



Distributing GIS to the Coast Guard – An Enterprise Solution



Presented by:
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Stanley Associates
US Coast Guard-Operations Systems Center

U.S. COAST GUARD

AMERICA'S LIFESAVER AND
GUARDIAN OF THE SEA



U.S. COAST GUARD



Homeland
Security



Topics

- What is **Coast Guard Enterprise GIS?**
- Enterprise GIS Data Warehouse
- Enterprise GIS Custom Client Viewer



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Coast Guard Enterprise GIS

Purpose: Provide GIS data and services to the Coast Guard for a multitude of missions

- Marine Safety
- Port Security
- Port Operations
- Environmental Response
- Law Enforcement
- Incident Management
- Port Intelligence (unclass)
- Search and Rescue



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Coast Guard Enterprise GIS /S

- A Data Warehouse for static GIS data
 - Contains an extensive library of vector and raster data
 - Alleviates need for local storage and maintenance of large or common data sets
- A web-enabled custom thin client
- Accessible to all Coast Guard users
- Sensitive but Unclassified (SBU)



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Coast Guard Enterprise GIS *IS NOT*

- A Common Operating Picture (COP)
- A Command and Control system
- Available outside the Coast Guard Data Network
- The solution for all GIS needs in the Coast Guard



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Enterprise GIS Data Warehouse

National Data Coverage

- Relevant vector data sets from federal government and industry providers
 - **Focus: Homeland Security Infrastructure Program (HSIP) vector data sets**
- Coast Guard data
 - Jurisdictional/CFR data
 - Program-specific data
- Raster Nautical Charts
- Aerial Imagery



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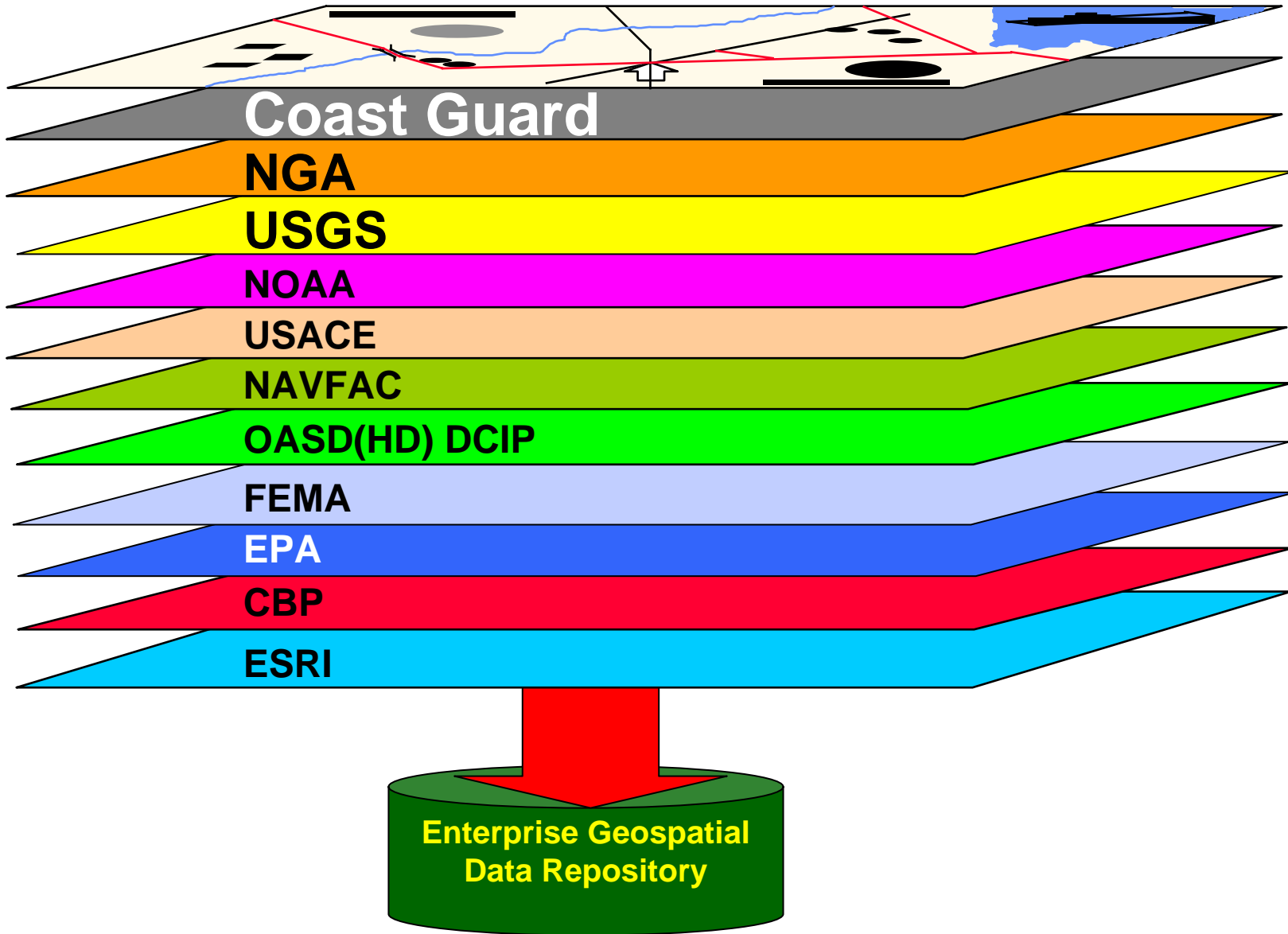


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Enterprise GIS *National* Data Providers



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NOAA ENC Vector Data

Marine Safety Network GIS - Microsoft Internet Explorer provided by United States Coast Guard

