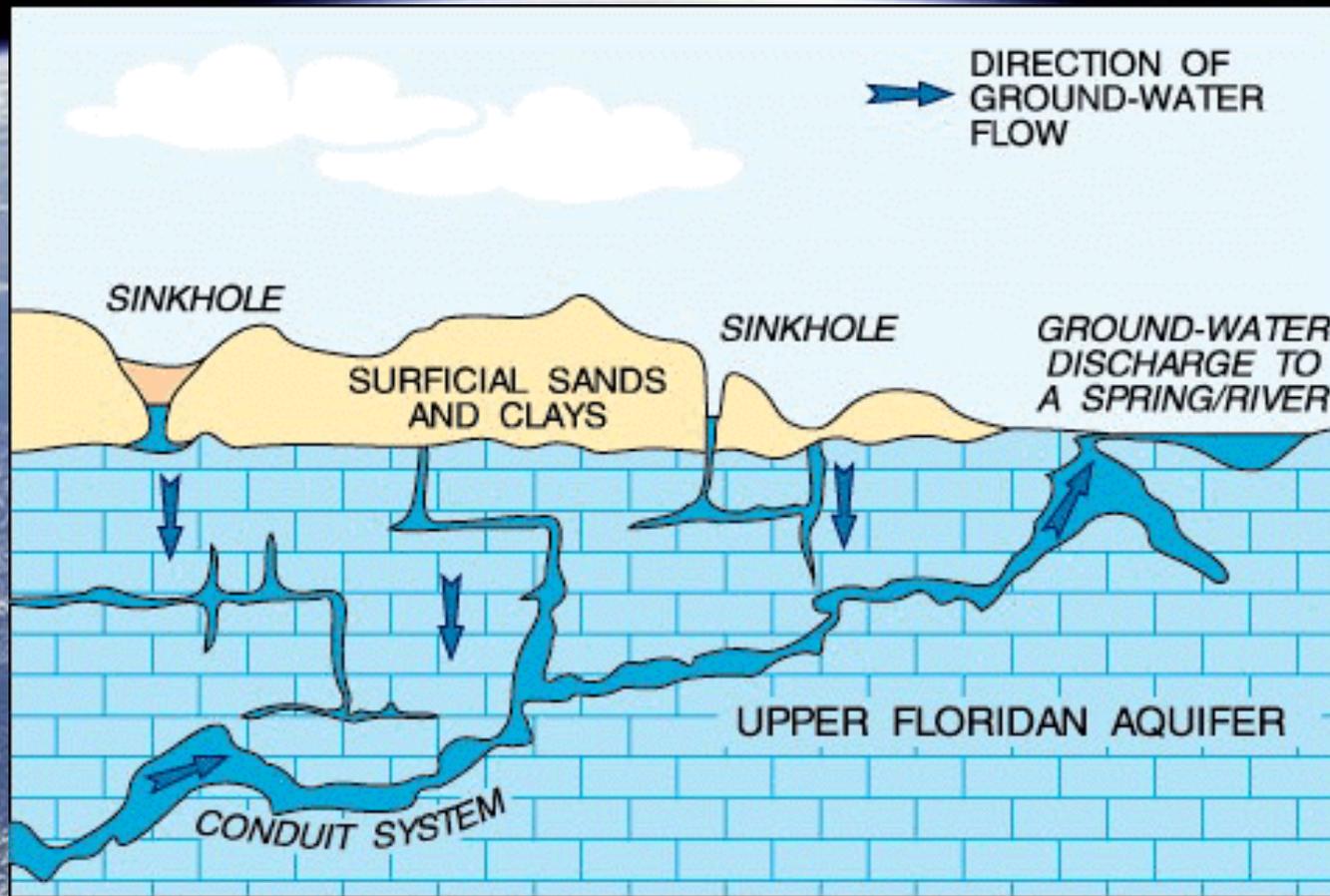
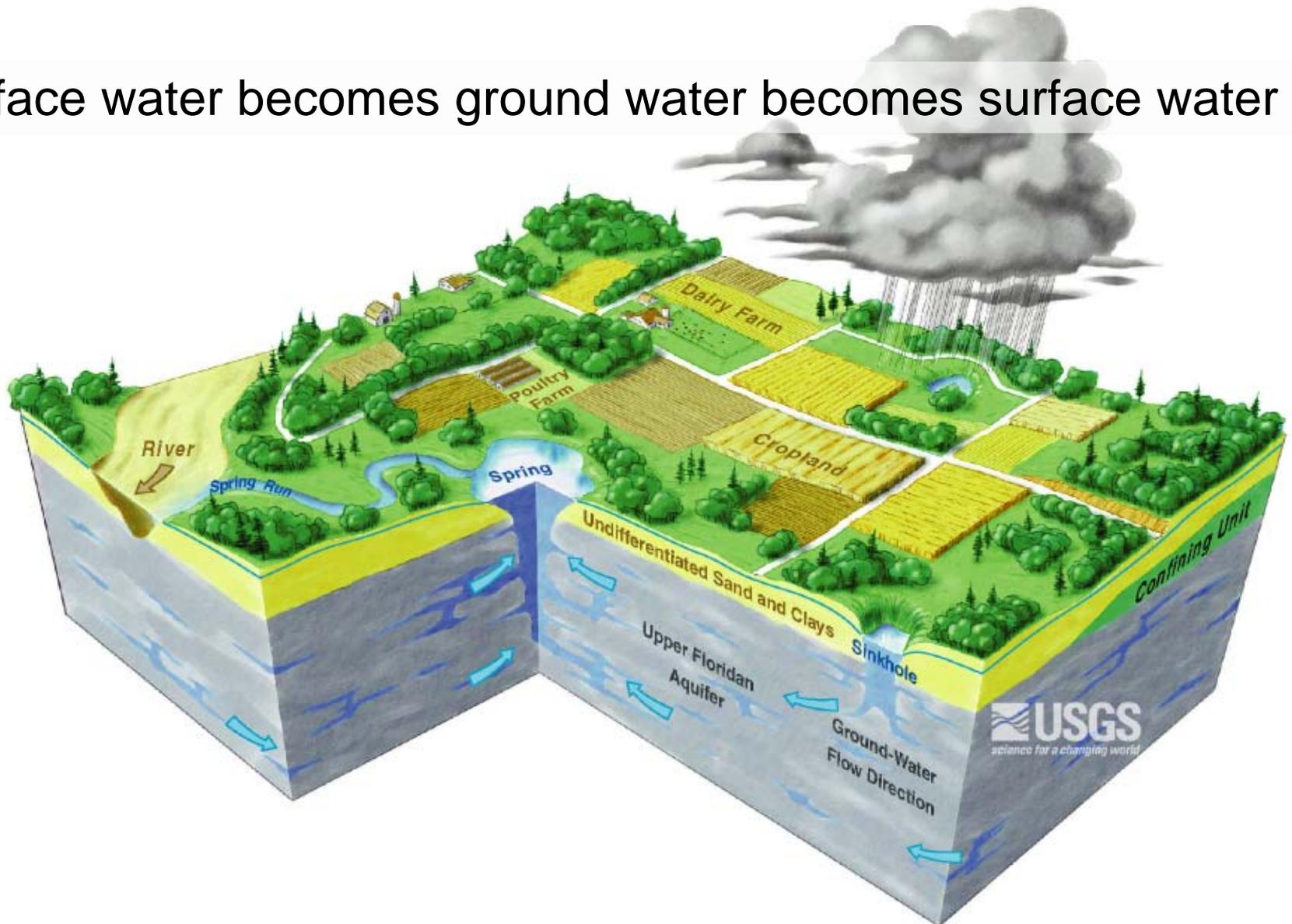


