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*."

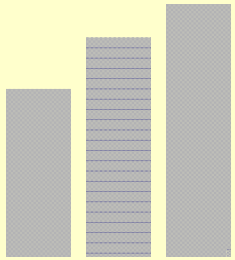
LTG Robert Flowers – e-mail to USACE on 19JUN02, commenting on his testimony to the Senate Environment and Public Works Committee hearing on Corps of Engineers water resources programs.

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

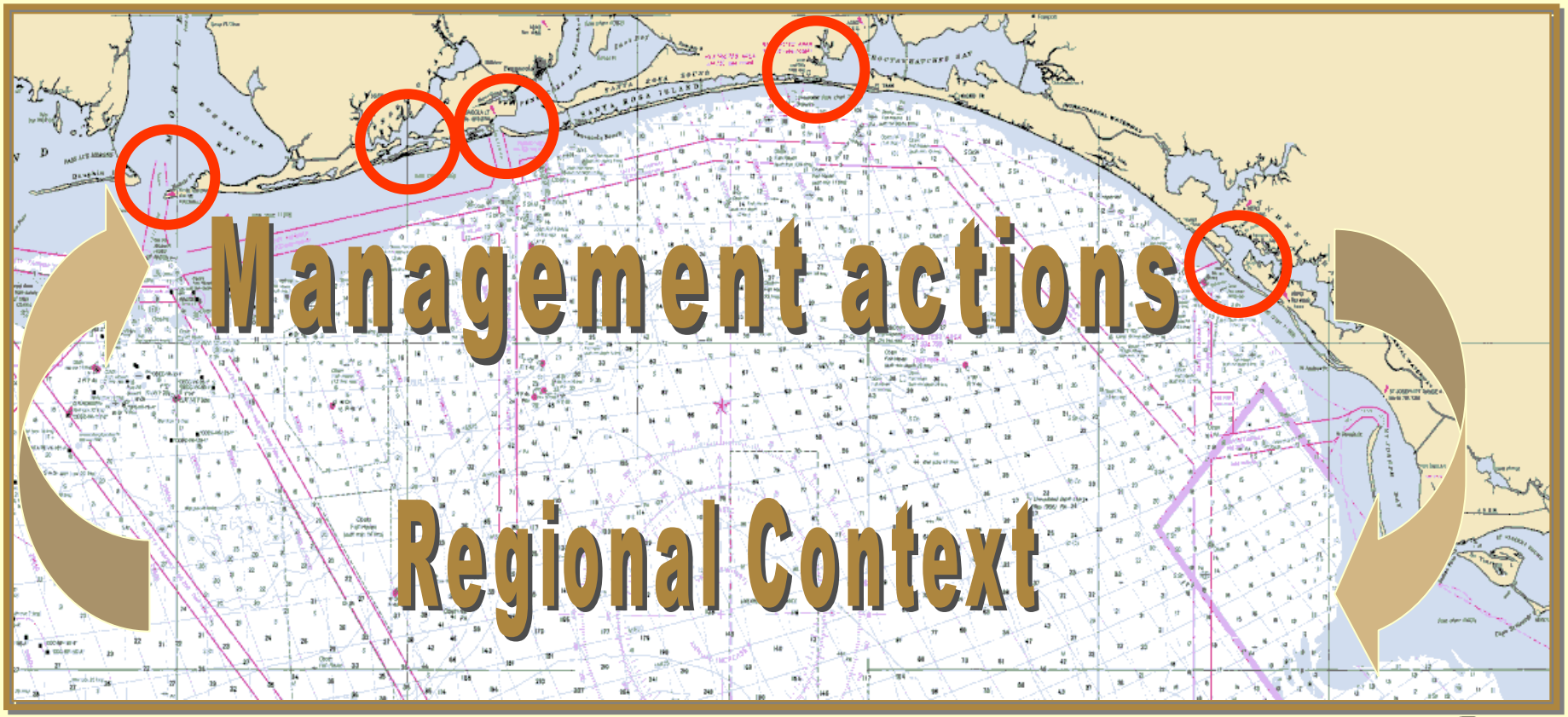
- Coastal, river & estuarine systems
- Regional sediment system -**Sources, sinks, timing, direction, quantity, quality, influencing factors …**

