SANDS - Sediment Analysis Network for Decision Support

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Objectives

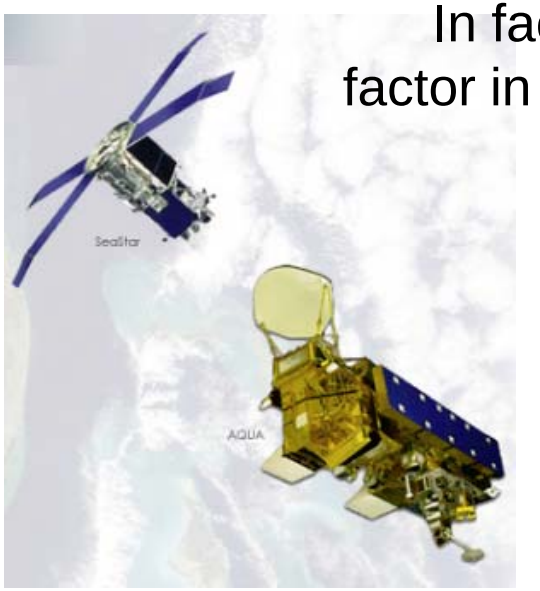
Help resolve the GOMA priority issues by providing sediment related decision support products to groups involved in coastal management, conservation, planning, recovery, and mitigation

Provide end users the opportunity to better analyze, detect, and identify compositions and patterns of suspended sediment and sediment deposits.

Influence of Sediment Disturbance

Since the year 2000, eastern Louisiana, coastal Mississippi, Alabama,
and the western Florida panhandle have been affected by 28 tropical storms, seven of which were hurricanes.

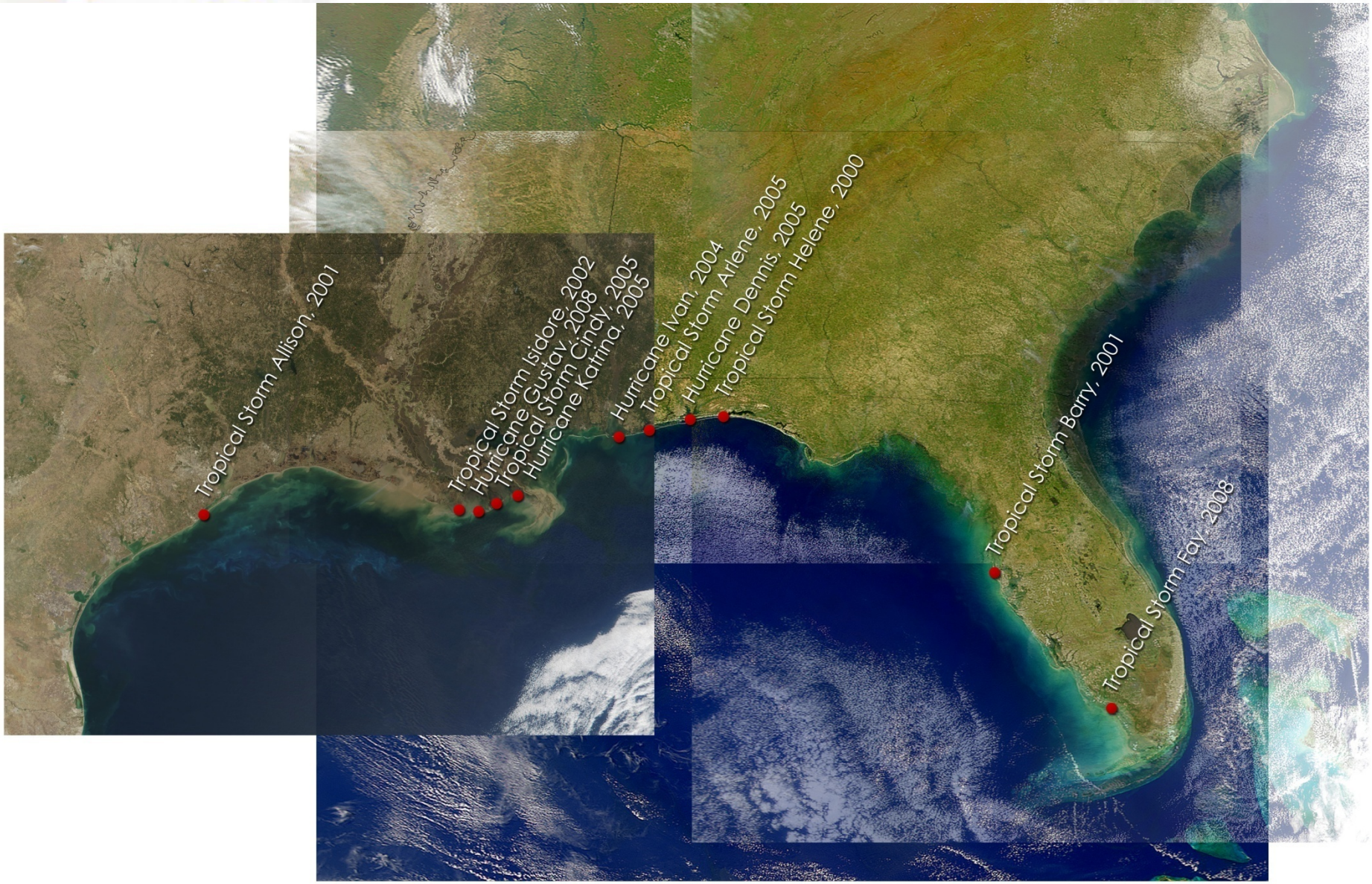
These tropical cyclones have significantly altered normal coastal processes and characteristics in the Gulf region through sediment disturbance.



