

CE-Dredge

A Dredging Management Enterprise GIS Application

Linda S. Lillycrop

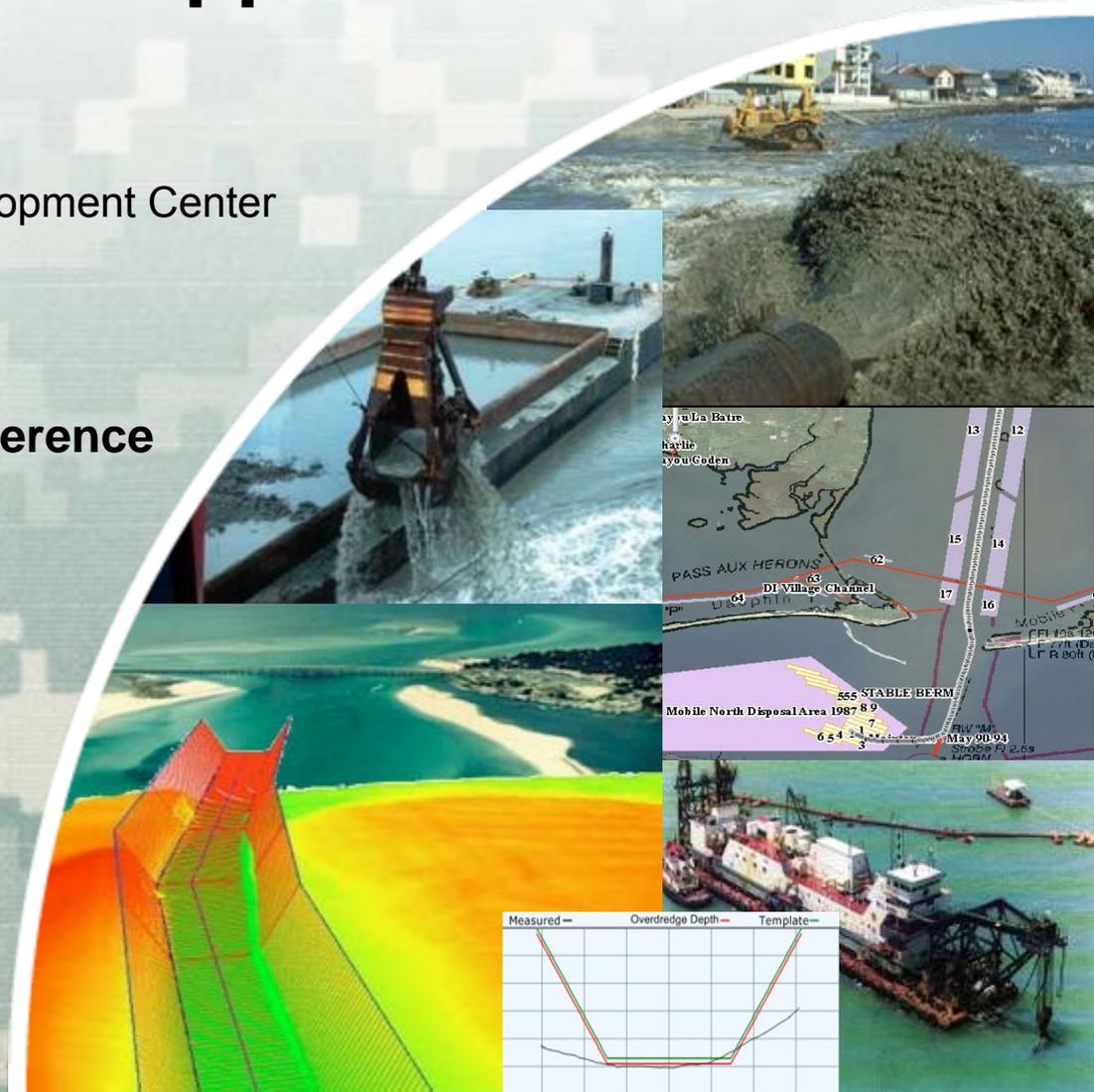
US Army Engineer Research and Development Center
Coastal and Hydraulics Laboratory

Galveston District Dredging Conference

29-30 October 2009



US Army Corps of Engineers
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Background

2008

- ERDC Dredging Operations and Environmental Research (DOER) Program
- Joe Hrametz, DOER Research Area Review Group (RARG)
 - ▶ CE-Dredge Champion
- Established National CE-Dredge PDT

