

Global Fishing Watch (GFW)

Open Source Maritime Domain Awareness

Paul Woods - Founder and Chief Innovation Officer

Open Source Maritime Domain Awareness



Maritime Domain Awareness

- Seeing and understanding all activity in the maritime domain in an area of interest
- Tracking compliant vessels
- Detecting non-compliant vessels
- Predicting vessel behaviors
- Close to real time, but not real time
- Understanding patterns of behavior and change over time



Open Source

- Public and commercial sources only
- Commercial licenses that allow for wide use
- Published methods and peer-reviewed science
- Global data and automation to achieve economies of scale
- Bringing closed data out into the public domain
- But not everything can be shared... and not everything should be shared



Open Source MDA Benefits

- Immediate Availability
- Highly Shareable
- No Cost
- No Restrictions
- Accelerates decision making
- Encourages cooperation



Who We Are



501c3 Non Profit
Washington DC
Globally distributed team
65 people in 20 countries

Data scientists
Engineers
Fisheries analysts
Government policy



Global Fishing Watch

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.



Our ocean is poorly monitored

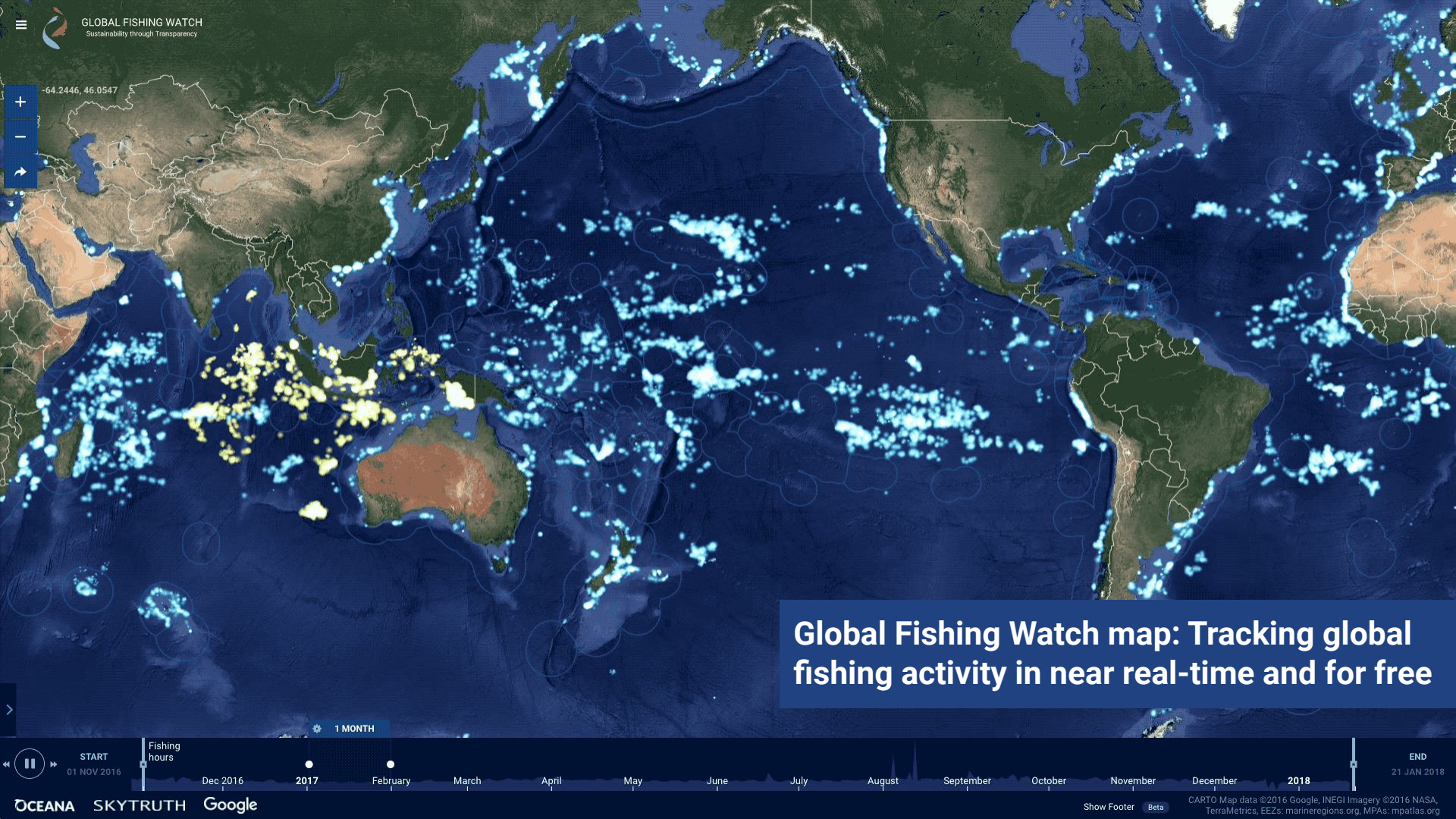
There is no global picture of all human activity at sea and we cannot truly understand humanity's impact on life below water. This lack of visibility allows illegal, unreported and unregulated fishing to thrive.