File View Data MISLE Help

Layers

District: District 11
Sector: Los Angeles-Long Beach
Theme: Basic

- Ground
- Air
- Water
 - Pipelines - Submarine
 - Port Facilities - USAC
 - Ferries
 - Buoys
 - Daymarks
 - Light Structures
 - Beacons
 - Soundings
 - Caution Area Points
 - Obstruction Points
 - Obstruction Lines
 - Waterways - USACE
 - Anchorage Areas
 - Depth Contour
 - Depth Area
- Base Layers

0 0.09mi
CG GIS Web Service ver 3.4.60 Running on 2

Status Ready Lat 33° 45' 26.52" N Lon 118° 11' 07.03" W Basic Zoom In



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 - Jurisdictional/CFR data
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- Aerial Imagery



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Layers

District:

Sector:

Theme:

- Transportation**
 - Ground**
 - Air**
 - Boston**
 - Airport Footprint**
 - Surface Type 0
 - Surface Type 1
 - Surface Type 3
 - Surface Type 4
 - Surface Type 5
 - Airport Complex**
 - Airports**
 - Heliports**
 - Water**
 - Base Layers**





CG/EPA Environmental Jurisdiction

US Coast Guard Enterprise GIS - Microsoft Internet Explorer provided by United States Coast Guard

File View Data Help

Layers

District: District 7
Sector: None
Theme: Basic

Service Layers

- MISLE Layers
- Harbor Approach
- Incident Response
- Environmental
- Critical Infrastructure
- Jurisdictions
 - Coast Guard Areas
 - Coast Guard Districts
 - Coast Guard COTP Zones
 - Coast Guard Stations
 - Coast Guard Groups
 - Coast Guard Sectors
 - Coast Guard Safety and Security
 - Coast Guard Environmental Jurisdiction
 - EPA Regions
 - FEMA Regions
 - 109th Congressional Districts
- Military Facilities

Map showing Florida coastline with environmental and jurisdictional overlays. Key locations include Oldemar, Dunedin, Hillsborough River, Tampa, MacDill Air Force Base, Gibsonton, Riverview, Alafia River, Mango, Largo, Seminole, Pinellas Park, Lealman, Madera Beach, Treasure Island, Saint Petersburg, Gulfport, Saint Petersburg Beach, Pinellas National Wildlife Refuge, Ruskin, Sun City, and Wimauma. Major highways I-275, I-4, and I-75 are shown. A scale bar indicates 5.21 miles. The text "Not for Navigational Use" is present in the bottom right corner of the map area.

Status: Ready

Lat: 28° 02' 25.48" N Lon: 082° 16' 47.84" W Basic Zoom In



Enterprise GIS Data Warehouse

National Data Coverage

- Relevant vector data sets from federal government and industry providers
 - **Focus: Homeland Security Infrastructure Program (HSIP) vector data sets**
- Coast Guard data
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- Raster Nautical Charts
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Raster Nautical Charts

Marine Safety Network GIS - Microsoft Internet Explorer provided by United States Coast Guard

File View Data MISLE Help

Layers

District: District 11
Sector: Los Angeles-Long Beach
Theme: NOAA Charts

- Transportation
 - Ground
 - Air
 - Water
 - Port Facilities - USACE
 - River Mile Marker - U
 - Ferries
 - Waterways - USACE
 - Depth Area
- Base Layers
- NOAA Charts - Regions 12 and 14

0 0.09mi
GIS Web Service ver 3.4.60 Running on 2

Status Ready

Lat 33° 45' 14.39" N Lon 118° 11' 25.20" W NOAA Charts Zoom In

Not for Navigational Use



Aerial Imagery

Marine Safety Network GIS - Microsoft Internet Explorer provided by United States Coast Guard

File View Data MISLE Help

Layers

District: District 11
Sector: Los Angeles-Long Beach
Theme: Aerial Images

- Transportation
 - Ground
 - Air
 - Water
 - Pipelines - Submarine
 - Port Facilities - USAC
 - Ferries
 - Buoys
 - Daymarks
 - Light Structures
 - Beacons
 - Soundings
 - Caution Area Points
 - Obstruction Points
 - Obstruction Lines
 - Waterways - USACE
 - Anchorage Areas
 - Depth Contour
 - Depth Area
- Base Layers

0.00 mi

OS Web Service ver 3.4.60 Run: 11/20/02

Status Ready

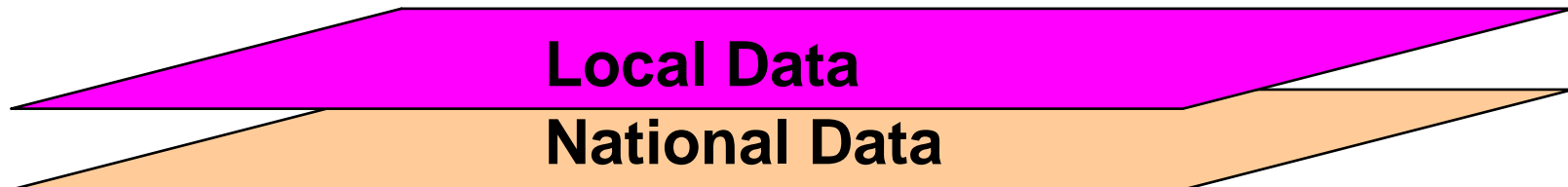
Lat 33° 45' 26.89" N Lon 118° 11' 16.99" W Aerial Images Zoom In



Enterprise GIS Data Warehouse

Local Data Coverage

- Collected with focused input from local Coast Guard user bases
- Vector and raster data sets relevant to a region/AOR



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Layers

District:

Sector:

Theme:

Service Layers

- MISLE Layers
- Lat/Long Grids
- Contingency and Response Plans
 - Hawaii
 - [Tsunami Evacuation Zor](#)
- Emergency Services
- Public Health
- Chemical Industry and Hazmat
- Education
- Telecommunications
- Water Supply
- Energy
- Commercial and Retail
- Boundaries
- Government
- Transportation
- Base Layers

Layers Identify EZ Reports



District 13 Spill Response



Marine Safety Network GIS - Microsoft Internet Explorer provided by United States Coast Guard

