JALBTCX Topo/Bathy Data

Charlene Sylvester

Physical Scientist

Mobile District/Joint Airborne Lidar
Bathymetry Technical Center of Expertise

January 13, 2011

US Army Corps of Engineers
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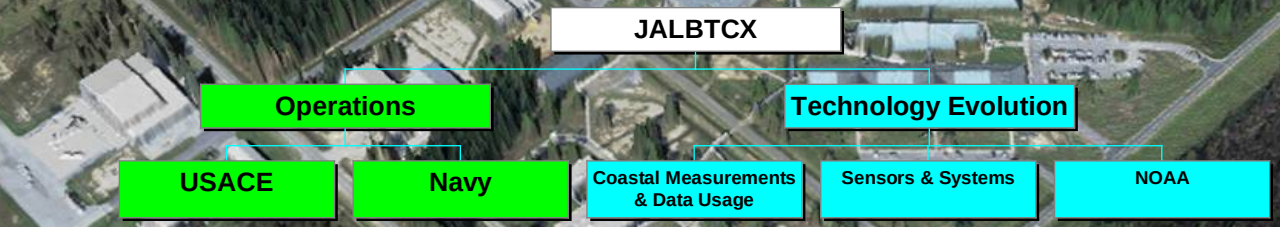
Joint Airborne Lidar Bathymetry Technical Center of Expertise



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US Army Corps of Engineers MOBILE DISTRICT

U. S. Naval Research Laboratory Stennis Space Center, MS

EARTH SCIENCE APPLICATIONS DIRECTORATE
John C. Stennis Space Center

Welcome to the US Army Corps of Engineers
Engineer Research and Development Center
Waterways Experiment Station, Vicksburg, MS

Department of Marine Science
of The University of Southern Mississippi

NAVAL OCEANOGRAPHIC OFFICE

NOAA Satellites and Information
National Environmental Satellite, Data, and Information Service

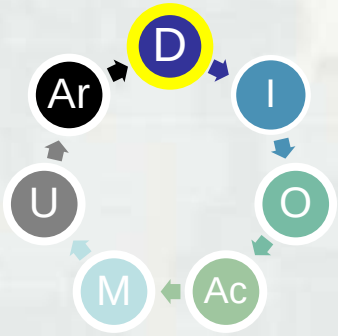
3001 the geospatial company

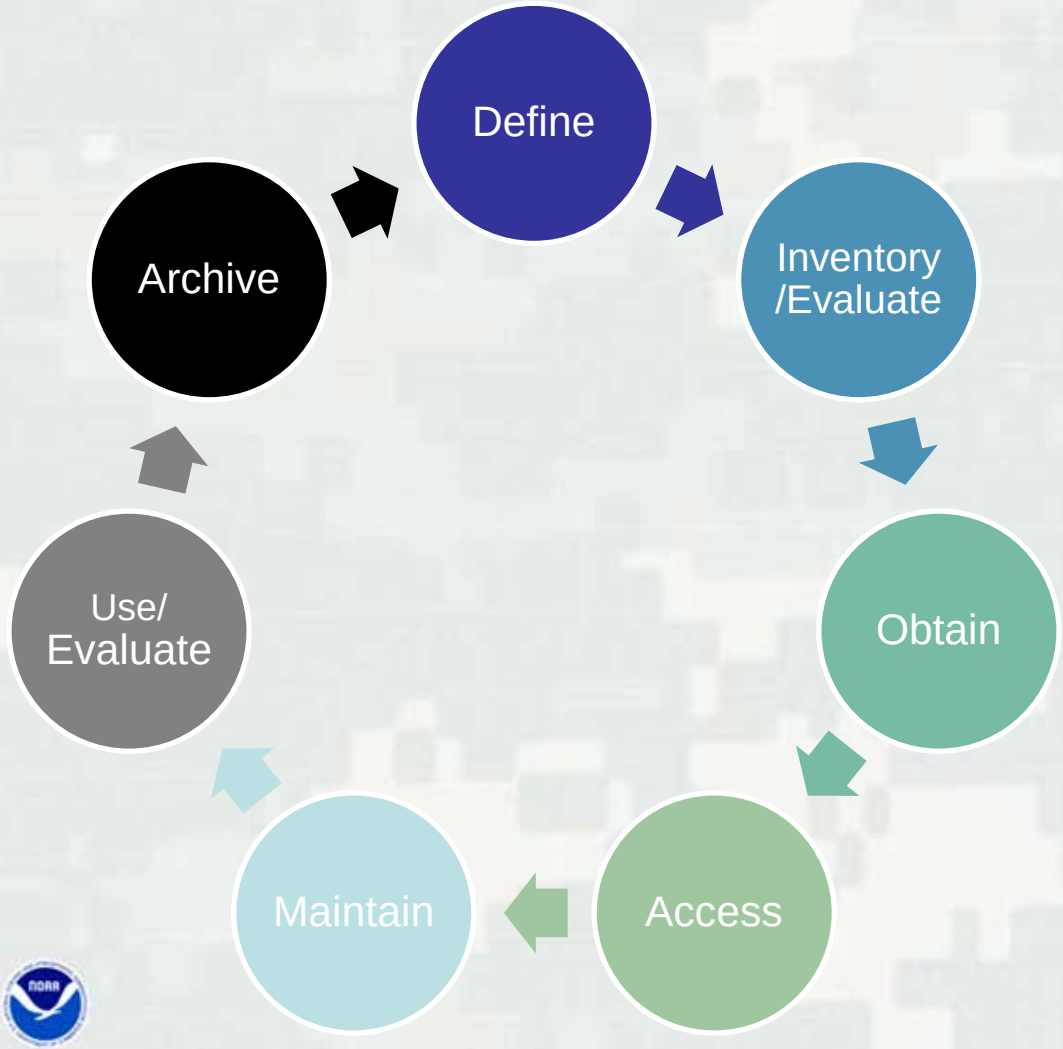
Bowhead

Director: Jennifer Wozencraft

JALBTCX, Stennis International Airport, Kiln, MS

FGDC Lifecycle





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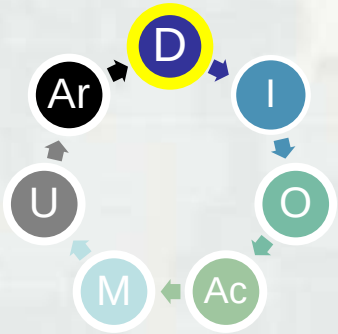
Data Types

Layers of Interest



- *Administrative and Political*
- *Agriculture and Farming*
- *Atmosphere and Climate*
- *Biology and Ecology*
- *Business and Economic*
- *Cadastral*
- *Cultural, Society and Demographic*
- **Elevation and Derived Products**
- **Environment and Conservation**
- **Geological and Geophysical**
- *Human Health and Disease*
- **Imagery and Basemaps**
- *Inland Water Resources*
- *Locations and Geodetic Networks*
- **Oceans and Coasts**
- **Transportation Networks**
- **Utilities and Communication**
- **Climate Change**
- **Oil Spill**

GOMA GMMMP Layers

BUILDING STRONG®

Building Partnerships for a Healthier Gulf

GULF OF MEXICO ALLIANCE

Water Quality • Nutrients • Ecosystems • Education • Restoration • Resilience

GOVERNORS' ACTION PLAN II

For Healthy and Resilient Coasts

2009 - 2014

Gulf of Mexico Master Mapping Plan

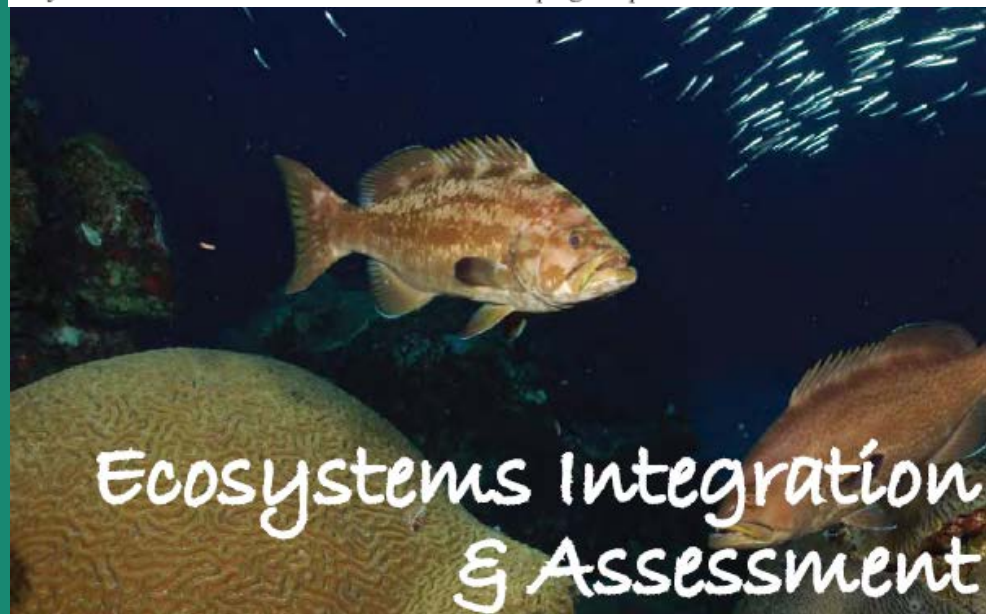
Alliance Action: Produce the Gulf of Mexico Master Mapping Plan (GMMMP), a comprehensive plan to collaboratively acquire data on the physical characteristics of the Gulf region, particularly elevation, shoreline, and surface data.