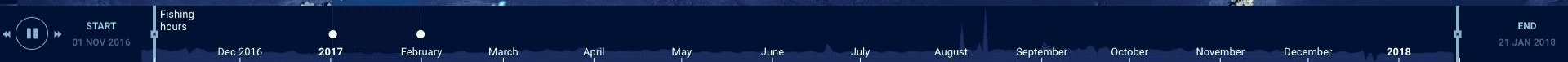


Our purpose

Create and publicly share knowledge about human activity at sea to enable fair and sustainable use of our ocean.



Global Fishing Watch map: Tracking global fishing activity in near real-time and for free



2015 - Sharing the Vision





2016 - Public Launch - Our Ocean, Washington DC



**Bloomberg
Philanthropies**



LEONARDO
DICAPRIO
FOUNDATION



ADESSIUM
FOUNDATION

thewaterloofoundation*



GORDON AND BETTY
MOORE
FOUNDATION



WALTON FAMILY
FOUNDATION



the David &
Lucile **Packard**
FOUNDATION



Global Fishing Watch

What we do

- Make maritime data more accessible and shareable
- Support scientific research, ground all our public data in peer-reviewed papers
- Make scalable, cost-effective solutions using AI/Machine Learning
- Establish a common (public) set of “Facts on the Water”
- Bring more data into the public domain
- Open-source intellectual property (code and algorithms)
- High level of collaboration with government, academia, NGOs and industry

Applications

- Distant water fleet monitoring
- Transshipment and encounters at sea
- Marine Protected Area monitoring
- Enforcement and patrol planning
- Data-driven communications
- Understanding activities of “dark”/ non-compliant vessels
- Forced Labor

