

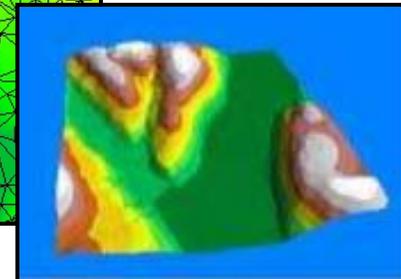
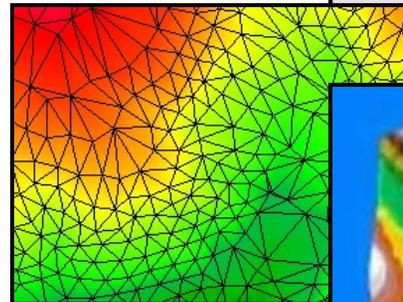
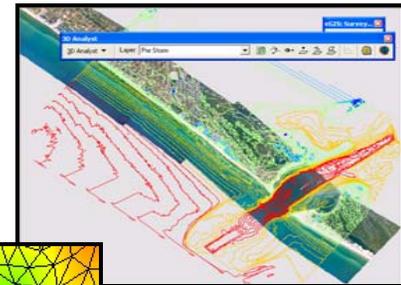
# eCoastal in a Nutshell:

## An Introduction to the eCoastal Program & Custom Applications

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<http://eCoastal.sam.usace.army.mil>  
<http://gis.sam.usace.army.mil>



## Regional Approach

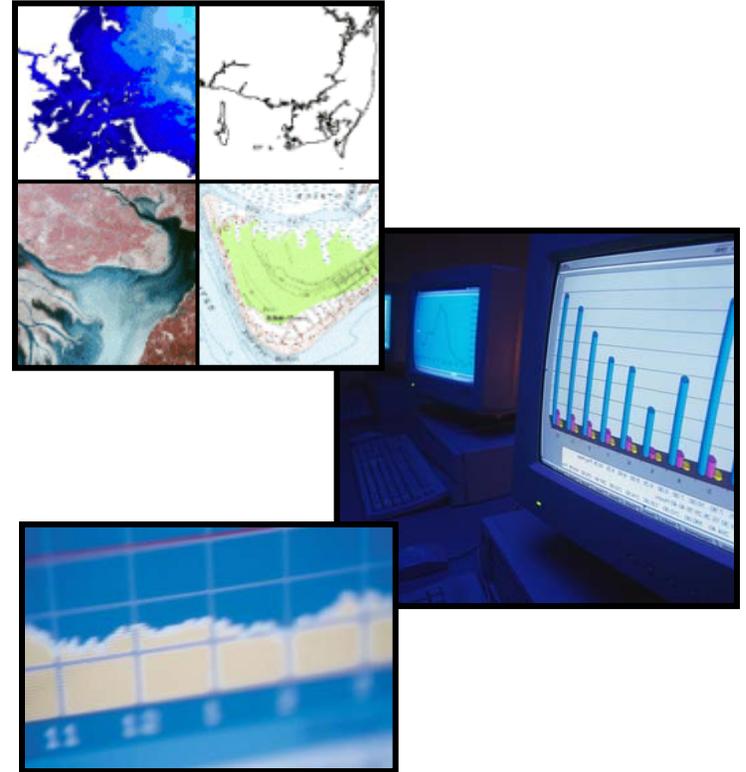
- In the past, the US Army Corps of Engineers (USACE) has focused on managing sand at coastal projects on a project-by-project basis.
- This approach to sand management may not adequately consider the impact of individual projects on down drift projects.
- A regional approach allows leveraging of:
  1. Resources
  2. Applications
  3. Database Architectures
- eGIS supports regional business center
  1. More efficient use of resources
  2. Propagate effective, more accurate and informed decision-making
  3. Increase access and dissemination of digital information



Introduction: What is eGIS?

**Enterprise GIS** is defined as *the integration of geospatial technology infrastructure to deliver spatial information products, services and standard datasets to all business elements and processes of the organization.*

The concept of enterprise GIS (eGIS) is taking a complete organizational approach to sharing, using, and managing spatial information.



Introduction: What is eCoastal?