2009

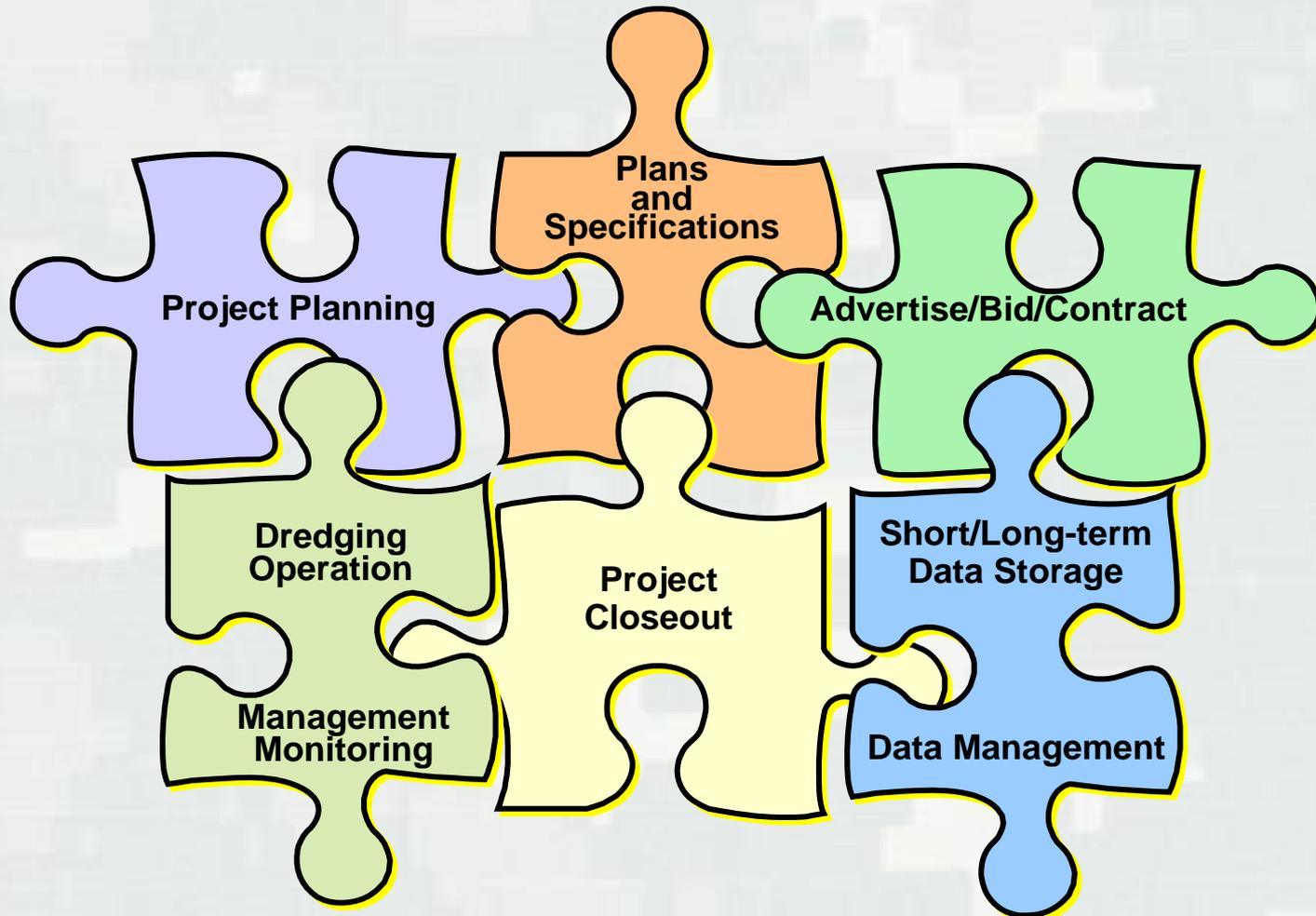
- CE-Dredge Website
- PDT Web-Portal
- Pilot Projects – SWG, SAM
- Phase I Tools

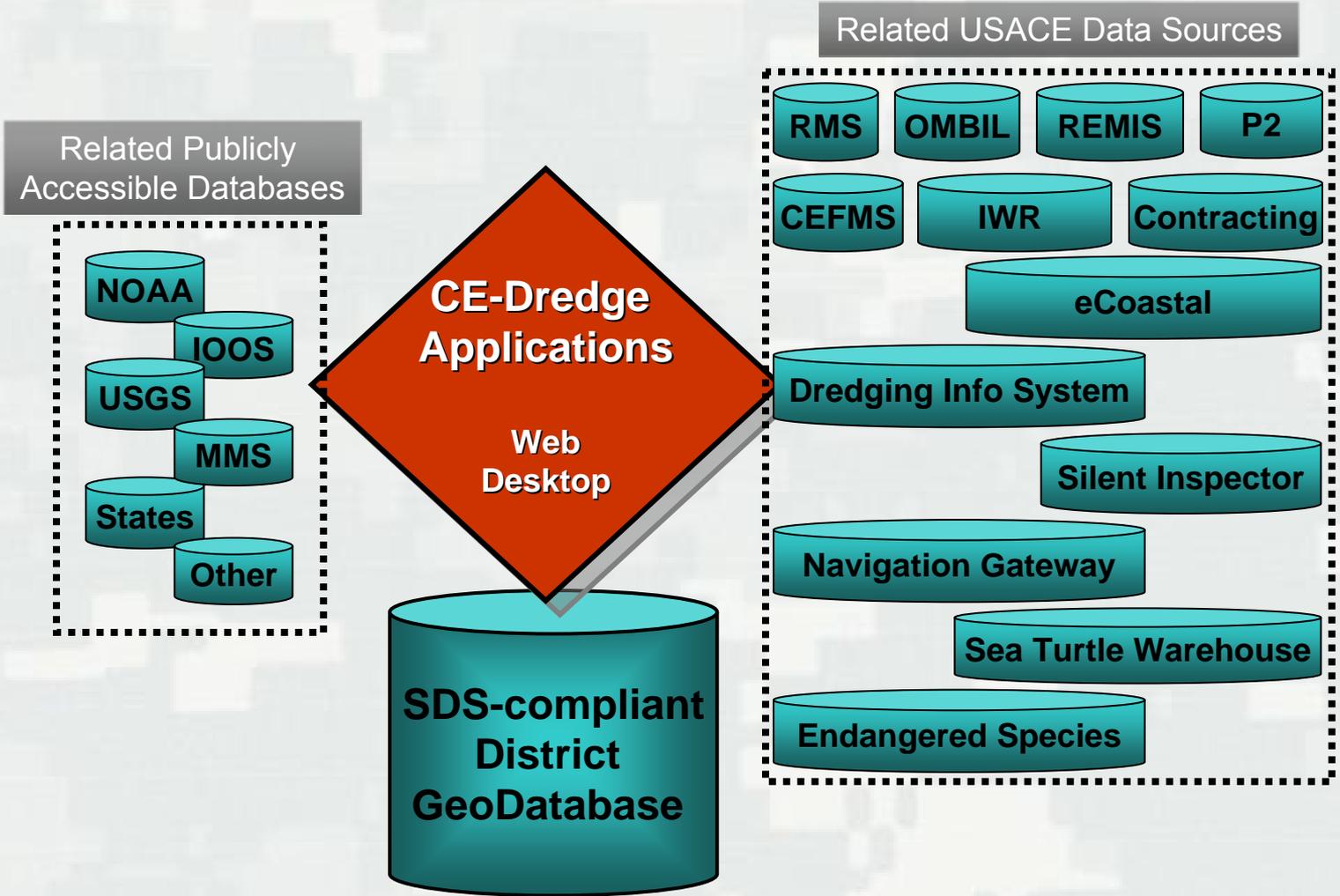


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Goal

An single integrated system within an enterprise GIS environment for the planning, implementation, and management of USACE dredging operations. Improve decision making capabilities at all levels.

