

Module 2: Automatic Identification System Analysis Package (AISAP) Introduction



<http://ais-portal.usace.army.mil/>

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Team Members:

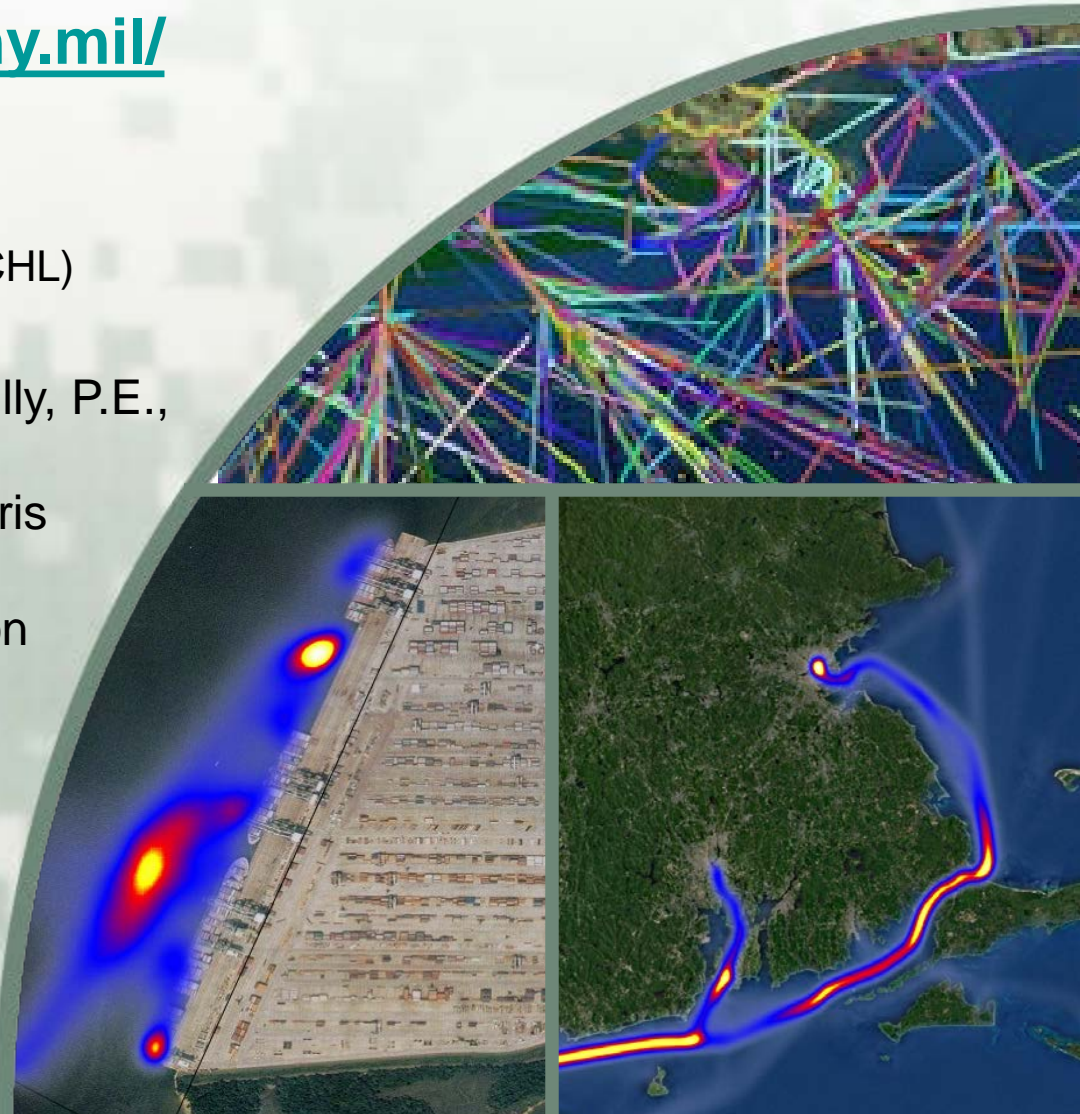
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(SAM-OPJ)

