Lock Operations Management Application

ERDC
Engineer Research and Development Center

LOMA overview

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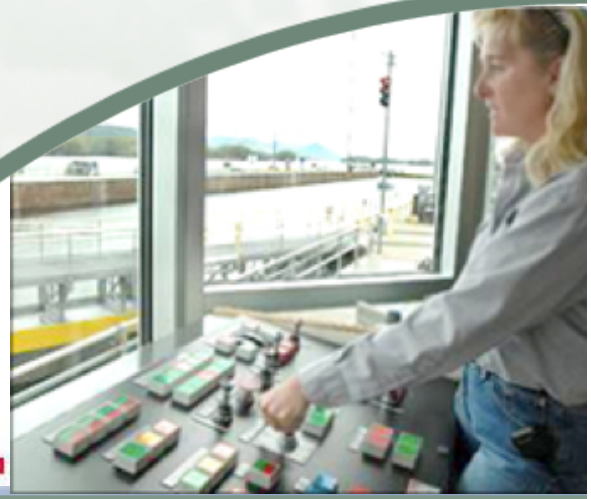
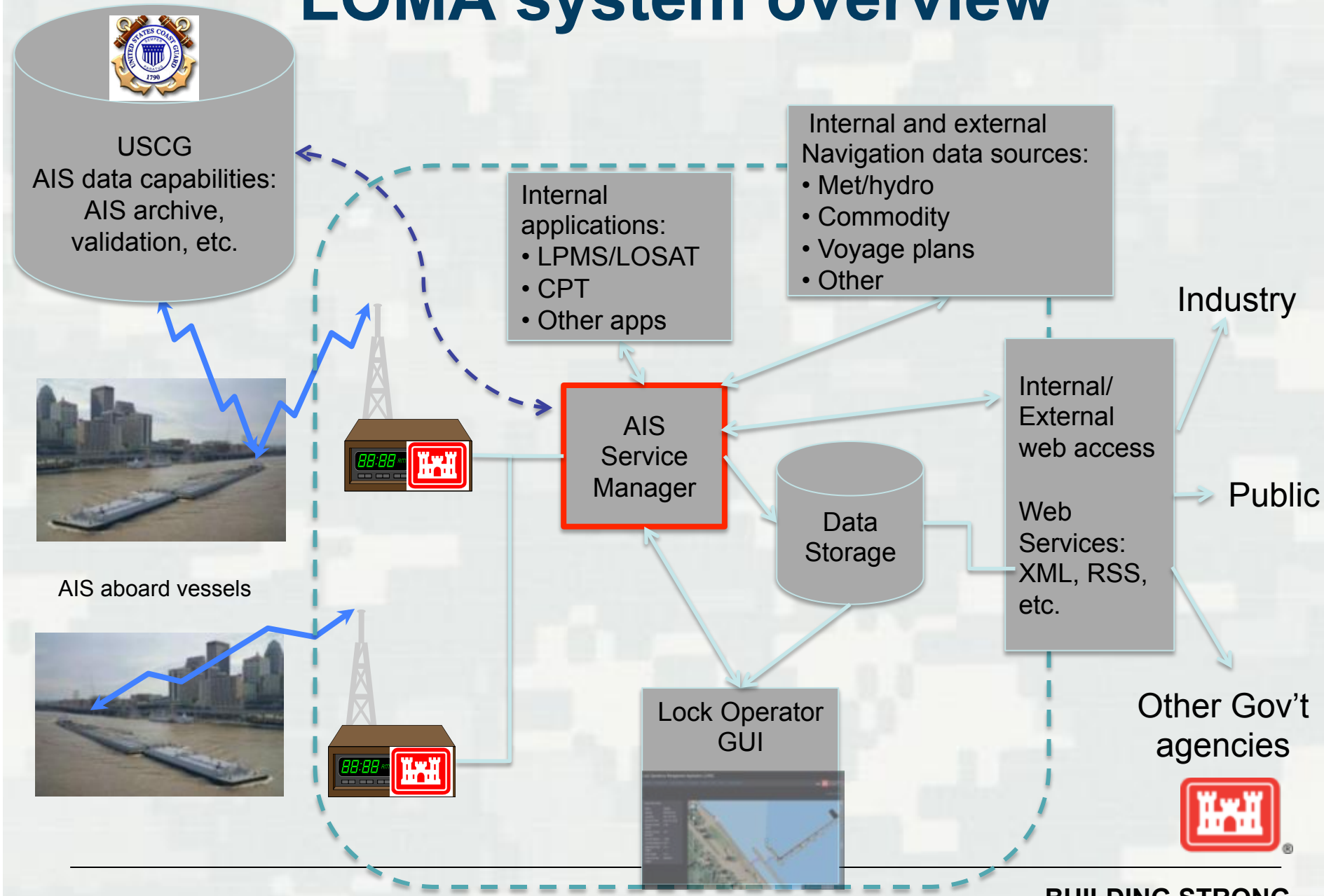
Feb 2016



US Army Corps of Engineers®

LOMA system overview



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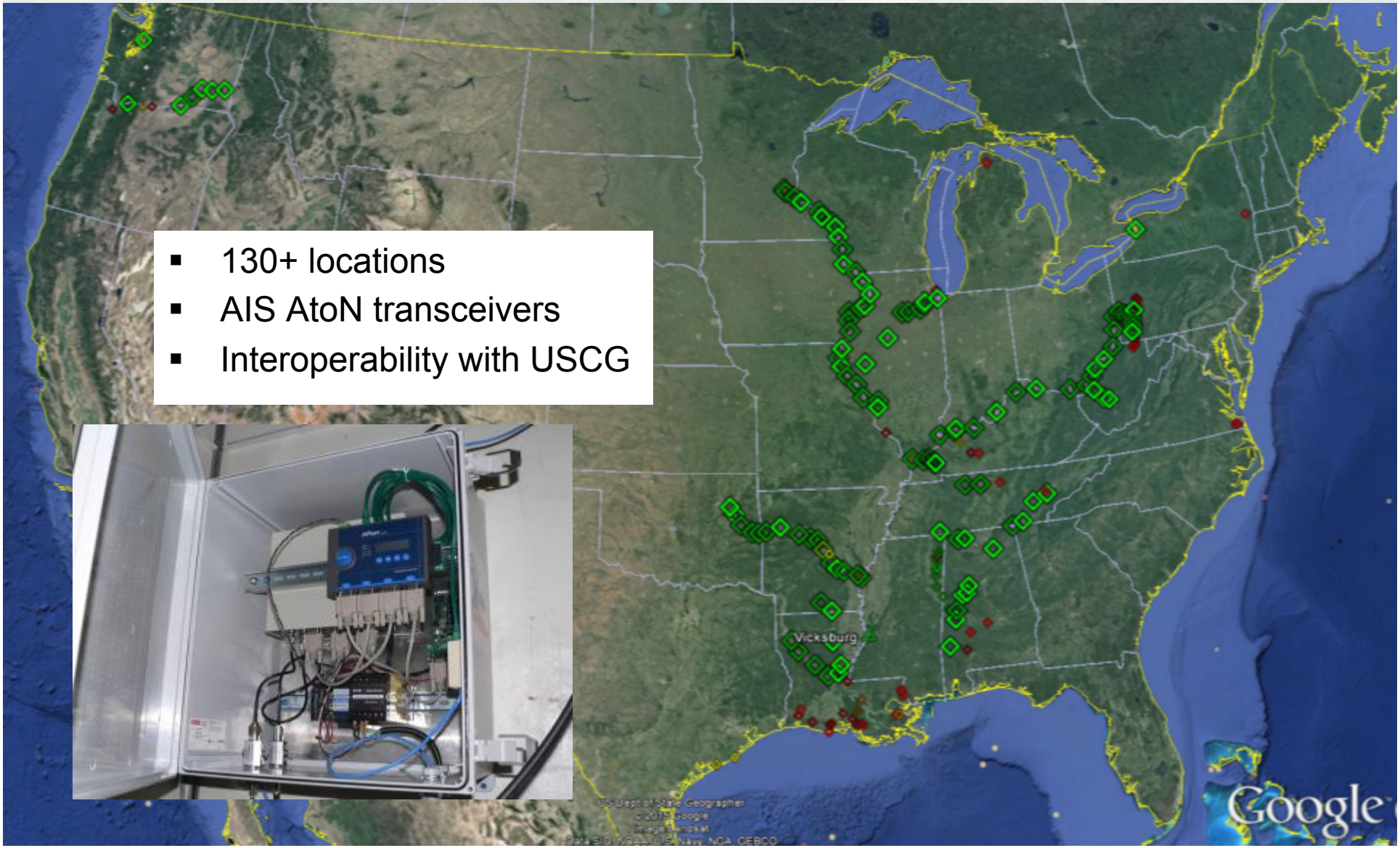
LOMA AIS equipment deployment

(February 2015)