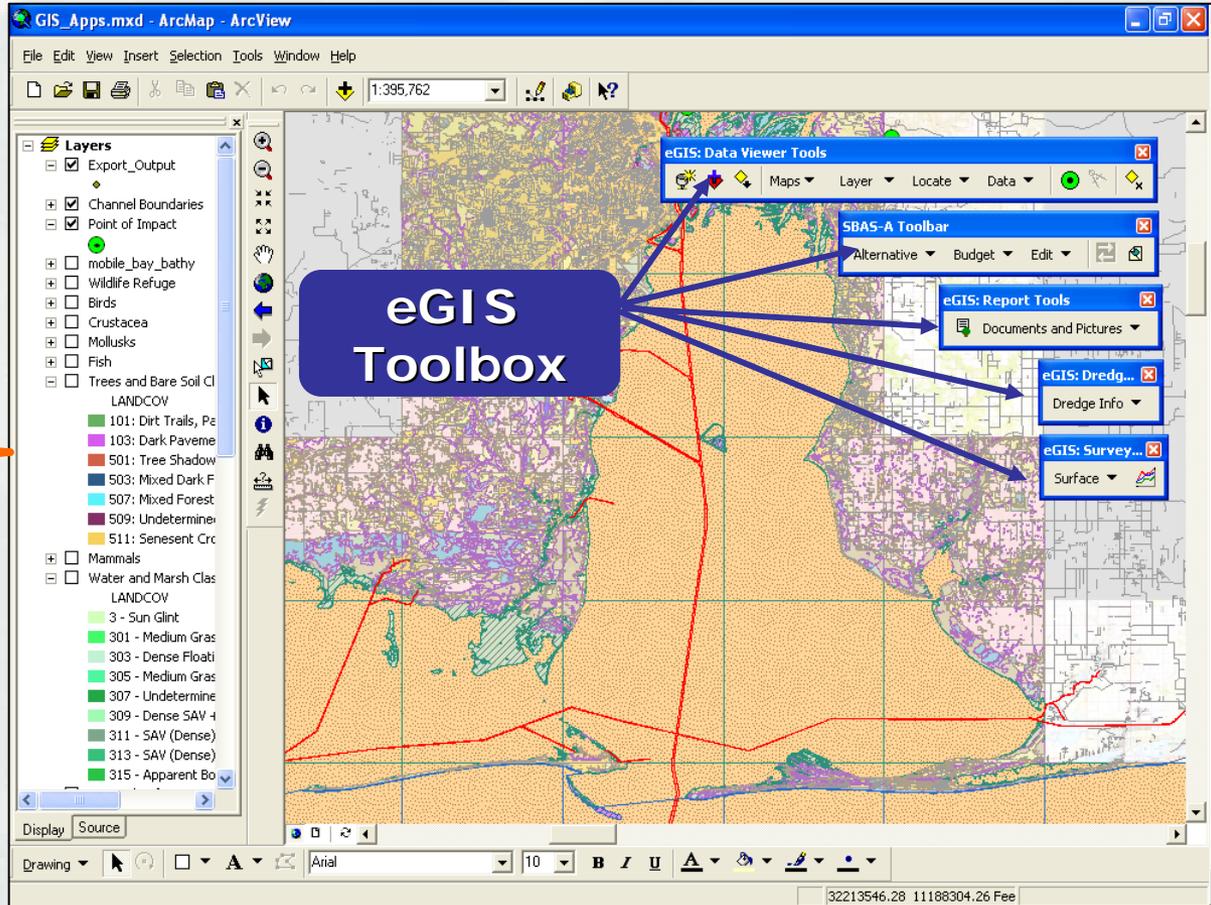




eCoastal

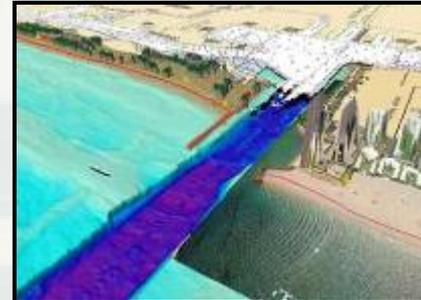
Data From Geodatabase

- Hydrographic data
- Topographic data
- Shoreline position
- Aerial/oblique photography
- Hyperspectral imagery
- Dredging records
- Environmental data
- Wetland boundaries
- Sediment data
- Digital nautical charts
- USGS quad sheets
- Regional utilities
- Infrastructure
- landuse



Benefits

- Single integrated system
- Standardized procedures and tools
- Consistency among Corps dredging operations
- Information/data access, sharing, archival
- Improve overall project coordination/communication
- Improve environmental compliance monitoring
- Enhance emergency operations
- Assist and encourage regionalization
- Improve overall efficiency of Corps dredging operations



Dredge Histories Database Application

- Retrieve dredging data as related to a selected channel, borrow area, or disposal area
- Dredging history needs were compiled and will be integrated in the design of the Dredging Histories database
- Central repository for archiving dredging event data not already captured in an existing database (e.g. DIS)

The screenshot shows the 'Disposal Area Tracker' application interface. The top navigation bar includes 'USACE Main', 'Who We Are', 'Missions', 'History', 'Related Links', and 'Kids Corner'. The main header features the US Army Corps of Engineers logo and the text 'Disposal Area Management Application' and 'RELEVANT READY RESPONSIVE RELIABLE'. Below the header is a 'Menu' with options: 'Disposal Area Tracker', 'Contract Manager', 'Disposal Area Inspections', 'Apply for Beneficial Usage', and 'Reports and Documents'. The main content area displays a table of disposal areas with columns for 'Disposal Area Name' and 'Type'.

Disposal Area Name	Type
AB01	Parent
AB02	Parent
AB02-P1	Cell
AB02-S1	Cell
AB03	Parent
AB03-P1	Cell
AB03-S1	Cell
AB04	Parent
AB04-P1	Cell
AB04-S1	Cell
AB05	Parent
AB05-P1	Cell
AB05-S1	Cell
AB06	Parent
AB06-P1	Cell
AB06-S1	Cell
AB07	Parent
AB07-P1	Cell
AB07-S1	Cell
AB08	Parent
AB08-P1	Cell

The screenshot shows the 'Disposal Area Tracker' application interface with detailed information for a specific disposal area. The top navigation bar and header are identical to the previous screenshot. The 'Menu' is the same. The main content area shows a dropdown menu for 'Disposal Area Reference' with the selected option 'AB02'. Below the dropdown is a list of details for the disposal area, including 'Beneficial Usage Requests/Agreements', 'Dredging History', 'GeoTechnical Analysis', 'Inspection List', 'Disposal Area Features (GIS)', 'Site Visits', 'Disposal Area Name', 'Date this record was last updated', 'Centerline Acreage', 'Perimeter Levee Length (foot)', 'Section 301 Impacted Acres', 'Date Impacted Area was Collected', and 'Eagle Nest location Zone Indicator'.