In fact, tropical storm-induced sediment disturbance is a factor in four of the five Gulf of Mexico Alliance (GOMA) priority issues:

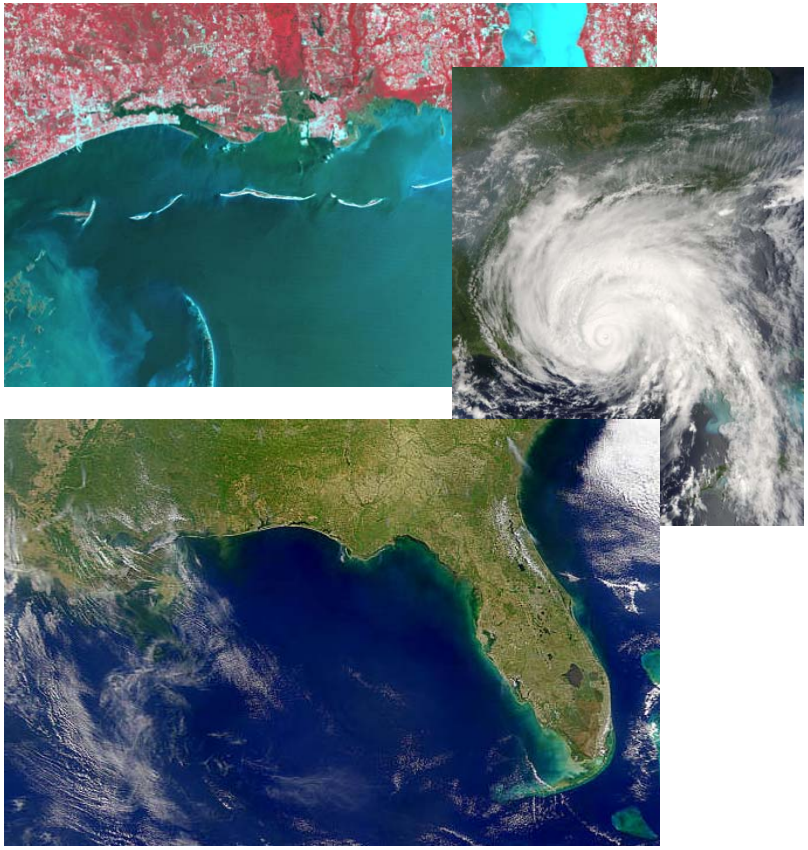
- water quality for beaches and shellfish beds,
- wetland and coastal conservation restoration,
- characterization of Gulf habitats,
- and reduction of nutrient inputs to coastal systems.

