

Applications of Sentinel Imagery for Maritime Monitoring in Skylight

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What is Skylight?

Founded by the Allen Institute for Artificial Intelligence (AI2), Skylight is a non-profit dedicated to developing **groundbreaking technology to support maritime domain awareness** and provide actionable intelligence for the protection of our oceans.

We strive to build the world's most advanced and robust AI technologies for analysis of maritime activity.

How We Work

Collaboration is fundamental to what we do. Without our deployment, technology, and capacity-building partners, much of our work and impact would be impossible.

200+

Partners

95

Countries

35

API Integrations

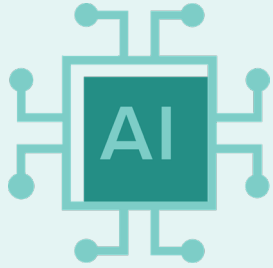
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Capacity Building
Partners

10

Technology
Partners





Trusted AI

Skylight works with world-class AI researchers to meet the needs of MDA practitioners



Real-Time Intelligence

Skylight's technologies provide real-time insights to support operational cases.



Offered at No Cost

Skylight is always free to use for all agencies sharing our mission of ending IUU fishing

User Interface

To access our AI-processed data instantly

API

To integrate and visualize our data within other MDA systems

Open-Source Models

To run our AI models against your own dataset

What Skylight Detects



AIS signals

Potential Transshipments

Potential Fishing Effort

Entry in Area of Interest

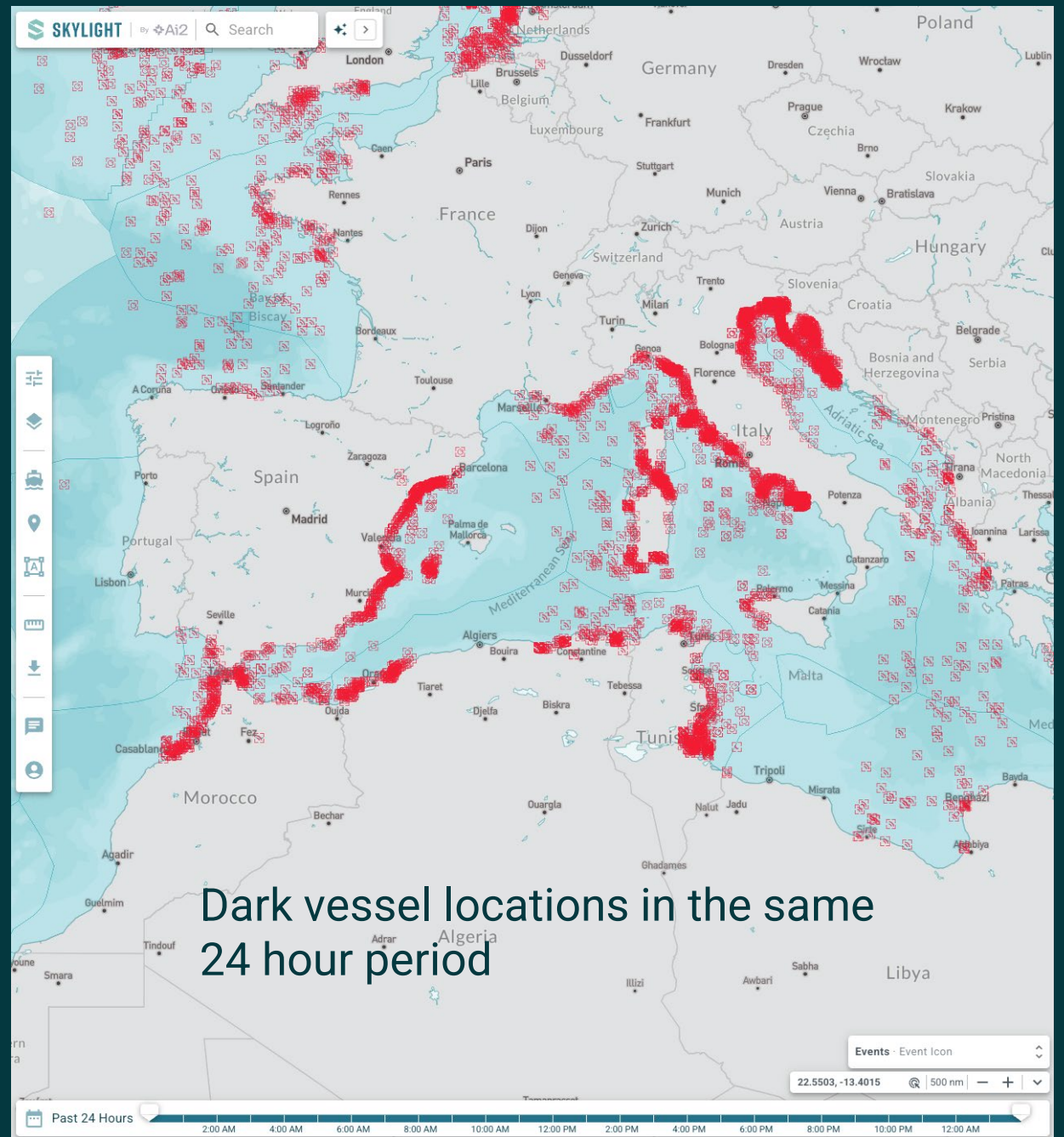
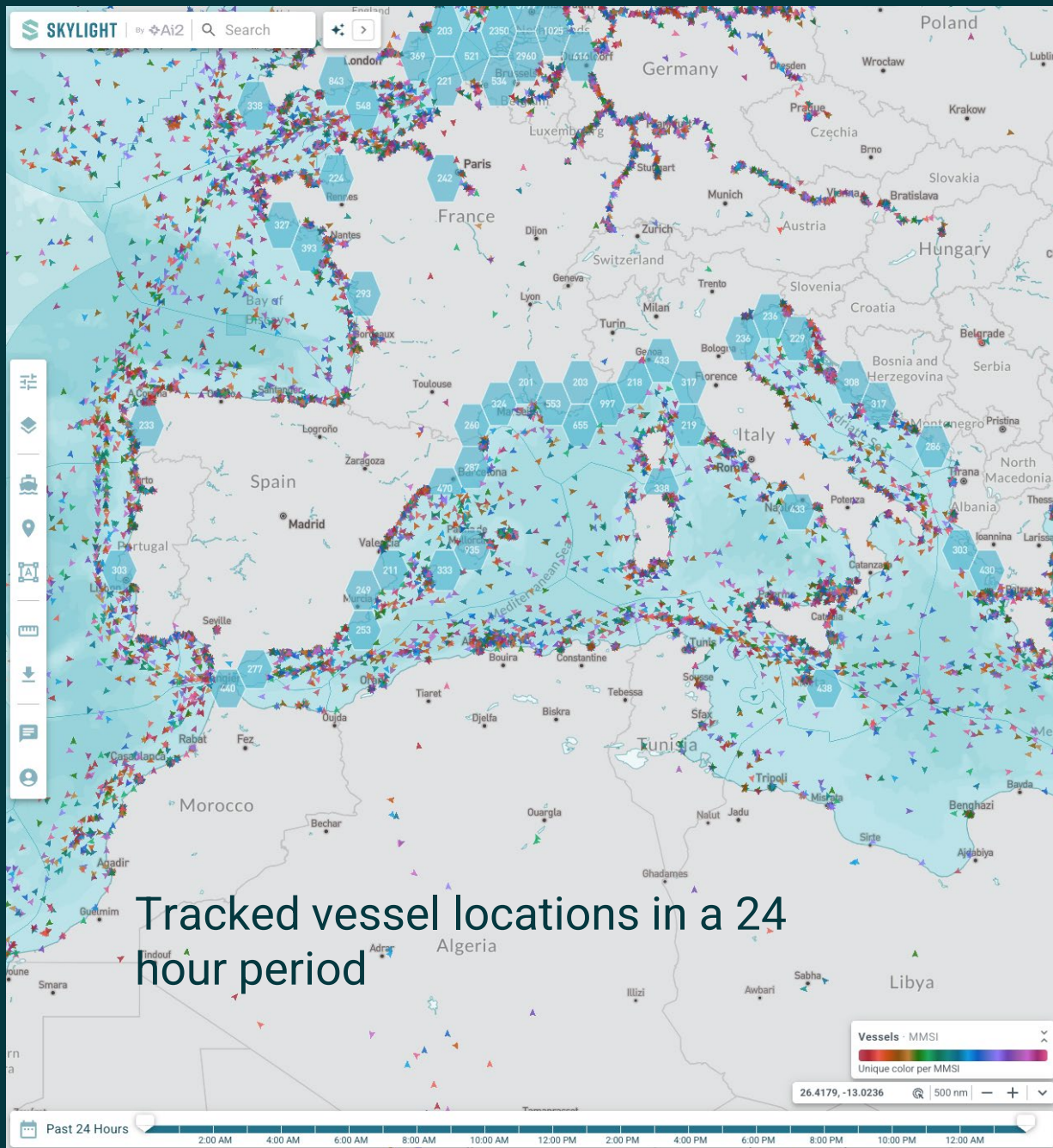
Speed Range Control



