WEDA
Western Dredging Association

Utilizing Geospatial Technologies to Manage Maritime Infrastructure

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Introduction

- Advances in geospatial technologies allow for enhanced monitoring, asset tracking, project management, and domain awareness in the maritime industry.
- These geospatial technologies include Geographic Information Systems, Unmanned Aerial Systems, and web dashboards.
- This presentation will discuss these various geospatial technologies and demonstrate use-cases in the maritime industry.

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Geographic Information Systems (GIS)

- GIS is not limited to traditional desktop workflows.
- State-of-the-art GIS technology allows for information to be disseminated via web and mobile applications.
- Data and maps are accessed via web portals, with user-level security controls.
- Information can be updated in real-time from a mobile workforce.
- Data from real-time feeds can be ingested into the web GIS environment.
- Web dashboards can be created to provide summary views and status updates.

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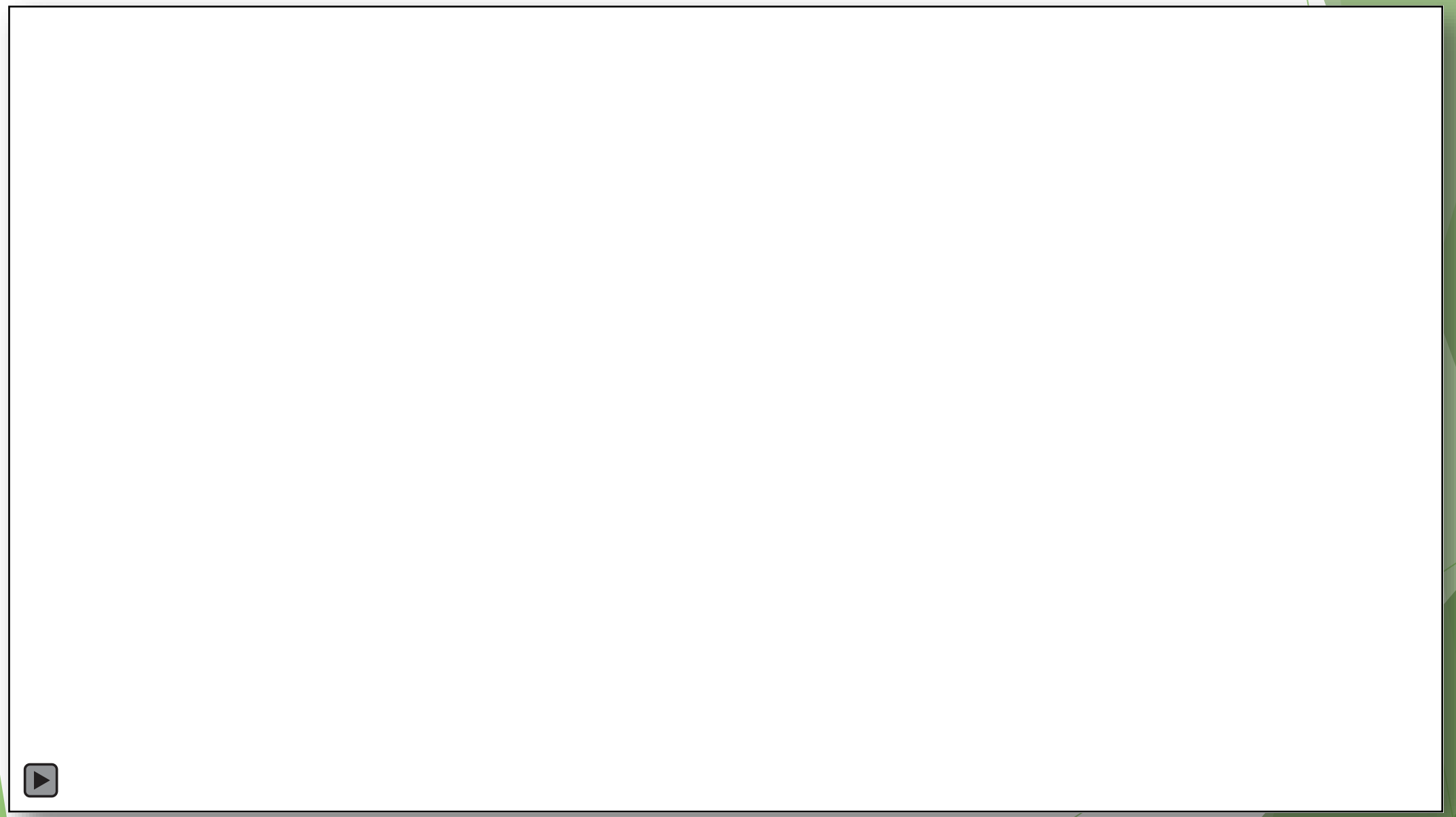
Web GIS – Project Planning / Management



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Unmanned Aerial Systems (UAS)

- Regulated Under FAA Part 107 Remote Pilot In Command
- WingtraOne: Fixed-Wing Vertical Takeoff / Landing
  - Orthophotography
  - Topographic Mapping
  - Large area
  - High precision
  - RGB and Multi-spectral sensors
- Quadcopters
  - Oblique photos / video
  - Inspections

