Global Fishing Watch

Transparency & technology to support sustainable fisheries management

Leah Buckley Fisheries Management Innovation Group 5 October 2023



Who are we?

Global Fishing Watch

An international NGO using satellite technology, machine learning and data visualization to build an accurate picture of human activity at sea through free and open data and tools.

Our work supports greater transparency, novel scientific research, sustainable use of our ocean, and reduction of Illegal, Unregulated and Unreported (IUU) fishing.

75+ GFW Staff in 20+ Countries88K Users in 200+ Countries



Our data









Vessel identity

Vessel insights

Vessel detection

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Fishing effort, ports and voyages and transhipment identified from AIS/VMS data by GFW algorithms Comprehensive vessel information (MMSI, flag, gear type, length, authorizations, etc.) for all vessels listed on public vessel registries Potential risks such as IUU blacklisting, forced labour, incursions into MPAs, potentially unauthorized events. AKA dark targets. Detection of vessels not broadcasting AIS or VMS through use of satellite imagery





Marine Manager



Human Activity Data

AIS Fishing, VMS Fishing, Fishing vessel night lights (VIIRS), Shipping, Dark vessels, Seismic Resource Testing, Underwater Noise, Mining...



Oceanographic Data

Sea Surface Temperature, Salinity, Bathymetry, Currents...



Biological Data

Net Primary Productivity (Chlorophyll a), Migratory Patterns, Habitat Suitability, **Animal Telemetry (upload capability)**...



Vessel Viewer

- Who they are
- Where they've been
- What they're doing

Complemented with

- Known authorizations
- Insights
- Fleet analysis

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NAME Lake Aurora VESSEL TYPE / Carrier MMSI 441258000 LENGTH 101		FLAG South Korea GEAR TYPE <i>i</i> Specialized reefer			
Lake Aurora VESSEL TYPE / Carrier MMSI 441258000 LENGTH 101		South Korea GEAR TYPE <i>i</i> Specialized reefer			
VESSEL TYPE / Carrier MMSI 441258000 LENGTH 101		GEAR TYPE <i>i</i> Specialized reefer			
MMSI 441258000 LENGTH 101					
LENGTH		IMO 9194892		CALL SIGN D7UQ	
		GROSS TONNAGE 3,936			
OWNER j Ji Sung Shipping	g (South Korea) Dec 28, 20	119 - Jun 30, 2023			
AUTHORIZATION <i>j</i> FFA Jan 14, 2020 - Jul 1, 2023 NPFC Jul 21, 2021 - Jul 1, 2022			WCPFC Jan 8, 2020 - J IOTC Jan 8, 2020 - Jan	lul 1, 2023 17, 2021	
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Detecting fishing effort

GFW identifies *apparent* fishing activity in the AIS data based on vessel movement by combining two convolutional neural network models.

Models:

- Vessel classification
- Fishing detection





Detecting vessel presence

All vessels present on AIS





AIS / VMS based





Synthetic Aperture Radar (SAR)





Hotspots of unseen fishing vessels

Heather Welch, Tyler Clavelle, Timothy D. White, Megan A. Cimino, Jennifer Van Osdel, Timothy Hochberg, David Kroodsma, Elliott L. Hazen. Science Advances 8.44 (2022): eabq2109.



Case study: Tristan da Cunha

British overseas territory // Population >200 // World's most remote inhabited island // 90% of EEZ protected

Identified cargo vessels not complying with Areas to be Avoided close to the islands

Provided information to UK Marine Management Organisation in support of Blue Belt

Characterised high-seas longline activity with a high risk of bycatch for Tristan albatross

Estimated long-term trends of longline activity and sea surface temperature

Monitored potential IUU activity



Emerging research: Estimating the footprint of bottom trawling globally

Collaboration between GFW and Woods Hole Oceanographic institution (WHOI)

Aim: Better estimate trawling activities

Developing a *trawler-specific* fishing model to differentiate bottom and midwater fishing.

Training data composed of logbook data from Norway, and the Adriatic and supplemented with data from other regions labeled by WHOI and GFW.



Thank you

For more information contact:

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Global Fishing Watch is an international nonprofit organization dedicated to advancing ocean governance through increased transparency of human activity at sea. By creating and publicly sharing map visualizations, data and analysis tools, we aim to enable scientific research and transform the way our ocean is managed. We believe human activity at sea should be public knowledge in order to safeguard the global ocean for the common good of all.

Discover more at globalfishingwatch.org