Action Steps:

1. Identify mapping needs and requirements to allow for informed coastal management decisions and data gap analysis.
2. Conduct an inventory of the capabilities and data assets of existing mapping programs and leverage ongoing efforts by the Interagency Working Group on Ocean and Coastal Mapping.
3. Develop a collaborative strategy to acquire the necessary region-wide physical characteristic data.

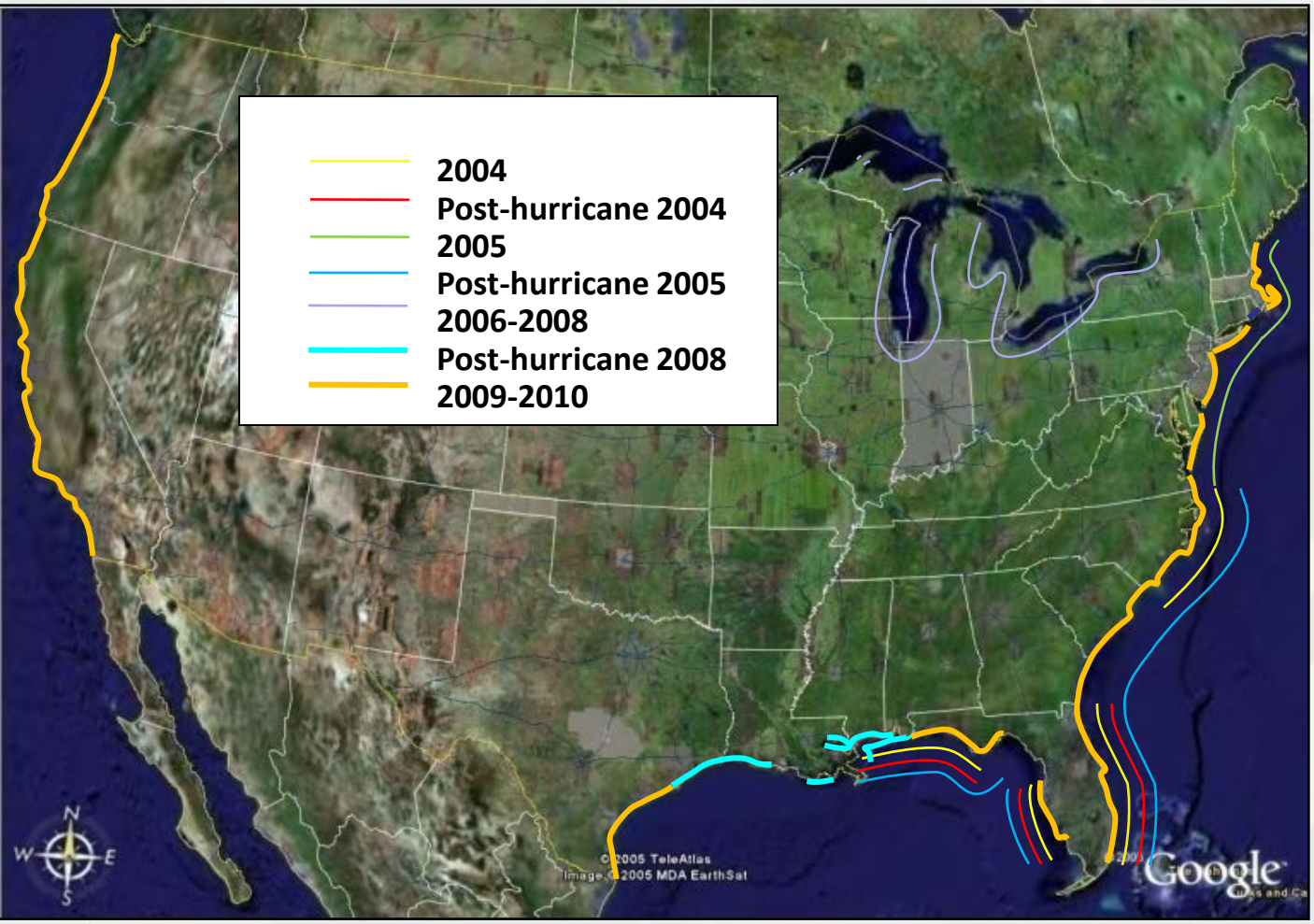
Why?

The Gulf is too large for any one agency to map, thus a collaborative approach is required; one that identifies and fulfills all mapping requirements with ongoing mapping programs. Therefore, by aligning data collection methods and sharing resources, critical mapping information can be collected at a lower cost to the program partners.



Ecosystems Integration & Assessment

USACE National Coastal Mapping Program



- Funded by USACE Headquarters
- Initiated in FY2004
- Collect lidar elevation and imagery data in support of engineering and research
- Focus on sandy shorelines
- In-house and contract survey capability

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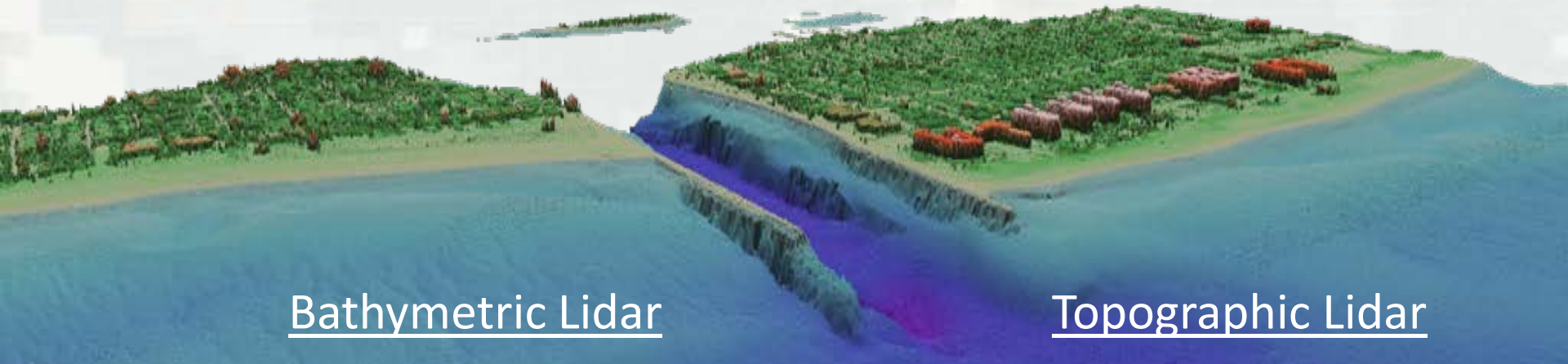
Data Types

Elevation



Bathymetric Lidar

- 1000 m offshore (laser extinction)
- 5 m postings
- 100% coverage (200% fed projects)

