



Utilizing Geospatial Technologies to Manage Maritime Infrastructure

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Es²

November 8, 2022



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.



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.

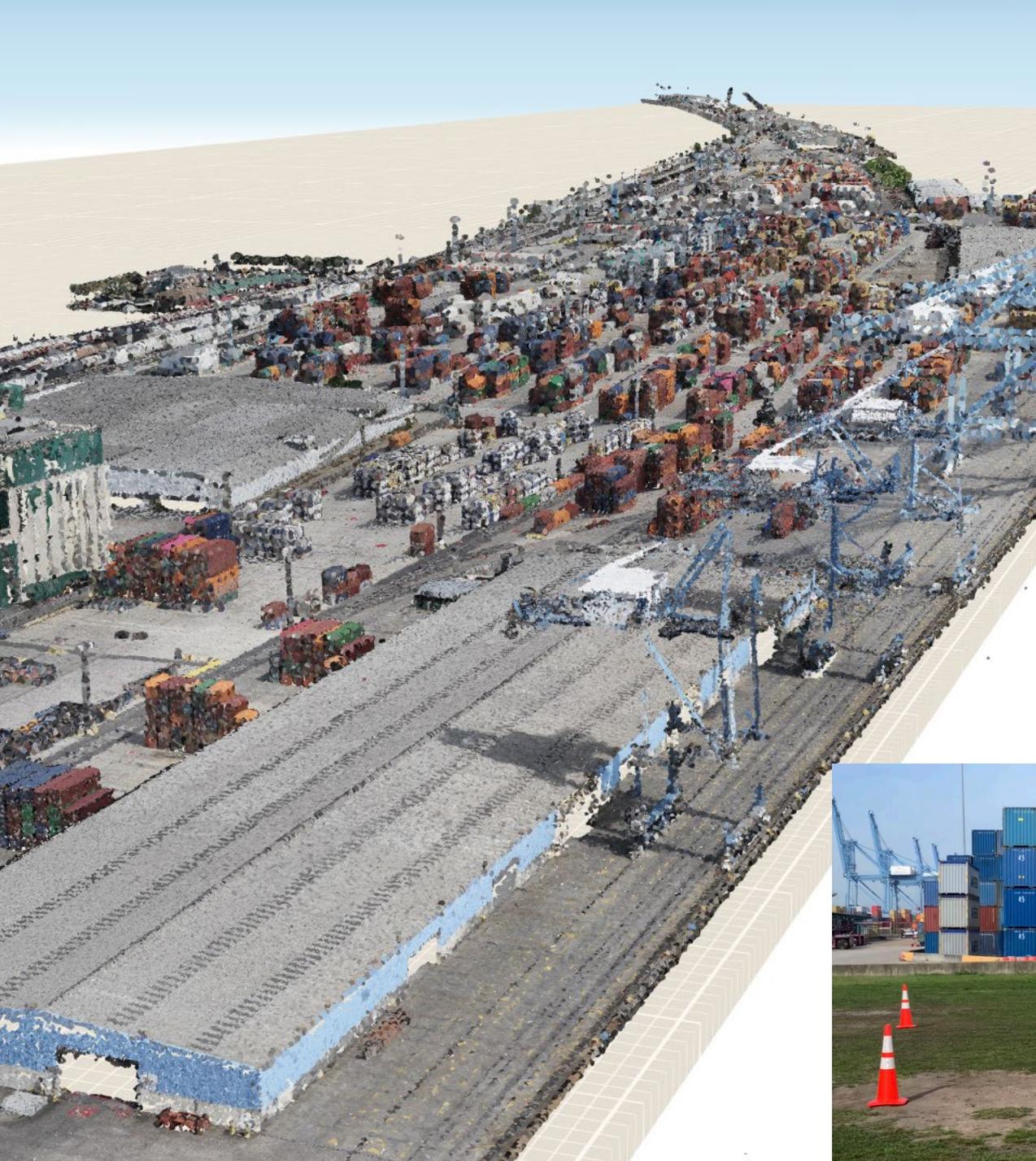
Web GIS – Project Planning / Management



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



UAS Data Acquisition

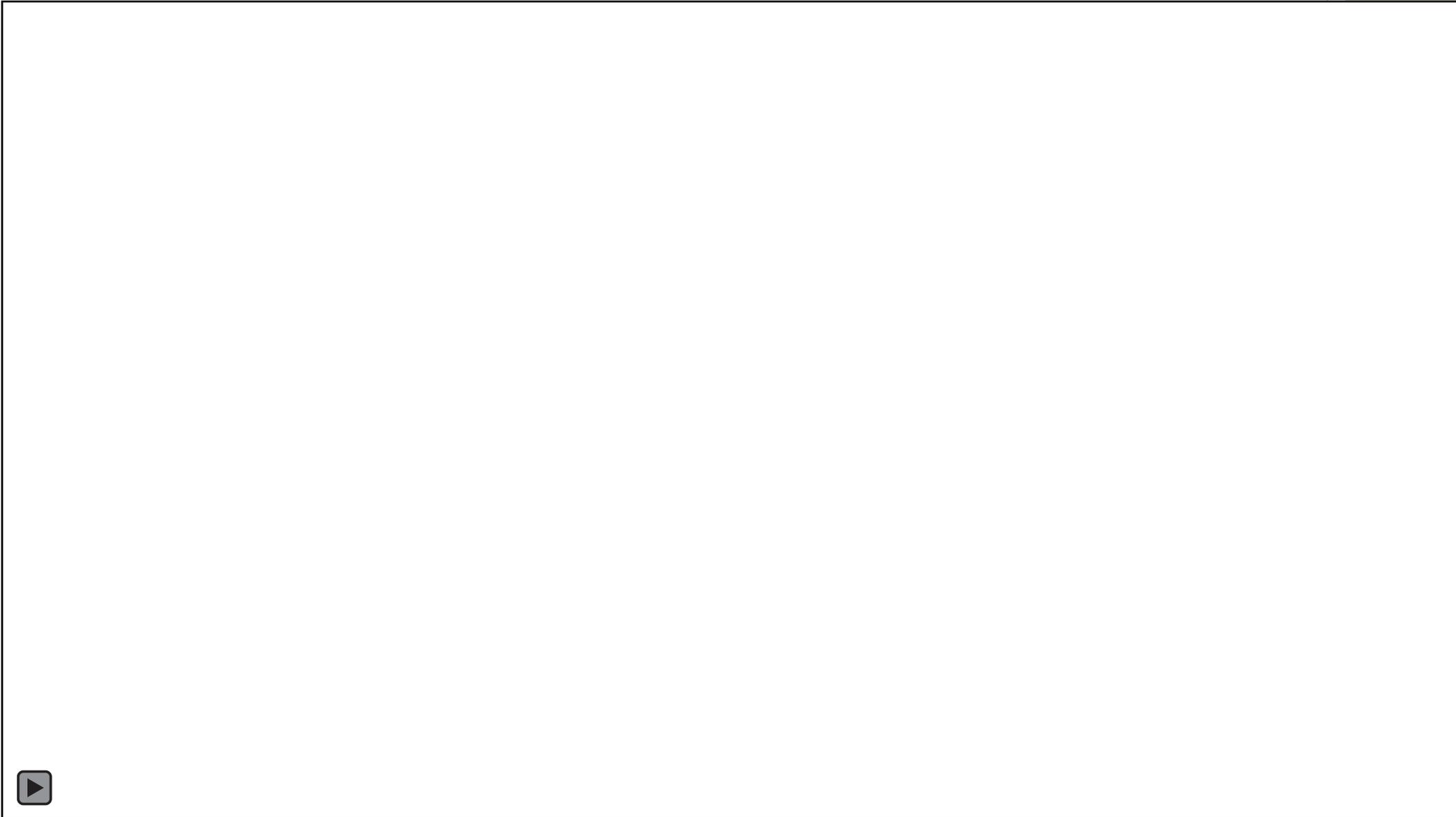
Due to accessibility and safety, UAS is utilized for data acquisition as well as for topographic mapping.



