JOINT ANALYTICAL CELL

IMCS NETWORK

Global Fishing Watch

TMT

C4ADS

SKYLIGHT
A product of AI2

Skylight

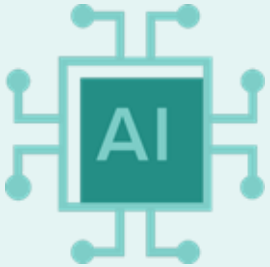
Regional Training Course for Fisheries Inspectors in the Implementation of Port State Measures (PSM)
29 September - 1 October 2026, SEAFDEC/TD, Thailand

Skylight

What is Skylight?

Founded by the Allen Institute for Artificial Intelligence (Ai2), Skylight is a non-profit research programme 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 data analysis of maritime activity.



World-Class AI Research

Skylight works with world-class AI researchers to develop the MDA technologies of tomorrow.

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

**Only selected data available through API*

Primary vessel detection data sources

Vessel Tracking Systems

The vessel emits signals that allow it to be tracked

VMS

AIS

Vessel Identity Known

Remote Sensors

Detection occurs even if the vessel is not transmitting signals.

Radars

Satellite Imagery

Radio Frequencies

Acoustic Sensors

Vessel Identity Unknown if no AIS

Data sources used by Skylight

Data sources used by Skylight by request

Data and insights available in Skylight

AIS signals

The vessel emits signals that allow it to be tracked

- Vessel Positions
- Potential Transshipments
- Potential Fishing Activity
- Entry in Area of Interest
- Speed Range Control

What Skylight detects

Satellite Imagery

Detection occurs even if the vessel is not transmitting AIS signals

- Vessel Detections
- Vessel Attributes Estimates*

**Sentinel-2 only*

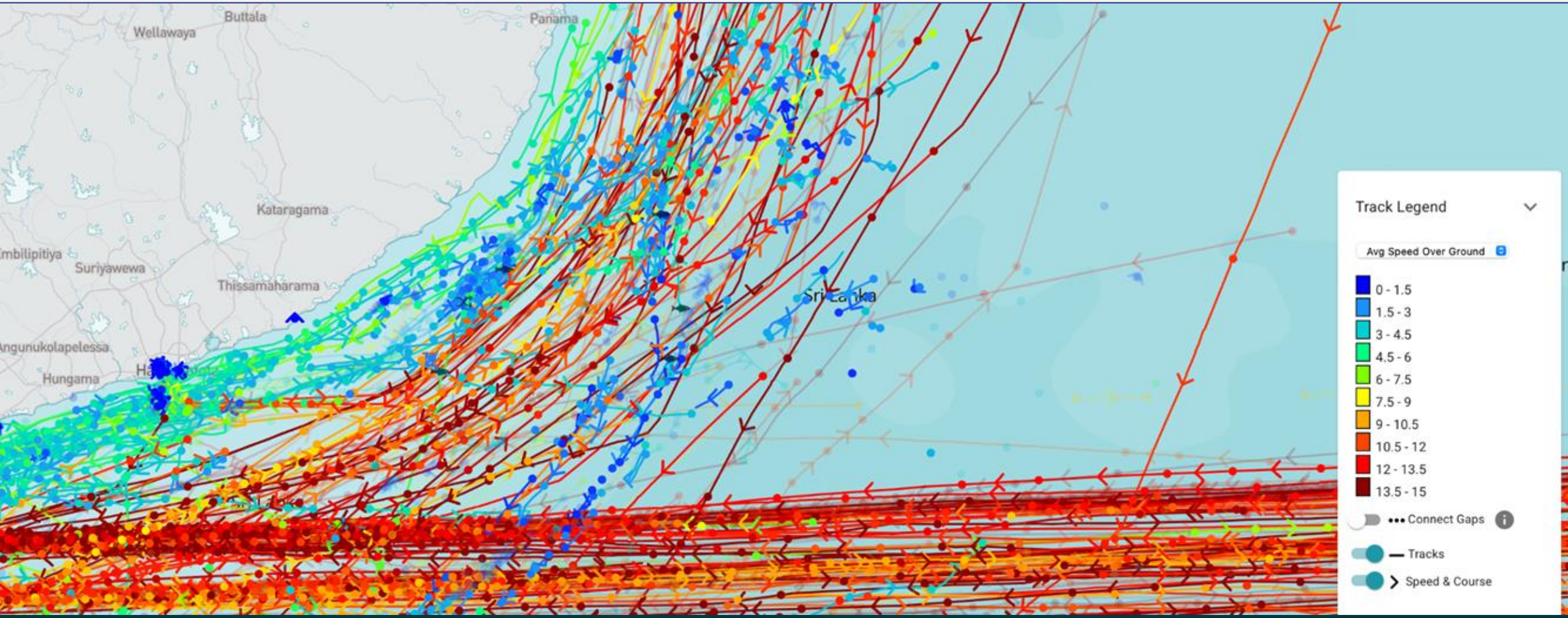
Considerations for a responsible use of AI in MDA

The AI models used by Skylight to surface maritime activity are primarily based on statistical algorithms, which means their outputs should not be interpreted as absolute truth. Instead, they represent **approximations or predictions of what the truth might be**, based on the patterns and data available at the time. These predictions are inherently probabilistic and should be understood within the context of uncertainty and model limitations.

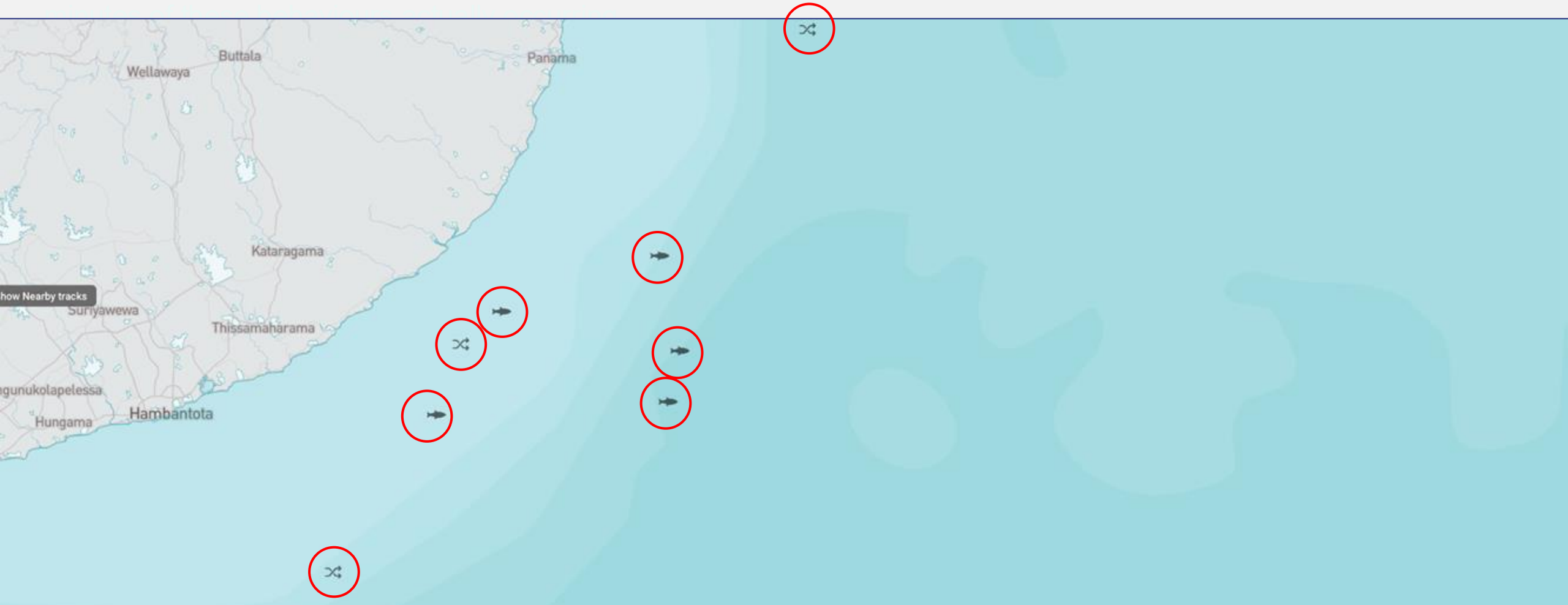
As a result, **AI-generated outputs from Skylight always require human validation**. Skylight's core function is to surface the most relevant and potentially significant maritime activity to enable analysts to prioritize their efforts more effectively in maritime surveillance-related tasks. Human validation is essential to bridge the gap between the AI model's prediction and the actual occurrence of the event.