20 countries by 2022

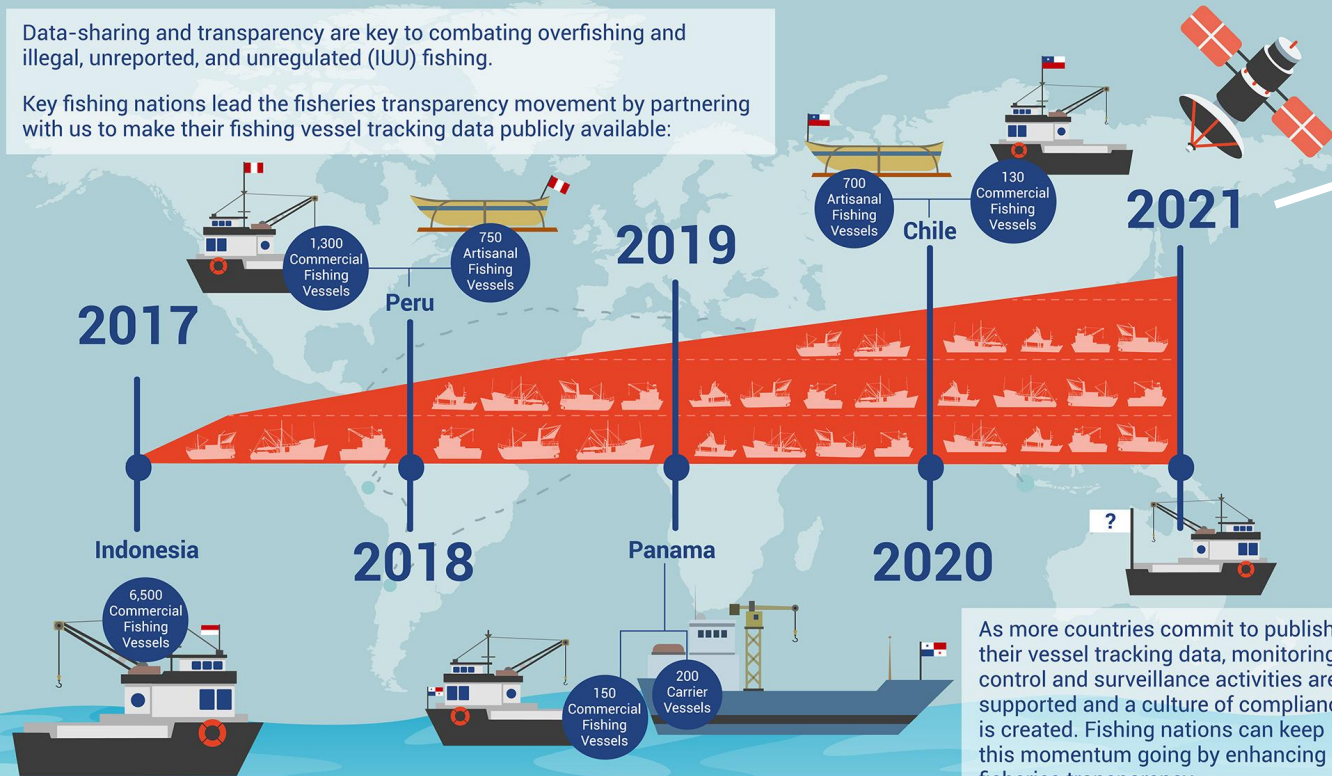
Global Fishing Watch is partnering with governments committed to fisheries transparency and sharing their data via our map. Transparency is the cornerstone in the fight against illegal, unreported and unregulated (IUU) fishing and the achievement of responsible ocean stewardship.



A New Age of Transparency

Data-sharing and transparency are key to combating overfishing and illegal, unreported, and unregulated (IUU) fishing.

Key fishing nations lead the fisheries transparency movement by partnering with us to make their fishing vessel tracking data publicly available:



In 2021, Costa Rica and Ecuador will share their data via the Global Fishing Watch map.

As more countries commit to publish their vessel tracking data, monitoring, control and surveillance activities are supported and a culture of compliance is created. Fishing nations can keep this momentum going by enhancing fisheries transparency.

Groundbreaking science

Global Fishing Watch is collaborating with leading scientists to develop datasets and models to create new insights into human activity at sea, and publishing innovative research that improves ocean management.



