



# AUTOMATIC IDENTIFICATION SYSTEM ANALYSIS PACKAGE

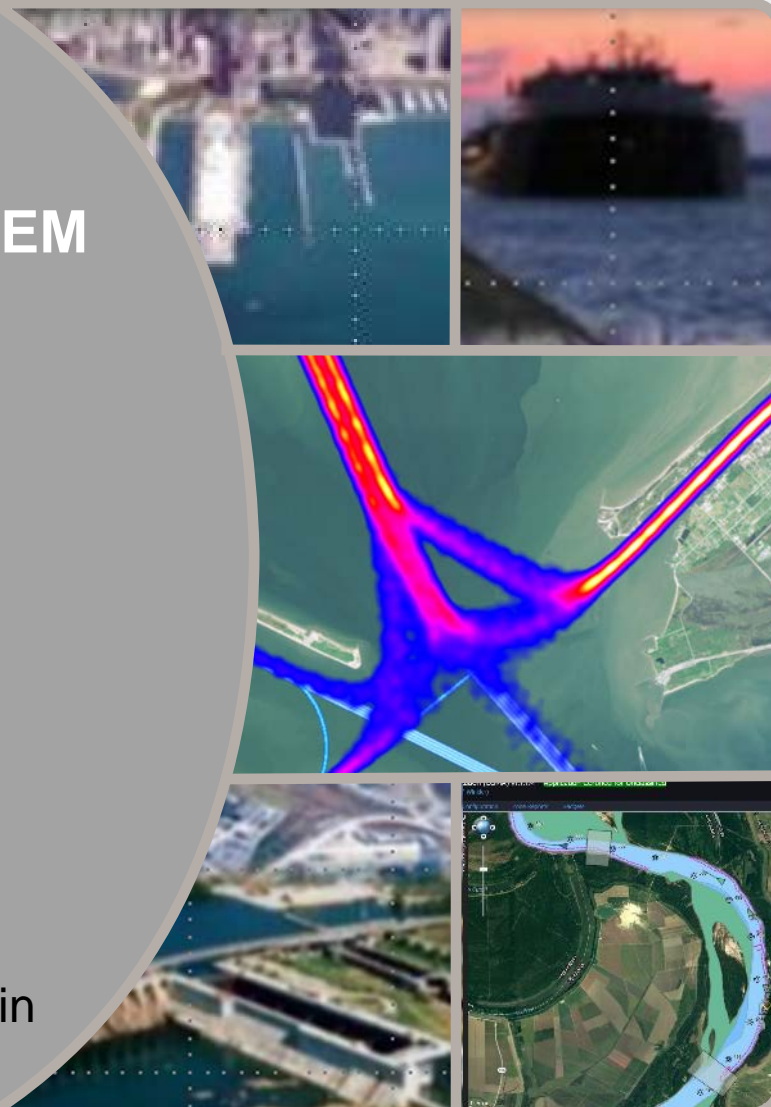
## AISAP LESSON 1: INTRODUCTION

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AISAP Training Class

8 January 2019

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Kress, PhD, SAM-OPJ, ARA



US Army Corps  
of Engineers

**ERDC**  
Engineer Research and  
Development Center

# MOTIVATION

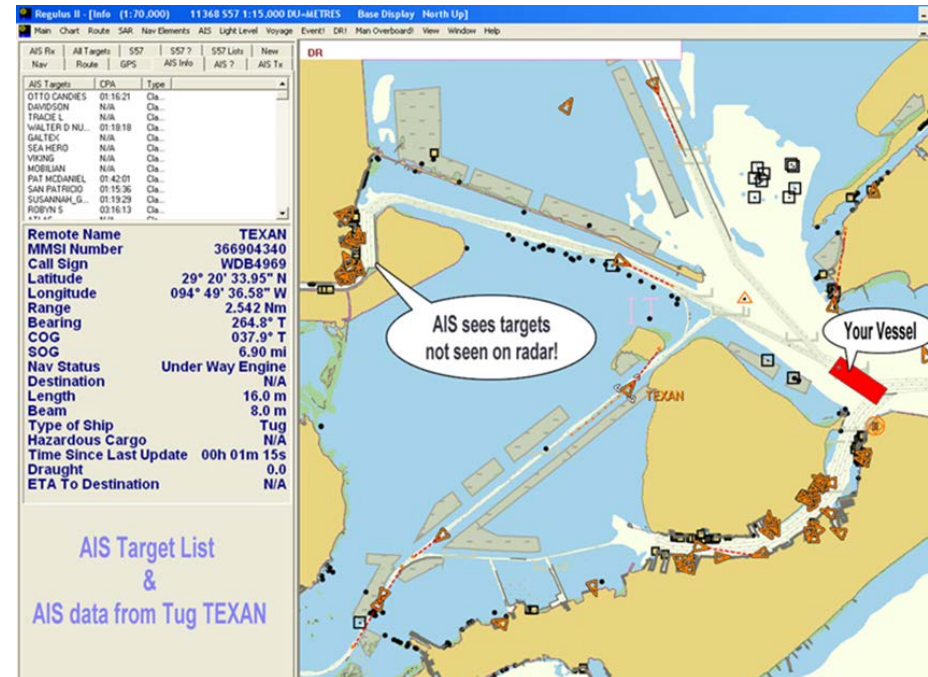
The USACE needs to identify and quantify vessels' transits and waterway traffic trends for informed O&M decisions, planning, and navigation and environmental studies.