It's also critical to understand that **AI does not know, decide, or determine legality**. Its role is to identify patterns in collected data and highlight potentially significant vessel activity. It is then the responsibility of maritime analysts to assess the legality of any AI-generated output manually, based on regulations in place.

How long would it take a maritime analyst to identify all vessels engaged in fishing or transshipment in this image?

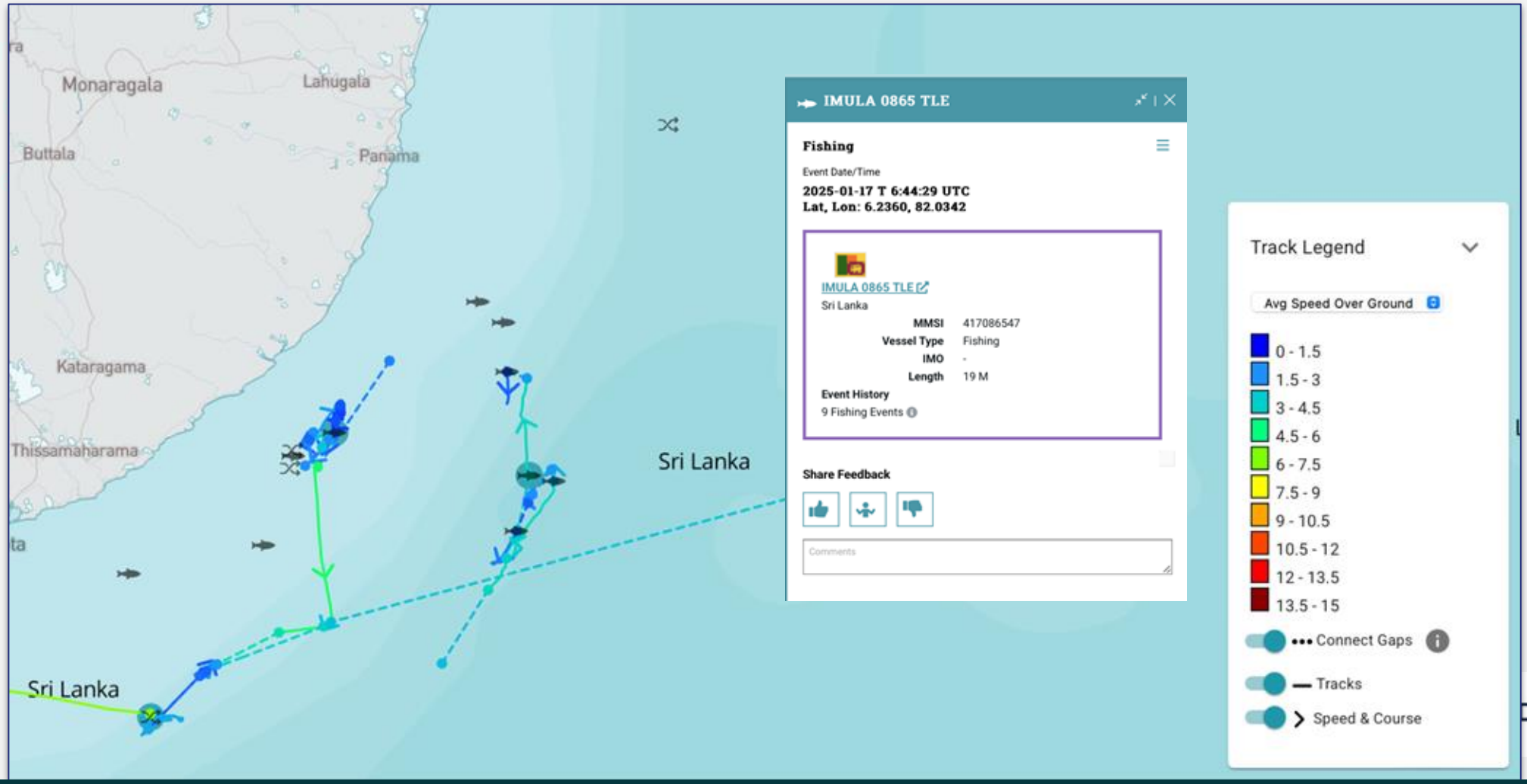


Skylight uses AI models to process the AIS data feed for you and is able to answer this question within a few minutes of these behaviours actually occurring.



Skylight AI models are based on predictions. Their purpose is to "**delete the noise**" and guide maritime analysts toward the most significant vessel activities for Monitoring, Control, and Surveillance (MCS).

However, **human input remains essential** to verify Skylight's predictions.

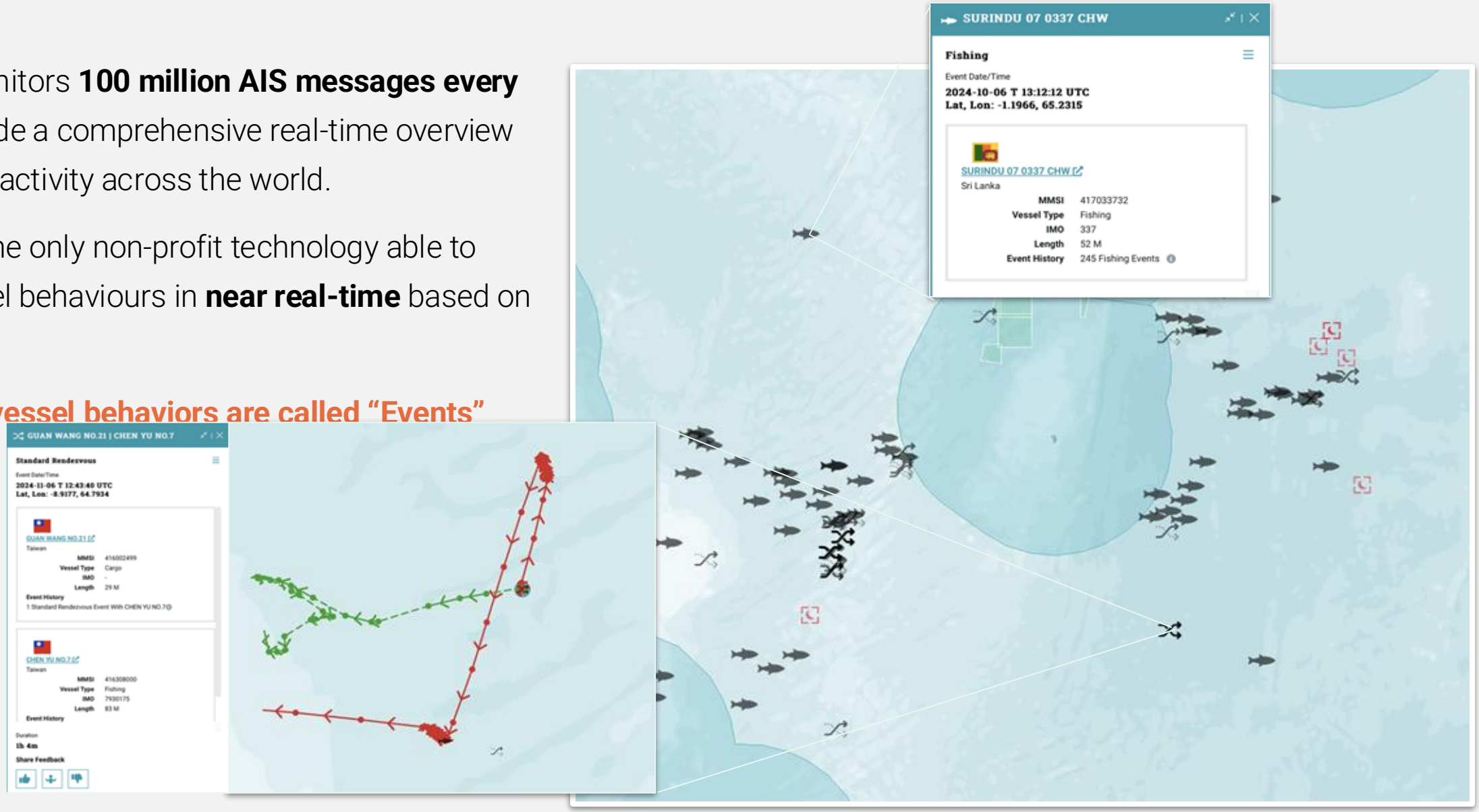


Real-time Detection of Vessel Behaviours

Skylight monitors **100 million AIS messages every day** to provide a comprehensive real-time overview of maritime activity across the world.