File View Data MISLE Help

Browse Mode

Layers

District: District 13
Sector: None
Theme: Basic

Service Layers

- MISLE Layers
- Contingency and Response Plans
 - Spill Origins
 - Contingency and Response Plan
 - Booms
 - Contingency and Response Plan
 - GRP Boundaries
 - Environmental Sensitivity I
- Emergency Services
- Public Health
- Chemical Industry and Hazmat
- Education
- Telecommunications
- Water Supply
- Energy
- Commercial and Retail
- Boundaries
- Government
- Defense Industrial Base

Keyport

NAVAL UNDERSEA ENGINEERING STATION

Washington

CPS-15

CPS-14

CPS-13

0 0.2mi

CG GIS Web Service ver 3.4.100 running on Prod 4

For Official Use Only
Not for Navigational Use

Status Ready

Lat 47° 42' 12.13" N Lon 122° 36' 50.68" W Basic Zoom In



Enterprise GIS Custom Client

Client Requirements

- Web-enabled, thin client architecture
- Typical web client functionality ***plus***
 - Real-time editing capability
 - Ability to display all layers stored in data catalog
 - Extended Identify, Query, Filter, Draw functionality
 - Ability to connect to non-spatial GIS data sources
- Enterprise design - Allow for multiple Coast Guard access points into GIS client



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Enterprise GIS Architecture

- Custom client viewer
 - Developed using Visual Basic and Windows APIs
 - Served to users as an ActiveX control through IE
- Web/Map Servers
 - Microsoft IIS
 - ArcIMS 9 (High-availability configuration)
 - ActiveX Connector
- Data Servers
 - Microsoft SQL Server (Clustered)
 - ArcSDE 9 (SDE C-API adds real-time editing capability)



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Activity Type: **Boarding** Activity Status: **Open - In Progress**

Activity No: 3000517 Status Date: 06/29/2004 Originating Unit: CG OSC

Activity Title/Description: Boarding of HMS GIS Test Activity Owner: CG OSC

Activity Start Date/Time: 06/29/2004 14:48 Prompt Date: Controlling Unit: CG OSC

Team Lead: Lakey, Mike Subject: **ABBY MAR** ID: 1096316

Case No: Not Attached to a Case Change Vessel Transfer Activity

POC: Change Status

Operational Controls Class/Group Membership Vessel Details Parties Documentation/Certificates Special Notes Activity Log Team Members

Use of Force Refer to Enforcement Print Summary

Boarding Data **Locations** Summary Narrative

Location Description	Latitude	Longitude	Date/Time
HMS GIS Test	28 24.0144 N	080 37.6188 W	2004/06/29 14:48

Add Facility Add Waterway Add Geo Location Remove Location

Activity Finder Save Changes Home

Enterprise GIS

Explorer View Boarding

0 1.69mi

CG GIS Web Site ver 3.2.180 Running on test

Not for Navigational Use

Status | Ready Lat 28° 25' 20.53" N Lon 080° 41' 30.23" W Basic Zoom In

MISLE

Layers: Activities

Selected MISLE Data

Identify Results

- Activities
 - Boarding of HMS GIS Test

Item Details

Field	Value
Activity_Id	3000517
Activity_Type	Boarding
Title	Boarding of HM...
Activity_Status	Open - In Progr...
Status_Date	06/29/2004 2:...
Start_Date	06/29/2004 2:...
End_Date	NULL
Unit_Of_Origin	CG OSC

Display Legend Identify EZ Reports



Layers

District:

Sector:

Theme:

- Service Layers
- MISLE Layer
 - Lat/Long G
 - Emergency
 - Public Health
 - Chemical In
 - Education
 - Telecommunications
 - Water Supply
 - Energy
 - Commercial and Retail
 - Boundaries
 - Government
 - Transportation
 - Base Layers

- User Added Layers
- Anchorage Areas
 - Collision Regulations Demarcation Li

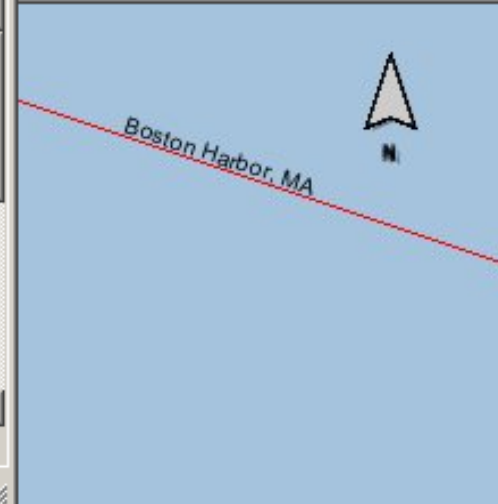
AvailableLayers

- Shapes <Vector Data>
 - Base Maps
 - Boundaries
 - Jurisdictional - Coast Gua**
 - Jurisdictional - Other
 - Chemical Industry and Hazma
 - Commercial and Retail
 - Contingency and Response F
 - Defense Industrial Base
 - Education
 - Emergency Services

Status: Ready

Name

- Anchorage Areas**
- Boundary Lines
- Coast Guard Areas
- Coast Guard COTP Zone
- Coast Guard Districts
- Coast Guard Environmental Jurisdictions
- Coast Guard Groups
- Coast Guard Sectors
- Coast Guard Stations
- Coast Guard Units
- Coast Guard Units from RMS
- Collision Regulations Demarcation Lines**

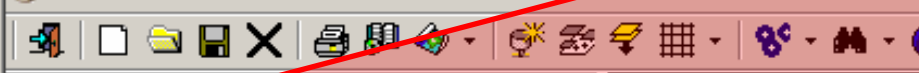


Layers

Identify

EZ Reports





Data Catalog

Search GIS Data Catalog

Search Options

Search in Current Map Extent

Overlaps Extent Within Extent

Category:

[Dropdown menu]

Keyword:

Oil

Search Catalog Clear Fields

Catalog Search Results



- Booms - WA
- GRP Bounds - WA
- Spill Origin - WA

Item Details

Show all info in dialog.