SBA U.S. Small Business Administration
8(a) Certified



Web GIS w/ Current UAS Data

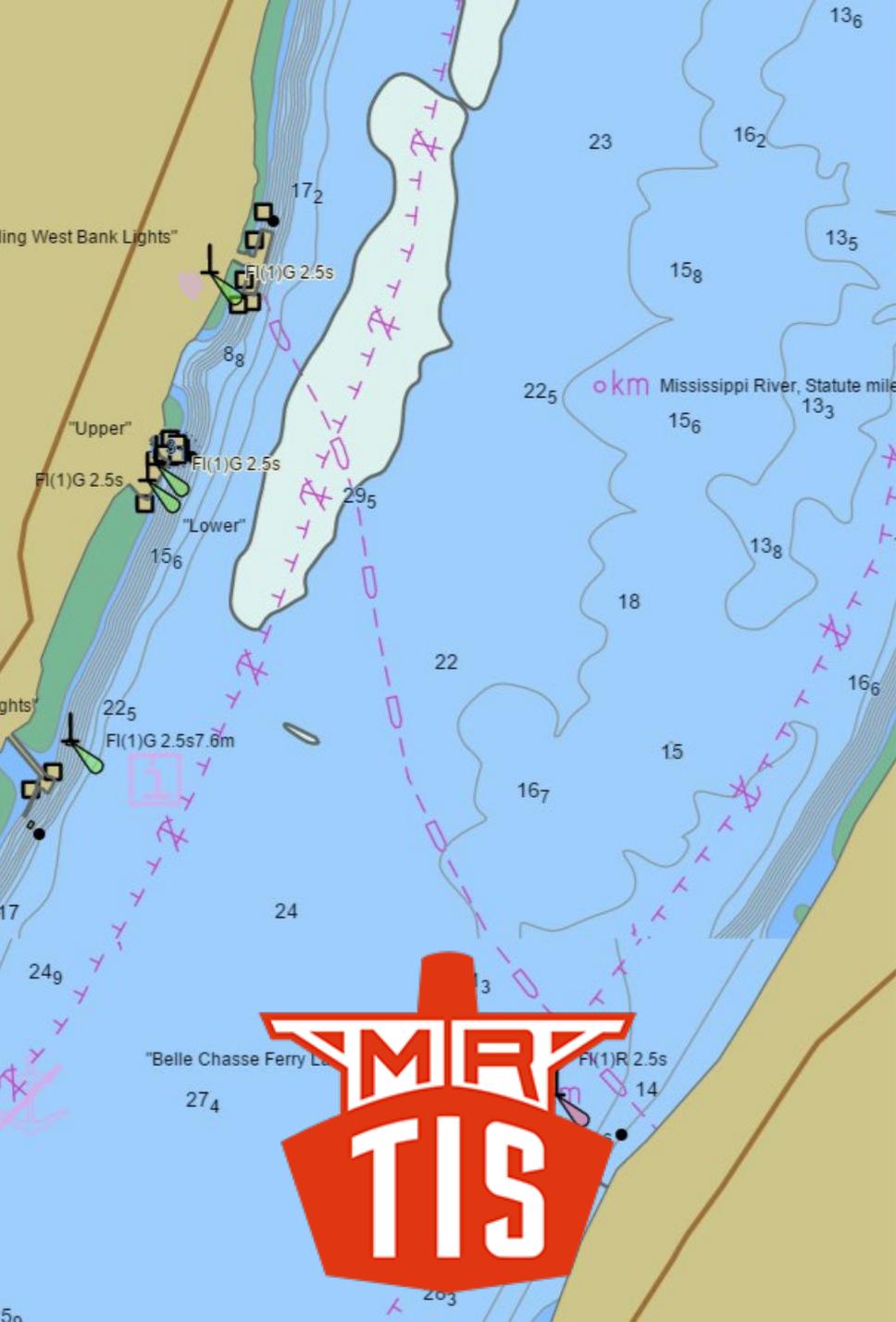


Real-Time Data

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

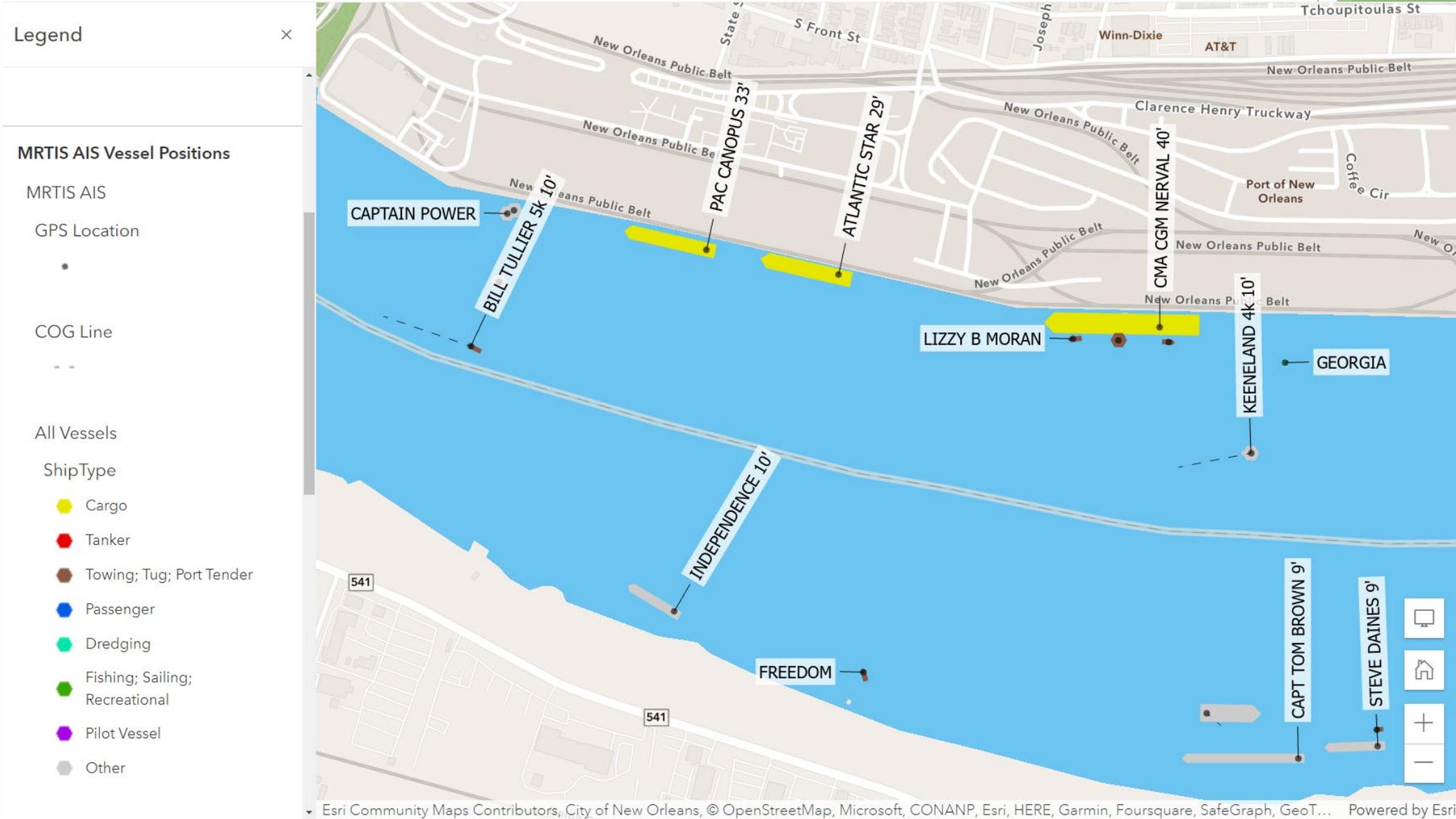
- ▶ Display Vessel Traffic Within Port Jurisdiction
- ▶ Automated Tariff Tracking:
 - ▶ Dock / Anchorage
 - ▶ Bunkering



Vessel AIS Location



PORT NOLA
THE PORT OF NEW ORLEANS



Vessel AIS Location Dashboard

PPHTD Common Operating Picture
Powered by MRTIS
Filter by Vessel Type
All Vessels

Update Time
2/11/2022, 08:59:19

Total Vessels
9

Tanker
0

Cargo
1

Passenger
1

Other
7

Anchorage

There are no
Anchorage in
this area.