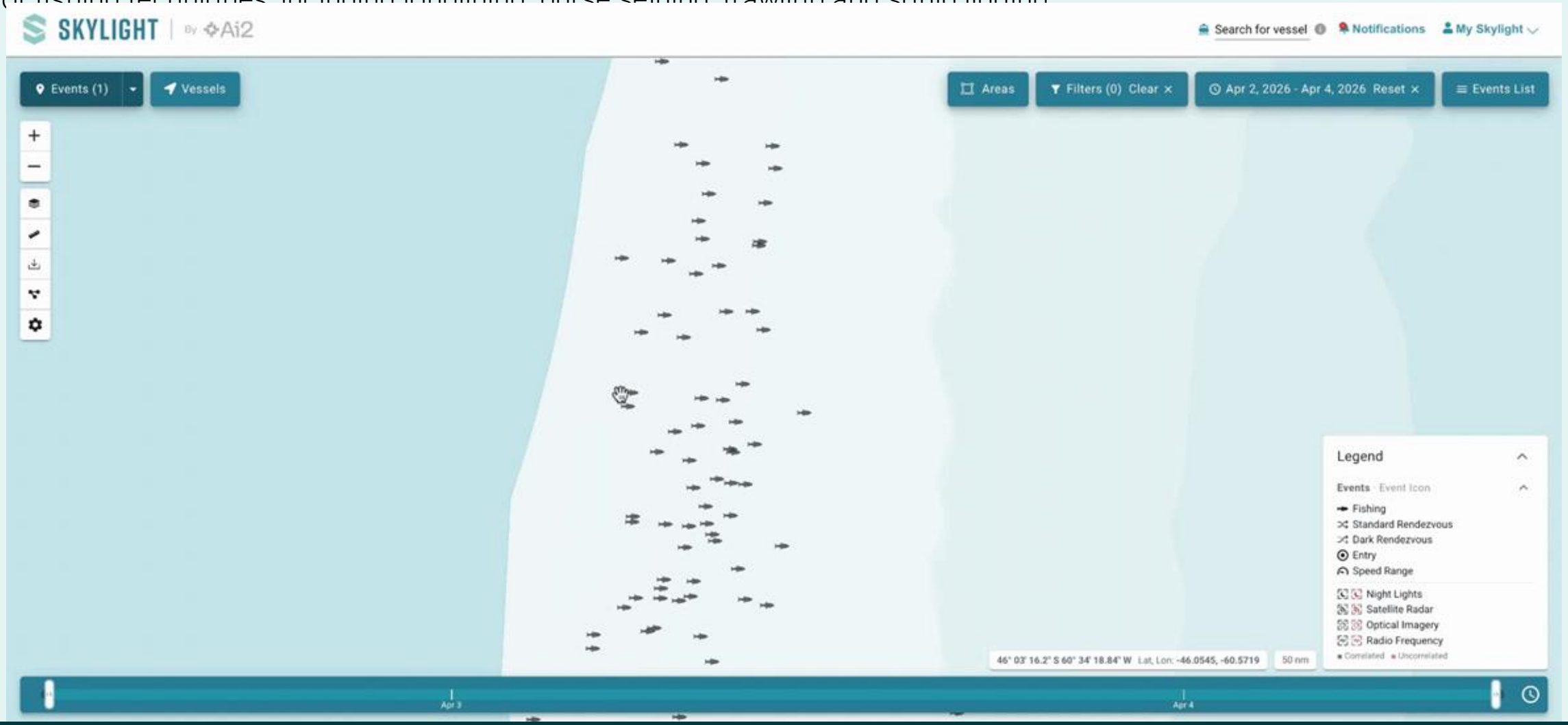
Skylight is the only non-profit technology able to detect vessel behaviours in **near real-time** based on AIS.

AI-derived vessel behaviors are called “Events”



A **Fishing Event** is created when the vessel behavior classification model detects fishing activity based on AIS signals.

When the model identifies fishing behavior, a corresponding Fishing Event is marked on the map. A vessel may engage in fishing multiple times during its journey and can be associated with multiple Fishing Events. The model is capable of detecting a variety of fishing techniques, including longlining, purse seining, trawling and squid jigging.



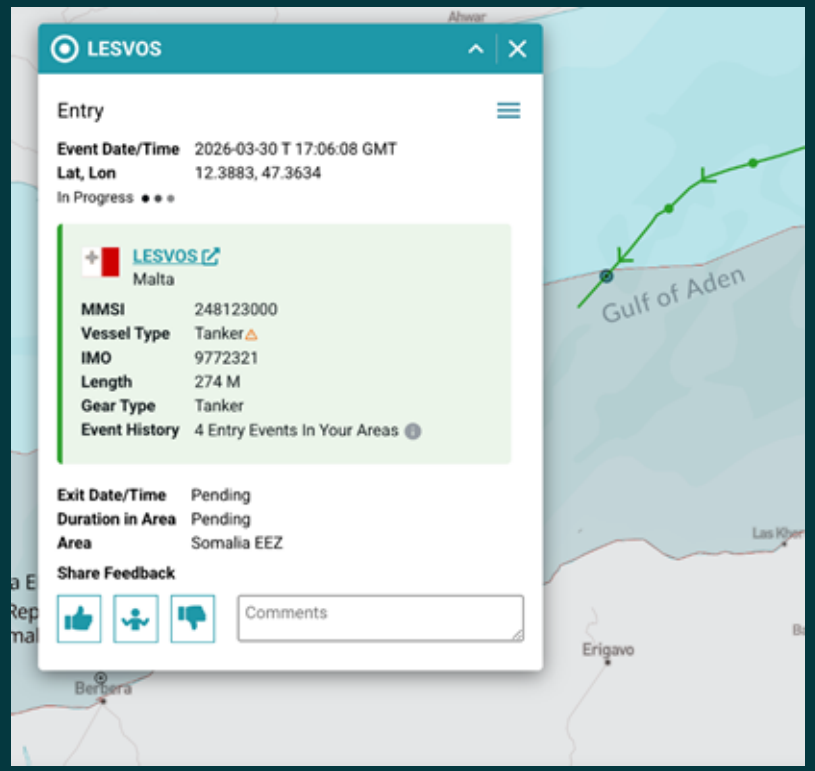
A **Standard Rendezvous** indicates potential transhipment behaviour between two AIS-transmitting vessels

Generated using a defined set of rules:

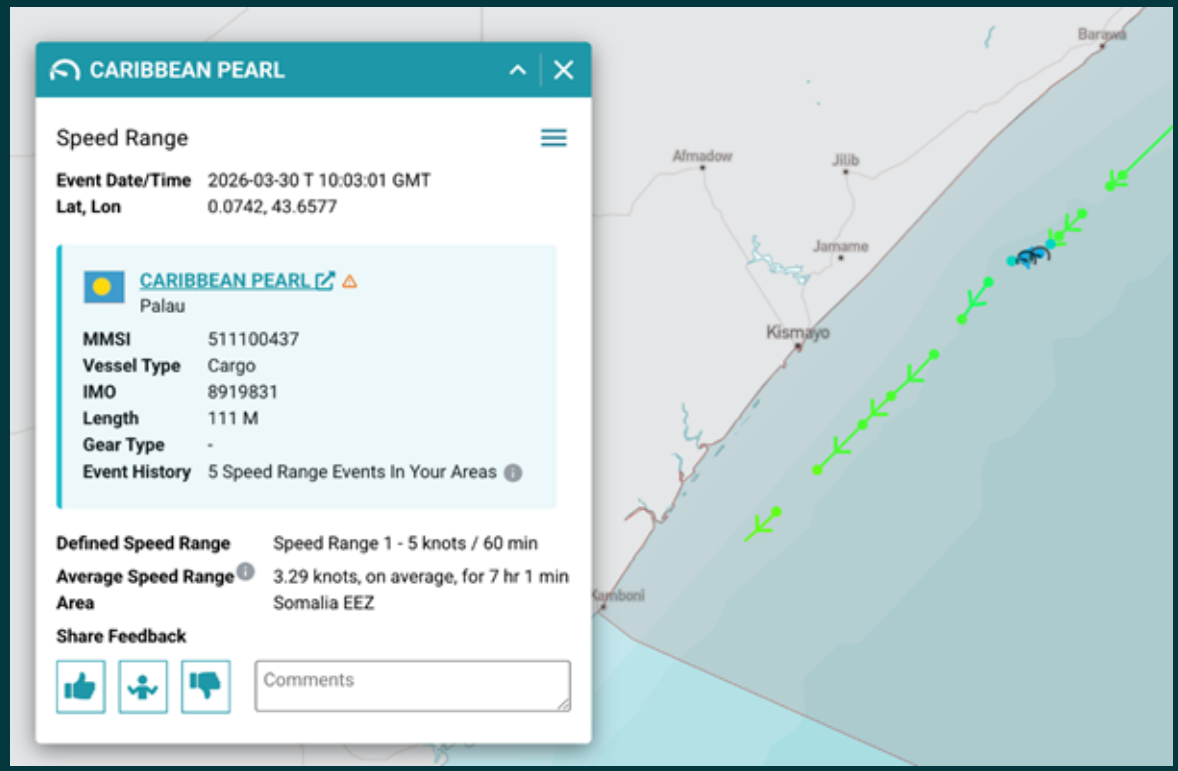
- **Two AIS** signals within **250 m** of each other
- Time together is **30 minutes** or more
- Speeds less than **4 knots**
- Distance from coast is greater than **10 km**

