

# Navigation

## Data Integration Framework

**Teresa Parks**

Mobile District, Spatial Data Branch, GIS Program Manager

**Clint Padgett**

Mobile District, Spatial Data Branch, Chief

**Jeff Lillycrop**

ERDC-CHL, Technical Director

**Navigation RARG - Mobile, AL**

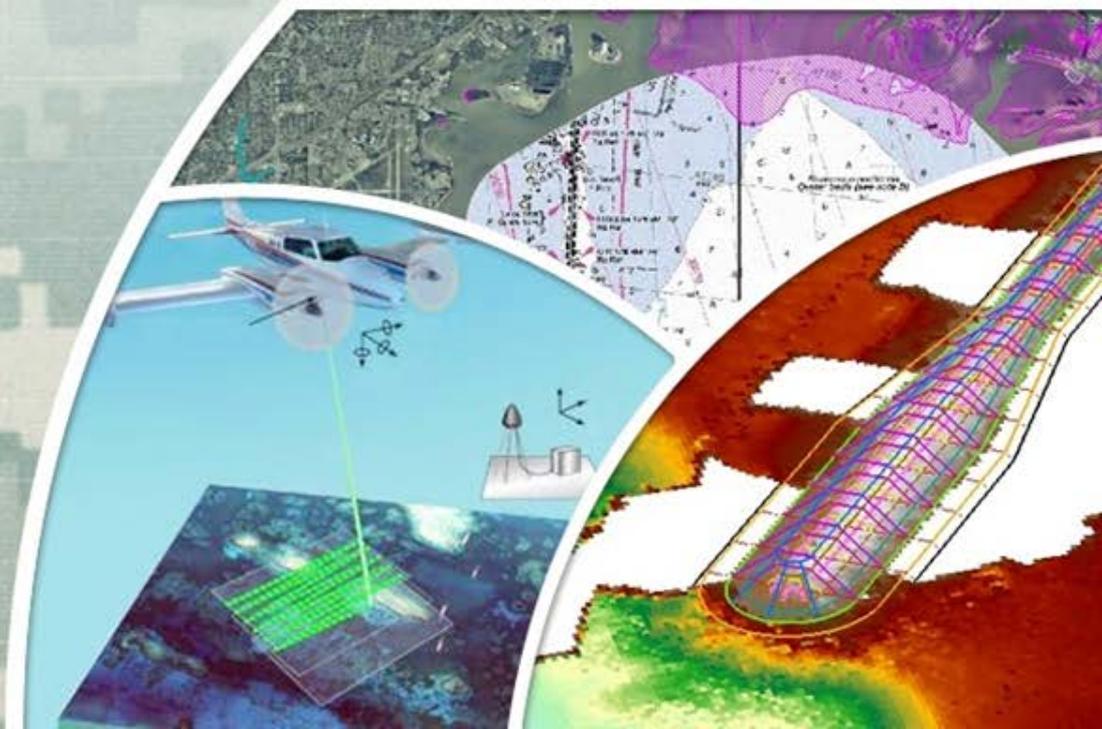
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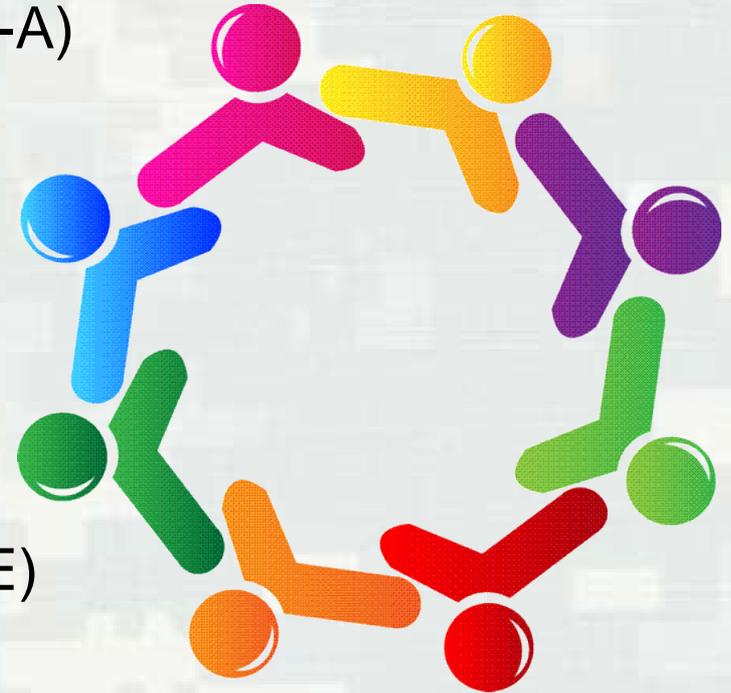
Mobile District  
**SPATIAL DATA**