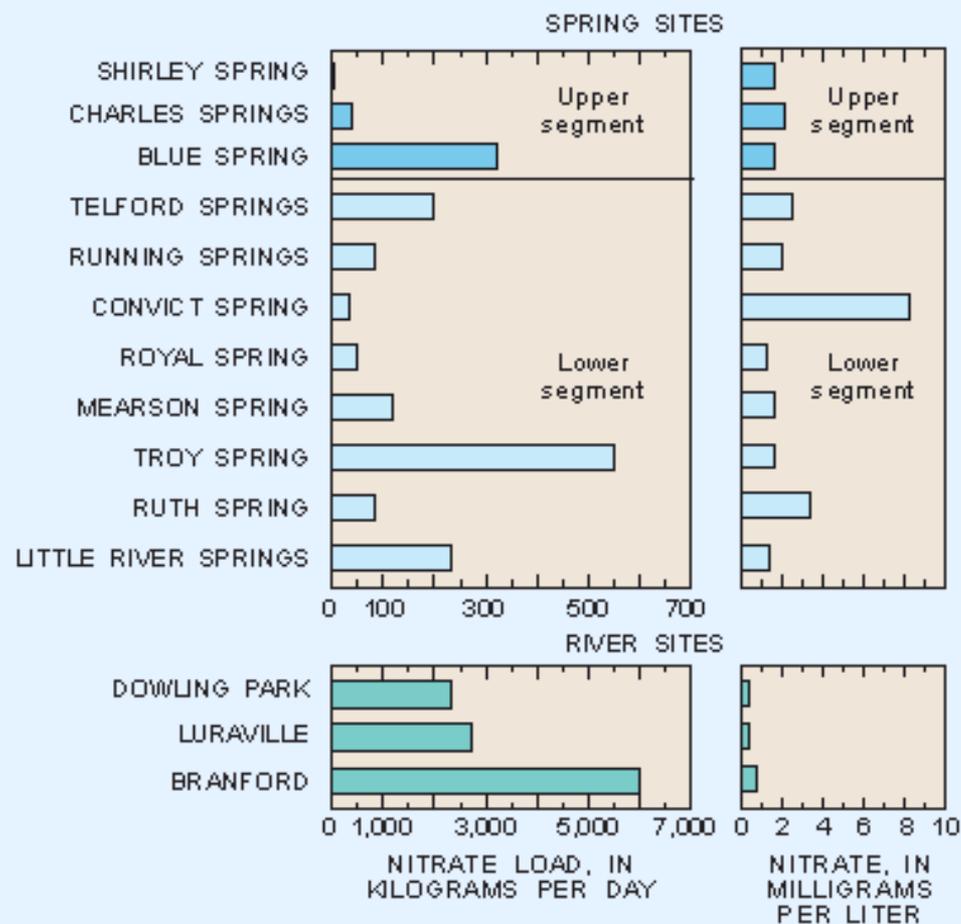
Figure 1. Generalized cross section in the Suwannee River basin showing karst features that facilitate the exchange of water between the surface and subsurface.

There is extensive connectivity between surface and ground waters in the Suwannee Basin.