Name: GRP Bounds - WA
Coverage: Washington State
Category: Contingency and Res...
Available: Yes; Available as a U...



Search GIS Data Catalog

Search Options

Search in Current Map Extent

Overlaps Extent Within Extent

Category:

[Dropdown menu]

Keyword:

Oil

Search Catalog Clear Fields



Identify

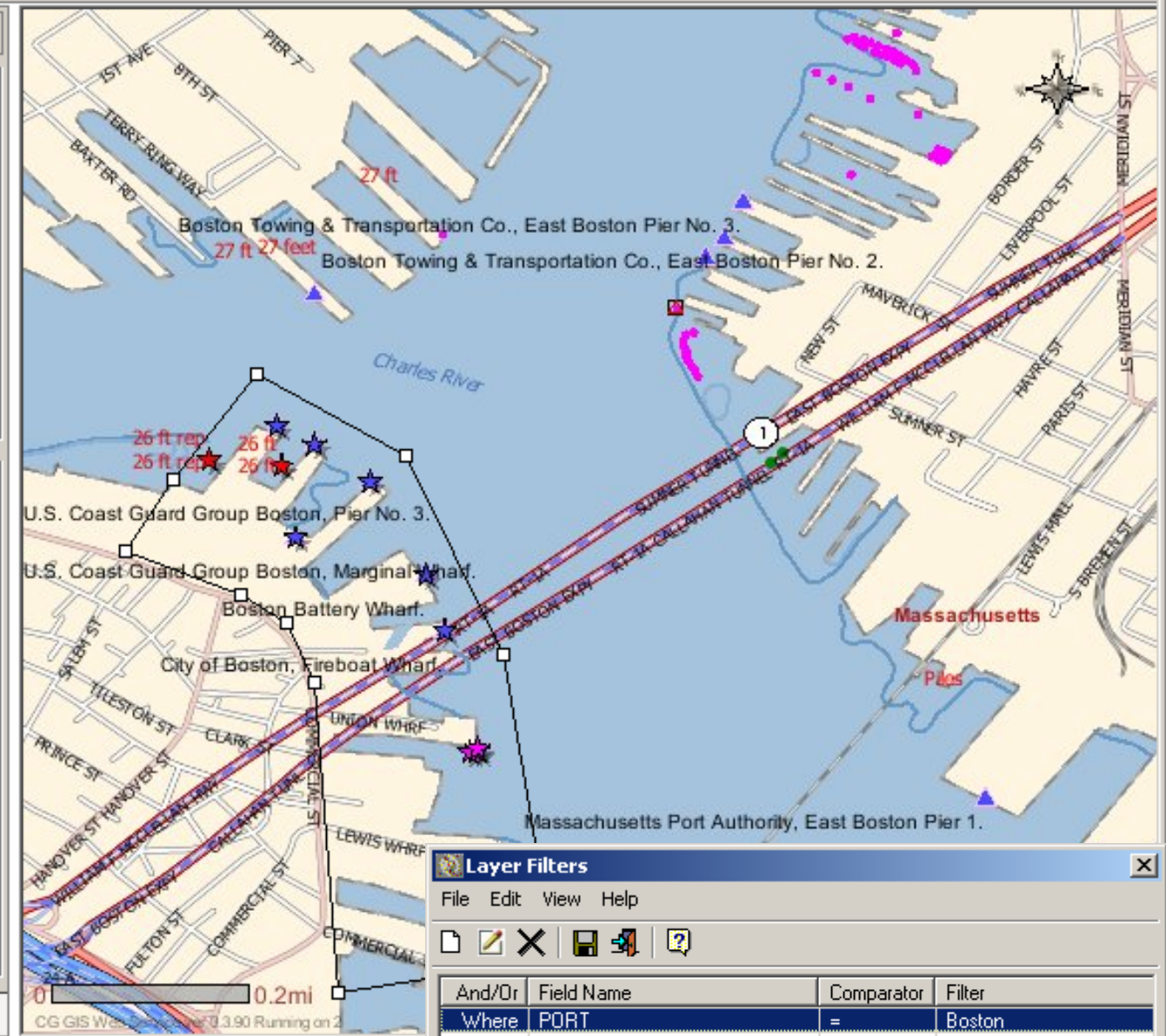
Identify Results

- Light Structures
- Caution Area Points
- Port Facilities

Boston Battery Wharf.
 City of Boston, Fireboat Wharf.
 U.S. Coast Guard Group Boston, Margi
 U.S. Coast Guard Group Boston, Pier N
 U.S. Coast Guard Group Boston, Pier N
 U.S. Coast Guard Group Boston, Pier N

Item Details

Field	Value
NAME	Boston Battery Wharf.
LOCATION	Westerly shore, Boston
ADDRESS	379-395 Commercial S
COUNTY	Suffolk
TOWN	Boston
STATE	MA
WTRWY	Boston Inner Harbor
PORT	Boston
MILE	
BANK	
LATITUDE	42.3675
LONGITUDE	-71.049444
OP1	Bay State Lobster Co.
OWNER	Angelo J., James R., J
PURPOSE	Receipt of seafood: m



Layer Filters

File Edit View Help

And/Or	Field Name	Comparator	Filter
Where	PORT	=	Boston



Database

Manage External Connections

- Build a Data Connection
- Existing Data Connections
- Registered Connections

Features

Feature Details

Draw Locate Database



Enterprise GIS External Data Connection Wizard

Select Data Source

Welcome to the Enterprise GIS External Database Connection Wizard. This wizard guides you through the process of creating a connection to an external data source with a spatial (e.g. latitude and longitude) component.

Select a database of a type supported, a table within that database, and data fields that uniquely identify and describe each record in the table.

Name:

Database: ...