**eCoastal** is an enterprise GIS developed for coastal engineering business practices. It was developed to concentrate on the specific needs of the coastal engineer.

eCoastal is an architecture developed by the U.S. Army Corps of Engineers that addresses spatial data standards (SDS), geodatabase development, and desktop and web applications. It was designed as data management solution to provide baseline information for effective planning and prediction of regional and local coastal processes.

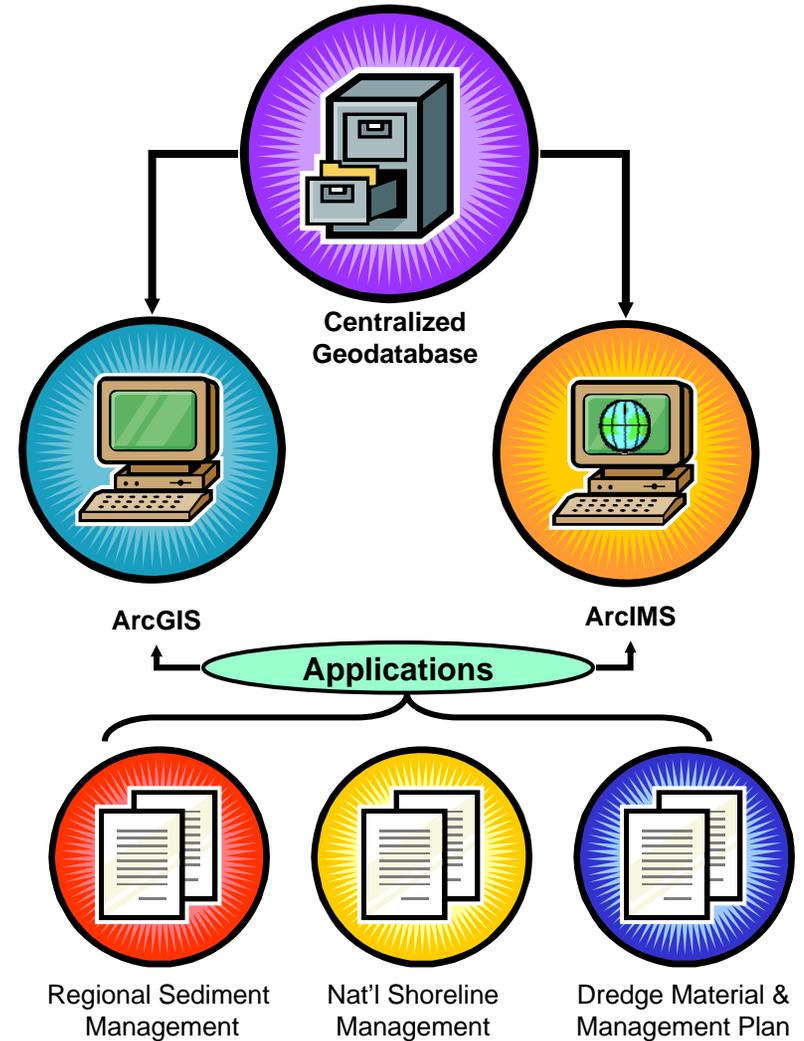
This architecture allows adjacent coastal projects to effectively share and access data contained in the system.



Introduction: Architecture Overview

The centralized geodatabase serves as the data repository for all spatial data accessed by the enterprise GIS applications. The underlying format of the enterprise database (SQL or ORACLE) is at the discretion of the local District Office.