+30 peer-reviewed papers published



UNIVERSITY OF WOLLONGONG

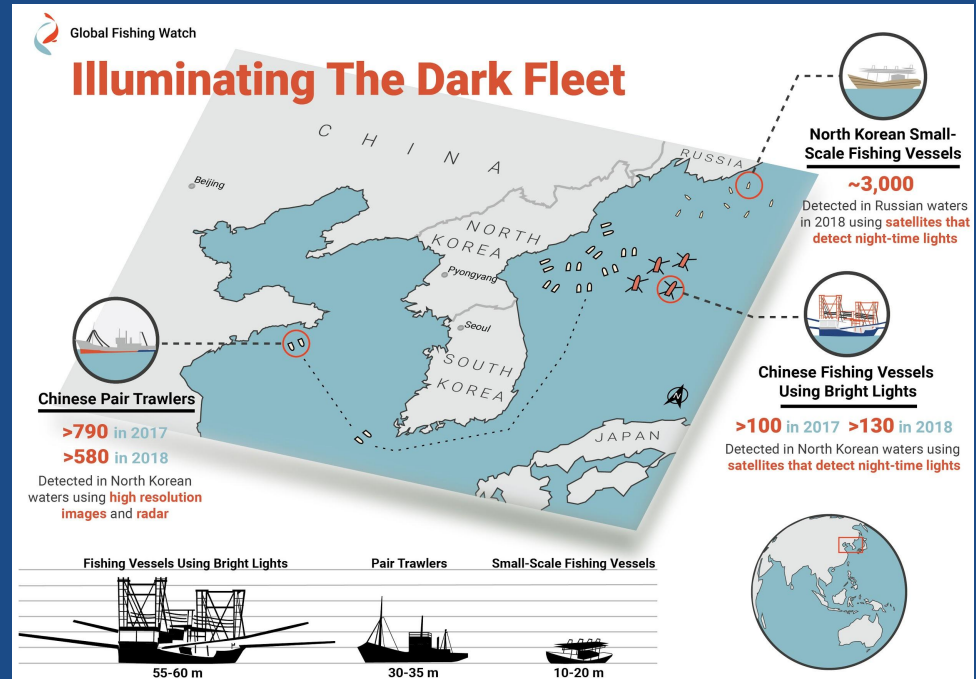


Scientific study reveals largest known case of illegal fishing

Unprecedented use of satellite technologies detected the vessels, known as the dark fleet as they do not appear in public monitoring systems.

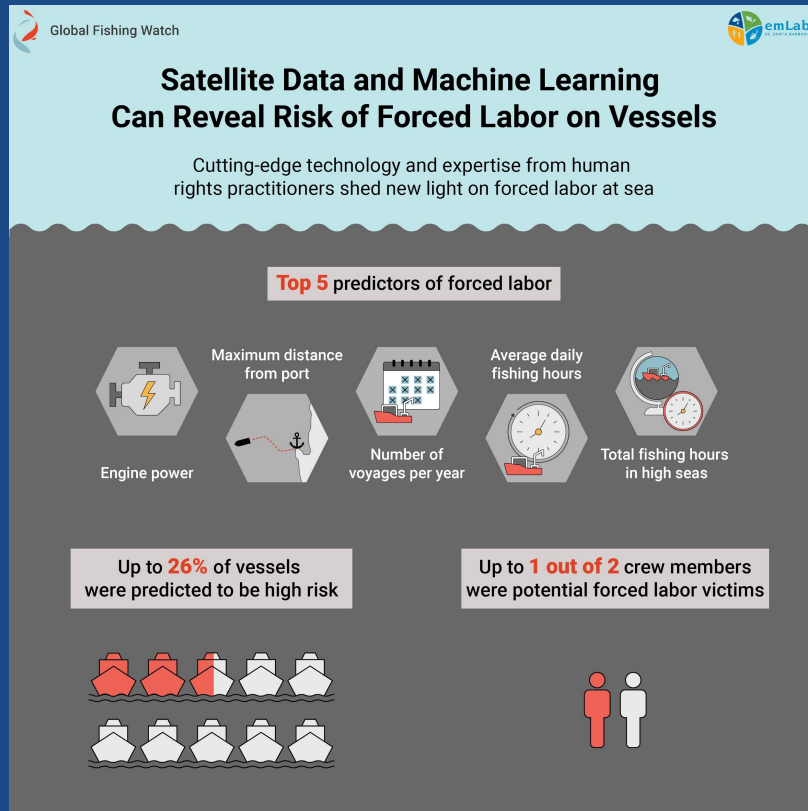
Key findings:

- more than 900 vessels in 2017, and 700 in 2018, originating from China, detected fishing in North Korean waters, likely violating U.N. sanctions.
- The vessels likely caught as much squid as Japan and South Korea combined, worth over US \$440 million.

