

Milestone 12: Vessel Monitoring Data datasets acquired and processing.

Milestone background:

Fishing is the main anthropogenic activity through which the productivity of the world's oceans is exploited. As such, information on the spatial and temporal distribution of fishing effort is fundamental in identifying areas that provide important fish habitat, support vulnerable marine ecosystems and deliver ecosystem goods and services.

Available fishing effort data sources

Until recently (early 2018), there was no single coherent dataset that provided information on the spatial and temporal distribution of fishing effort at the scale of north Atlantic basin. Whilst data on fishing effort did exist for parts, e.g. the OSPAR / ICES vessel monitoring by satellite data that covers the OSPAR sea area, none extended to both the eastern and western areas simultaneously. However, in early 2018, Global Fishing Watch (GFW) released data describing fishing effort at a global scale (Kroodsma *et al.*, 2018).

OSPAR / ICES fishing effort data

For ATLAS case studies that occur within the OSPAR sea area of the NE Atlantic, processed 'final product' VMS data, which include a suite of fishing effort metrics and gear types, are available to download as shapefiles from [ICES](#).

GFW fishing effort data

These data are derived from Automatic Identification System (AIS) and are at a high spatial (0.01° x 0.01°) and temporal (daily) resolution. The raw data can be downloaded in various file formats from [GFW](#). The metric of fishing intensity is 'fishing hours' and is given for each of the gear types: drifting longlines, purse seines, trawlers, fixed gear, squid jigger and other fishing. The definitions given by GFW are listed below:

- Fishing hours: hours that vessels of this gear type and flag were fishing in this grid cell on this day
- Gear types:
 - Drifting longlines: drifting longlines
 - Purse seines: purse seines, both pelagic and demersal
 - Trawlers: trawlers, all types
 - Fixed gear: a category that includes set longlines, set gillnets, and pots and traps
 - Squid jigger: squid jiggers, mostly large industrial pelagic operating vessels
 - Other fishing: a combination of vessels of unknown fishing gear and other, less common gears such as trollers or pole and line

In order to make data on fishing effort available to the ATLAS case studies, the daily GFW data were downloaded from the above link and processed. The final processed raster layers are available in the ATLAS shared drive at the University of Edinburgh within the 'Fishing intensity' subfolder. In the interests of transparency and to serve as a detailed methodology

for the processing work undertaken, the raw data and R script are also provided in the shared drive.

The final processed GFW data are in the form of multi-banded raster layers, which give the summed daily fishing hours for each grid cell and each year (2012 – 2016) on a regular 0.01° x 0.01° grid across the north Atlantic basin (i.e. within the area given by the bounding box: -100°E, 50°W, 25°N, 90°N). An example of the data is given in figure 1.

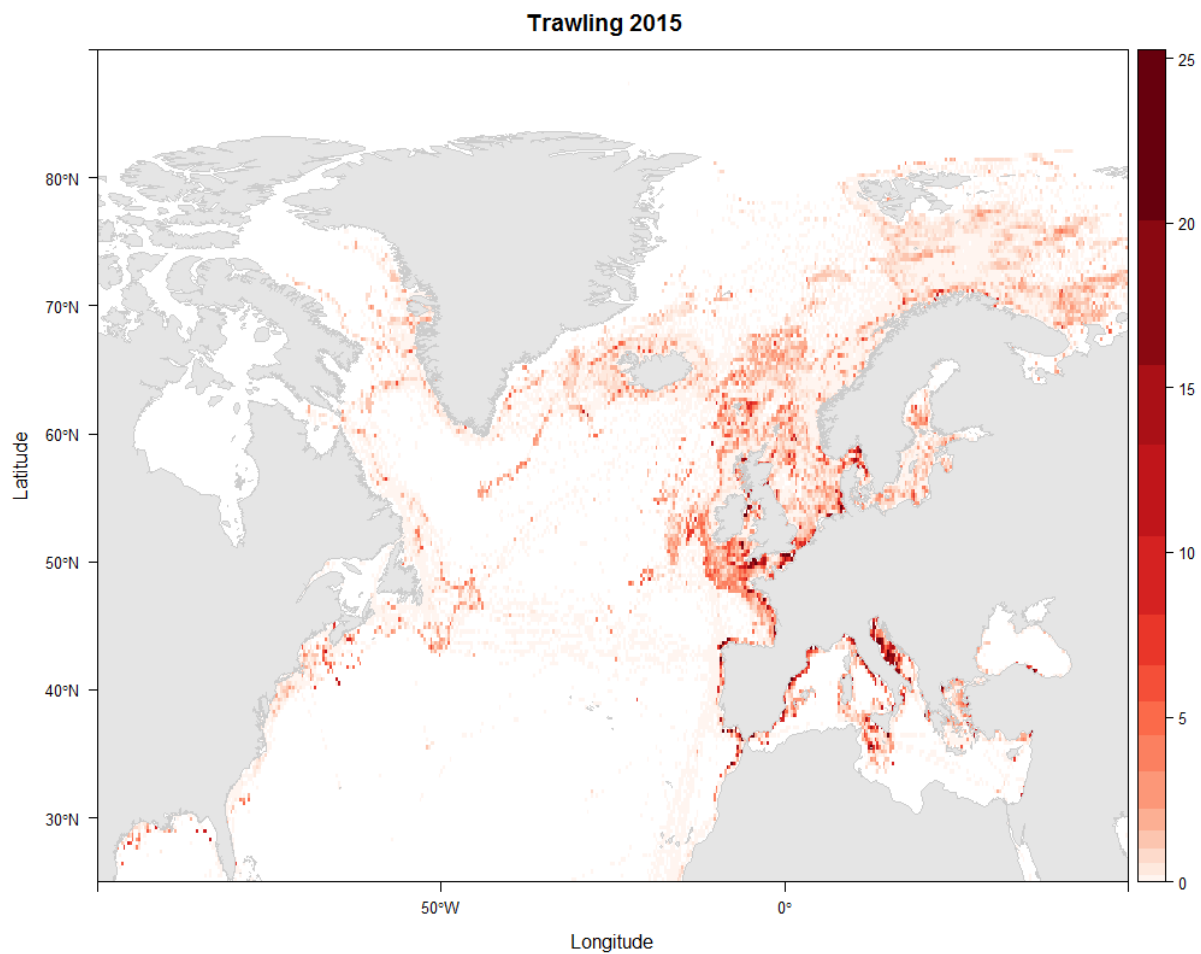


Figure 1. Global fishing watch data for the *trawlers* gear type (2015) at the north Atlantic basin scale (NB the data have been aggregated by a factor of 10 for display purposes).

Reference:

Kroodsma D.A., Mayorga J., Hochberg T., Miller N.A., Boerder K., Ferretti F., Wilson A., Bergman B., White T.D., Block B.A., Woods P., Sullivan B., Costello C., & Worm B. (2018) Tracking the global footprint of fisheries. *Science*, **359**, 904–908.