1. Which vessels use the waterway and what are their characteristics?
2. Do vessels stay within a designated channel?
3. Where are vessels coming from and going to?
4. How much time do vessels spend at a location?
5. What are vessels transit times from one location to another?
6. What type of changes have there been from year to year or before and after an event?

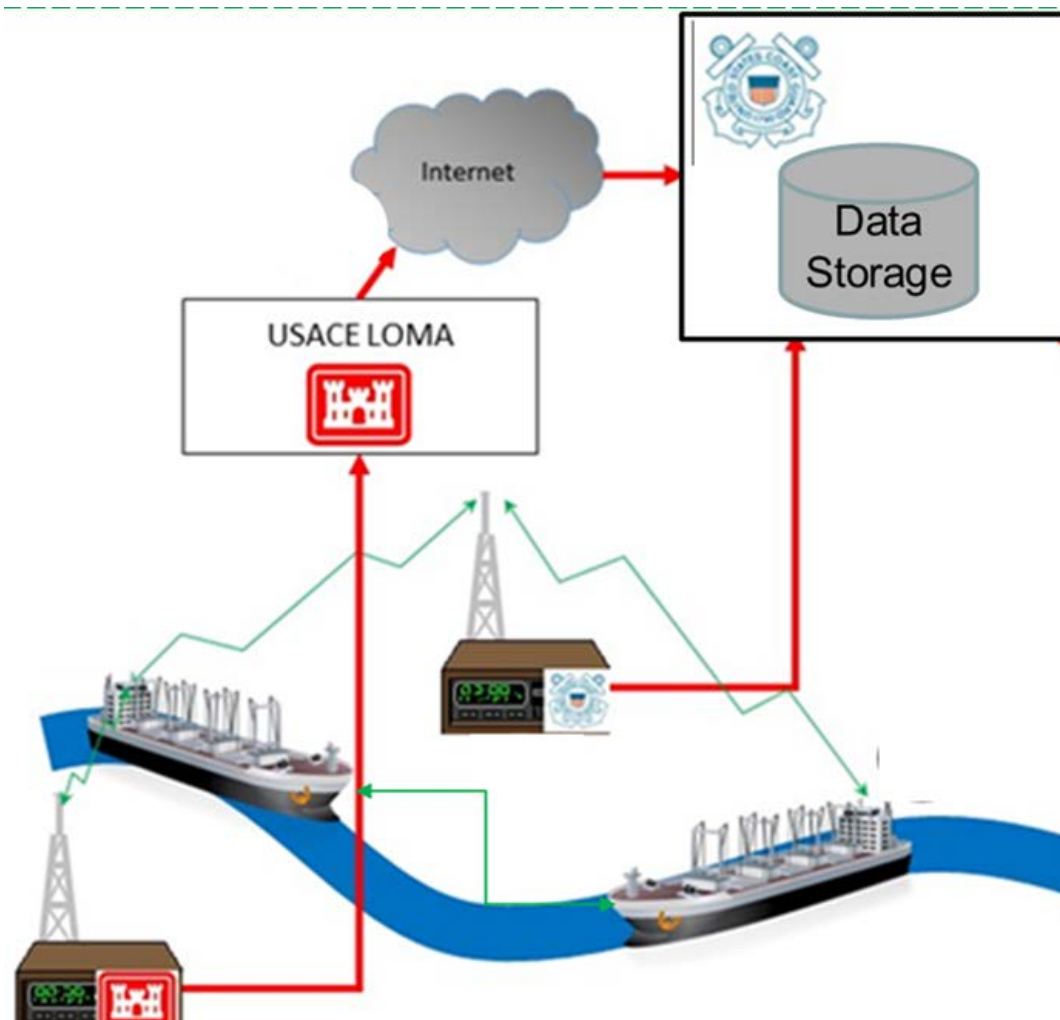


# AUTOMATIC IDENTIFICATION SYSTEM (AIS)

- AIS is a real-time shipboard broadcast system
- Information included in broadcasts:
  - Vessel identification,
  - Vessel characteristics,
  - Time stamp,
  - Location (Lat/Lon),
  - Speed over ground,
  - Course over ground,
  - Heading.
- Broadcasts are every few seconds.
- Carriage requirements are set by federal regulations.