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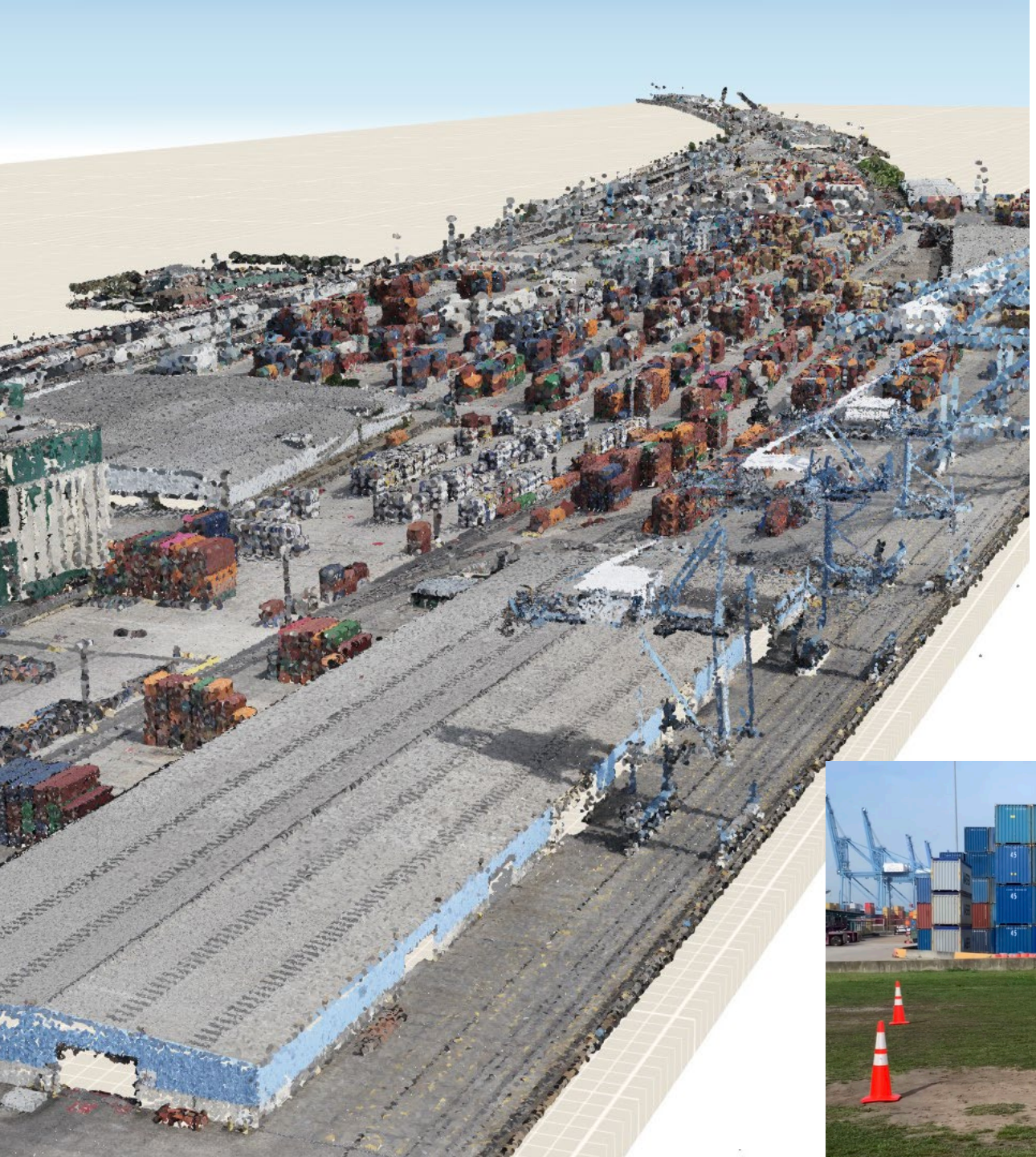

UAS Data Acquisition

Due to accessibility and safety, UAS is utilized for data acquisition as well as for topographic mapping.

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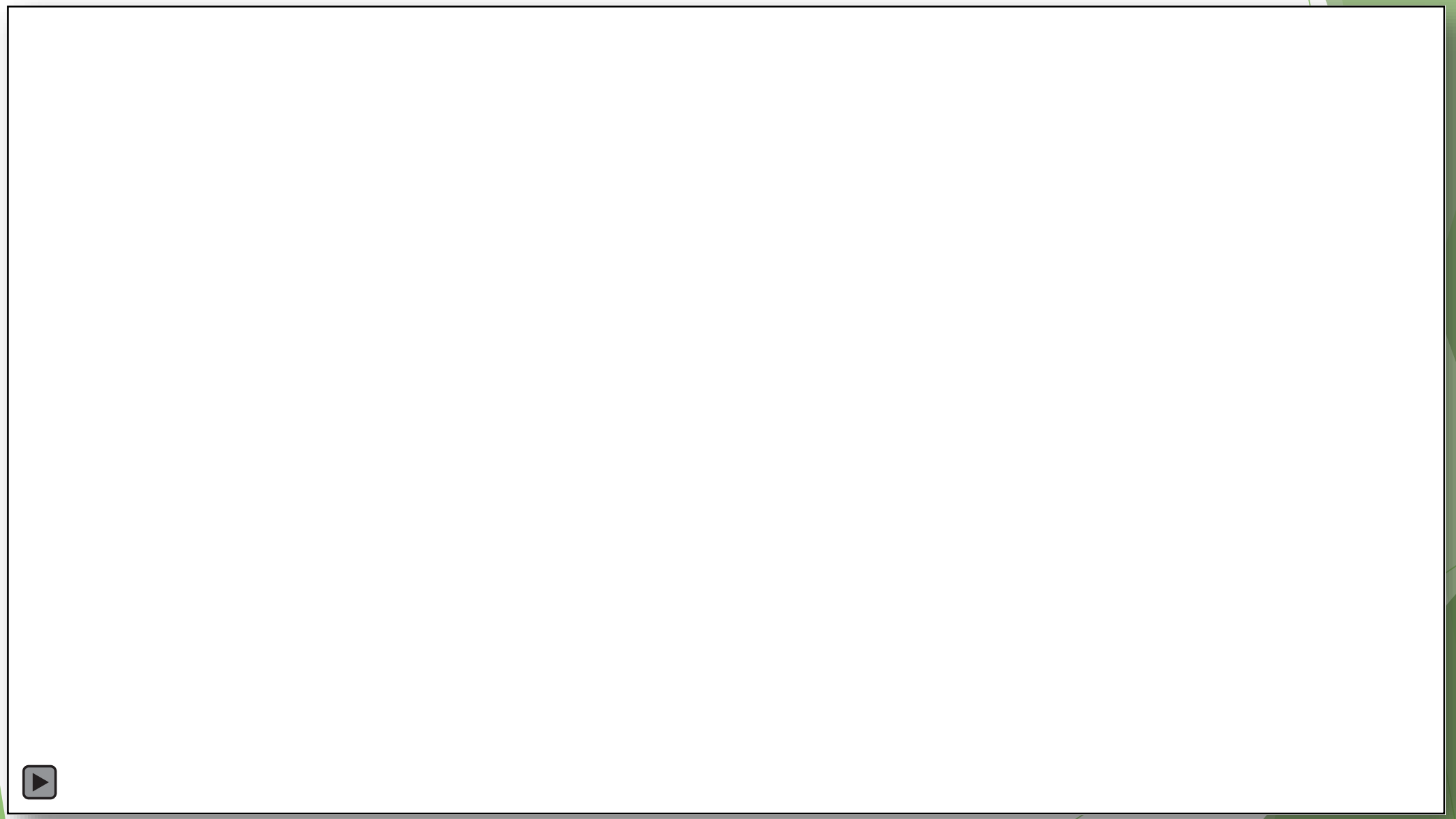
Web GIS w/ Current UAS Data



