

# Regional Sediment Management



...for balanced, sustainable solutions

# Regional Sediment Management

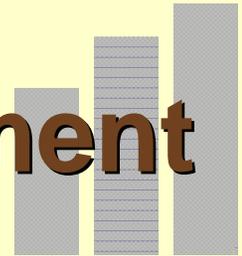
LTG Flowers stated:

**“We need to move to a watershed approach as it applies to water resources projects so that *each of our projects fits into the context of a regional plan.*”**

LTG Robert Flowers – e-mail to USACE on 19JUN02, commenting on his testimony to the Senate Environment and Public Works Committee hearing on Corps of Engineers water resources programs.



# Regional Sediment Management

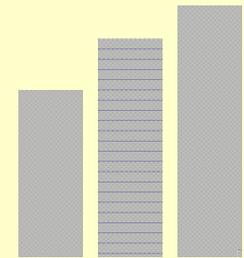


**Regional Sediment Management is...**

*...fitting each of our sediment management actions into the context of a regional strategy.*



# RSM Approach



## Recognizes Sediment as a Resource

**Integral to economic and environmental vitality**

**Consider the multiple inter-related resource needs and opportunities**

## Sediment System provides context for managing projects/activities involving sand & other sediments

Coastal, river & estuarine systems

Regional sediment system -**Sources, sinks, timing, direction, quantity, quality, influencing factors ...**

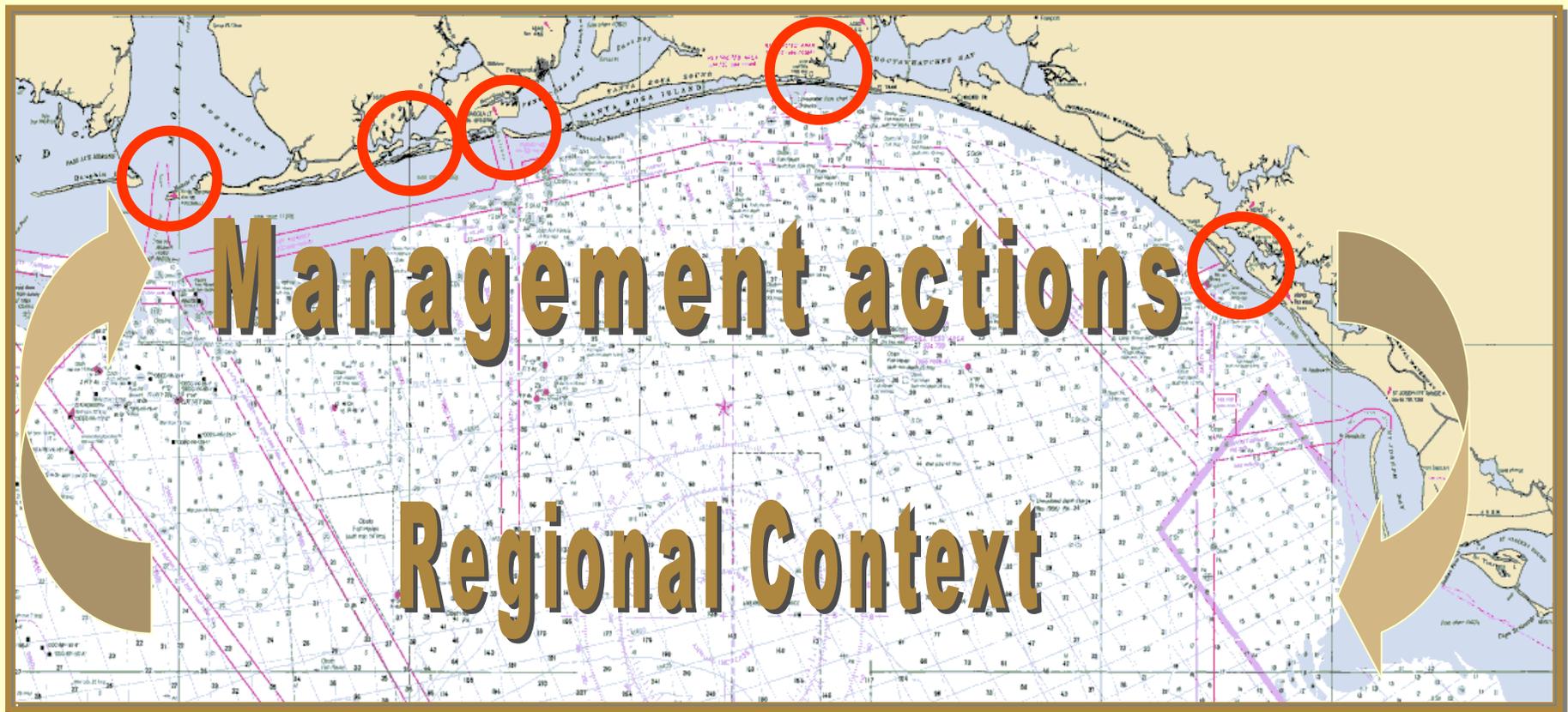
## Uses

Knowledge about the sediment system as context for local project decisions and consideration of long range implications

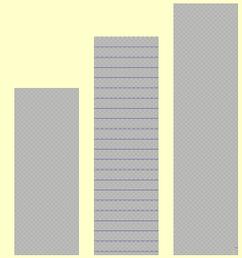
Partnerships across government levels and w/ private sector  
**to balance objectives and leverage resources**