A **Dark Rendezvous** indicates a transshipment-like behavior between one AIS-transmitting vessel and another vessel that is **not** broadcasting AIS. If other vessels were transmitting AIS nearby, Skylight will detect and list those vessels in the vicinity. This allows users to identify nearby vessels that may potentially have participated in or been present during the encounter.

Two other types of events can be created specifically for the purpose of Area of Interest (AoI) monitoring.



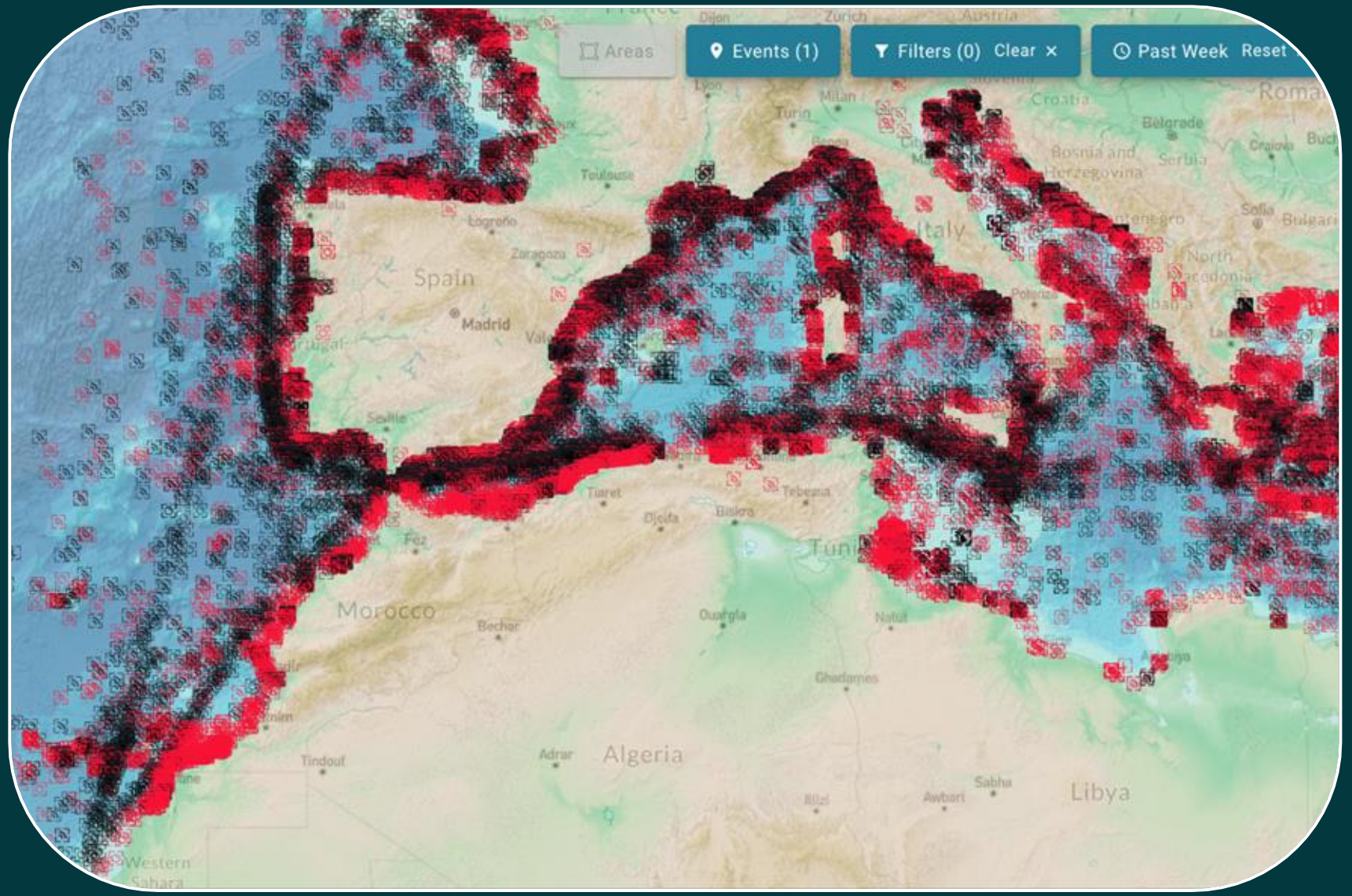
Entry Event in an Area of Interest



Speed Range Event in an Area of Interest

Skylight has developed the largest non-profit satellite data infrastructure dedicated to vessel detection — transforming how maritime analysts interpret dark vessel activity at scale. Every day, we detect over 20,000 vessels using satellite imagery alone.

We can process public satellite imagery for vessel detection globally, faster than anyone else in the world.



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 AI model analyzes satellite imagery and detects objects that match learned vessel shapes and characteristics.

AIS Correlation

A second AI layer utilizing machine learning performs AIS correlation at the specific location where the vessel was detected. If an AIS match is found, Skylight links the detection to the vessel's available information. If no correlation is identified, the vessel is marked as "dark."

Uploading the detection on Skylight

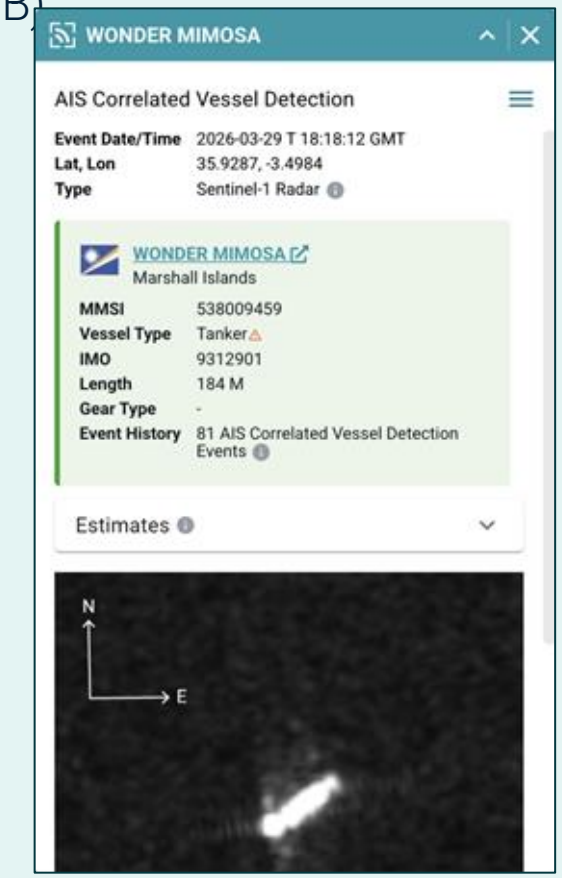
1-3 hours (VIIRS)
2-6 hours (EO & SAR)