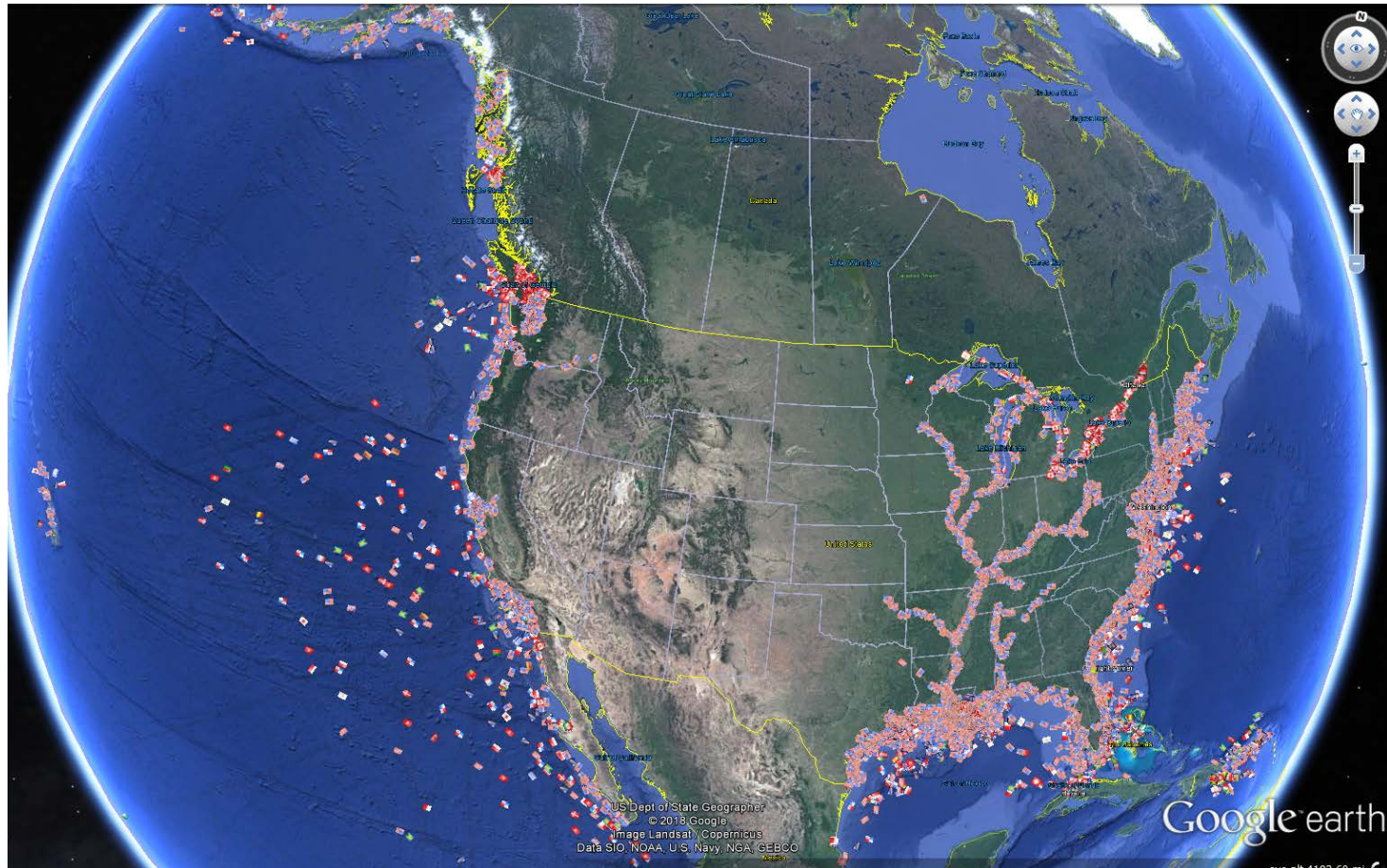
# NATIONAL AUTOMATIC IDENTIFICATION SYSTEM (NAIS)





# NAIS DATA COVERAGE

- Almost all commercial vessels and some recreational vessels.
- Navigable waterways including coastal, Great Lakes, inland, AK, and HI.
- Data available from 3 years prior to 3 hours ago.



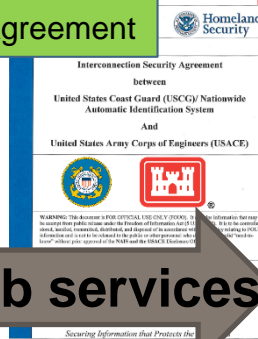
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# AISAP FUNCTIONAL LAYOUT