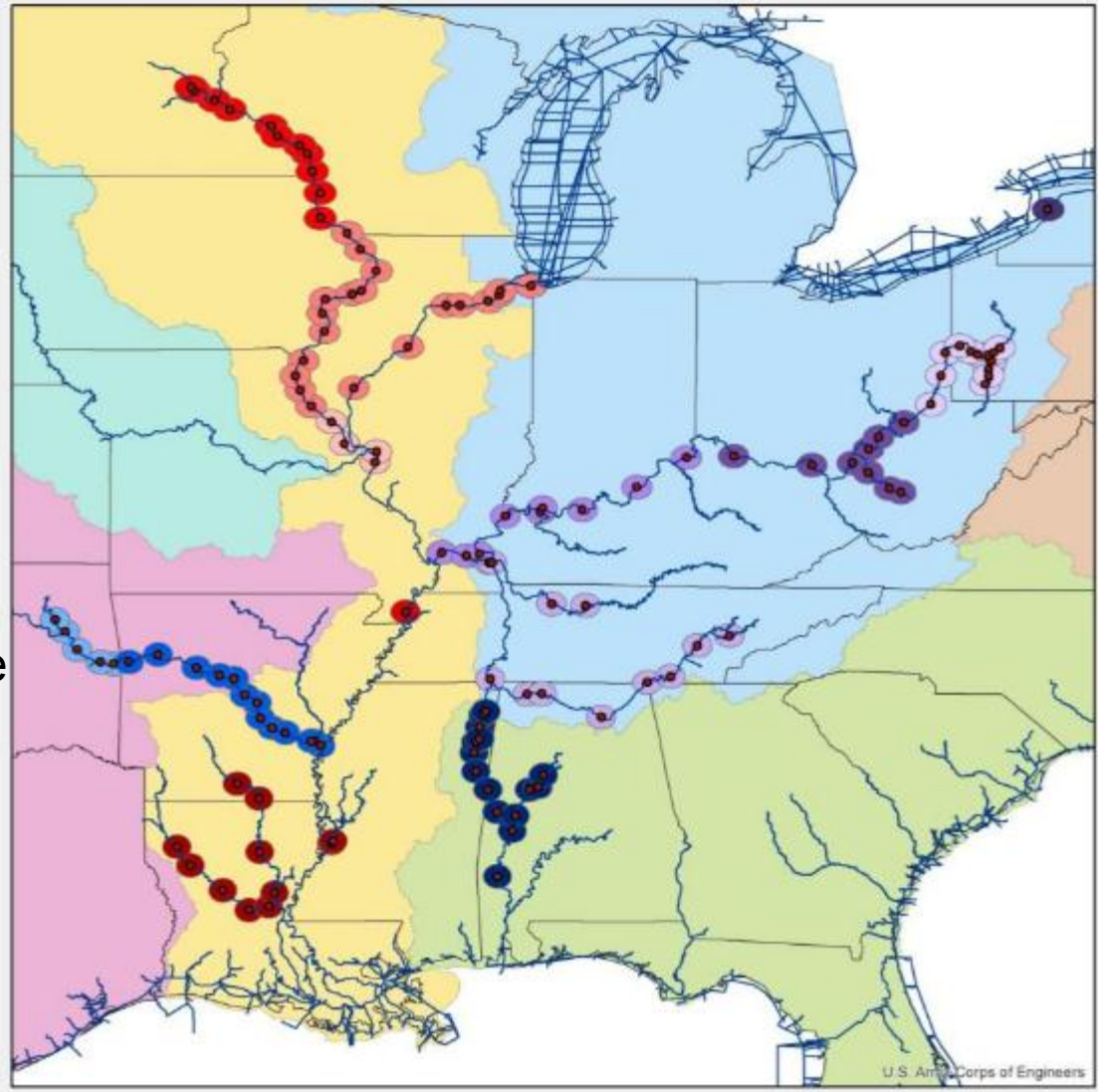


- 130+ locations
- AIS AtoN transceivers
- Interoperability with USCG

FY15 Product Development

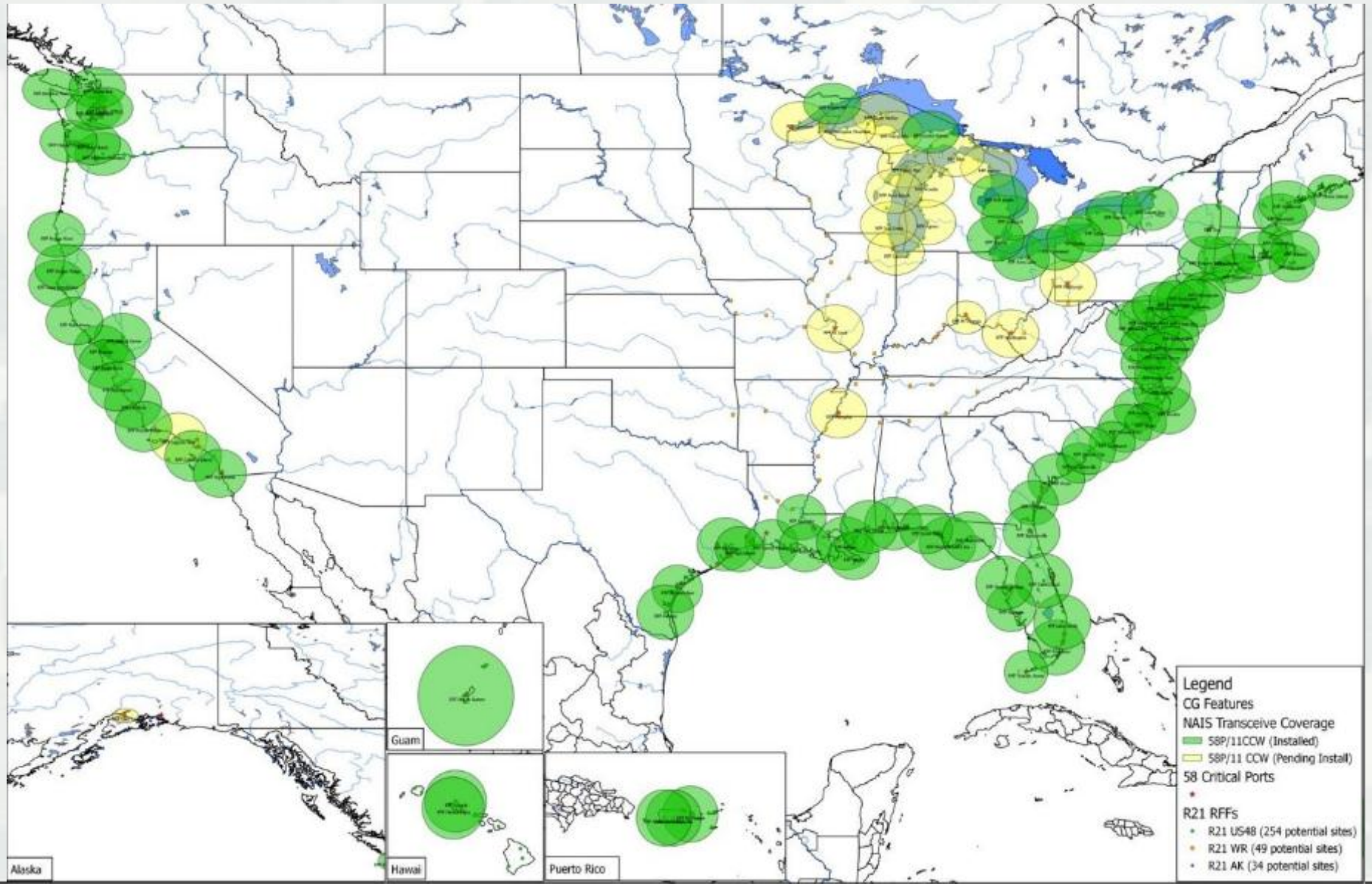
LOMA AIS Coverage (nominal – 12nm)

- LOMA coverage: 3878 river miles
- 32% of USACE-maintained (12,000 miles)
- 50% of IENC coverage (7700 miles)
- Working on more detailed, accurate coverage analysis
  - System performance
  - Additional coverage priorities