Topographic Lidar

- 500 m onshore
- 1 m postings
- 200% coverage

Lake Worth Inlet, FL, 2007 topo/bathy

US Army Corps of Engineers

Data Types

Orthoimagery

RGB Imagery

- 20-cm on-ground resolution

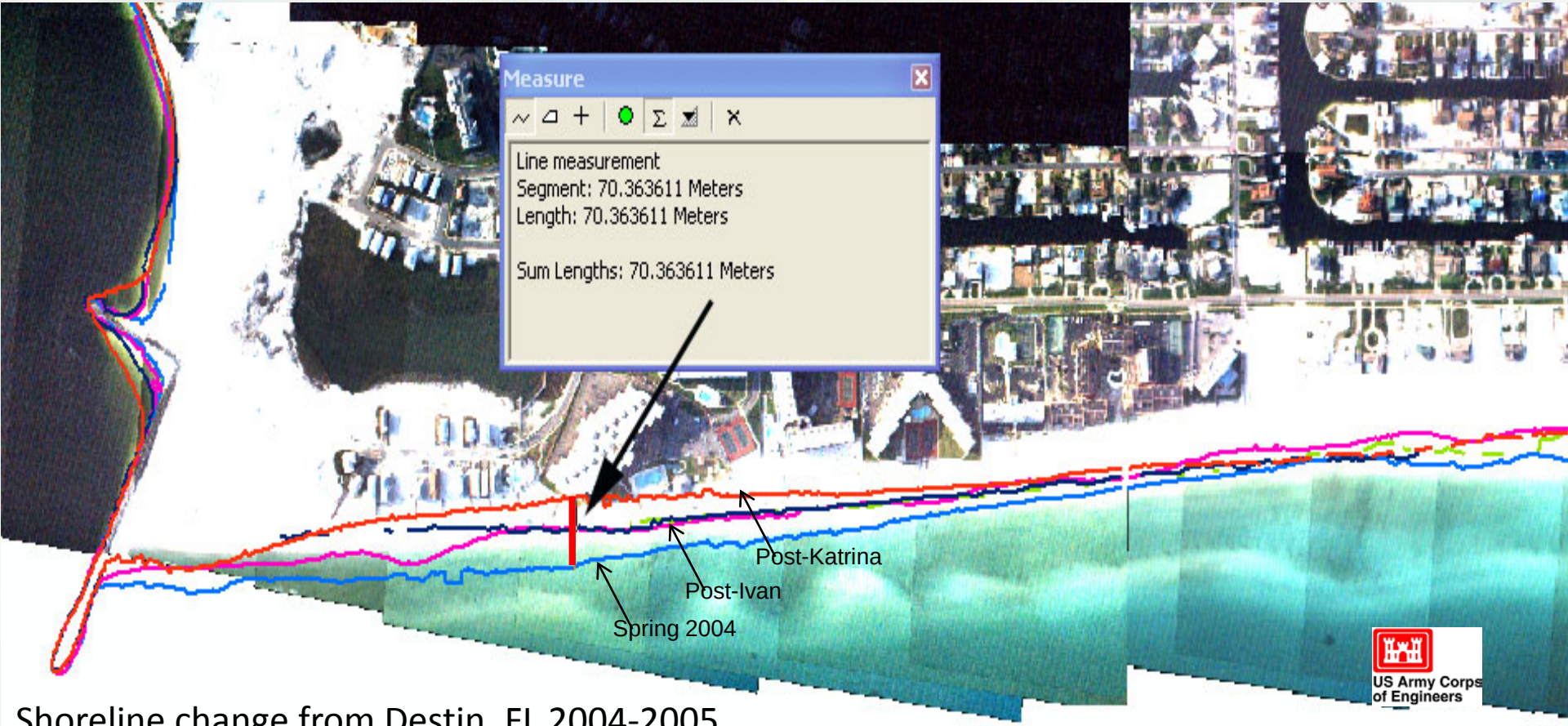
Hyperspectral Imagery

- 1-m on-ground resolution
- 36 20-nm bands, 380-1050 nm

US Army Corps of Engineers

Data Types

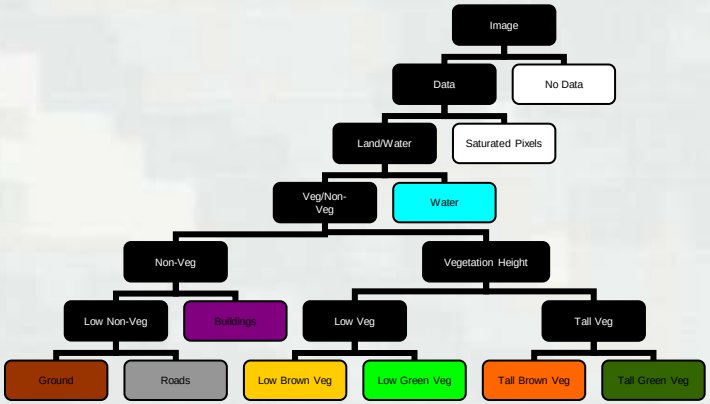
Shoreline



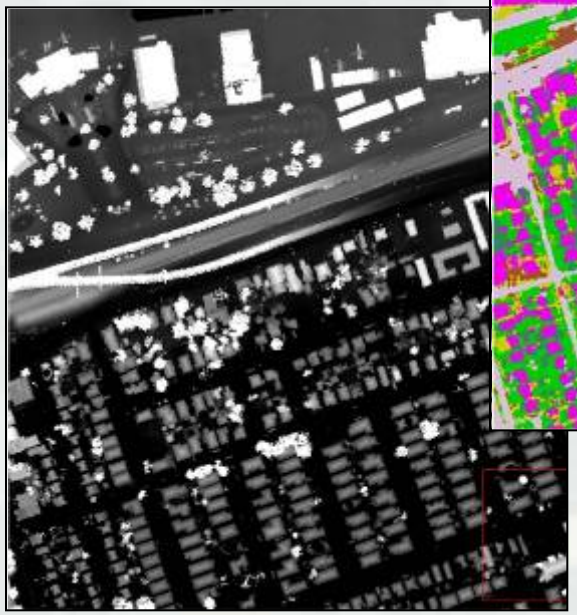
Shoreline change from Destin, FL 2004-2005

Data Types

Land Cover



RGB from hyperspectral imagery



Grayscale topographic lidar first returns

Land Cover Classification Image

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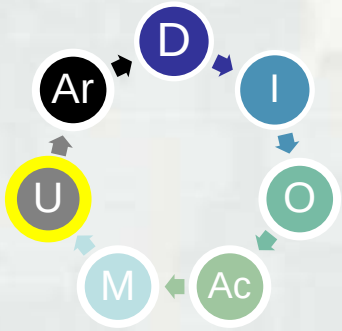
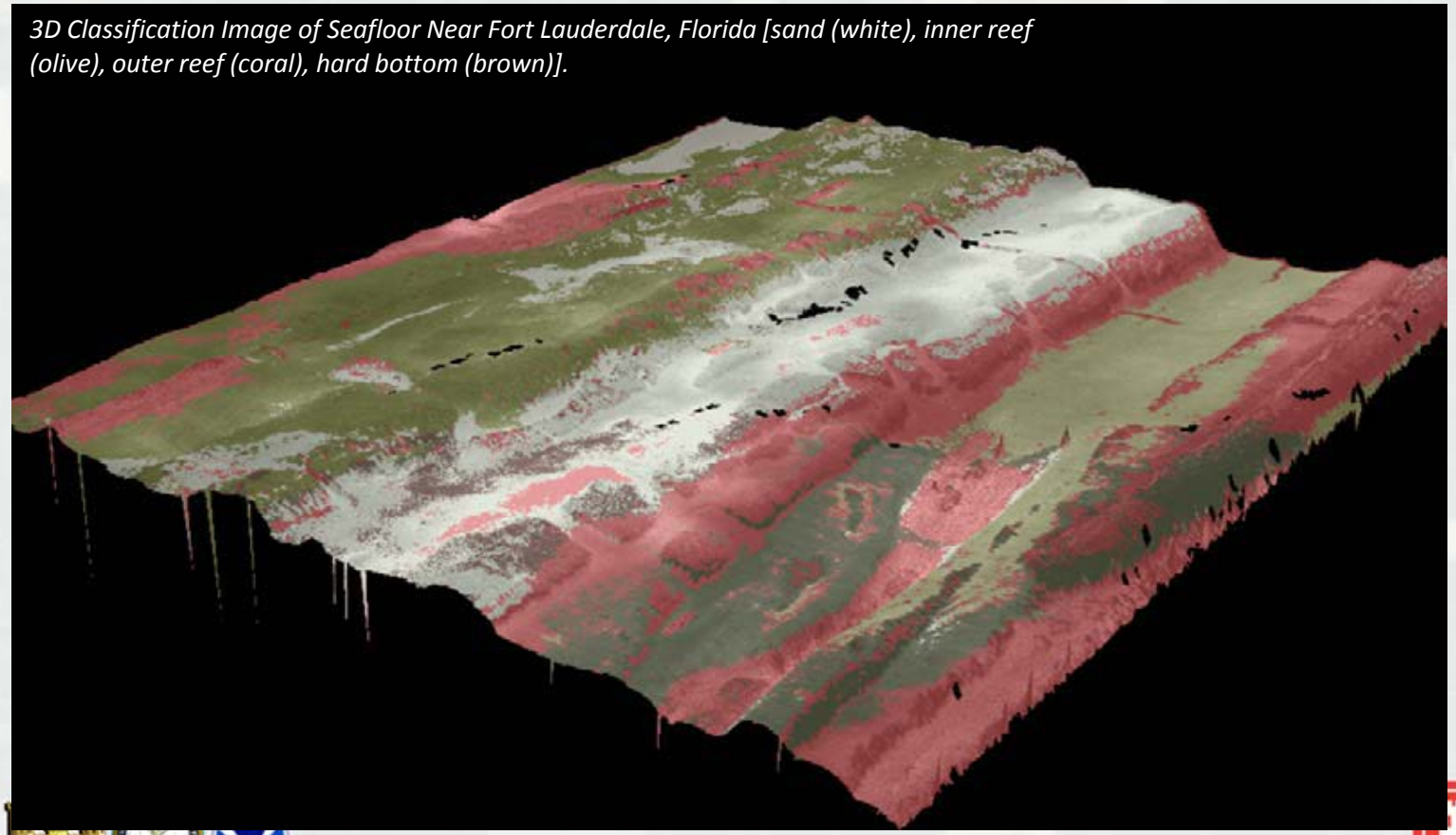
Data Types