Table:

Label Field:

Id Field:



Change Icon



Arial

12

B*I*U

G34

fx

A	B	C	D	E	F	G	H	I	J
ID	Title	Name	Contact Info	Date	Time	Notes	URL	Latitude	Longitude
1	Waste in river	John Doe		4/13/2006	0400 Z	Caller observed person throw waste (oil?) into Potomac near tidal basin		38.88	-77.0405
2	Man swimming near Natl' Airport	Norman Conquest	(202) 111-2222	4/13/2006	0630 Z	Man observed swimming around Reagan Natl' Airport boundary. Caller thinks it was a fraternity prank		38.8628	-77.0385
3	Debris from bridge		(703) 222-3333	4/14/2006	0200 Z	Caller observed debris falling off the I-66 bridge (tire?). Said it appeared to be tossed by an individual		38.8924	-77.0582
4	Raw sewage spilled into the Potomac River	Maj.Major Major	(202) 333-4444	5/19/2006	1930 Z	Power failure caused raw sewage to be spilled into the Potomac River. Water/sewer authority suspects disgruntled employee may have sabotaged.	http://www.washingtonpost.com/wp-dyn/content/article/2006/05/19/AR2006051901595.html	38.8207	-77.0205

Manage External Connections

- Build a Data Connection
- Existing Data Connections
- Registered Connections
- Suspicious Activity Waypoints**

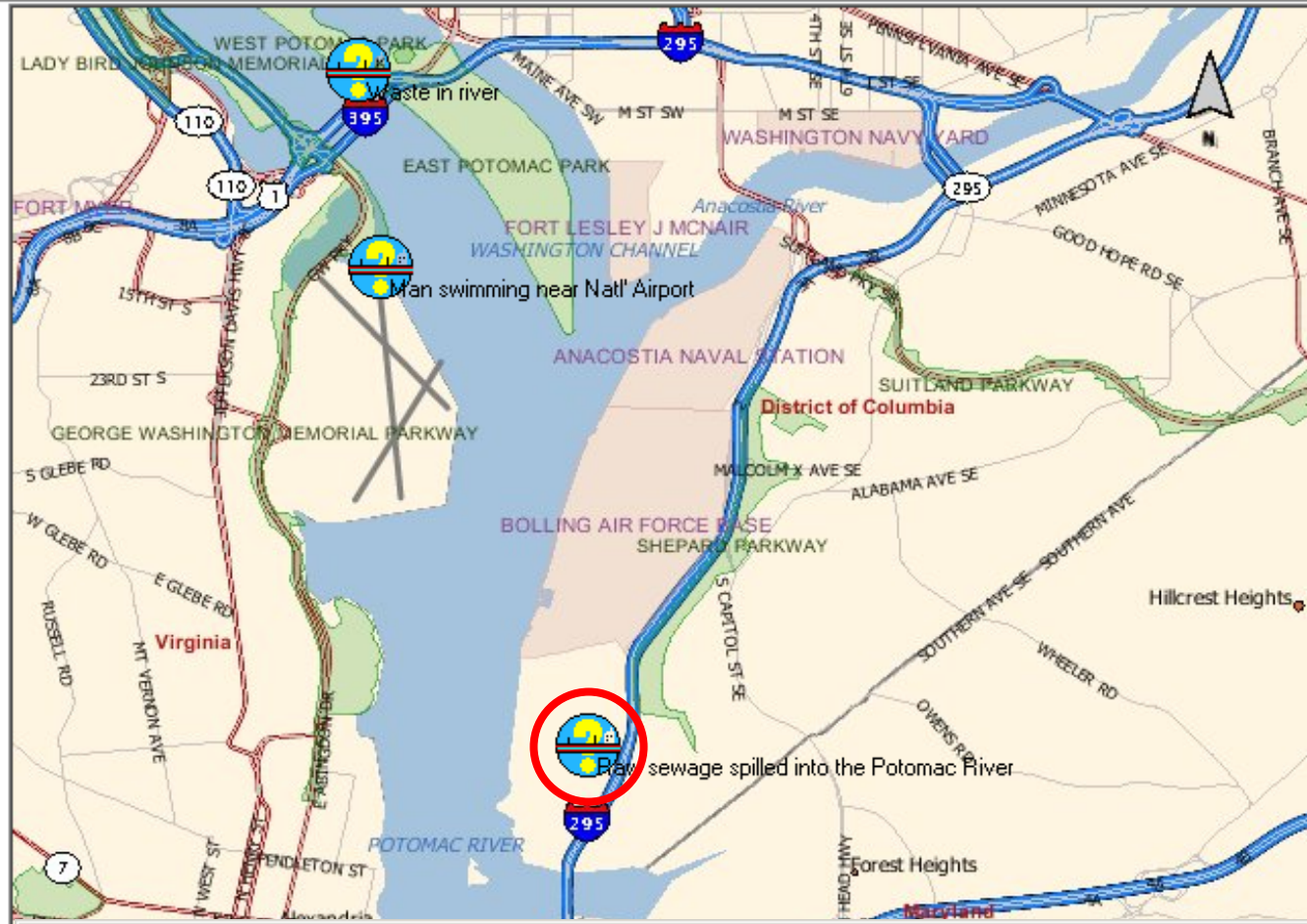
Features

- Suspicious Activity Waypoints**
 - Waste in river
 - Man swimming near Natl' Airport
 - Raw sewage spilled into the Pot...

Feature Details

Show all info in dialog.

Title	Raw sewage spill...
Name	Maj.Major Major
Contact Info	2023334444
Date	05/19/2006
Time	1930 Z
Notes	Power failure cau...
URL	http://www.washi...



Raw sewage spilled into the Potomac River - All Information.