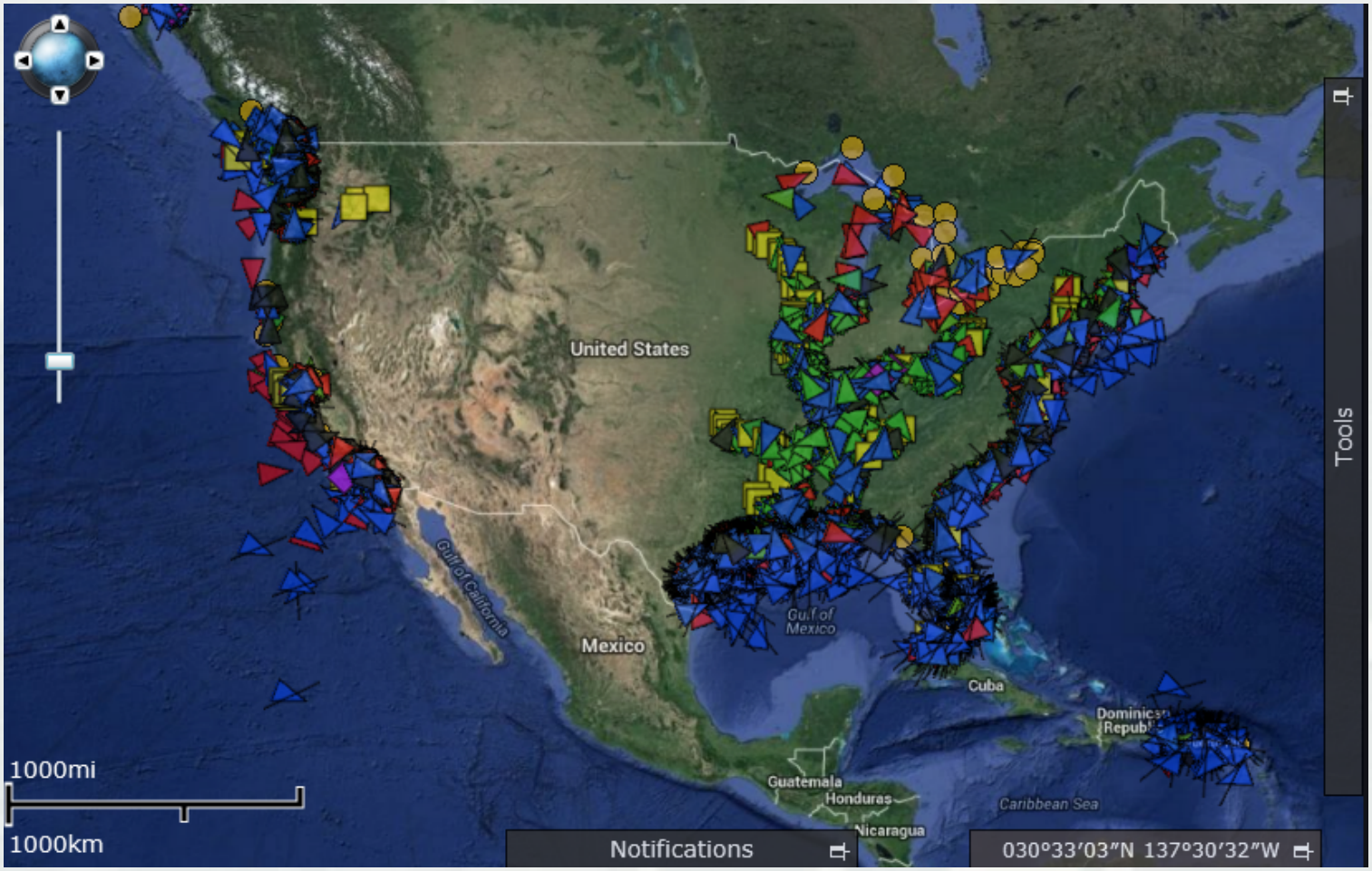


USCG AIS coverage

Nationwide AIS (NAIS) program

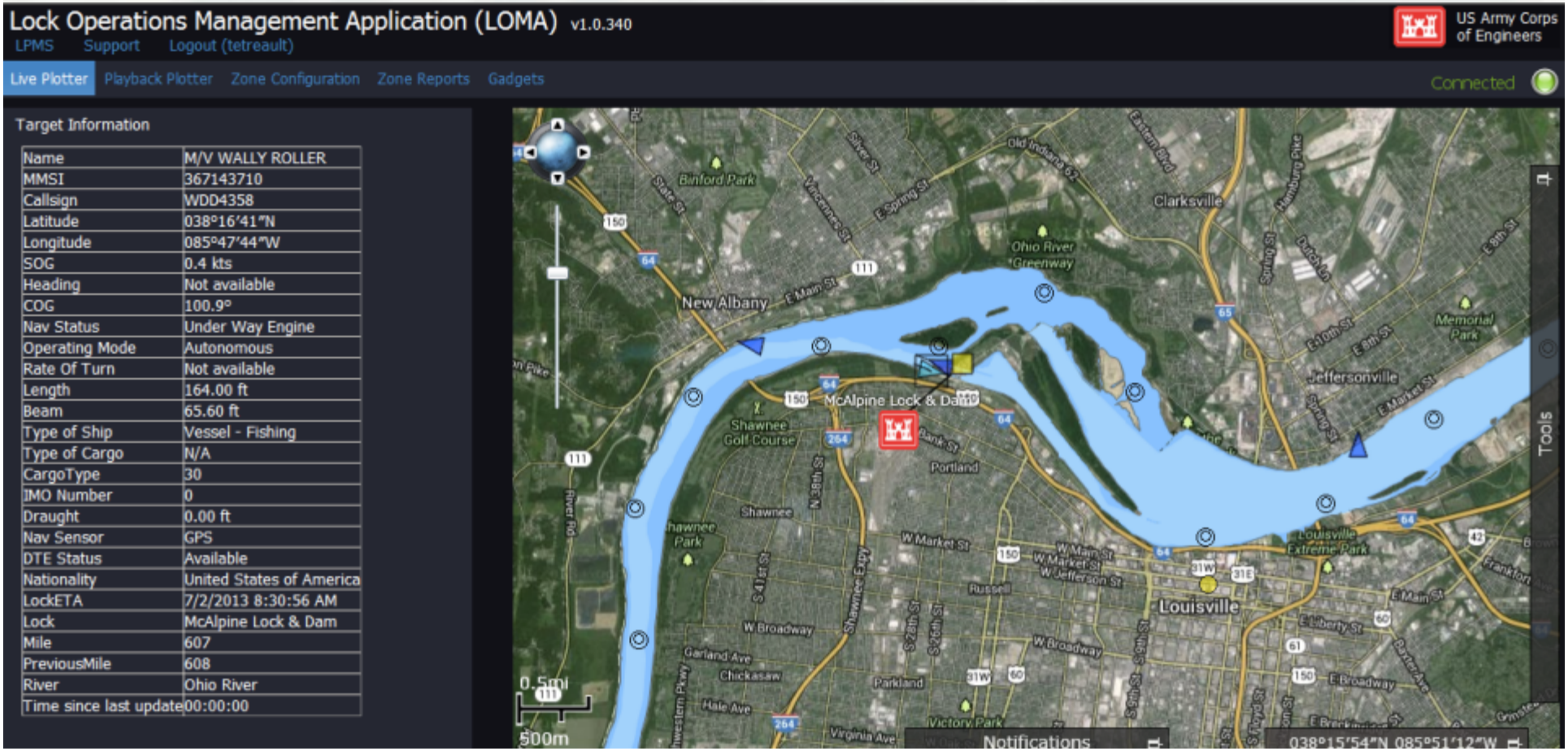


Full LOMA Feed

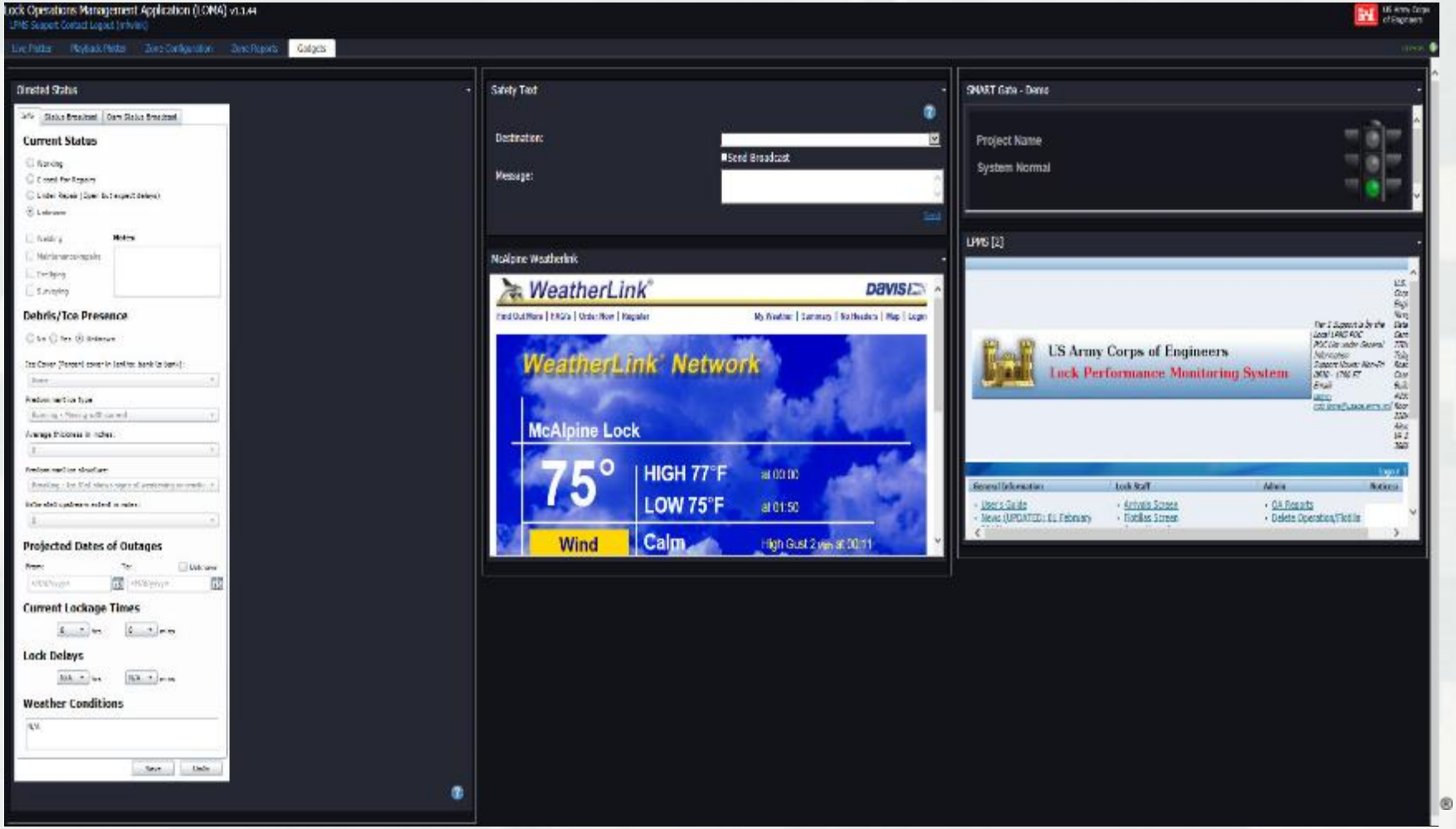


Current LOMA Capabilities

- Lock operator situational display
- AIS vessel information
- Zone Management
- Playback capability



LOMA - Gadgets



Lock Operations Management Application (LOMA) v1.0.357

US Army Corps of Engineers

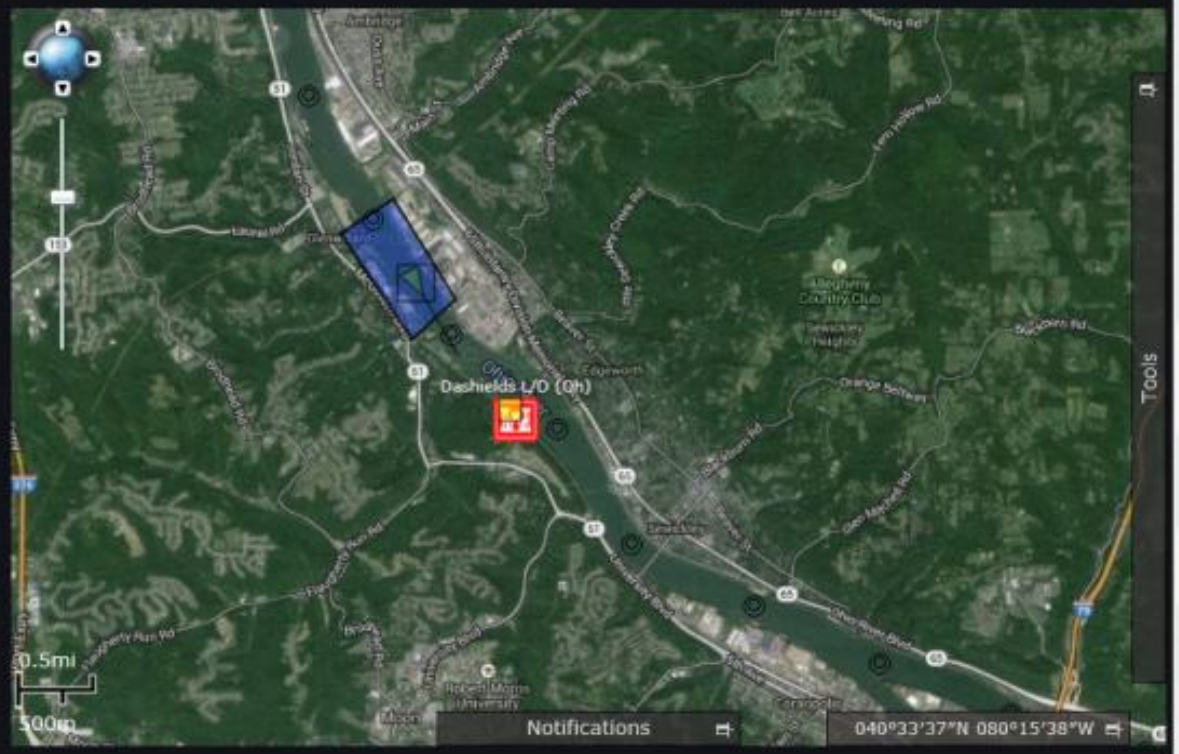
LPMS Support Logout (test)

Live Plotter | Playback Plotter | Zone Configuration | Zone Reports | Gadgets

Connected

Target Information

Name	ZEPHYR
MMSI	143481
Callsign	WDB5170
Latitude	040°33'43"N
Longitude	080°13'09"W
SOG	1.035 mph
Heading	Not available
COG	147.7°
Nav Status	Under Way Engine
Operating Mode	Autonomous
Rate Of Turn	-731
Length	78.72 ft
Beam	26.24 ft
Type of Ship	Tugs
Type of Cargo	N/A
CargoType	52
IMO Number	8842260
Draught	10.17 ft
Nav Sensor	GPS
DTE Status	Available
Nationality	Not found
LockETA	7/10/2014 2:36:02 PM
Lock	Dashields L/D (Oh)
Mile	14



Targets in pitt — Minimize Close Delete Edit

- ZEPHYR

Dashields L/D (Oh) Weather — Minimize Close Delete Edit

Decreasing Clouds
High: 79.00°F
Low: 58.00°F

Dashields L/D (Oh) Status — Minimize Close Delete Edit

Info | Status Broadcast | Dam Status Broadcast

Current Status (Read only)

- Working
- Closed For Repairs
- Under Repair (Open but expect delays)

Zone Report

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US Army Corps of Engineers

LPMS Support Logout (test)

Live Plotter | Playback Plotter | Zone Configuration | Zone Reports | Gadgets

Connected

Show 10 entries

Search:

Zone Name	MMSI	Vessel Name	Cargo Type	Ship Type	Entry Time	Exit Time	Time In Zone	SOG	COG	Callsign	Mile Mark	River	Nationality	Lat/Lon	Zone Owner
pitt	143481	ZEPHYR	N/A	Tugs	7/10/2014 1:53:52 PM	N/A	0:04:27	2.875 mph	143.4	WDB5170	15	Ohio River	Not found	040°33'51"N 080°13'16"W	test

Showing 1 to 1 of 1 entries

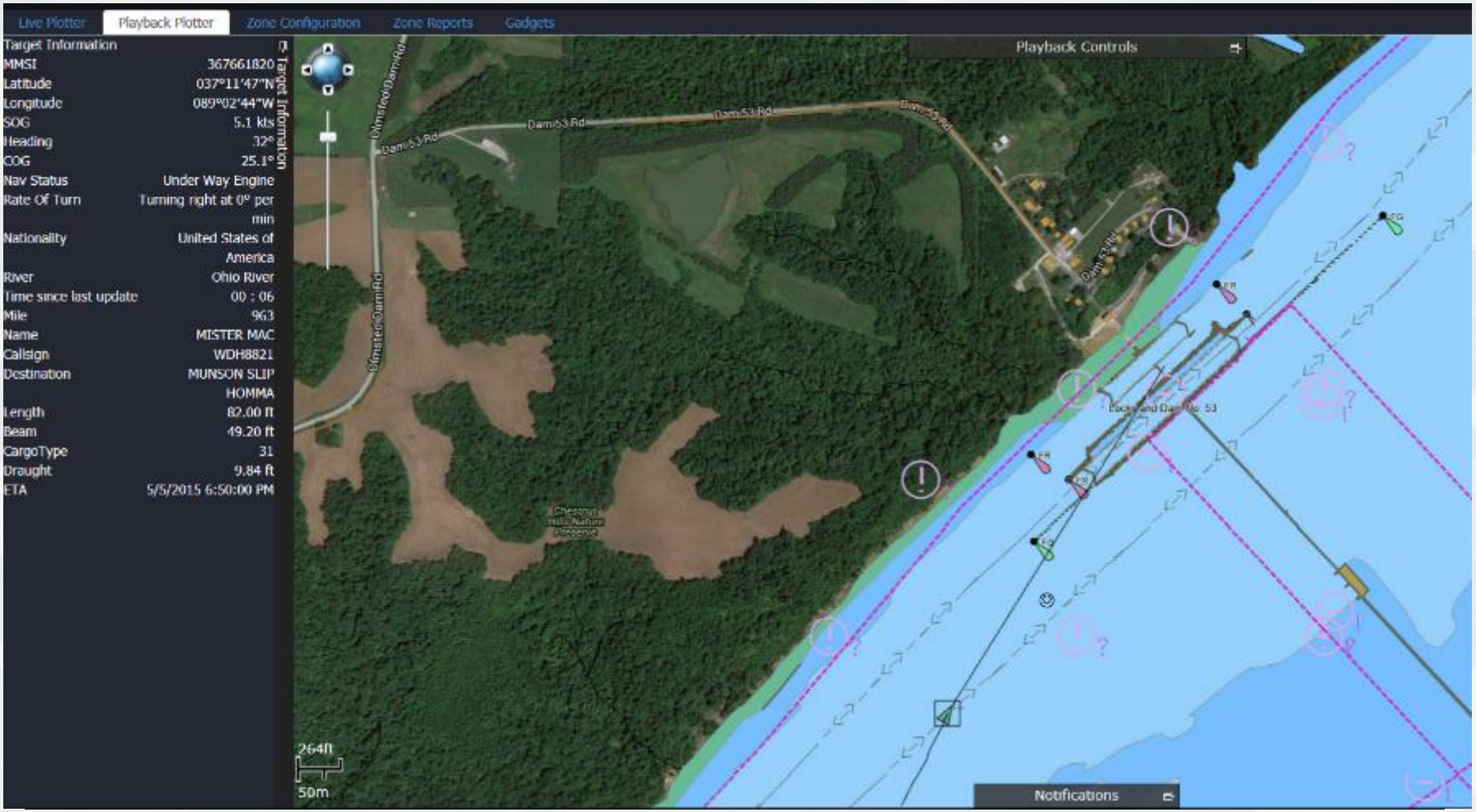
First Previous 1 Next Last

☑Zone Name ☑MMSI ☑Vessel Name ☑Cargo Type ☑Ship Type ☑Entry Time ☑Exit Time ☑Time in Zone ☑SOG ☑COG ☑Callsign ☑Mile Mark ☑River ☑Nationality ☑ Lat/Lon ☑Zone Owner

Download CSV | Refresh

Last updated: Thu Jul 10 2014 13:58:19 GMT-0500 (Central Standard Time)

