Global Spatial Technology Solutions

DIANA BORDA
KATHERINE BORDA

Designs and develops advanced global digital solutions that enhance safety, security, efficiency and environmental sustainability in the maritime domain.

USE CASE

Using satellite imagery to detect vessels and maritime activities.

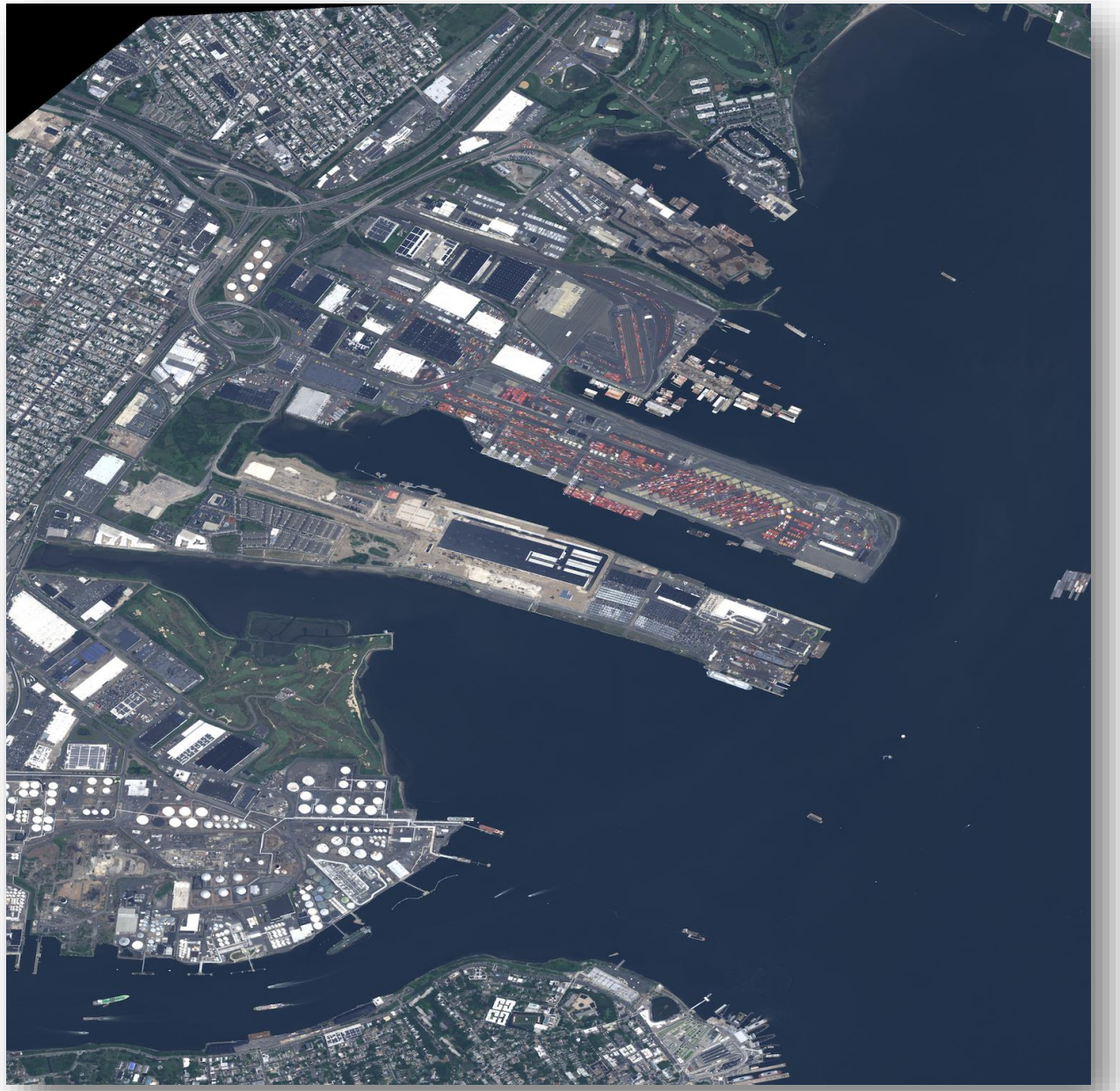
Application: Maritime Intelligence and Port Surveillance
Location: Port New York/New Jersey, United States
Products: Pléiades Neo

Challenge

GSTS aims to implement a Global Maritime Intelligence system that allows maximizing the efficiency of port operations and vessel monitoring; using VHR satellite imagery that provides an accurate snapshot of the sea area (port areas and open water) with other data sources (e.g., S-AIS) will help understand and solve current challenges such as overwhelmed ports and proactive monitoring to identify illegal vessels.