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AISAP User Workshop

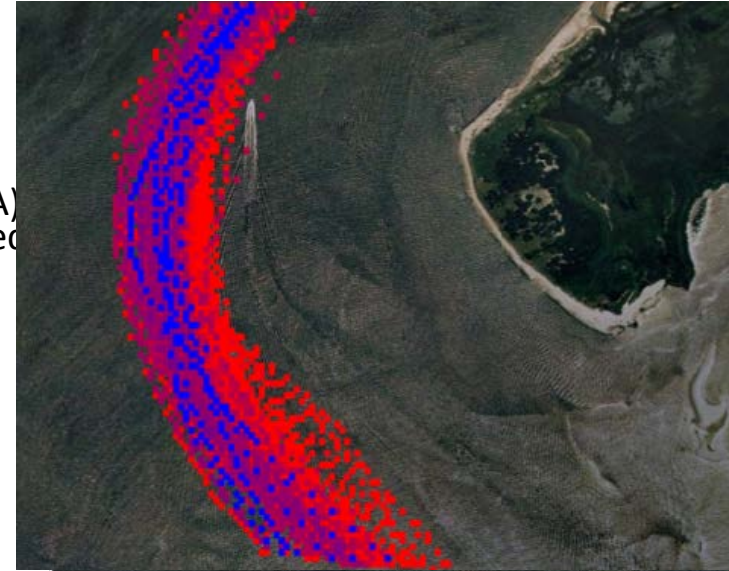
SWD – Dallas, TX
31 AUG 2016



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Background

- AISAP has existed as a desktop tool since FY12(!); Applied Research Associates (ARA)
- Corps and Coast Guard have an Interagency Services Agreement (ISA) to share NAIS data → suite of web services for accessing USCG-stored archival AIS data
- AIS has been used by many across the Corps on an *ad hoc* basis to support both inland and coastal studies and operational decision making.



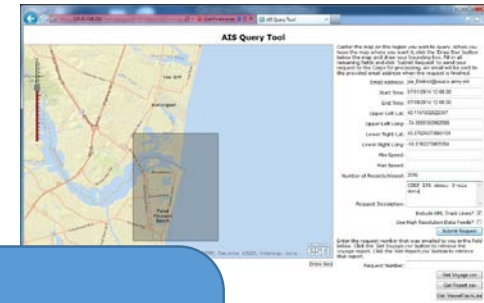
AISAP Functional Layout

USCG NAIS

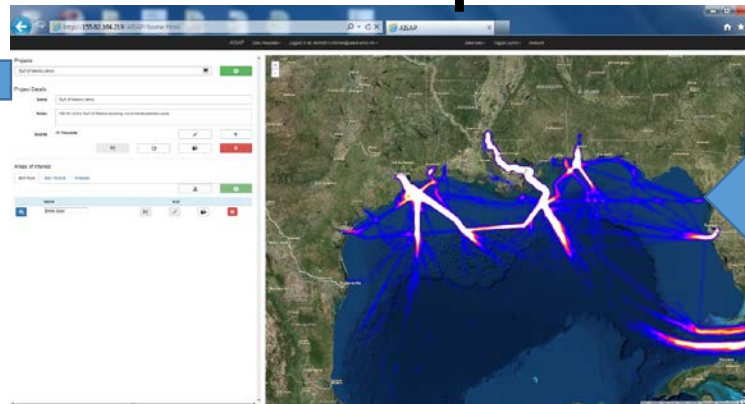


USCG web services

Scripts for batch service calls via GUI



AISAP web portal



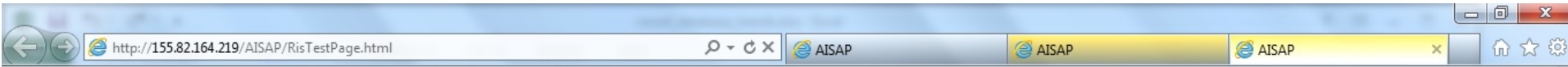
SAM-OPJ data cache



Basic data retrieval
(.csv and .kml)



NAIS Web Services



Testing Suite

Parameters

Services

- Particular vessel's present location
- Particular vessel's voyage history
- Particular vessel's track history over defined date range
- Details of all vessels within bounded region right now
- List of all vessels within bounded region over defined date range

Output from Webservice

```
<VoyageHistoryResponse><Voyage><mmsi>237921000</mmsi><imoNumber>9122916</imoNumber><callSign>n>SVIL</callSign><name>ASTRO ARCTURUS</name><eta>02011600</eta><destination>NEW YORK</destination><startTime>2008-02-01T22:48:23Z</startTime><endTime>2008-02-02T05:30:30Z</endTime><numReports>107</numReports></Voyage><Voyage><mmsi>237921000</mmsi><i
```



NAIS Web Services

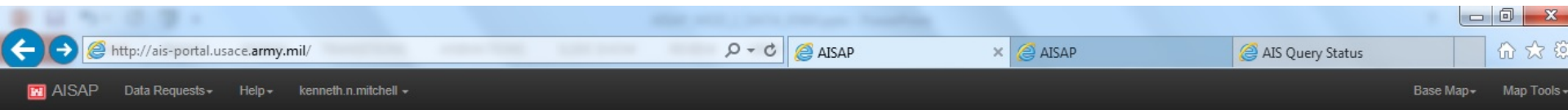
Example:

<https://service.uscg.mil/service/uscg.mda.position.vessel/nais/VesselPositionList-KMLPosition?argparent=VesselPositionListRequest&MMSI=338065964&StartDateTime=2011-06-01T00:00:00Z&EndDateTime=2011-06-03T00:00:00Z&DesiredNumberOfRecords=200>

- NAIS web services provide the basic building blocks for the AISAP data acquisition architecture
- AISAP automates the process of repeatedly calling the various web services so as to assemble large amounts of archival NAIS data relevant to USACE decision making
- Important to understand these underlying components in order to know strengths and limitations of AISAP data requests



AISAP Data Requests



Query Tool

After completing the form, click 'Submit Request' to send your request to the Corps for processing. An email will be sent to the provided email address when the request is finished.

Email:

Start Time:

End Time:

Which Vessels? All MMSIs Selected MMSIs

Draw a bounding box or enter the coordinates manually.

Upper Left Lat:

Upper Left Lon:

Lower Right Lat:

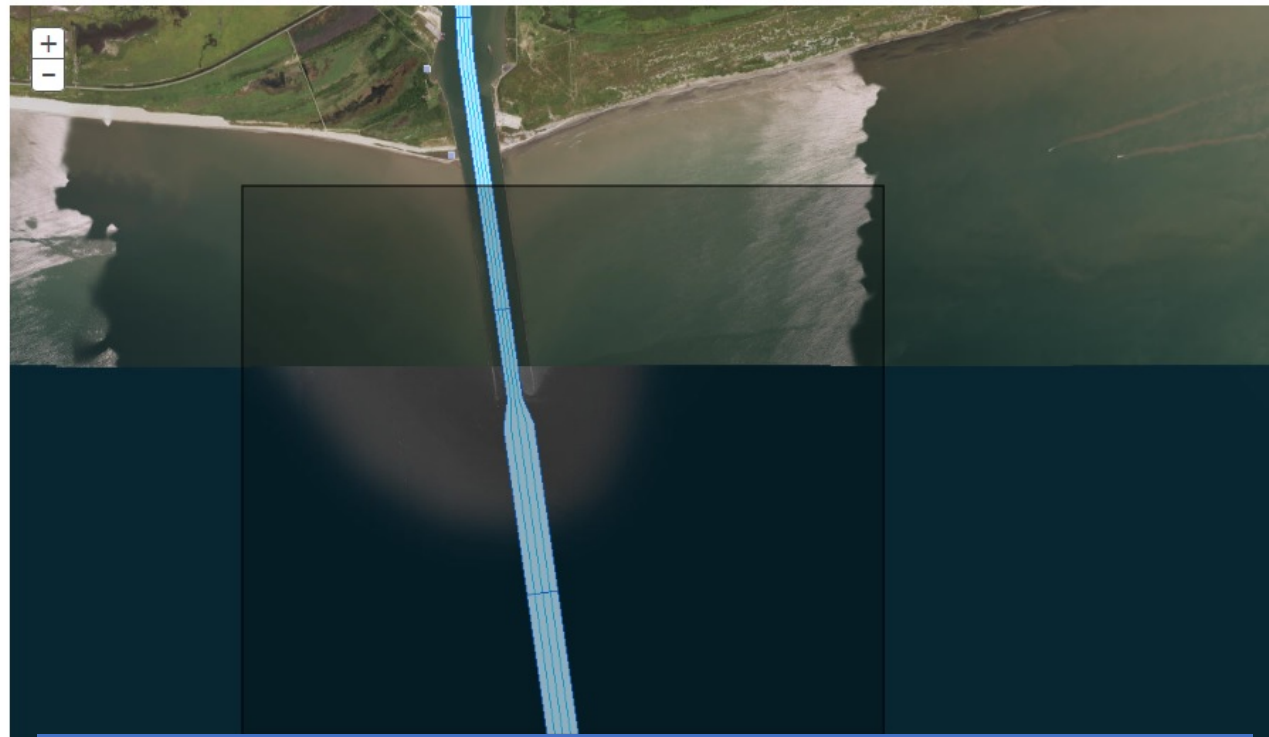
Lower Right Lon:

Min Speed (knots):

Max Speed (knots):

Sampling Rate:

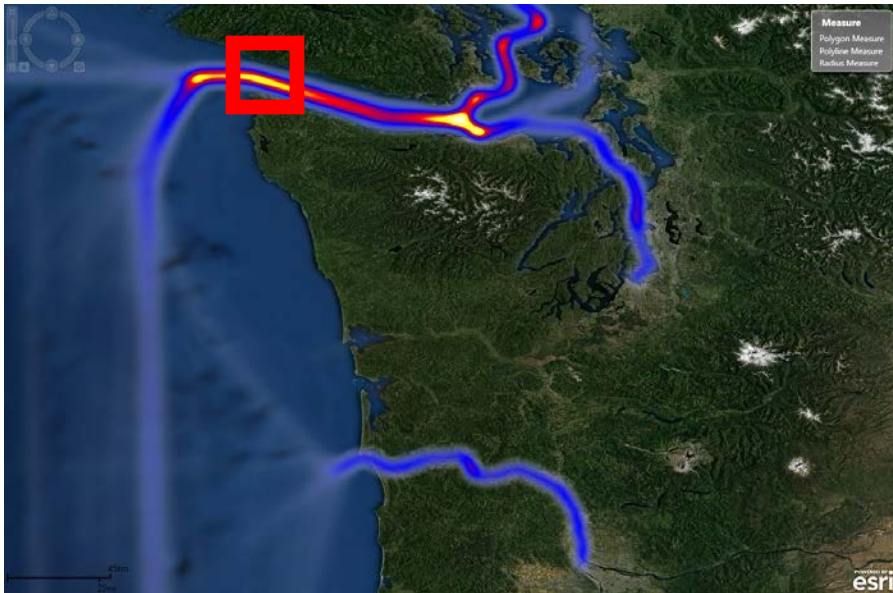
Num Records/Vessel:



- 1) Calls one NAIS web service to get all vessels that transited the box over defined date range.
- 2) Then calls another web service for each observed vessel to return the vessel track over the defined date range.



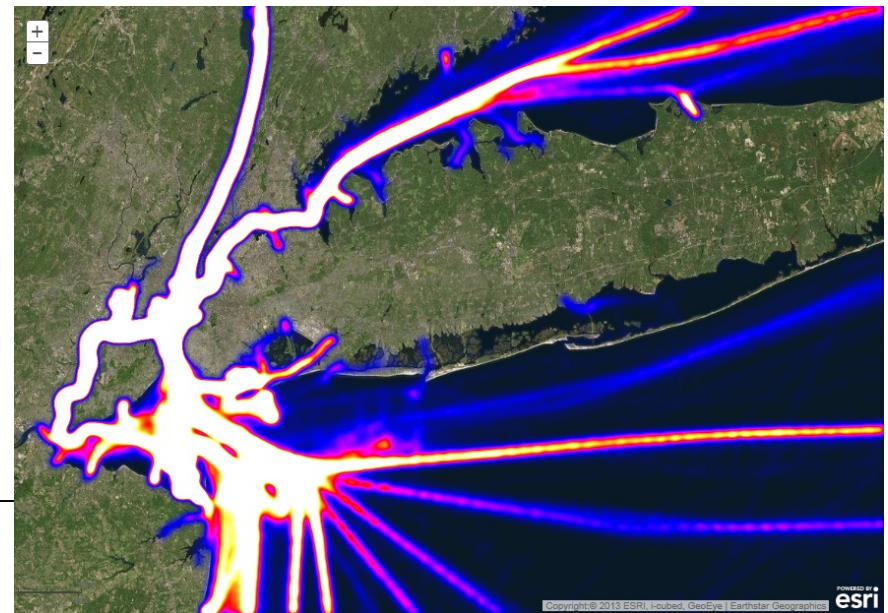
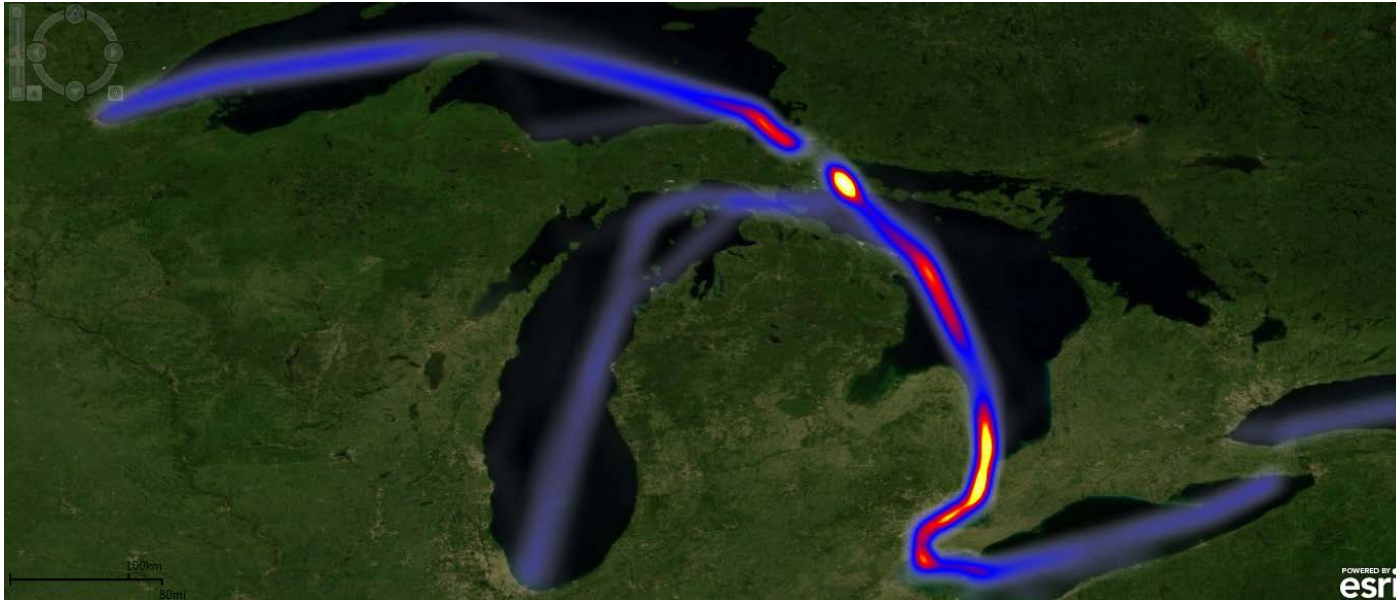
AISAP Data Cache