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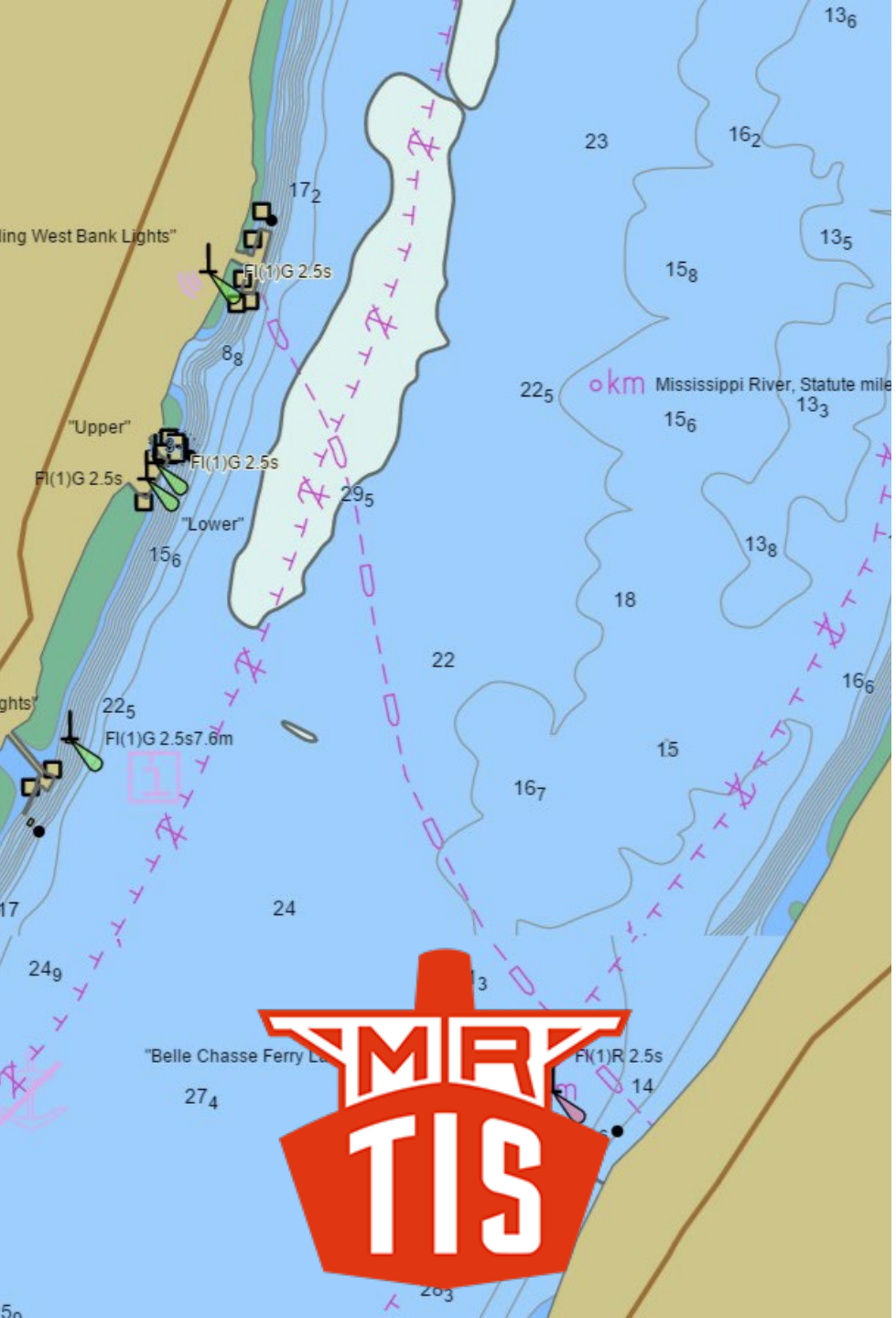
Real-Time Data

Domain Awareness and Operations

- Operations Dashboards
- Real-Time Data Feeds
  - AIS Vessel Locations
  - GPS Vehicle Locations
  - Weather Sensors
  - Waze Traffic



Integration With MRTIS AIS

- Mississippi River Traffic Information System
- Obtain Raw AIS Feed From MRTIS Antenna Network
- Process AIS Feed Using GIS Server

Add Input	Count	Rate	Edit Rate	Max Rate
MRTIS AIS Incoming UDP	19,501,398	42 /sec		56 /sec

- Display Vessel Traffic Within Port Jurisdiction
- Automated Tariff Tracking:
  - Dock / Anchorage
  - Bunkering

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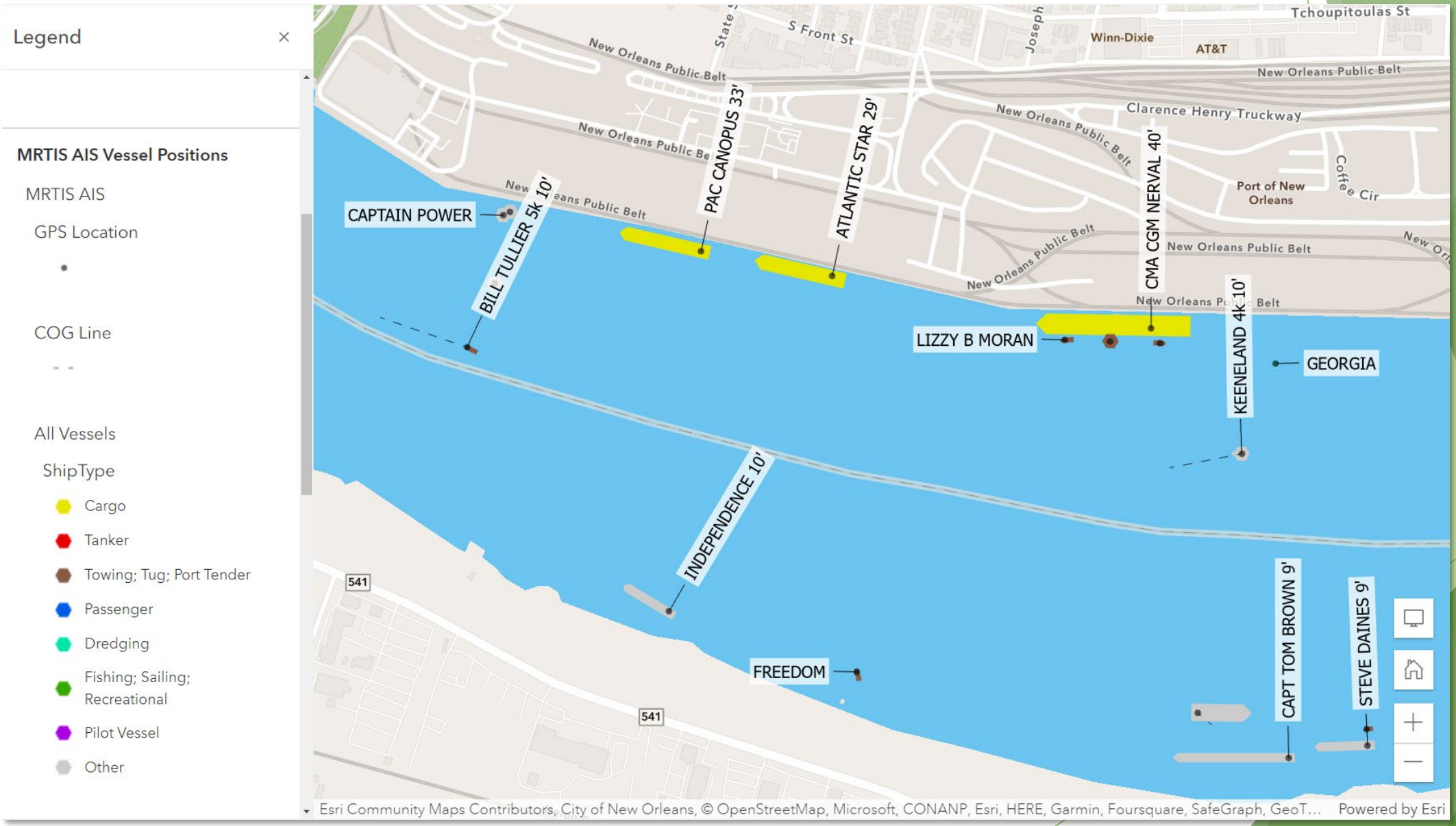
Vessel AIS Location