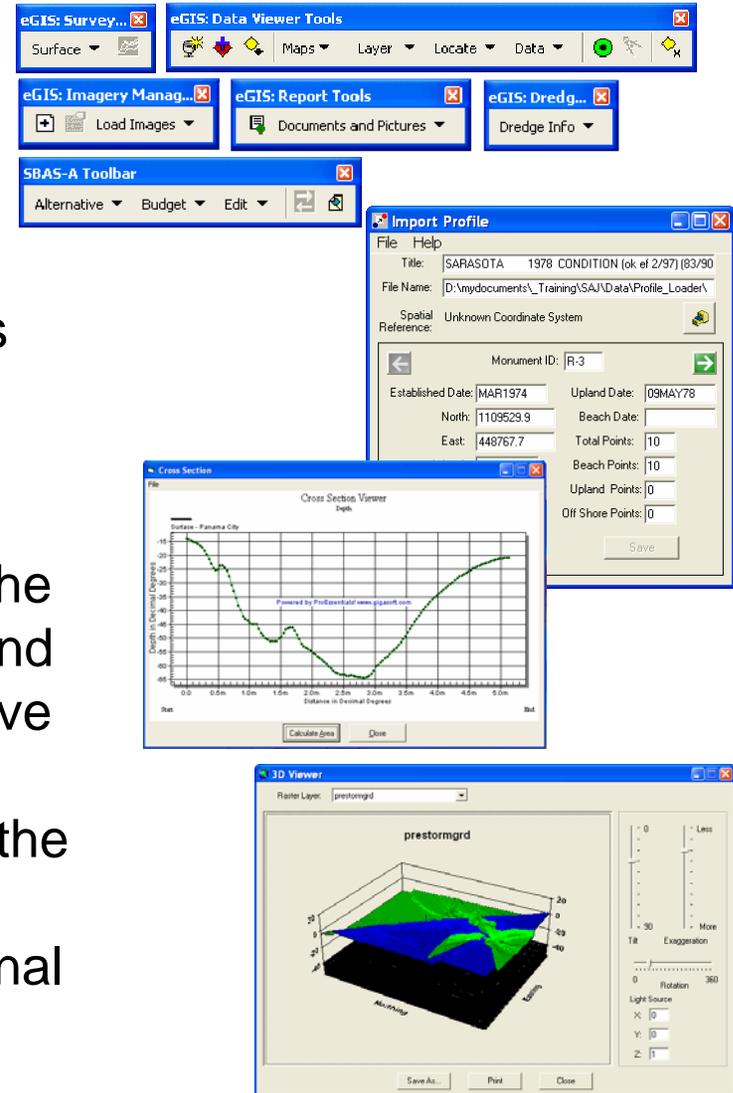
Data collected or created for all coastal projects are imported into the geodatabase. Only one geodatabase exists to serve data to the public, via the Internet accessible interface, and to support the internal applications.