Playback - Lock 53



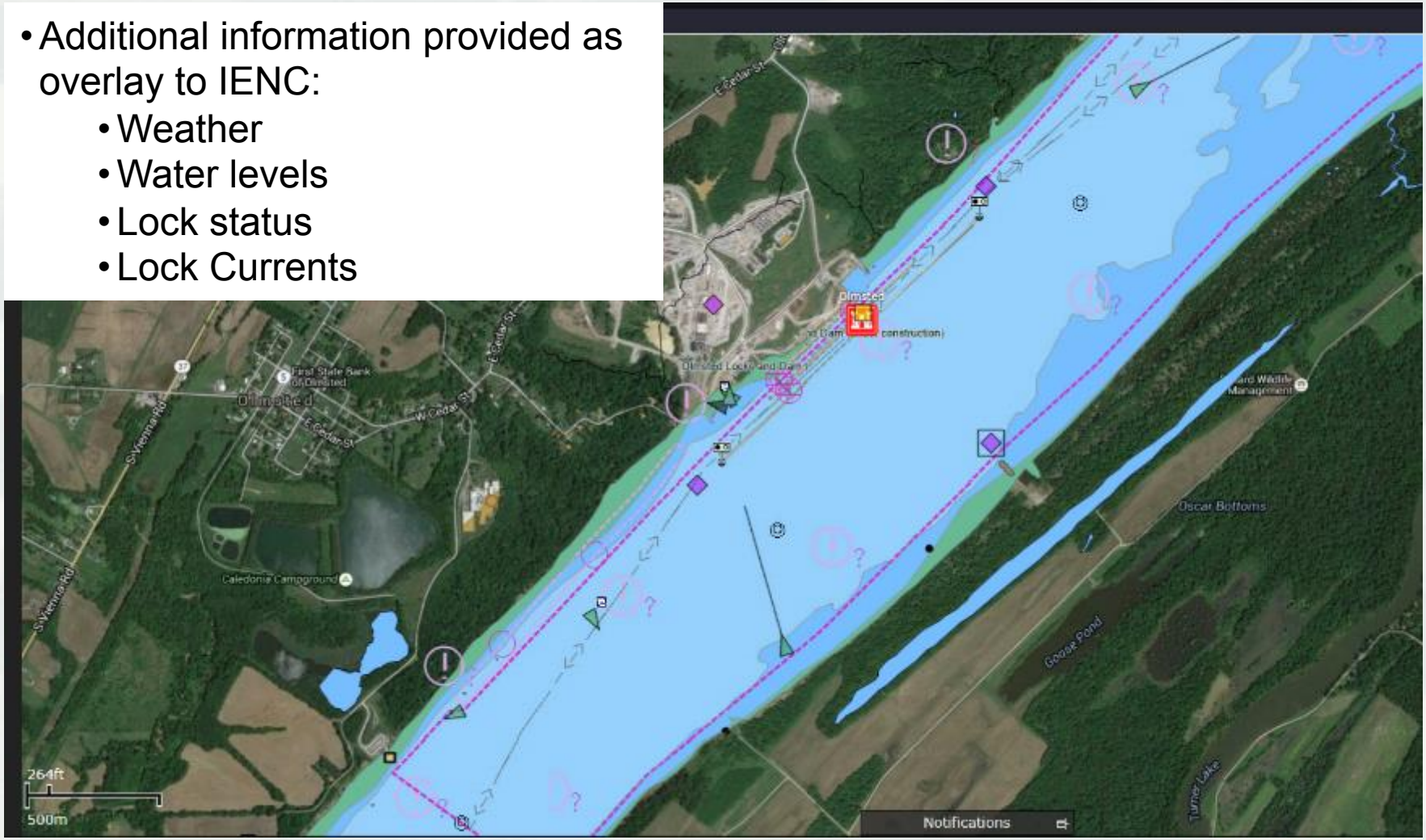
Lock 53

New AIS Information

- AToN discrepancy
- Synthetic AIS AToN
- Virtual AIS AToN
- Geographic Notices
- Vessels awaiting lockage
- Lock status
- River current
- Water depth
- Weather

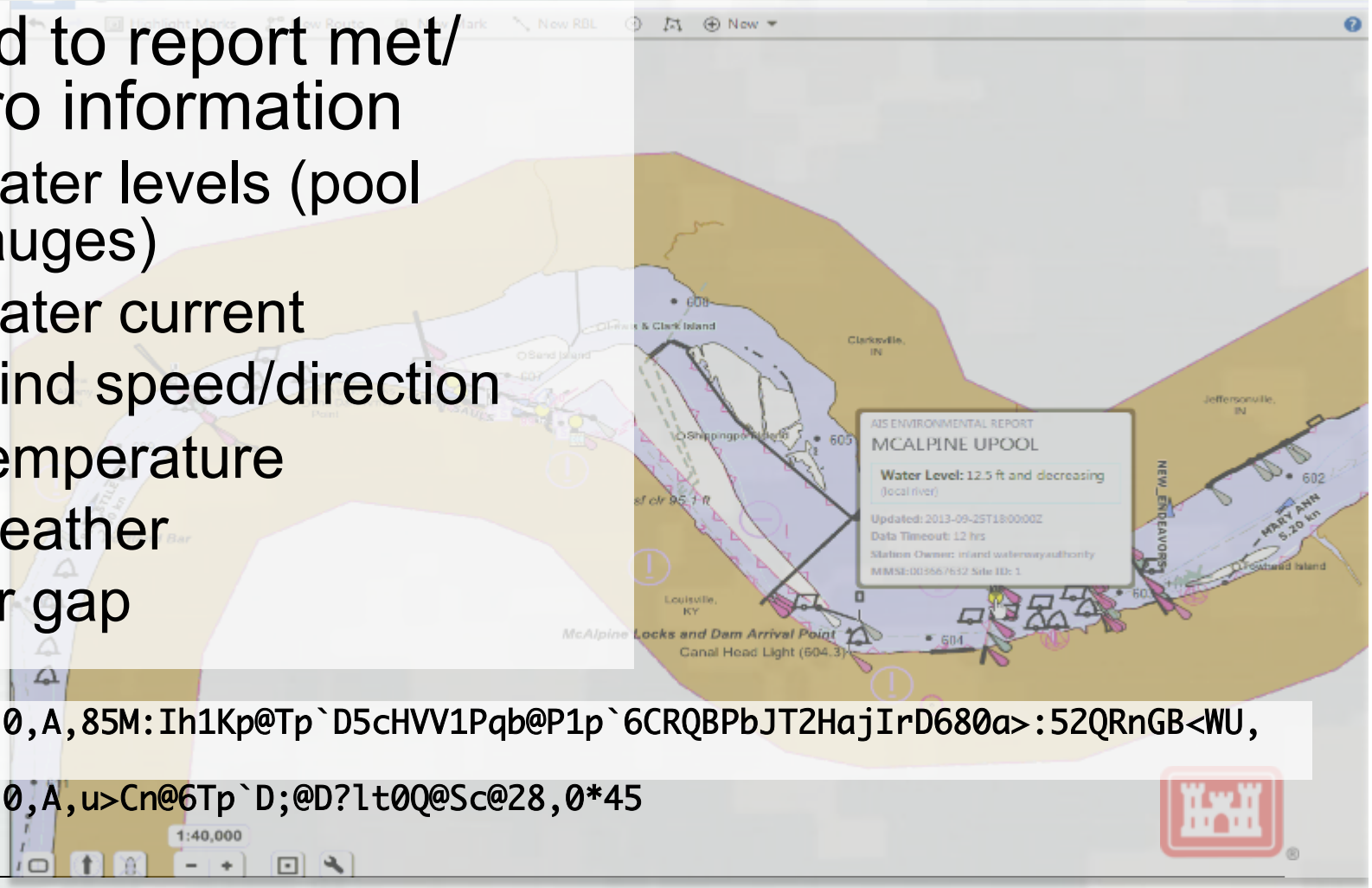
LOMA - Transmit

- Additional information provided as overlay to IENC:
  - Weather
  - Water levels
  - Lock status
  - Lock Currents



Environmental Message

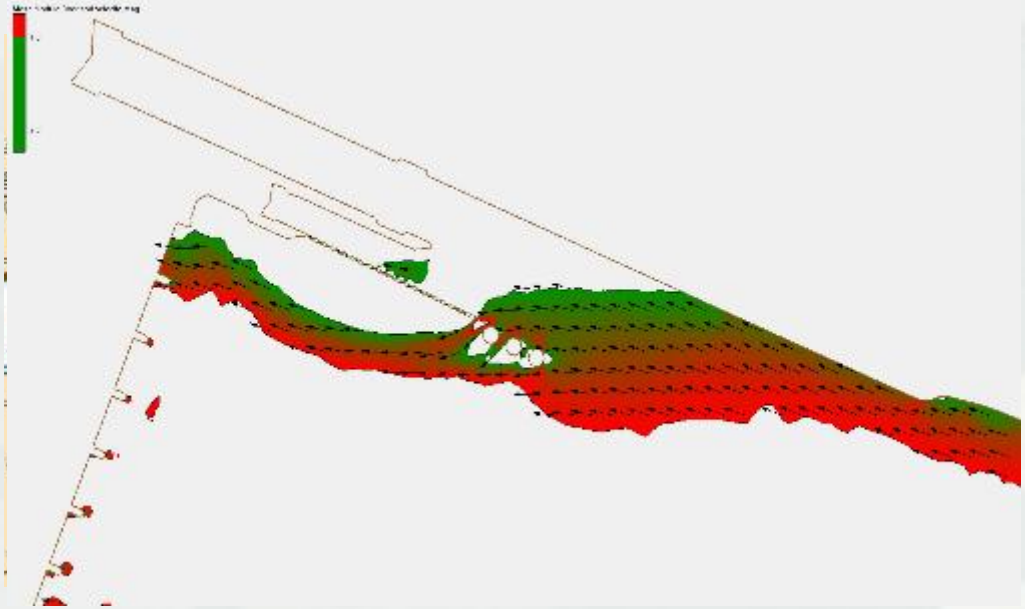
- Used to report met/ hydro information
  - Water levels (pool gauges)
  - Water current
  - Wind speed/direction
  - Temperature
  - Weather
  - Air gap

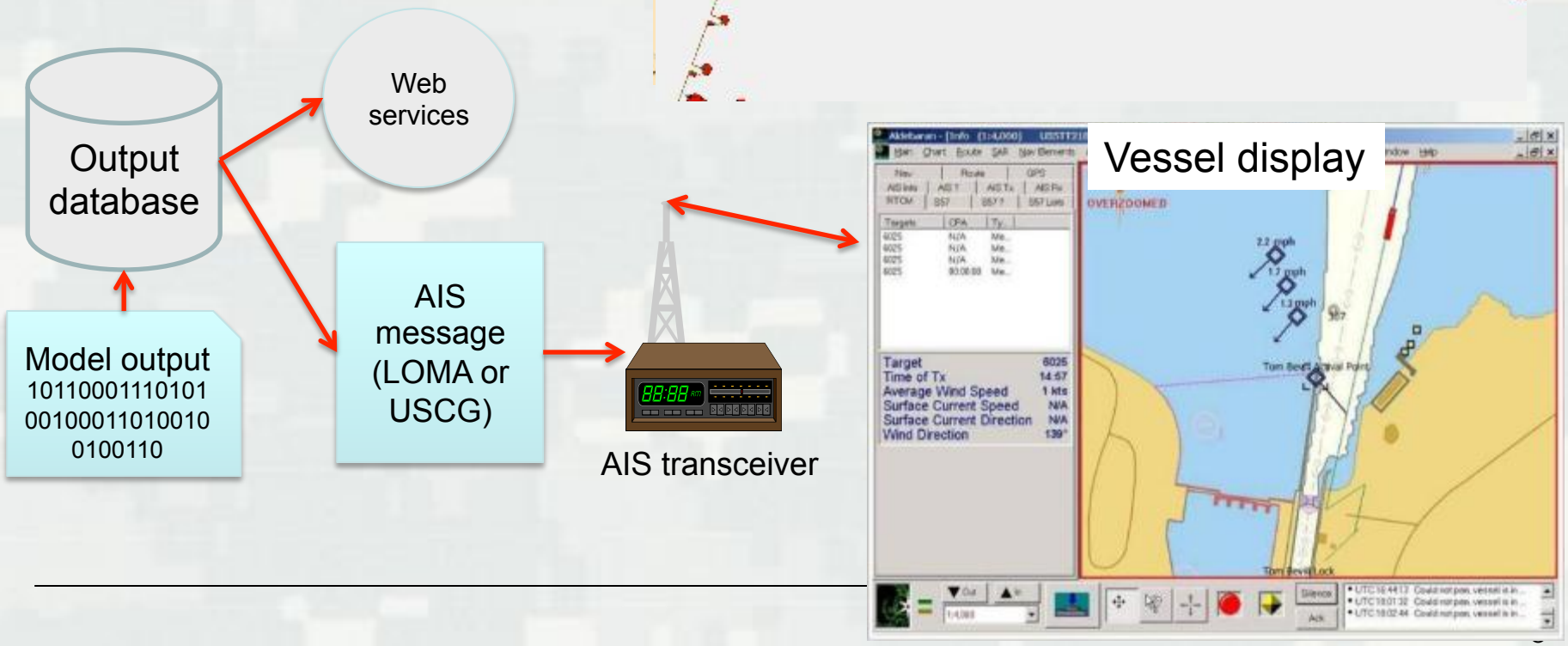



```
!AIVDM,2,1,0,A,85M:Ih1Kp@Tp`D5cHVV1Pqb@P1p`6CRQBPbJT2HajIrD680a>:52QRnGB<WU,
0*45
!AIVDM,2,2,0,A,u>Cn@6Tp`D;@D?lt0Q@Sc@28,0*45
```