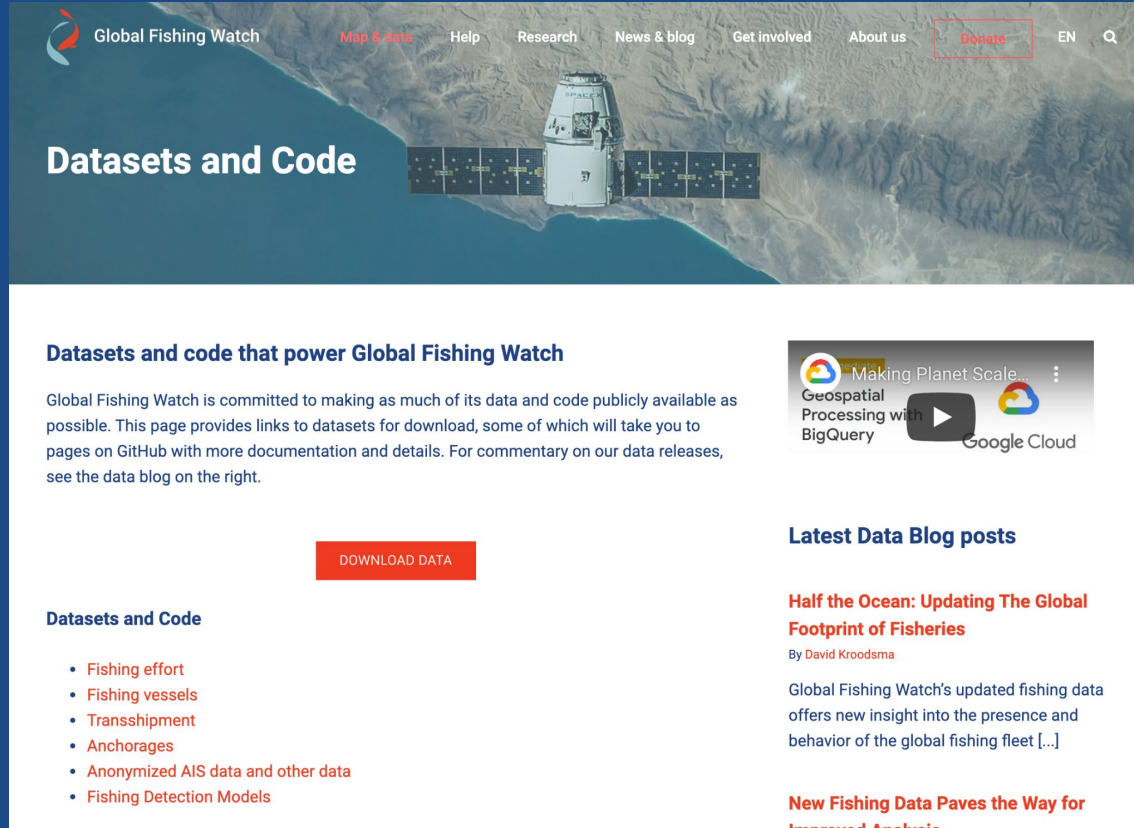


Scientific study reveals risk of forced labor in fishing fleets

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.



Data Availability



The screenshot shows the Global Fishing Watch website. The top navigation bar includes links for 'Map & data', 'Help', 'Research', 'News & blog', 'Get involved', 'About us', 'Donate', 'EN', and a search icon. The main header features the text 'Datasets and Code' over a background image of a satellite in orbit. Below this, the page is divided into two columns. The left column contains a section titled 'Datasets and code that power Global Fishing Watch' with a paragraph explaining data availability and a 'DOWNLOAD DATA' button. Below this is a list of dataset categories. The right column features a video thumbnail titled 'Making Planet Scale... Geospatial Processing with BigQuery' and a section for 'Latest Data Blog posts' with two article titles.

Global Fishing Watch

Map & data Help Research News & blog Get involved About us Donate EN

Datasets and Code

Datasets and code that power Global Fishing Watch

Global Fishing Watch is committed to making as much of its data and code publicly available as possible. This page provides links to datasets for download, some of which will take you to pages on GitHub with more documentation and details. For commentary on our data releases, see the data blog on the right.

[DOWNLOAD DATA](#)

Datasets and Code

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

Making Planet Scale...
Geospatial Processing with BigQuery
Google Cloud

Latest Data Blog posts

Half the Ocean: Updating The Global Footprint of Fisheries
By David Kroodsmma

Global Fishing Watch's updated fishing data offers new insight into the presence and behavior of the global fishing fleet [...]

New Fishing Data Paves the Way for Improved Analysis

Analysis and training

Global Fishing Watch's globally-distributed team of analysts provide insights and training to help authorities use and benefit from our data and technology.

Our open and shareable analysis is being used to strengthen key areas of fisheries monitoring, control and surveillance (MCS)

IUU fishing risk
assessment



Transshipment
monitoring



Port control
implementation



Marine protected
area monitoring



MCS operational
support



Supporting fisheries surveillance and control



Collaboration and information sharing are key to detecting suspicious vessels and achieving well-managed fisheries.

Global Fishing Watch provides open and shareable analysis to fisheries enforcement agencies that enables risk-based targeting of assets. This makes for more effective and cost-efficient operations that have impact on the water.