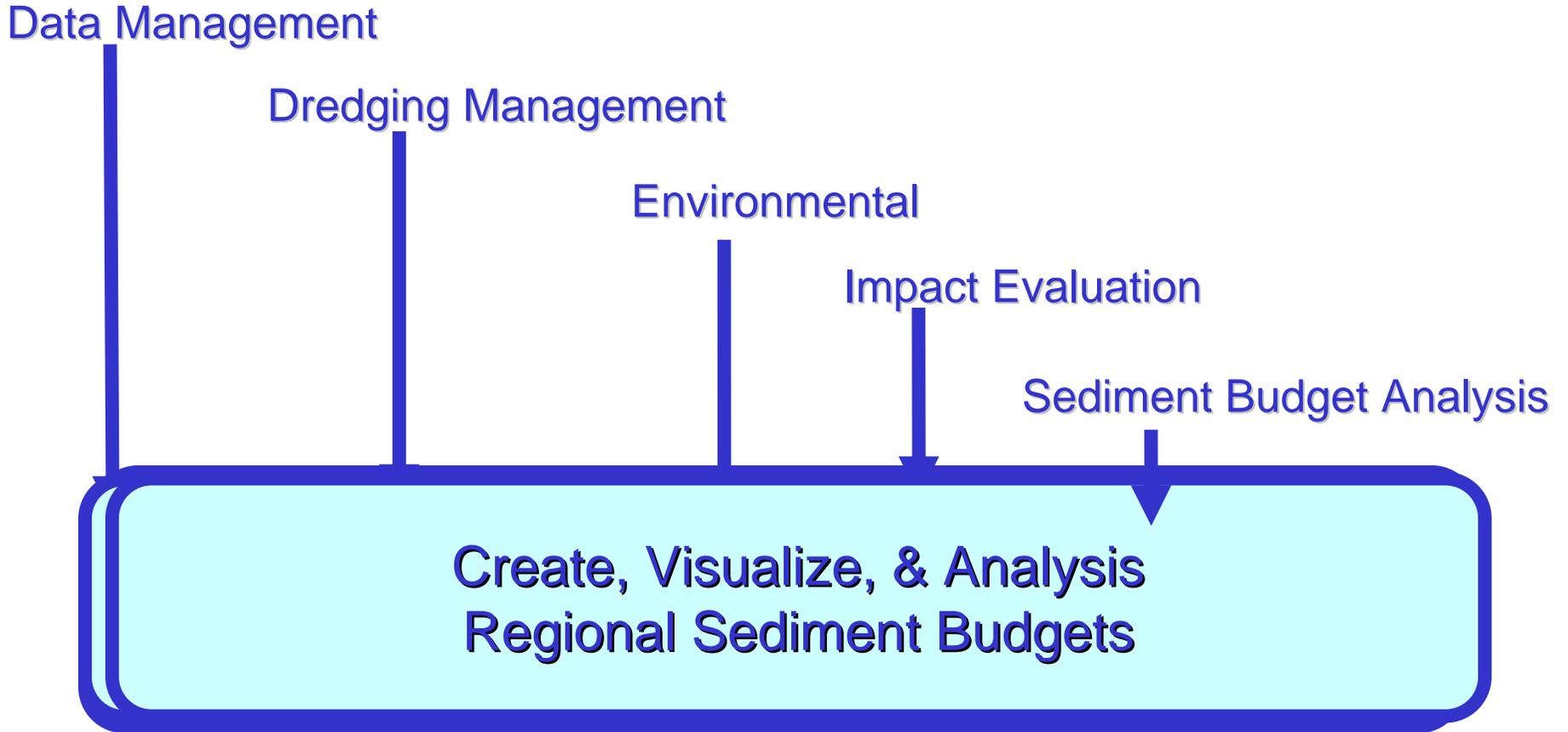
## Introduction: Architecture Overview

Natively, users can browse the geodatabase using ESRI's ArcCatalog™ or ArcMap™. However with eCoastal, a series of custom applications have been developed for ESRI's desktop products as well as the internet accessible, ArcIMS™ platform.

These applications were designed to assist the users of the enterprise system with access and analysis of the coastal data. Applications have been developed to support the needs of the existing and future coastal projects, such as the Regional Sediment Management, Dredge Material and Management Plan, or the National Shoreline Management projects.



## eCoastal System



## Application Demonstration – Data Viewer & Imagery Manager

The eCoastal's eGIS Toolbox was created as a comprehensive set of applications that enable stakeholders in management decisions to explore the broad spatial and temporal impacts of potential management actions.

In the U.S. Army Corps of Engineers (USACE), these tools have emerged as necessary components for effective planning and prediction of regional and local coastal processes. A geographic information system with specialized applications was developed to provide baseline information for regions including hydrographic and topographic data, shoreline position, aerial and oblique photography, hyperspectral imagery, dredging records, nautical charts, and other data regarding regional utilities, infrastructure, and land use.

This demonstration will show the utility of the Data Viewer Tools and Imagery Manager toolbars.



## Application Demonstration – Beach Profile Importer

Beach profiles can be delivered in a variety of formats. Not all formats are directly compatible with ArcMap. The Beach Profile tool was designed to allow you to import profile data that currently exists in a distance-azimuth format.

The Profile Loader application reads all values listed in the text file, and transposes them into an XYZ format. The application also places values stored in the header how and automatically places them in a metadata file. When data is converted into this format, ArcGIS can plot the file.

FLORIDA 1978 CONDITION (ok ef 2/97) (83/90 H DATUM)												
R-3	MAR1974	00	1109529.900	448767.700	245.00	10.89						
	09MAY78		10	0	10	0						
			-13.0	10.65	20.0V	9.50	25.0	6.31	26.0	5.90	48.0	4.70
			75.0	1.75	125.0	-2.08	135.0	-2.76	149.0	-5.17	175.0	-6.32
R-8	MAR1974	00	1105254.000	451243.200	235.00	8.52						
	09MAY78		12	0	12	0						
			.0	7.85	4.1W	7.56	5.7	7.56	7.0	3.85	14.0	3.60
			21.0	4.12	50.0	-.30	53.0	-1.65	60.0	-2.03	62.0	-1.50
			100.0	-1.82	150.0	-4.51						
R-14	MAR1974	00	1100367.100	454819.100	235.00	7.09						
	09MAY78		13	0	13	0						
			.0	6.76	33.0	7.13	44.0	6.74	50.0	7.99	56.0V	8.33
			57.0	7.08	62.0	5.03	73.0	3.54	100.0	1.43	150.0	-1.51
			174.0	-2.27	180.0	-2.80	200.0	-4.03				
R-19	MAR1974	00	1096631.800	458053.600	230.00	5.60						
	09MAY78		11	0	11	0						
			.0	5.21	15.0V	5.13	16.0	4.54	30.0	3.00	43.0	3.28
			50.0	3.23	65.0	3.01	100.0	1.11	150.0	-2.25	200.0	-2.04
			250.0	-5.41								
R-20	MAR1974	00	1095894.100	458740.200	230.00	6.08						
	09MAY78		8	0	8	0						