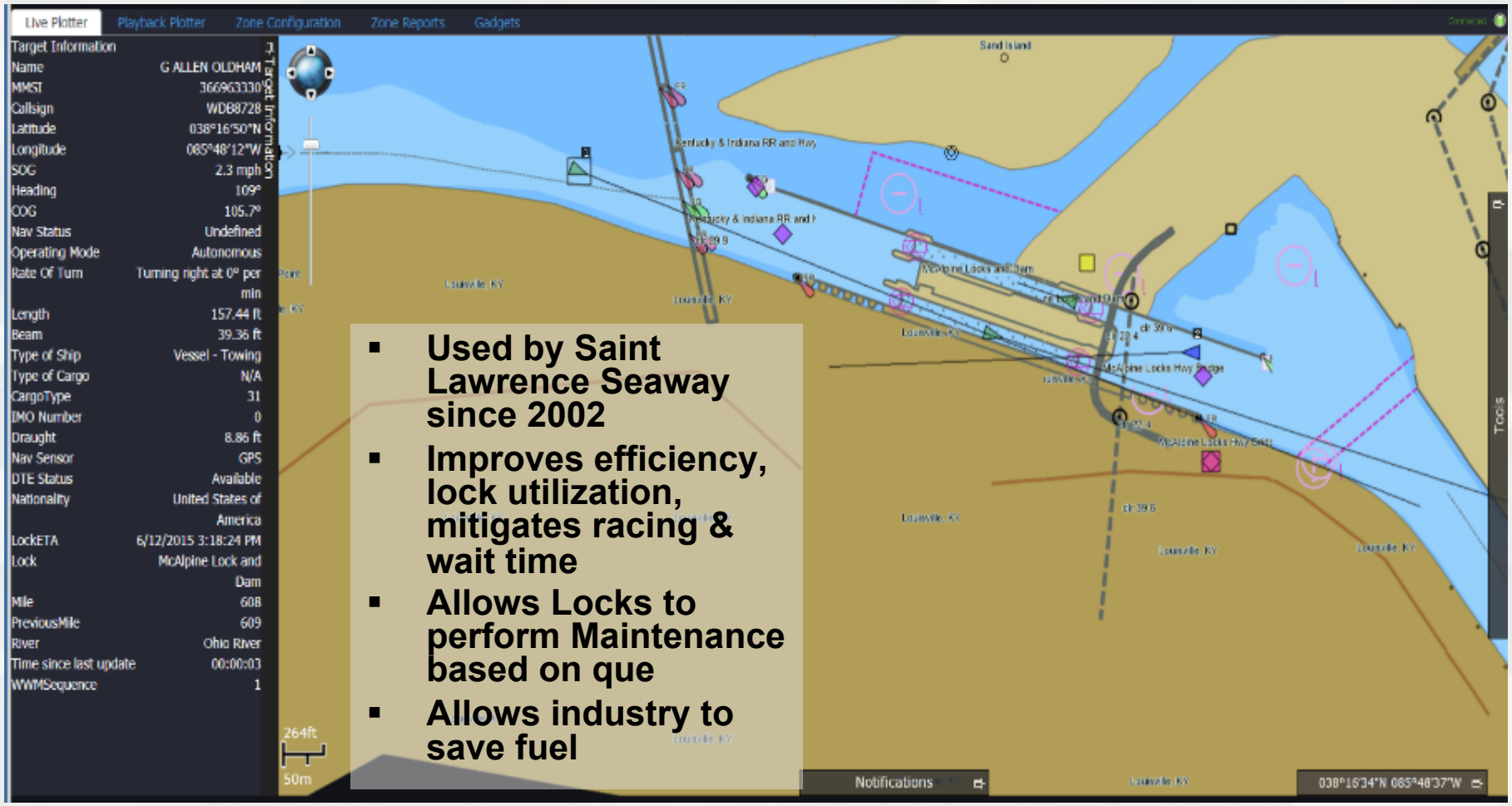
Lock Approach Current Models

- Develop and run current models
- “Library” of output
- Communicate to users based on real-time conditions





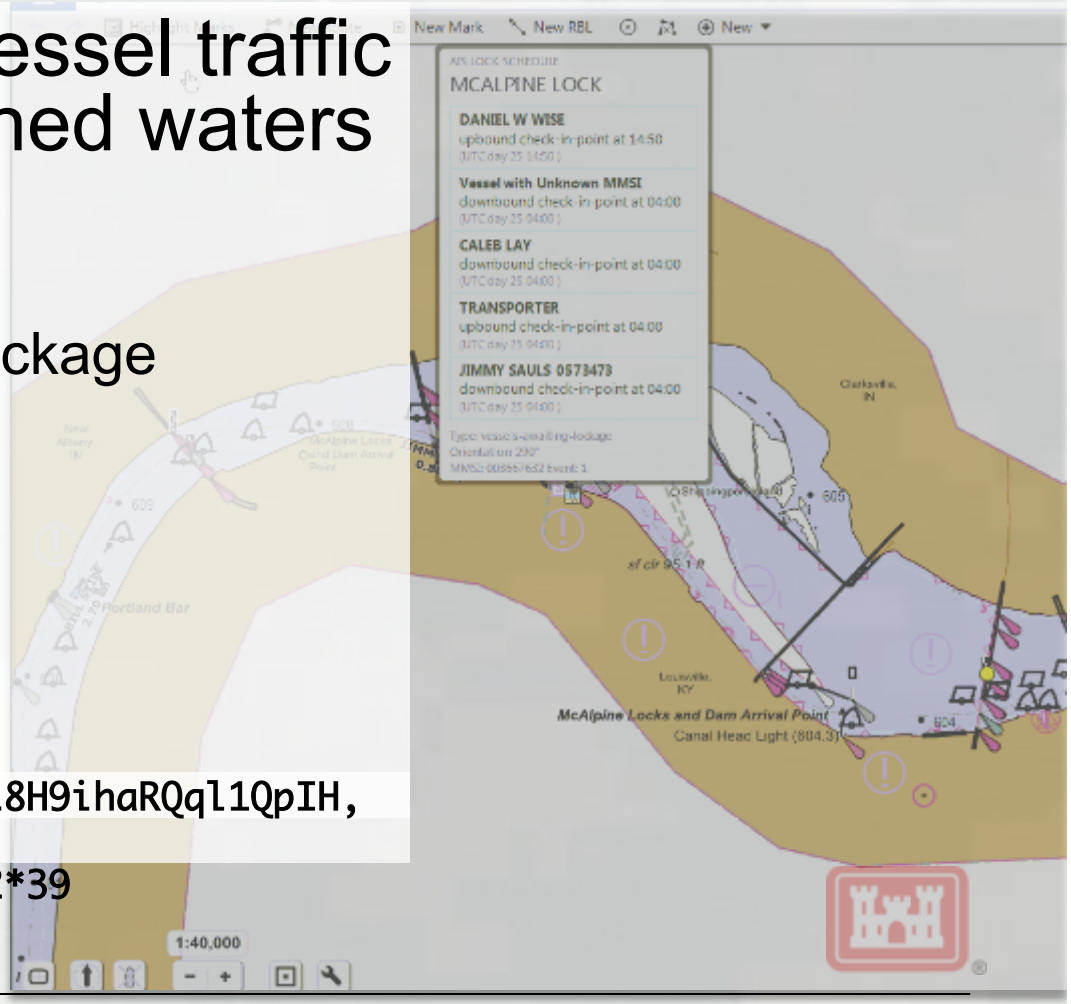
Lock Order Message



- Used by Saint Lawrence Seaway since 2002
- Improves efficiency, lock utilization, mitigates racing & wait time
- Allows Locks to perform Maintenance based on que
- Allows industry to save fuel

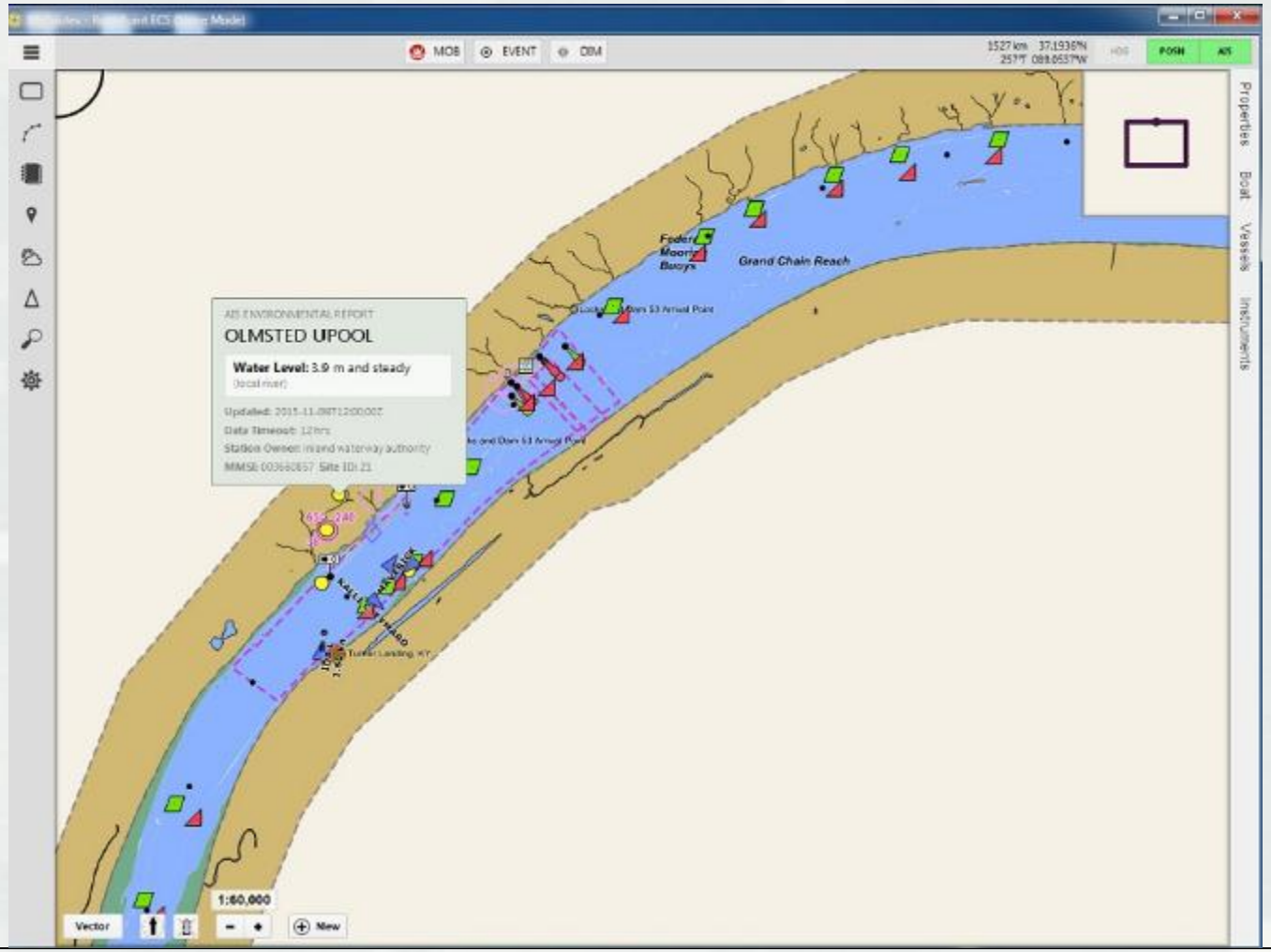
Waterways Management Message

- Used to facilitate vessel traffic movement in confined waters
  - ► List of vessels through a point
    - Vessels awaiting lockage
    - Procession Order
    - Enter/exit port
    - Bridge
    - Narrows
    - Gate