Global Fishing Watch and the U.S. Coast Guard (USCG)

Global Fishing Watch provided information for the 2020 USCG patrol in the North Pacific and West Atlantic, highlighting suspicious transshipments, IUU fishing risks and identifying vessel tracks that appeared to manipulated to report false information. The collaboration built on the support we provided to the USCG Cutter MELLON in 2019, which saw an eightfold increase in identified violations compared to 2018.

“Global Fishing Watch provides a vital overlapping layer of intel, giving greater transparency on legitimate vessels and potential violators involved in IUU fishing. Whether you’re a large or small national state, to have access to near real-time data on fishing activity in or outside your waters is a very powerful tool. It sheds light on the problem, so that countries with restricted enforcement ability can focus their efforts efficiently on illegal fishing.”

Captain Adam B. Morrison, U.S. Coast Guard

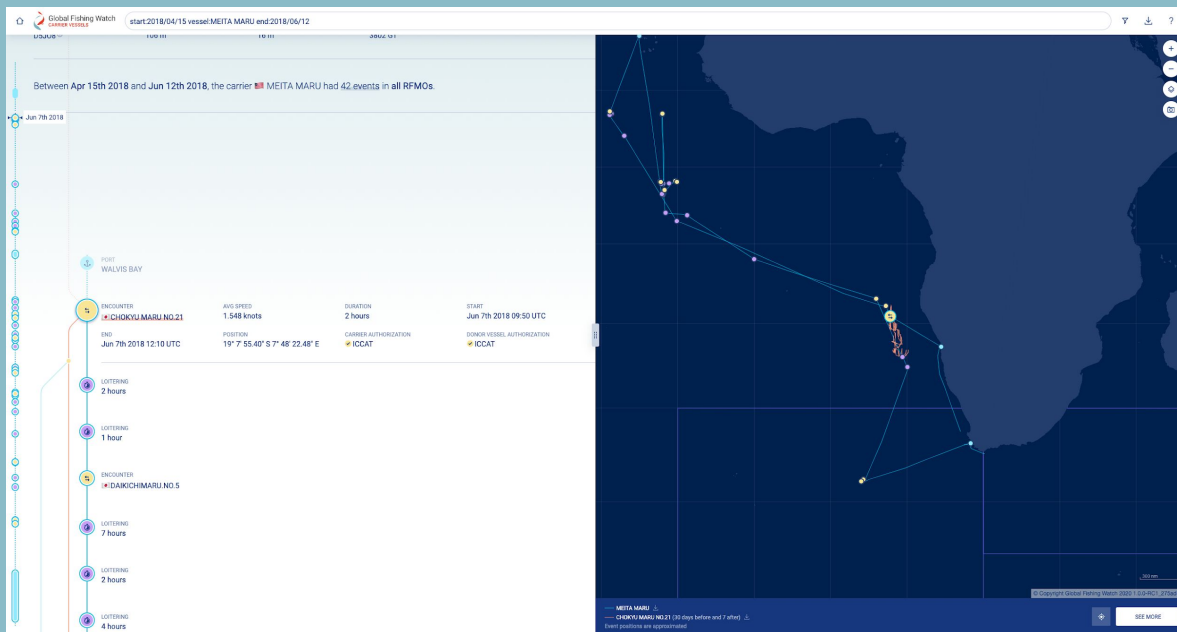
New tools to help transform marine management

Global Fishing Watch carrier vessels

Transshipment – moving fishing catch from one vessel to another – is a vital but largely hidden part of the global commercial fishing industry.

Our transshipment monitoring portal pinpoints encounters between vessels, collates fishing authorizations, and identifies frequently-visited ports to build a picture of risk. This enables authorities to investigate potential transshipment activities from flagged and foreign vessels that may not be compliant with regulations.