Docks

MGMT/K2 - mile 58.1

IMT Coal - mile 57.0

MERCURIUS

Click Photo for More Information

Callsign	V7A4251
NavStatus	moored
MMSI	538009057
IMO	9580091
Longitude	-89.912587
Latitude	29.628303

Vessels Within PPHTD:

- **ANDREW S.**
Tug: under way using engine
- **BARBARO**
Spare - Local Vessel: not under command
- **BREEZE**
Passenger, all ships of this type:
- **DEE WHITE**
Fishing: under way using engine
- **JASON E. DUTTINGER**
Spare - Local Vessel: moored
- **MERCURIUS**
Cargo, all ships of this type: moored
- **ROYAL**
Not available (default):
- **RUFFIAN**
Towing: under way using engine
- **SIR BARTON**
Towing: undefined

MRTIS AIS

MRTIS AIS

GPS Location

COG Line

Small Vessels

- Cargo
- Tanker
- Towing; Tug; Port Tender
- Passenger
- Dredging
- Fishing;
- Sailing;
- Recreational
- Pilot Vessel
- Other

Anchorage

Dock Areas

USACE Waterway Mile Markers

Plaquemines Parish Boundary



Vessel AIS Location Dashboard





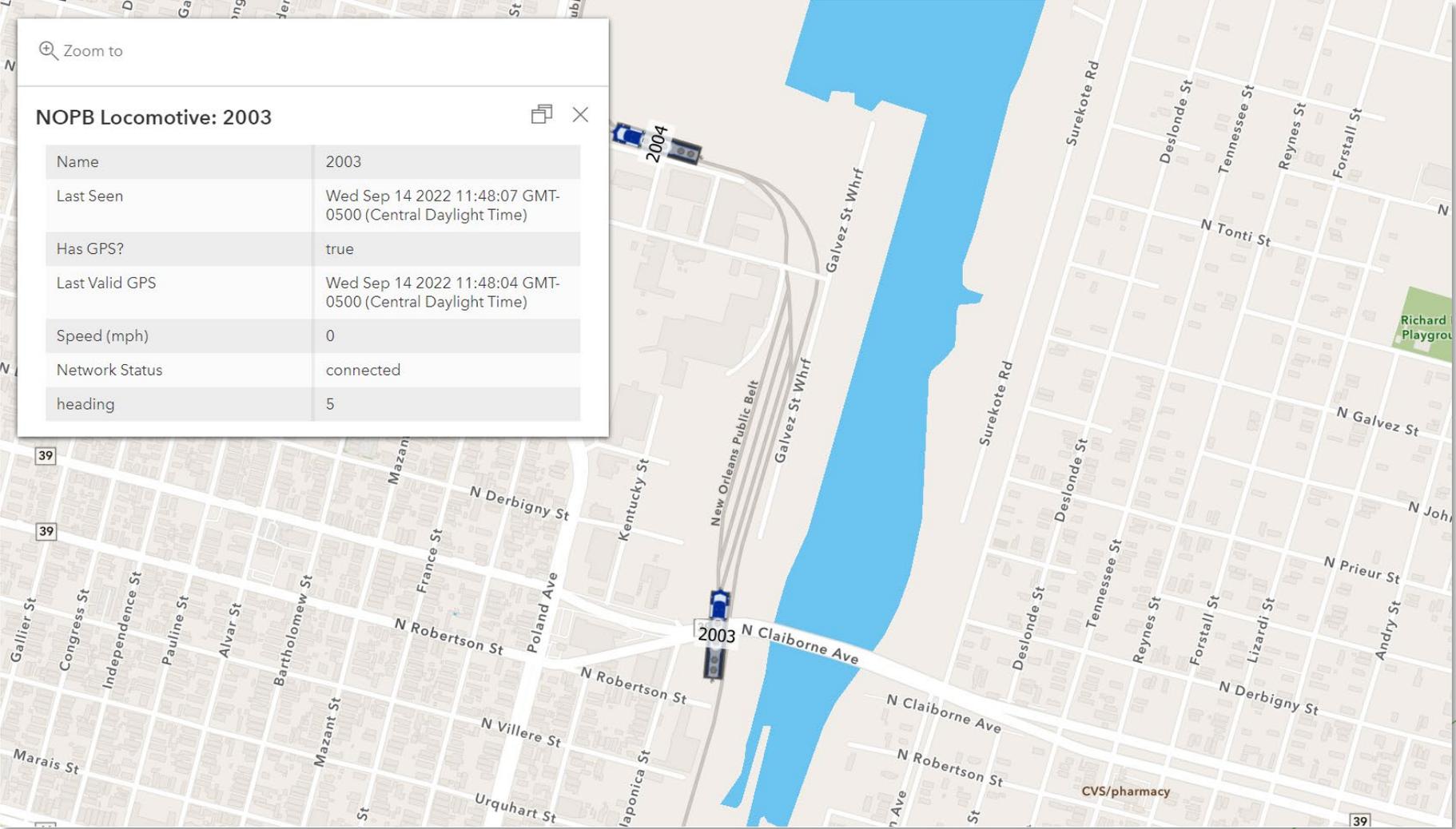
NOPB Locomotive Locations

- ▶ 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

NOPB Locomotive Locations





Weather Stations

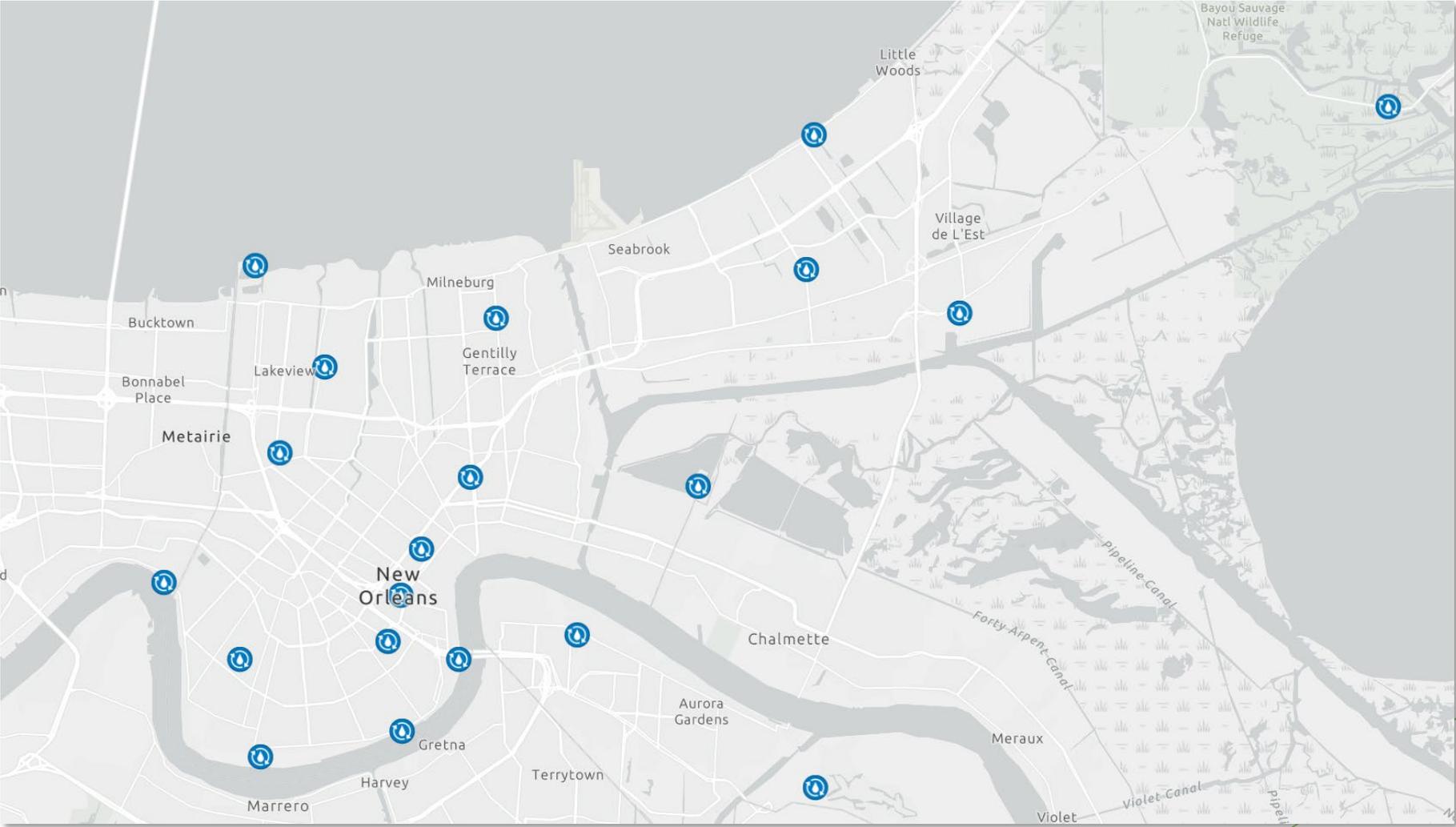
- ▶ Partnership with City of New Orleans and Weather STEM
- ▶ 20 Stations Installed Throughout Orleans Parish (3 at Port NOLA)
- ▶ Data Stream from API Processed With GIS Server:

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

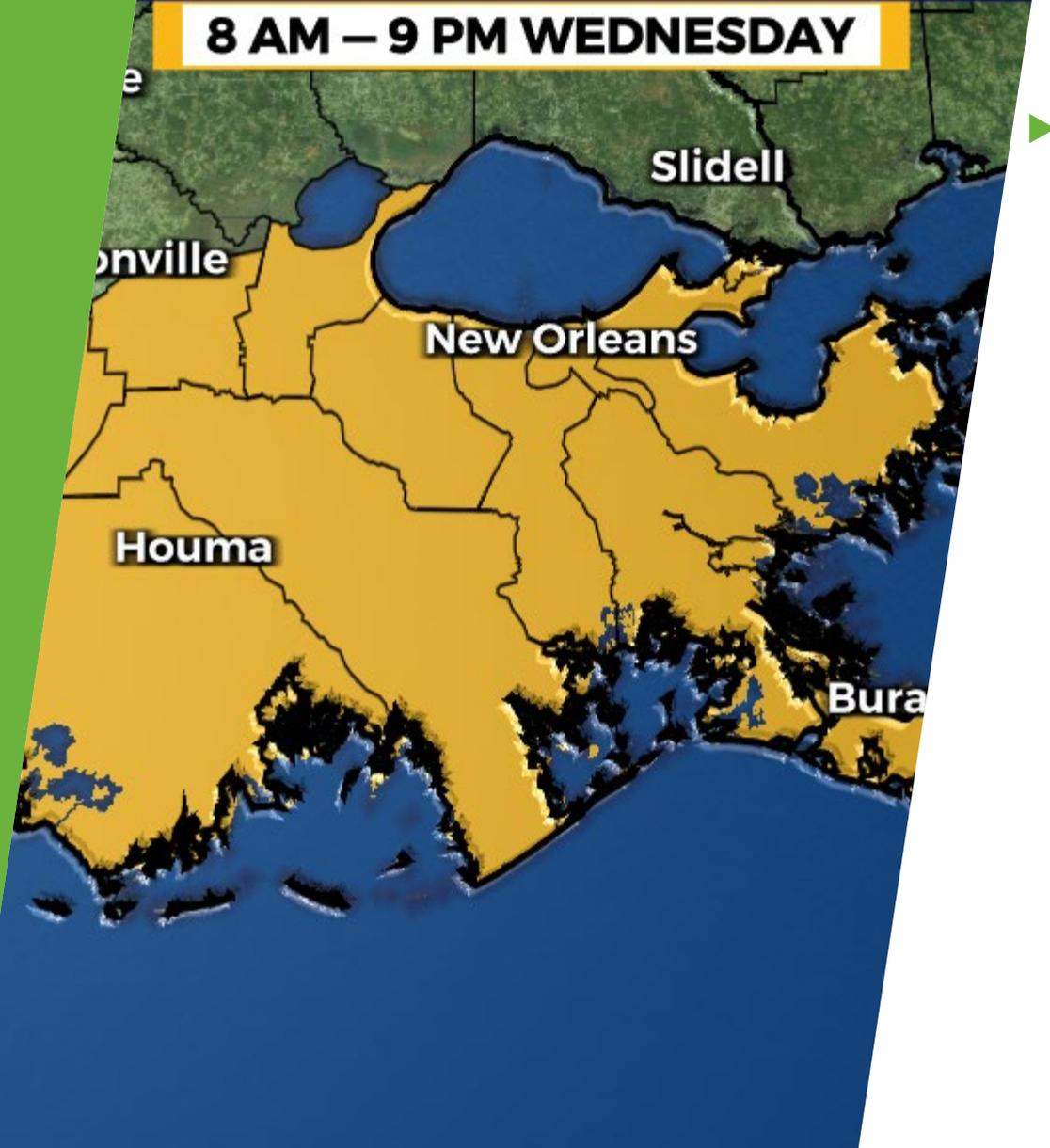


Weather STEM Station Locations



WIND WARN

8 AM – 9 PM WEDNESDAY



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](#)

Hurricane EOC Dashboard

Port of New Orleans Hurricane EOC Dashboard

Select a Weather Station
All

Select a Facility by Name
No category selected

Select a Facility by ID #
No category selected

Facilities Surveyed:

19

Last update: a few seconds ago

Facilities Status

Entergy Outage Map

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Admin Building

5.5

2 Minutes Average Wind Speed (mph)

Wind Speed

Damaged Facilities:

- EBR132, NASHVILLE AVENUE A WHARF SHED
- EBR206, NAPOLEON AVENUE B WHARF
- EBR210, NAPOLEON AVENUE PRE-INSPECTION CANOPY
- EBR218, NAPOLEON AVENUE CONTAINER TERMINAL GATEHOUSE GENERATOR
- EBR226, NAPOLEON AVENUE C WHARF SHED
- EBR228, COMFORT STATION (NAPOLEON C)
- EBR258, LOUISIANA AVENUE WHARF SHED
- None, TENANT OWNED FACILITY
- WBC626, TRANSIT SHED (3998 FRANCE ROAD)

Harbor Police

6.3

2 Minutes Average Wind Speed (mph)

Wind Speed

Rainfall for Last 24 Hours

PortNOLA Maintenance Building: 0.0 in

PortNOLA Harbor Police: 0.0 in

PortNOLA Admin Building: 0.0 in

Hazards Observed

MSRV @ Carrollton

3.3

Stage (ft)

IHNC @ Seabrook

1.4

Stage (ft)

IHNC @ Morrison

1.2

Stage (ft)

