

## IUU Vessel Tracker Methodology

Automatic identification system (AIS) data for *IUU Vessel Tracker*\* was obtained from Global Fishing Watch's (GFW) database. Trygg Mat Tracking\*\* gathers and compiles information on RFMO IUU-listed vessels, which was then accessed through GFW. The GFW database contains information from AIS transmissions that are broadcast through satellite and terrestrial receivers.

*IUU Vessel Tracker* provides vessel information, including the name, flag state, vessel type, Maritime Mobile Service Identity (MMSI), International Maritime Organization (IMO) number, call sign (a unique identifier for radio transmissions), and other known names. The tracker also highlights when an IUU-listed vessel appears to fish\*\*\* and for how long. While the MMSI, ship name, location, and timestamp are recorded from each vessel's AIS signals, the IMO, call sign, class, and flag state are determined from the best available registry information. Using *IUU Vessel Tracker*, Oceana located two IUU-listed vessels that broadcast AIS signals in 2021 as of June 16, 2021, based on their MMSI and IMO.

The position data is gathered daily from GFW via Google BigQuery. The data is transferred to the Carto software via Google App Script and subsequently displayed by Carto's mapping software. Via the Carto interface, users can view vessel information by hovering or clicking on individual AIS points. The map is customized to show exclusive economic zone (EEZ) boundaries, no-take marine protected areas, and ports. The top 100 ports in the world, ranked by number of visits determined by GFW, are displayed on the map. For visualization, each country is limited to a maximum of five ports and the European Union is limited to 20.

The EEZ boundaries on the *IUU Vessel Tracker* map were downloaded from MarineRegions.org (Flanders Marine Institute, 2019). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11. Available online at <https://www.marineregions.org/>. <https://doi.org/10.14284/386>:

MarineRegions - <https://www.marineregions.org/eezsearch.php>

The MPA boundaries on the *IUU Vessel Tracker* map were downloaded from the Marine Conservation Institute (Marine Conservation Institute. (2020). MPAtlas. Seattle, WA. [www.mpatlas.org](http://www.mpatlas.org) [Accessed 04/2020]).

Marine Protection Atlas uses the World Database of Protected Areas (WDPA) as the starting point for its database, conducting an independent, third-party review of the data and making additions and corrections as necessary.

UNEP-WCMC and IUCN (2020), Protected Planet: The World Database on Protected Areas (WDPA) [On-line], [April, 2021], Cambridge, UK: UNEP-WCMC and IUCN. Available at: [www.protectedplanet.net](http://www.protectedplanet.net).

Protected Planet – [www.protectedplanet.net](http://www.protectedplanet.net)

Detailed information about the RFMO IUU listing and delisting process, as well as the current IUU lists, can be found on their respective websites:

Commission for the Conservation of Antarctic Marine Living Resources

(CCAMLR): <https://www.ccamlr.org/en/organisation>

Inter-American Tropical Tuna Commission (IATTC): <https://www.iattc.org/HomeENG.htm>

Indian Ocean Tuna Commission (IOTC): <https://iotc.org/>

Southern Indian Ocean Fisheries Agreement (SIOFA): <https://www.apsoi.org/>

International Commission for the Conservation of Atlantic Tunas

(ICCAT): <https://www.iccat.int/en/>

General Fisheries Commission for the Mediterranean (GFCM): <http://www.fao.org/gfcm/en/>

Western and Central Pacific Fisheries Commission (WCPFC): <https://www.wcpfc.int/home>

Northwest Atlantic Fisheries Organization (NAFO): <https://www.nafo.int/>

North-East Atlantic Fisheries Commission (NEAFC): <https://www.neafc.org/>

South Pacific Regional Fisheries Management Organization (SPRFMO): <https://www.sprfmo.int/>

South East Atlantic Fisheries Organization (SEAFO): <http://www.seafo.org/>

Commission for the Conservation of Southern Bluefin Tuna (CCSBT): <https://www.ccsbt.org/>

*\*IUU Vessel Tracker* uses vessel information in the Global Fishing Watch database. This information is transmitted from a vessel's automatic identification system (AIS) device, which is collected via satellites and terrestrial receivers. Faulty AIS devices, user error, intentional manipulation, crowded areas, poor satellite reception, and transmission flaws are factors that contribute to noise and errors in AIS data, and sometimes those inaccuracies can be reflected in the speed and location of a vessel. Vessel operators can accidentally or purposefully enter false information into their ship's AIS, thus concealing their identity or location. In crowded areas, such as ports, the massive number of radio transmissions can crowd the bandwidth of satellite and terrestrial receivers, leading to inaccuracies as well. For these reasons, use *IUU Vessel Tracker* information at your own risk.

*\*\*IUU Vessel Tracker* uses data from Trygg Mat Tracking's Combined IUU Vessel List ([www.iuu-vessels.org](http://www.iuu-vessels.org)), which provides the best available, up-to-date information on all fishing vessels that appear on the IUU vessels lists. This source is compiled from RFMO IUU lists, online vessel databases, national fisheries authorities, and Interpol. Oceana takes steps, such as cross-

referencing RFMO lists, to ensure designations are as accurate as possible. Because of the timing of listing and delisting decisions by RFMOs, vessels that have been cross-listed may remain listed on the cross-listing RFMO despite being delisted from the original listing RFMO. For these reasons, any and all information about IUU listed vessels should be considered reflective of current RFMO listings and must be used at your own risk.

\*\*\*Any and all references to "fishing" should be understood in the context of Global Fishing Watch's fishing detection algorithm, which is a best effort to determine "apparent fishing effort" based on vessel speed and direction data from the automatic identification system (AIS) collected via satellites and terrestrial receivers. As AIS data varies in completeness, accuracy, and quality, it is possible that some fishing effort is not identified and conversely, that some fishing effort identified is not fishing. For these reasons, Global Fishing Watch qualifies all designations of vessel fishing effort, including synonyms of the term "fishing effort," such as "fishing" or "fishing activity," as "apparent," rather than certain. Any and all Global Fishing Watch information about "apparent fishing effort" should be considered an estimate and must be used at your own risk. Global Fishing Watch is taking steps to make sure fishing effort designations are as accurate as possible.