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Big Picture

Est 4.6M fishing vessels in the world

94% of global stocks are maximally or over fished

1/3 of global catch estimated to be result of IUU fishing

• Space-based sensing required given the distances involved
• Capabilities, sources and cost of data improving:
  • New commercial sources
  • Improved analysis
  • Power in combining sources & layered surveillance

Canada is working to combat IUU fishing through space-based sensing by:

1. Investing in research and development of new capabilities
2. Engaging in partnerships to improve transparency & data access

Why Space-Based Sensing?
Canada’s Dark Vessel Detection Project

- Canada working to test layered approach to near real-time surveillance
- Working to identify vessels that extinguish transponders – ‘Dark Vessels’
- Leveraging Canada’s Radarsat Constellation Mission for SAR
- Partnered with Ecuador to provide monitoring support around the Galapagos Islands in 2021-2022
Synthetic-Aperture Radar
Radarsat Constellation Mission

Radio Frequency Data

VIIRS WX Satellite
Light emissions

Sea Surface Data
Track the Fish

Voluntary Signals
AIS / VMS

RF Detection
Example: Ecuador – 1 Week Access Opportunities

- Accessing multiple constellations can provide robust monitoring.
- To have operational relevance, data must be rapidly processed and displayed (vessels are moving).
DVD platform & Pacific monitoring
• **Partnerships** are critical to addressing the vast area of our oceans, expansive fleets and multi-jurisdictional nature of illegal fishing

• Canada partners with Non-Governmental Organizations on the issue of IUU fishing to increase global impact

• Canada has a partnership with **Global Fishing Watch** to support their mission of bringing greater transparency through open data
Global Fishing Watch

Advancing ocean governance through increased transparency and use of space-based systems

Tony Long
CEO, Global Fishing Watch

April 2021
Our ocean is under immense pressure

A third of the world’s major commercial fish species are overfished and the United Nations estimates that two thirds of the marine environment has been significantly altered by human actions.

There is huge cost to the sustainability of the fisheries, to the coastal communities that depend on this source of food and to the environment.
Our ocean is poorly monitored

There is no global picture of all human activity at sea and we cannot truly understand humanity’s impact on life below water. This lack of visibility allows illegal, unreported and unregulated fishing to thrive.

But, advances in big data and the access and affordability of space-based technology are rapidly transforming our ability to generate new insights at global scale and make them public and visible.
Combining more satellite data to reveal more activity at sea

- **Optical Imagery**: Daytime, high-resolution optical imagery can be used to visually identify vessels.
- **AIS (Automatic Identification Systems)**: A collision avoidance system that constantly transmits a vessel's location at sea and can be used to identify and track fishing vessels.
- **Night-time Light**: Night-time optical imagery (VIIRS) picks up the presence of fishing vessels using lights to attract catch or conduct operations at night.
- **Radar**: Radar images (SAR) can identify large metal vessels and penetrate clouds.
- **Penetrate clouds**
- **Identify vessels**
- **Detect lights**
- **Global daily coverage**
- **Identify metal vessels**
Satellite Radar Can Illuminate “Dark” Fishing

AIS Only:
Fishing appears only in Europe

AIS + Satellite Radar:
Widespread fishing along the African continent

We are processing more than 1000 terabytes of satellite radar to identify all fishing vessels > 15m that do not use AIS
Scientific study reveals risk of forced labor in fishing fleets

Vessels known to have crew that are subject to forced labor behave in systematically different ways to the rest of the global fishing fleet. The discovery was used to build a first-of-its-kind model to identify and predict vessels at high risk of engaging in these abuses.
Creating impact at scale

+30 peer-reviewed papers published

Datasets and Code

- Fishing effort
- Fishing vessels
- Transshipment
- Anchorages
- Anonymized AIS data and other data
- Fishing Detection Models

What is required for me to access and use the data?

- Register (free, self service)
- Agree to the terms of service
- Participate in follow-up surveys
- Acknowledge Global Fishing Watch in anything you publish (see terms for proper citation)

Need help?

Contact research@globalfishingwatch with questions

Note: Unless otherwise stated, Global Fishing Watch data is licensed under a Creative Commons Attribution-ShareAlike 4.0 International license and code under an Apache 2.0 license.

https://globalfishingwatch.org/datasets-and-code/
Marine Manager

Human Use Data
AIS Fishing, AIS Non-Fishing, VMS, Dark Targets, Seismic Resource Testing, Underwater Noise, Mining, Tourism,...

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

Biological Data
Net Primary Productivity (Chl a), Migratory Patterns, Habitat Suitability, Coastal & Deep Sea Ecosystems, Animal Telemetry (upload capability), and more

Global Fishing Watch
Thank you

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