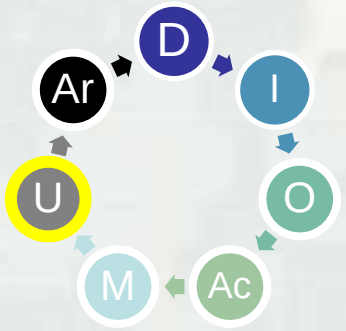
Benthic Habitat



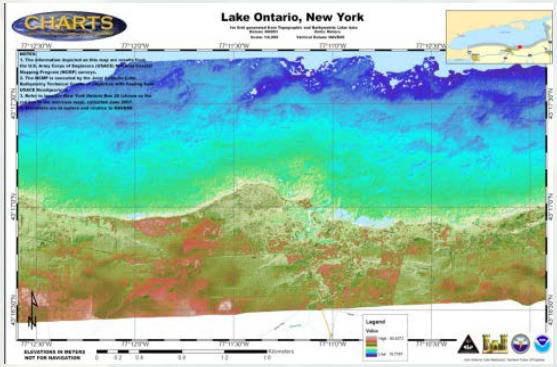


3D Classification Image of Seafloor Near Fort Lauderdale, Florida [sand (white), inner reef (olive), outer reef (coral), hard bottom (brown)].

National Coastal Mapping Program Data Products

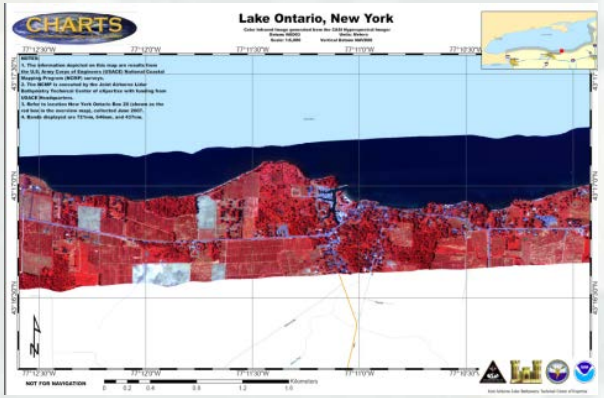


1-m Bathy/Topo DEM

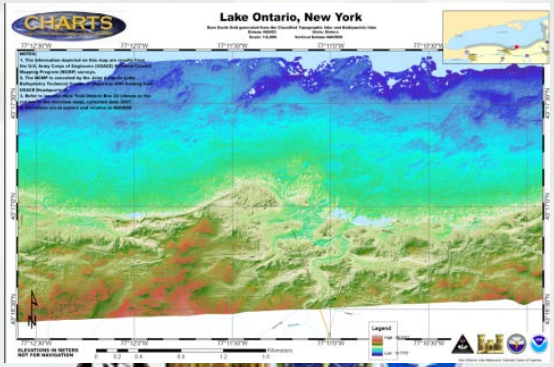


- ASCII xyz point clouds
- ASPRS LAS 1.1 point clouds
- 1-m bathy/topo DEMs
- 5-m bathy/topo DEMs
- GoogleEarth bathy/topo coverage
- NAVD88 “0” Contour
- Classified ASPRS LAS 1.1 point clouds
- 1-m bare earth DEMs
- RGB mosaics
- Hyperspectral mosaics
- Bottom reflectance images
- Basic land cover classification images

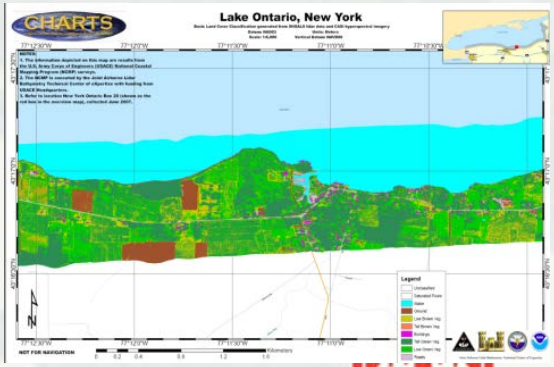
Hyperspectral Mosaic



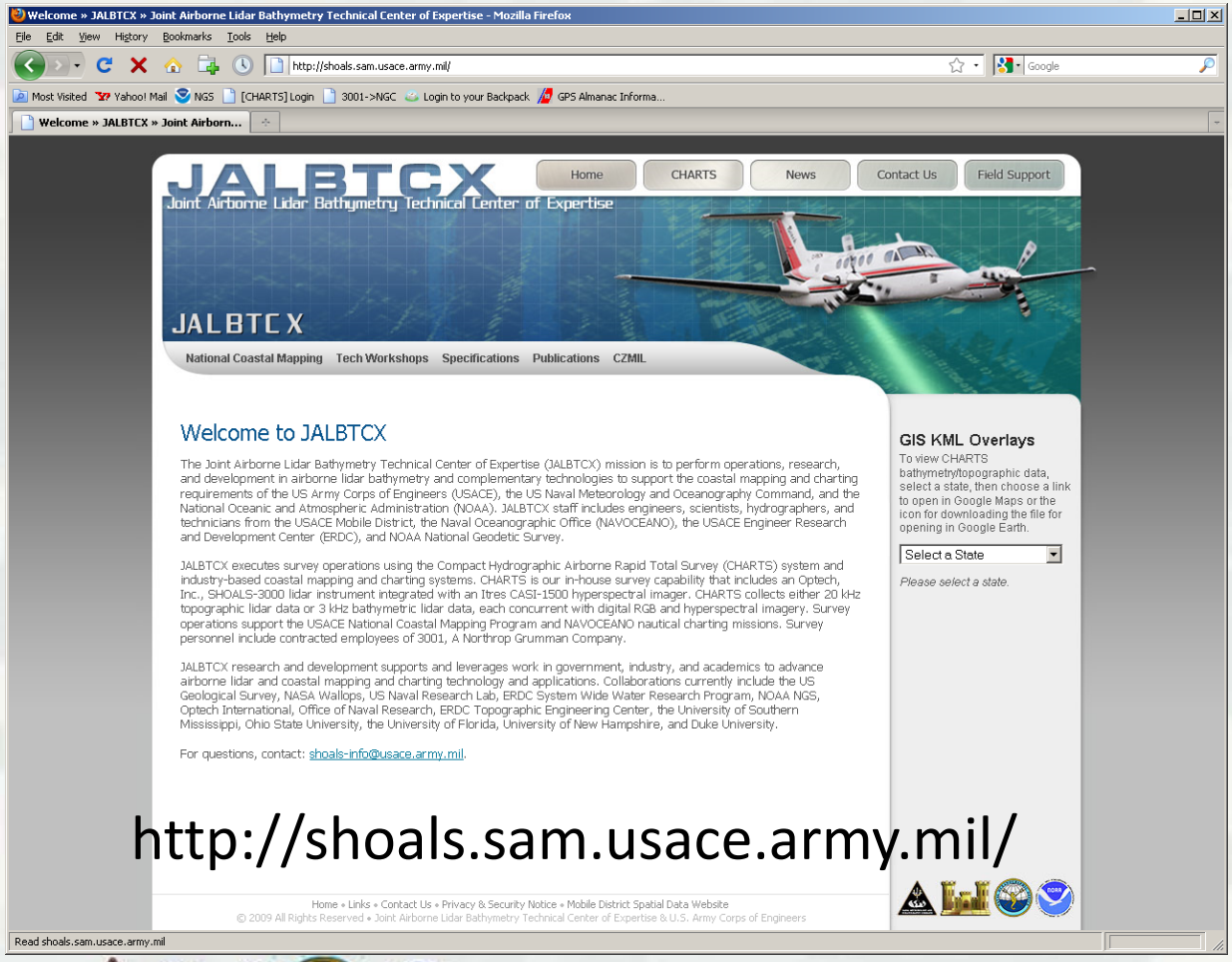
1-m Bare Earth DEM



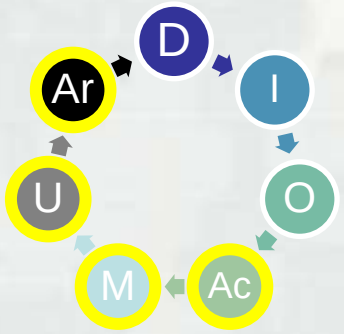
Land Cover Classification Image



Primary Customers



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



Automatic Delivery of Data Products

- ✓USACE Districts
- ✓USGS St. Petersburg
- ✓USGS EROS Data Center
- ✓NOAA NGDC
- ✓NOAA CSC