Satellite Imagery

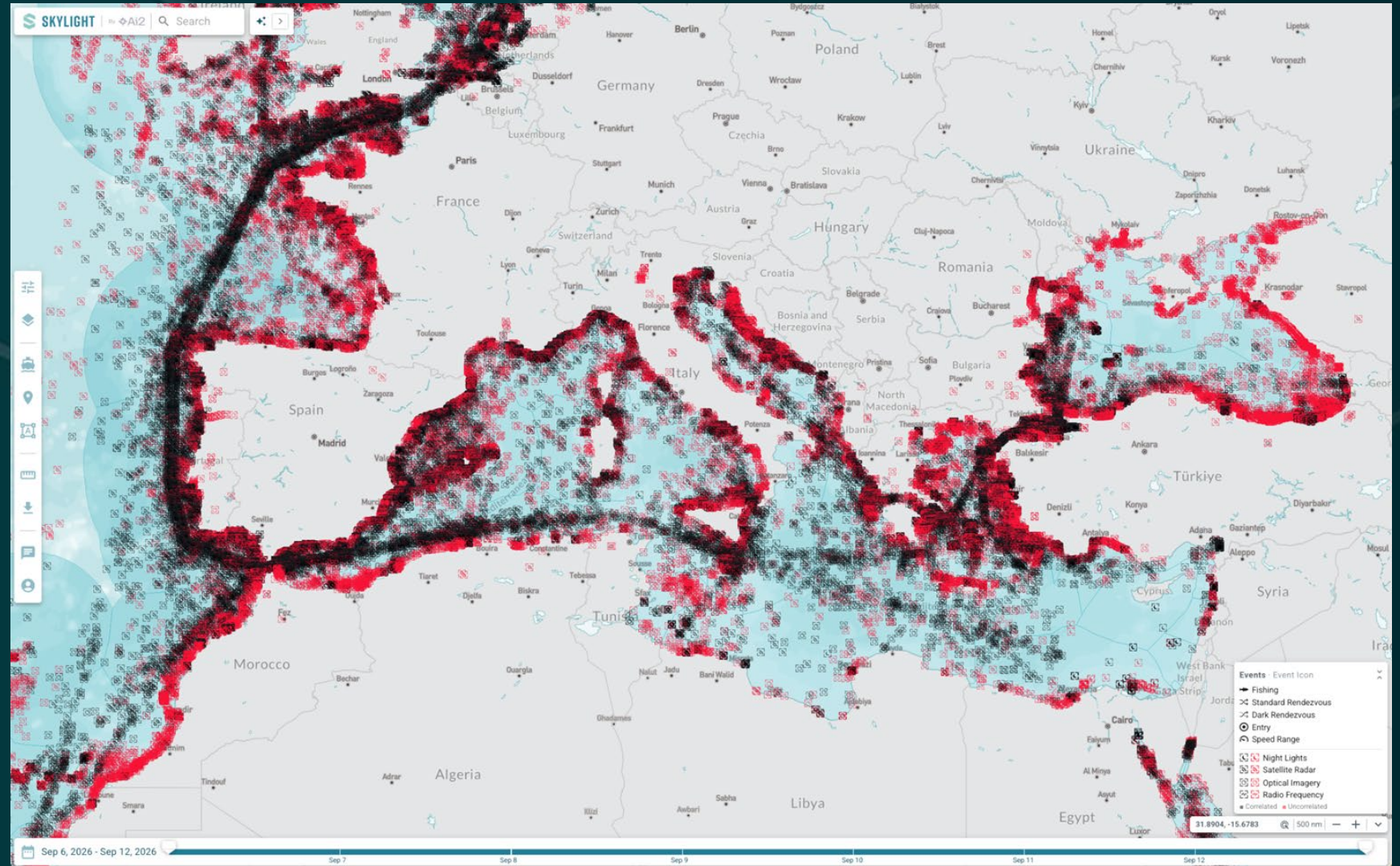
Vessel Detections

Vessel Attributes Estimates

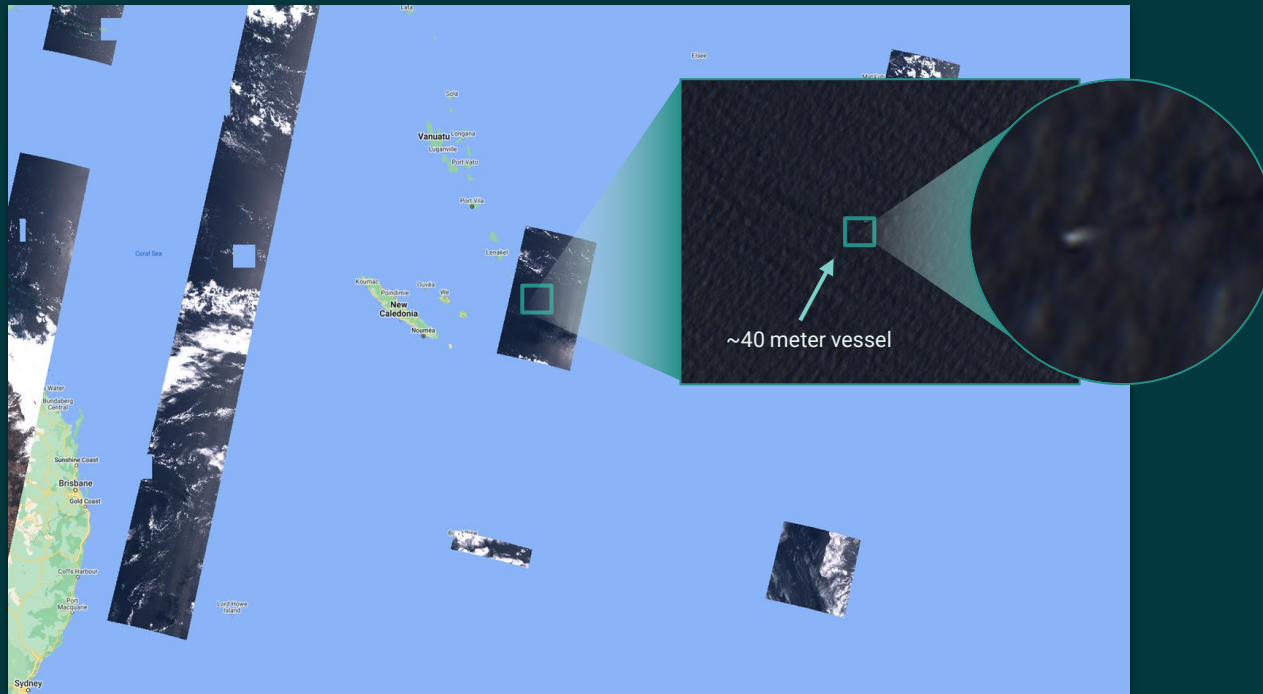




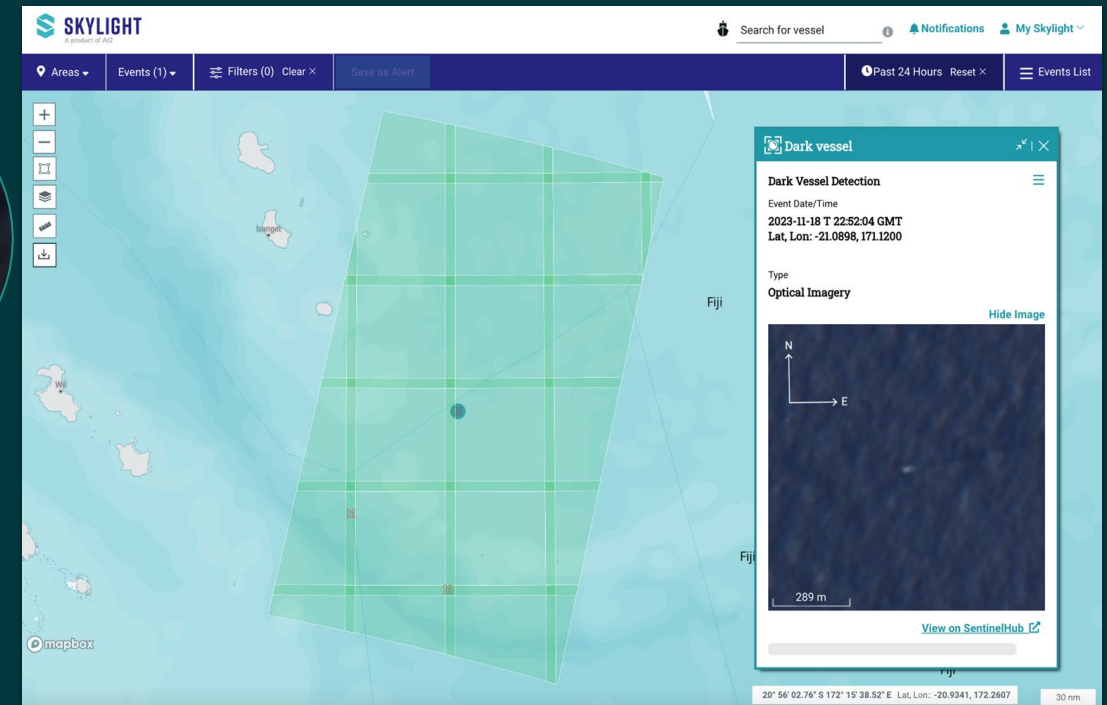
Skylight operates the largest non-profit satellite data infrastructure for vessel detection, processing public global imagery to identify over 20,000 vessels daily, enabling maritime analysts to track dark vessel activity at scale faster than anyone else.



Detecting Vessels from Space



Vessel detected by Computer Vision model in a 150,000 sq km (300 x 500 km) Sentinel-2 collection



The data and vessel as seen in the Skylight platform

Detection Process



Satellite Collection

A public satellite captures an image of a specific ocean area and transmits it to Earth as soon as it connects with the ground infrastructure.

AI-assisted Vessel Detection

Skylight's computer vision AI model analyzes satellite imagery and detects objects that match learned vessel shapes and characteristics.

AIS Correlation

A second AI process correlates AIS tracks at the location of the vessel detection. If an AIS match is found, Skylight links the detection to the vessel's information. If no correlation is identified, the vessel is marked as "dark."