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

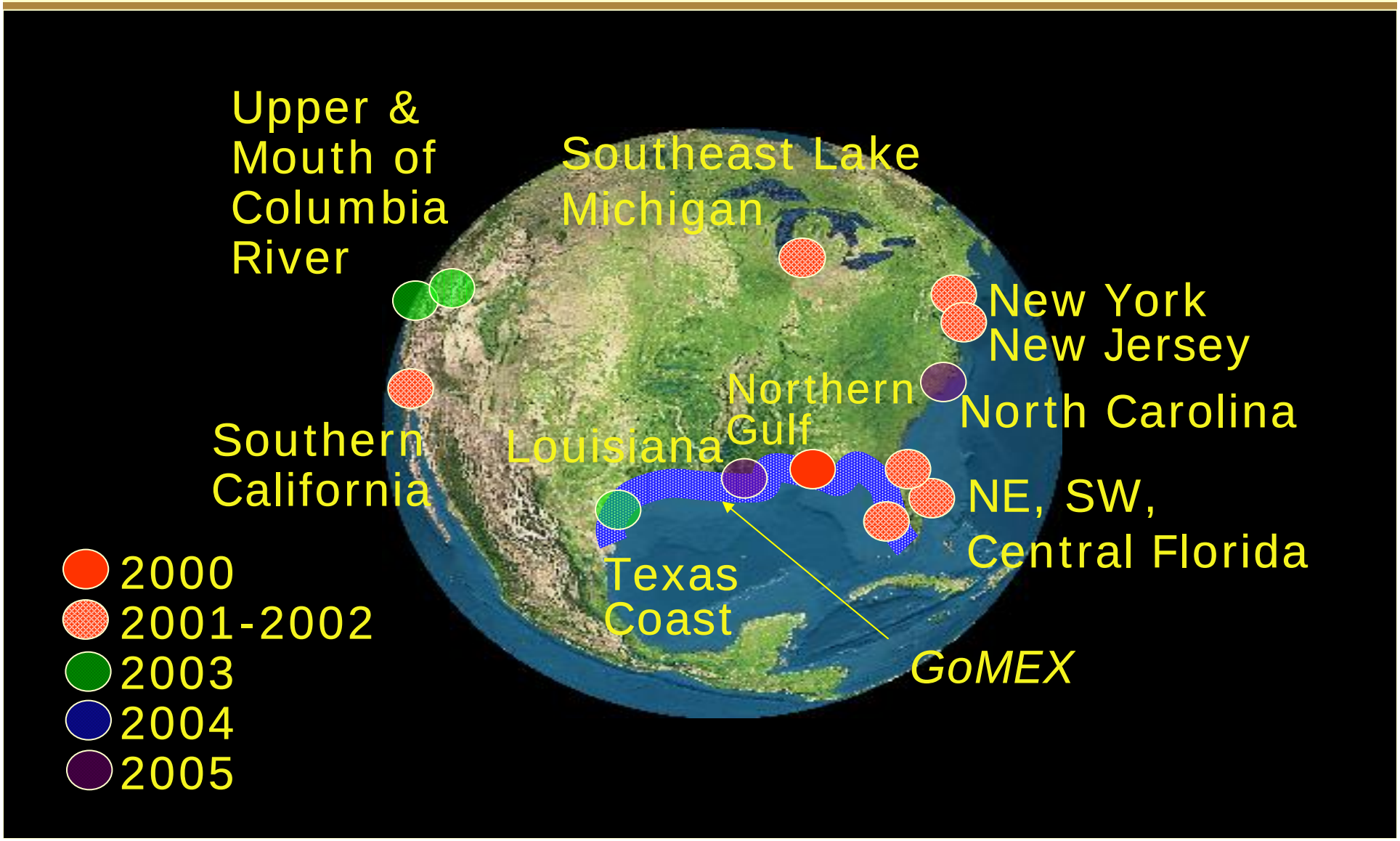
Regional Sediment Management

Requires

stakeholder partnering &

technology.

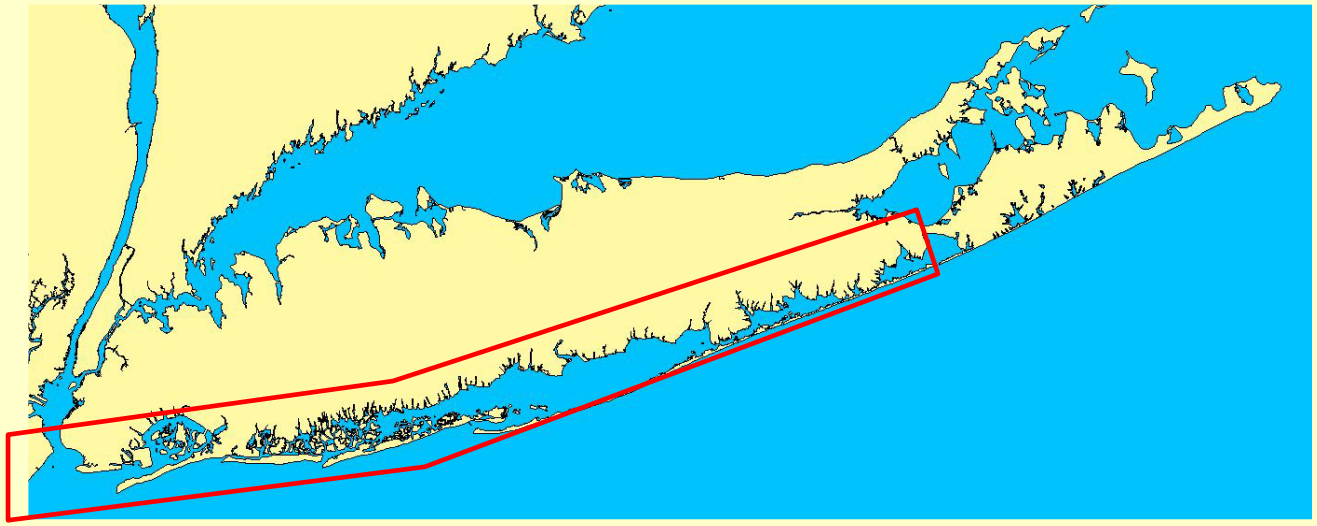
National RSM Demonstration Program



Sediment Needs Assessment

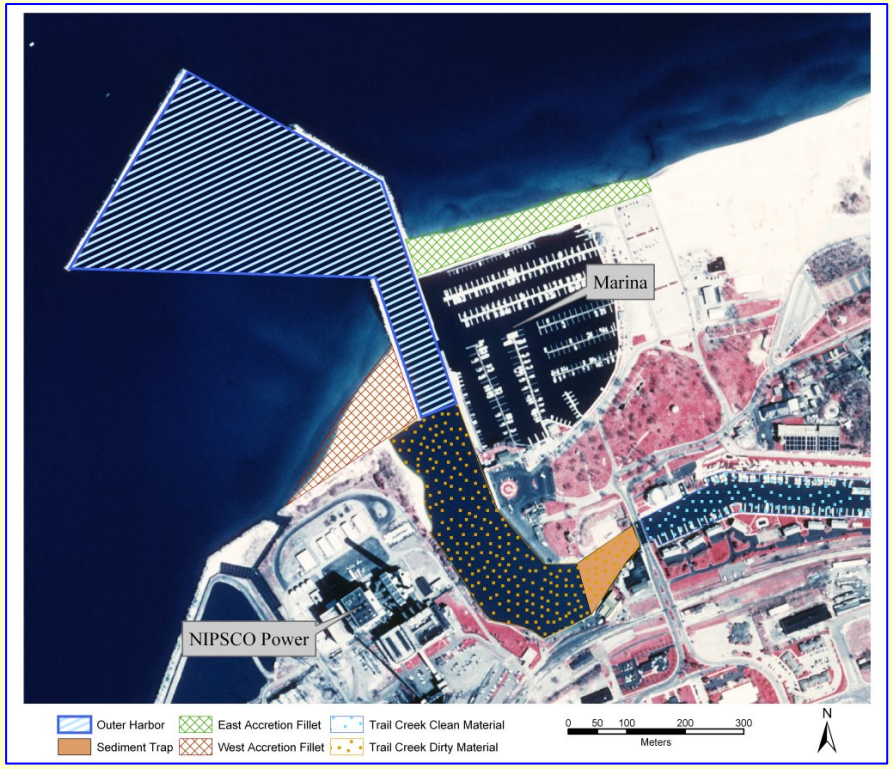
- **Address sediment issues and needs in a larger context.**