globalfishingwatch.org/carrier-portal



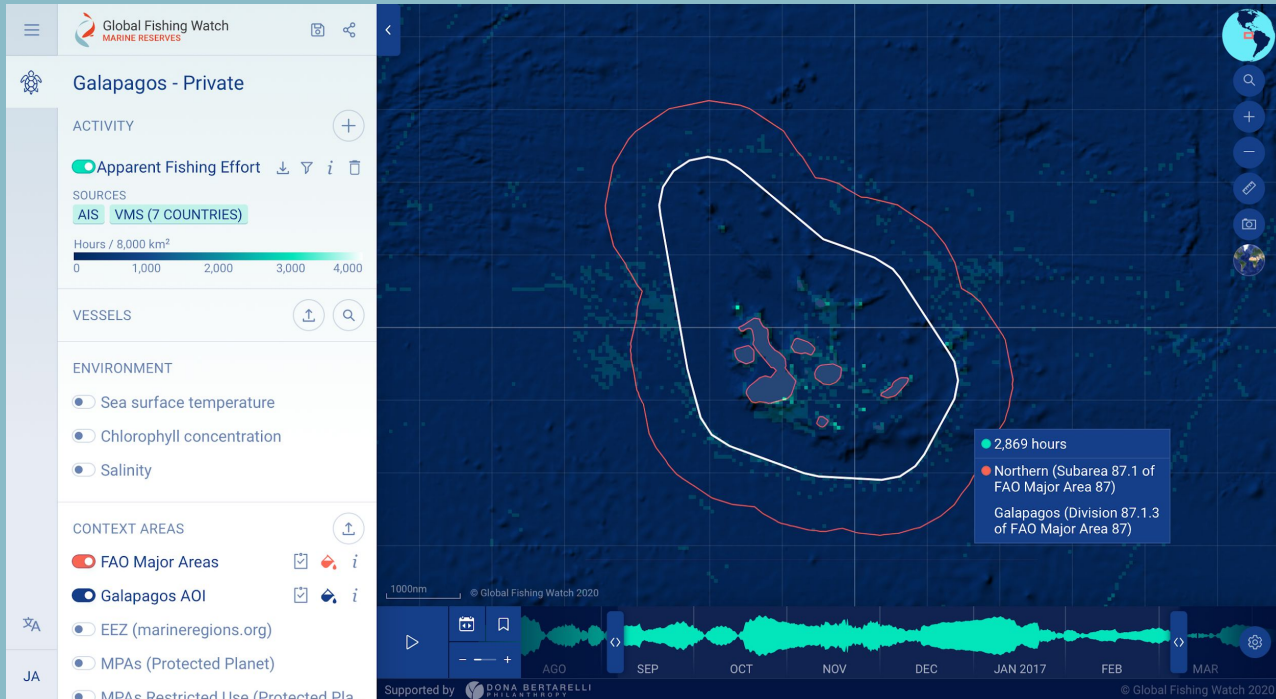
Timeline of interactions, port visits and key information

User driven, map-based visualization for analysis

New tools to help transform marine management

Global Fishing Watch Marine Manager

A freely available, innovative technology portal, founded in partnership with Dona Bertarelli. It provides near real-time, dynamic, and interactive data on ocean conditions, biology, and human-use activity to support marine spatial planning, marine protected area design and management, and scientific research.



Global Fishing Watch
MARINE RESERVES

Guyana

VESEL ACTIVITY

Apparent Fishing Effort

SOURCE

AIS VMS (4 countries)