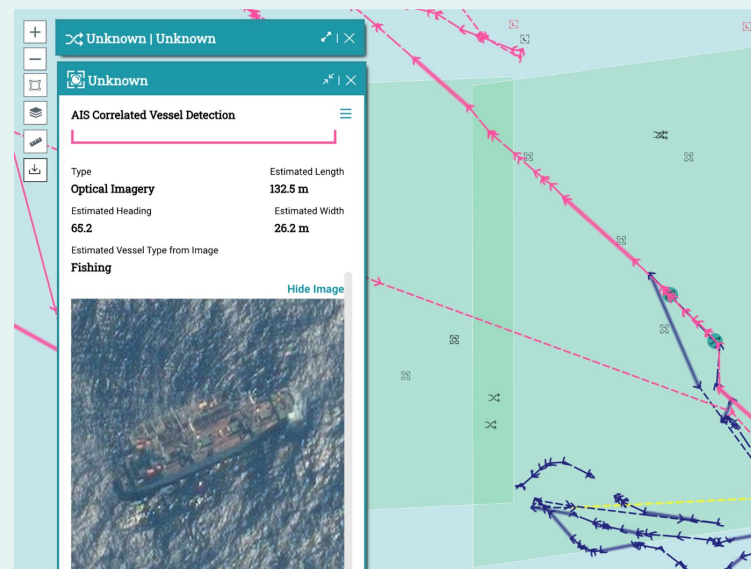
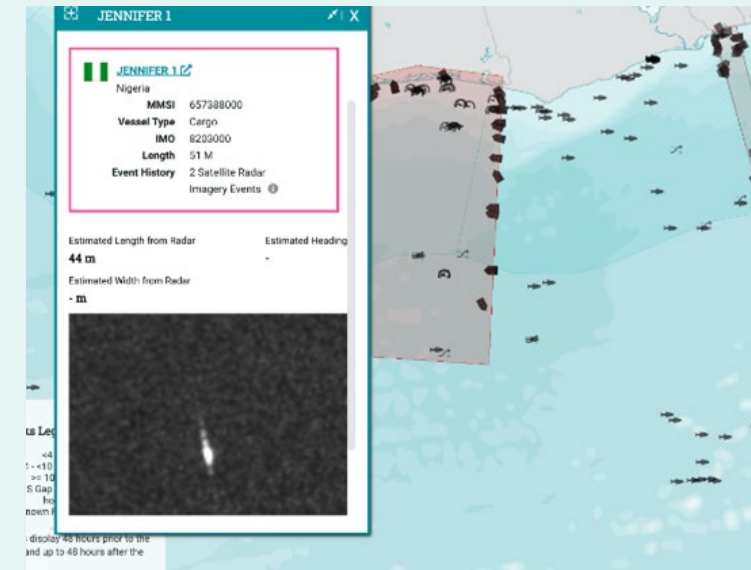
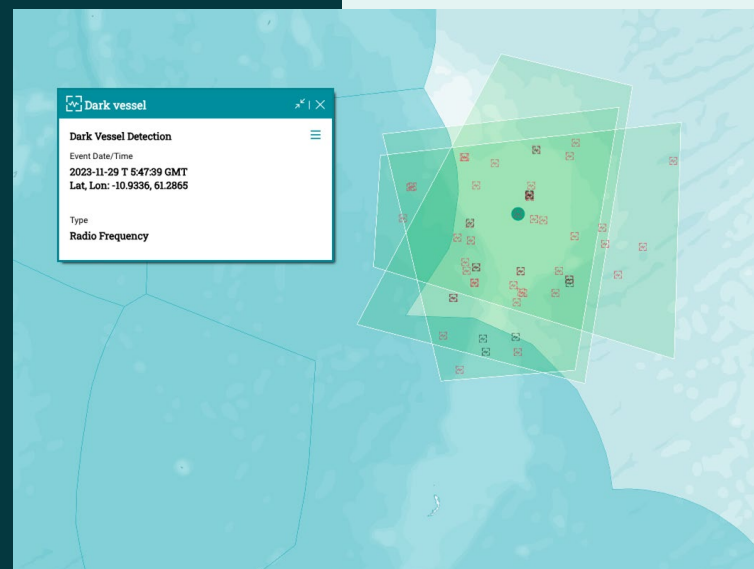
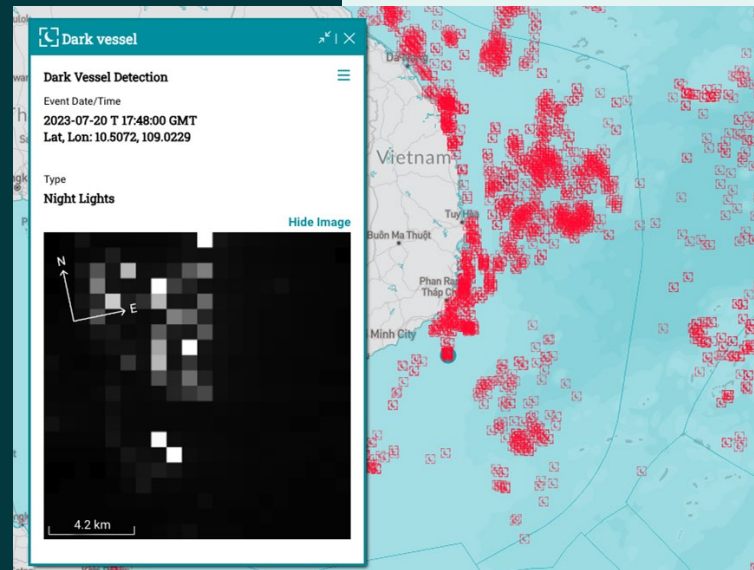
Detections appear in Skylight

1-3 hours (VIIRS)
2-6 hours (EO & SAR)