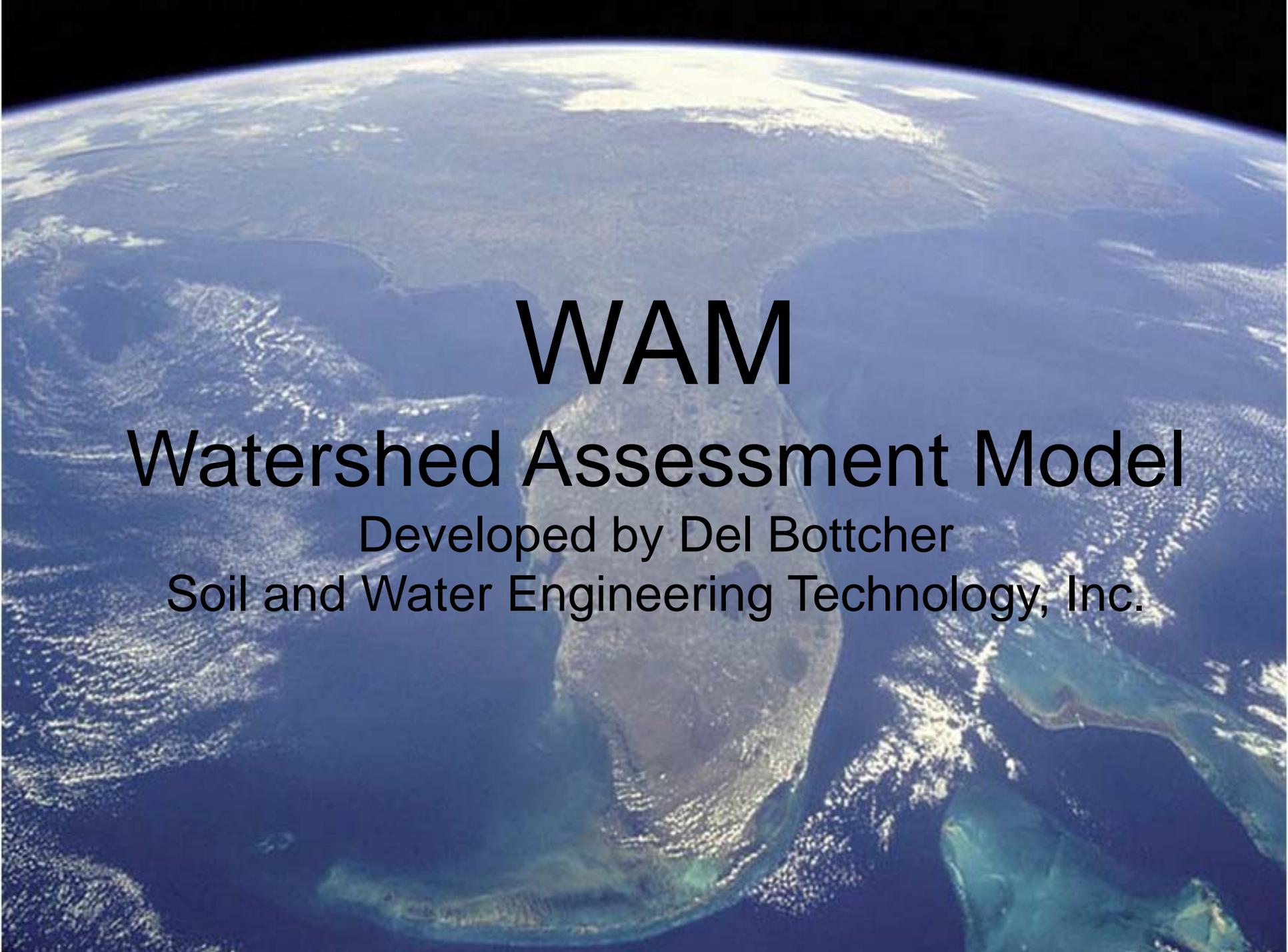
Surface water becomes ground water becomes surface water



During low flow, ground-water discharge increases nitrate concentrations and loads in the Suwannee River.



Nitrate concentrations were higher in the measured springs than in the river. Nitrate loads in the river reach increased twice as much in the lower segment than the upper segment.

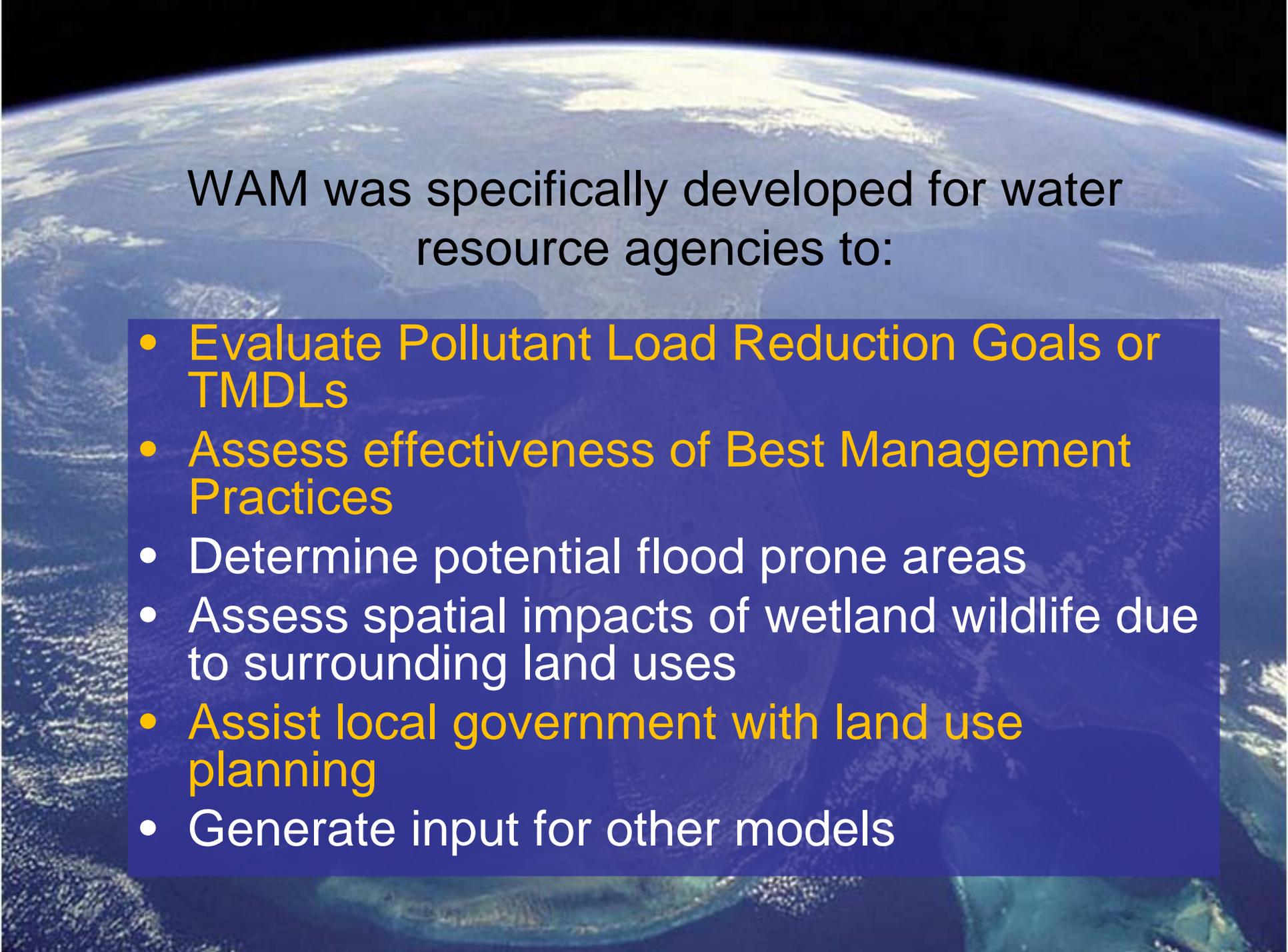
A satellite view of Earth from space, showing the curvature of the planet and various landmasses and oceans. The text is overlaid on the center of the image.