Landfall Locations for Storms in SANDS Study Area

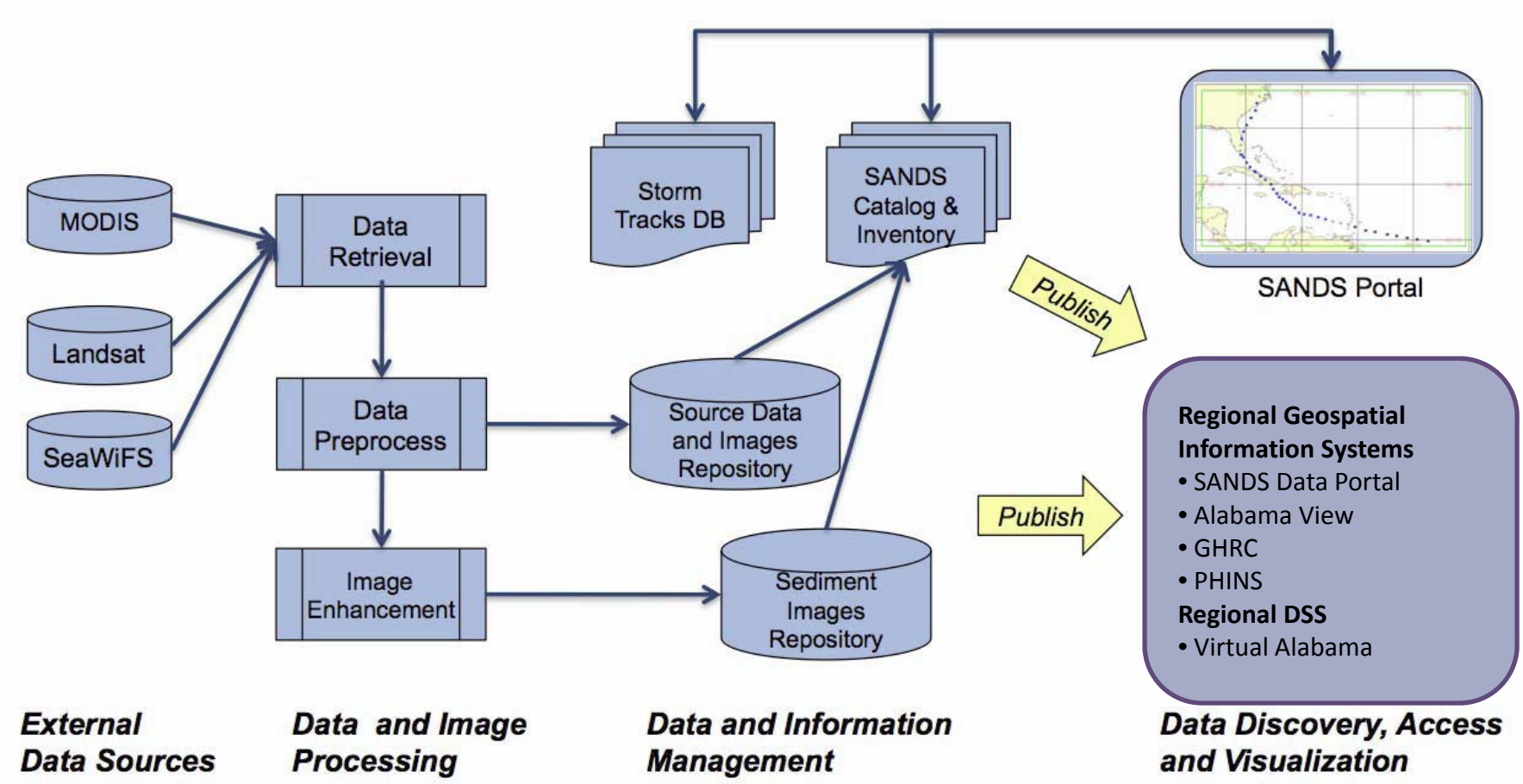


SANDS Source Data

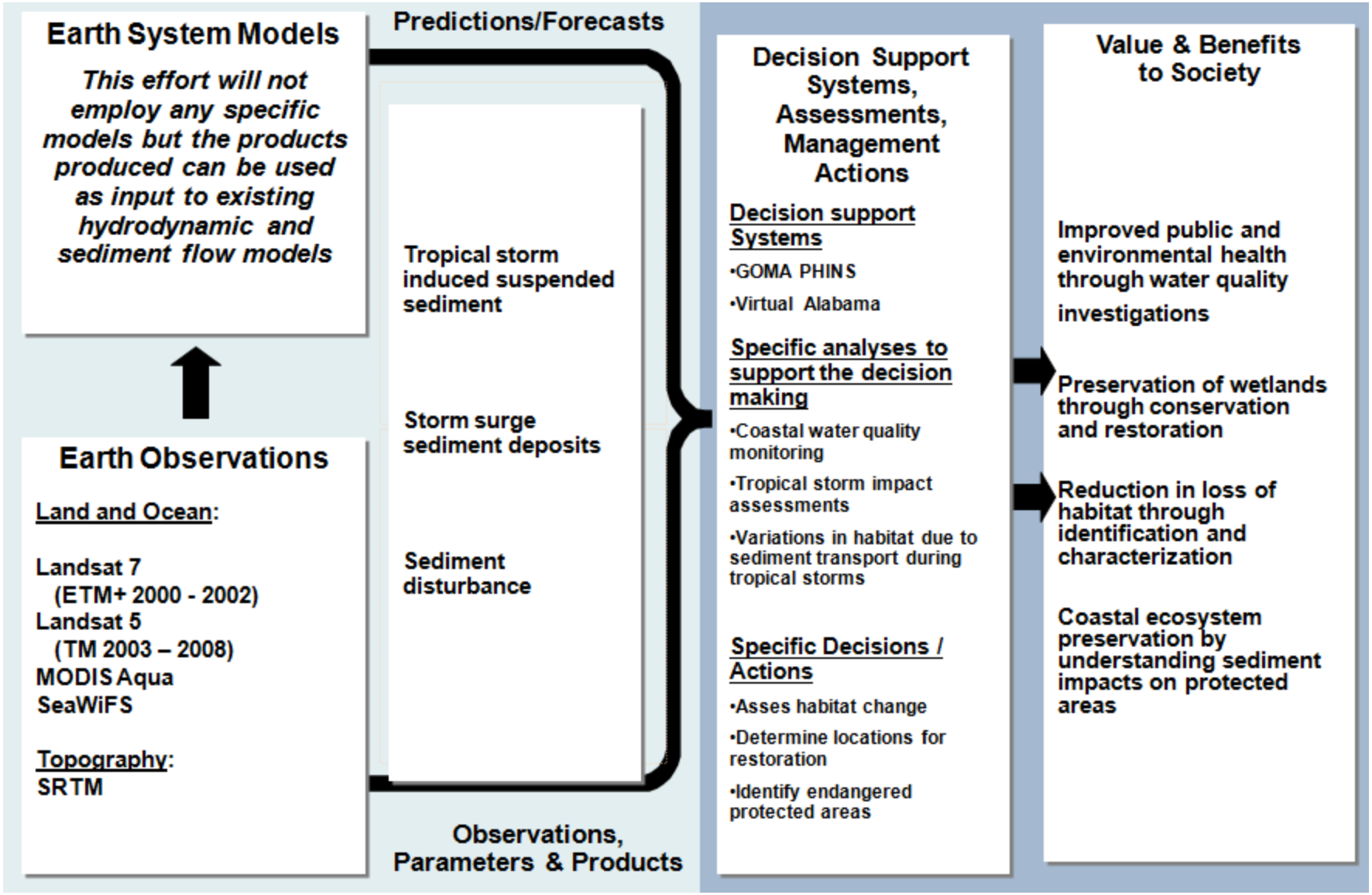
- Landsat 7 ETM+ all bands for 2000 through 2002
- Landsat 5 TM all bands for 2003 through 2008
- MODIS Aqua surface reflectance bands 8 through 16
- SeaWiFS data, all bands, covering the region
- SRTM elevation data
- NDVI and EVI vegetation indices derived from MODIS