# Regional Sediment Management



# Stakeholder Objectives



**Navigation**



**Ecosystem  
Restoration**



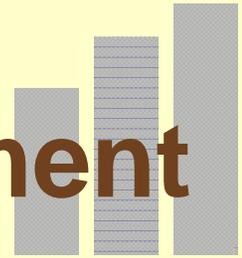
**Recreation**



**Storm  
Protection**



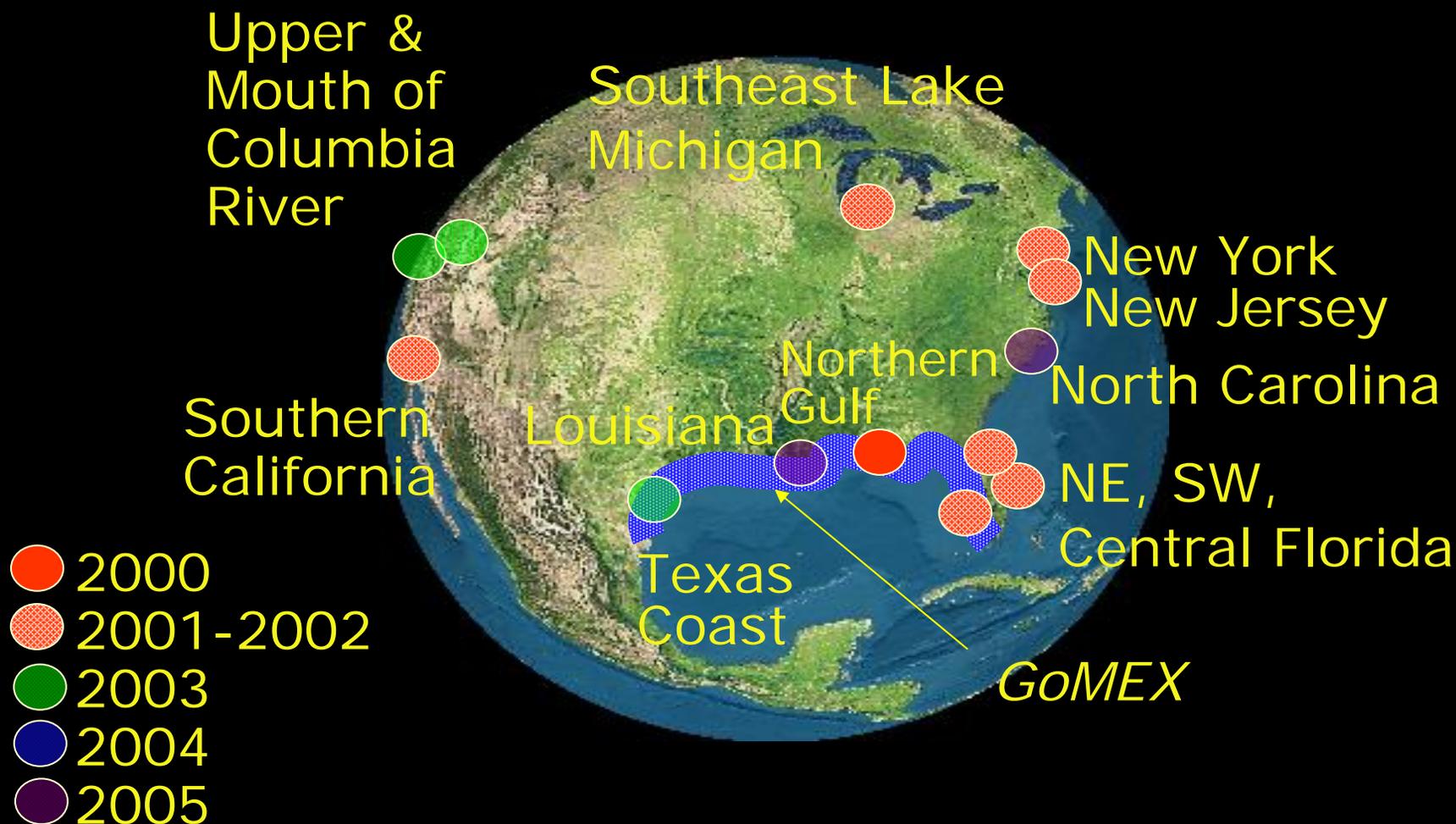
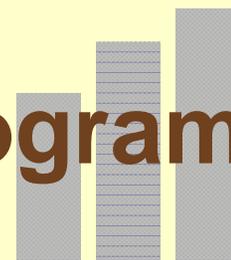
# Regional Sediment Management



**Requires**  
**stakeholder partnering &**  
**technology.**

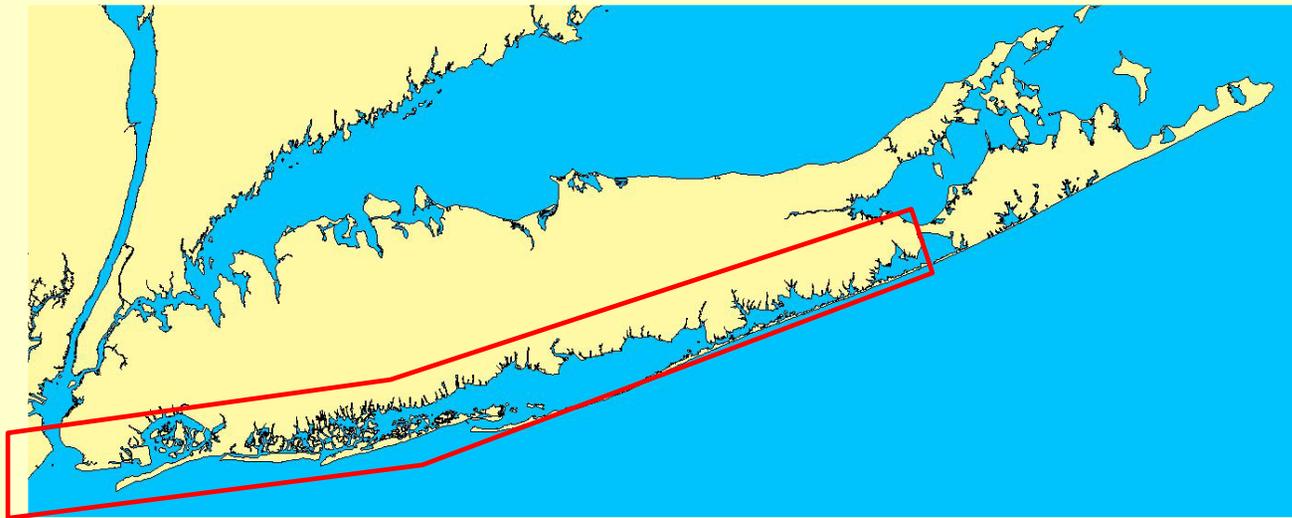


# National RSM Demonstration Program

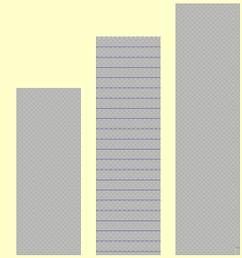


# Sediment Needs Assessment

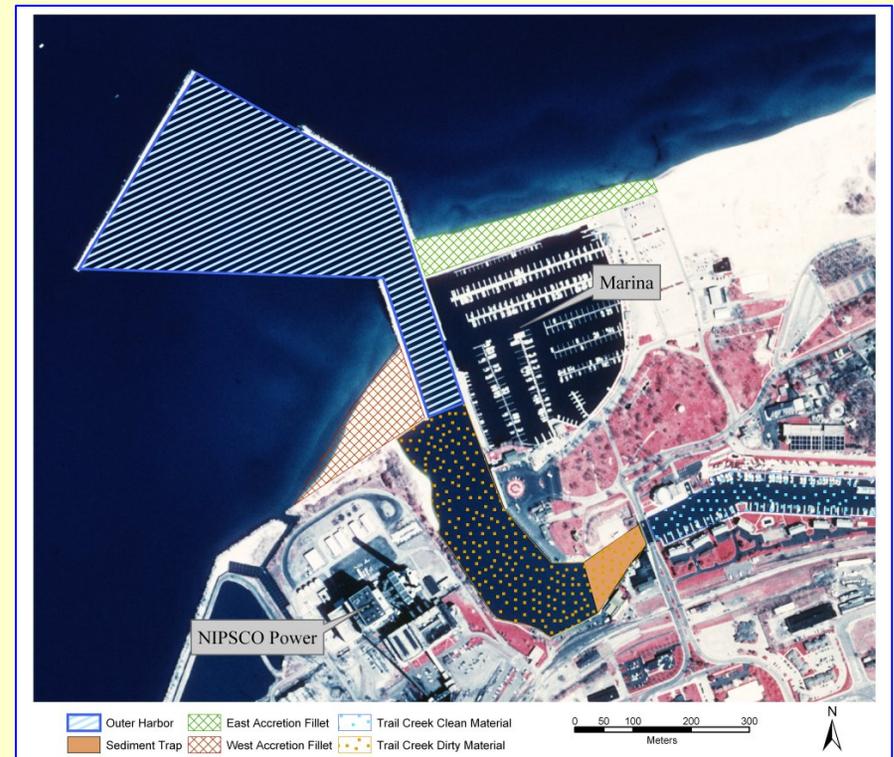
- **Address sediment issues and needs in a larger context.**
- **Agency, Academic, Public Involvement.**