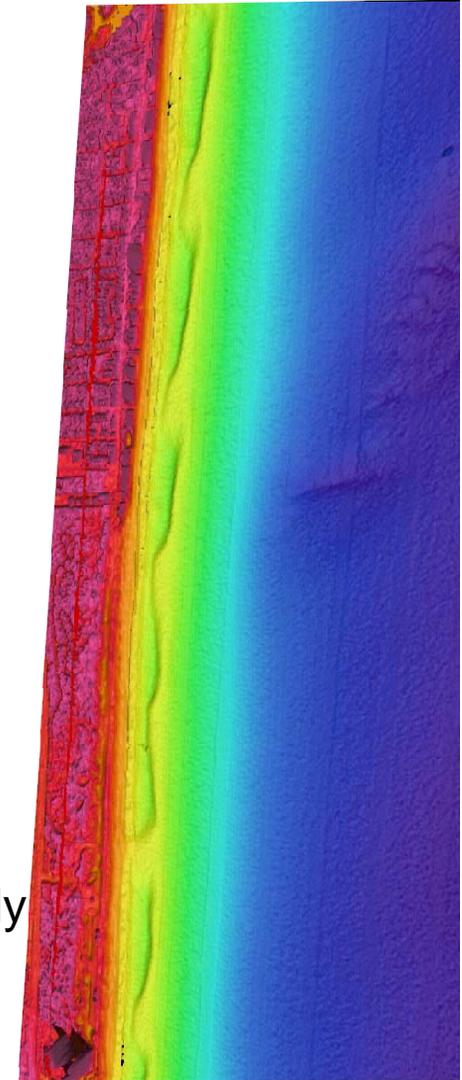
## Application Demonstration – Survey Tools

Lidar data is an integral part for data analysis in coastal engineering. The eGIS: Survey Toolbar was specifically designed for coastal engineers to simplify the formatting process of lidar datasets.

You can:

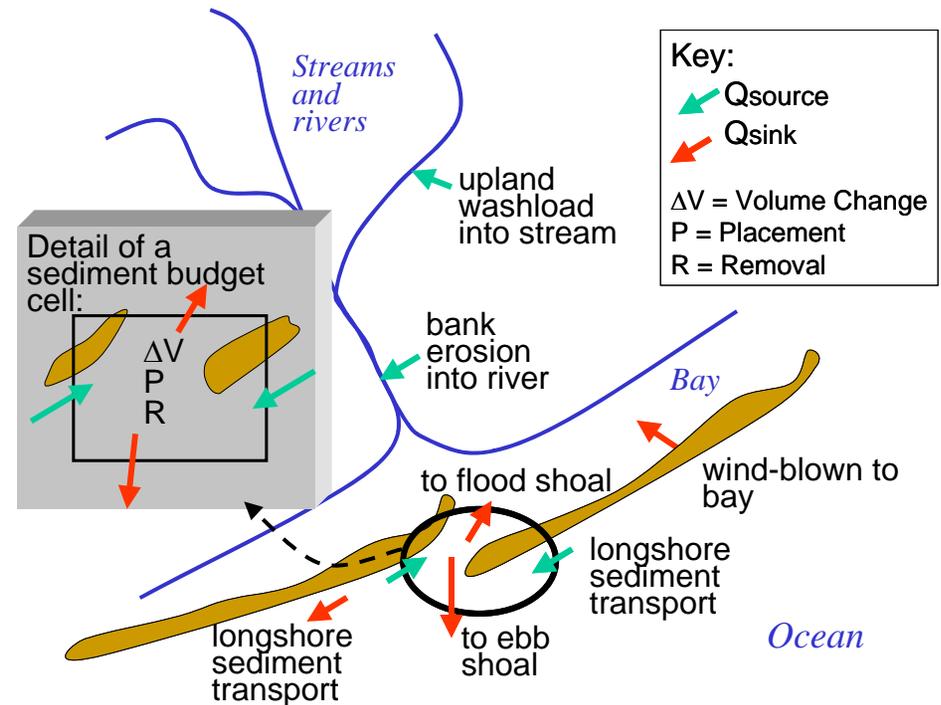
- Generate contiguous TIN or grid surfaces based off of existing point files.
- Calculate the Volume Difference between surveys.
- Cut, extract and view Profile data from surfaces.
- View surface in 2D window.

