AUTOMATIC IDENTIFICATION SYSTEM ANALYSIS PACKAGE

AISAP LESSON 1: INTRODUCTION

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AISAP Training Class
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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.
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.
AISAP FUNCTIONAL LAYOUT

USCG NAIS

USCG-USACE Interagency Security Agreement

Script for batch service calls via GUI

USCG web services

USACE data cache

AISAP web portal

Basic data retrieval (.csv and .kml)

Built-in analysis and visualization features
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
# 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.

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td></td>
</tr>
<tr>
<td>Start Time</td>
<td></td>
</tr>
<tr>
<td>End Time</td>
<td></td>
</tr>
<tr>
<td>Which Vessels?</td>
<td>All MMSIs</td>
</tr>
<tr>
<td>Upper Left Lat</td>
<td></td>
</tr>
<tr>
<td>Upper Left Lon</td>
<td></td>
</tr>
<tr>
<td>Lower Right Lat</td>
<td></td>
</tr>
<tr>
<td>Lower Right Lon</td>
<td></td>
</tr>
<tr>
<td>Min Speed (knots)</td>
<td>0</td>
</tr>
<tr>
<td>Max Speed (knots)</td>
<td>25</td>
</tr>
<tr>
<td>Batch Size</td>
<td>1</td>
</tr>
<tr>
<td>Sampling Rate</td>
<td>seconds</td>
</tr>
<tr>
<td>Num Records/Vessel</td>
<td></td>
</tr>
<tr>
<td>Request Description</td>
<td></td>
</tr>
</tbody>
</table>

Include KML Track Lines?
### AISAP SUMMARY STATISTICS EXAMPLE

**Total time per transit within a user-defined area**

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

**Travel time between two areas**

<table>
<thead>
<tr>
<th>Vessel Name</th>
<th>Departure Area</th>
<th>Leaving Date Time</th>
<th>Arrival Area</th>
<th>Arriving Date Time</th>
<th>Travel Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV</td>
<td>AreaA</td>
<td>6/25/2018 21:50</td>
<td>AreaB</td>
<td>6/26/2018 12:50</td>
<td>0 15:00:00</td>
</tr>
<tr>
<td>MV</td>
<td>AreaB</td>
<td>6/27/2018 19:00</td>
<td>AreaA</td>
<td>6/28/2018 14:10</td>
<td>0 19:10:00</td>
</tr>
</tbody>
</table>
AISAP VESSEL TRACK LINES EXAMPLES

vessel tracks by draft

vessel tracks by vessel type

US Army Corps of Engineers • Engineer Research and Development Center
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:

Non ACE-IT Computer (CAC enabled):
https://aisap.usacegis.us/aisap_portal/home.html
THANK YOU

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