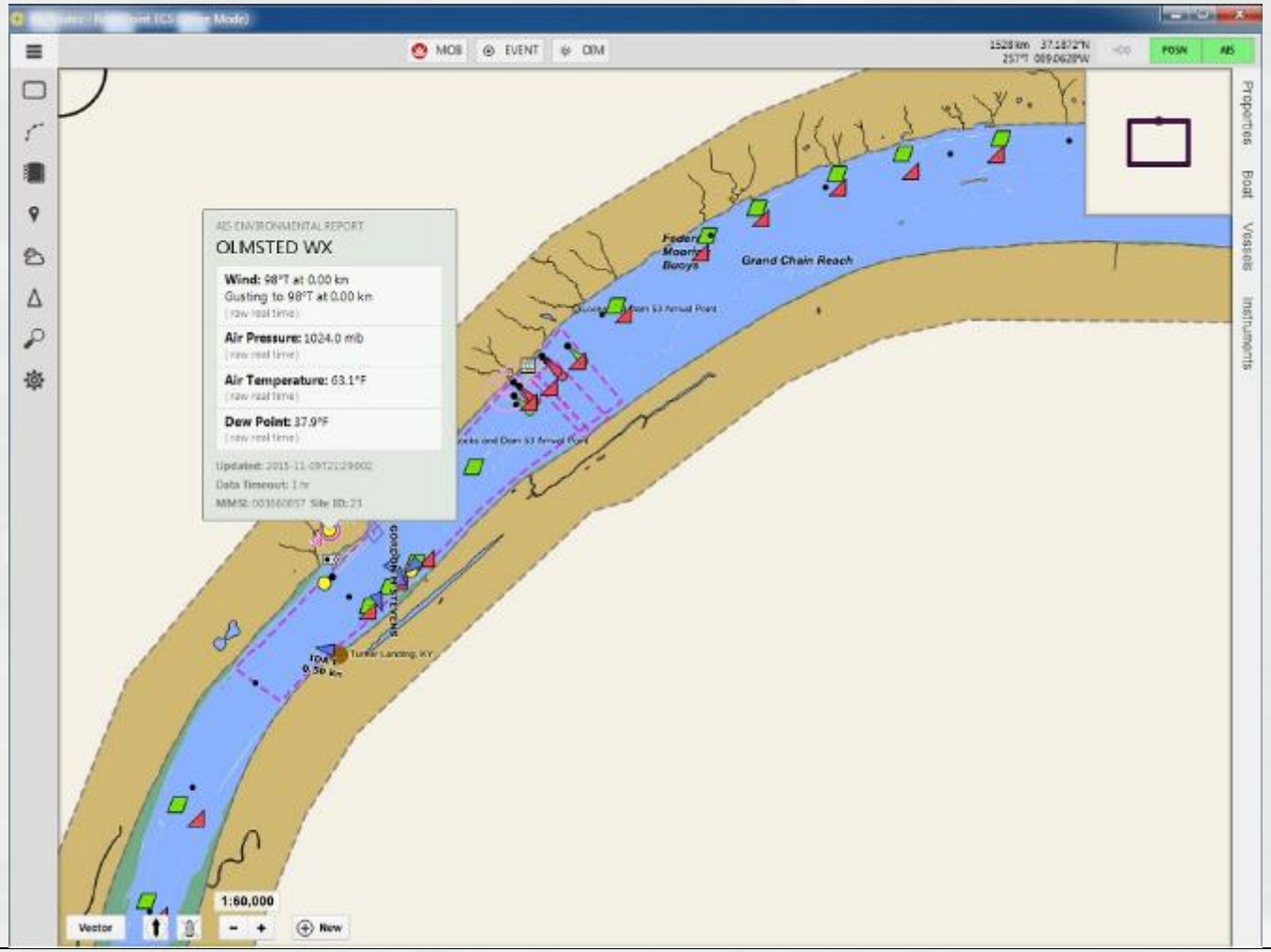



```
!AIBBM,1,1,3,3,8,Fv<0d@LqRog:muJ:L8H9ihaRQql1QpIH,
0*26
!AIBBM,1,1,4,3,8,Fv<0d5N3K>8E5@0,2*39
```

Received AIS Water Level



Received AIS Weather



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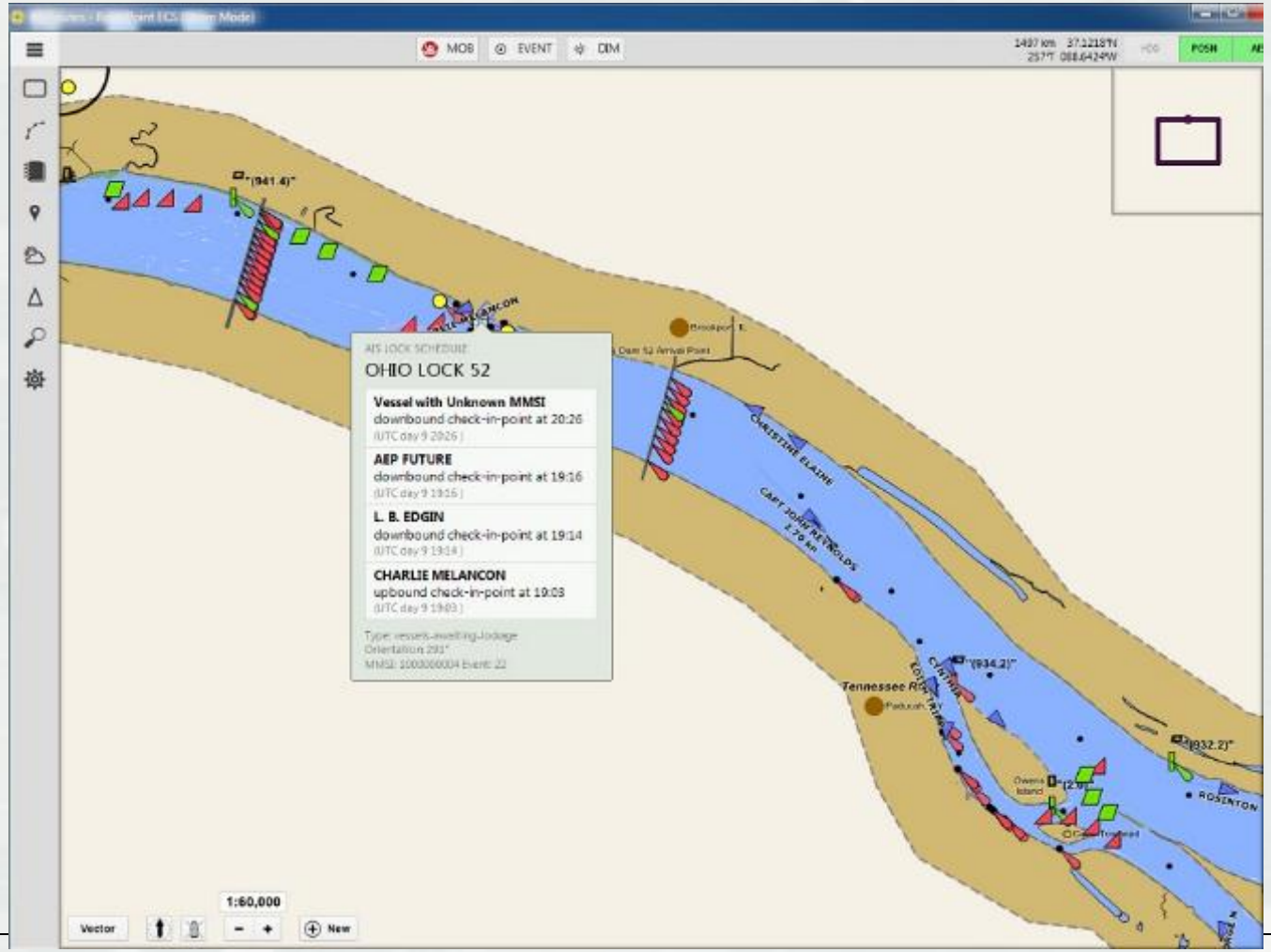
Received AIS Lock Order



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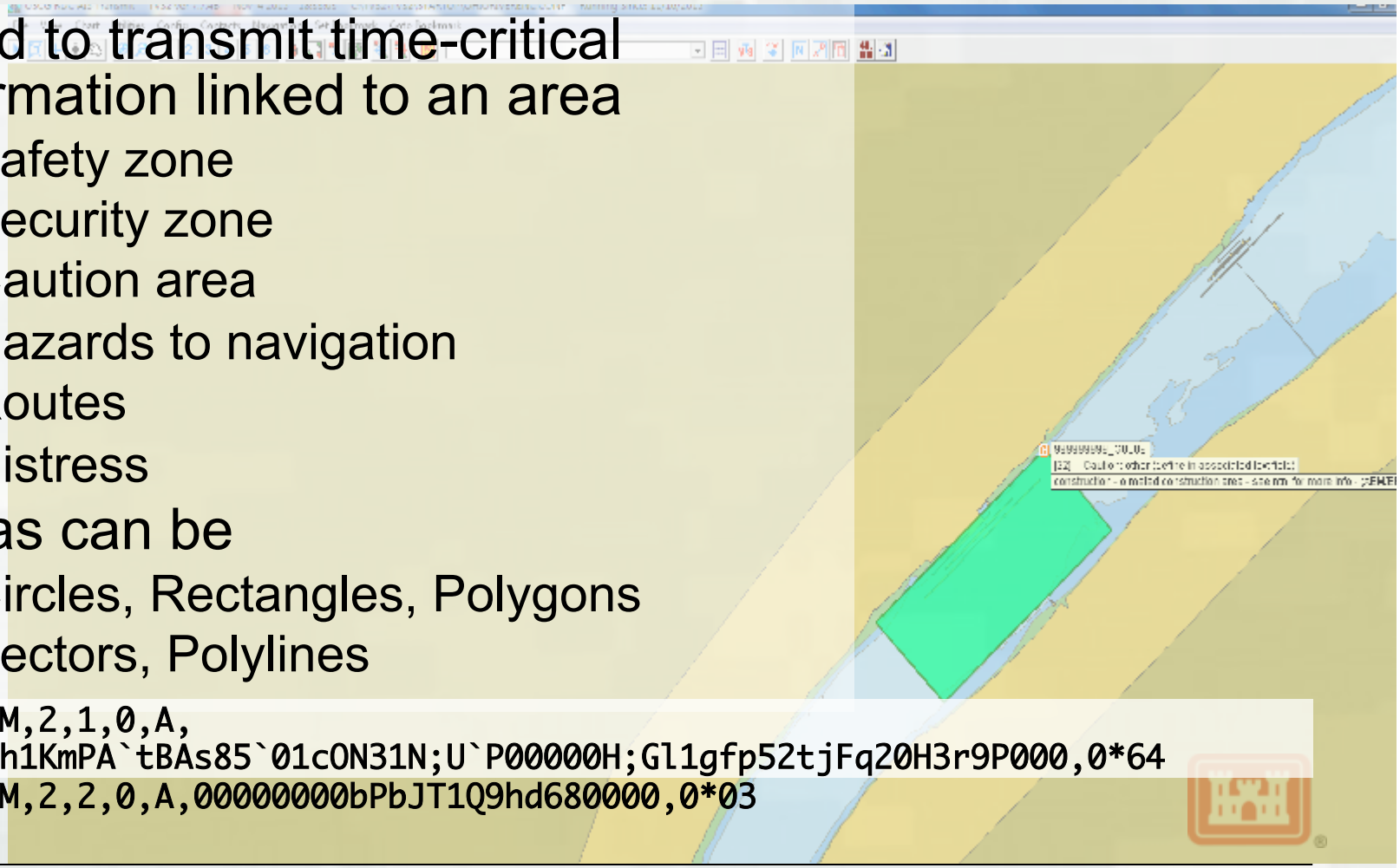
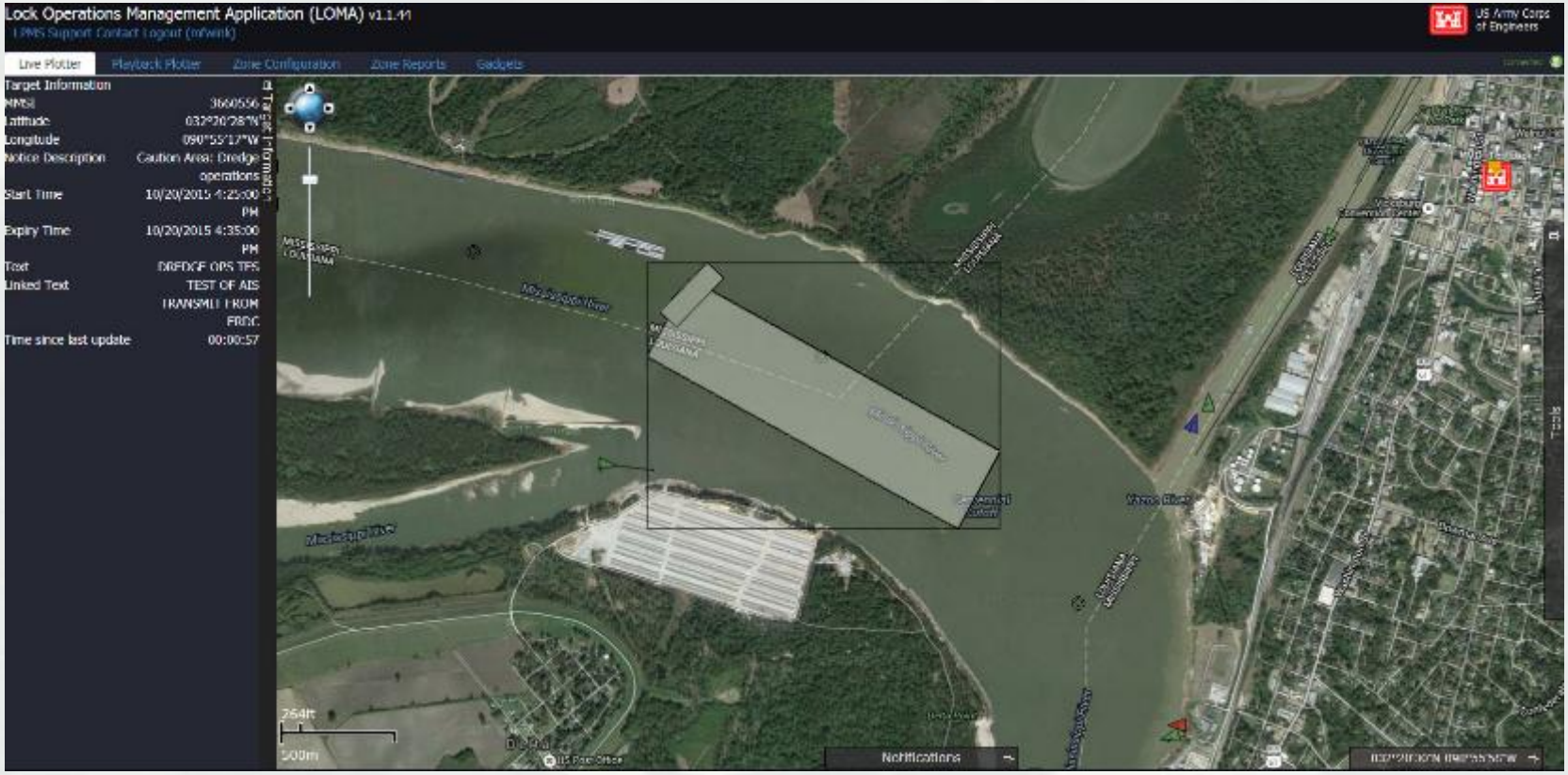
Geographic Notice