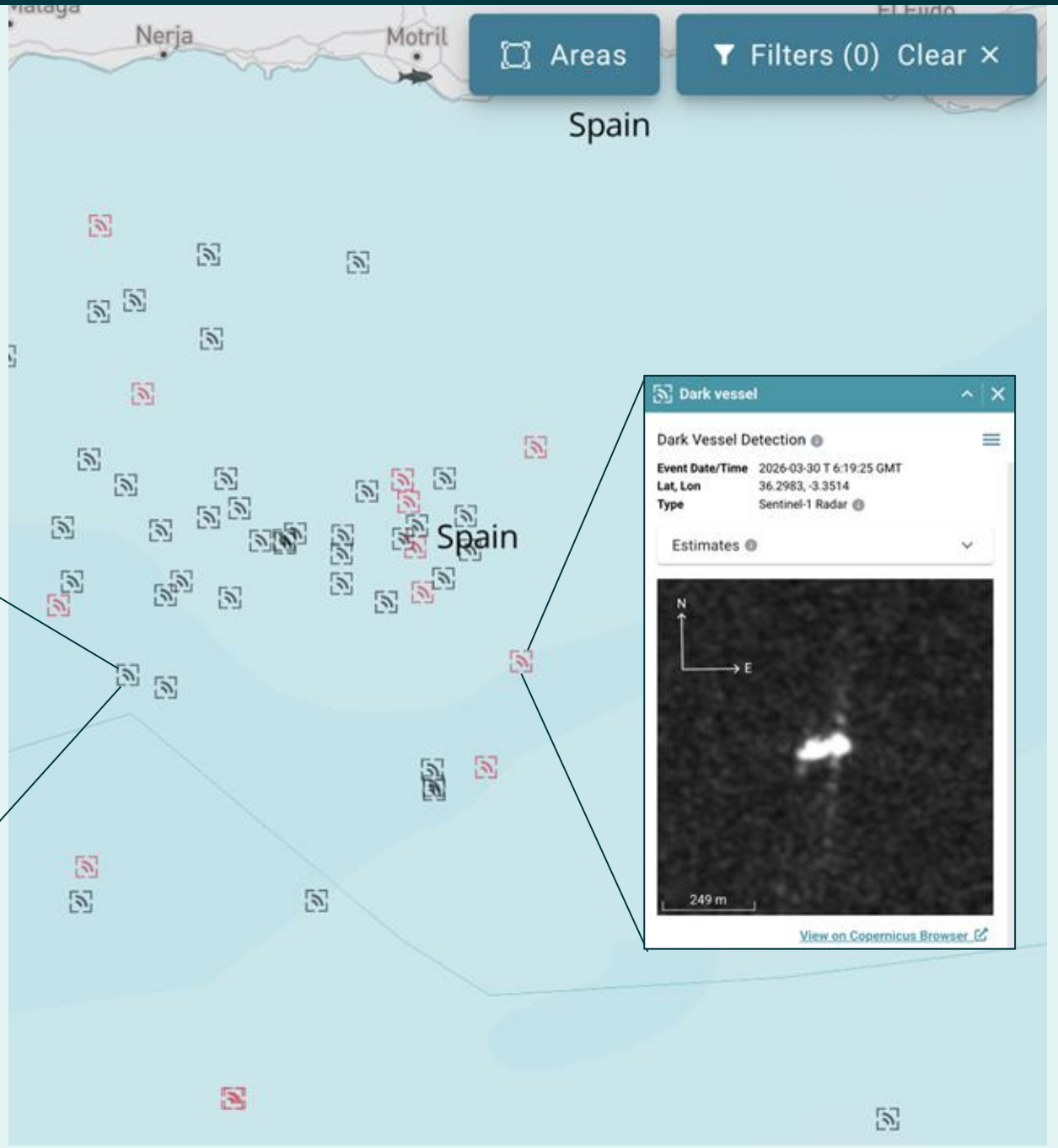
< 1 minute on average

› Satellite Radar (SAR)

Synthetic Aperture Radar (SAR) can penetrate through clouds, making it a useful tool to detect vessels in any weather.

Skylight process imagery for vessel detections from Sentinel-1 (A & B).

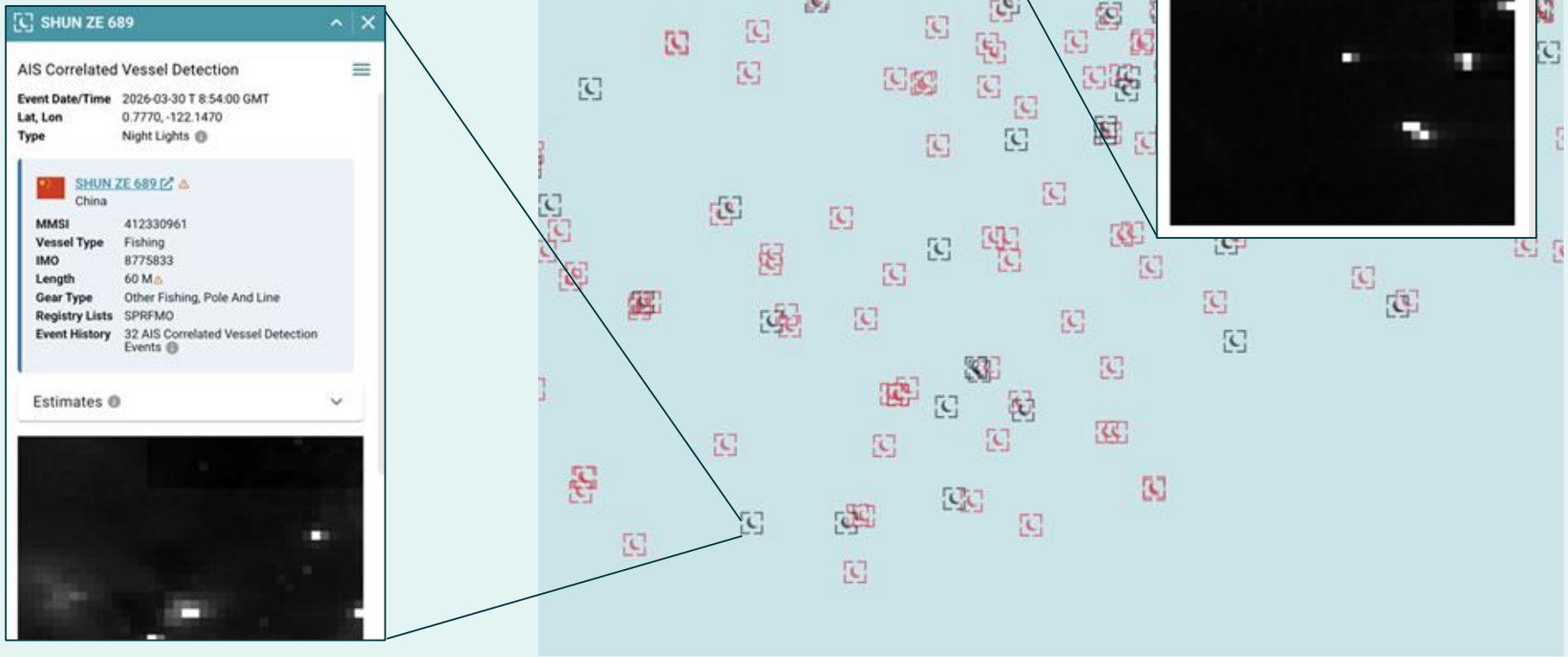




› Night Lights (VIIRS)

Boats emitting light at night are differentiated from other light sources and displayed globally from three different satellites every night.

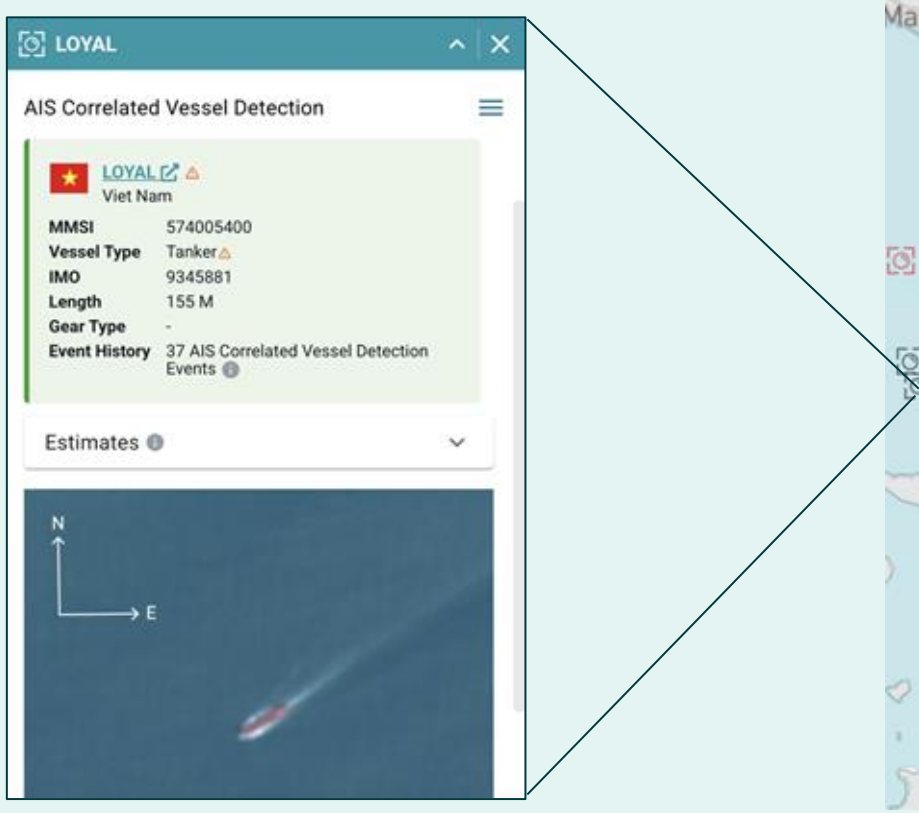
Skylight processes VIIRS satellite imagery for vessel detection from Suomi NPP, NOAA-20, and NOAA-21.