WAM

Watershed Assessment Model

Developed by Del Bottcher

Soil and Water Engineering Technology, Inc.

A satellite view of the Earth from space, showing the curvature of the planet and the blue oceans. The text is overlaid on this image.

WAM was specifically developed for water resource agencies to:

- Evaluate Pollutant Load Reduction Goals or TMDLs
- Assess effectiveness of Best Management Practices
- Determine potential flood prone areas
- Assess spatial impacts of wetland wildlife due to surrounding land uses
- Assist local government with land use planning
- Generate input for other models

What WAM can do

- Assess the spatial impact of existing and modified land use on water quality and quantity and wetland function in small or large river basins.
- Utility of Results:
 - Identify “Hot Spots”
 - Rank Pollution by Sources & Sub-Basins
 - Assess Growth Directions and Individual Development Projects
 - **Assess Abatement Strategies (BMPs)**
 - Help Develop TMDLs

Parameters Simulated

- Surface and Ground Water Flow
- Water Quality
 - Suspended Solids, **Nutrients (N and P)**, and Toxins, BOD, and Coliform Bacteria
- Wetlands Function
 - Water Quality Benefits
 - Wildlife Diversity Value in Wetlands
- Flood Proneness
 - Basins
 - Stream Flood Elevations

Data Inputs Requirements

- GIS Coverages for:
 - Land use
 - Soils
 - Topography
 - Hydrography
 - Basin Boundaries
- Climate Data
- Land Use and Soils Description Files

Simulated Outputs

- Source Load Maps (Surface and Ground Water)
- Attenuated Subbasin and Basin Loads
- Ranking of Land Uses by Load Source
- Daily Time Series of Flow and Pollutants
- **Comparative Displays of Different BMP / Management Scenarios**
- Wetland Value (WQ and Wildlife)