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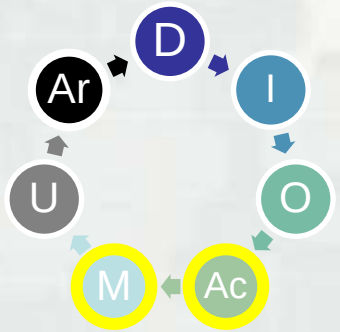
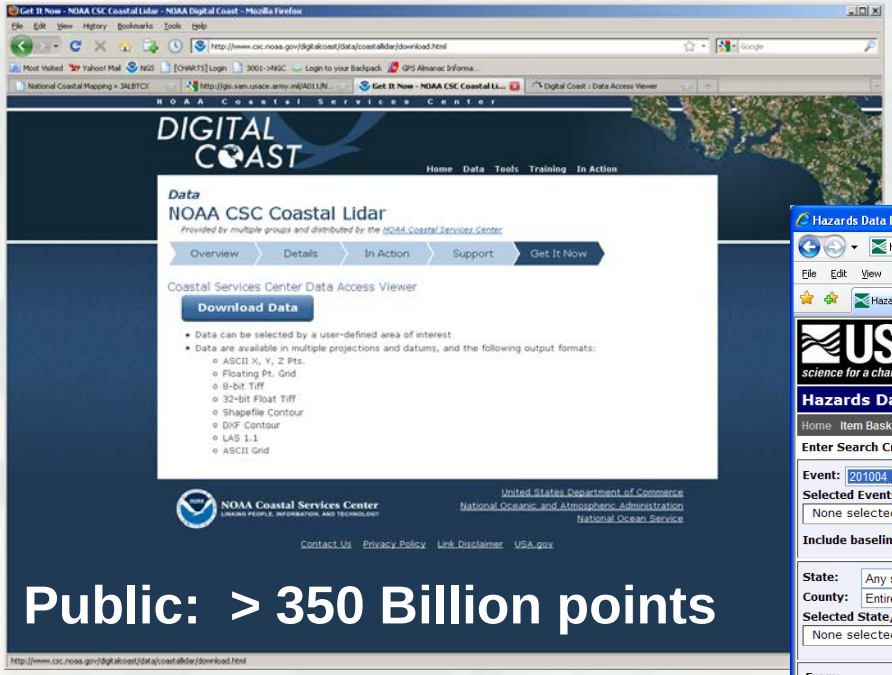
Interagency Support

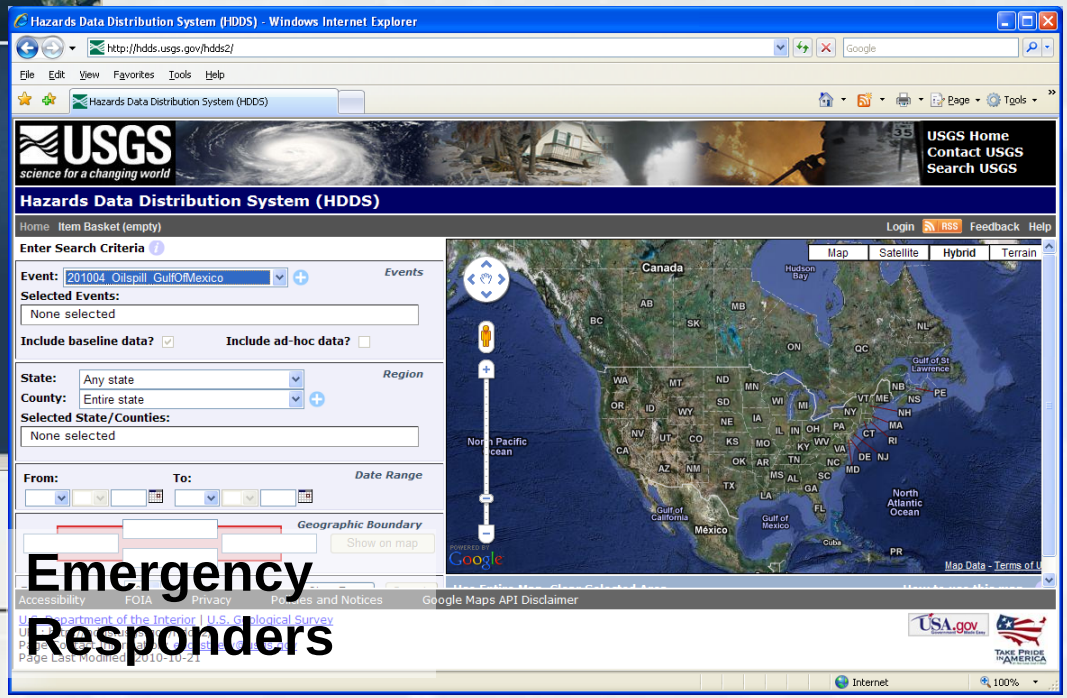
Data discovery and access



***Distributed authoritative source**



Public: > 350 Billion points



Emergency Responders

Interagency Support

Data archival

NCMP data products

*JALBTCX archives raw data and imagery and all data products

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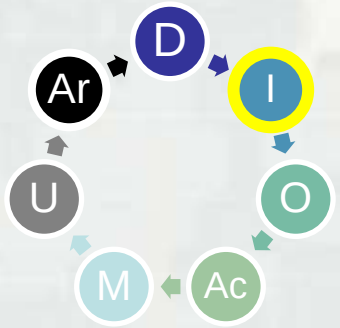
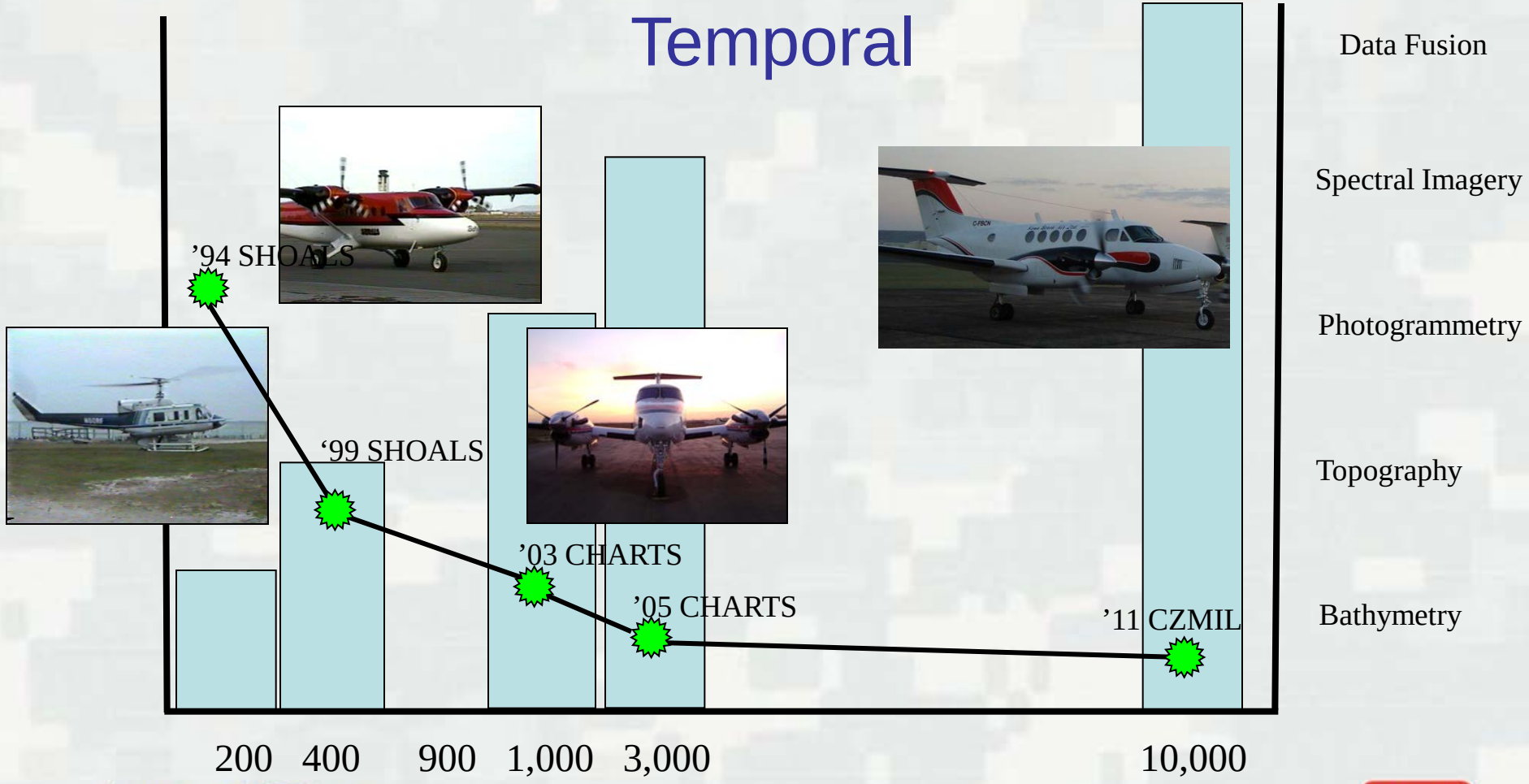
Gaps in Data Holdings