Detail	Value
Disposal Area Reference	AB02
Beneficial Usage Requests/Agreements	
Dredging History	
GeoTechnical Analysis	
Inspection List	
Disposal Area Features (GIS)	
Site Visits	
Disposal Area Name	AB02
Date this record was last updated	
Centerline Acreage	161.21064098
Perimeter Levee Length (foot)	12494.8135302
Section 301 Impacted Acres	161.3
Date Impacted Area was Collected	
Eagle Nest location Zone Indicator	NOAG



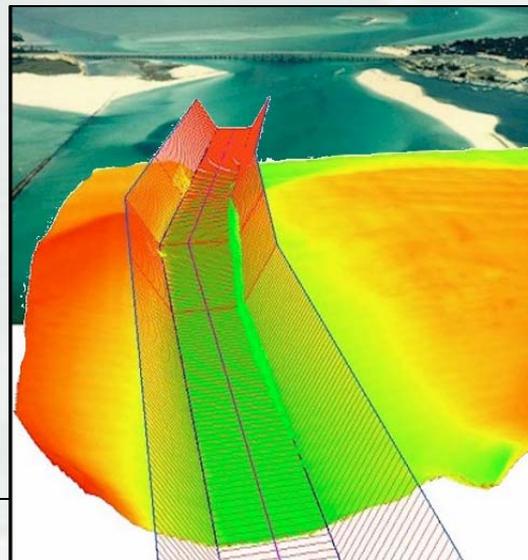
Survey Upload and Delivery System - SUDS

- ▶ Allows upload of hydrographic/topographic surveys to a centralized District geodatabase
- ▶ Supports uploading surveys to District navigation web pages
- ▶ Supports HQ-requested channel condition indices reporting
- ▶ Relates national channel framework to uploaded and inventoried surveys
- ▶ All uploaded surveys are compatible and accessible from the eCoastal Survey Analysis and Management System (SAMS) for analysis and volume calculations

The screenshot shows the 'SUDS Metadata Form' window. It has a 'General' tab selected. The form contains several fields for survey metadata:

- Survey Date: 2009-04-03
- Survey Title: (empty)
- Type of Survey: Profile
- Survey Classification: Profile After Design Channel Condition Survey
- Basin: CREAM
- Project Name: BALVOULA BAY TRB HARBOR
- Sub Project: BalvoULA Bay
- Disposal Area: 95C
- Beetow Area: MA
- Survey Title: (empty)
- Survey Description: (empty)

Buttons at the bottom include 'v Back', 'Continue', and 'Cancel'.



Threatened & Endangered Species Information and Data



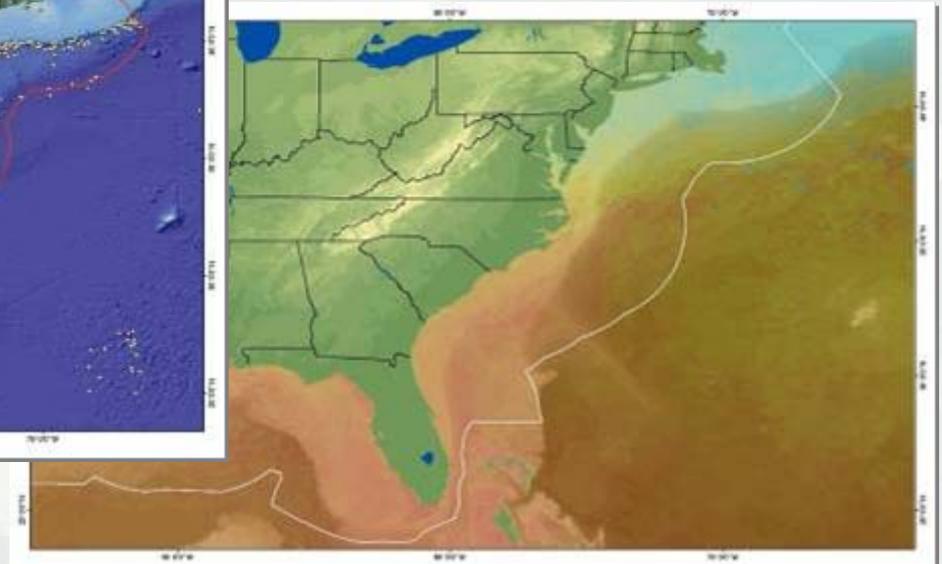
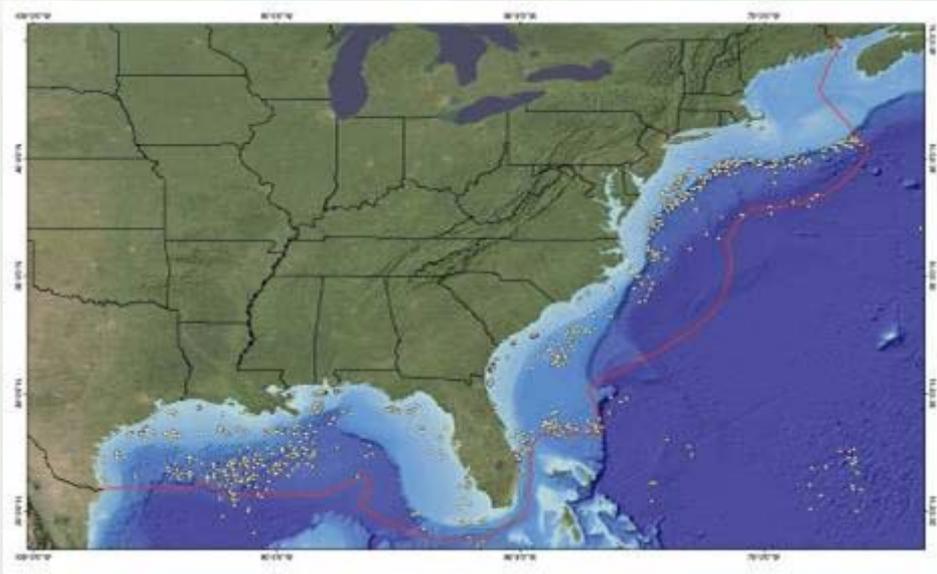
US Army Corps
of Engineers