< 1 minute on average

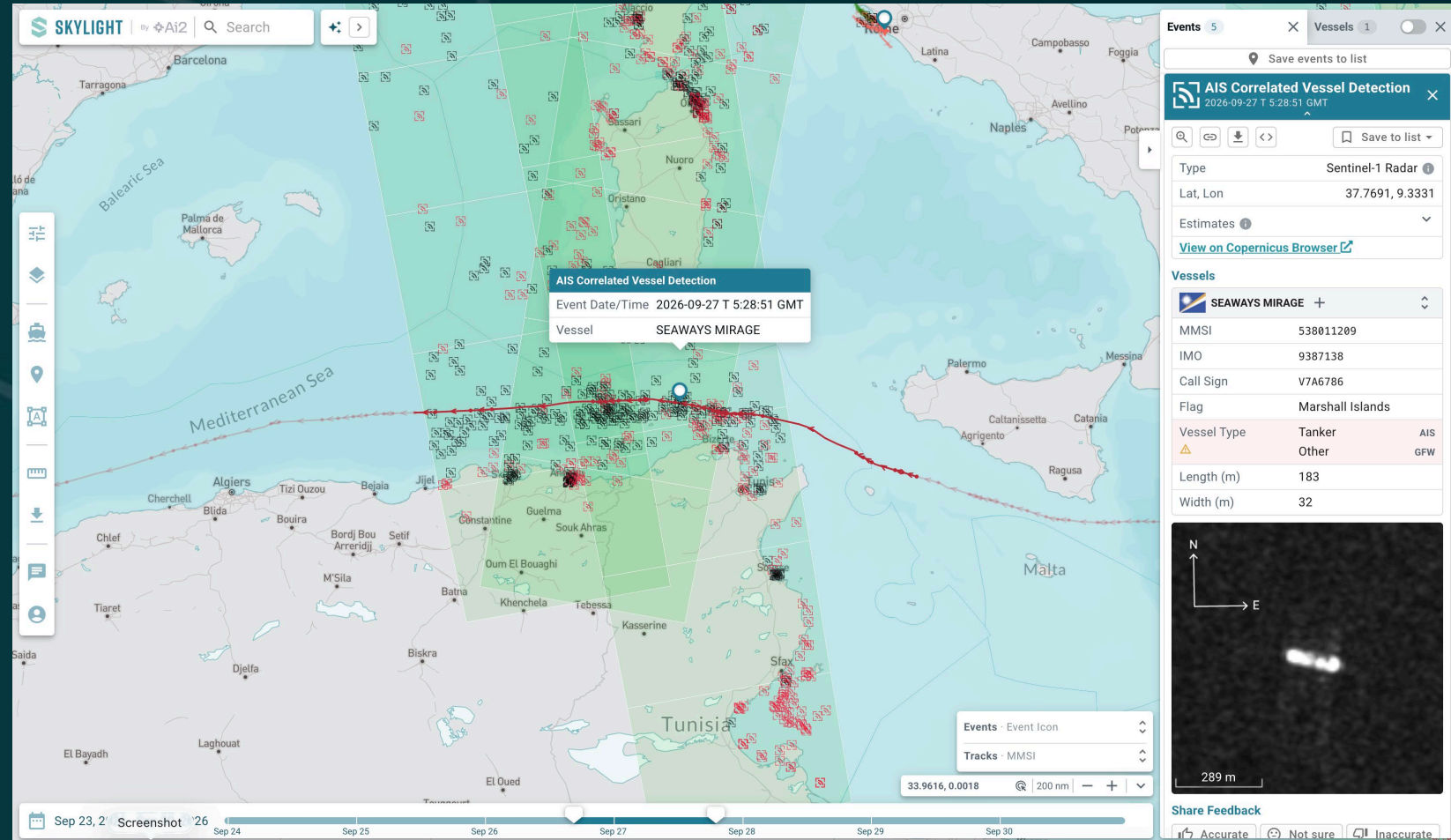
Vessel Detections

AI sifts through the full coverage of public satellite imagery from Sentinel 1 & 2, Landsat 8 & 9, and NOAA 20 & 21.



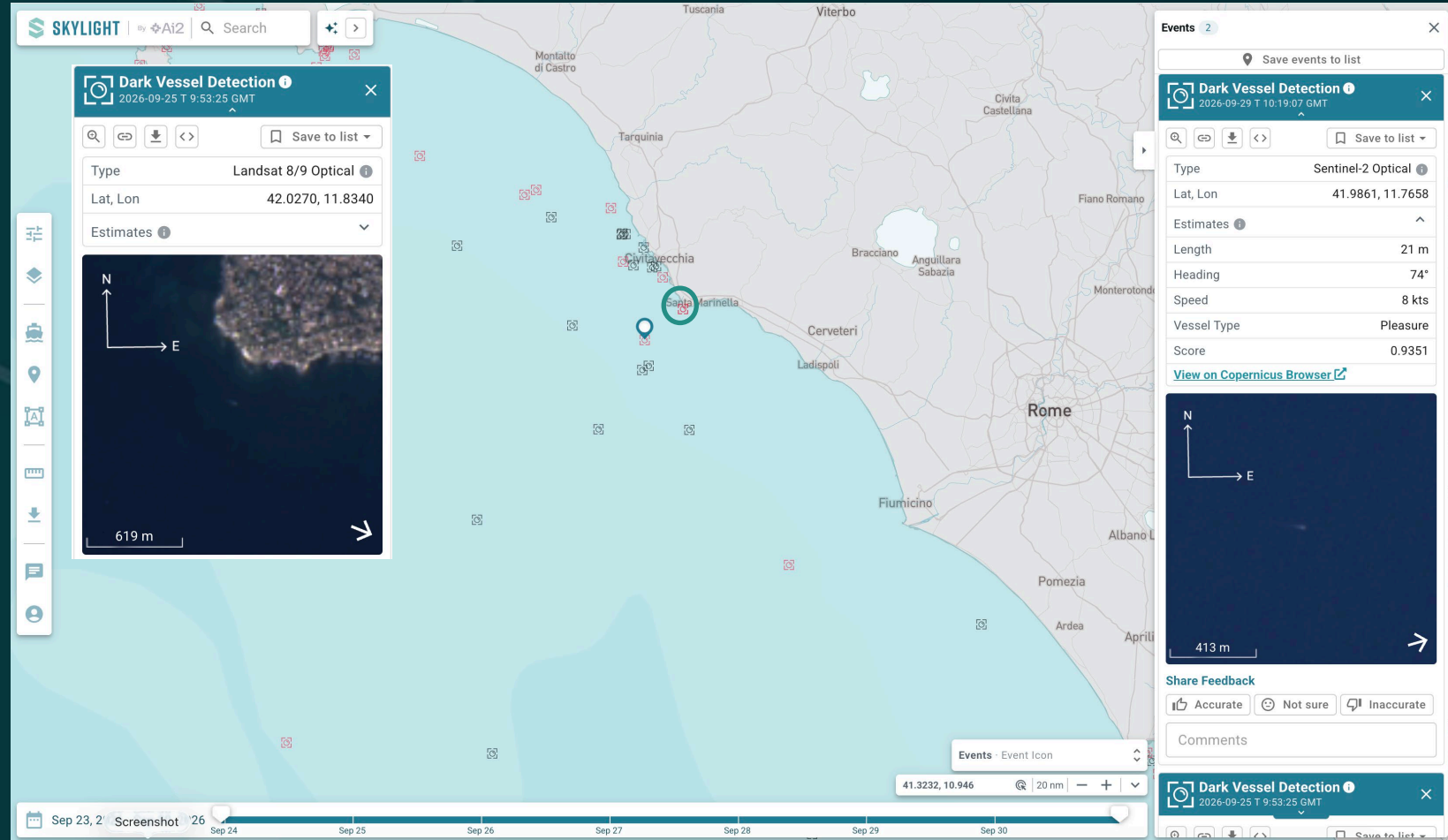
Satellite Radar

Skylight uses Sentinel 1 Synthetic Aperture Radar with computer vision to pinpoint potential illicit activities, regardless of weather conditions.