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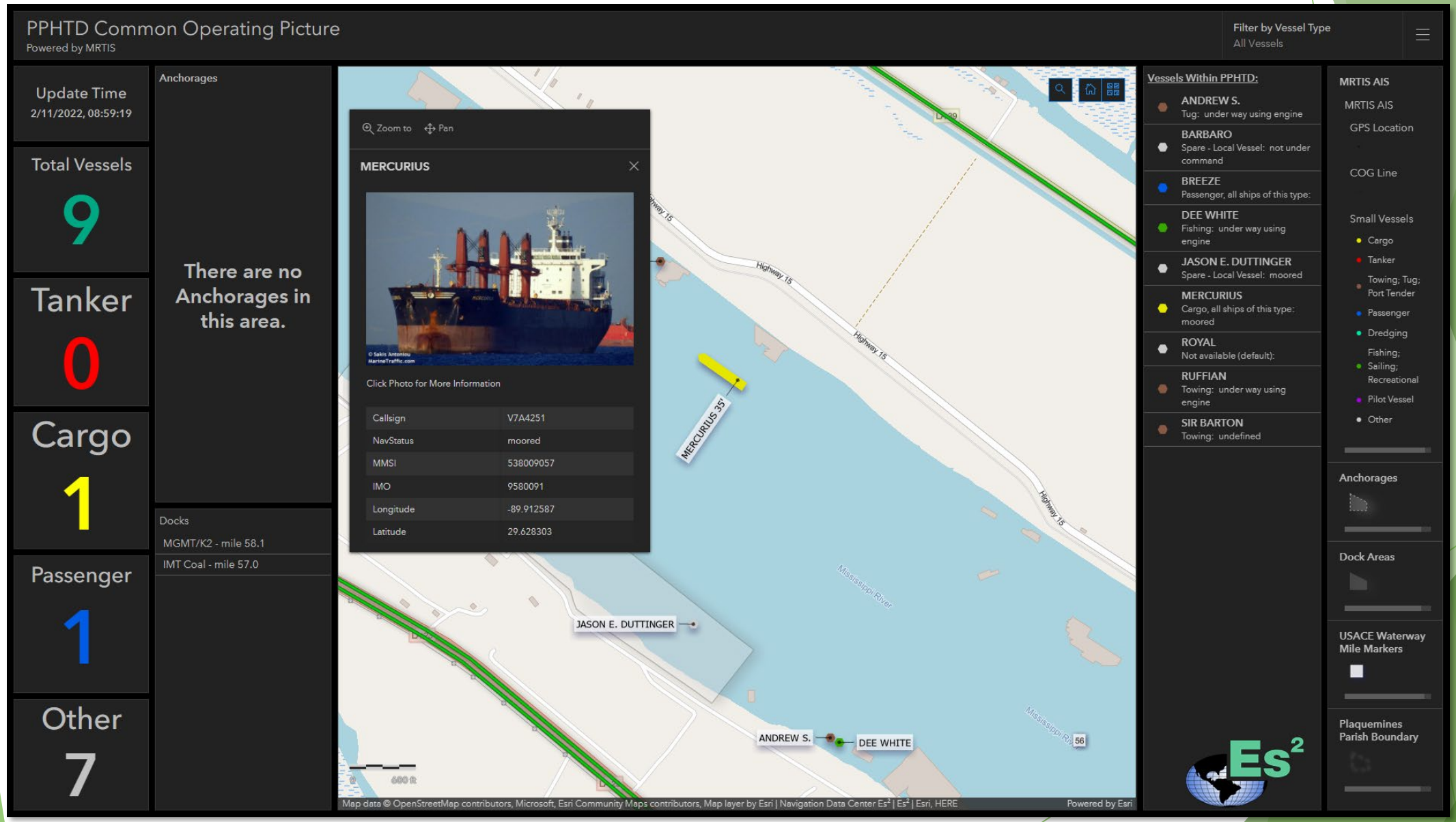
Vessel AIS Location Dashboard



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Vessel AIS Location Dashboard

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NOPB Locomotive Locations

- GPS Installed on All Locomotives
- Data Feed from AngelTrax System
- Processed With GIS Server

Add Input	Count	Rate	Edit Rate	Max Rate
NOPB AngelTrax Locomotive Locations Input Feed [Running On: geoevent]	3,188,312	7 /sec		7 /sec

