Reducing Nutrients and Nutrient Impacts Priority Issue Team

St. Louis Bay Project

Implementing Nutrients PIT Action Step 1.1

scan with smart phone

The NASA Applied Science & Technology Project Office at Stennis Space Center (SSC) used satellites, *in-situ* measurements and computational modeling to study relationships between water quality in St. Louis Bay, Mississippi and the watershed characteristics of the Jourdan and Wolf rivers from 2000-2010.

Methodology/Approach
Satellite data was used to detect and monitor changes in land cover, land use, sediment and nutrient inputs into St. Louis Bay. Ongoing analysis will reveal any correlations between the Jourdan River and Wolf River watershed vegetation phenology, land use and land cover change, and water quality in St. Louis Bay.

Water samples were collected and optical properties of the water column were measured at specific locations in St. Louis Bay and the Mississippi Sound. This *in-situ* data was used to develop, assess and validate satellite data products. In phase one, existing data sets were processed to estimate parameters of interest such as chlorophyll a, total suspended solids (TSS), and colored dissolved organic matter (CDOM). Satellite data was organized by hydrologic units into a geographic information system that allowed temporal analysis in geographic regions of interest. In phase two, spatial and temporal analysis techniques were used to examine relationships between the watershed and St. Louis Bay water quality characteristics. In the final phase, BASINS/HSPF analysis is being performed on the data to provide parameter values for water quality studies.
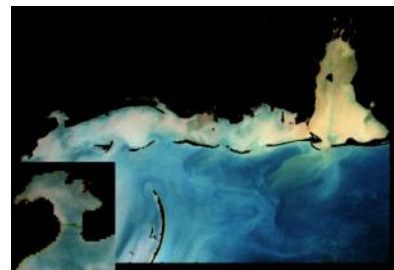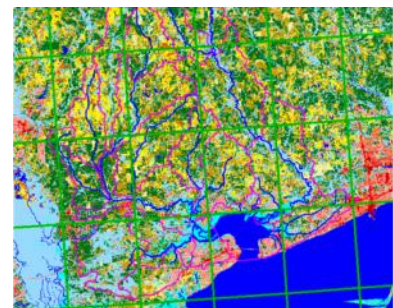
Partners:
NASA SSC, MDEQ, CSC, ARTS, USM, A2R

Transferability:
This project will augment the MDEQ project titled "Monitoring Design for Determining the Sources, Fate, Transport, and Effects of Nutrients within the St. Louis Bay (Mississippi) Estuary System."
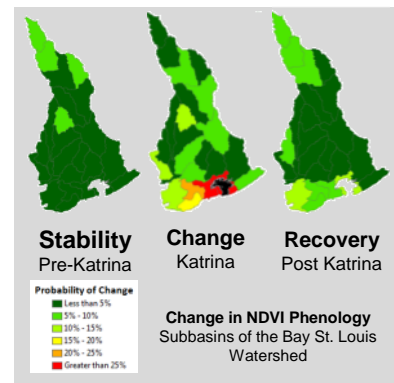
Project Status: Ongoing

Ocean color image created from Landsat 7 data aggregated to 240 m

BASINS modeling area overlaid with land use and precipitation grids

Multi-sensor water sampling instrument used for *in-situ* surveys

Stability Pre-Katrina

Change Katrina

Recovery Post Katrina

Probability of Change
- Less than 5%
- 5% - 10%
- 10% - 15%
- 15% - 20%
- 20% - 25%
- Greater than 25%

Change in NDVI Phenology Subbasins of the Bay St. Louis Watershed