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AISAP Data Cache



AISAP web portal

AISAP Desktop version

**OPJ
cache**

Communal database!



AISAP web version



- Revised AISAP architecture eliminates need for locally stored AIS data sets and associated file management efforts.
- Data cache is intended as a temporary, working repository, not a permanent replication of NAIS archives.



AISAP web portal

The screenshot shows the AISAP web portal interface. The browser address bar displays <http://ais-portal.usace.army.mil/>. The page header includes the AISAP logo, a 'Data Requests' dropdown menu, the user login 'Logged in as: kenneth.n.mitchell@usace.army.mil', and a 'Base Map' dropdown menu. The main content area features a 'projects' dropdown menu on the left, a satellite map of North America in the center, and a 'Areas of Interest' section at the bottom. A blue text box is overlaid on the map, providing instructions for the workflow.

projects

- CWG_NYC_demo
- Select a Project...
- CWG_demo1
- CWG_demo3**
- test_small_AOI
- first_project_demo
- CWG_demo_Chesapeake
- CWG_demo2
- New Project
- New Project
- Gulf of Mexico demo
- test_project_entire_dbase
- New Project
- New Project
- Mobile_demo
- New Project
- Upper_Miss_demo
- Galveston_demo
- CERB_demo1
- CWG_NYC_demo

channel

Areas of Interest

Edit AOIs Edit Vectors Analysis

1) Login
2) Select/create project
Point project to previously queried archival data

1000km
600mi

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AISAP web portal

The screenshot displays the AISAP web portal interface. At the top, the browser address bar shows the URL <http://ais-portal.usace.army.mil/>. The page header includes the AISAP logo, a "Data Requests" dropdown menu, the user login "Logged in as: kenneth.n.mitchell@usace.army.mil", and a "Base Map" dropdown menu.

On the left side, there is a list of data requests, each with a search icon and a radio button. The requests are as follows:

- 50175 Chincoteague, VA; Aug. 2015; 5-min data
- 50245 SRH testing call to our procedure
- 50360 Grays Harbor, WA; Jul. 2015; 5-min data
- 114 Testing new database
- 50171 Barnegat, Jersey coast; Aug. 2015; 5-min data
- 50174 Ocean City, MD; Aug. 2015; 5-min data
- 50178 Chesapeake Entrance; Aug. 2015; 5-min data
- 50184 Chesapeake-Tangier Sound; Aug. 2015; 5-min data
- 50185 Cuttyhunk vicinity, MA; Aug. 2015; 5-min data
- 50187 Rockport-Newburyport, MA; Aug. 2015; 5-min data
- 50190 NY Ambrose entrance; Oct. 2015; 5-min data

On the right side, a satellite map of the Chesapeake Bay area is displayed. A blue text box is overlaid on the map with the text: "Point project to previously queried archival data". The map includes zoom controls (+ and -) in the top left corner. A copyright notice at the bottom right reads "Copyright © 2013 ESRI. I-cubed. Geo".