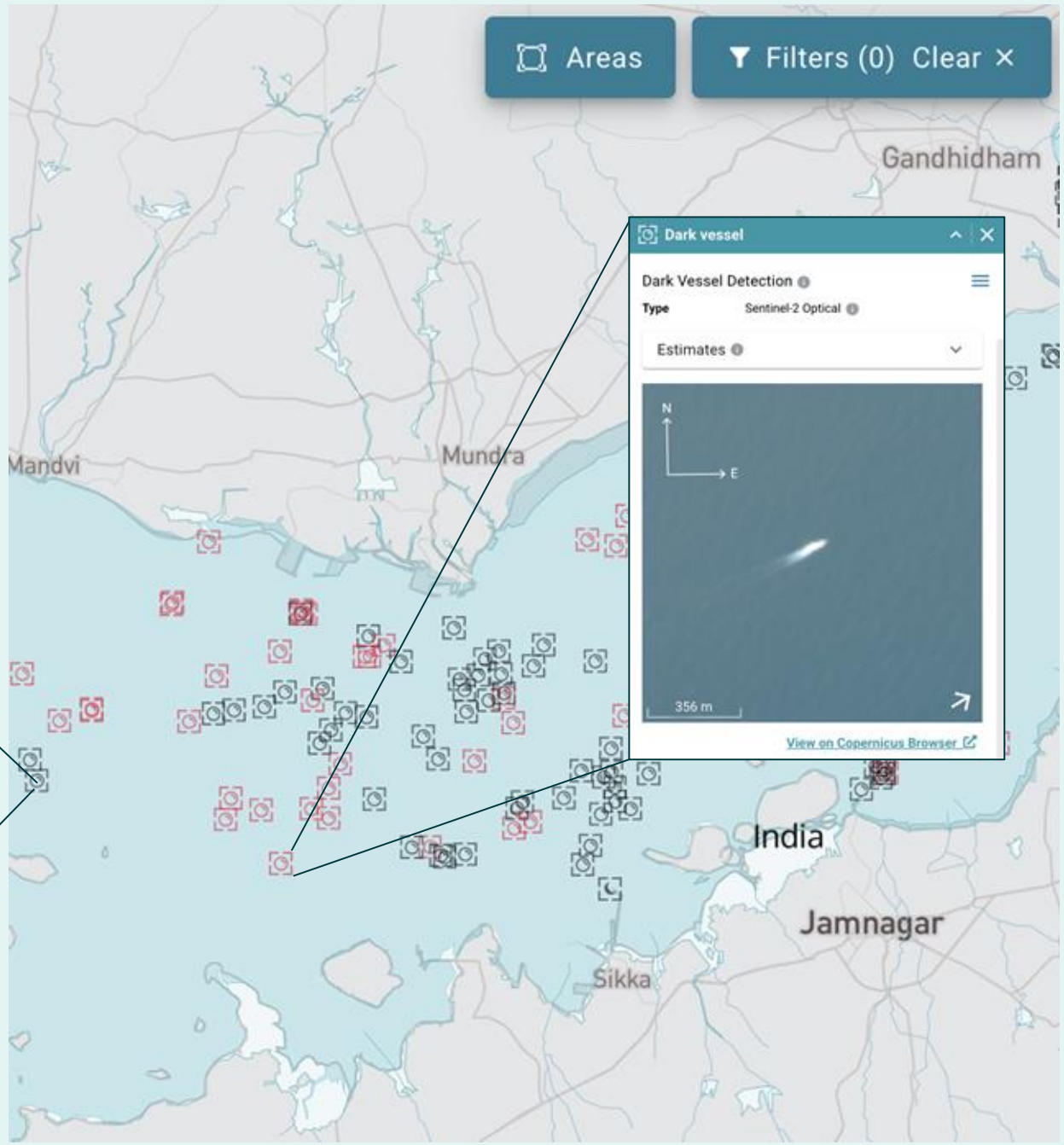


› Electro-Optical (EO)

Like a photograph of the water from space, optical imagery from Earth observation satellites offer a snapshot of vessels on the water.

Skylight process imagery for vessel detection from the Sentinel-2 (A, B & C) and Landsat-8 and Landsat-9.





Limitations of Satellite-Based Vessel Detection

Satellites follow fixed orbits and can only pass over an Area of Interest at predetermined intervals, meaning their paths cannot be adjusted on demand. Additionally, because satellites move quickly across an EEZ, they can capture images but not continuous video.

Due to these constraints, satellite surveillance is inherently **static**—it provides a snapshot of a vessel at a specific location and time. In contrast, tracker-based monitoring (e.g., AIS and other systems) enables dynamic tracking of vessel activity over time.

With current technology, it is **generally not possible to determine the identity of a dark vessel** from a single satellite image alone. When a satellite detects a dark vessel, Skylight can only provide the time and location of the detection.

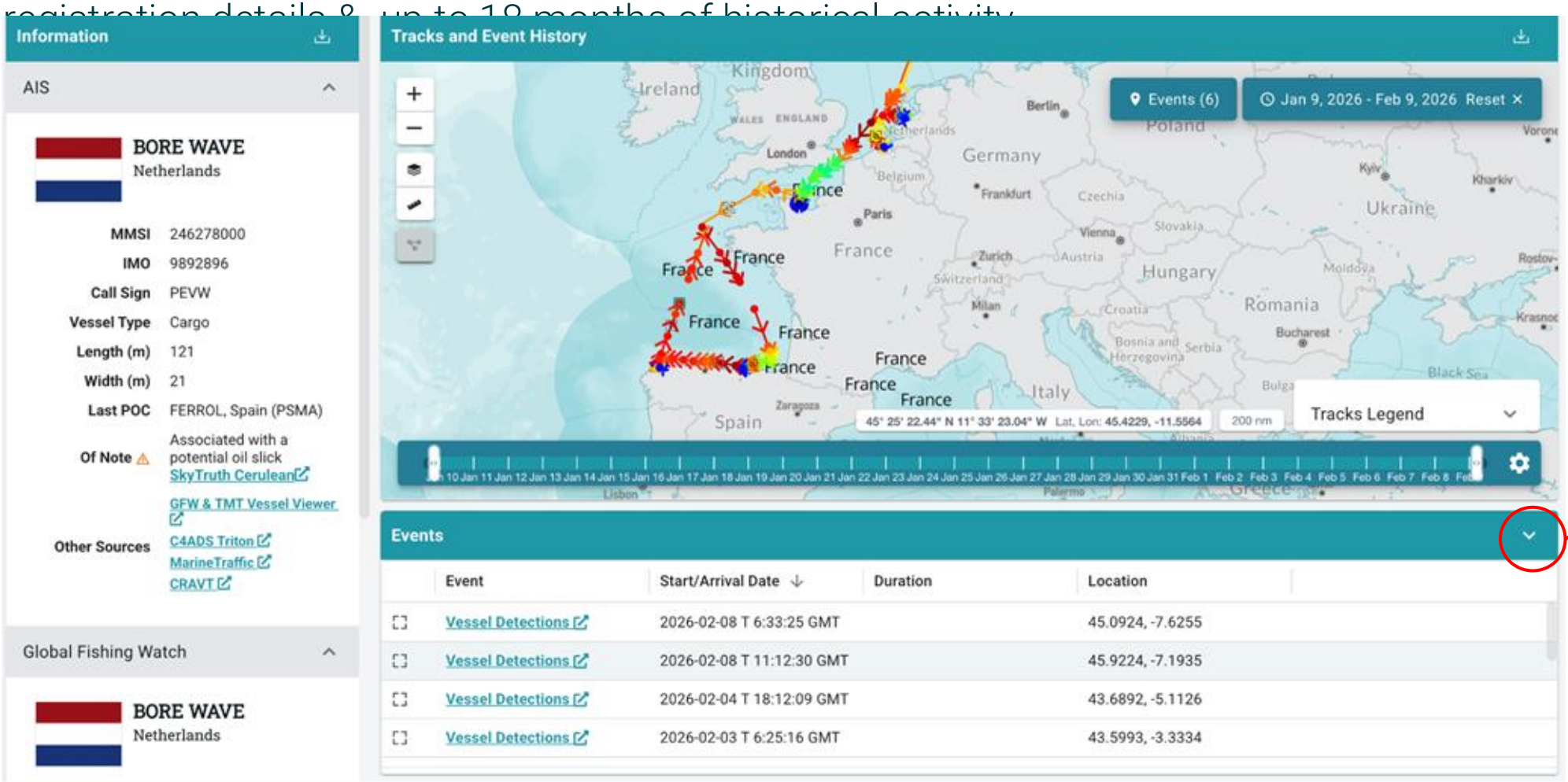
To receive satellite detections as close to real-time as possible, we invite you to monitor the satellite collection schedule to know precisely in advance when the next satellite will pass over your EEZ. The satellite collection schedule can be accessed here.