Tools

Zoom Scale
1.5



MAJ. ROADS

On Off

MIN. ROADS

On Off

STREAMS

On Off

CITIES

On Off

COUNTIES

On Off

SECTIONS

On Off

MODIFY

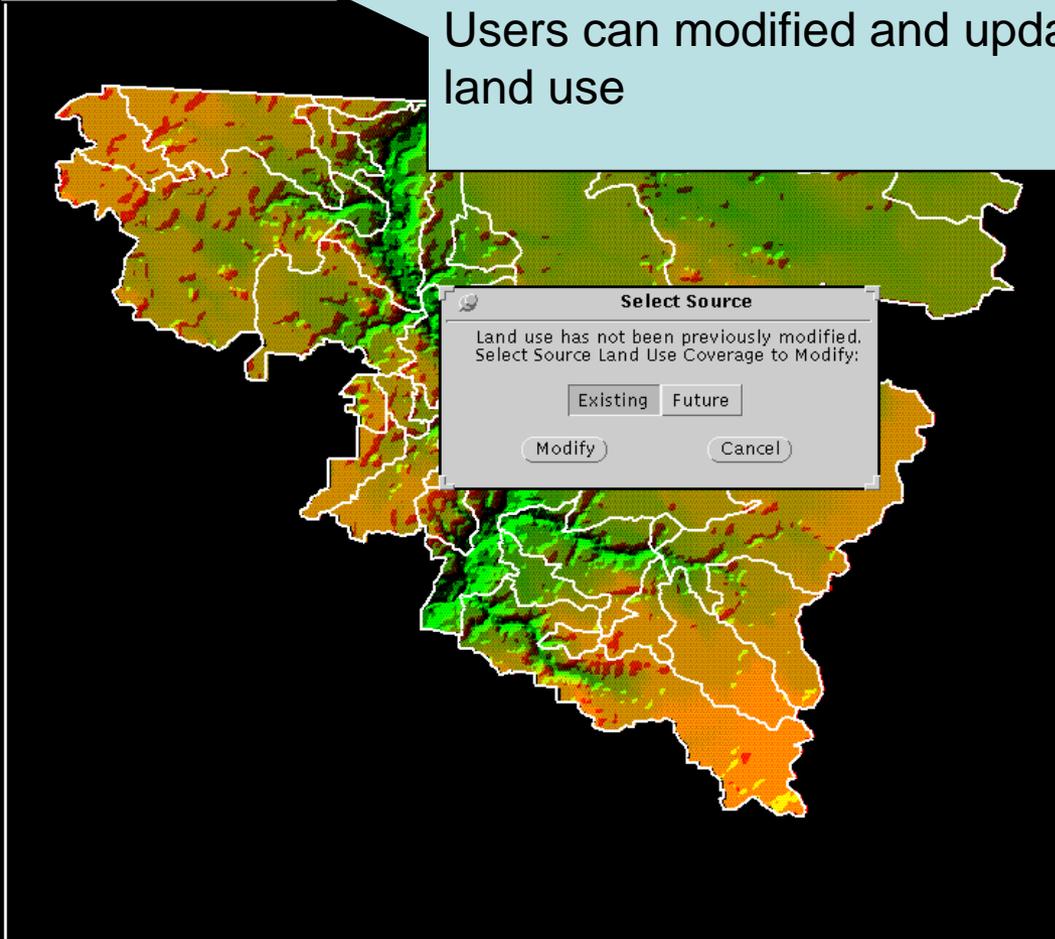