USACE Threatened, Endangered, and Sensitive
Species Protection and Management System

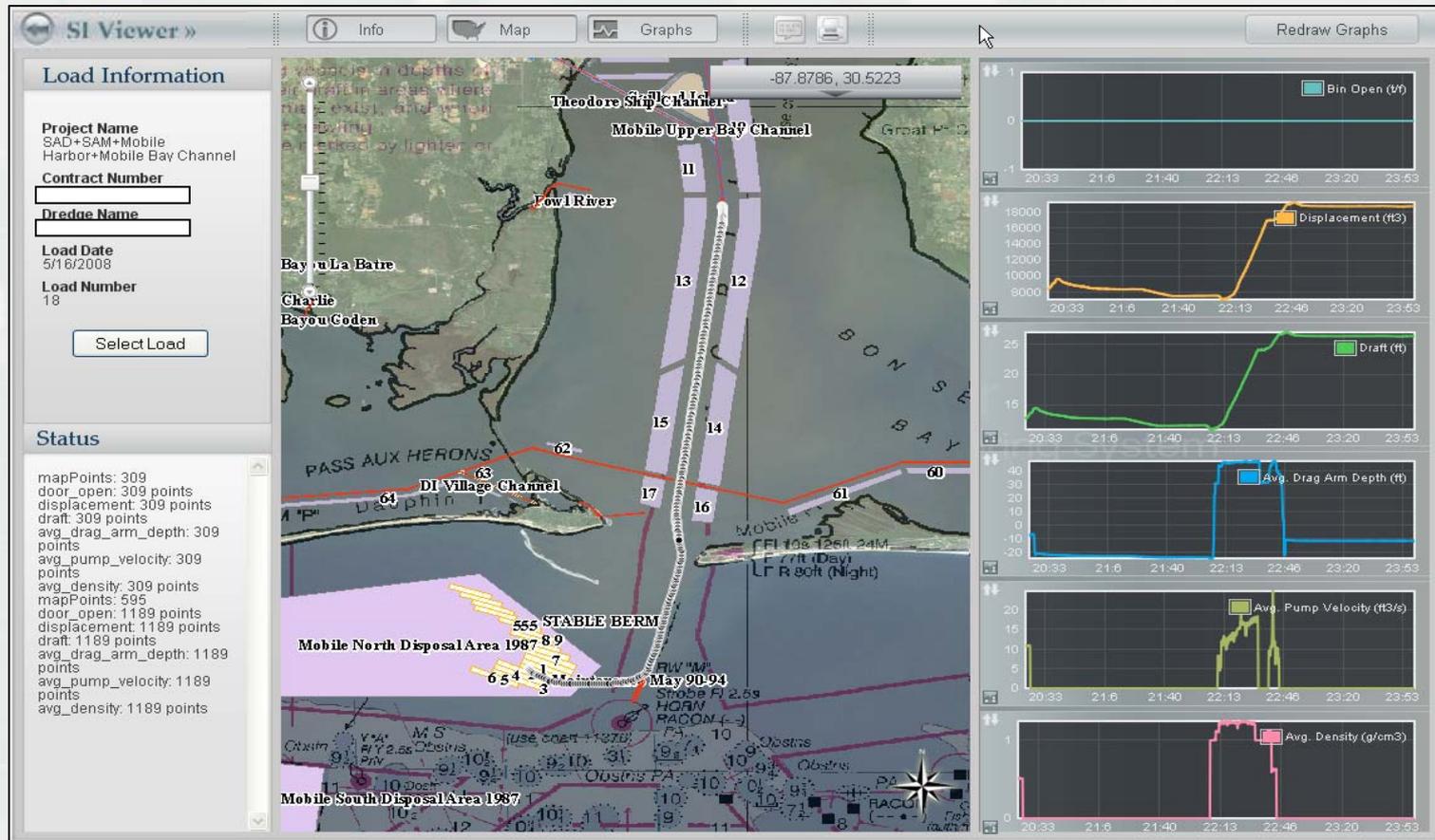


US Army Corps
of Engineers

USACE Sea Turtle
Data Warehouse



SI Viewer – Dredge Monitoring



CE-Dredge Website

The screenshot shows the CE-Dredge website interface. At the top, there is a navigation menu with links for 'Homepage', 'About CE-Dredge', 'CE-Dredge Tools', 'Mapping & Data', 'Library', 'Links', and 'Contact Us'. A 'menu' icon is visible in the top right corner. Below the navigation menu is a banner featuring the U.S. Army logo on the left, a world map in the center, and the text 'Teams of Engineers CE-Dredge' on the right, accompanied by a red castle logo. A dropdown menu is open under 'Mapping & Data', listing 'CE-Dredge Map Viewer', 'Inventory of District GIS Data', 'Inventory of Related Map Services', 'ArcGIS Models', and 'Dredging History'. Below the banner is a 'Google Custom Search' box with a 'Go' button and a 'Navigation Homepage' link. The main content area is divided into two columns. The left column, titled 'CE-Dredge Quick Links', contains three links: 'CE-Dredge Online Mapping', 'CE-Dredge Tool Download', and 'Dredging History Viewer', each with a brief description. The right column features a 'Welcome' heading, a paragraph of text describing the CE-Dredge program, and a large image of a dredging vessel at work.

Homepage About CE-Dredge CE-Dredge Tools Mapping & Data Library Links Contact Us menu

U.S. ARMY

Teams of Engineers
CE-Dredge

Google Custom Search Go Navigation Homepage

CE-Dredge Quick Links

CE-Dredge Online Mapping

Access the online mapping portal to link to dredging data hosted by participating CE-Dredge Districts.

CE-Dredge Tool Download

Looking to download any of the CE-Dredge Desktop Tools? Follow this link to preview and download available installation files.

Dredging History Viewer

Allows users to access general reporting-, online mapping-, disposal area management- and dredging contract management-focused modules.