- **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

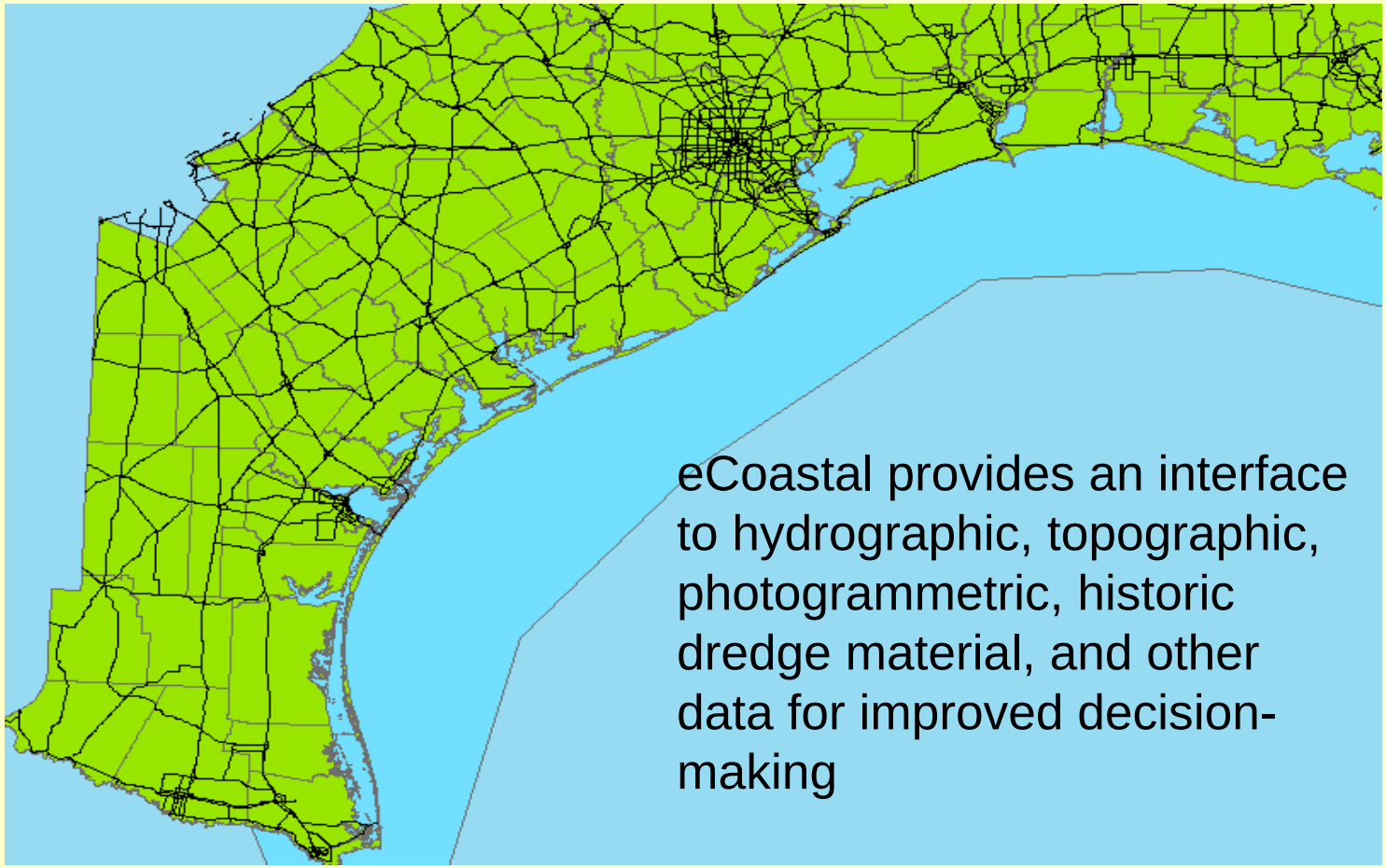
- Sediment Needs Assessment – Long Island, NY
- Wrightsville Beach to Carolina Beach- beach and inlet management plan
- Sediment Inventory – Great Lakes sources, demands, shoaling impacts
- Chesapeake Bay Sediment Management Coordination Workshops
- Lower Snake R Programmatic Sediment Management Plan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

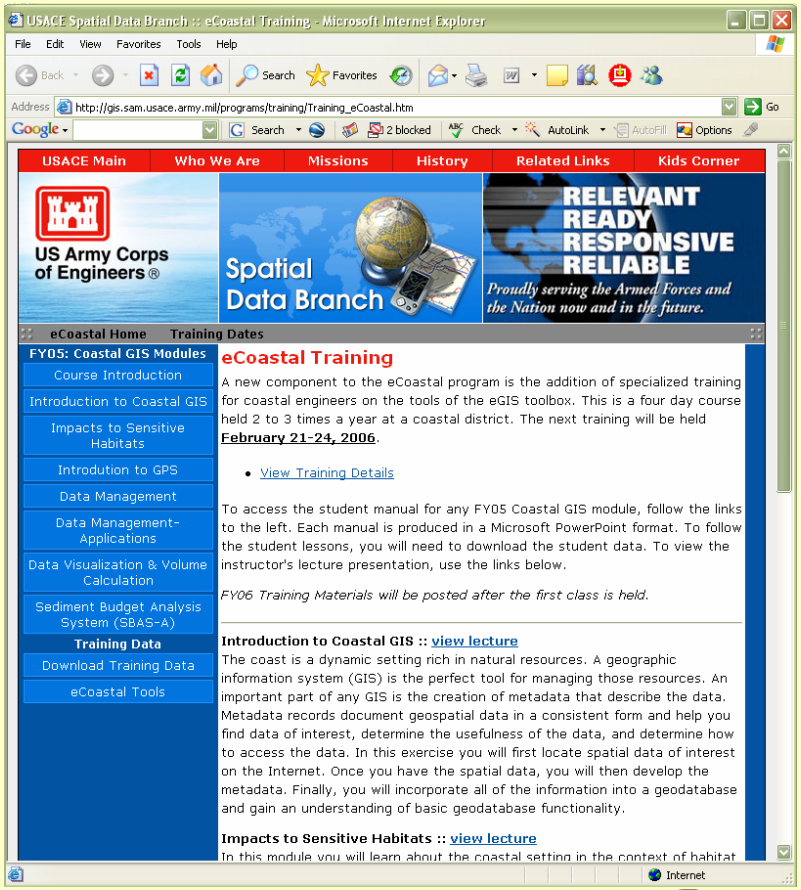
- Hydrographic Survey Tools
- National Coastal Databank