- Locomotive Data:
  - Speed
  - Heading

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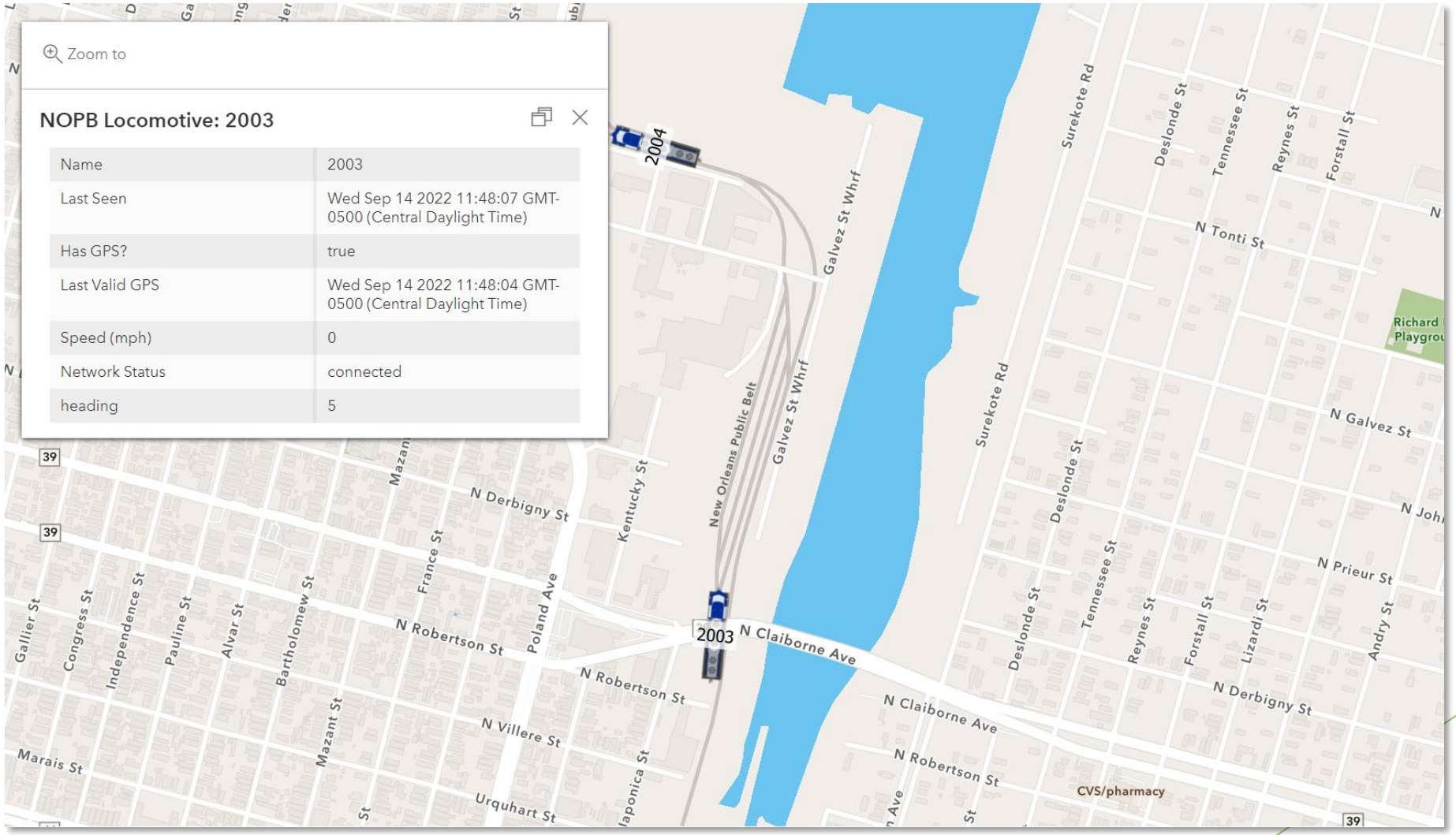
NOPB Locomotive Locations



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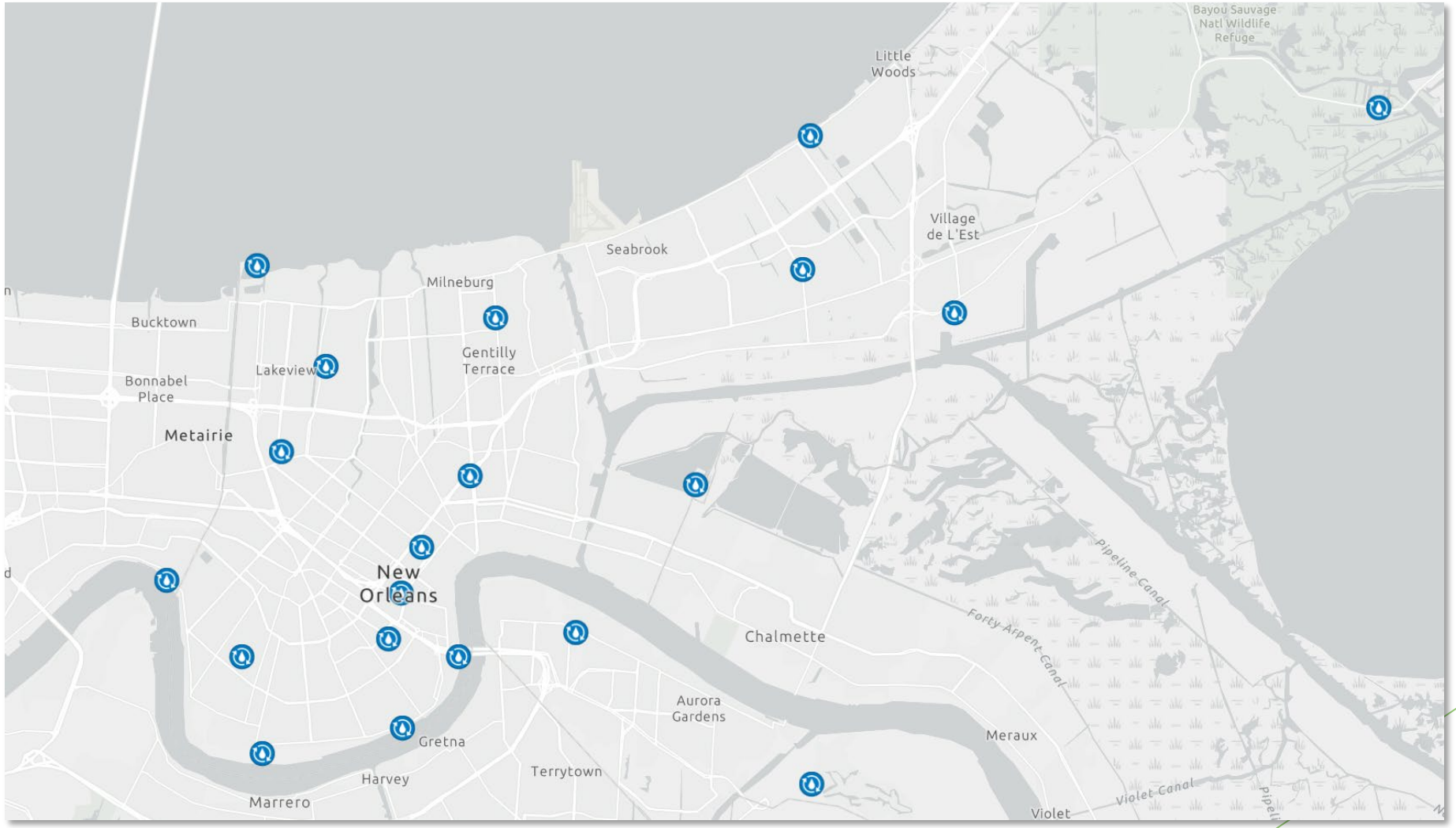
Weather Stations

- Partnership with City of New Orleans and Weather STEM
- 20 Stations Installed Throughout Orleans Parish (3 at Port NOLA)
- Data Stream from API Processed With GIS Server:

Add Input	Count	Rate	Edit Rate	Max Rate
WeatherStem: PortNOLA Admin Building [Running On: geoevent]	45,348	0 /sec		1 /sec

- Data Powers Multiple Dashboards and Severe Weather Text Alerts

Weather STEM Station Locations



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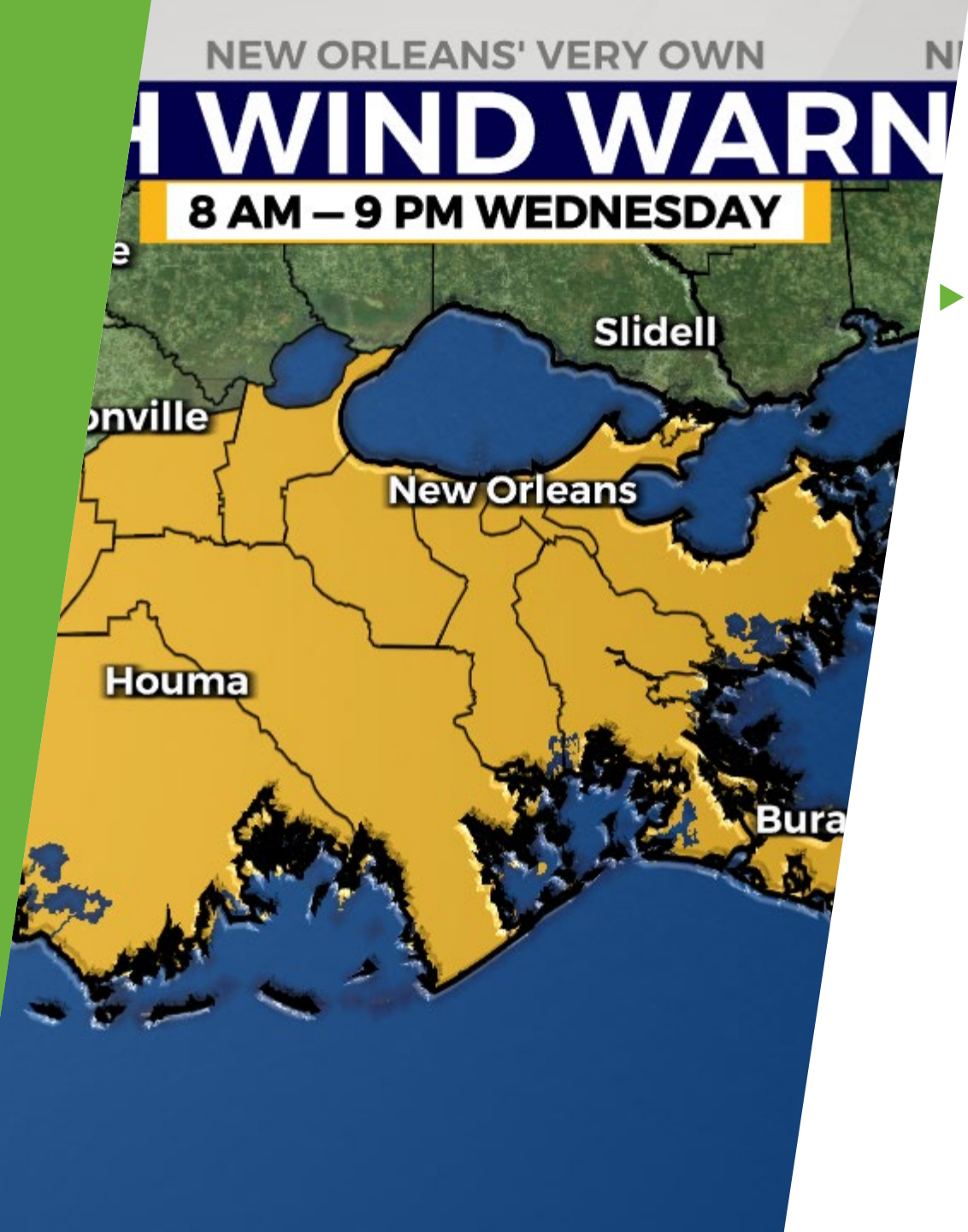

Weather Alerts

- Text Message Alerts for Severe Weather Configured With GIS Server:

- Text Alert - Freeze Protocol (Verizon) Output
- Text Alert - High Wind Cranes (T-Mobile) Output
- Text Alert - High Wind Cranes (Verizon) Output
- Text Alert - High Wind Huey P (AT&T) Output
- Text Alert - High Wind Huey P (Verizon) Output
- Text Alert - High Wind Metro (Verizon) Output
- Text Alert - Hurricane CAT1 Winds (Verizon) Output
- Text Alert - Hurricane CAT3 Winds (Verizon) Output
- Text Alert - IHNC Gauge (Verizon) Output
- Text Alert - Tropical Storm Winds (Verizon) Output

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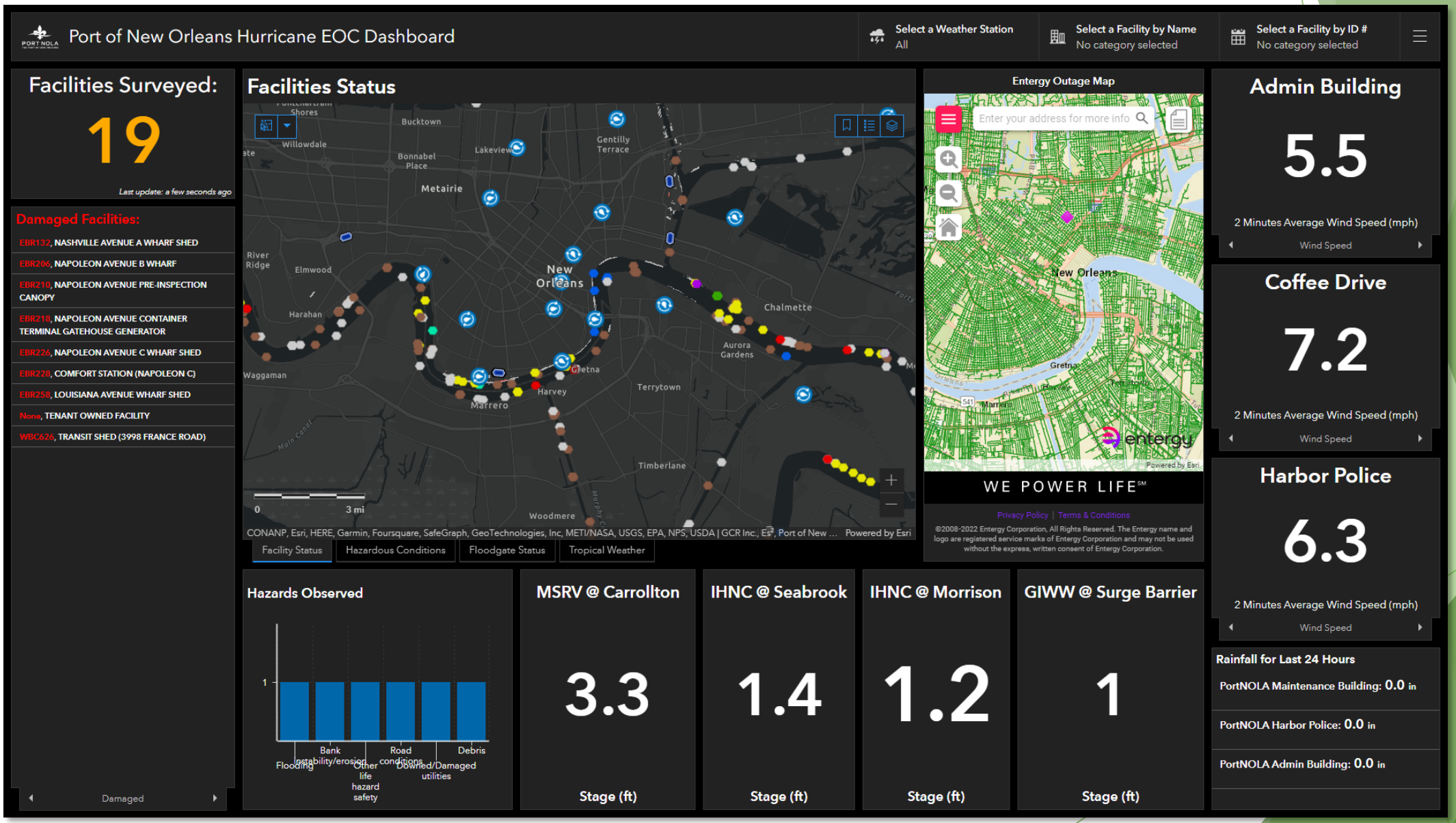
Hurricane EOC Dashboard