Port New York/New Jersey

- Largest port on the U.S. East Coast
- Third largest in the US
- Nearly 15,000 vessels passed through the Port of New
- York & New Jersey



Solution & Results

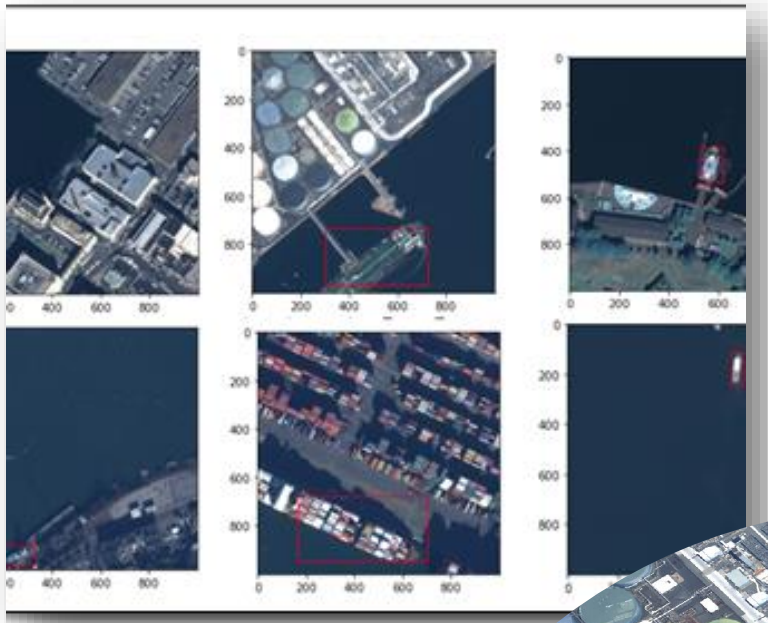
Computer vision model (SSD) was used to identify and extract the geographical positions and boundaries of vessels

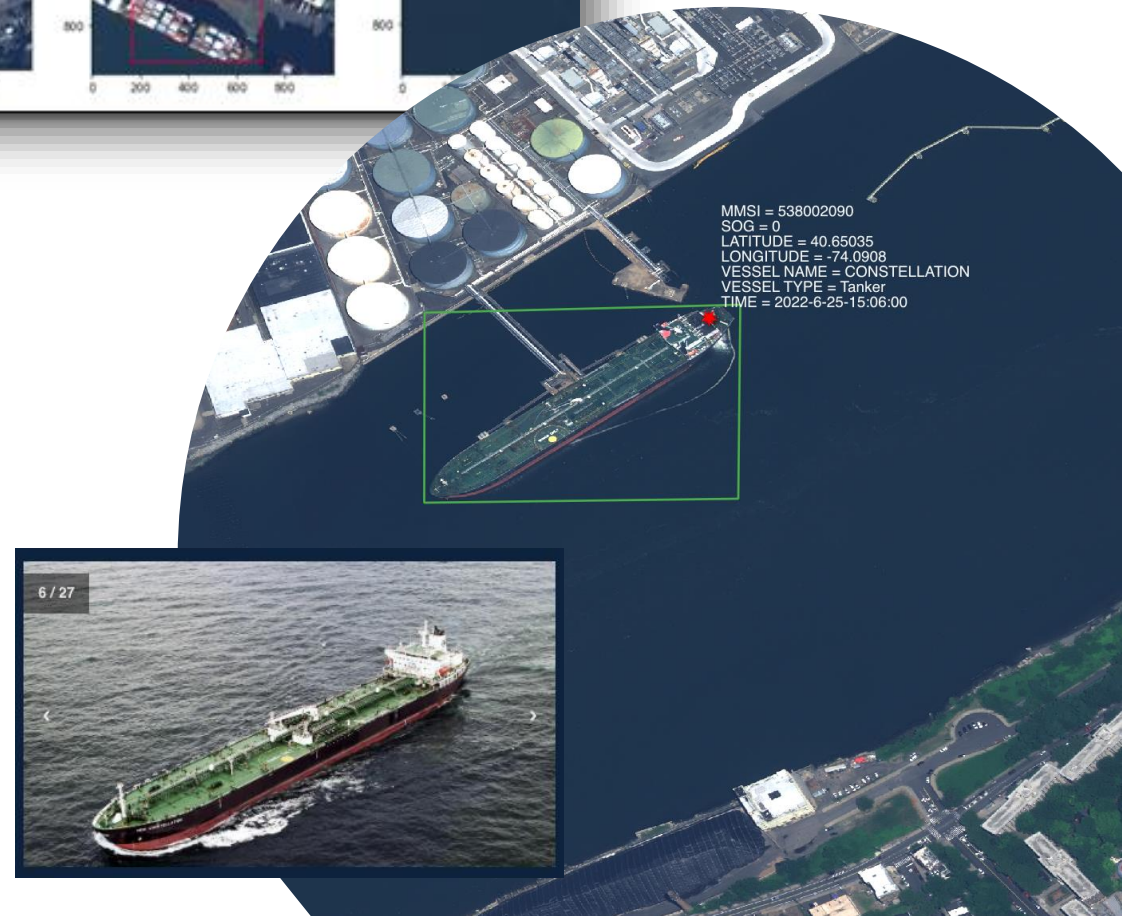
Fusing the detections with the AIS messages allow the identification of vessels. The detection of a vessel with its AIS message gives additional information like the MMSI (Maritime Mobile Service Identity), name of the vessel, type of the vessel and others.

Pléiades Neo Imagery helped to:

- Identify vessels and improve the performance of the model
- Classify vessels (bulk, tanker, container, etc.)**
- Through VHR imagery and complementary data (AIS), it is possible to have a 360 vision of the behavior of vessels.

**Research could not be concluded but images show a high potential for it.





Benefits

Pléiades Neo images seem to be a good source for ship detection models, their spatial resolution allows not only to detect ships but also to classify them with good precision.

This solution improves the maritime domain in key areas such as safety, surveillance, and monitoring in port and vessel operations. Extracting features from object-based imagery to gather important or relevant geospatial information, from identifying and classifying vessels, monitoring illegal fishing activity, and tracking commercial vessels going dark to port provisioning.