Los Angeles District

- Dredging / Sediment Placement Decision Support

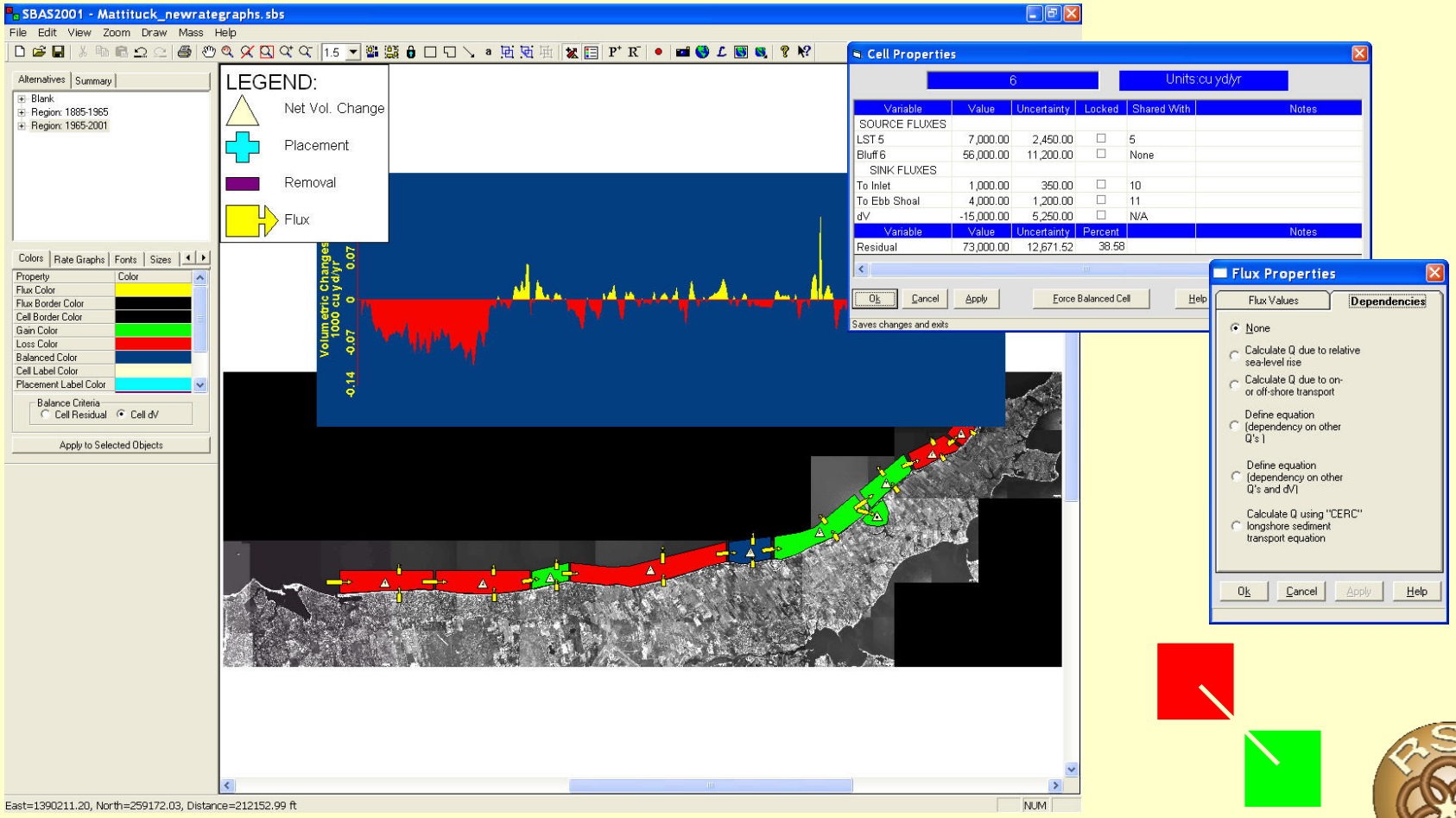
Engineer Research & Development Center

- Sediment Budget Analysis System
- Structure Condition Index Assessment
- Silent Inspector

