Geographic Information System (GIS) use within U.S. Coast Guard

Presented by: Mr. Pete Noy (CG-6331)
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Purpose: Provide GIS data and services to the Coast Guard for its fundamental missions:

- Maritime Safety
- Maritime Security
- Maritime Mobility
- National Defense
- Incident Management
- Port Intelligence (unclassified)
- Protection of Natural Resources
- Search and Rescue
Geographic Information System (GIS) use within U.S. Coast Guard

Current challenges

- Ease of use
- Adaptability of technology
- Data Accuracy
- Identification of Trusted Data Sources
- DOD/DHS IT requirements
What is Coast Guard Enterprise GIS (EGIS)

- **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

- **Accessible to all Coast Guard users**
  - Through both a desktop client and a web-enabled viewer
  - GIS clients include ArcGIS Explorer for Desktop and ArcGIS Desktop

- **Sensitive but Unclassified (SBU)**
**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
- Nautical Charts (NOAA RNC/ENC, USACE IENC, CYC)
- Access to Microsoft Bing via DHS ELA

**HSIP Vector Data Sets**

- Other Vector & Raster Data from Federal Providers
- External and Internal Data Services
- Real-time Vessel Track Data Fee Data Warehouse for National-level GIS Data
GIS Data Providers

- Coast Guard
- NGA
- USGS
- NOAA
- USACE
- NAVFAC
- DPO-MA
- FEMA
- EPA
- CBP
- ESRI

Enterprise Geospatial Data Repository
Conceptual model of GIS user community within United States Coast Guard.
ArcGIS Explorer for Desktop (Build 1700)
USCG Modified ArcGIS Explorer for Desktop
USCG Modified ArcGIS Explorer for Desktop
USCG Modified ArcGIS Explorer for Desktop
(Custom Projections)
Leverages DHS ELA with Microsoft Bing
Leverages DHS ELA with Microsoft Bing
Automatically displays appropriately scaled information
USCG Customized Capabilities
Reports
USCG Customized Capabilities

External Data Import

This example shows an example of a locally held spreadsheet.
USCG Customized Capabilities
MTSR-CART Function
USCG Customized Capabilities

Vessel Tracks - NAIS
USCG Customized Capabilities
Vessel Track – Drill Through

Marine Information for Safety and Law Enforcement
EGIS has been utilized to support some well known Coast Guard operations. Here is the track of the Cosco Busan.
USCG New Customized Capabilities
Vessel Track Playback
This shows the latest Tropical Storm IDA project path being consumed from live NOAA data feeds. User has added all waterfront facilities for planning purposes.
Conceptual model of GIS user community within United States Coast Guard.
Search and Rescue Optimal Planning System (SAROPS) – Probability Grid
Search and Rescue Optimal Planning System (SAROPS) – Search Pattern
Search and Rescue Optimal Planning System (SAROPS) – AMVER Linkage
Conceptual model of GIS user community within United States Coast Guard.

GIS Software Capability

ArcGIS Desktop

ArcGIS Explorer for Desktop

ArcGIS Viewer for Silverlight

Level of GIS Experience Increases

Number of Users Increases
Indicates flow of data. In this example, SAROPS consuming EGIS RNC Charts as a service.
Coast Guard GIS – CG1V

Architecture And Governance Framework

USCG GMO
DHS GMO
Geospatial Information Infrastructure
Existing Backend Architecture

Convergence Framework Presentation Layer

EGiS
SAROPS
Existing/Future USCG Requirement

CG1V Spiral 1
CG1V Spiral 2
CG1V Spiral 3
CG1V Continual Spiral

Existing USCG Data Sources

Vessel Track (NAIS, BFT, Other)
CART
MISLE
IATONIS
Other USCG Systems
NOAA USACE State
External Sources
Coast Guard One View (CG1V)
Silverlight-based Common Viewer
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## Coast Guard One View (CG1V)

**Silverlight-based Common Viewer**

### USCG Enterprise GIS

**Table of Contents**

Select from the following Map Services, Feature Layers, XML, WMS and GeoRSS data sources to add content to the map. Additional data sources may be added using the Add/Configure button.

- Barge Fleeting Areas
- Bridge
- Deepwater Port
- Fixed Platform
- Intake
- Lock/Tam
- MSIS Municipal Facility
- MSIS Shipyard/Repair Facility
- Marina/Boat Ramp
- Mobile Transfer Facility
- Non-Marine Facility/Local
- Pipeline
- Response Gear Facility
- Waterfront Facility

### Details

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Coast Guard One View (CG1V)
Silverlight-based Common Viewer
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Silverlight-based Common Viewer
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Infrastructure Status Information Service (ISIS)
Coast Guard One View (CG1V)
Silverlight-based Common Viewer
Conceptual model of GIS user community within United States Coast Guard.

GIS Software Capability

ArcGIS Desktop

ArcGIS Explorer for Desktop

ArcGIS Viewer for Silverlight

Level of GIS Experience Increases

Number of Users Increases
Coast Guard GIS – Advanced Use

- Currently leverage DHS ELA with Esri
  - Unclassified
  - Classified

- Software available to all Coast Guard users
  - Moving to ArcGIS 10/10.1
  - Access includes extensions
  - Will use concurrent use model – users can checkout license on a quarterly basis

- Training
  - Available via Esri Virtual Campus
  - NGA Training
SECTOR UPPER MISSISSIPPI MTS STATUS
Upper Mississippi River from Mile Marker 185.5 (L/D 27)
CART data provided by SUMR

Data valid as of 19APR11, 0945 CST

Lock and Dam 25 and 27
- L/D 27 anticipated to open early AM 20SEP2012.

- 58 Stopped Tow Boats
- 409 Barges being transported by these Tow Boats.

Upper Mississippi River cannot be transited north of L/D 27.

Legend
- Waterway Closure
- Limited Navigation
- Waterway Open
- Stopped Vessel
SECTOR UPPER MISSISSIPPI MTS STATUS
Upper Mississippi River Mile Marker 185.5 (L/D 27)
CART & VqPASS data provided by SUMR

Data valid as of 21SEP12, 1352 CST

Legend
- Waterway Closure
- Limited Navigation
- Waterway Open
- Stopped Vessel
- Cleared Vessel

- 30 Stopped Tow Boats
- 244 Stopped Barges
- 39 Cleared Tow Boats
- 255 Cleared Barges
Expected ASB Fishing Grounds 08NOV12

Analysis consists of sea surface temperatures (14 day average) and fishing reports.

Sea Surface Temp
- Cool < 47
- Ideal 47-50
- Acceptable 50-60
- Too Warm 60+

Source: SST, NOAA GOES Imager, Day and Night, 0.05 degrees
14 Day average centered on 01NOV12
Black areas denote no data due to persistent cloud cover.
Expected HMS Fishing Grounds
04OCT12

Analysis consists of sea surface temperatures (5 day average) and identifying the tightest front.

Legend
VMS Declaration

- HMS
- DOF
- No Declaration

Yellow: Acceptable
Red: Ideal

Positions plotted on the inset correspond to the VMS vessels on the main map.

Source: SST, NOAA GOES Imager, Day and Night, 0.05 degrees 8 day average centered on 30SEP12.
Undersea Fiber Optic Cable Landings
Questions?
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