Welcome

CE-Dredge is a program currently under development to assist with the planning, monitoring, and management of Corps dredging operations. CE-Dredge is based on the fundamentals established for the eCoastal program with modules interchangeable for coastal and dredging management. Both programs provide for a standard data management and data storage solution for all types (spatial and non-spatial) of dredging and coastal data. Under the CE-Dredge program, custom GIS and database applications/tools will be designed and deployed to support data access and tools to all interested users for dredging management.



CE-Dredge Launch Pad

The screenshot displays the CE-Dredge Launch Pad web application. The interface is organized into several sections:

- Left Sidebar (CE-Dredge Website Functions):**
 - Home Page
 - Documentation Library
 - Dredging History Database Application
 - Summary Reports
 - Sediment Sampling
 - Contract Manager
 - Disposal Area Management
 - Additional Applications
 - Survey Upload and Delivery System (SUDS)
 - Channel Condition
 - Maps and Data
 - Online Map Viewer
 - District Data Inventory
 - Map Service Inventory
 - Related Web Resources
 - Navigation Gateway
 - Dredge Material Management
 - Channel Indices
 - ArcGIS Desktop Mapping
 - Open ArcMap
 - CE-Dredge Tools List: (select for description and/or installation)
 - Show Advanced Components
- Page Description/Instruction:** CE-Dredge Public web page. Includes a "View All" button.
- Navigation:** Back and Forward buttons.
- Main Content Area:**
 - Navigation menu: Homepage, About CE-Dredge, CE-Dredge Tools, Mapping & Data, Library, Links, Contact Us.
 - Header: US Army Corps of Engineers CE-Dredge logo and a red castle icon.
 - Search: Google Custom Search bar.
 - Section: CE-Dredge Quick Links
 - CE-Dredge Online Mapping: Access the online mapping portal to link to dredging data hosted by participating CE-Dredge Districts.
 - CE-Dredge Tool Download: Looking to download any of the CE-Dredge Desktop Tools? Follow this link to preview and download available installation files.
 - Dredging History Viewer: Allows users to access general reporting-, online mapping-, disposal area management- and dredging contract management-focused modules.
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 - Image: A large dredging machine operating in a body of water.
- Bottom Right:** A red castle icon logo.

Data Challenges

- Navigation & coastal data scattered among districts & offices within them
- Data collected by many sources:
 - little standardization, can generally be difficult to access
- Duplicate datasets
- Lack of knowledge:
 - Existence of data
 - Location of data
 - Details about data