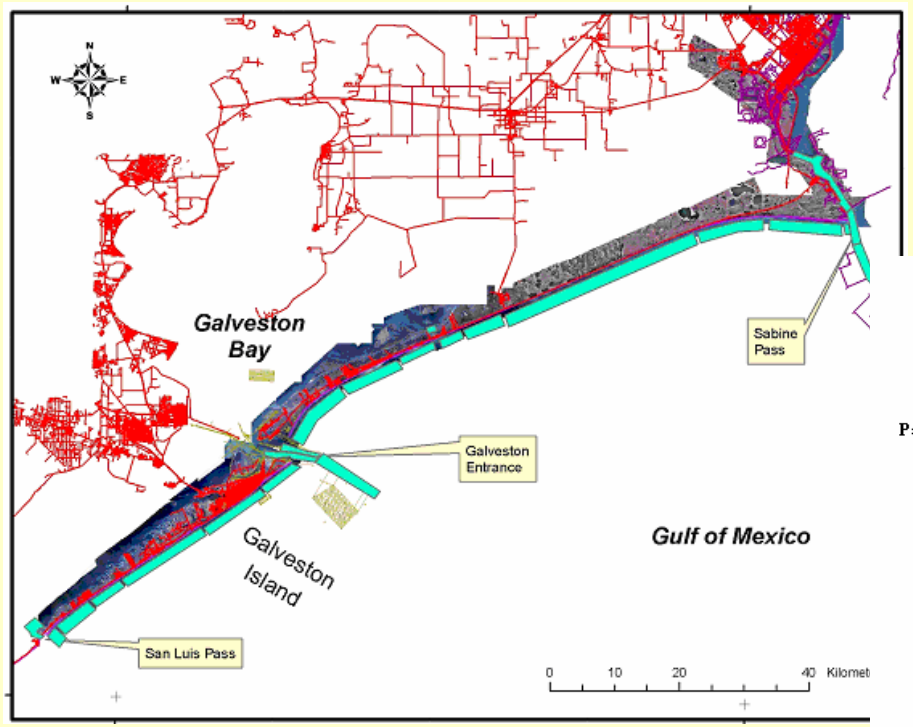


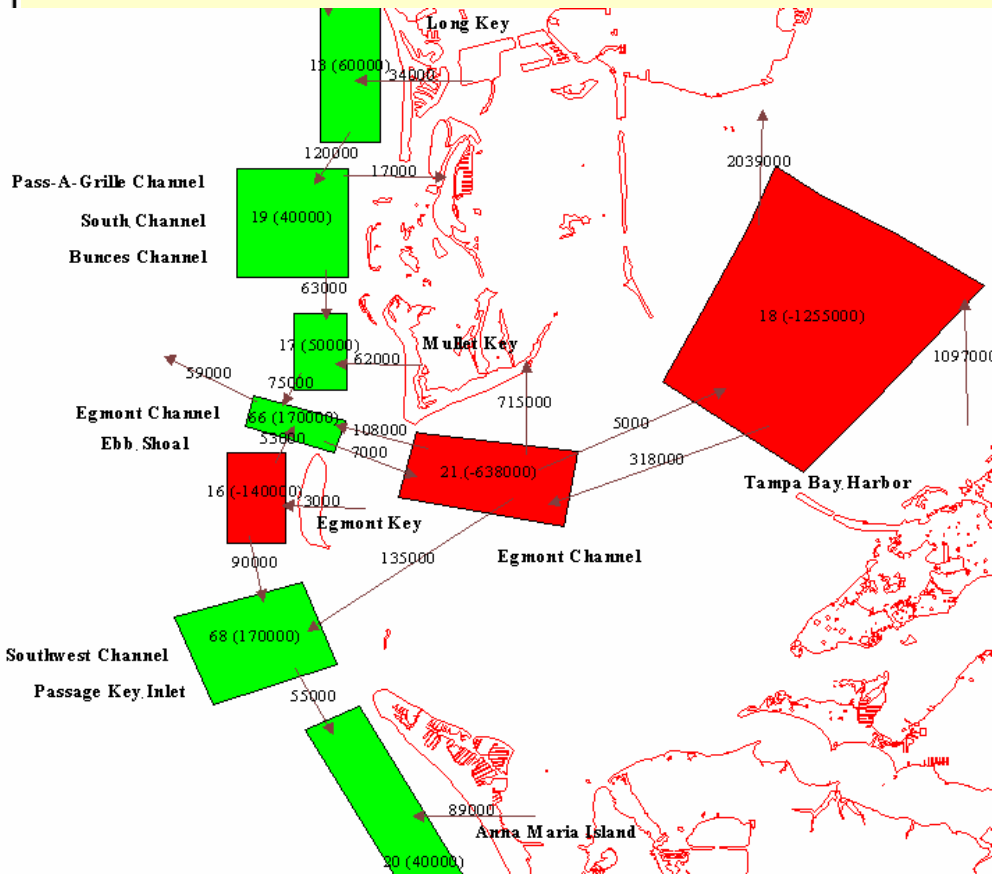
SBAS

Sediment Budget Analysis System



Regional Sediment Budgets



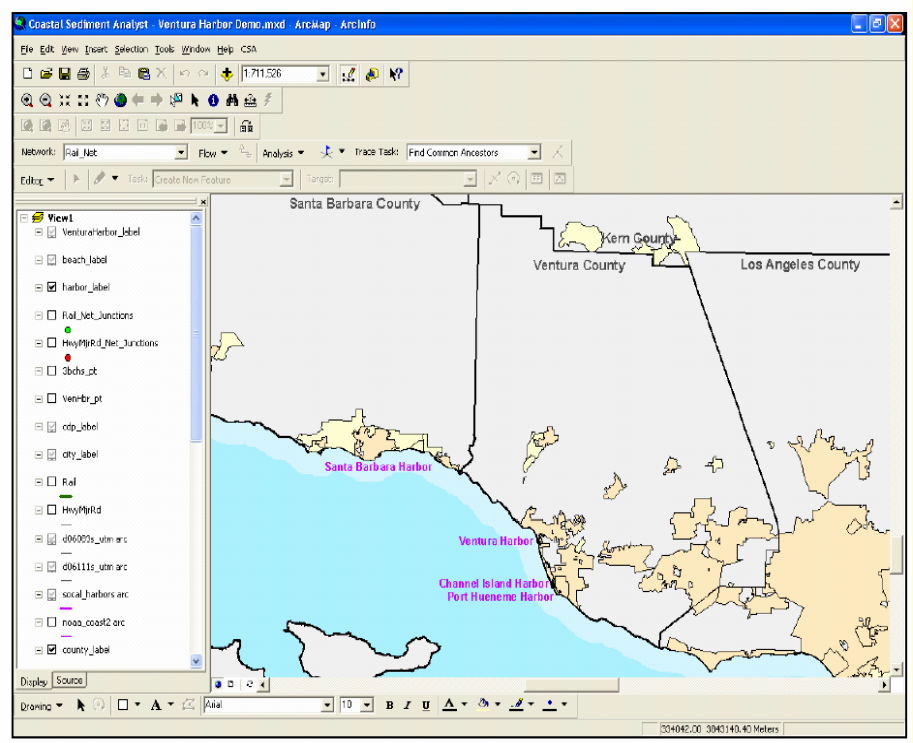


Provide a detailed accounting of sediment movement as a tool for evaluating present and future RSM activities and decisions.