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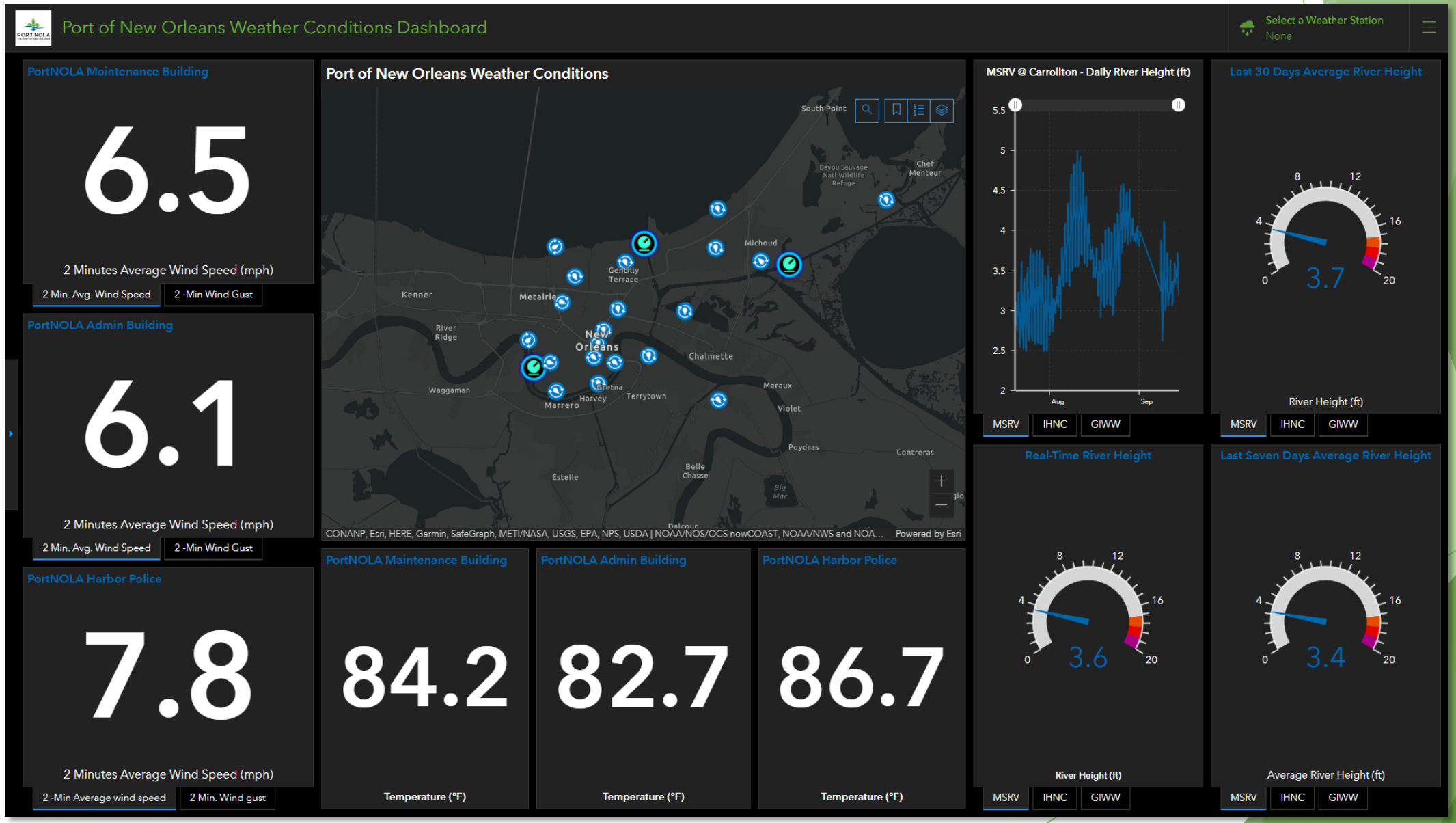
Weather Conditions Dashboard