Before these tools can be utilized, lidar data must be properly formatted.



## Application Demonstration – SBAS-A

The **Sediment Budget Analysis System** (SBAS) provides a framework for formulating, documenting, and calculating sediment budgets, including estimation of uncertainty, hence the reliability of the budget. SBAS allows representation of multiple inlets within a sediment budget that can be local or regional. The model formulates a sediment budget by allowing the user to create a series of cells and arrows representing sources and sinks which characterize the conceptual budget. Sediment budget cells, arrows expressing directions of net, east-, and west-directed transport rates, and notation of P and R values comprise what is called the sediment budget topology.



## eCoastal Applications in Development

- Survey Management Application
- Jetty Condition Survey
- Coastal Structures Application
- Silent Inspector Ocean Disposal Monitoring Program



# Survey Application

**Process Surveys**

Survey Information

Survey ID:	Loaded by user:
File Name:	Output Table:
Date of Survey:	Orig Projection:

New Process    Automate 1-6

1. Select Survey for Pre-Processing

2. Generate Shapefiles

- Create Shapefile Orig Projection
- Create Geo WGS84 Shapefile

3. Bounding Polygon & Vertex Export

- Create Survey Area Boundary
- Export Boundary Vertices to DB

4. Survey Attributes & Export Image

- Insert Project Codes
- Insert StationIDs (Buffered)
- Export Image for Verification

5. Generate Finished ASCII Data

Pre-Process for Bulk Insert

1. Post-Processing

- Post-Process & Bulk Insert
- Load post-processed surveys into geodatabase
- Build post-processed survey layer files