INDIVIDUAL LAND USE EDITS

APPLICATION OF BMPS

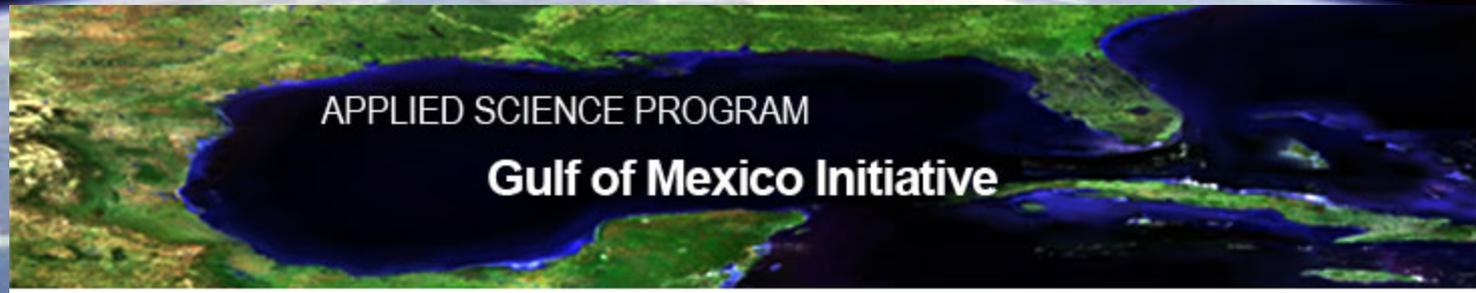
GLOBAL LAND USE SWAP

Map

Users can modified and update land use



Waste



APPLIED SCIENCE PROGRAM