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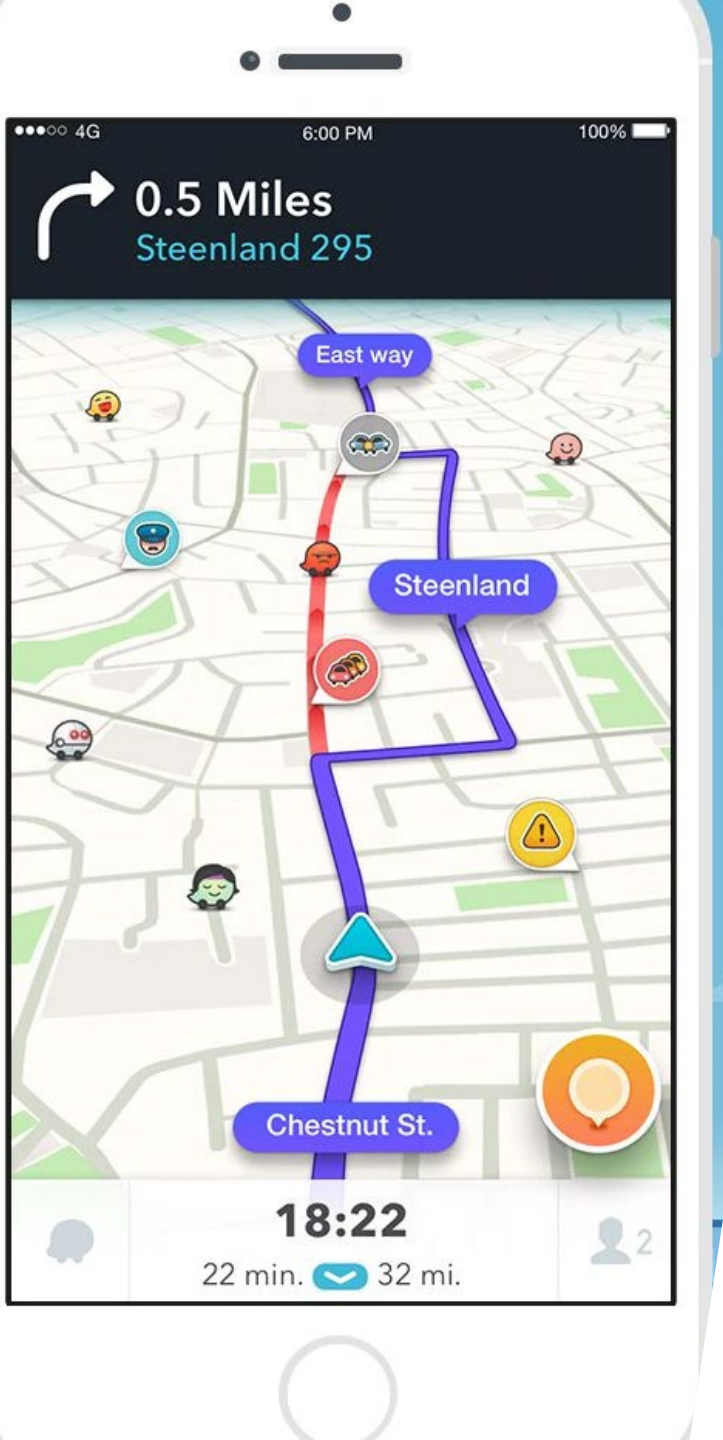

Waze Traffic

- Partnership with the City of New Orleans
- Waze for Cities – City of New Orleans Provides Incident Feed to Waze
- Waze Incident Feed Available on Esri Marketplace for Waze for Cities Partners

- Incident Feed in Feature Service Format, Ready to Use in Esri Web Maps
- Port of New Orleans Filtered the Feed to Only Show Major Accidents, Traffic, or Weather Hazards

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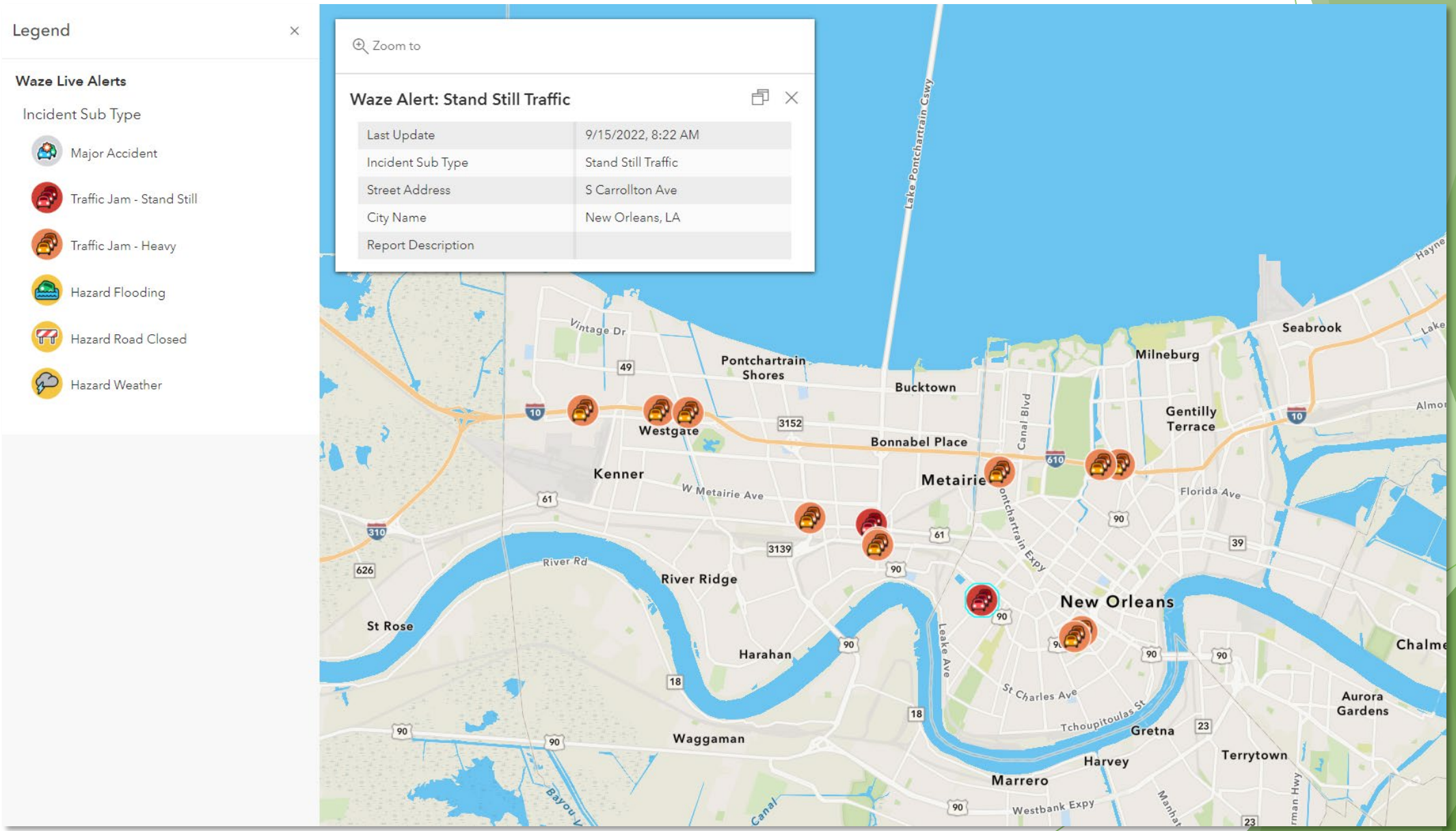
Waze Traffic Map



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