Display    Source    Selection

Drawing    Arial    10    B    I    U    100%

**Survey Application**

Zoom to Scale

1"=6000

Change



Report - Microsoft Internet Explorer

1 of 1+ [Navigation icons] 100% powered by crystal

### Summary

2/10/2005

<u>FROM STATION ID</u>	<u>TO STATION ID</u>	<u>FROM END AREA</u>	<u>TO END AREA</u>
MB_02046+0	MB_02020+0	0.00	0.00

<u>DISTANCE - FT (STATION to STATION)</u>	<u>CUBIC FEET</u>	<u>CUBIC YARDS</u>
2,599.92	0.00	0.00

<u>FROM STATION ID</u>	<u>TO STATION ID</u>	<u>FROM END AREA</u>	<u>TO END AREA</u>
MB_02020+0	MB_02021+0	0.00	126.88

<u>DISTANCE - FT (STATION to STATION)</u>	<u>CUBIC FEET</u>	<u>CUBIC YARDS</u>
99.72	6,326.20	234.30

<u>FROM STATION ID</u>	<u>TO STATION ID</u>	<u>FROM END AREA</u>	<u>TO END AREA</u>
MB_02021+0	MB_02022+0	126.88	199.41

<u>DISTANCE - FT (STATION to STATION)</u>	<u>CUBIC FEET</u>	<u>CUBIC YARDS</u>
100.72	16,431.87	608.59

<u>FROM STATION ID</u>	<u>TO STATION ID</u>	<u>FROM END AREA</u>	<u>TO END AREA</u>
MB_02022+0	MB_02023+0	199.41	179.11

<u>DISTANCE - FT (STATION to STATION)</u>	<u>CUBIC FEET</u>	<u>CUBIC YARDS</u>
99.72	18,872.48	698.98

Layers/L

Dredge Ch

AL-Mobile Bar Char

USGS Quad

GIWW M

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Disposal

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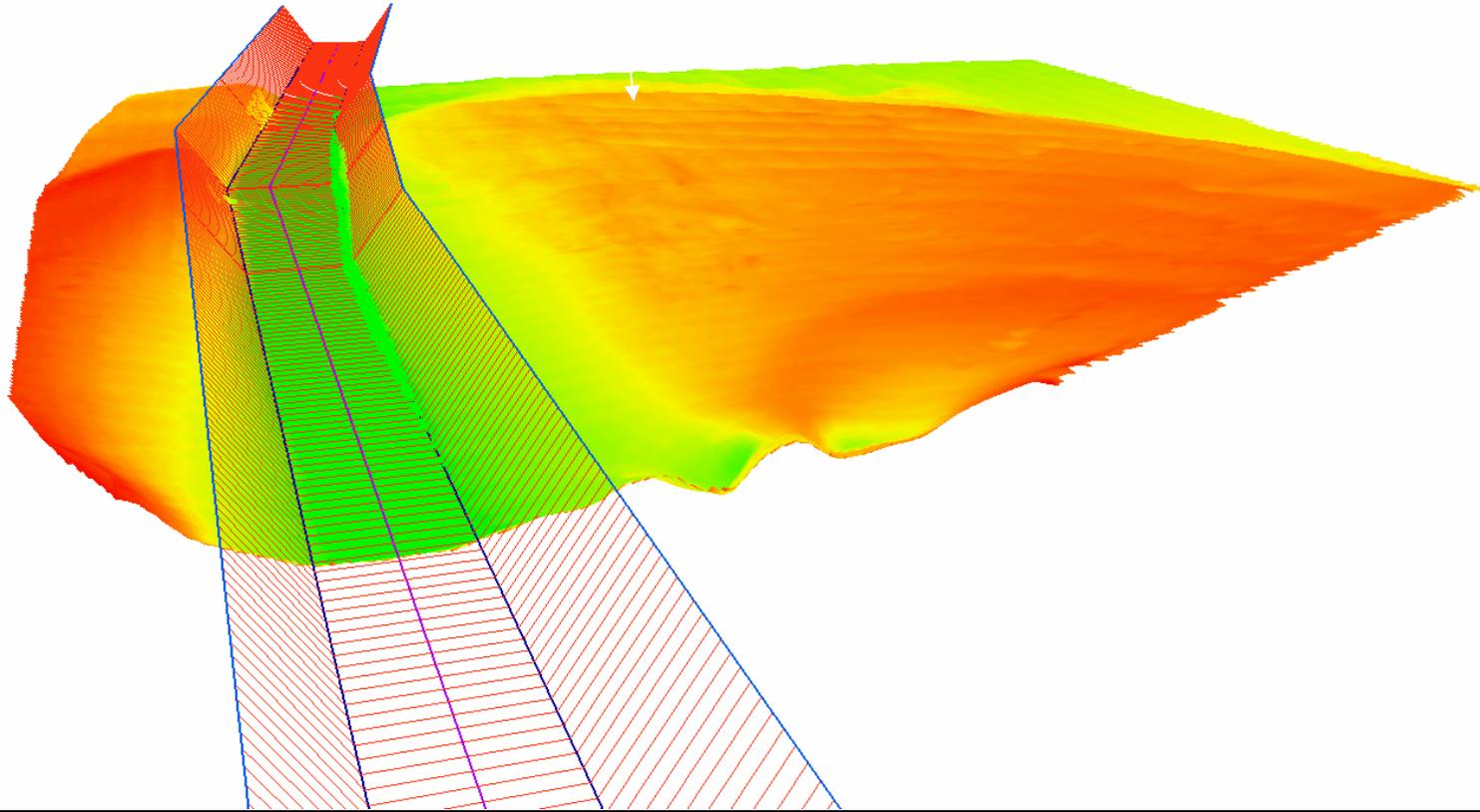