# DMMP Development



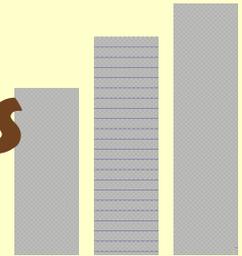
- **Expand Focus of DMMP from Project-Based Decisions to Regional-Based Decisions.**
- **Include All Stakeholders in Decision making Process.**
- **Address Sediment Management rather than just Dredging and Disposal Issues.**



Michigan City, IN



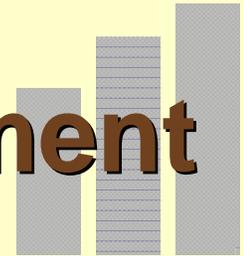
# Some '06 RSM Demo Efforts



- **Sediment Needs Assessment – Long Island, NY**
- **Wrightsville Beach to Carolina Beach- beach and inlet management plan**
- **Sediment Inventory – Great Lakes sources, demands, shoaling impacts**
- **Chesapeake Bay Sediment Management Coordination Workshops**
- **Lower Snake R Programmatic Sediment Management Plan**
- **Darby-Cobbs Watershed Sediment Assessment**
- **California Coastal Sediment Management Plan**



# Regional Sediment Management



## R&D Program Objective

...provide the Corps and Nation with **tools and knowledge** needed to **manage** sediment on a regional basis to achieve **effective & efficient water resources projects** that are environmentally **sustainable**.



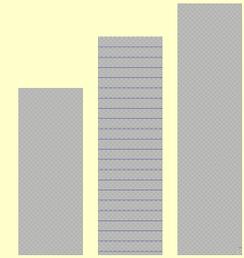
# Implementation of eCoastal



eCoastal provides an interface to hydrographic, topographic, photogrammetric, historic dredge material, and other data for improved decision-making



# eCoastal Tools



## Jacksonville District

Beach Profile Tools

## Mobile District

Hydrographic Survey Tools

National Coastal Databank

## Los Angeles District

Dredging / Sediment Placement Decision Support

## Engineer Research & Development Center

Sediment Budget Analysis System

Structure Condition Index Assessment

Silent Inspector

USACE Spatial Data Branch :: eCoastal Training - Microsoft Internet Explorer

Address: [http://gis.sam.usace.army.mil/programs/training/Training\\_eCoastal.htm](http://gis.sam.usace.army.mil/programs/training/Training_eCoastal.htm)

USACE Main Who We Are Missions History Related Links Kids Corner

US Army Corps of Engineers®

Spatial Data Branch

**RELEVANT  
READY  
RESPONSIVE  
RELIABLE**

*Proudly serving the Armed Forces and the Nation now and in the future.*

eCoastal Home Training Dates

**FY05: Coastal GIS Modules**

- Course Introduction
- Introduction to Coastal GIS
- Impacts to Sensitive Habitats
- Introduction to GPS
- Data Management
- Data Management-Applications
- Data Visualization & Volume Calculation
- Sediment Budget Analysis System (SBAS-A)

**Training Data**

- Download Training Data
- eCoastal Tools

**eCoastal Training**

A new component to the eCoastal program is the addition of specialized training for coastal engineers on the tools of the eGIS toolbox. This is a four day course held 2 to 3 times a year at a coastal district. The next training will be held **February 21-24, 2006**.

- [View Training Details](#)

To access the student manual for any FY05 Coastal GIS module, follow the links to the left. Each manual is produced in a Microsoft PowerPoint format. To follow the student lessons, you will need to download the student data. To view the instructor's lecture presentation, use the links below.

*FY06 Training Materials will be posted after the first class is held.*

**Introduction to Coastal GIS :: [view lecture](#)**

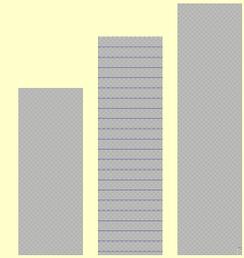
The coast is a dynamic setting rich in natural resources. A geographic information system (GIS) is the perfect tool for managing those resources. An important part of any GIS is the creation of metadata that describe the data. Metadata records document geospatial data in a consistent form and help you find data of interest, determine the usefulness of the data, and determine how to access the data. In this exercise you will first locate spatial data of interest on the Internet. Once you have the spatial data, you will then develop the metadata. Finally, you will incorporate all of the information into a geodatabase and gain an understanding of basic geodatabase functionality.

**Impacts to Sensitive Habitats :: [view lecture](#)**

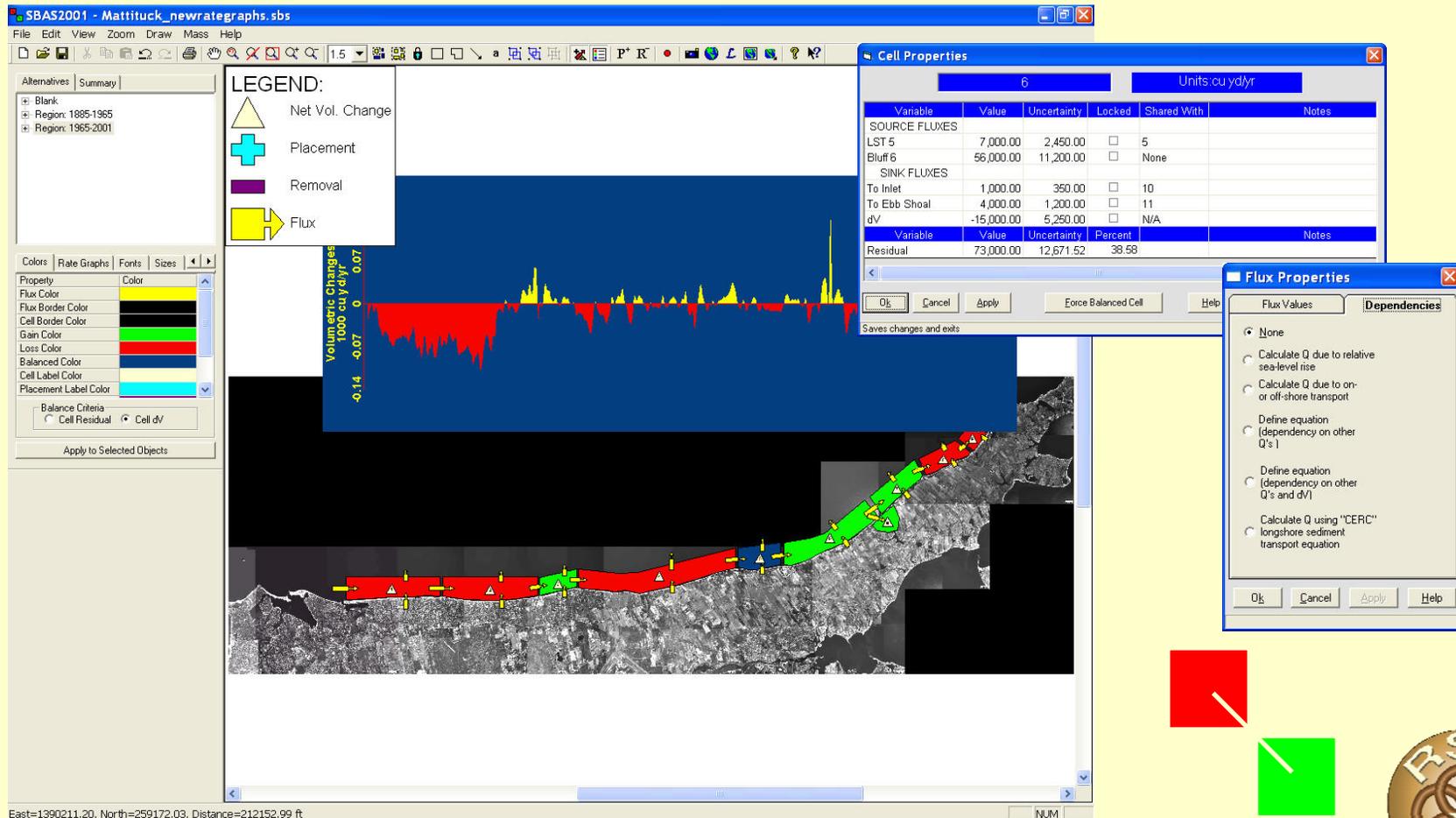
In this module you will learn about the coastal setting in the context of habitat