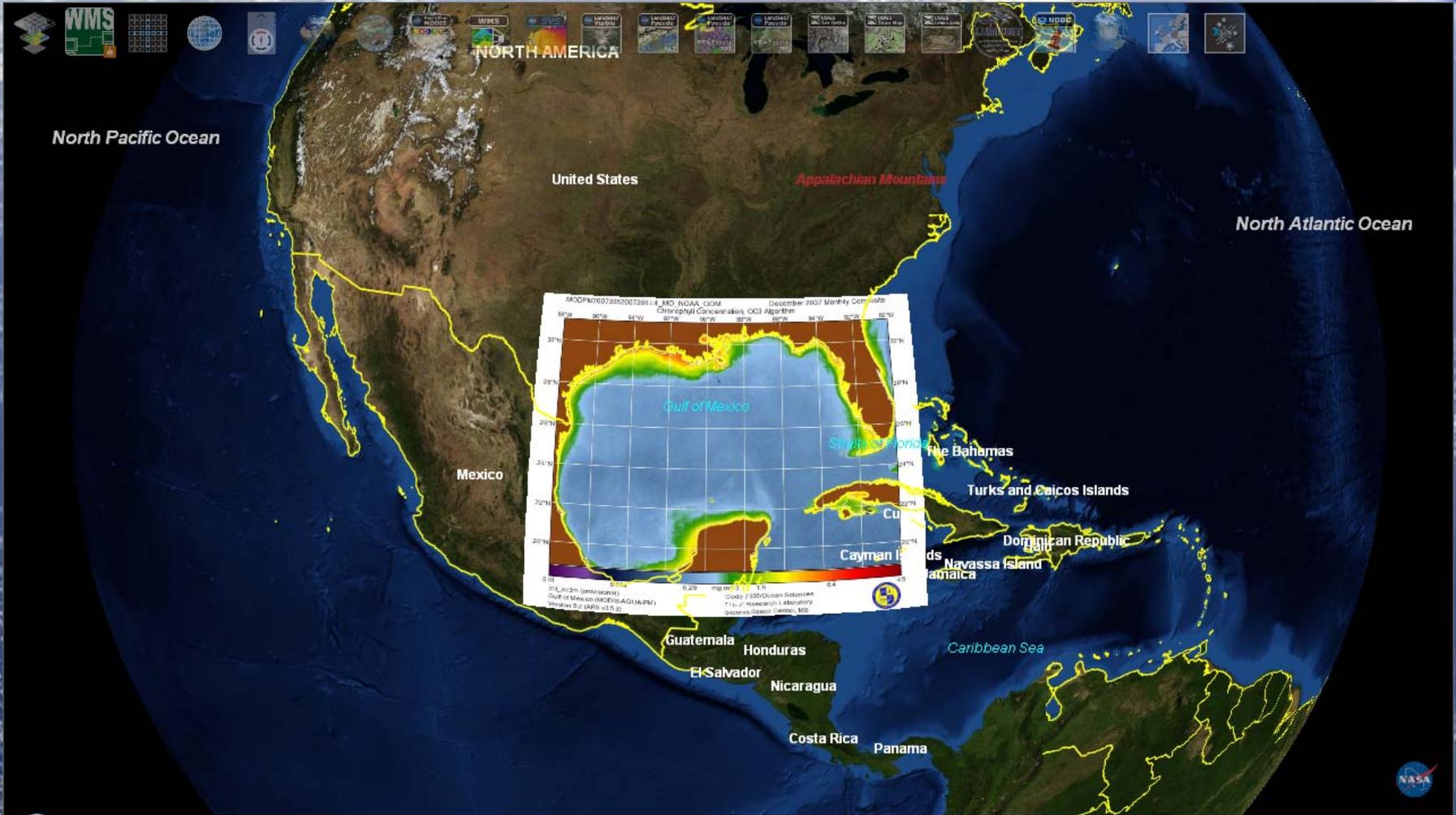
Gulf of Mexico Initiative

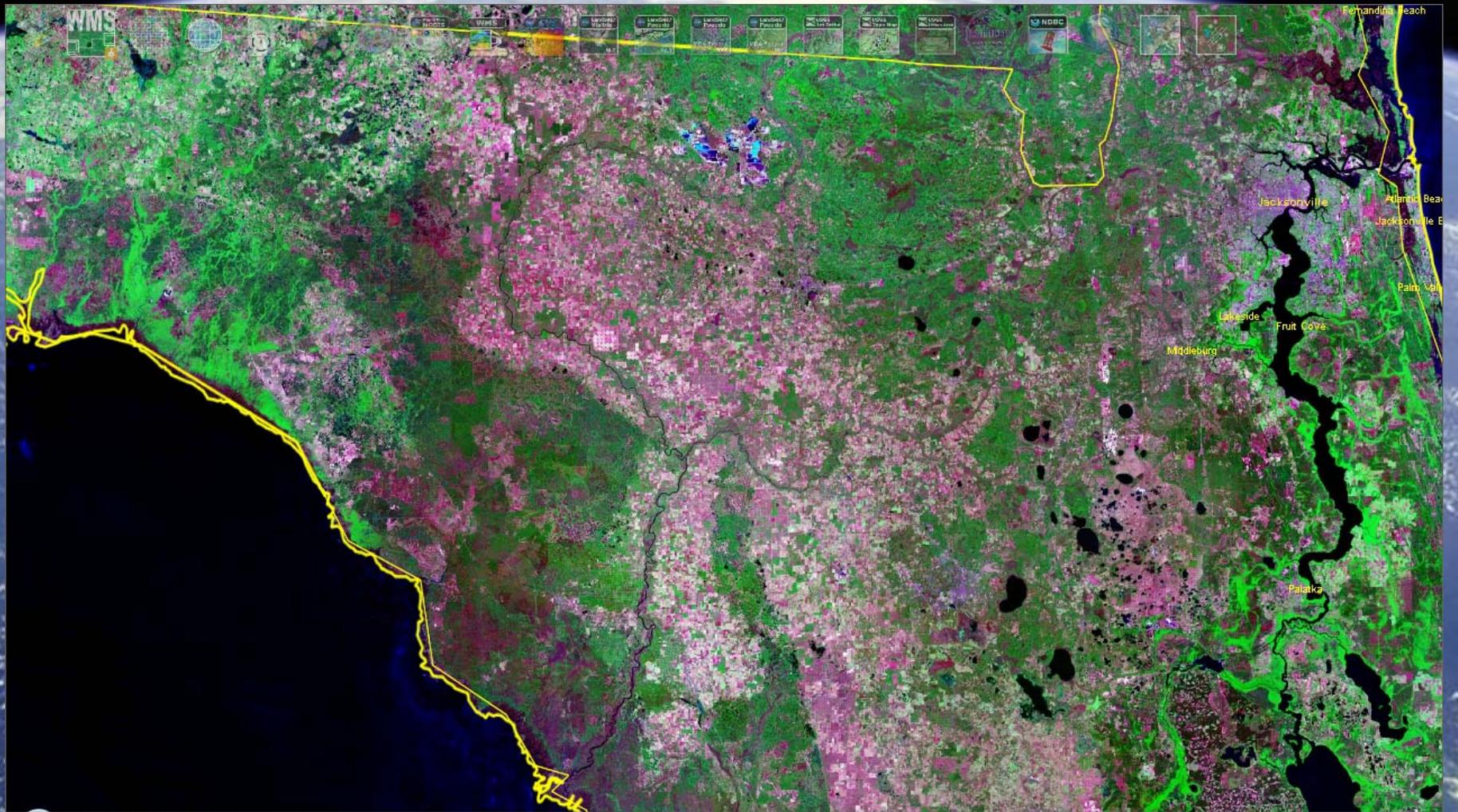
COAST

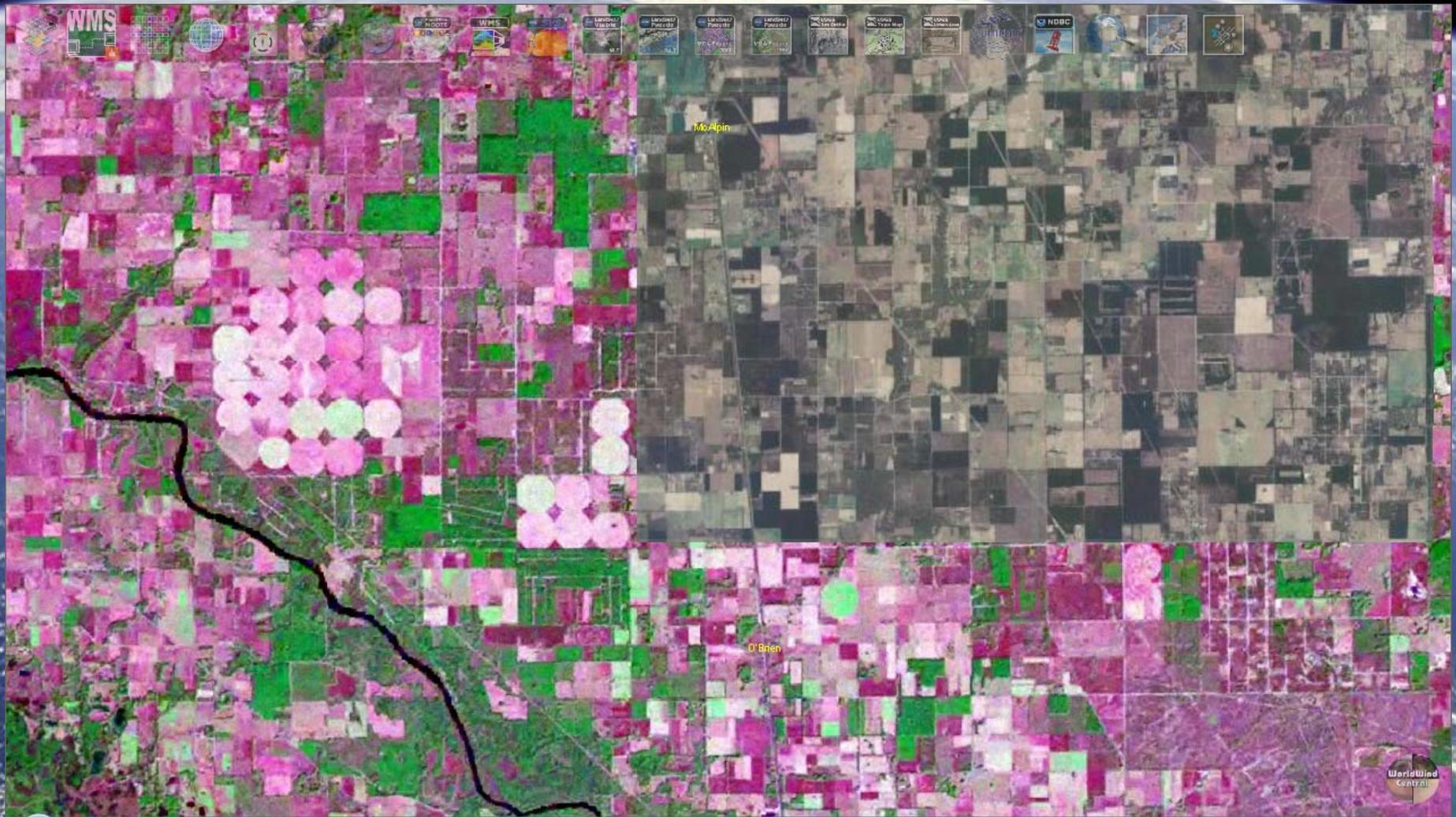
Coastal Online Assessment and
Synthesis Tool