AISAP web portal

The screenshot displays the AISAP web portal interface. The browser address bar shows the URL <http://155.82.164.219/AISAP/home.html>. The page title is "AISAP". The user is logged in as "kenneth.n.mitchell@usace.army.mil".

Projects
CWG_demo_Chesapeake

Project Details
Name: CWG_demo_Chesapeake
Notes:
Source: Request 50178: Chesapeake Entrance; Aug. 2015; 5-min data (kenneth.n.mitchell@usace.army.mil)

Areas of Interest
Edit AOIs | Edit Vectors | Analysis

Name
Chesapeake region

The main map area shows a satellite view of the Chesapeake region with a white and blue highlighted path or boundary overlaid on the water bodies. The ESRI logo is visible in the bottom right corner of the map.



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AISAP web portal

The screenshot displays the AISAP web portal interface. The browser address bar shows the URL `http://ais-portal.usace.army.mil/`. The page header includes navigation options: "AISAP", "Data Requests", "Logged in as: kenneth.n.mitchell@usace.army.mil", "Base Map", "Toggle Layers", and "Measure".

The left sidebar contains the following sections:

- Projects:** A dropdown menu showing "Travel_time_demo" and a green refresh button.
- Project Details:**
 - Name:** "Travel_time_demo"
 - Notes:** An empty text input field.
 - Source:** "Request 50186: Connecticut River; Aug. 2015; 5-min data (kenneth.n.mitchell@usace.army.mil)" with edit and filter icons.
 - Buttons for home, refresh, print, and close.
- Areas of Interest:** Tabs for "Edit AOIs", "Edit Vectors", and "Analysis".
- Table:** A table with columns for "Name" and various icons. It lists "Connecticut River" and "Easter_LI".

The main map area shows a satellite view of the Connecticut River delta. Numerous blue circular markers with numbers (e.g., 4, 7, 286, 416, 2, 110, 49, 3, 11, 60, 55, 20, 14, 154, 35, 506, 328, 622) are scattered across the map. A popup window titled "Cluster 7" is open, displaying the following information:

- (1 of 380)
- Cluster 7
- Latitude: 41.131641
- Longitude: -72.070321
- Zoom to

The bottom right corner of the map area features the text "POWERED BY Earthstar Geographics esri".



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AISAP web portal



Summary

Report Date Range: 2015-02-28T18:00:00 to 2015-03-06T18:00:00

Num Reports: 6968

Num Unique Vessels: 68

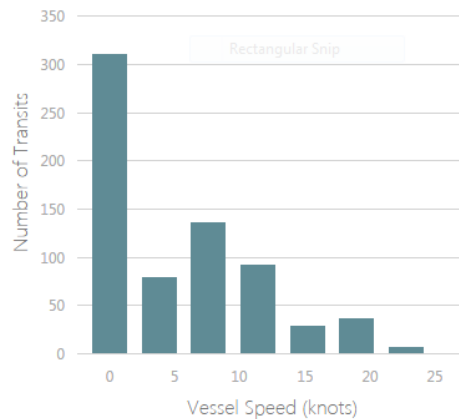
Num Transits: 688

Traffic Sample Statistics

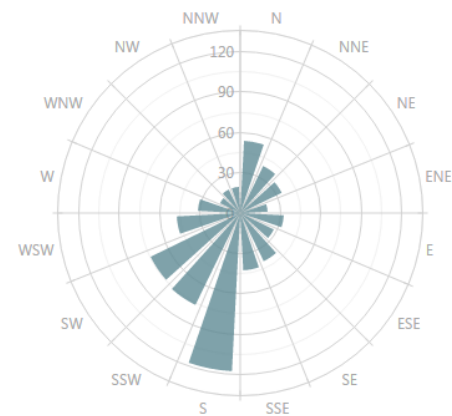
Metric	Mean	StdDev
Vessel Draft (ft)	14.73	11.94
Vessel Length (ft)	260.32	281
Vessel Width (ft)	53.13	40.06
Vessel Speed (knots)	4.24	1.31