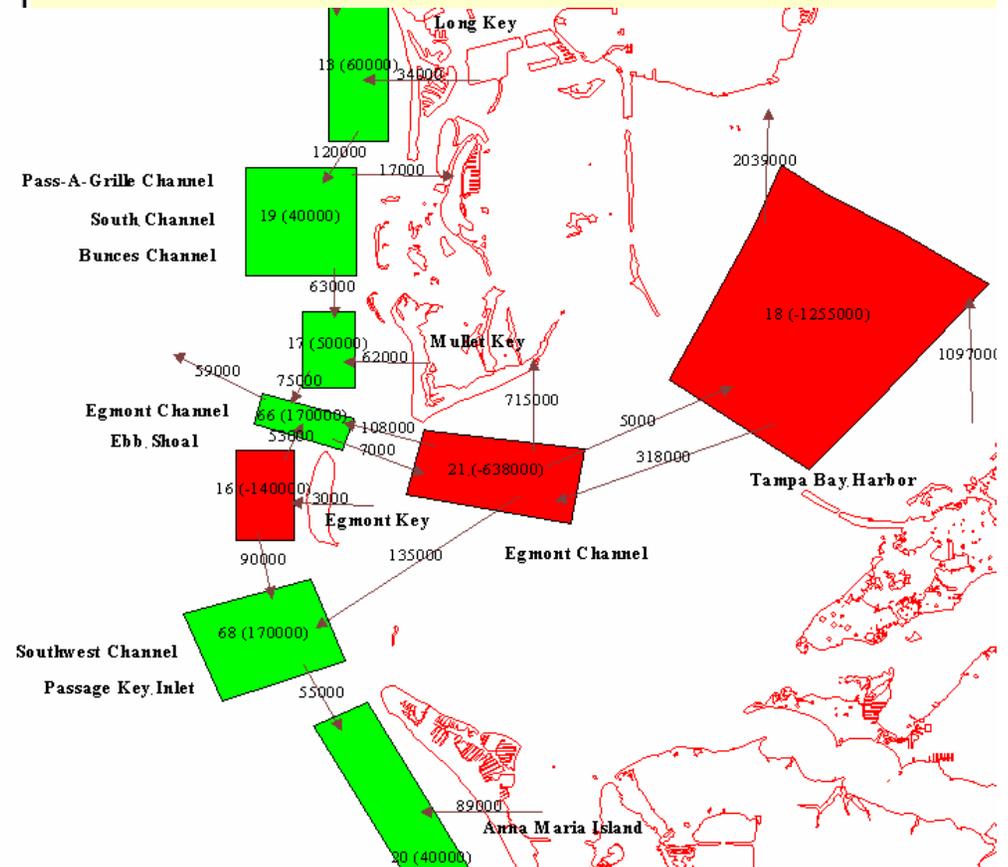
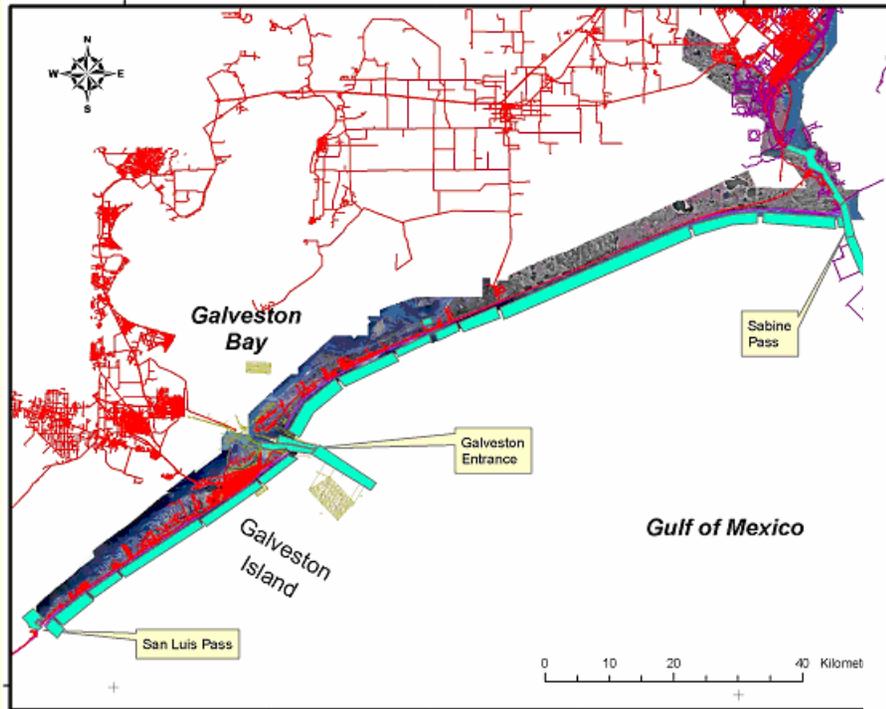
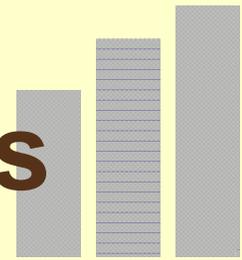
# SBAS



## Sediment Budget Analysis System

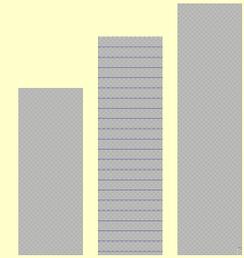


# Regional Sediment Budgets



Provide a detailed accounting of sediment movement as a tool for evaluating present and future RSM activities and decisions.