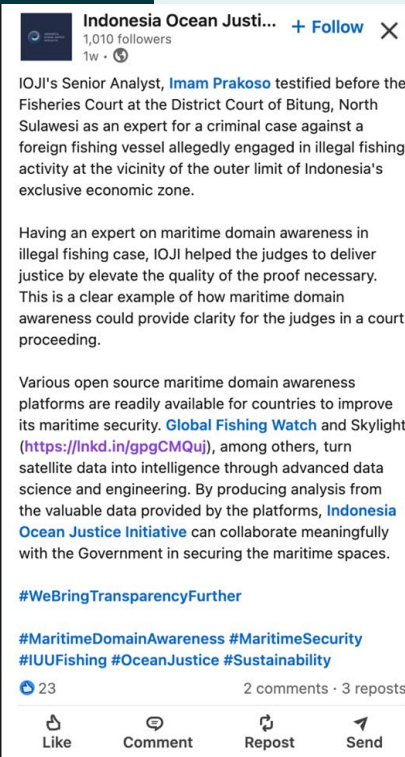
Optical Imagery

Through analysis of public optical imagery, including Sentinel2 and Landsat 8/9, Skylight's AI is capable of detecting a wide variety of vessels, including very small ones.





IOJI's Senior Analyst, **Imam Prakoso**, testified before the Fisheries Court at the District Court of Bitung, North Sulawesi as an expert for a criminal case against a foreign fishing vessel allegedly engaged in illegal fishing activity at the vicinity of the outer limit of Indonesia's exclusive economic zone.



Detections as Evidence

The Indonesia Ocean Justice Initiative (IOJI) utilized Skylight's satellite detections from Sentinel 1 and Sentinel 2 to identify pair trawlers operating in the northern part of the Indonesian EEZ.

They testified to their analysis in an illegal fishing case.



Figure 5C

Lon: 108.7
Age: 5.62

Date: July 22, 2025 03:16:00 (GMT)



Figure 5D

Lon: 106.74
Age: 5.58

Date: August 4, 2025 03:26 (GMT)



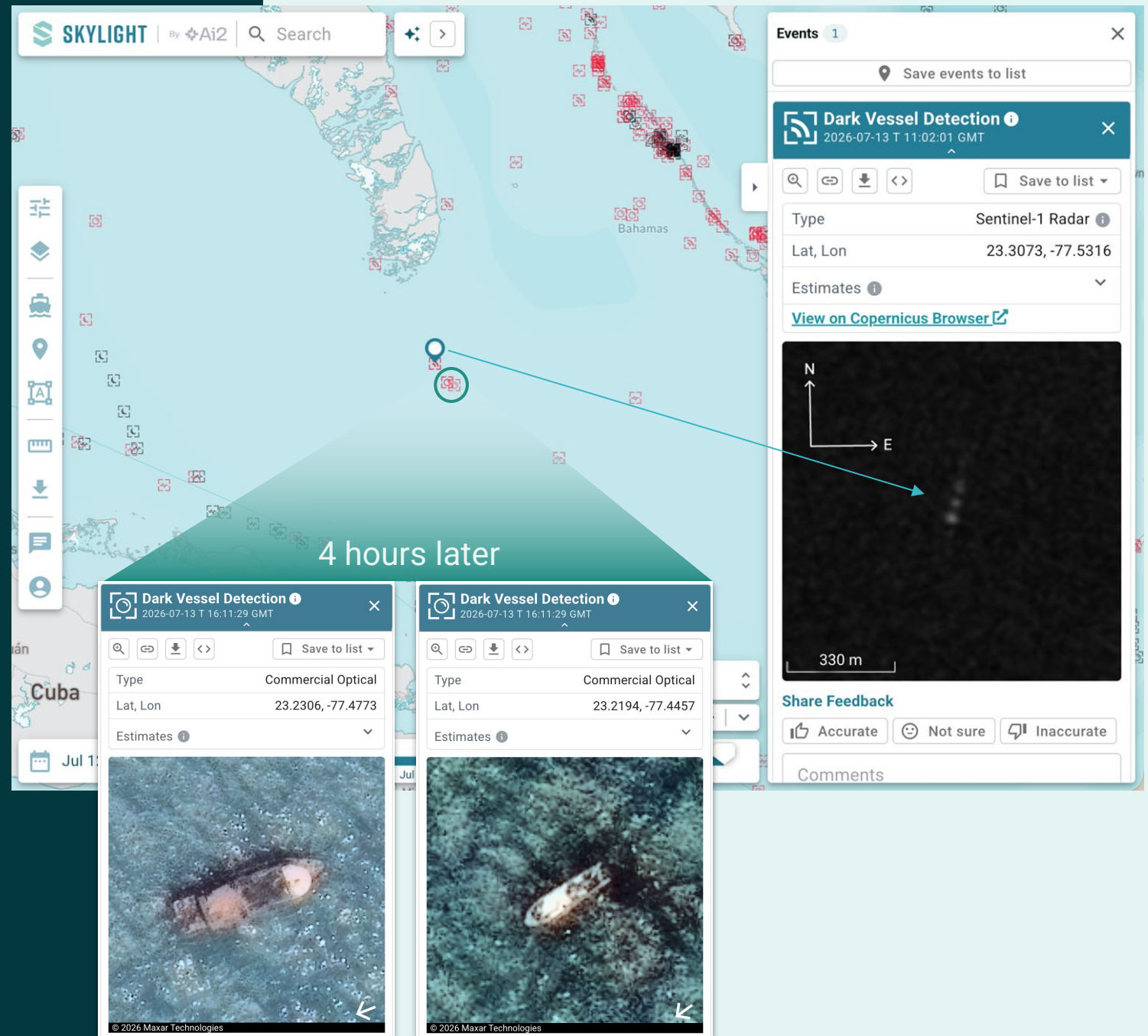
Figure 7. Vietnamese Fishing Vessels Is Supported By Other Vessel.