Field	Value
Title	Raw sewage spilled into the Potomac River
Name	Maj.Major Major
Contact Info	2023334444
Date	05/19/2006
Time	1930 Z
Notes	Power failure caused raw sewage to be spilled into the Potomac River. Water/sewer autho
URL	http://www.washingtonpost.com/wp-dyn/content/article/2006/05/19/AR2006051901595

Layers

District:

Sector:

Theme:

- Service Layers**
- MISLE Layers
 - Contingency and Response Plans
 - Emergency Services
 - Public Health
 - Chemical Industry and Hazmat
 - Education
 - Telecommunications
 - Water Supply
 - Energy
 - Commercial and Retail
 - Boundaries
 - Government
 - Defense Industrial Base
 - Transportation
 - Base Layers

Posit Time: 2007-01-03 17:27:12 Z
Location: 38° 56' 31.49" N 075° 10' 33.84" W
Course: 221 **Speed:** 0.1
Source: RDC AIS
In MISLE?: Yes - Matched MMSI Name to MISLE Vessel Name
Vessel Type: Tank Ship | Crude & Products Tank Ship



For Official Use Only
Not for Navigational Use



Enterprise GIS Custom Client

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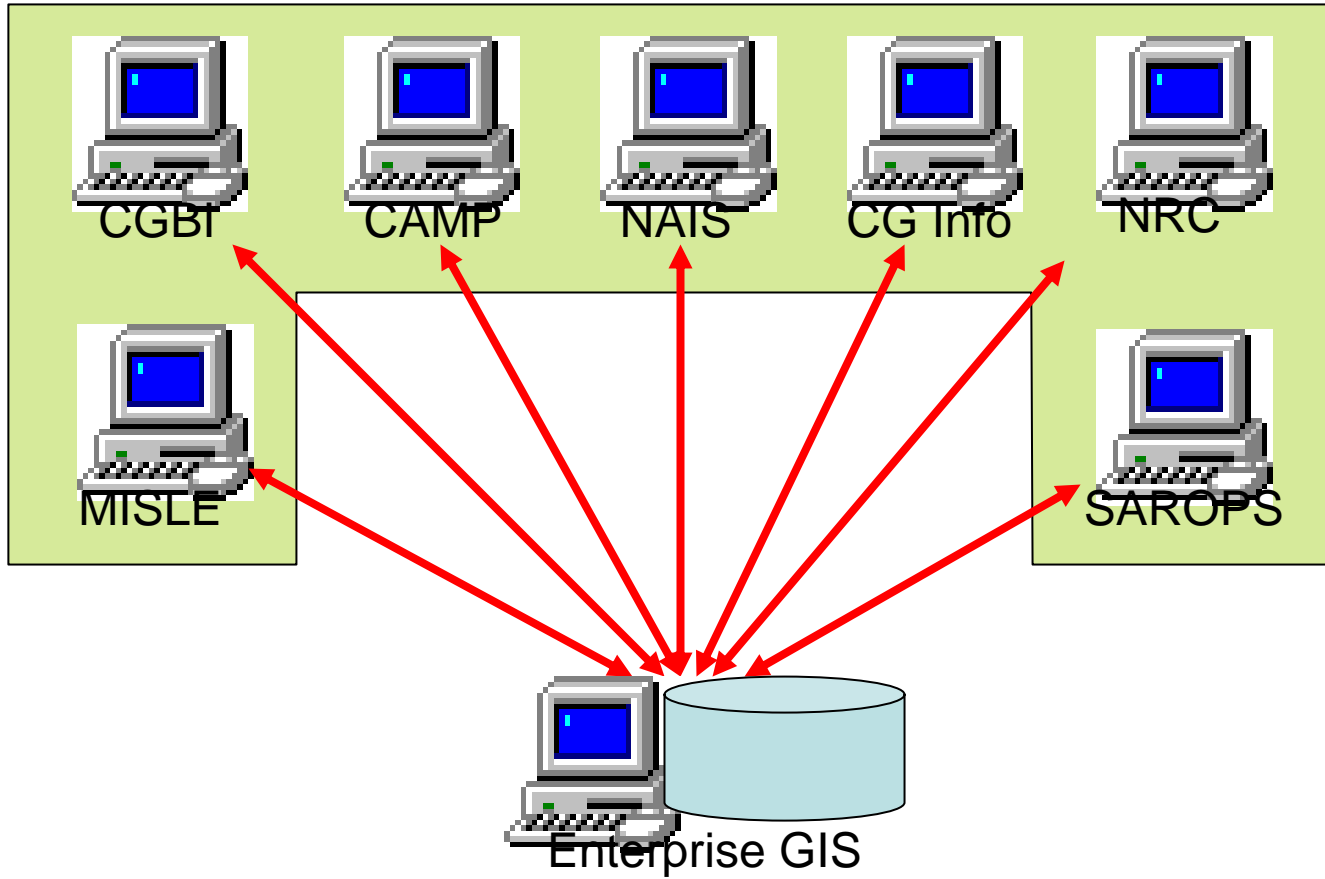
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Programs Interfacing with Enterprise GIS



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Activity Type: **Boarding** Activity Status: **Open - In Progress**

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Activity Start Date/Time: 06/29/2004 14:48 Prompt Date: Controlling Unit: CG OSC

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Add Facility Add Waterway Add Geo Location Remove Location

Activity Finder Save Changes Home

Enterprise GIS

Explorer View Boarding

0 1.69mi

CG GIS Web Site ver 3.2.180 Running on test

Not for Navigational Use

Status | Ready Lat 28° 25' 20.53" N Lon 080° 41' 30.23" W Basic Zoom In

MISLE

Layers: Activities

Selected MISLE Data

Identify Results

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Item Details

Field	Value
Activity_Id	3000517
Activity_Type	Boarding
Title	Boarding of HM...
Activity_Status	Open - In Progr...
Status_Date	06/29/2004 2:...
Start_Date	06/29/2004 2:...
End_Date	NULL
Unit_Of_Origin	CG OSC