# ArcGIS Coastal Sediment Analyst (CSA)



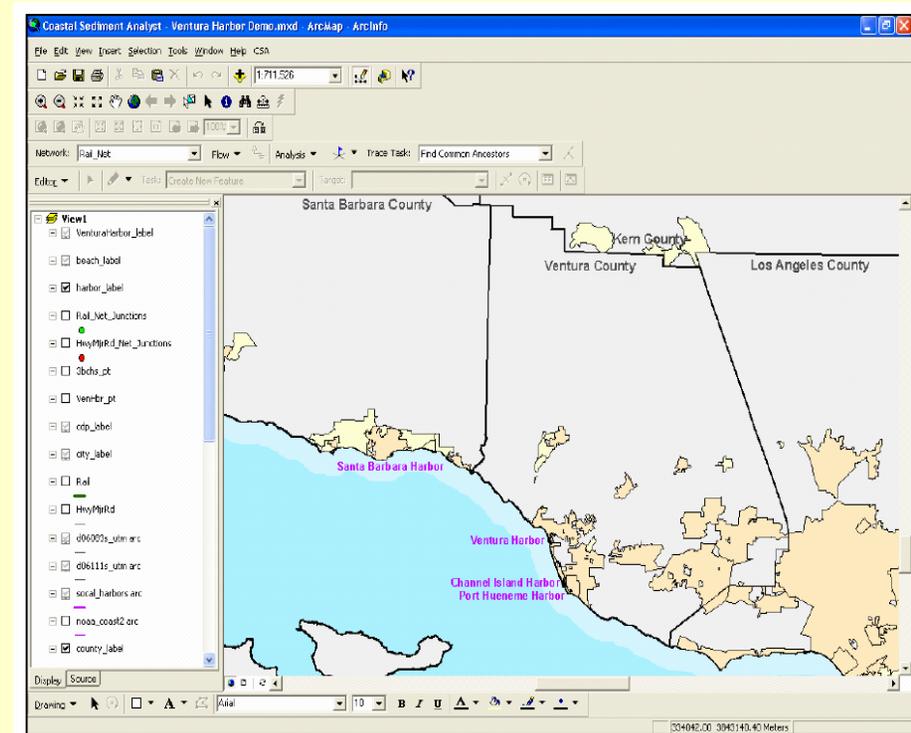
## Decision-Support Tool

- Evaluate future dredging and disposal options.

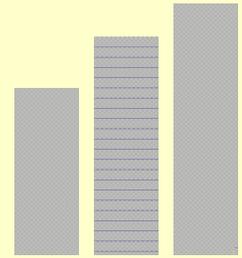
**Create cost functions for dredge material disposal**

**Calculate benefits for dredge material placed on beach sites.**

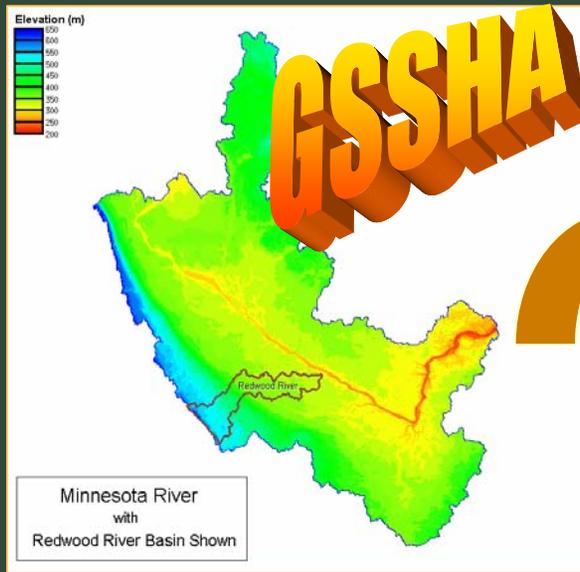
**Estimate differential cost versus regional benefits for beach sites.**



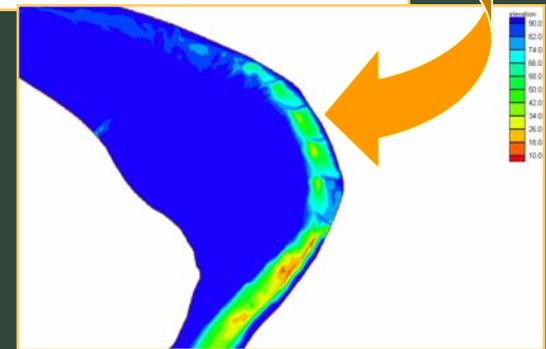
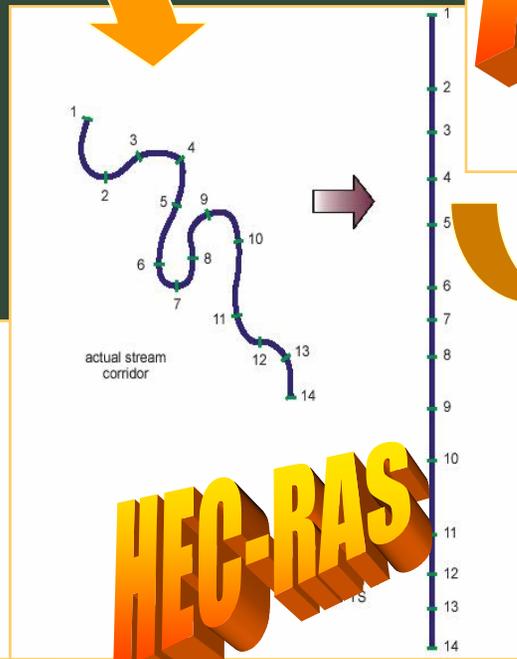
# River Basin Models



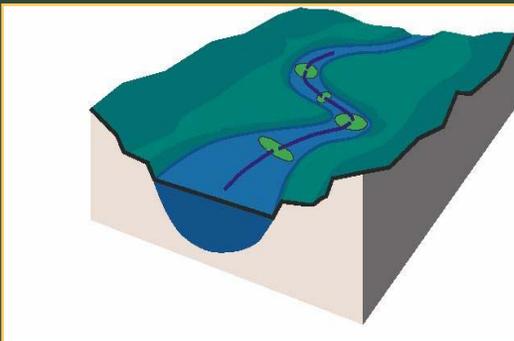
Watershed loads...