Spatial

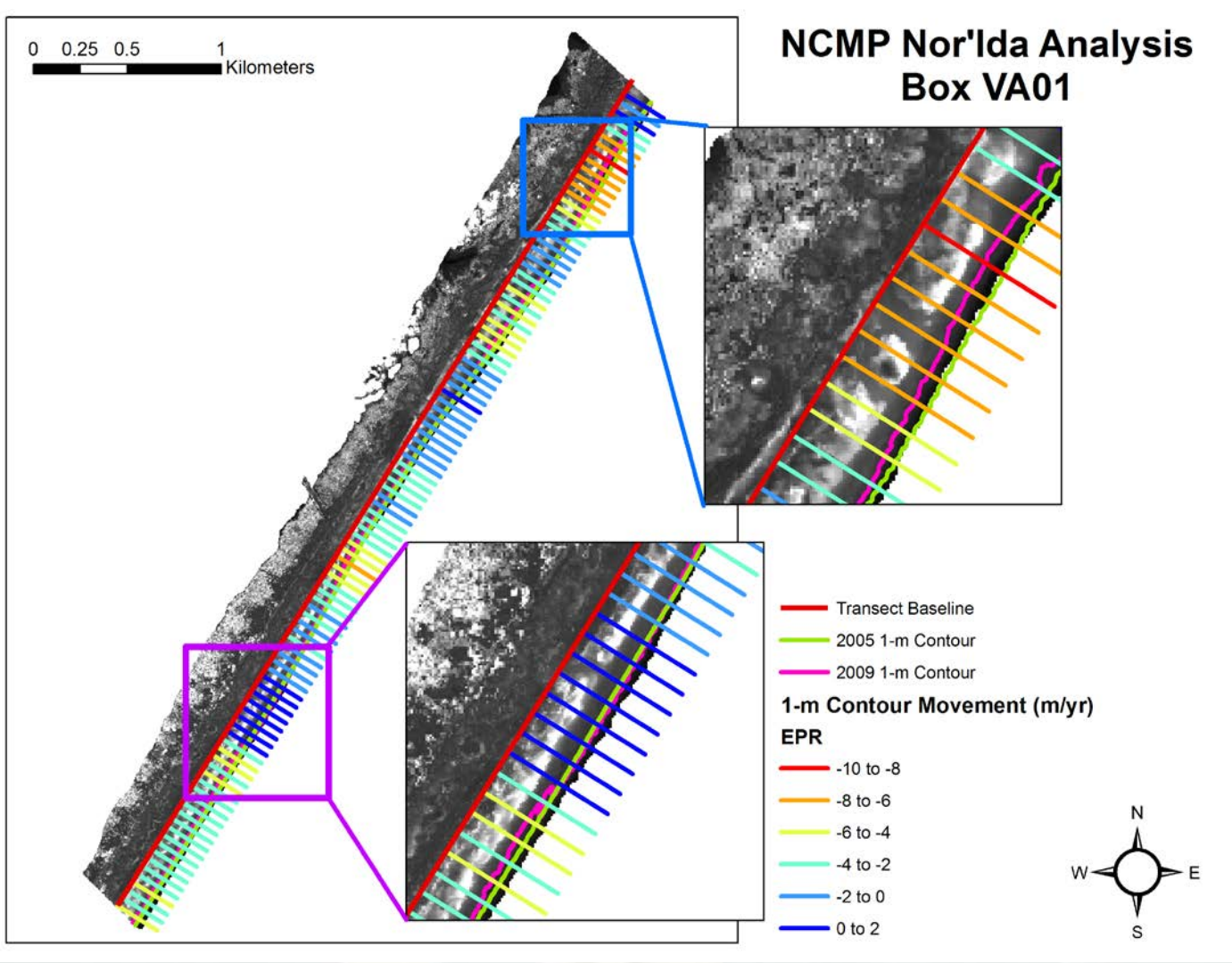
- NCMP data only along sandy, wave-impacted coasts.
  - Inland bays/estuaries, Northern Maine, Florida Big Bend
- Poor water clarity
  - Runoff, dirty harbors
- Sensor capabilities
  - Challenges in the 0-2m depth range