ArcGIS Coastal Sediment Analyst (CSA)

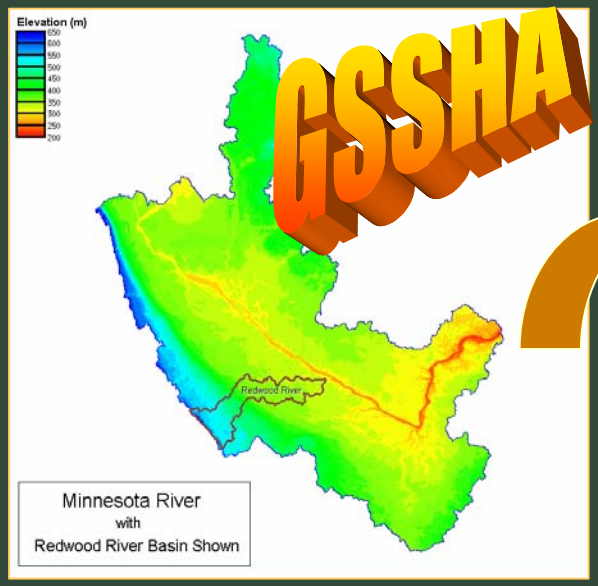
Decision-Support Tool

- **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.**

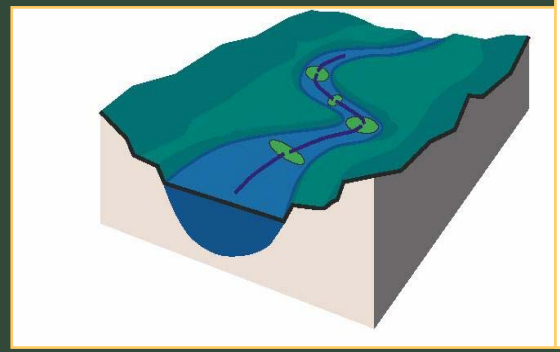


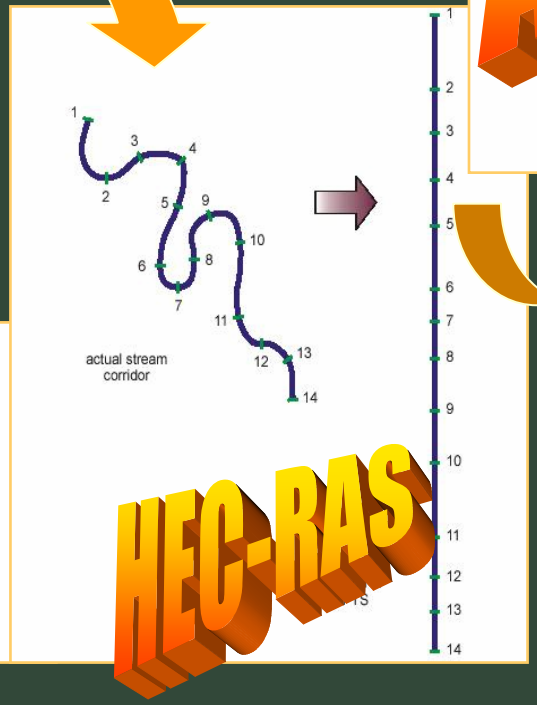
River Basin Models

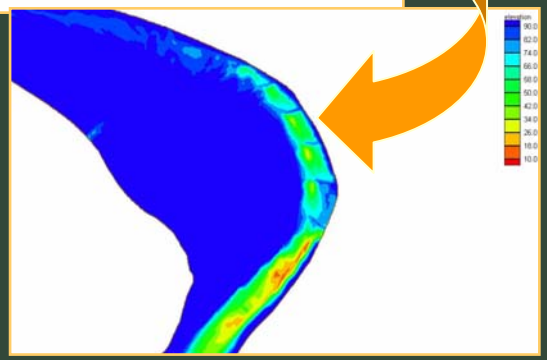
Watershed loads…



…to River Models…

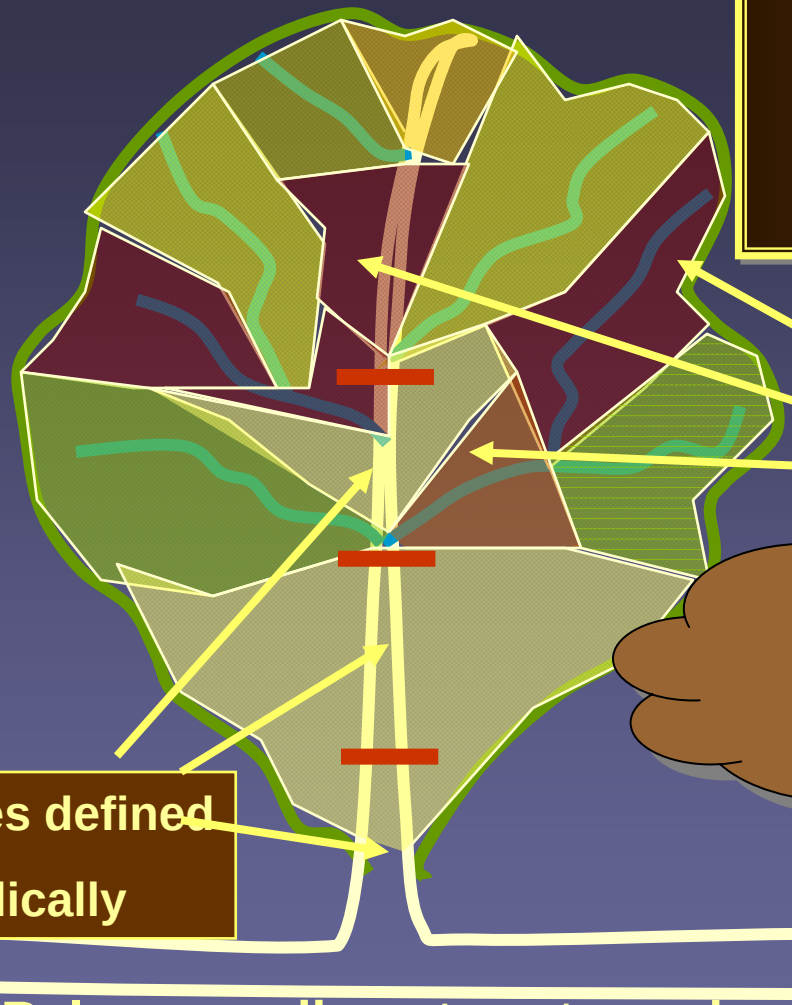






…with capability to zoom in for detailed work.