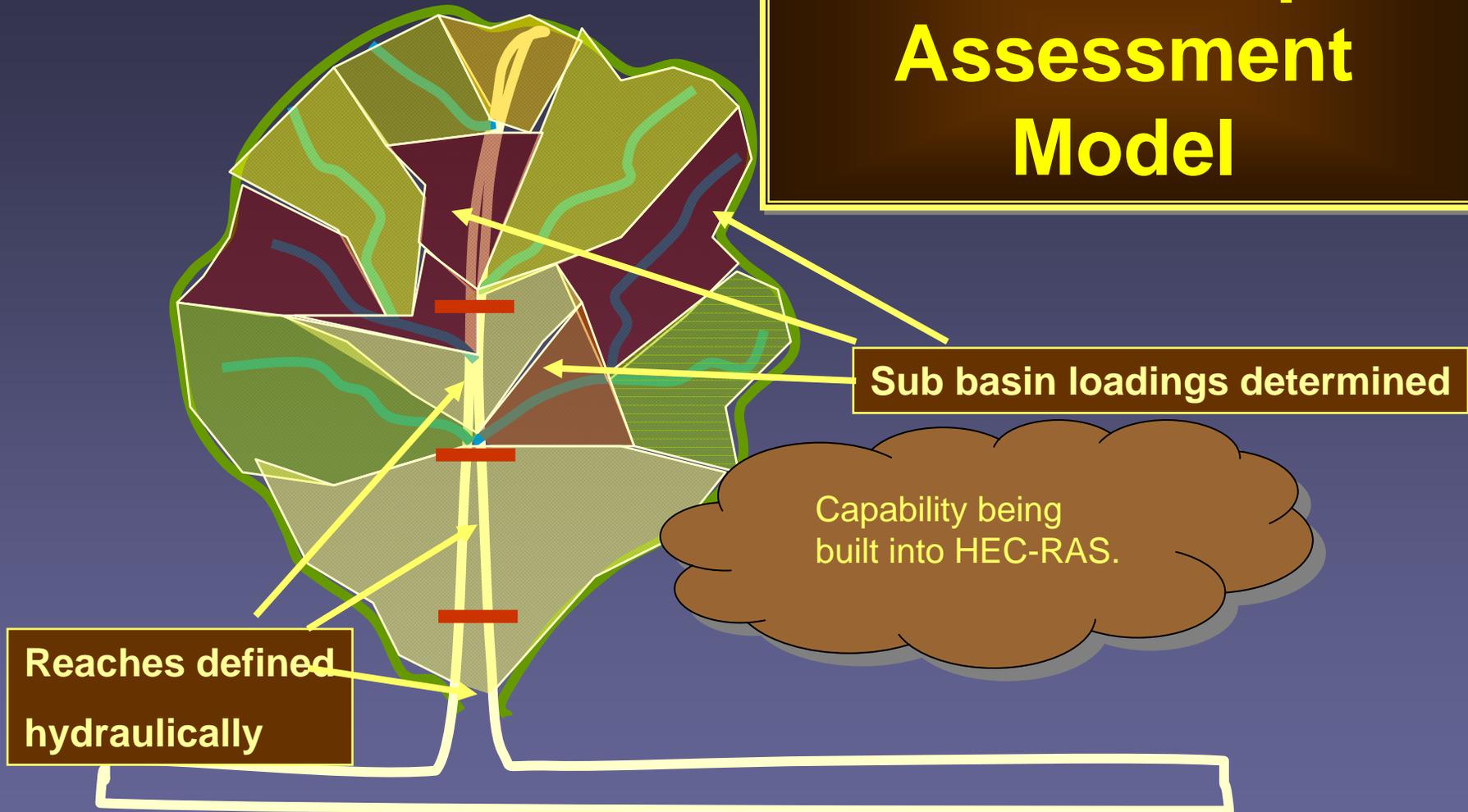
...to River Models...



...with capability to zoom in for detailed work.



# Sediment Impact Assessment Model

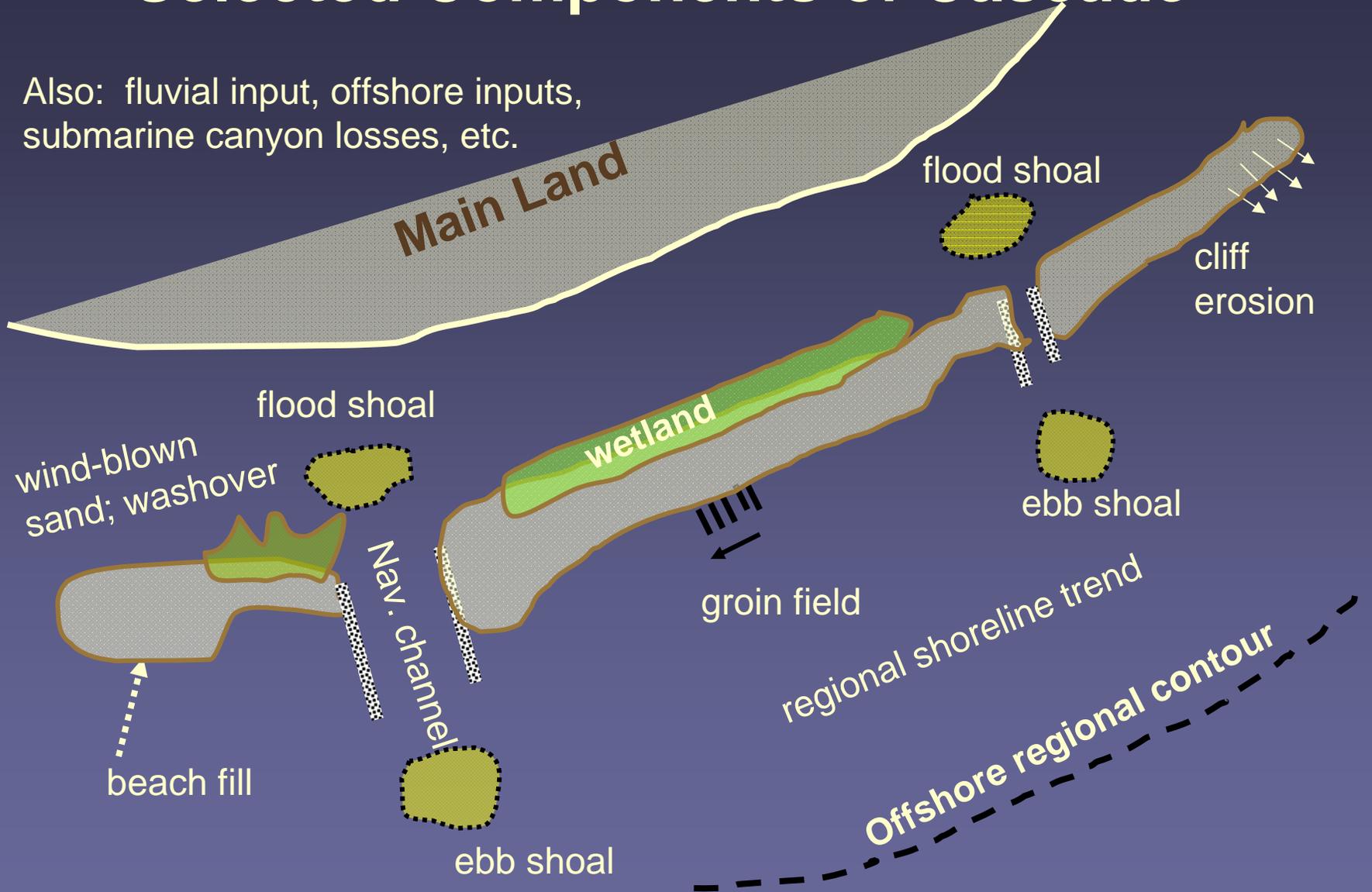


Goal: Balance sediment system when sub-basin loadings change (e.g. due to grade control, bank stabilization) & predict resulting instabilities/stability in downstream channel reaches.

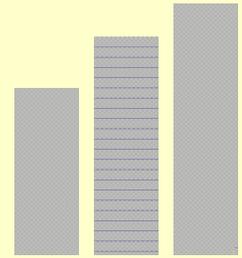
POC David Biedenbarn ERDC CHL

# Selected Components of Cascade

Also: fluvial input, offshore inputs, submarine canyon losses, etc.