OP-J



# NDIF Steering Committee

- Jessica Burton-Evans (CESPN-PM-A)
- Allen Churchill (CEPOA-CO-O)
- Dylan Davis (CESAD-PDO)
- Chris Frabotta (CESWG-OD-N)
- Karen Garmire (CENWP-EC-C)
- Steve Jones (CEMVD-PD-KM)
- Jeff Lillycrop (CEERD-HV-T)
- Rich Lockwood (CELRP/HQUSACE)
- Doug McDonald (CEIWR-NDC)
- Clint Padgett (CESAM-OP-J)
- Teresa Parks (CESAM-OP-J)
- Rich Thorsen (CENAD-PD-OR)



# Coastal Working Group Survey

## 26 Data Use Questions

Office Symbol	Division	District	1. What types of coastal projects do you have? (i.e. shoreline protection, beach nourishment, shallow draft harbors, deep draft harbors, recreation, environmental restoration, etc.)
LRC, LRB	Great Lakes and Ohio River Division	Buffalo, Chicago	shoreline protection, beach nourishment, shallow draft harbors, deep draft harbors, recreation, environmental restoration, confined disposal facilities, navigation channels dredging projects
LRE		Detroit	Shore protection, Re-hab of Navigation Structures (Shallow and Deep Draft, Sediment Transport Studies, Dredged Sediment Placement Studies, Inner Harbor Wave Analyses, FEMA Flood Elevation Determination, Lawsuit Defense Studies
NAE	North Atlantic Division	New England	Shoreline protection and inundation prevention, coastal structure repair, beach nourishment, shallow draft harbors, deep draft harbors, recreation, environmental restoration, confined disposal facilities, navigation channels dredging projects
NAN		New York	shoreline protection (storm damage reduction), beach nourishment, shallow draft harbors, deep draft harbors, ecosystem restoration, intracoastal waterways, breakwaters, coastal inlets
NAP		Philadelphia	Hurricane and Storm Damage Reduction projects (including 10 beach nourishment projects), coastal structures (seawalls, jetties, revetments), shallow draft navigation, submerged breakwaters, environmental restoration
NAB		Baltimore	Shoreline Protection; Beach Nourishment; Shallow draft navigation, environmental restoration, Sand bypassing
NAO		Norfolk	Storm damage reduction, ecosystem restoration, beach nourishment, shallow and deep draft navigation projects
SAW	South Atlantic Division	Wilmington	Shoreline protection, beach nourishment, deep draft harbors, shallow draft channels, and environmental restoration.
SAW		Charleston	Shoreline protection, beach nourishment, deep draft harbors, shallow draft channels, and environmental restoration.
SAS		Savannah	Deep Draft Navigation Harbors, Beach Renourishment, Environmental Mitigation/Restoration, Dredged Material Disposal Areas, Shallow Draft Waterways, Flood Damage Reduction
SAJ-EN		Jacksonville	All of the above.
SAJ-PD		Jacksonville	all of the above, mainly shore protection with beach nourishment. hard structures used to a lesser extent. current construction of hard structures is to maintain beach fill in place. Navigation projects include both deep and shallow draft navigation and Intra Coastal Waterway. Navigation: deep draft harbors at 5 major cities and various shallow draft projects as well as the Gulf and Atlantic Intra Coastal Waterways
SAM		Mobile	Shoreline protection, beach nourishment, deep draft navigation harbor, restoration.
MVN	Mississippi Valley Division	New Orleans	Beneficial Use, Marsh restoration and protection, shoreline protection, Freshwater and sediment diversions, deep draft navigation channels, locks, gates, barrier island restoration, hydrologic restoration, sediment trapping, sand mining, sand management
SWG	Southwestern Division	Galveston	Coastal projects in SWG include coastal storm damage reduction, ecosystem restoration, deep-draft and shallow-draft navigation, and flood risk management. The coastal storm damage reduction project also takes into consideration a recreation aspect.
SPL	South Pacific Division	Los Angeles	All of the above including shoreline protection, storm damage reduction, navigation, recreation, ecosystem restoration.
SPN		San Francisco	Shore Protection, Flood Control, Shallow Draft Harbor, Deep Draft Harbors, Environmental Restoration
NWP	Northwestern Division	Portland	Deep draft and shallow draft navigation channels, rubblemound jetty navigation entrances, small local harbors, riverine and estuary pile-dike systems, shoreline erosion and protection, open water dredged material disposal sites, environmental restoration, shoreline/coastal flooding
NWS		Seattle	Shallow draft harbors, deep draft harbors, environmental restoration, beach nourishment
POA	Pacific Ocean Division	Alaska	shore protection, deep draft navigation, shallow draft harbor, flood damage reduction
POH		Hawaii	shoreline protection, beach nourishment, shallow draft harbors, deep draft harbors