## USCG NAIS



USCG-USACE  
Interagency Security Agreement



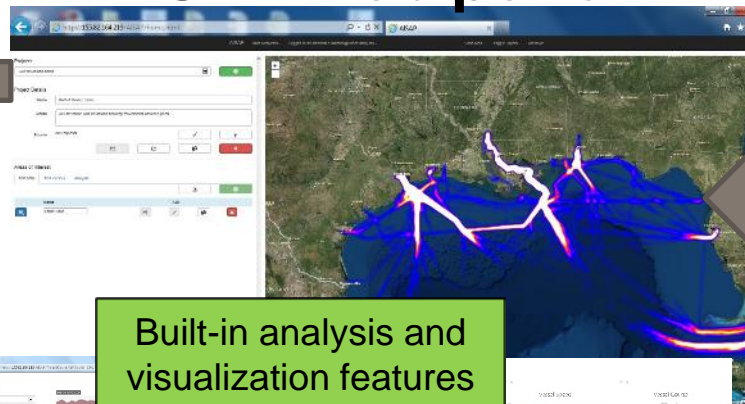
USCG web services

Scripts for batch  
service calls via  
GUI



## AISAP web portal

USACE data  
cache



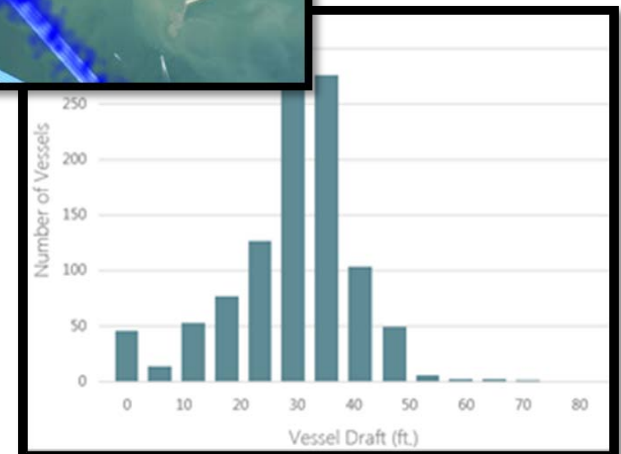
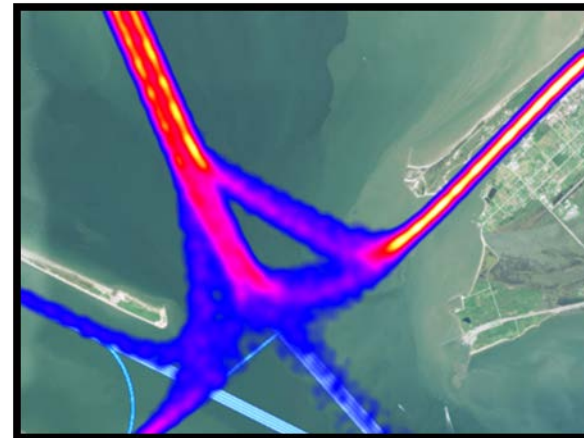
Built-in analysis and  
visualization features

Basic data  
retrieval  
(.csv and .kml)

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# AISAP BUILT-IN FEATURES

1. Accessed online
2. Available to the USACE & Federal Partners
3. Electronic, automated, user-defined NAIS data downloads
4. Data filtering
  - a. Time period, location, vessel characteristics, speed, & direction of travel
5. Data statistical analysis tools
  - a. Number of vessels
  - b. Vessel characteristics
  - c. Average vessel speeds
  - d. Arrival and departure times
  - e. Travel times between locations
  - f. Time spent at a location
6. Data visualization tools
  - a. Vessel track lines
  - b. Heat maps
  - c. Cluster maps





# DATA REQUEST TOOL

## ☒ Query Tool

Complete the form below to retrieve data from the NAIS archive for use in AISAP. Each submission constitutes a **request** in AISAP. Please note that position reports more than three years old are not retrievable.

An email will be sent to the provided email address when the request is complete. The time from submission to completion varies from minutes to days depending on the amount of data requested.

Email

Start Time

End Time

Which Vessels?

☒ All MMSIs

☐ Selected MMSIs

Draw a bounding box or enter the coordinates manually.

Draw Box

Upper Left Lat

Upper Left Lon

Lower Right Lat

Lower Right Lon

Min Speed (knots)

Max Speed (knots)

Batch Size

Sampling Rate

seconds ▼

Num Records/Vessel

Request Description

☐ Include KML Track Lines?





# AISAP SUMMARY STATISTICS EXAMPLE

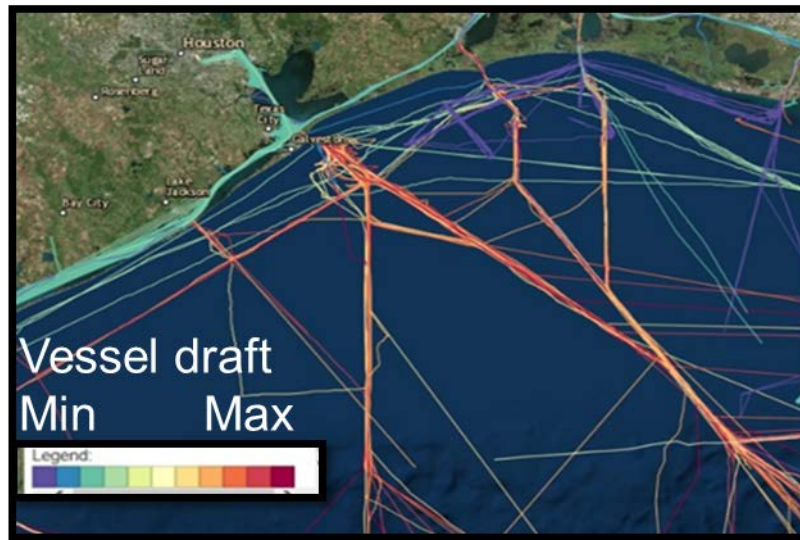
Total time per transit within a user-defined area