# Cascade Capabilities



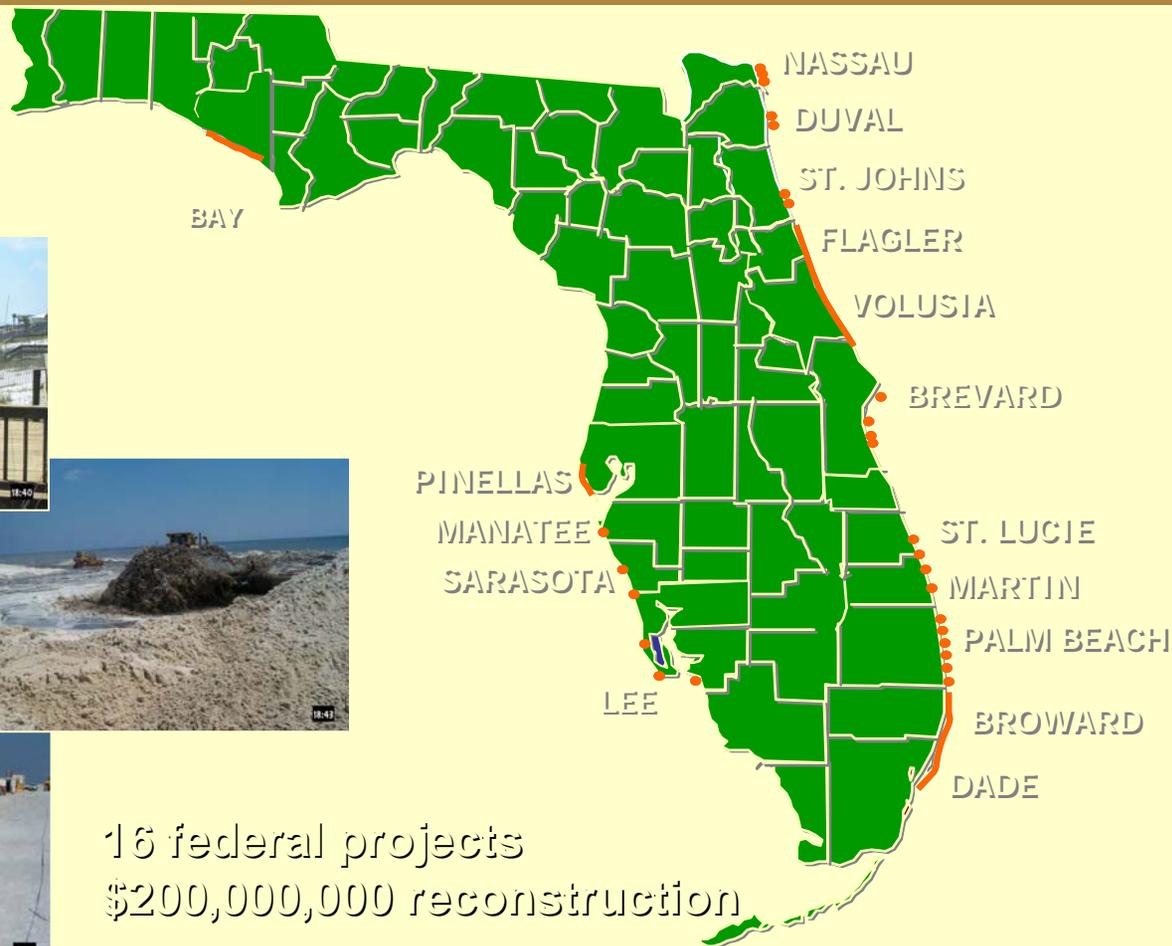
**Simulate longshore sediment transport and coastal evolution with respect to:**

- **Complex regional trends**
- **Multiple, interacting projects**
- **Inlet sediment storage and transfer**
- **Sources and sinks (beach nourishment, washover, wind-blown sand, cliff erosion, etc.)**
- **Jetty construction (impoundment, bypassing)**
- **Navigation channel maintenance**
- **Large-scale gradients in forcing**



# National Coastal Mapping Program

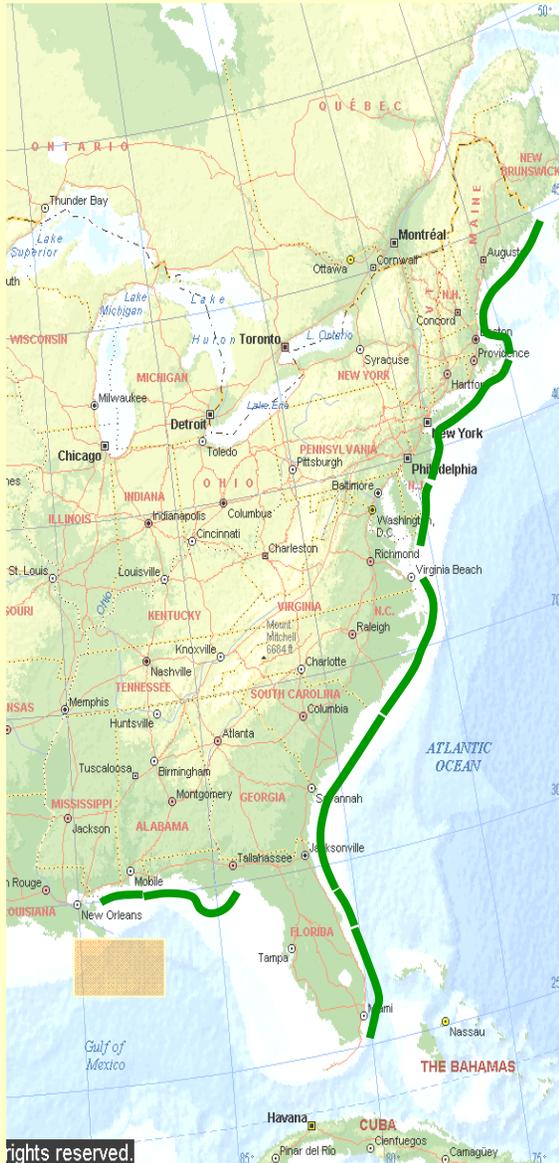
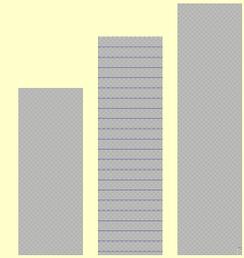
2004 / 2005



16 federal projects  
\$200,000,000 reconstruction



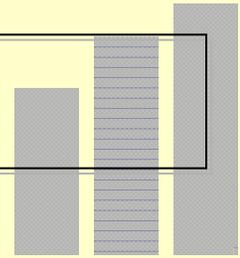
**2005**



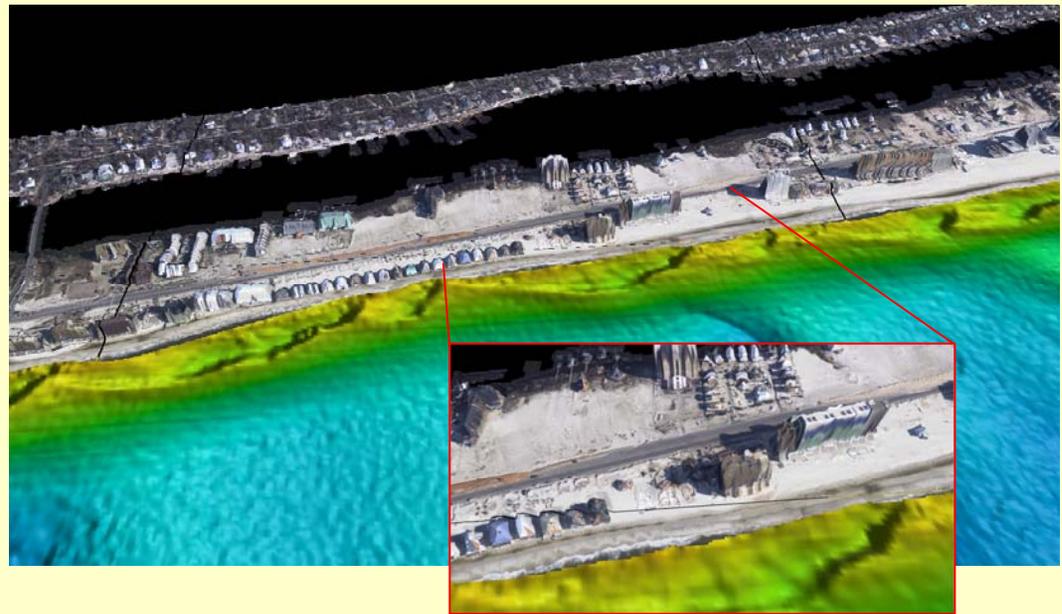
- **North Atlantic Division**
- **Pre Dennis**
- **Post Dennis**
- **Post Katrina**
- **Post Ophelia**
- **Post Rita**
- **3,600 km +/-**
- **Topo/Bathy/Ortho/Spectral**