ARRA - Navigation and Coastal Data Bank



Mobile District

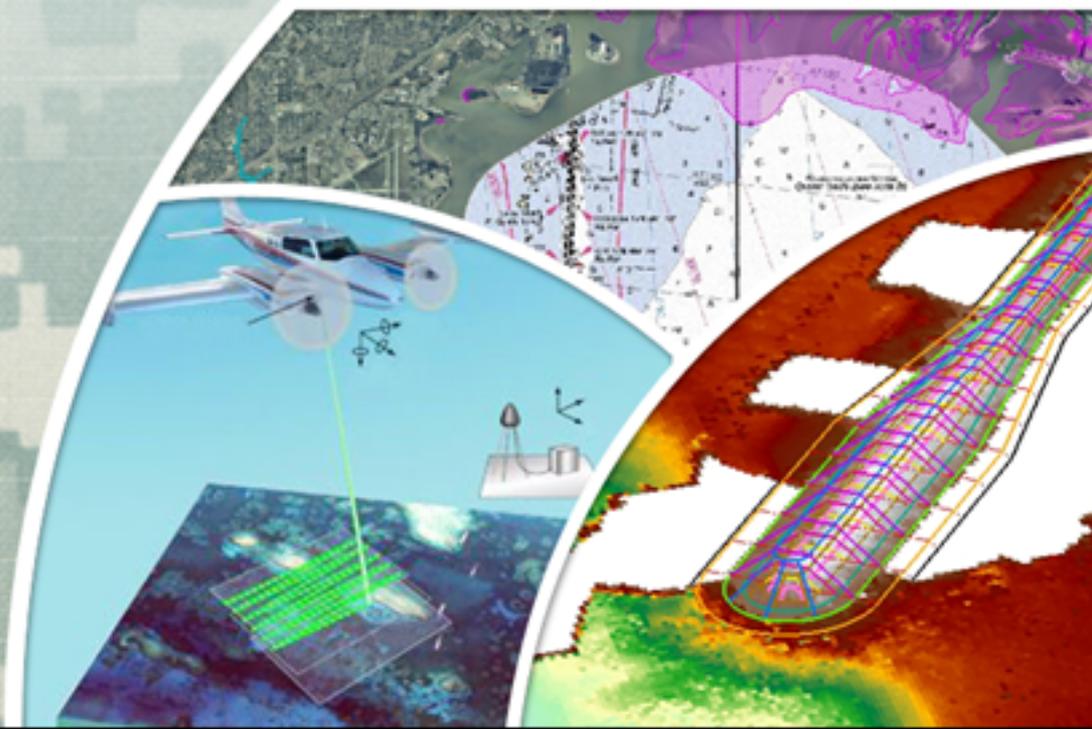
SPATIAL DATA

OP-J



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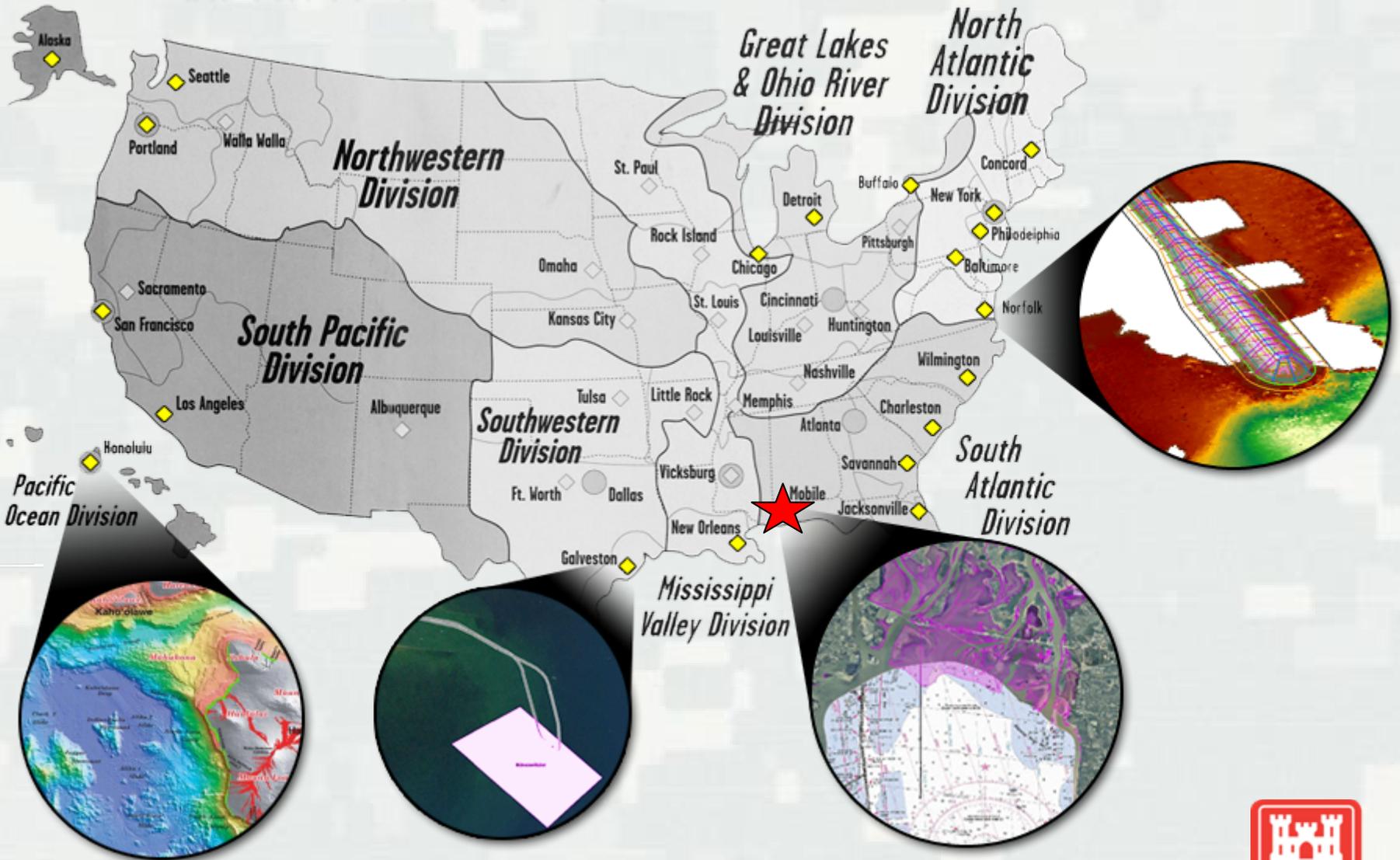


Goal

Promote data access to USACE navigation, dredging, and coastal data to support the daily operation and maintenance of projects and develop new tools and models for regional management. Work in conjunction with other efforts and systems under development.



NCDB District Locations

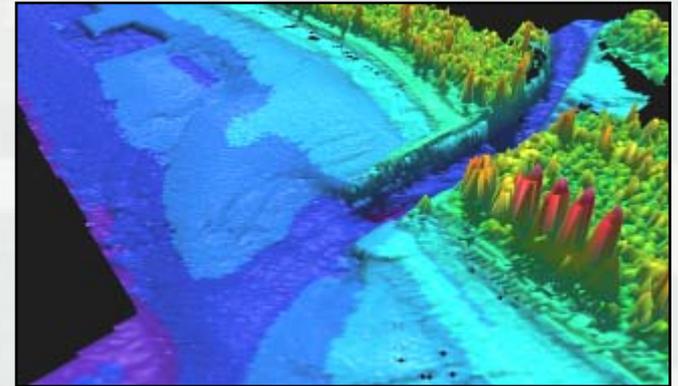


NDCD Data Gathering

- Creating or populating each district's enterprise GIS

- ▶ Priority Data sets

- Disposal sites
 - Structures as built drawings
 - Channel condition surveys
 - Channel framework
 - Legacy dredging data
 - National coastal mapping products
 - Tide gage data
 - Wave/water level data