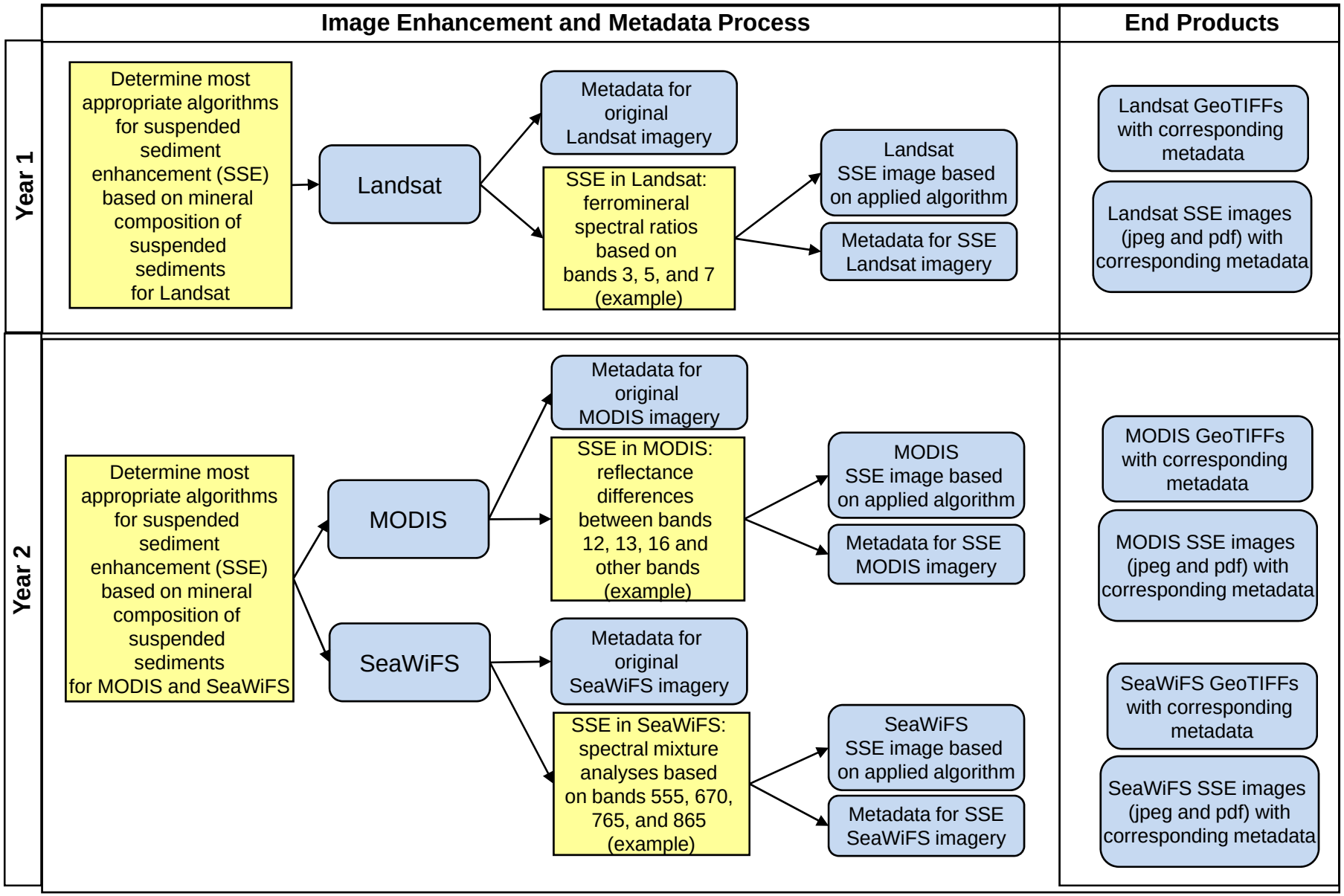
System Architecture



ISS Diagram

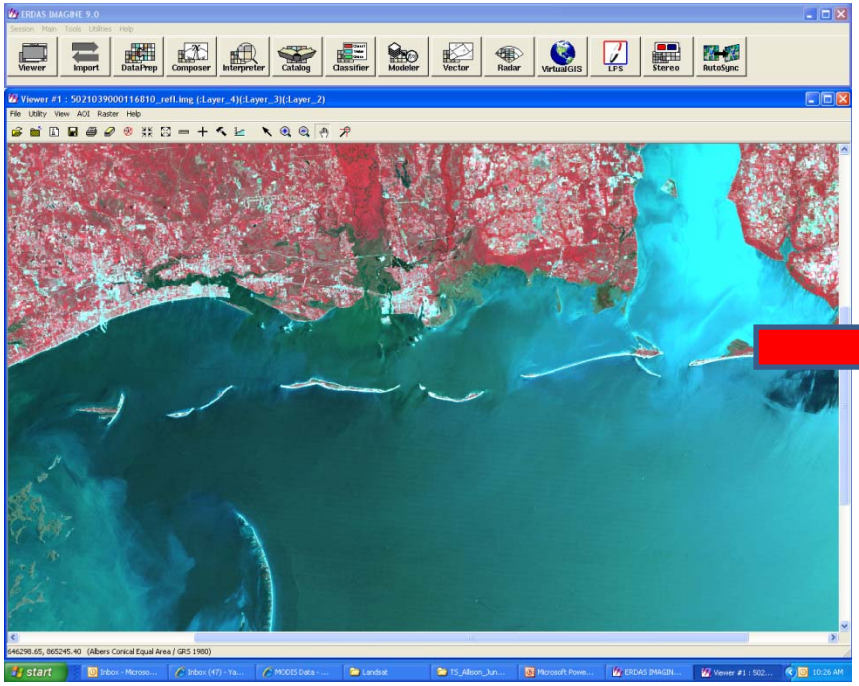

Earth System Models
This effort will not employ any specific models but the products produced can be used as input to existing hydrodynamic and sediment flow models
Earth Observations
Land and Ocean:
Landsat 7 (ETM+ 2000 - 2002)
Landsat 5 (TM 2003 – 2008)
MODIS Aqua
SeaWiFS
Topography:
SRTM
Predictions/Forecasts
Tropical storm induced suspended sediment
Storm surge sediment deposits
Sediment disturbance
Observations, Parameters & Products
Decision Support Systems, Assessments, Management Actions
Decision support Systems
•GOMA PHINS
•Virtual Alabama
Specific analyses to support the decision making
•Coastal water quality monitoring
•Tropical storm impact assessments
•Variations in habitat due to sediment transport during tropical storms
Specific Decisions / Actions
•Asses habitat change
•Determine locations for restoration
•Identify endangered protected areas
Value & Benefits to Society
Improved public and environmental health through water quality investigations
Preservation of wetlands through conservation and restoration
Reduction in loss of habitat through identification and characterization
Coastal ecosystem preservation by understanding sediment impacts on protected areas