Gaps in Data Holdings



Gaps in Data Holdings

Temporal



5-year NCMP acquisition cycle does not capture annual and event driven change

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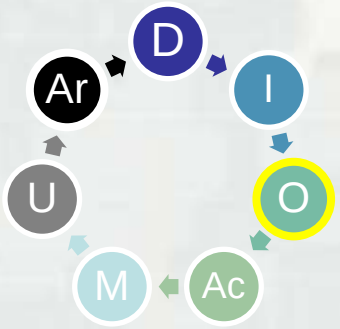
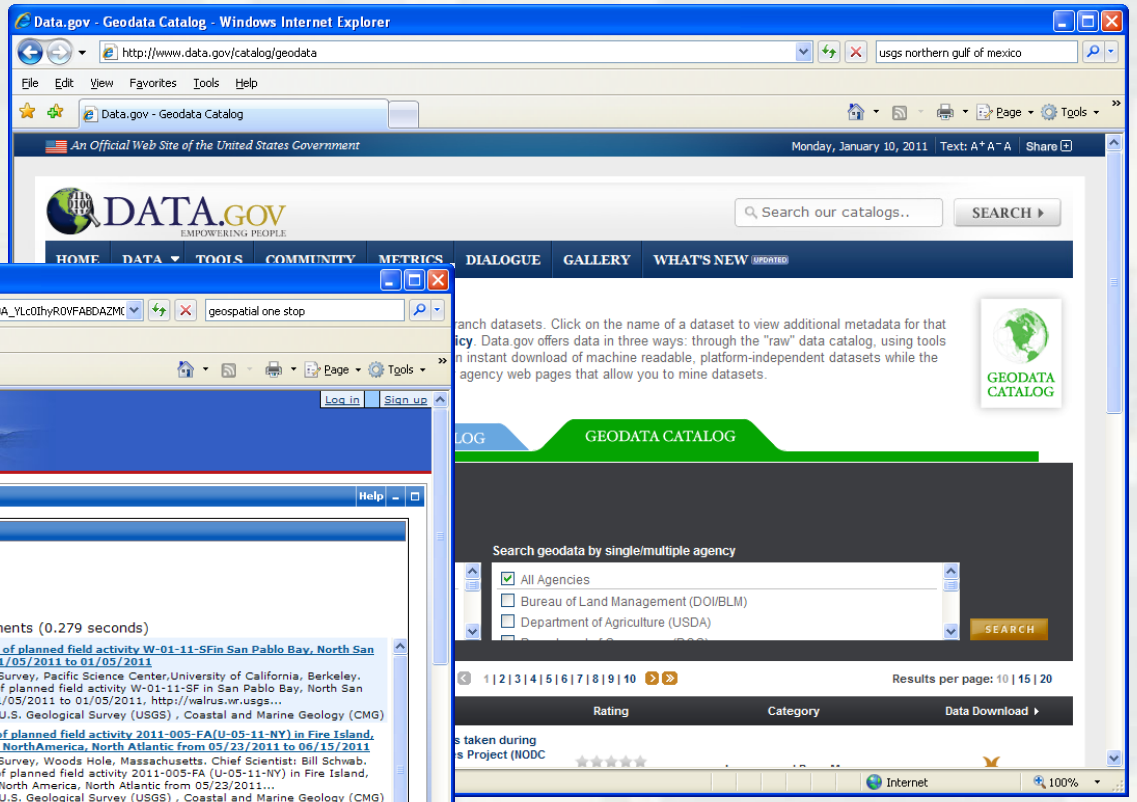
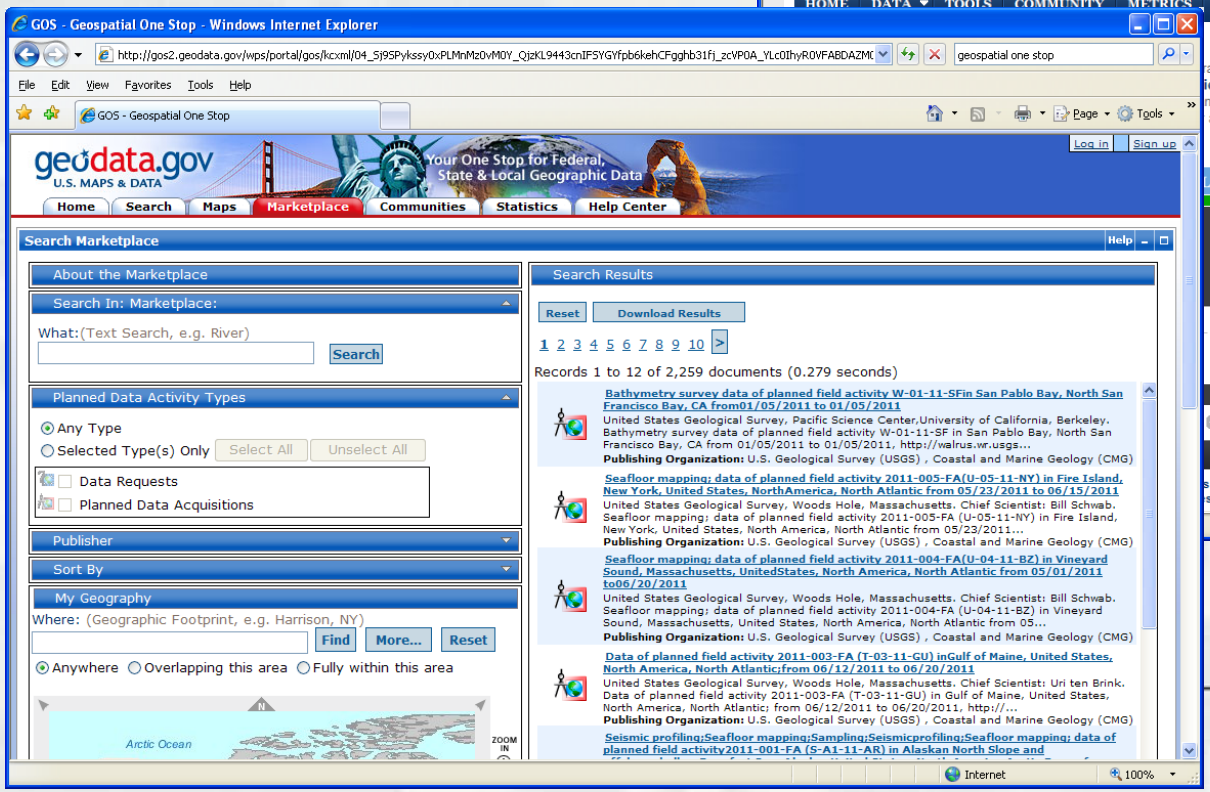
Interagency Collaboration

Data acquisition







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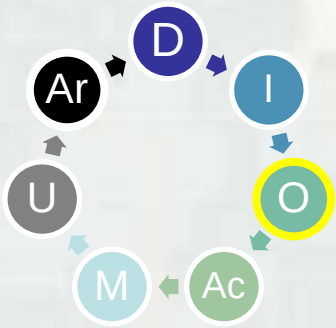
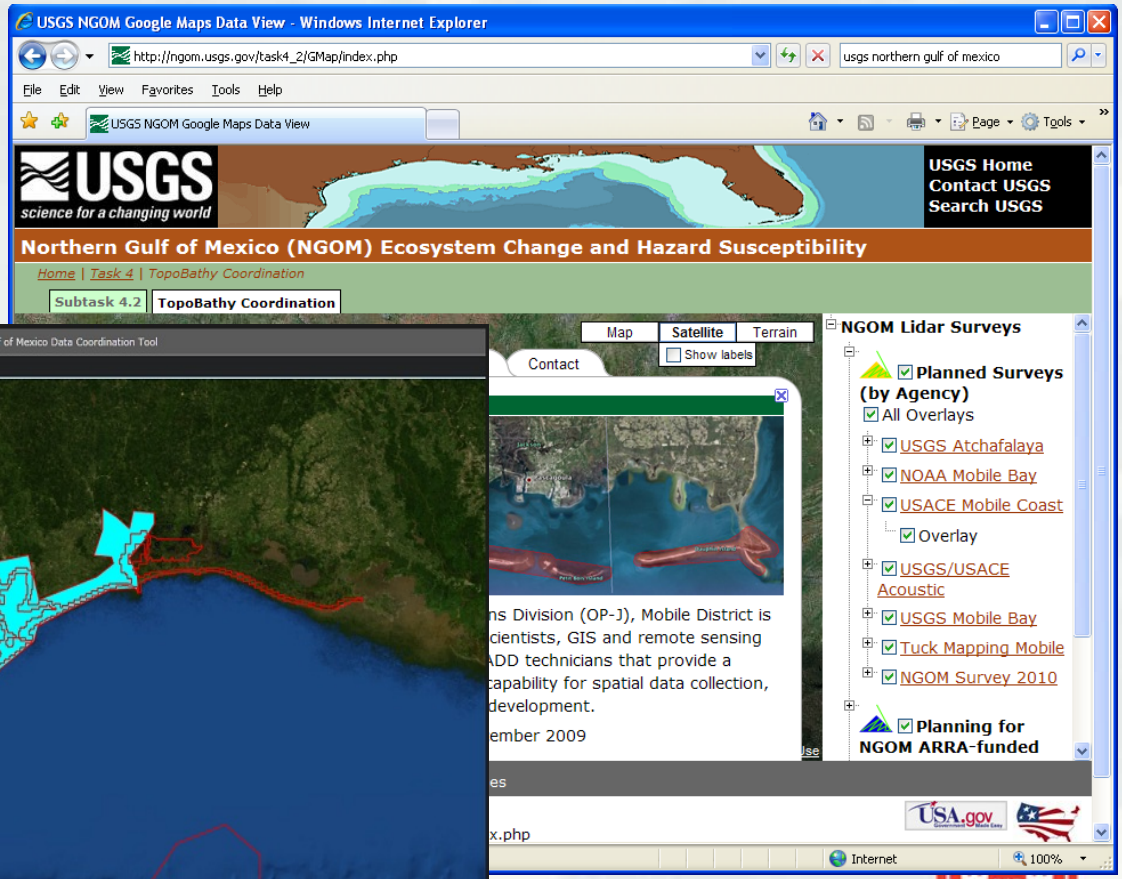
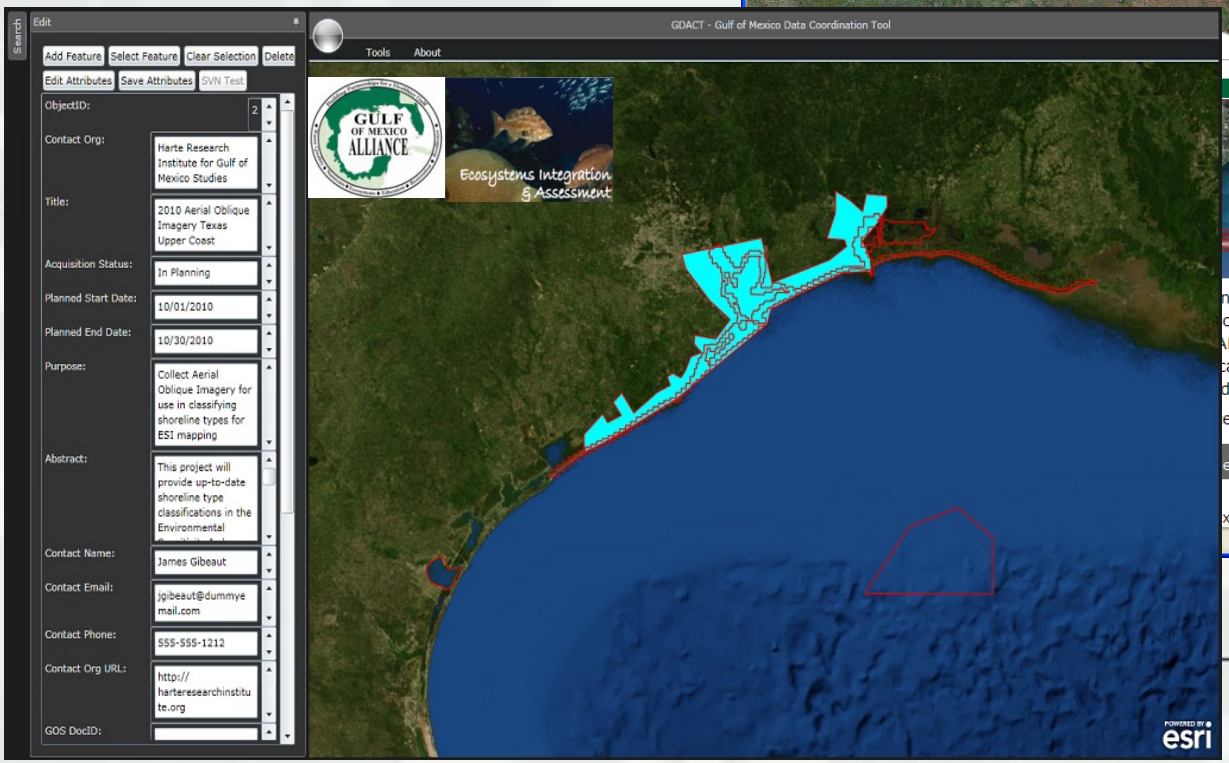
Interagency Collaboration