- Used to transmit time-critical information linked to an area
  - Safety zone
  - Security zone
  - Caution area
  - Hazards to navigation
  - Routes
  - Distress
- Areas can be
  - Circles, Rectangles, Polygons
  - Sectors, Polylines



```
!AIVDM,2,1,0,A,
85M:Ih1KmPA`tBAs85`01cON31N;U`P00000H;Gl1gfp52tjFq20H3r9P000,0*64
!AIVDM,2,2,0,A,00000000bPbJT1Q9hd680000,0*03
```

Area notices for Floating Plant



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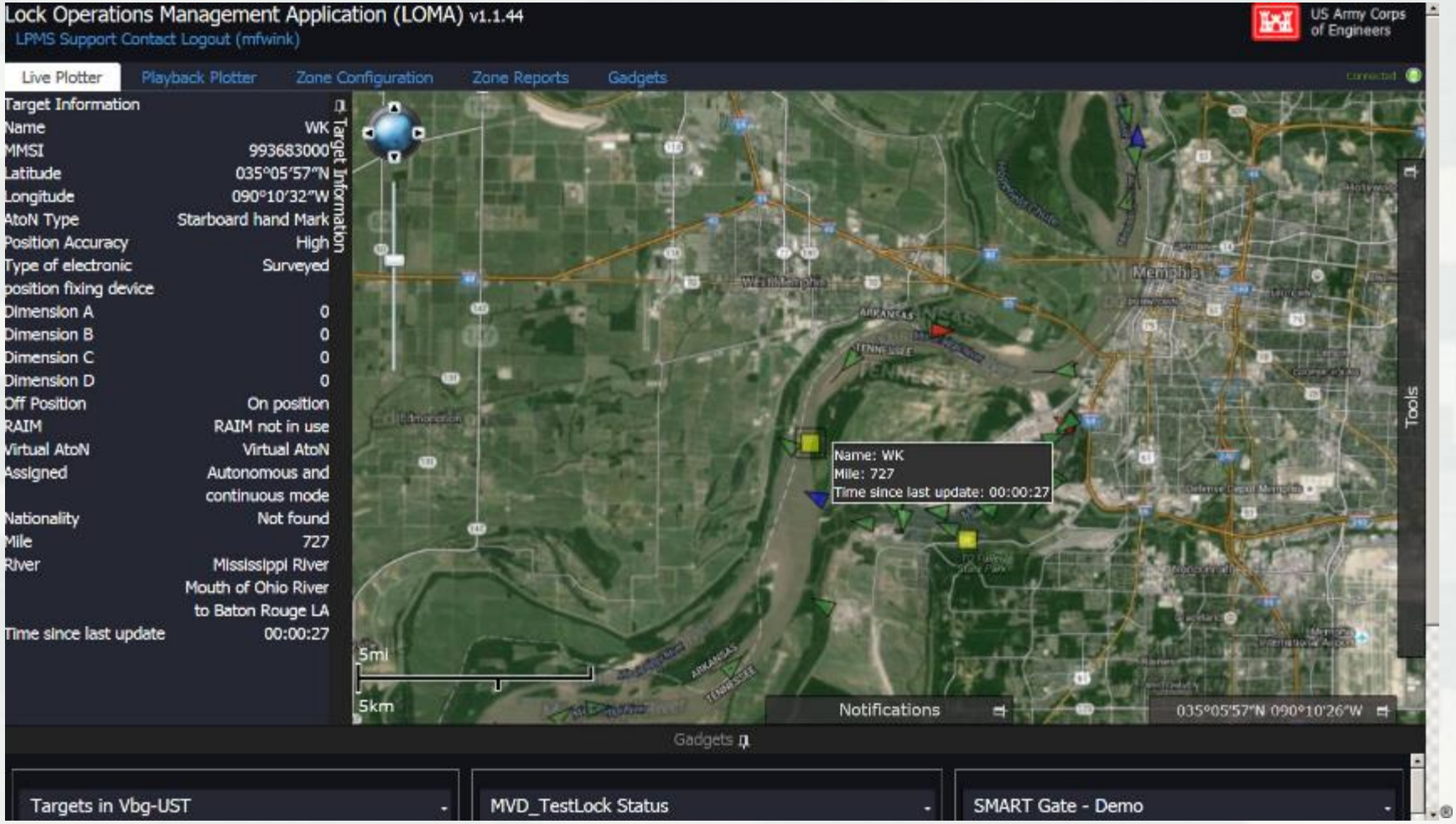
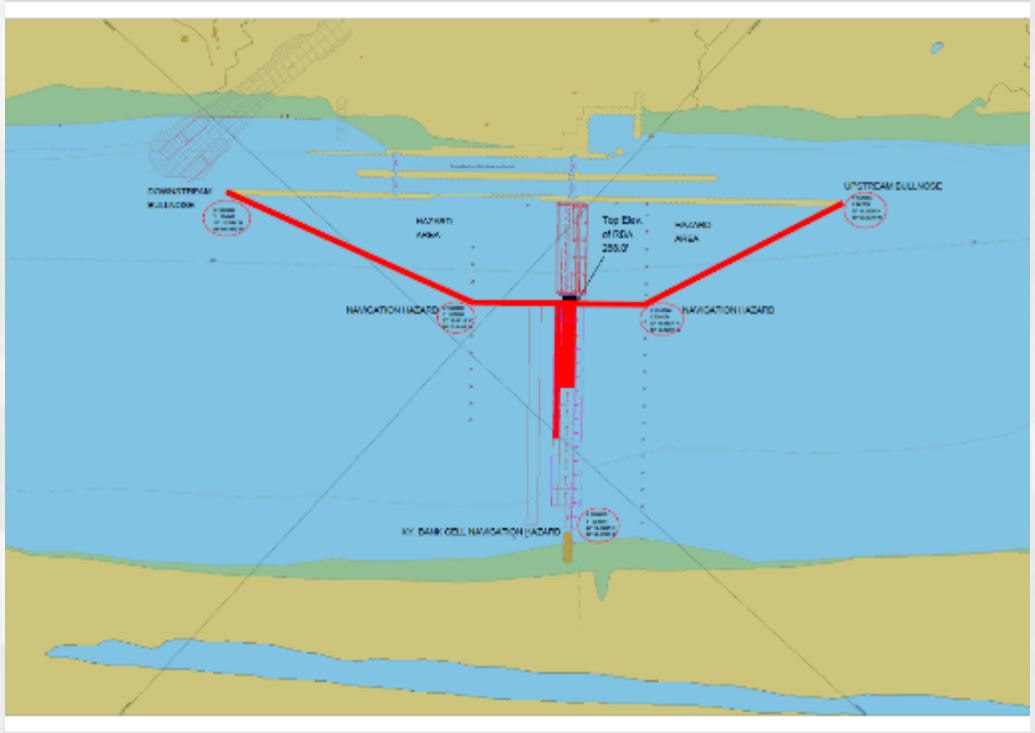
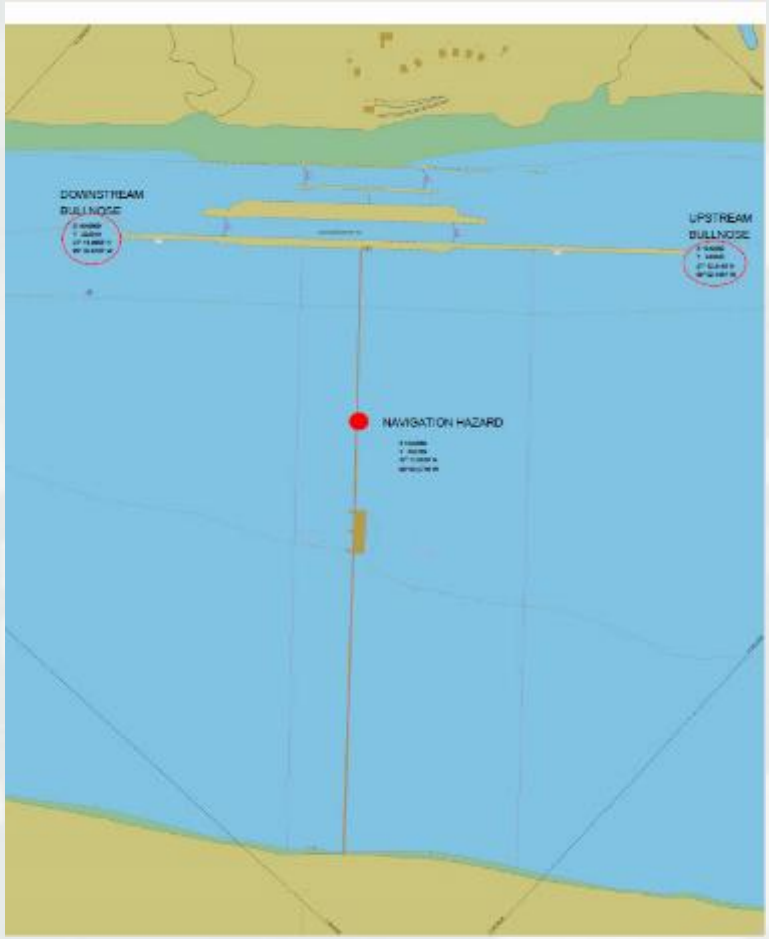
Virtual Aid to Navigation