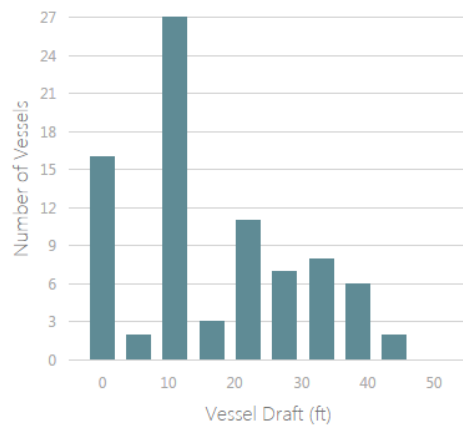
Vessel Speed



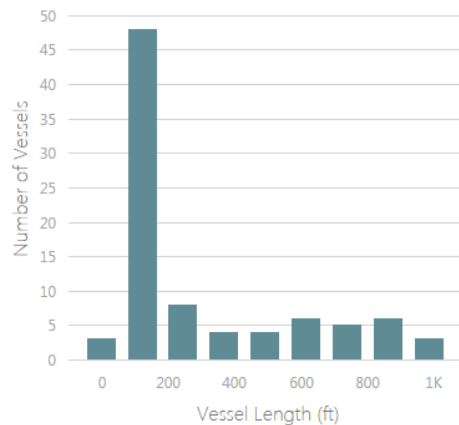
Vessel Course



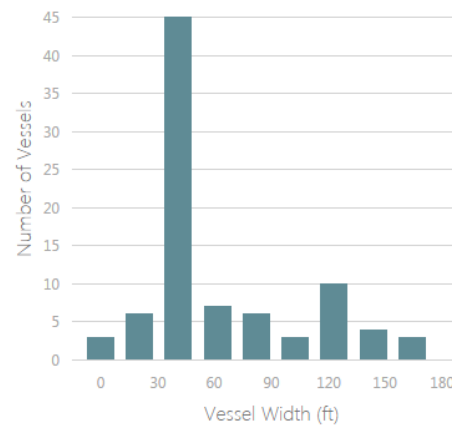
Vessel Draft



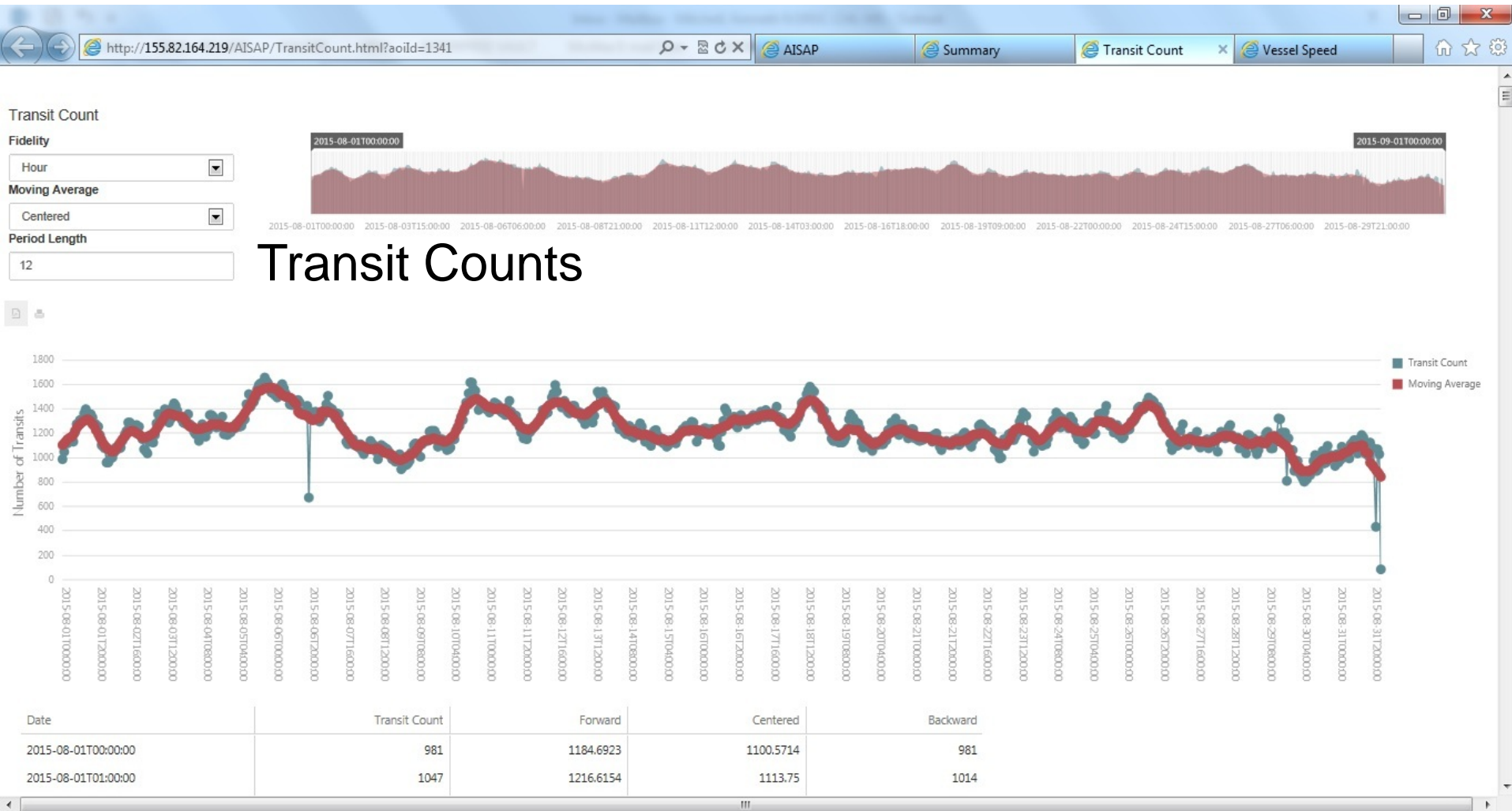
Vessel Length



Vessel Width



AISAP web portal



AISAP web portal

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Project Details

Name: CWG_demo2

Notes: [Empty text box]

Source: Request 50188: Shark River-Manasquan, NJ; Aug. 2015; 5 -min data (kenneth.n.mitchell@usace.army.mil)

Areas of Interest

Buttons: Edit AOIs, Edit Vectors, Analysis

Name: Jersey_coast

Map: A satellite map of Cape May, NJ, overlaid with numerous colorful lines representing vessel tracks. A popup window for 'Vessel MMSI - 366940530' is open, displaying the following information:

Vessel MMSI - 366940530	
Transit 4	
Start	
Date:	2015-08-28T11:30:00
Latitude:	39.377497
Longitude:	-74.421588
End	
Date:	2015-08-28T20:15:00
Latitude:	38.978985
Longitude:	-75.113942
Zoom to	

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On the left side, there is a "Notes" section with a text input field. Below it is the "Source" section, which contains the text: "Request 50178: Chesapeake Entrance; Aug. 2015; 5-min data (kenneth.n.mitchell@usace.army.mil)". There are also several icons for editing and deleting the source.

The "Areas of Interest" section is active, showing a table with columns for "Name", a checkmark, an up arrow, a "V" icon, and a "C" icon. The table lists four areas of interest:

Name	<input checked="" type="checkbox"/>	↑	V	C
Chesapeake_entrance	<input checked="" type="checkbox"/>	↑	V	C
Baltimore	<input checked="" type="checkbox"/>	↑	V	C
C&D Canal	<input checked="" type="checkbox"/>	↑	V	C
Norfolk-Hampton Rds	<input checked="" type="checkbox"/>	↑	V	C

The main map area displays a satellite view of the Chesapeake Bay region. A yellow polygon highlights a specific area in the bay, with a red arrow pointing to it. Other areas are outlined in black. The map includes zoom controls (+ and -) in the top left corner. The bottom right corner of the map area contains the text: "Copyright © 2013 ESRI, i-cubed, GeoEye | Earthstar Geographics" and the "POWERED BY esri" logo.