Vessel Name	Country	Vessel Type	Draft (ft.)	Length (ft.)	Width (ft.)	Entrance Time	Exit Time	Time in Area (hr)
LONA	Germany	Cargo	35.1	984.3	131.2	12/8/2018 6:45	12/8/2018 22:55	16.2
ALES	Germany	Cargo	36.1	987.5	131.2	8/9/2018 17:35	8/10/2018 8:40	15.1

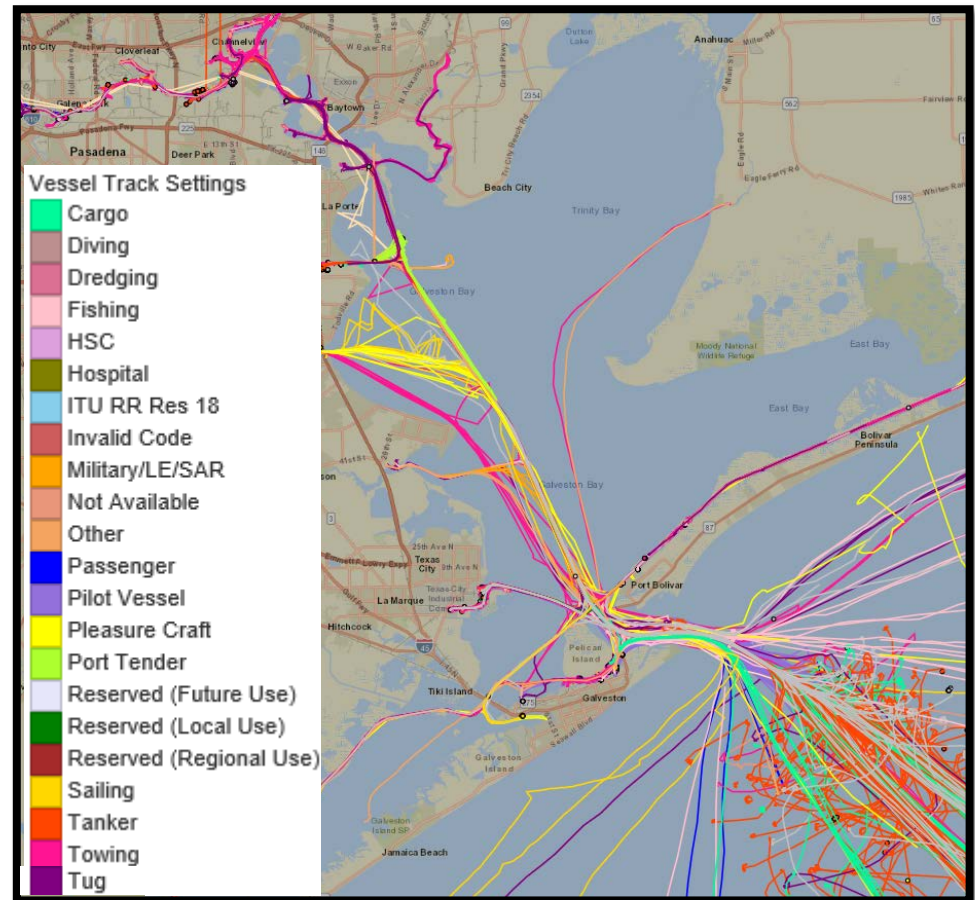
Travel time between two areas

Vessel Name	Departure Area	Leaving	Arrival Area	Arriving	Travel Time
MV	AreaA	6/25/2018 21:50	AreaB	6/26/2018 12:50	0 15:00:00
MV	AreaB	6/27/2018 19:00	AreaA	6/28/2018 14:10	0 19:10:00