Vessel Detection Capabilities

Type of Data	Symbol	Resolution	Swath	Coverage areas	Latency	Revisit	Strengths	Weaknesses
Satellite Radar (SAR)		10m	Moderate	Many continental coastlines	2-6 hours	6 days	Weather-independent	Minimal detail about vessels
Night Lights (VIIRS)		Detects bright lights	Very Large	Global (incl. International waters)	1-3 hours	> 2x per night	Global coverage High revisit rate Low latency	Weather-dependent (clouds, moonlight) Multiple vessels can appear as one No details about vessels
Optical Imagery (Sentinel 2)		10m	Moderate	Many EEZs	2-6 hours	3 days	Vessel attributes and behaviours can be estimated	Weather-dependent (sunlight + no clouds)
Optical Imagery (Landsat 8&9)		15m b/w band 30m color	Moderate	Many EEZs	2-6 hours	8 days		

› Vessel Details Page

Users investigating specific Vessels of Interest can refer to the Skylight Vessel Details Page, which provides comprehensive information on each vessel. This includes identity, vessel type, flag state, and registration details & up to 18 months of historical activity.

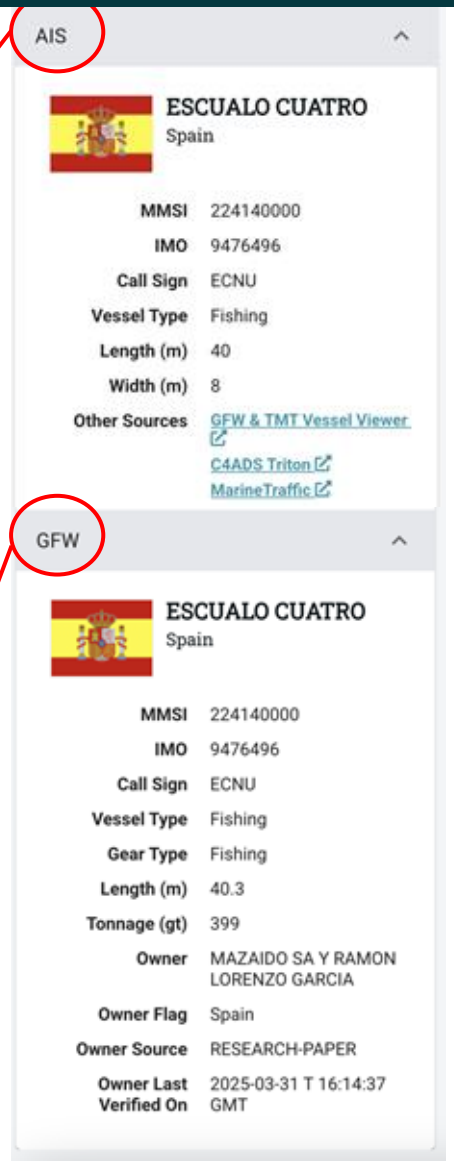


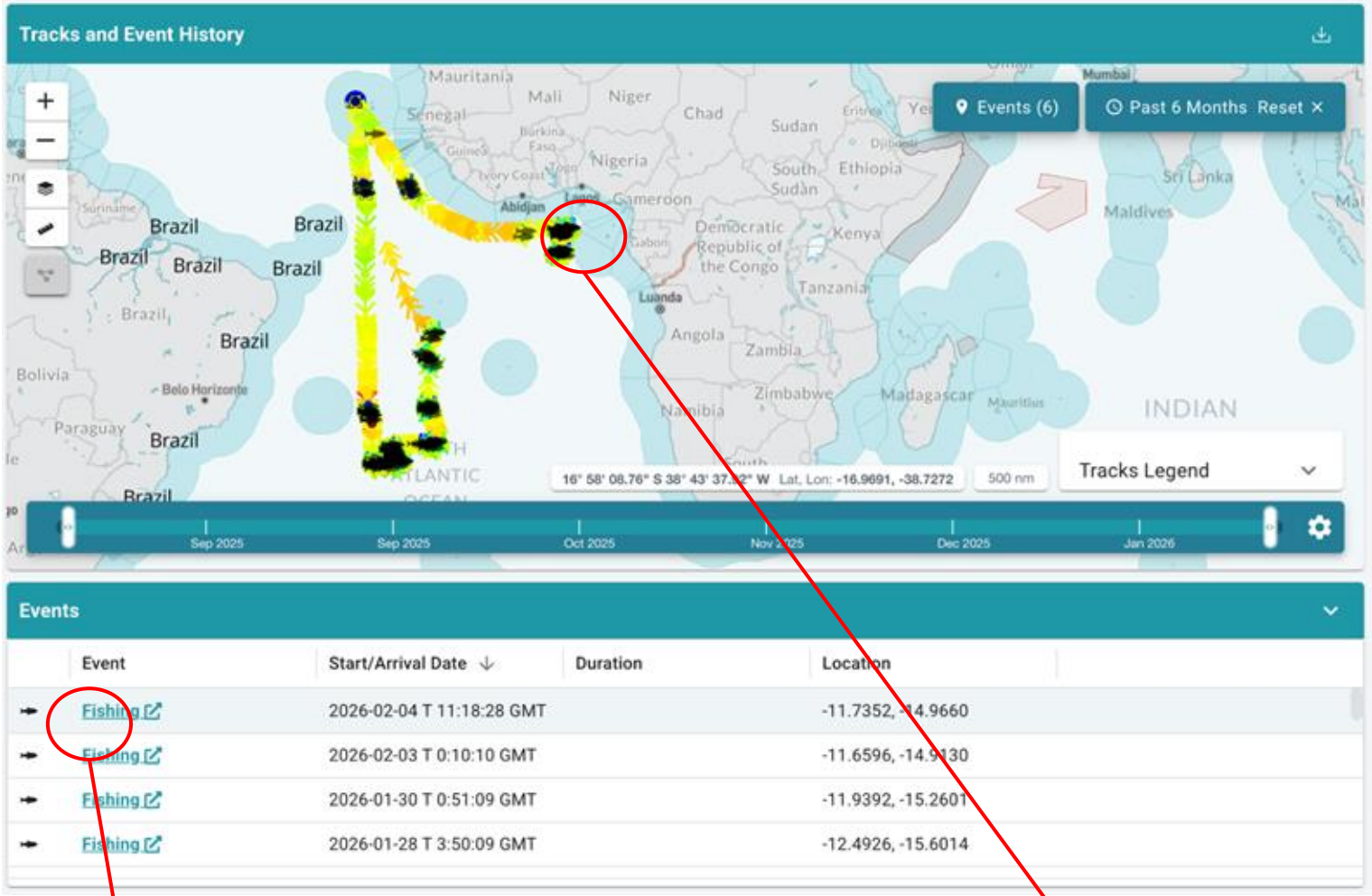
Toggle on/off to collapse the table and expand the map view