Display Legend Identify EZ Reports

CG Business Intelligence



File View Data Help

Identify

Identify Results

- Marine Safety
 - CG MSO HONOLULU**
- Comm Stations
 - CG COMMSTA HONOLULU

Item Details

Field	Value
STATUS	M
SCORE	100
ARC_ZIP	96813
ORG_DEPTID	000116
ORG_DEPT_N	CG MSO HONOLULU
ORG_ADDRES	433 ALA MOANA BLVD PI
ORG_CITY	HONOLULU
ORG_STATE	HI
ORG_ZIPCOD	96813
ORG_COUNTR	USA

Layers Identify EZ Reports

CG GIS Web Service ver 3.4.60 Running on 2



CG MSO

DEPARTMENT PEOPLE

Employee Count:

Position Count:

Allowance Fill:

Position Fill:

Quality of Match:

Time in Service*:

Time in Grade*:

Time in Position*:

Time at Unit Type*:

Sea Time*:

Dental Deployable:

Physical Compliance:

Currently Weighed:

Turnover:

* = Average Years

[Return to Top](#)

DEPARTMENT TRAINING

Tasks

[Sort by Unit](#)

[Sort by Current Status](#)

Competencies

[With Direct Access Qualified](#)

[Without Direct Access Qualified](#)

Training

[Sorted by Unit](#)

[Sorted by Course](#)

Military Outload Homeland Security

CPRL Competencies - no data available

Capital Asset Management Portal



US Coast Guard Enterprise GIS - Microsoft Internet Explorer provided by United States Coast Guard

File View Data Help

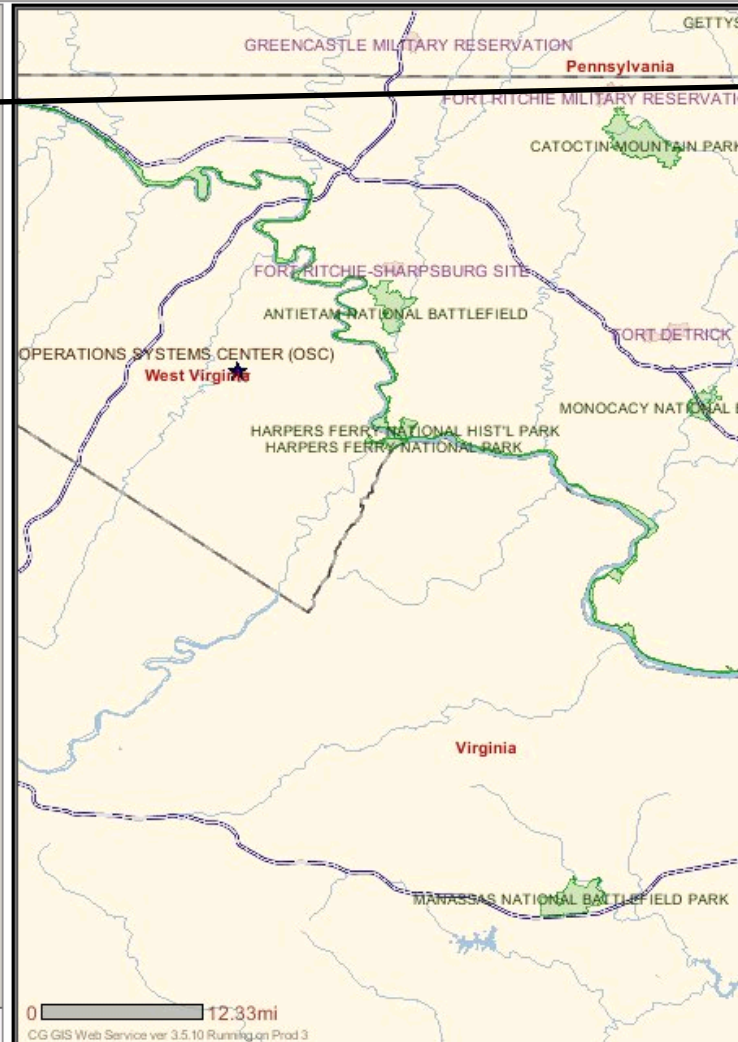
Identify

Identify Results

- Unit Locations
- OPERATIONS SYSTEMS CENTER (OSC)

Item Details

Field	Value
UNIT_ID	4204
PARENT_ID	3970
ATU	49
OPFAC	52301
OPFAC_MOD	
NAME	OPERATIONS ...
SHORTNAME	OSC
UNITTYPE	OSC
SDL_SECTIO	B:p
PHONE	(304) 264-2552
ADDRESS1	408 Coast Guar...
ADDRESS2	
CITY	Kearneysville
STATE	WV
POSTALCODE	25430
COUNTRY	
CONGRESSIO	WV02
LATITUDE	39.38622224



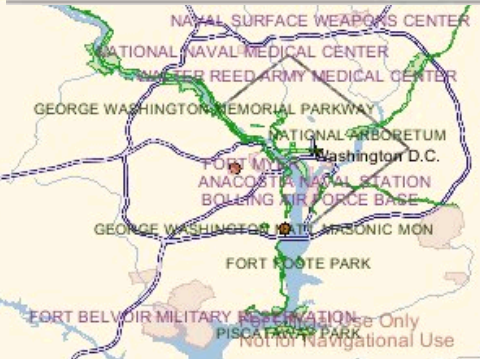
CG U.S. Coast Guard
Capital Asset Management Portal
 U.S. Department of Homeland Security

Hurricane ER What's New RIAC SAM GIS CG-TIM

USCG \ HQ \ OSC
 Notice: Project and property information now pulled from SAM. Read our [CAMP/SAM Intro](#)
 Viewing project and property data for OPERATIONS SYSTEMS CENTER (OSC)

- Assets
- Projects
- Documents
- Applications
- Contacts

Map Layers
 Imagery





NAIS

File View Data Help

Layers

District: District 5

Sector: None

Theme: Basic

Service Layers

- MISLE Layers
- Contingency and Response Plans
- Emergency Services
- Public Health
- Chemical Industry and Hazmat
- Education
- Telecommunications
- Water Supply
- Energy
- Commercial and Retail
- Boundaries
- Government
- Defense Industrial Base
- Transportation
- Base Layers