Data acquisition







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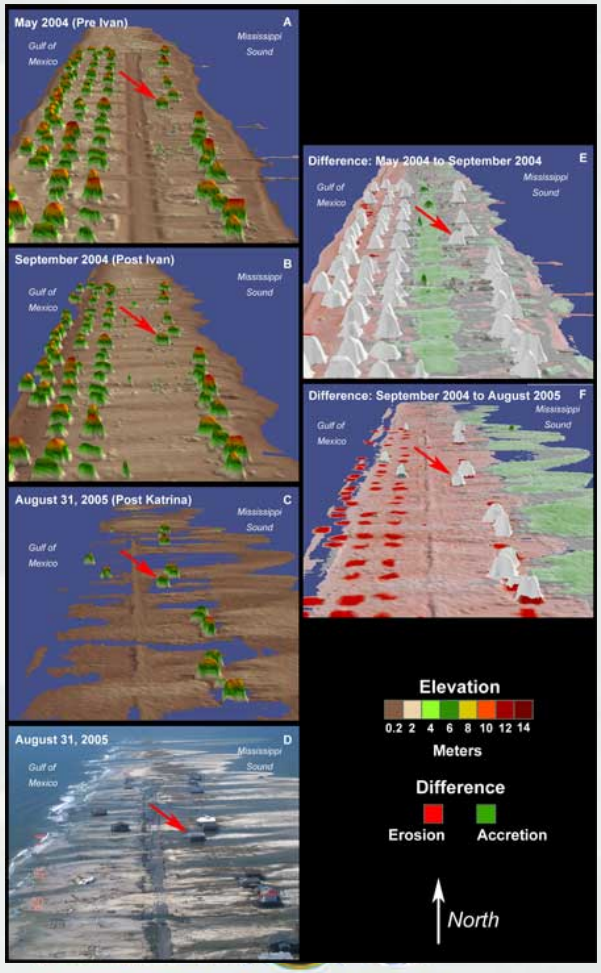
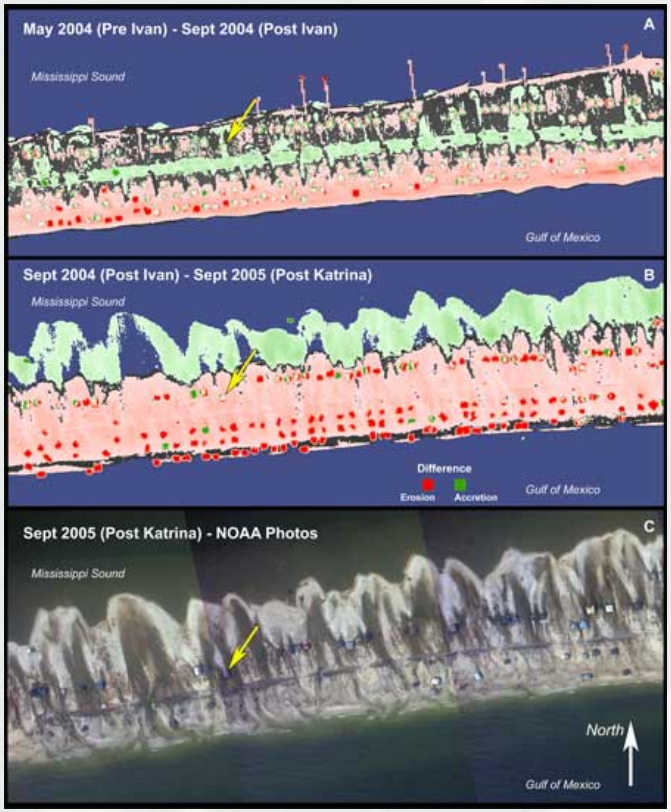
Interagency Collaboration

Data use and evaluation





Post-Hurricane Ivan (2004) and Katrina (2005) Coastal Change

USGS science for a changing world

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*Image Courtesy of USGS St. Petersburg Coastal and Marine Science Center

Success Stories

- Programmatic, ARRA and other agency funding leveraged to acquire elevation and imagery for continental US coast within one year
- 2nd cycle of regional coastal mapping initiated this past summer under the USACE NCMP
- $200 M coastal project reconstruction following 2004 hurricane season utilizing multi-agency data resources
- To date, >350 billion data points downloaded via digital coast

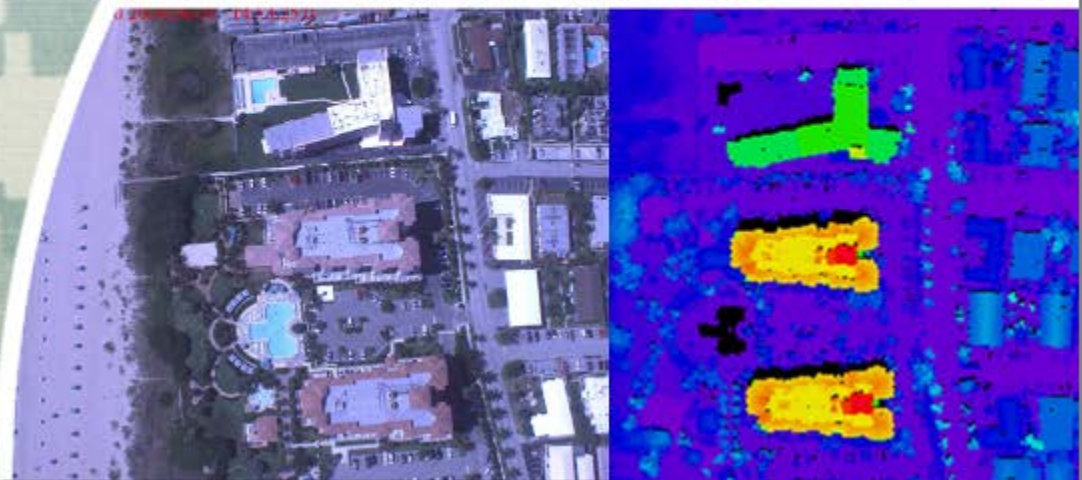
Joint Airborne Lidar Bathymetry
Technical Center of eXpertise

Follow-on Q&A

Charlene.S.Sylvester@usace.army.mil

228.252.1115 (office)

228.265.0156 (cell)



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NOAA