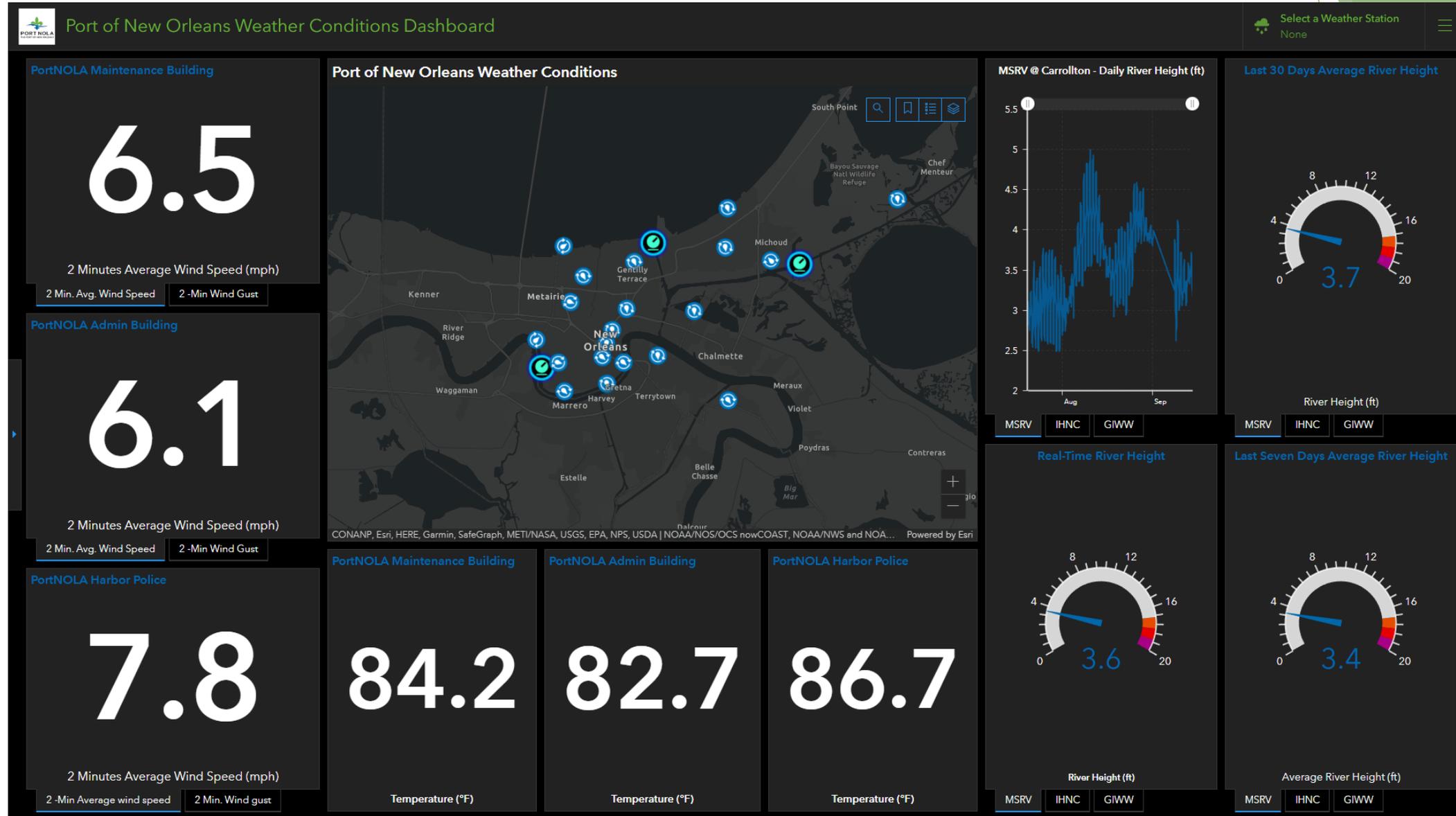
GIWW @ Surge Barrier

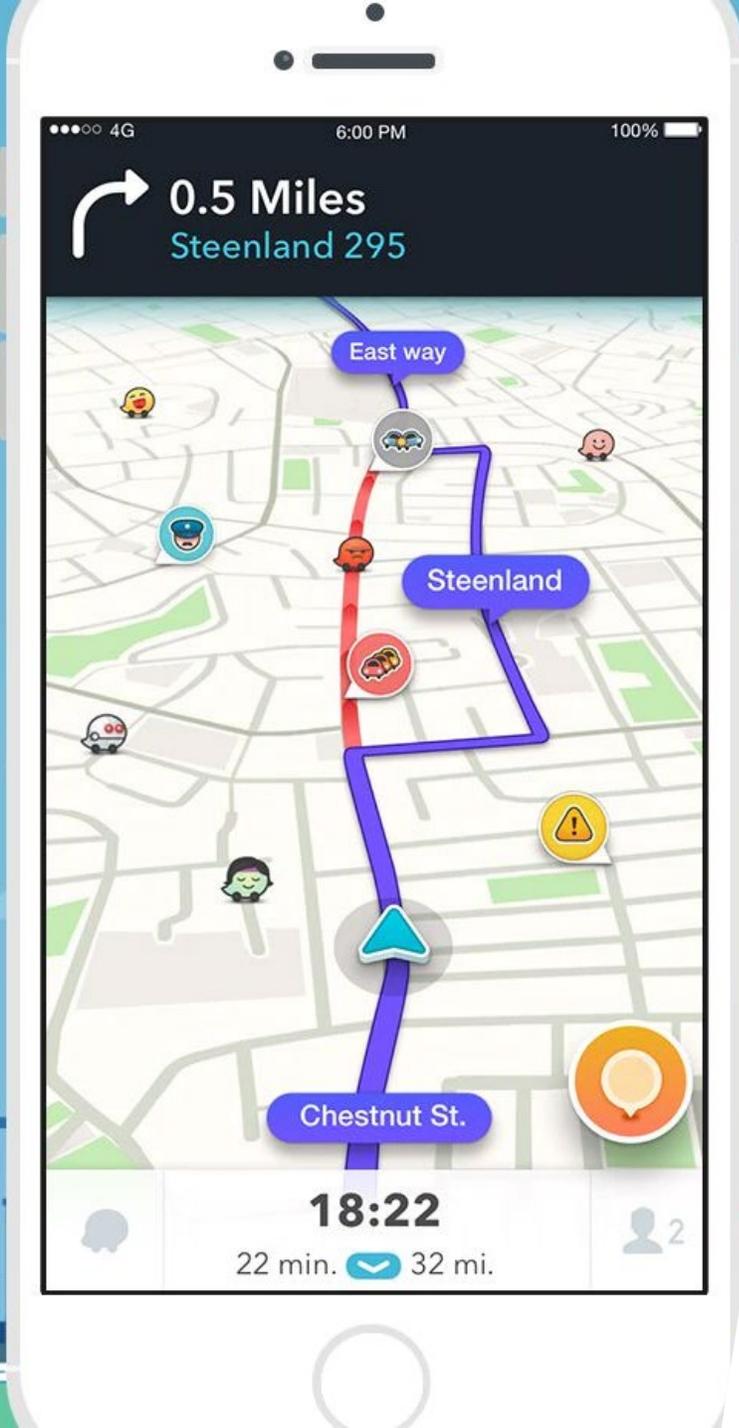
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Stage (ft)