Enhance!

Using S1 SAR dark detections to tip high resolution satellites

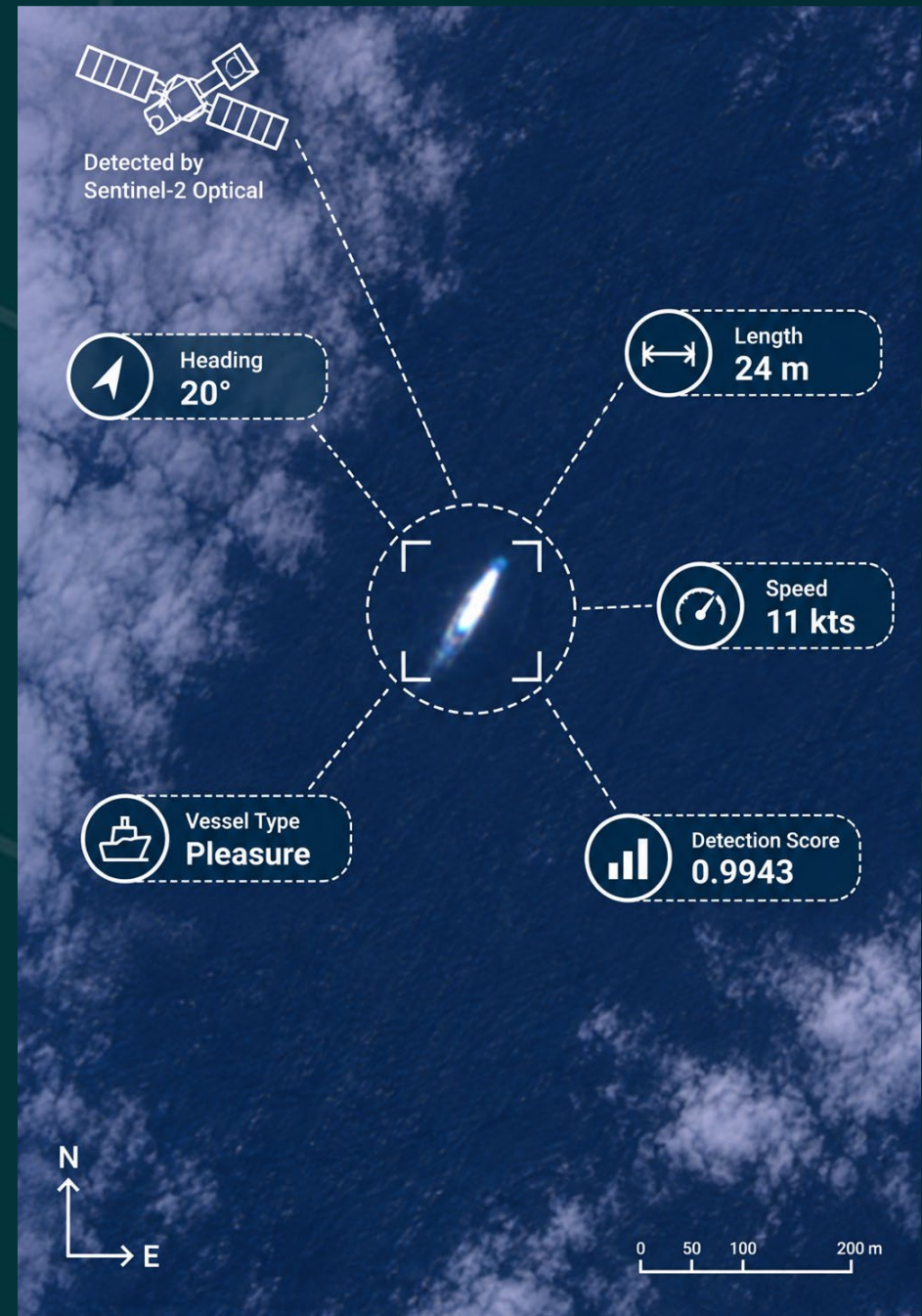
The Royal Bahamas Defense Force requested assistance from Skylight to detect vessels fishing illegally for lobster during the closed season.

A S1 dark detection automatically triggered Vantor Worldview Legion high-resolution imagery (35cm), which showed a suspicious vessel and its support boat. RBDF redirected their patrol vessel to investigate.