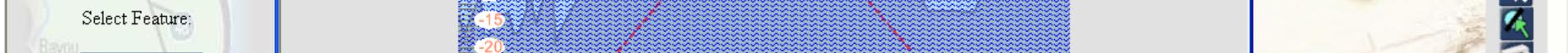
Width of map:48944 FEET

0 6000ft

Map Datum: Geographic WGS-

Sounding Point





http://precision1.3001data.com - CoastalGraph - Microsoft Internet Explorer

**Online GIS Maps Coastal Structure Profile**

Jetty Name: *East Jetty*

Label Area  Track On Map  Sea Level 0 Update

Generate Report

Area of Change: 64.22SF

First Previous CS: 80 Next Last

Active Survey:  Previous Survey 9/1/2003  Next Survey

Calculate Missing Volume Between (Active Survey Only):

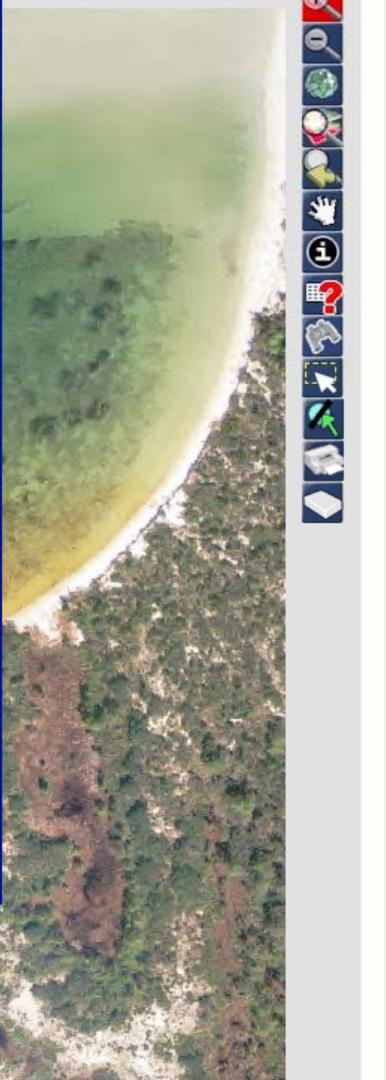
CS: 2 and CS: 2

Cubic Yards

Calculate

Include In Report

Done Internet



http://precision1.3001data.com - Selected Feature Report - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Google Search 52 blocked Check AutoLink AutoFill Options

### USACE Jetty Condition Report

#### East Jetty

**Survey Information**  
Survey Date: 9/1/2003  
Cross Section Number: 1  
Area of Change: 1.58 sf

**Jetty Information**  
Operation Status: RUINED  
Latitude: -85.7283  
Longitude: 30.1191  
Design Cap Elevation: 6  
Design Cap Width: 15  
Design Base Elevation: -55  
Design Base Width: 200

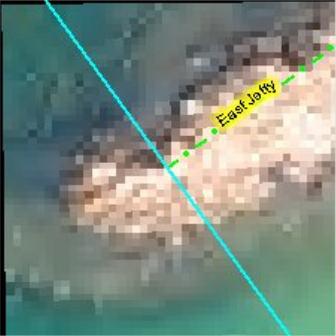


Fig. 1A - Curent Cross Section Selection

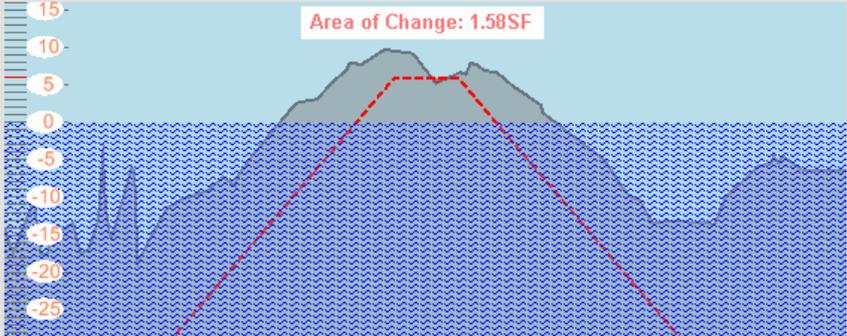


Fig. 1B - Lidar Generated Cross Section Profile Against Original Desgin Profile

Jetty Condition:

Comments:

Done Internet



## Questions?

Visit the eCoastal training modules online at –  
<http://gis.sam.usace.army.mil/programs/project.asp?id=W001>