# AISAP VESSEL TRACK LINES EXAMPLES



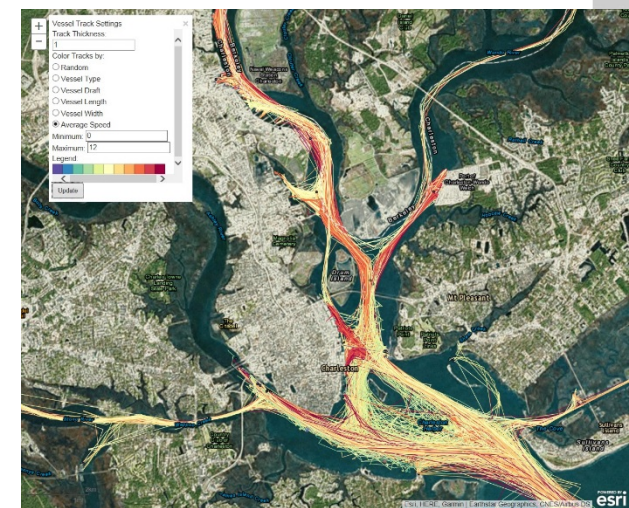
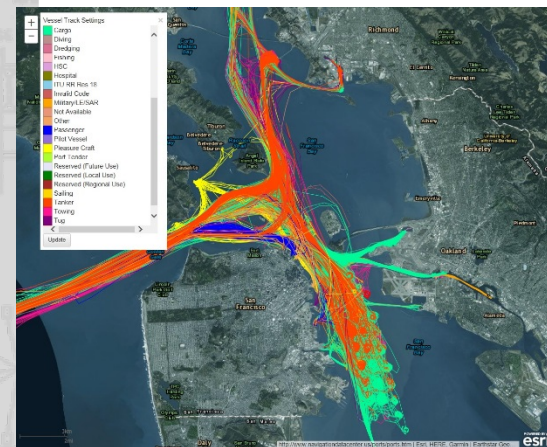
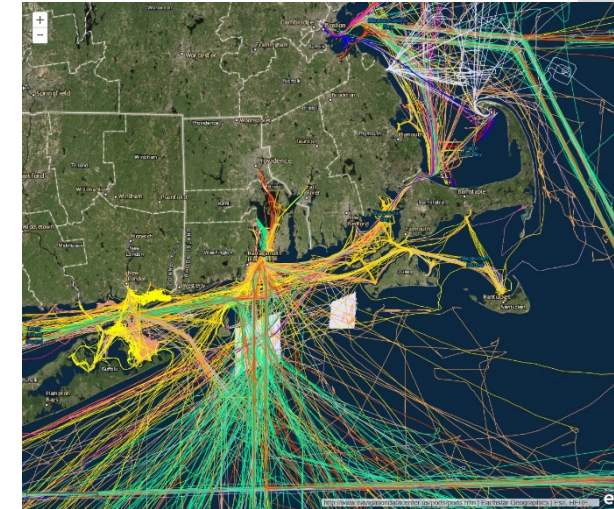
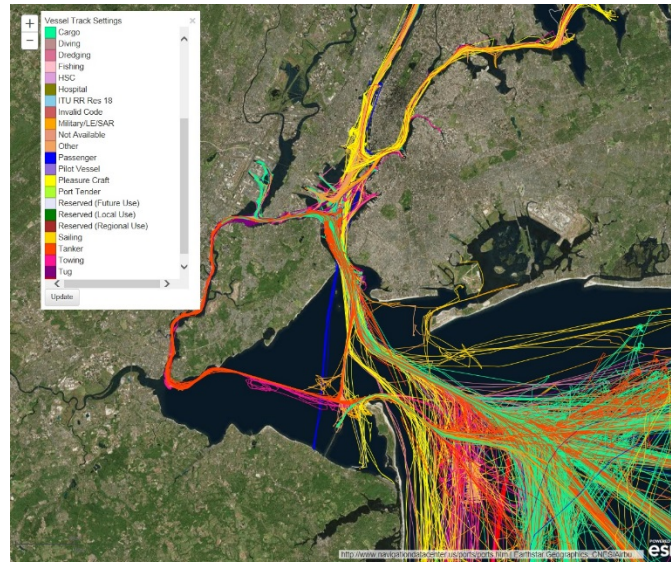
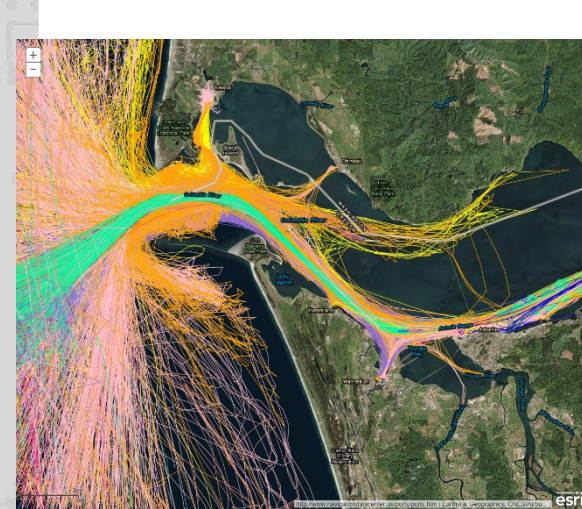
vessel tracks by draft