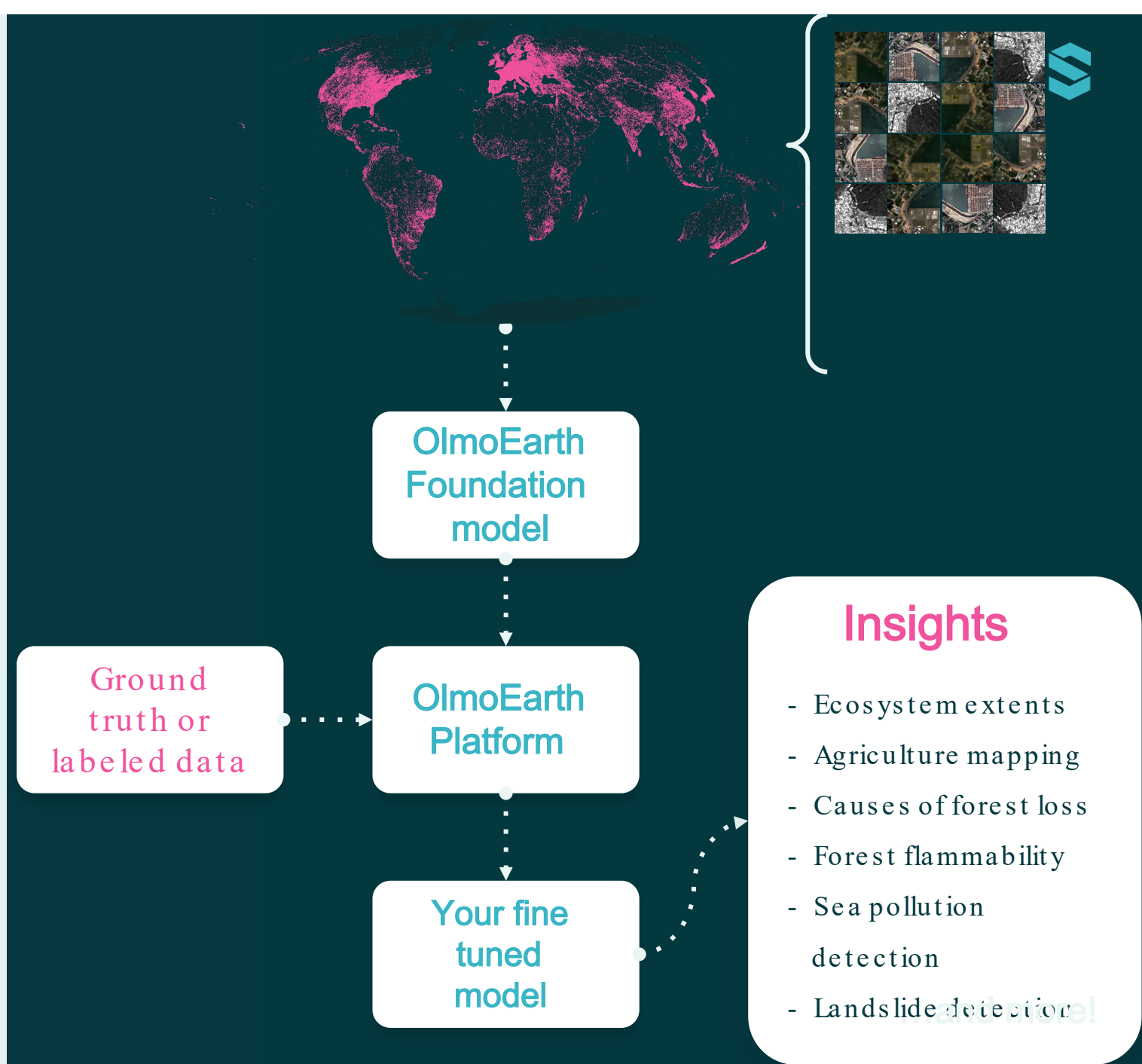
Seeing More in Every Detection

Because of Sentinel 2's higher resolution, Skylight's models can estimate vessel length, speed, heading, and type, all from a still image.



OlmoEarth

- **Foundation models** learn the context of **complex, global features**
- The **OlmoEarth platform** enables **fine tuning** model parameters allows users to to create a **high performance custom models**
- The **OlmoEarth platform** makes fine tuning **easy** and **efficient** for a variety of tasks

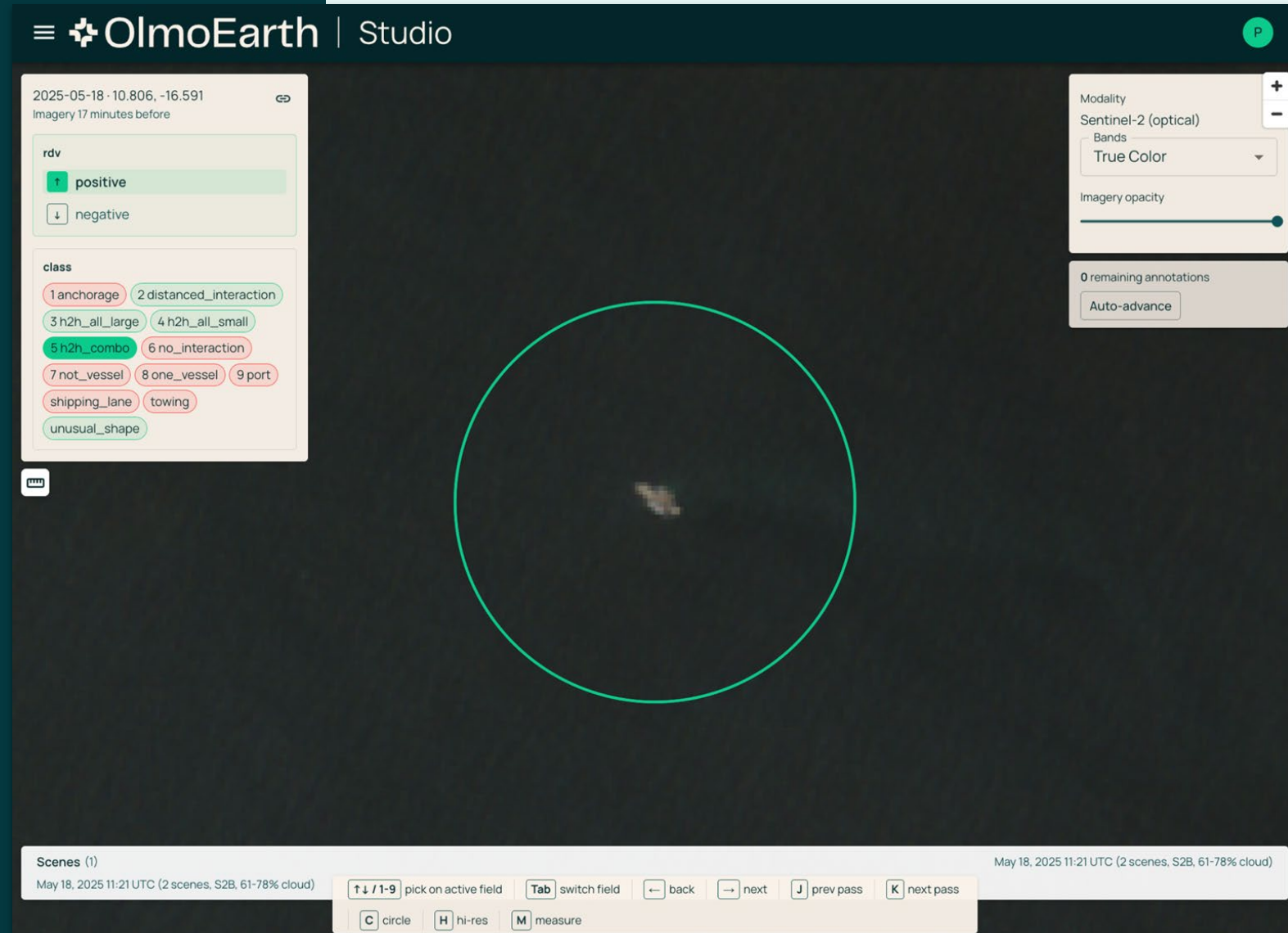


Coming up

Rendezvous in Sentinel 2 imagery

Using OlmoEarth, Skylight is developing a model to detect when two vessels are meeting using imagery alone.

Non-AIS rendezvous detection will give maritime analysts another tool to identify potentially illicit behavior.



Meet Shippy



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<https://www.skylight.global/>



SKYLIGHT

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