Weather Conditions Dashboard





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

Waze Traffic Map

Legend

Waze Live Alerts

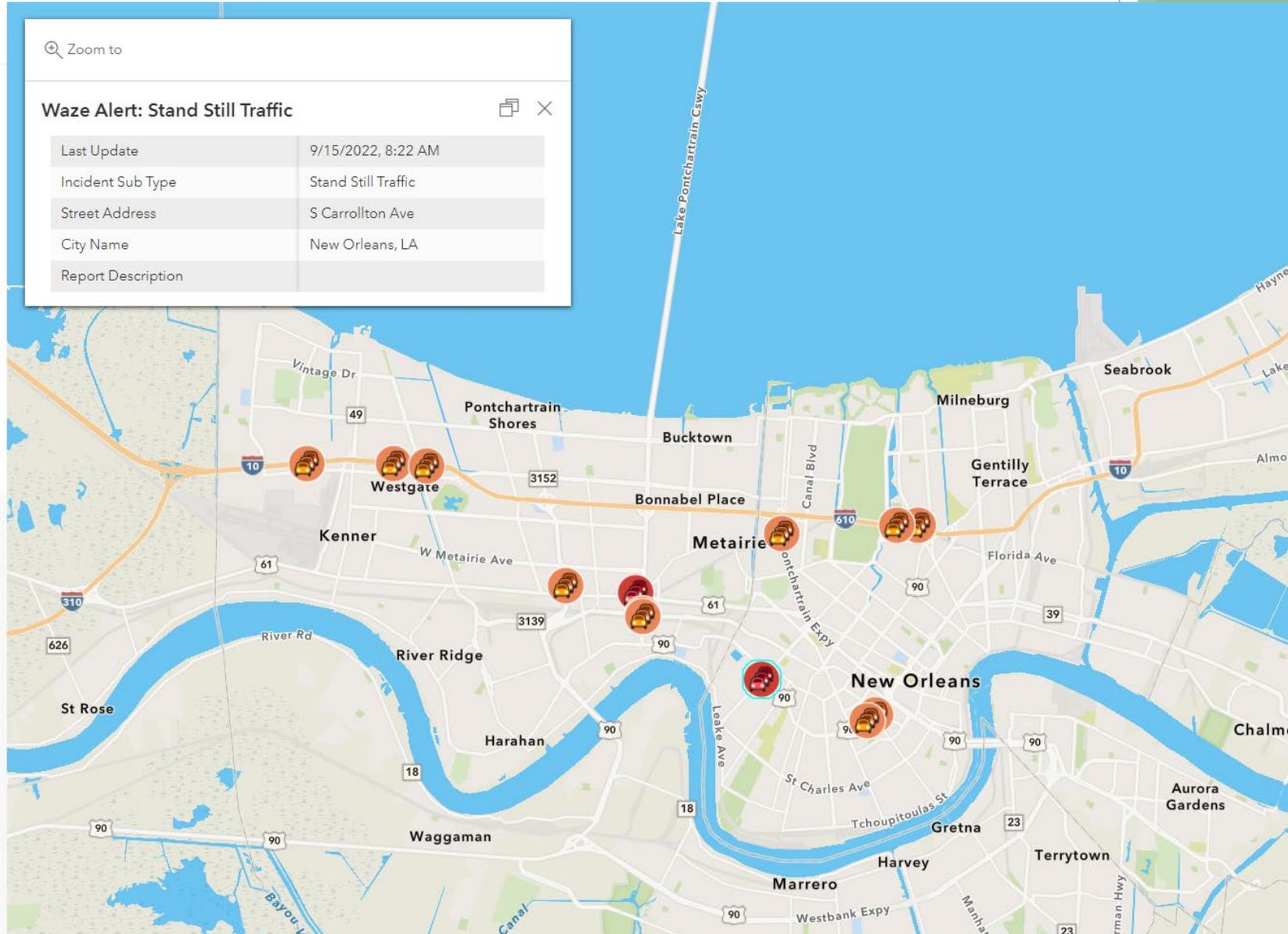
Incident Sub Type

-  Major Accident
-  Traffic Jam - Stand Still
-  Traffic Jam - Heavy
-  Hazard Flooding
-  Hazard Road Closed
-  Hazard Weather

Zoom to

Waze Alert: Stand Still Traffic

Last Update	9/15/2022, 8:22 AM
Incident Sub Type	Stand Still Traffic
Street Address	S Carrollton Ave
City Name	New Orleans, LA
Report Description	





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