Posit Time: 2007-01-03 17:27:12 Z
Location: 38° 56' 31.49" N 075° 10' 33.84" W
Course: 221 **Speed:** 0.1
Source: RDC AIS
In MISLE?: Yes - Matched MMSI Name to MISLE Vessel Name
Vessel Type: Tank Ship | Crude & Products Tank Ship

0 4.89mi

CG GIS Web Service v3.10 Running on Prod 3

For Official Use Only
Not for Navigational Use

Status Ready

Lat 38° 42' 14.37" N Lon 075° 25' 48.28" W Basic Pan

National Response Center



NATIONAL RESPONSE CENTER

US Coast Guard Enterprise GIS - Microsoft Internet Explorer provided by United States Coast Guard

File View Data Help

Layers

0 5.21mi

CG GIS Web Service ver 3.2.10 Running on 2

Not for Navigational Use

District: District 7

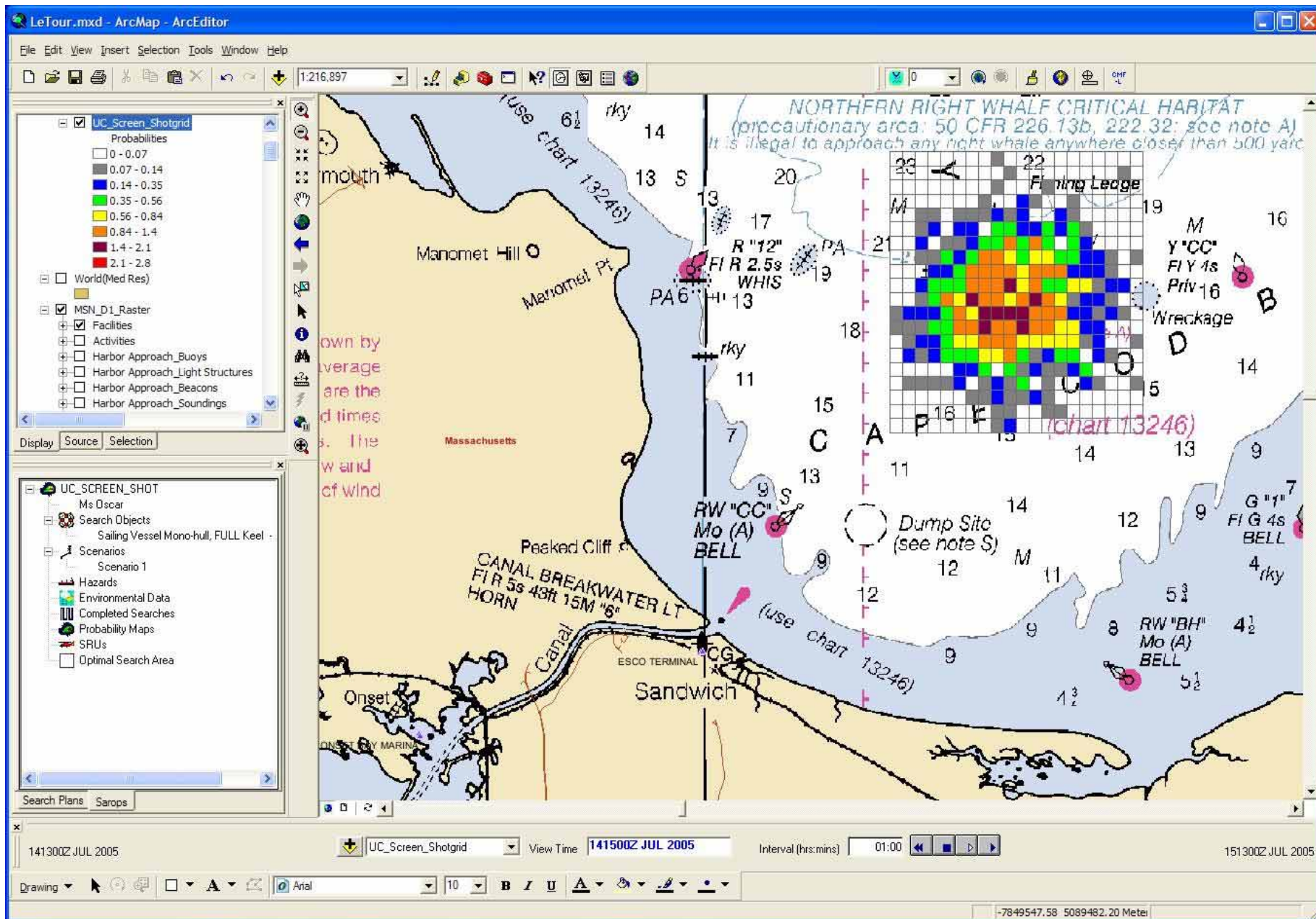
Sector: None

Theme: Basic

- Service Layers**
- MISLE Layers
 - Harbor Approach
 - Incident Response
 - Environmental
 - Critical Infrastructure
 - Jurisdictions
 - Coast Guard Areas
 - Coast Guard Districts
 - Coast Guard COTP Zones
 - Coast Guard Stations
 - Coast Guard Groups
 - Coast Guard Sectors
 - Coast Guard Safety and Security
 - Coast Guard Environmental Jurisdi
 - EPA Regions
 - FEMA Regions
 - 109th Congressional Districts
 - Military Facilities



SAROPS





Enterprise GIS - Summary

- Supports a variety of mission-specific applications
- Maintains a central GIS data repository accessible to ***all*** Coast Guard users
- Integrates with other enterprise systems
- Offers technology, data, and data service solutions available throughout CG community...

...An Enterprise Solution!



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Questions?



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US Coast Guard-Operations Systems Center
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AMERICA'S LIFESAVER AND
GUARDIAN OF THE SEA



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