vessel tracks by vessel type

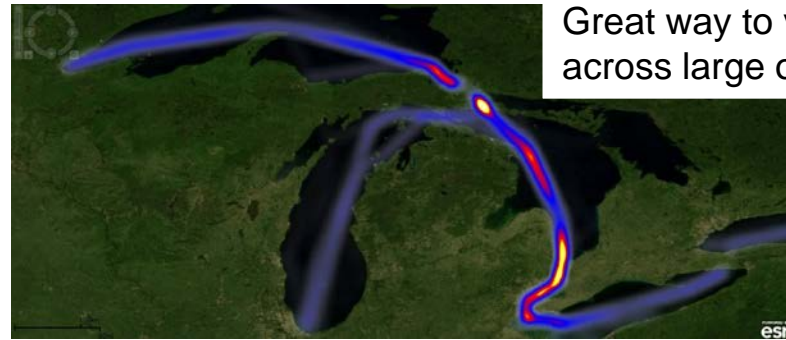
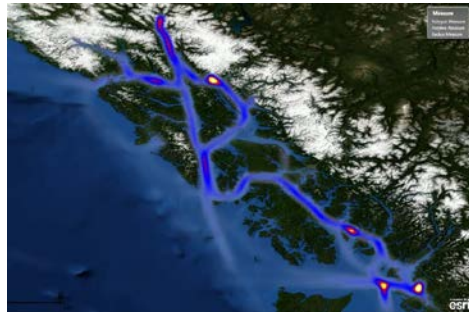


# AISAP TRACK LINE OVERLAYS

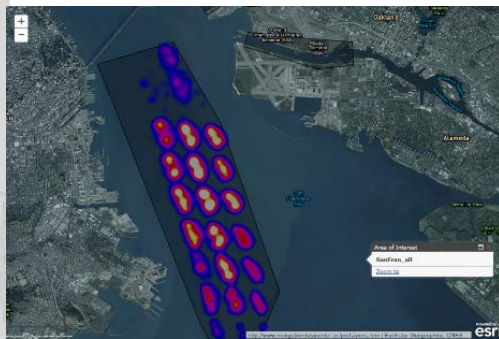
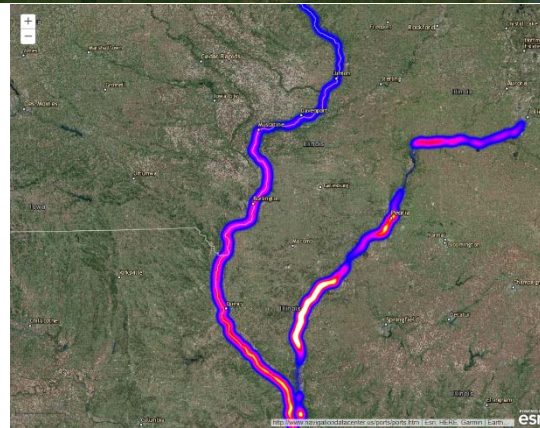
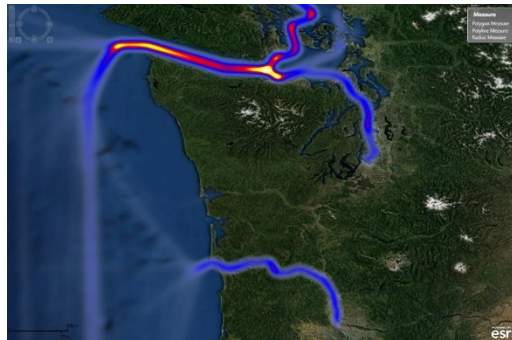