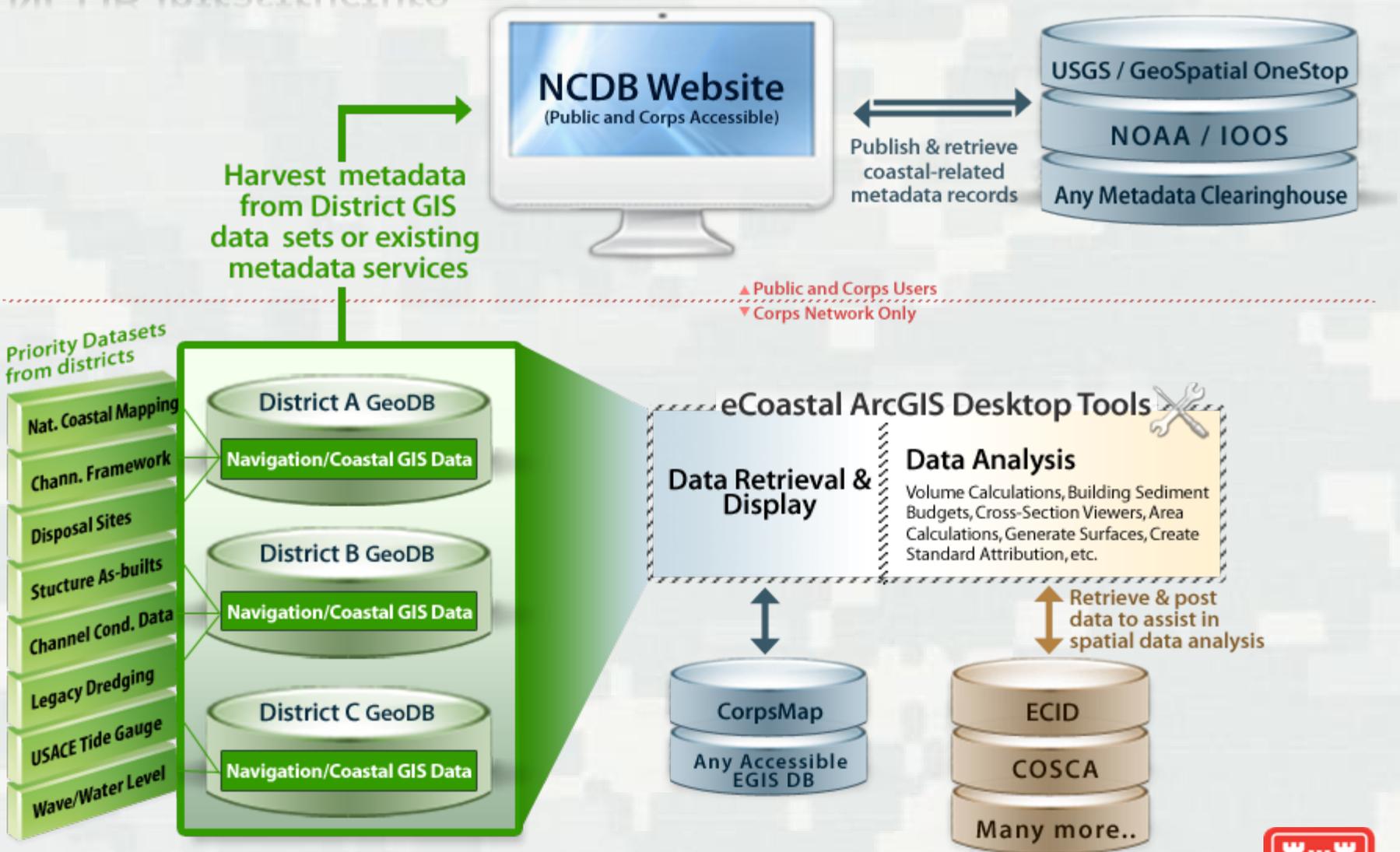


- ▶ SDSFIE-compliant geodatabase templates will be provided to each District's NCDB team for their mapping efforts

- All data will be built, loaded into the geodatabase template
 - NCDB will have a quality assurance process
 - Data will be loaded into the district eGIS for access and updates



NCDB Infrastructure



Integrated Coastal Navigation Programs

Questions

Where are the shoals?

What is the shoal volume?

Channel significance and priority?

Disposal site location & capacity?

What condition are the jetties in?

Should I rehab the jetties?

What is CE channel performance?

What do I need to dredge in a year?

Applications

Major Rehab Toolbox

eCoastal

CPT

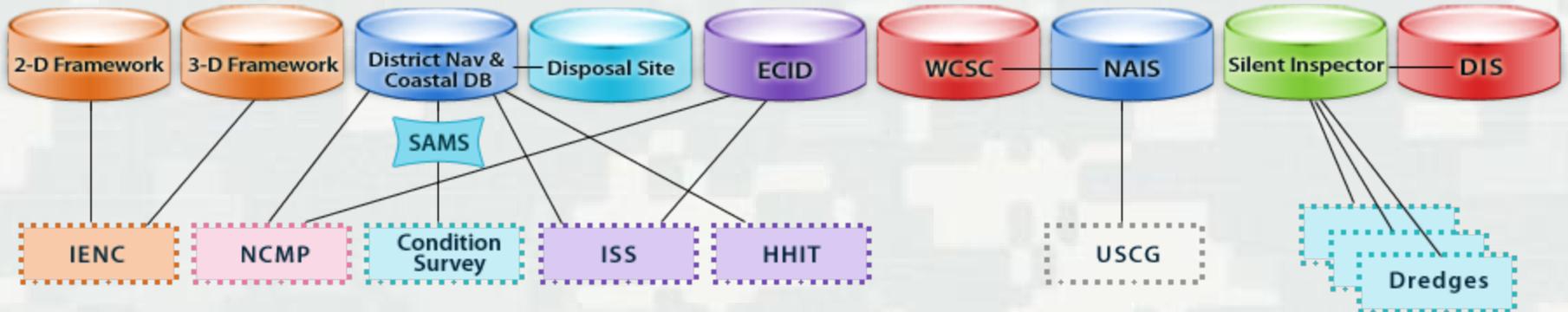
SI Toolbox

CE-Dredge

CoSCA

CESMART

CIRP-o-meter



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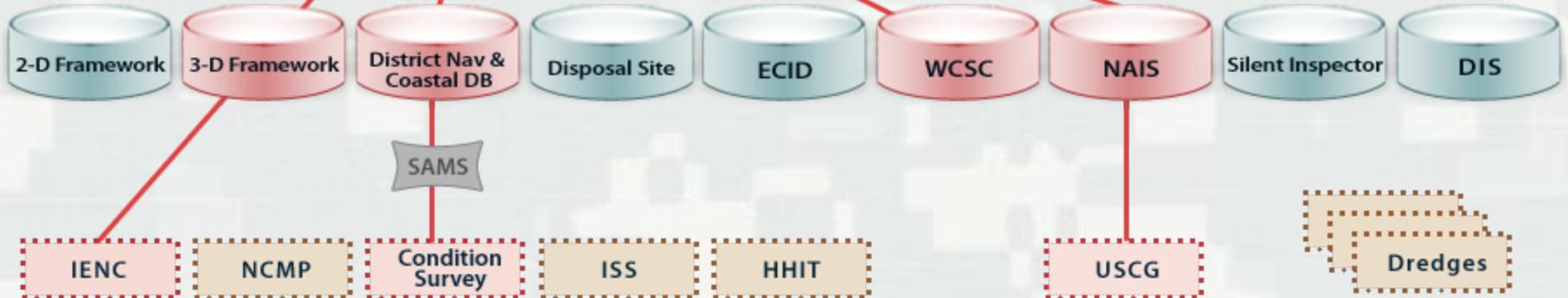
SI Toolbox

CE-Dredge

CoSCA

CESMART

CIRP-o-meter



Benefits

- Organizes District data as a corporate asset
- Provides a standardized “one stop” for navigation and coastal data
- Improves efficiency and saves time and money by reducing the wait time between requesting and receiving data
- Increases consistency in data analysis and modeling results among coastal organizations
- Accelerates implementation of enterprise practices throughout the Corps
- Enhances the decision-making ability of the navigation business line



Contact Information

CE-Dredge

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