Developed by NASA Applied Science and
Technology Office
Stennis Space Center





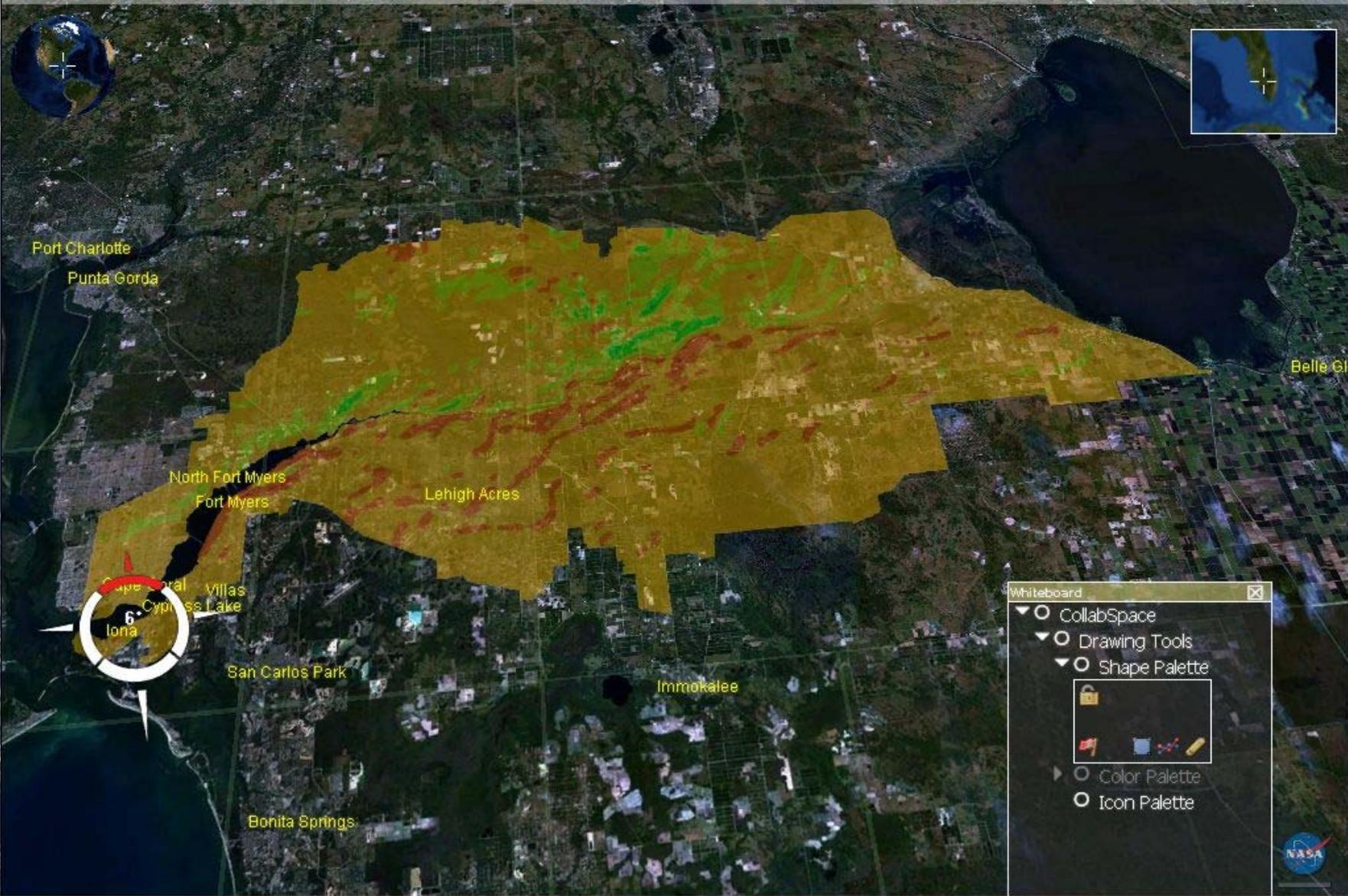




McAlpin

O'Brien

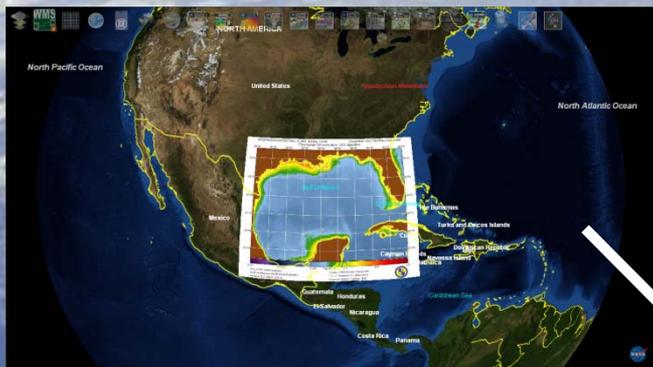
WorldWind
Central



Whiteboard

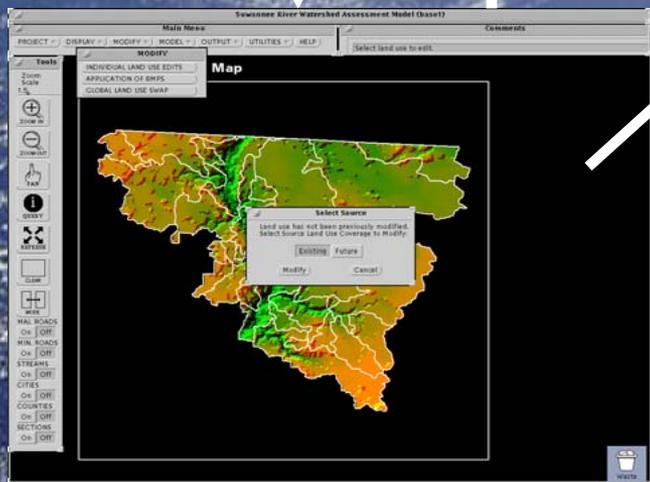
- CollabSpace
- Drawing Tools
- Shape Palette
- Color Palette
- Icon Palette

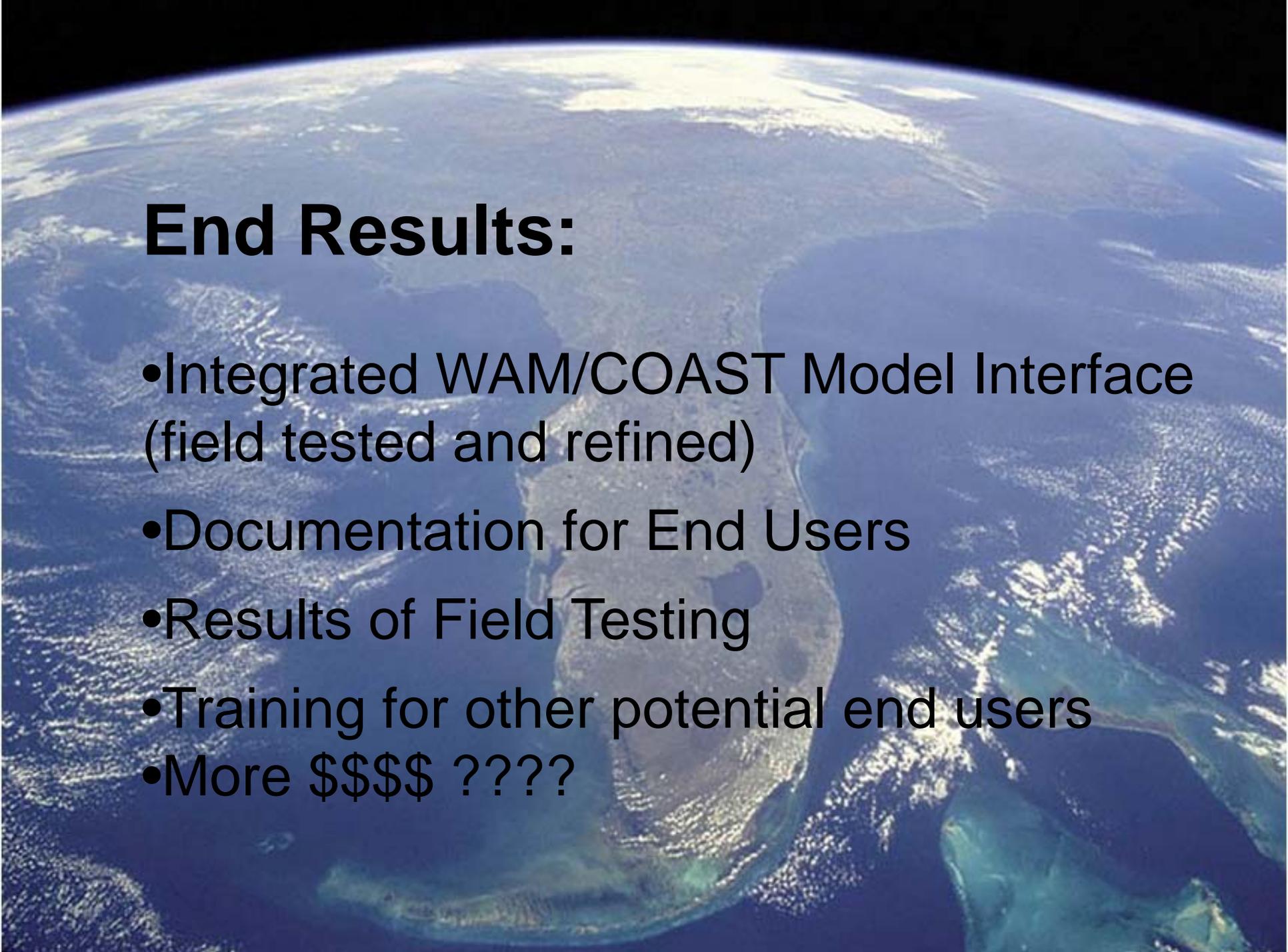
A whiteboard panel with a list of tool categories and their corresponding icons. The categories are CollabSpace, Drawing Tools, Shape Palette, Color Palette, and Icon Palette. The Shape Palette icon shows a lock symbol and several drawing tools like a rectangle, circle, and line.



WAM/COAST
System
Interface

End User
(FDACS)
Others could
include FDEP,
NRCS, Extension
Agents



A satellite view of Earth from space, showing the curvature of the planet and the blue oceans. The text is overlaid on the left side of the image.

End Results:

- Integrated WAM/COAST Model Interface (field tested and refined)
- Documentation for End Users
- Results of Field Testing
- Training for other potential end users
- More \$\$\$\$?????