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The main content area is divided into a sidebar on the left and a map on the right. The sidebar contains:

- Notes:** A text input field.
- Source:** "Request 50178: Chesapeake Entrance; Aug. 2015; 5-min data (kenneth.n.mitchell@usace.army.mil)" with edit and filter icons.
- Areas of Interest:** A section with tabs for "Edit AOIs", "Edit Vectors", and "Analysis". Below the tabs is a table of AOIs.

Name	<input checked="" type="checkbox"/>	↑	<input checked="" type="checkbox"/>	V	<input checked="" type="checkbox"/>	C
Chesapeake_entrance	<input checked="" type="checkbox"/>	↑	<input type="checkbox"/>	V	<input type="checkbox"/>	C
Baltimore	<input checked="" type="checkbox"/>	↑	<input type="checkbox"/>	V	<input type="checkbox"/>	C
C&D Canal	<input checked="" type="checkbox"/>	↑	<input type="checkbox"/>	V	<input type="checkbox"/>	C
Norfolk-Hampton Rds	<input checked="" type="checkbox"/>	↑	<input type="checkbox"/>	V	<input type="checkbox"/>	C

The map on the right shows a satellite view of the Chesapeake Bay area with a heatmap overlay. The heatmap uses a color scale from blue (low) to red (high) to indicate values. A path of white dots is overlaid on the heatmap, following the main waterway. The map includes zoom controls (+/-) and a copyright notice at the bottom right: "Copyright © 2013 ESRI, i-cubed, GeoEye | Earthstar Geographic...".



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AISAP Future Development

- Future vision (continued development)
 - Short term: Additional automated analysis capabilities to meet District needs
→ need your feedback!
 - Mid-term: Foundation for a nationwide MTS health monitoring capability (e.g. inland travel time atlas, coastal port performance tracking, etc.)
 - Long term: Amazon cloud services...?
 - Long term: Enhanced suite of USCG web services