Hours / ~120 km²

0 339 849 2.5k

VESSLES

ENVIRONMENT

Sea surface temperature

25 26 27 28

Salinity

Chlorophyll concentration

0 2 4 6

CONTEXT AREAS

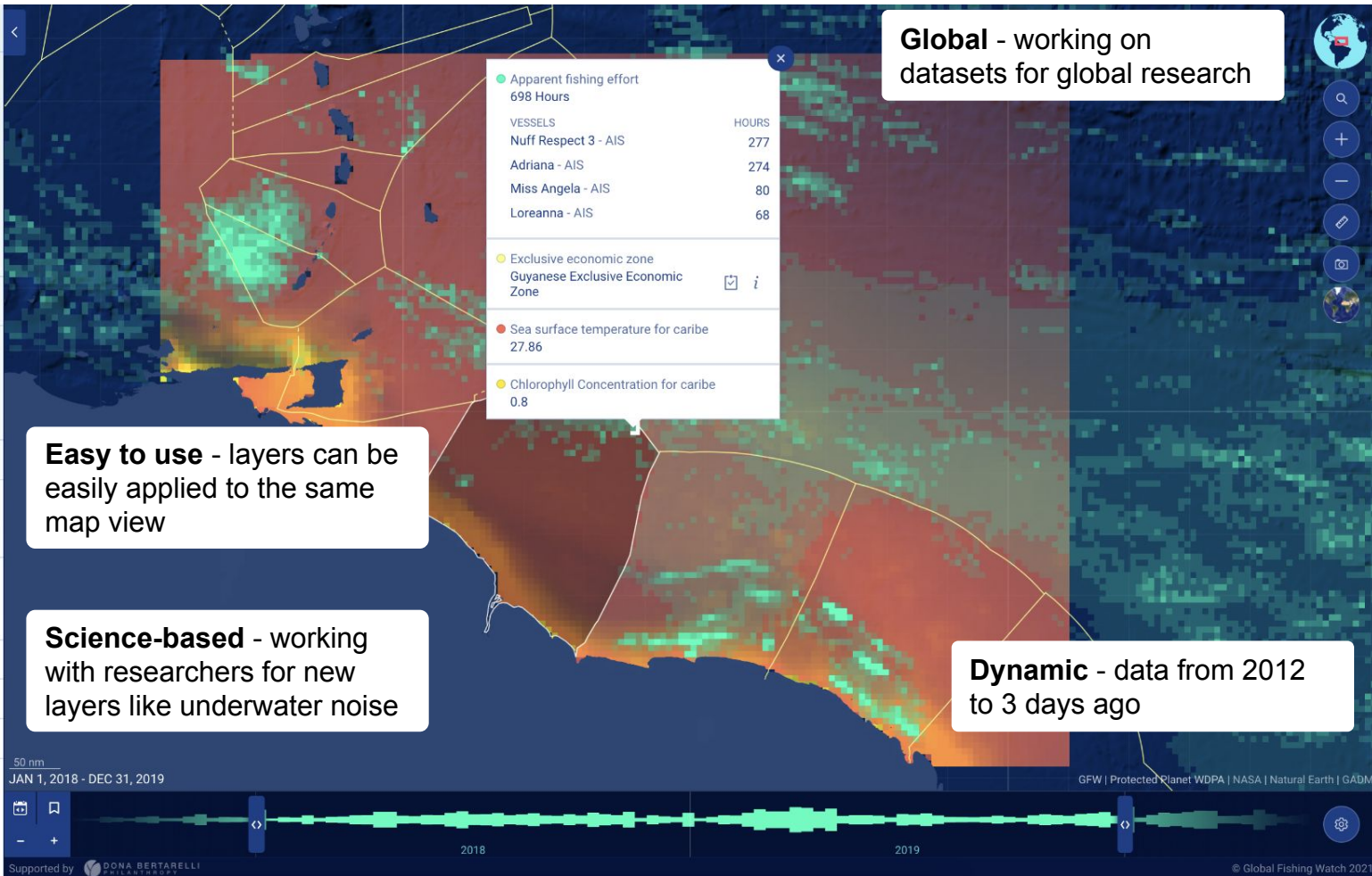
Exclusive economic zone

Marine Protected Areas

MPA - No take

MPA - Restricted

Tuna RFMO



Innovation and open data

Global Fishing Watch is harnessing emerging technologies to shine a light on human activity at sea and power data-driven monitoring and management of our global ocean



Share data easily

Create blueprints and Application Programming Interfaces (APIs) -- software that allows two applications to talk to each other -- to enable the global community to efficiently access and use our data. Support 3rd party app development using our data streams to accelerate innovation.



Innovation and open data

Global Fishing Watch is harnessing emerging technologies to shine a light on human activity at sea and power data-driven monitoring and management of our global ocean



Detect more vessels

Synthesize multiple satellite data sources, including radio frequency to detect vessels hidden from public monitoring systems

By 2025 we will detect every vessel on the ocean larger than 15 meters, every day, everywhere. Fully automated, highly scalable, open data available to everyone



Coming up tomorrow



Foundations

Data Sources

Methods:
-AI/Machine
Learning, Big Data



Applications

USCG Patrol support

Dark targets in North
Korea



Tools

Public Map

Carrier Vessel Portal

Marine Manager

Data Download
Portal



Special Report: High Seas Squid Fleet

Preview of our new report
documenting the behaviors and
mis-behaviors of vessels the distant
water high seas squid fleet