AIS-based vessel information

Global Fishing Watch (GFW) vessel data

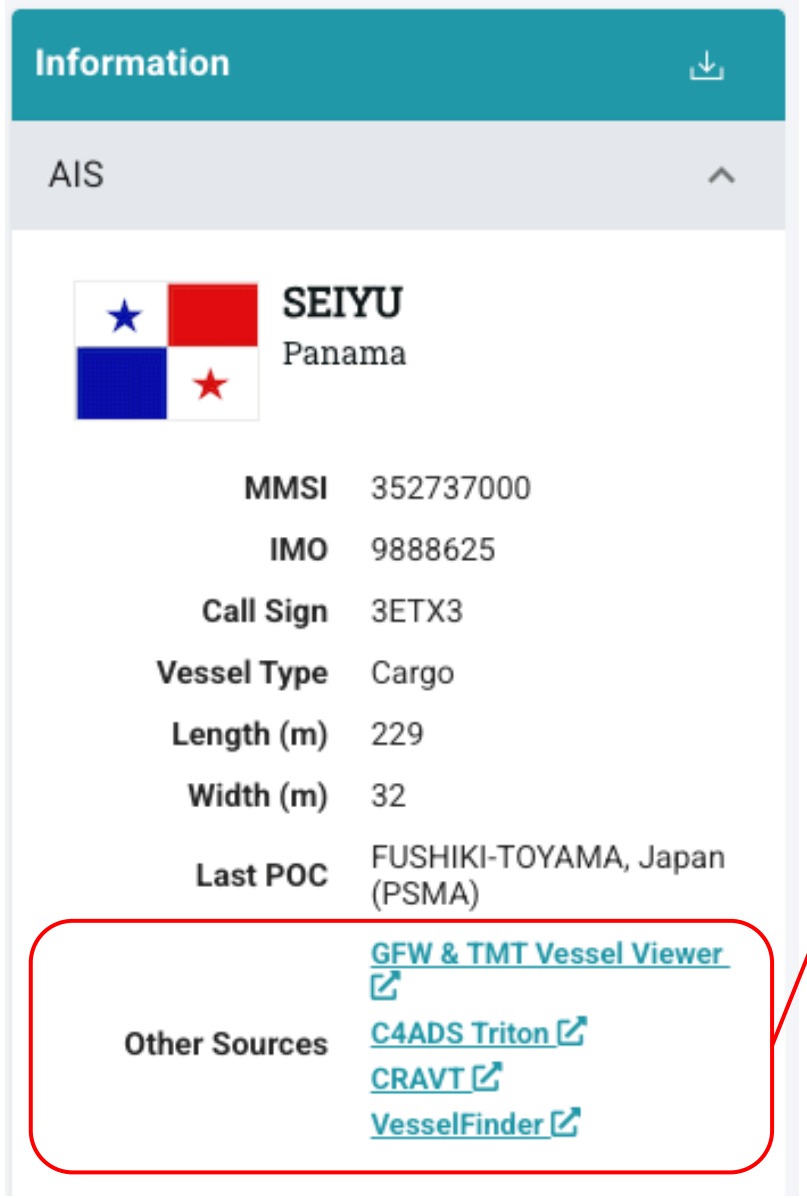
Manually verified vessel information, including details on gear type, tonnage, vessel ownership and RFMO authorizations.





Vessel History by AIS tracks (< 18 months)

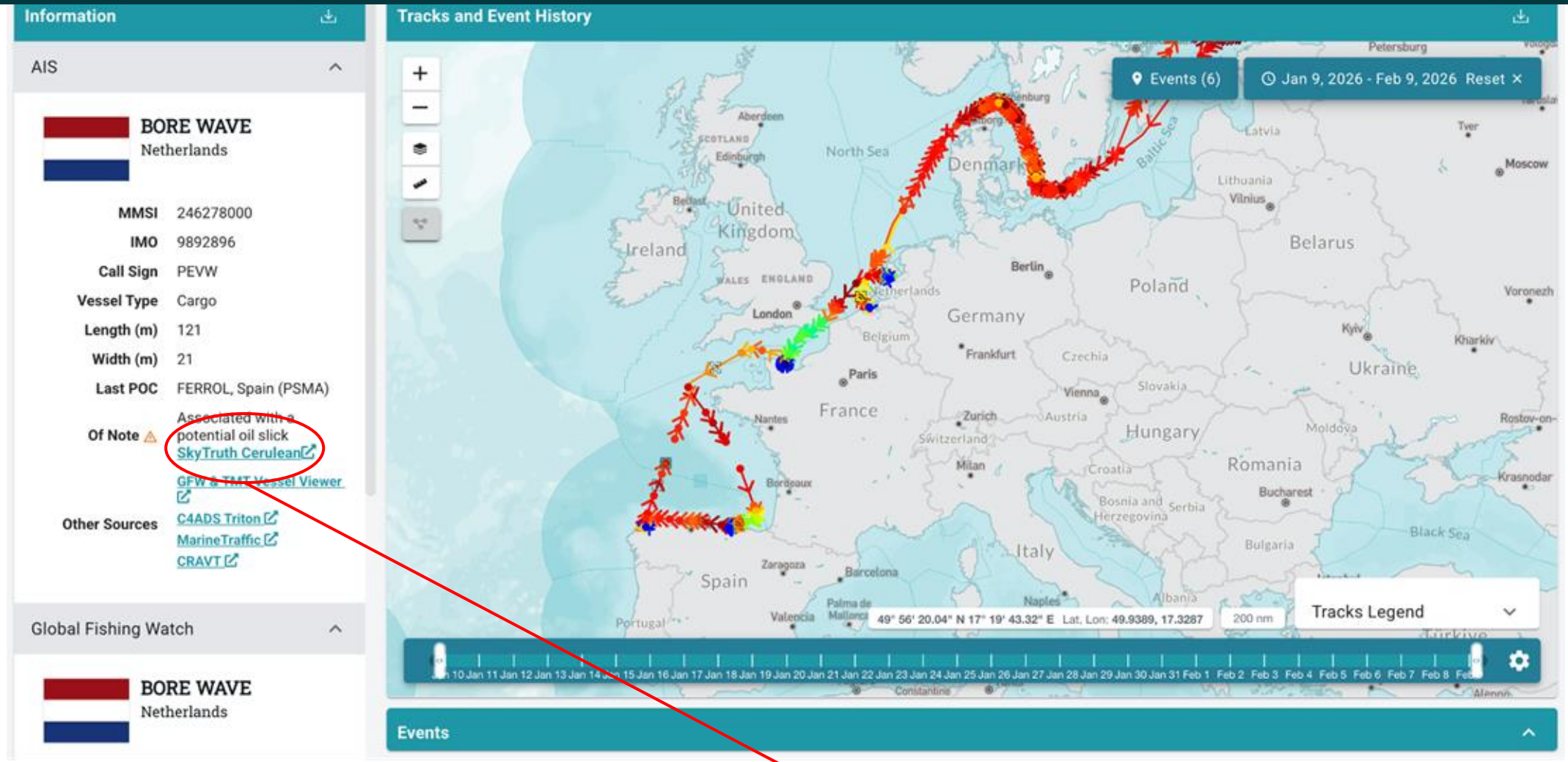
Vessel History by AIS Events (< 18 months)



Deep-links to external data sources

Skylight's Vessel Details Page integrates direct deep links to help users navigate vessel profiles across multiple external platforms and access complementary data and insights:

- **Global Fishing Watch** — up to 16 years of historical vessel activity data
- **C4ADS Triton** — manually verified information on vessel networks and beneficial ownership
- **CRAVT** — vessel authorisation data issued by Regional Fisheries Management Organizations (RFMOs) and Regional Fisheries Bodies (RFBs)
- **VesselFinder** — generic AIS feeds for maritime traffic monitoring



SkyTruth – Maritime Pollution Incidents

Skylight's vessel database can identify vessels associated with oil slicks detected by our partner SkyTruth. A dedicated entry appears for any vessel identified in connection with a potential oil slick, based on satellite data. Users can click the link to access the SkyTruth User Interface & analyze the corresponding incident. For questions, expert slick review and training is available via support@skytruth.org.

JOINT ANALYTICAL CELL

About the Joint Analytical Cell:

The Joint Analytical Cell (JAC) is a unique collective of organizations that provides maritime authorities with high quality fisheries intelligence, technology, data analysis and capacity building to combat illegal, unreported and unregulated fishing (IUU). Together, the JAC members, IMCS Network, Global Fishing Watch, TMT, C4ADS and Skylight, harness innovative technology and complementary expertise to improve the effectiveness of fisheries monitoring control and surveillance, and foster cooperation to build insights and capacity that support and enhance fisheries management.

www.jointanalyticalcell.org

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