2 Summary Spreadsheets Compiling Input from 21 Coastal Districts

Office Symbol	Division	District	Beach Profiles		
			Sources of Data	Problems Encountered	Related Data Needs
LRC, LRB	Great Lakes and Ohio River Division	Buffalo, Chicago	SHOALS in-house surveys contract	SHOALS - inconsistent coverage due to turbidity and breaking waves	
LRE		Detroit	Contractors D&M	Inconsistent datum	Denser coverage around harbor
NAE	North Atlantic Division	New England	SHOALS/CHARTS in-house surveys contract	SHOALS/Charts - inconsistent coverage due to turbidity and breaking waves	
NAN		New York	In house (survey Branch) Contract Engineering Staff Local University	timeliness of data collection increasing costs difficulty in getting immediate post-storm profiles (for model calibration)	LIDAR vs. short profiles
NAP		Philadelphia	Contractor, in-house non-Federal sponsor (DE) University (Stockton)	environmental windows (not completing profiles) accuracy in surf zone	technologies that develop accuracy surveying the surf zone
NAB		Baltimore	A-E	Control issues on occasion	
NAO		Norfolk	Local sponsor, Local Universities		
SAW		South Atlantic Division	Wilmington	Annual monitoring 2 projects.	
SAW	South Atlantic Division	Charleston	University State of South Carolina contractor	incorrect equipment setup	
SAS		Savannah	Construction Contractor Surveys	Reliability due to potential conflict of interest	
SAJ-EN		Jacksonville	In-House Survey Crews	Due to the large tidal range, it is difficult to get both hydrographic and topographic surveys during a reasonable time frame.	
SAJ-PD	South Atlantic Division	Jacksonville	AE's, In-house	none	
SAM		Mobile	Lidar, In-house Bathymetric Survey, State databases	Inconsistent vertical datums. Issues with post processing.	
MVN	Mississippi Valley Division	New Orleans			
SWG	Southwestern Division	Galveston			
SPL	South Pacific Division	Los Angeles	hydrographic and nearshore surveys Old Corps and BEB records Old County records BEACON/SANDAG Organization of Local Gov't	datum conversions, accuracy not geo-referenced ambiguous alignment and zero location inconsistent datums (vertical) and local datums	Data to Produce Accurate Beach Profiles. long-term records that are geo-referenced need frequent enough capture seasonal and long-term trend Comparing historic beach profiles with current profiles and LIDAR
SPN		San Francisco	Survey Contractors NOAA Coast & Geodetic Survey USGS Surveys In-house staff	Datums Variability in survey techniques or assumptions Poor understanding of the true accuracy of various survey techniques	Datums; transect reference point Risk and Uncertainty Lidar capable software and computer power
NWP		Northwestern Division	Portland	in-house crew, contractor State governments, local agencies photogrammetric methods, lidar	some datum and control issues ground control setup expensive
NWS	Northwestern Division	Seattle	WA Dept. Ecology	Data is unavailable without requesting	
POA		Alaska	Contract surveyor	survey control. vertical datum changed relative to survey due glacial rebound and sea level rise	new monuments and tide gaging to update old monuments
POH	Pacific Ocean Division	Hawaii	A/E Contracts	Cost is extremely high in remote locations. Datum issues.	In-house resources and tools would be beneficial.