William Strait

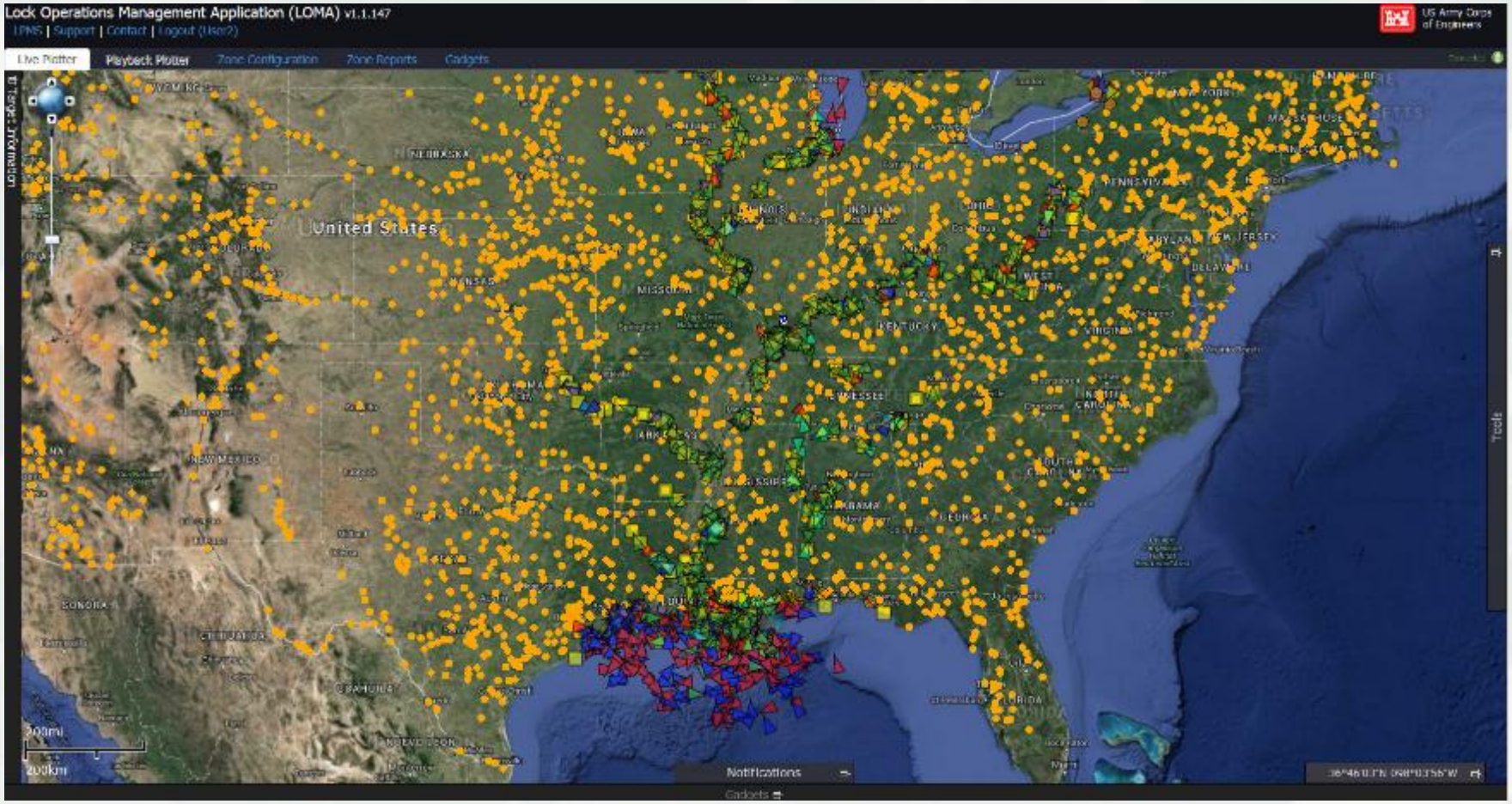
Virtual Buoys – Olmsted & 53



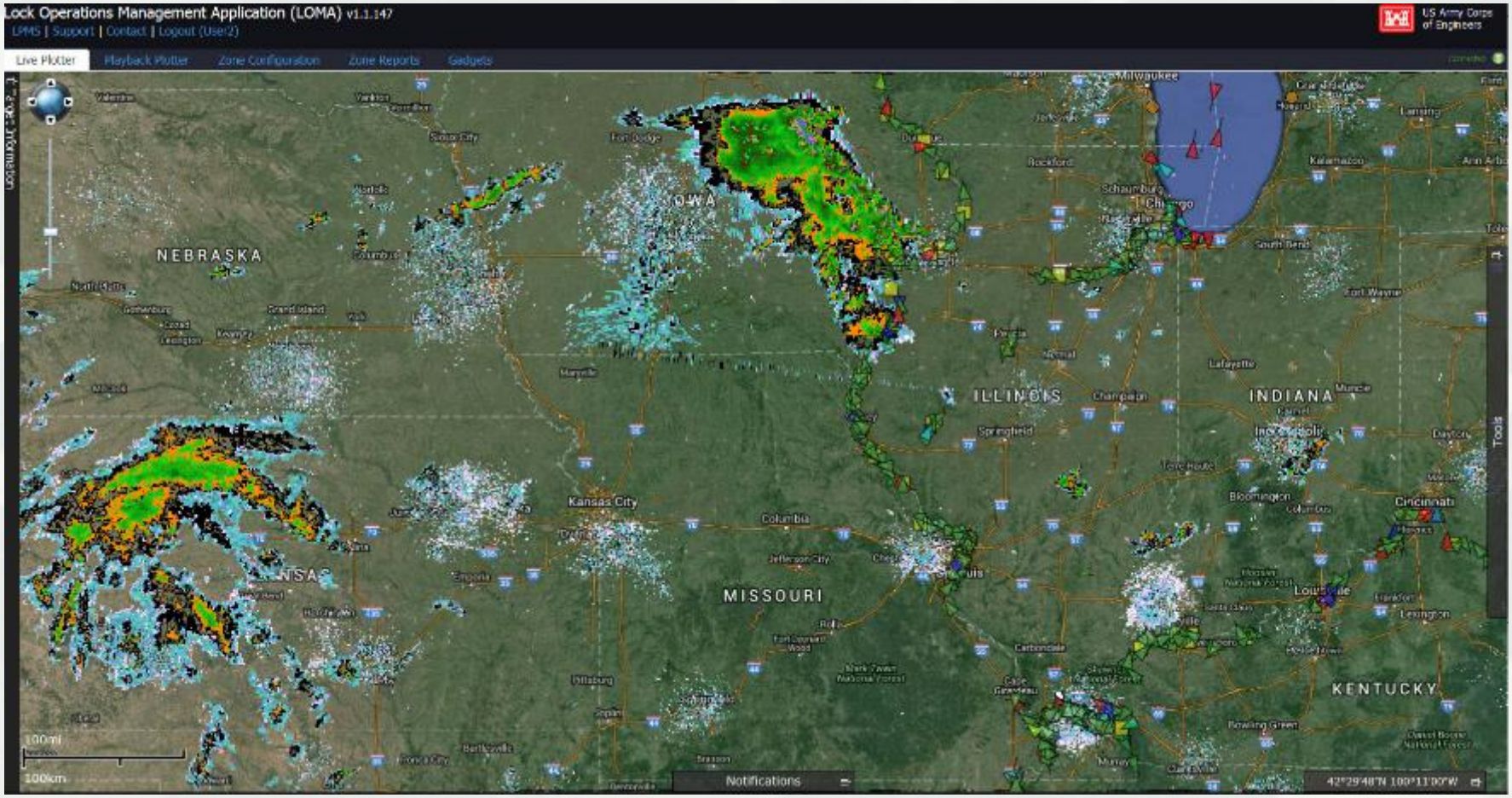


LOMA Overlay

Display of USGS Gauge Locations



LOMA Overlay Weather Radar

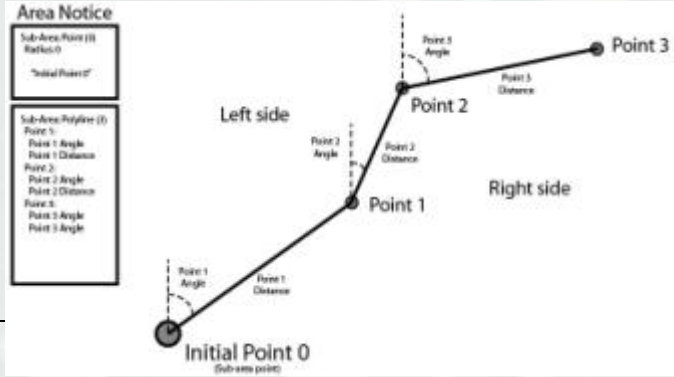


Navigation information via AIS

- Use AIS capability to transmit information on river conditions on the Ohio River
  - ► "e-AtoN"
  - ► Information extracted from survey data
  - ► Area notices (e.g., points, polyline, polygons) to indicate survey conditions
    - Depth points/areas/lines
    - Recommended sailing line

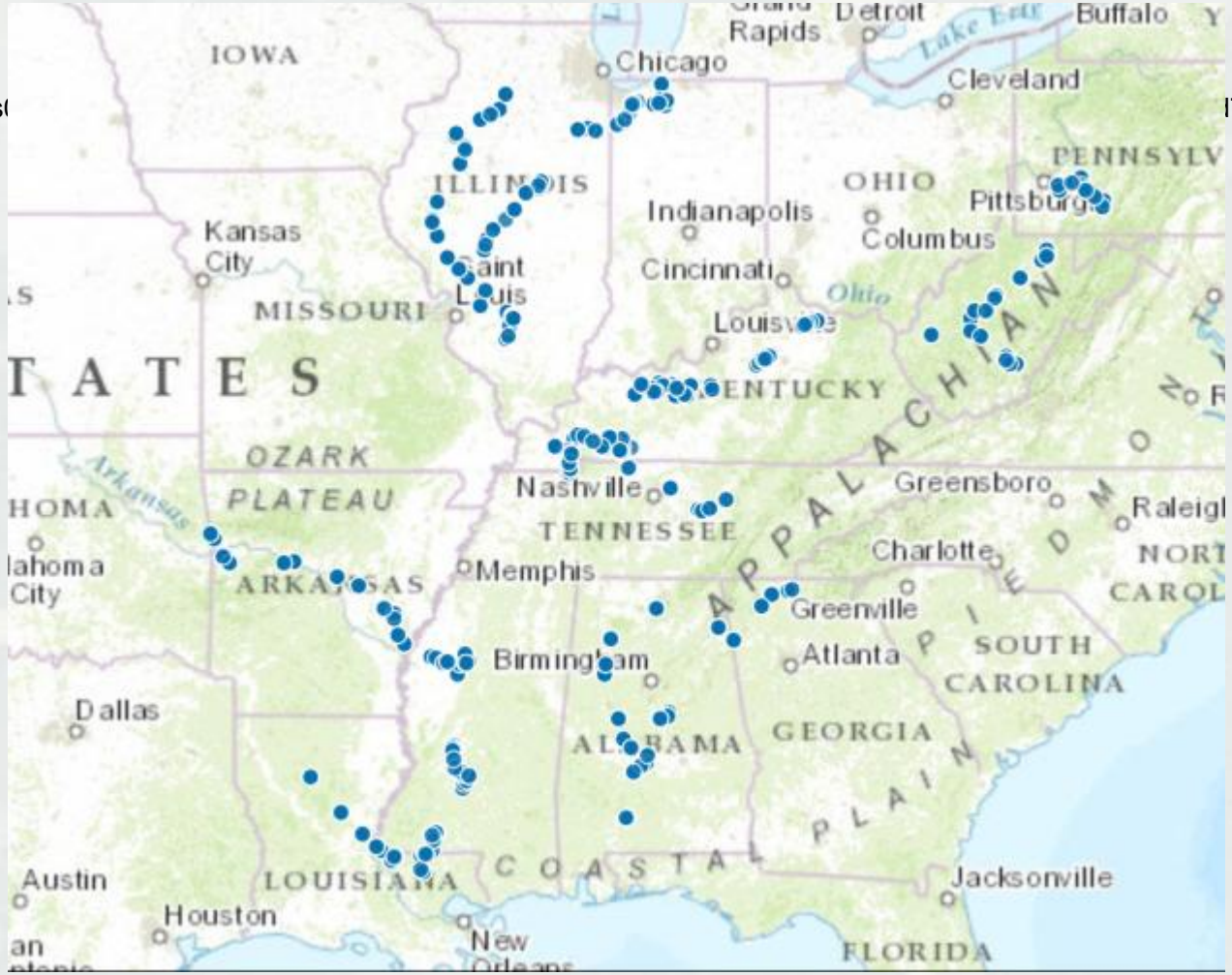
Table 4: Other Symbols

Topic	Symbol	Description
AIS Based AtoN Real Position of Charted Object		Diamond with crosshair centred at reported position. (Shown with chart symbol. Chart symbol not required for radar.)
AIS Based AtoN Virtual position		Diamond with crosshair centred at reported position.



Mobile Service

- http://eis-ags(l79b90885e7c



For more information

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