Sediment Impact Assessment Model



Sub basin loadings determined

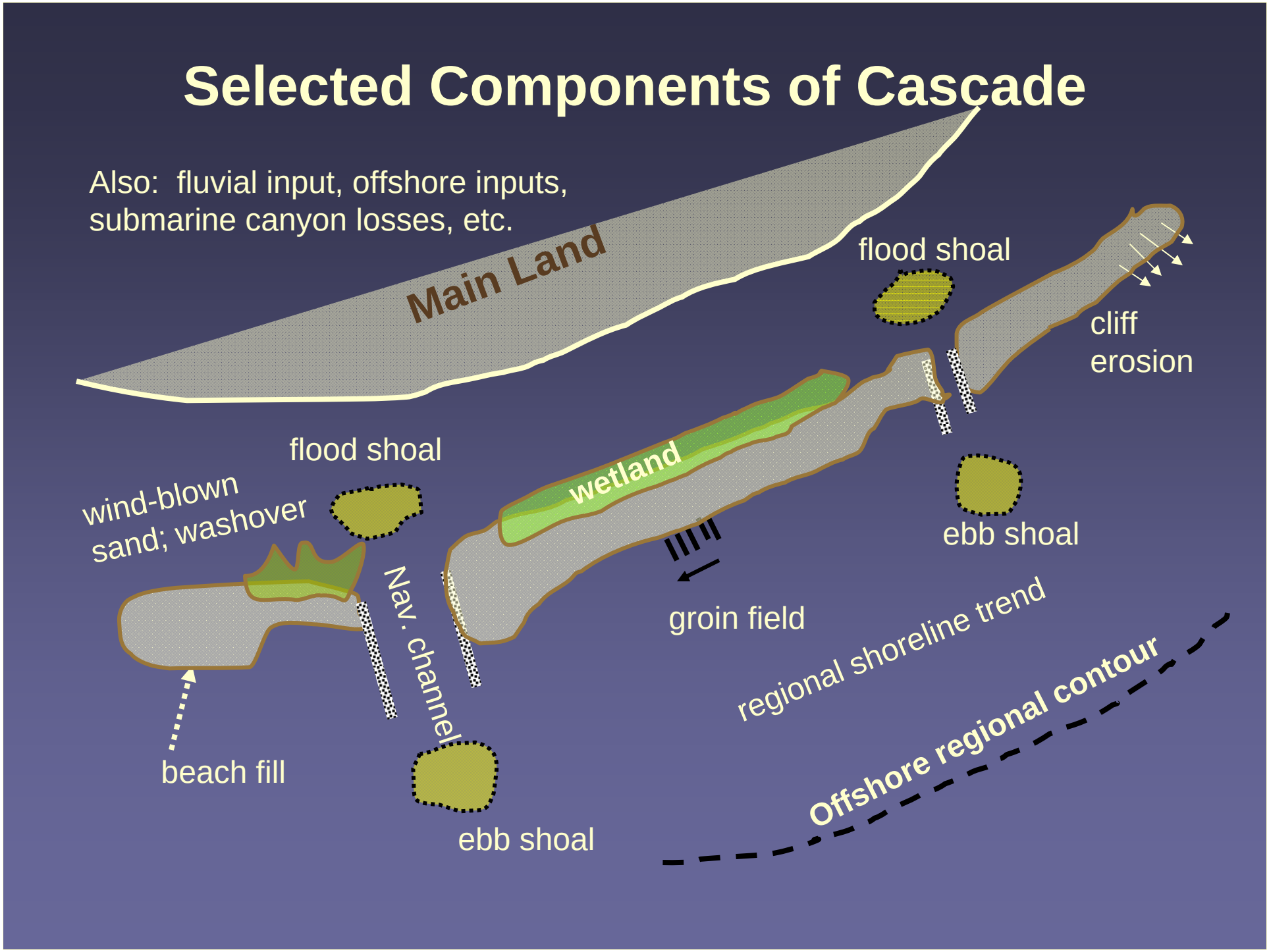
Capability being built into HEC-RAS.

Reaches defined hydraulically

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 Biedenharn ERDC CHL

Selected Components of Cascade



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

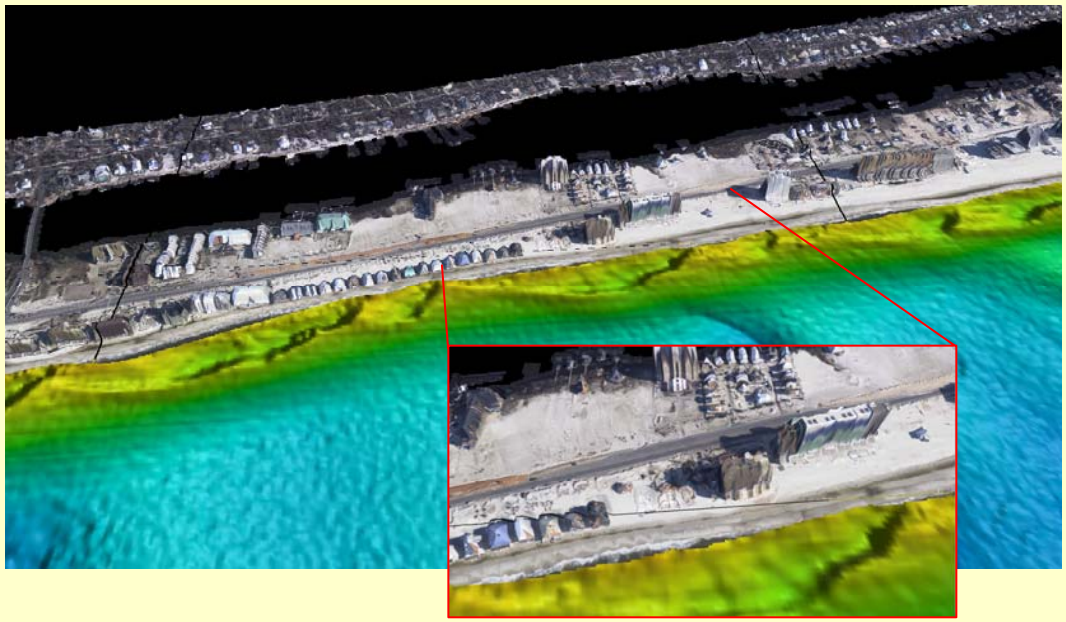
JALBTCX
Joint Airborne Lidar Bathymetry Technical Center of Expertise