# Summary of Needs

- **Data is required to execute our missions**
- We have **requirements for a wide range of data types** – temporal, spatial, financial, real-time, legacy, biological, chemical, physical, environmental, economic...
- **Corps collects / produces a lot of data that is indispensable to us, our stakeholders, and the public**
- Corps **relies on other agencies** for much data: other Fed (USGS, NOAA, others), coastal States (TX, LA, MS, AL, FL, CA, OR, WA, all), NGO's, and Universities
- There are **national & regional issues** that **require data partnerships to adequately address**
- Corps spends **\$200M/yr - Need a sustainable framework to discover, access, and use data**



# 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

DQM Toolbox

CoSCA

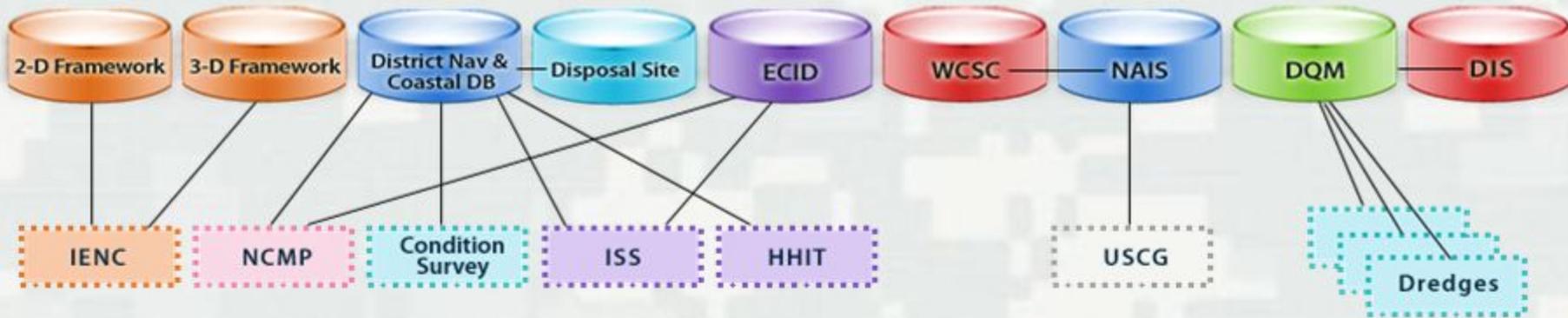
CSMART

CE-Dredge

CIRP-o-meter



## Databases

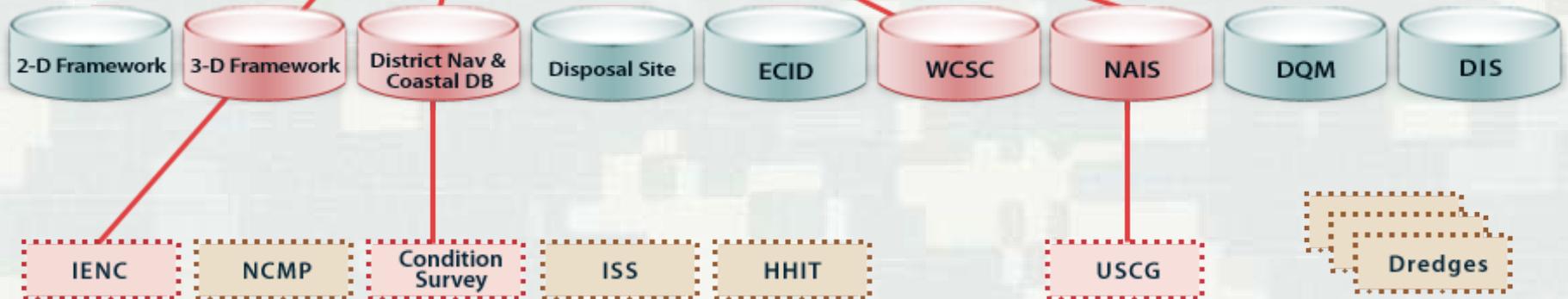
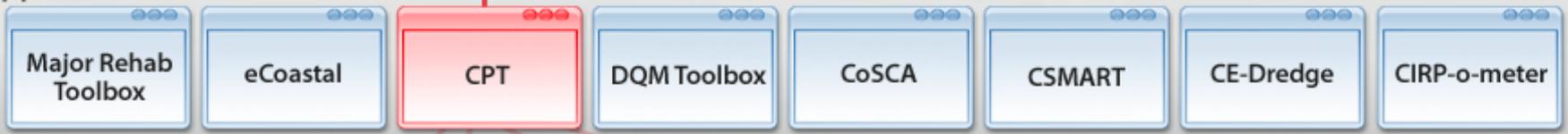