Product Generation Process

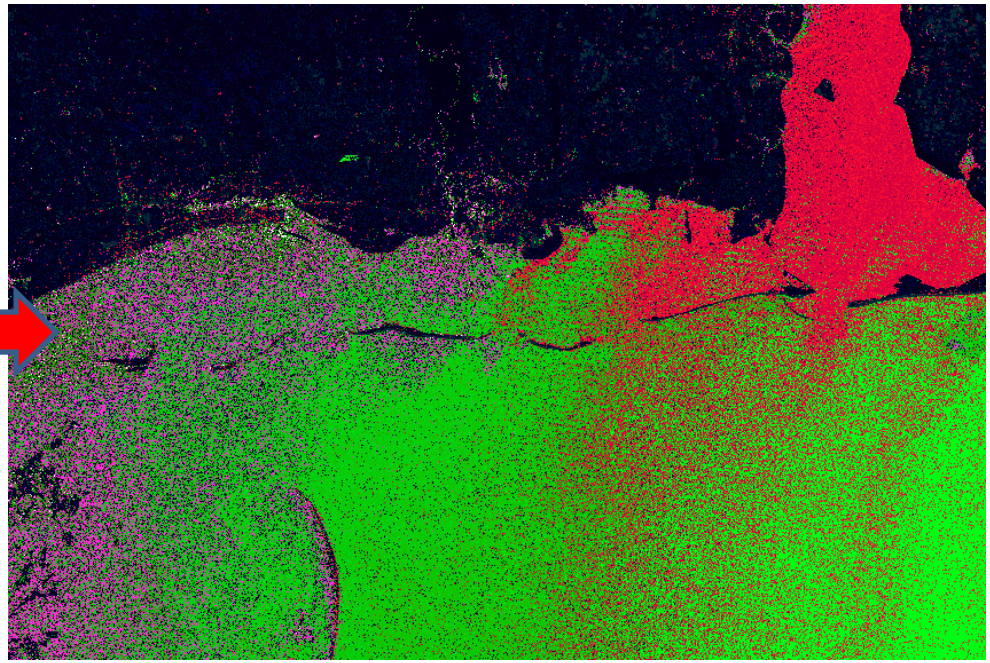


Example: SANDS Product Generation

Landsat Imagery



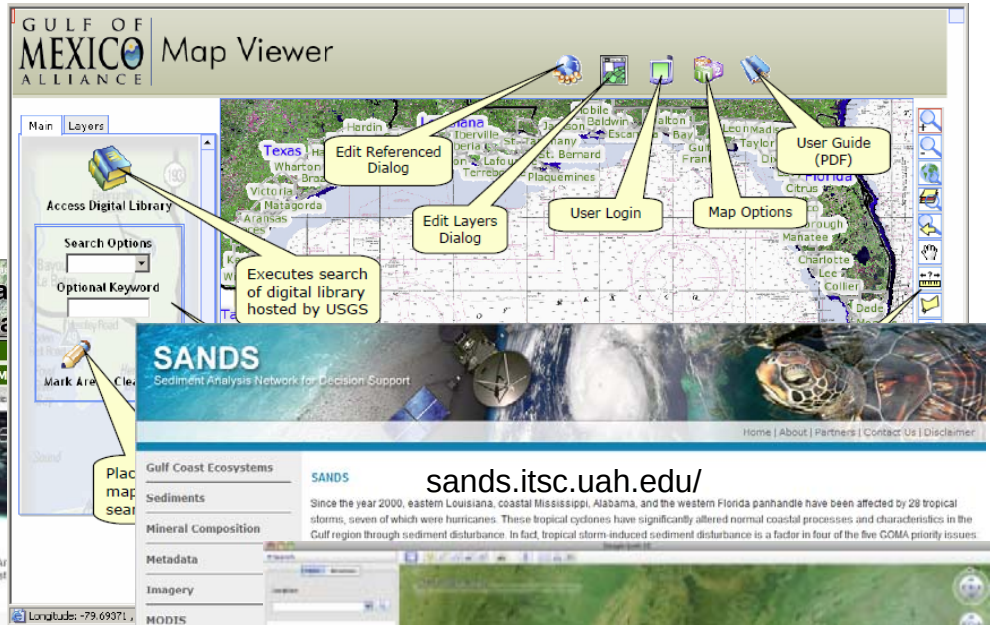
Mineral Enhancement Decision Support Product