# AISAP RELATIVE DENSITY PLOT (HEAT MAP) EXAMPLES

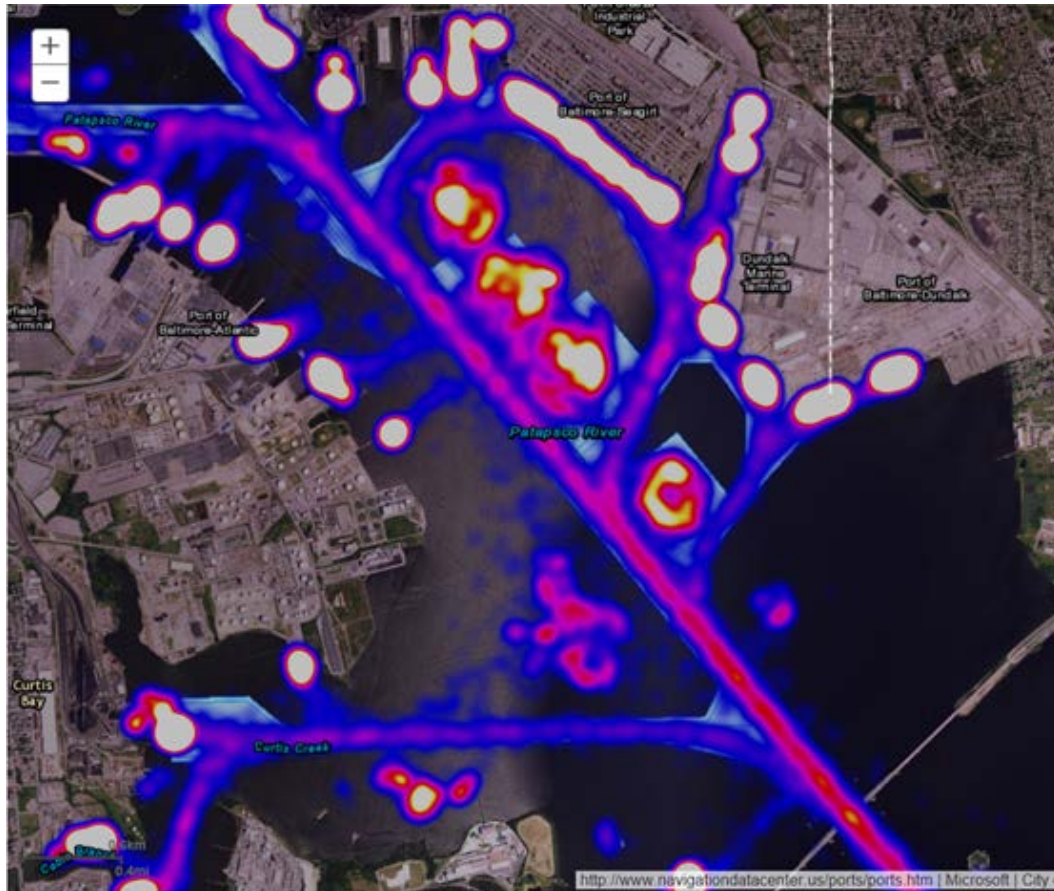


Great way to visualize relative traffic densities across large or small spatial domains.





# AISAP RELATIVE DENSITY PLOT (HEAT MAP) EXAMPLES CONTINUED



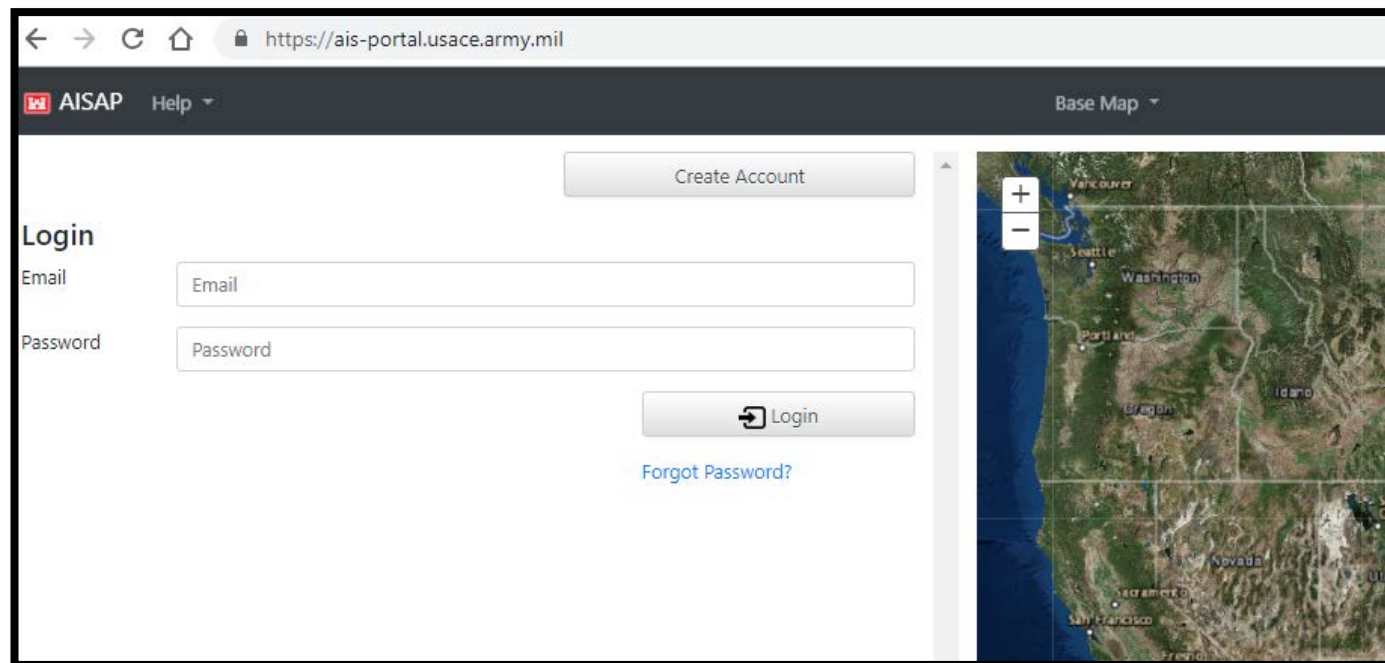
# AISAP ACCESS

ACE-IT Computer:

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

Non ACE-IT Computer (CAC enabled):

[https://aisap.usacegis.us/aisap\\_portal/home.html](https://aisap.usacegis.us/aisap_portal/home.html)



# THANK YOU

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<http://cirp.usace.army.mil/techtransfer/workshops/AIS2019/AIS-Workshop.php>