# Integrated Coastal Navigation Programs

## Questions

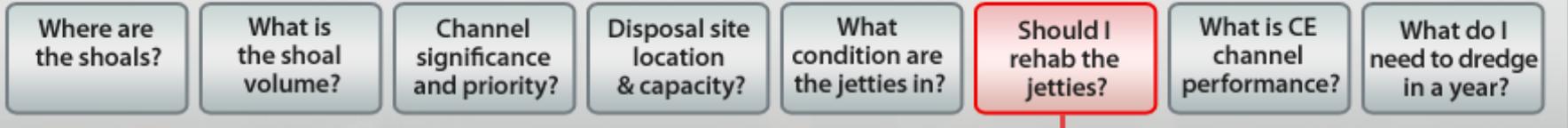


## Applications

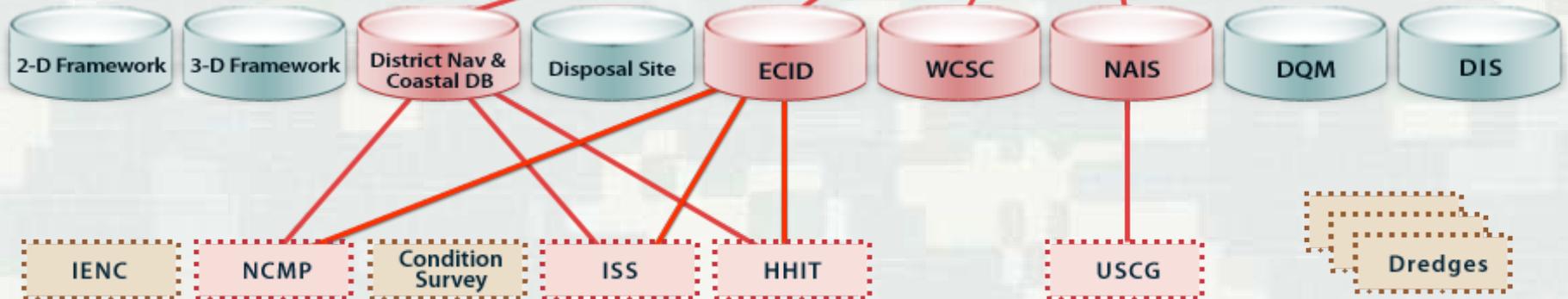
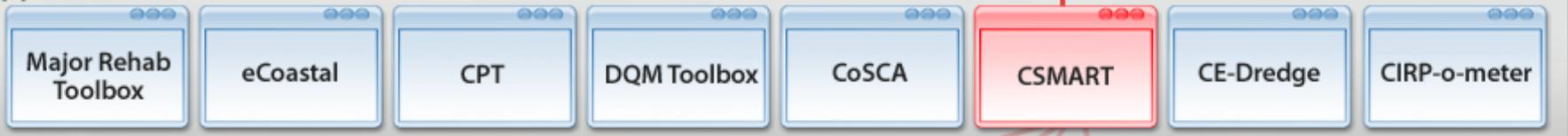


# Integrated Coastal Navigation Programs

## Questions



## Applications



# Challenges

- Multiple, disconnected navigation databases
- Data format
- Data inconsistency
- User time and effort
- User participation
- Data availability
- Data timeliness



# Data Integration Framework (DIF)

- A combination of processes, standards, people, and tools used to transform disconnected enterprise data into useful, easily accessible information for strategic analysis and reporting
- A blueprint identifying how all of its pieces interact and establishing a set of standards and best business practices
- Turns data scattered among different databases and locations into data that is consistent across databases, that can be easily discovered, accessed, and used



# NDIF Architecture

- Source Databases (data)
- Data Hub (catalog)
- Web Service Layer (access)
- Tools (analysis)
- Portal (discovery)



# NDIF Subsections

1. Dredging
2. River Information Services (RIS)
3. Surveying and Mapping
4. Infrastructure & Asset Management
5. Engineering with Nature & RSM
6. Marine Transportation



# Question/Comments?

- Upcoming Milestones
  - ▶ Dredging Portal Prototype (May 2013)
  - ▶ Paper - NDIF: The Concept and the Vision (June 2013)

**Teresa.C.Parks@us.army.mil**  
**<http://spatialdata.sam.usace.army.mil>**