2005

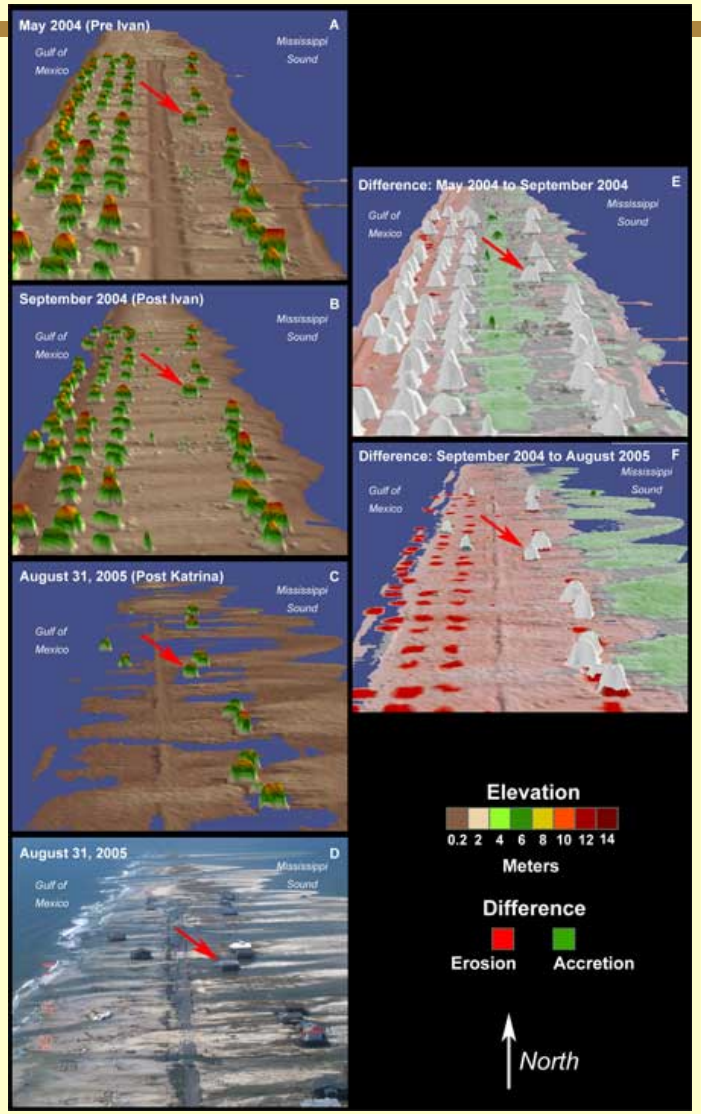
- North Atlantic Division
- Pre Dennis
- Post Dennis
- Post Katrina
- Post Ophelia
- Post Rita
- 3,600 km +/-
- Topo/Bathy/Ortho/Spectral

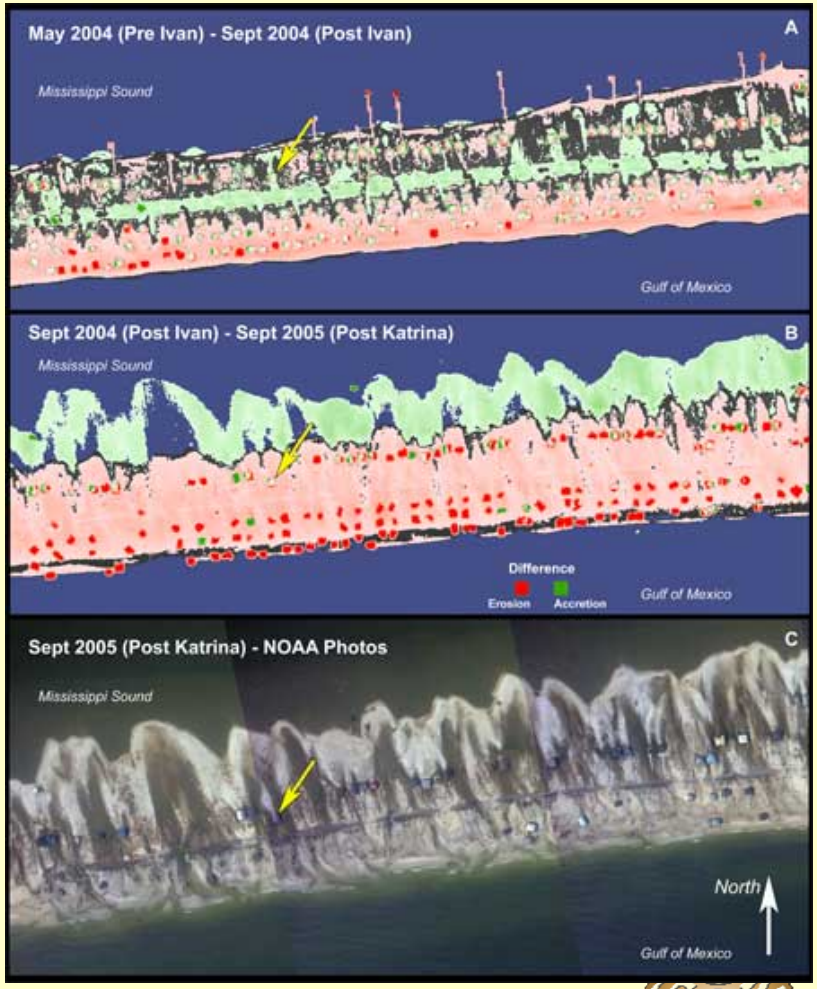
Data & Products

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

CHARTS JALBTCX Joint Airborne Lidar Bathymetry Technical Center of Expertise

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**

Regional Sediment Management

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