Data Product Distribution

www.alabamaview.org

http://phins.sam.usace.army.mil/



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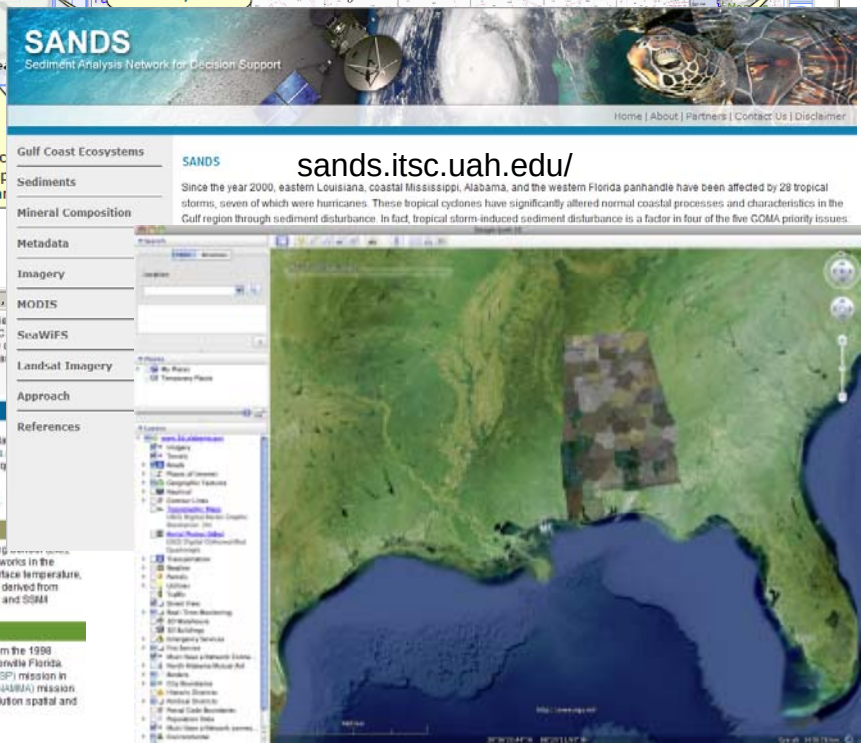
ghrc.nsstc.nasa.gov/



sands.itsc.uah.edu/

www.dhs.alabama.gov/virtual_alabama/home.aspx

Related Coastal Projects

CAMEX

NAMMA

TCSP

SERVIR

GoMRC/COAST

SCOOP

Northern Gulf Coast
Coastal Hazards Collaboratory

NASA Tropical Storm
Field Campaigns

SANDS End Users

- Dauphin Island Sea Lab
  GOMA Priority Area - water quality for beaches and shellfish beds
- Alabama Department of Conservation
  GOMA Priority Area - wetland and coastal conservation restoration
- Department of the Interior Fish and Wildlife Service
  GOMA Priority Area - characterization of Gulf habitats
- Mobile Bay National Estuary Program
  GOMA Priority Area - reduction of nutrient inputs to coastal systems
- NOAA Center for Coastal Ocean Research
  GOMA Priority Area - characterization of Gulf habitats