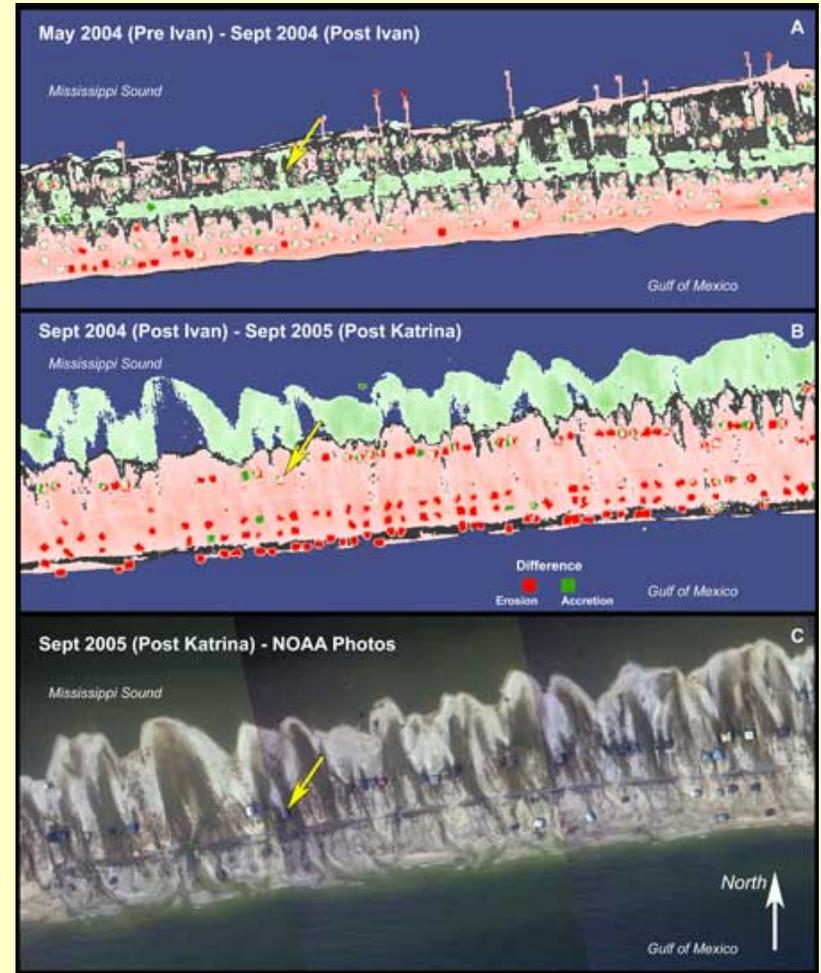
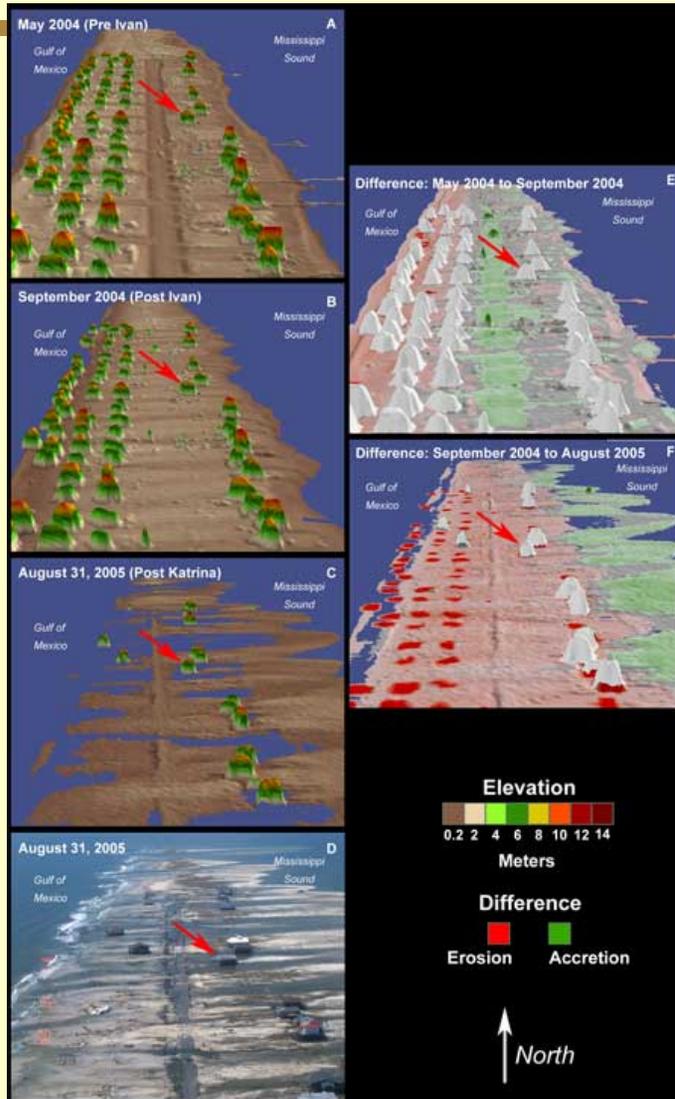
# Data & Products



1. Ortho RGB imagery
2. Topo-bathy elevations
3. 1-m grid for GIS
4. Shoreline vector
5. Building footprint
6. Bare earth DEM
7. Bottom reflectance
8. Hyperspectral cube
9. Environmental TBD



# Pre & Post Ivan, and Post Katrina



# Hurricane Katrina Physical & Environmental Impacts



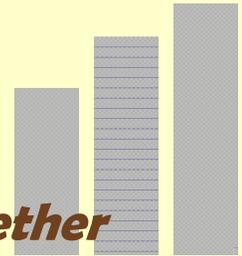
Hyperspectral  
Lidar  
1-m pixels



[NOTE: Conference](#)

**Managing Sediments in the Watershed:**

***Bringing Dredged Material & Watershed Managers Together***



- 29-31 August 2006, Portland Oregon
  - *Integrating dredged material management into watershed plans*
  - *Integrating broader watershed perspectives into dredged material management*
- **National Dredging Team - Sediment mgt & Beneficial use – Watershed approaches to Sediment management – National Estuary Program – Regional Dredging Teams – Local Management Teams**



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