Source

This dashboard is a collaborative initiative between the UN Statistical Division (https://unstats.un.org), the Environmental Change Institute at the University of Oxford (https://www.eci.ox.ac.uk) within the context of the AIS Task Team work programme (https://unstats.un.org/bigdata).

Methodology

Port calls are mapped for a total of 1200 ports globally, across 176 countries, which are based on ports included in the World Port Index\(^1\). First, the outlines of port boundaries are mapped manually. Within these bounds, Automatic Identification System (AIS) geospatial data with the location and attributes of all vessels with an AIS transponder are extracted. Here, we only extract tanker and cargo vessels, thereby neglecting non-trade carrying vessel types (e.g. passenger vessels, tugs, piloting vessels, bunkering vessels etc.). A port call is derived by looking at the in- and outgoing movements of vessels, with the turnaround time defined as the time a vessel spends inside the port boundaries. For every port, port calls with a turnaround time of less than 5 hours and more than the 95th percentile of the distribution of turnaround time are removed to filter out port calls not associated with trade (e.g. refuelling, passing by). Moreover, we remove port calls that have less than 10 hours turnaround time and have an ingoing and outgoing direction with a difference of less than 45 degrees to filter out vessels that are passing a port without loading or unloading (important for ports along rivers). Based on the data of a detailed vessel database of approximately 38,000, we build a Random Forest Classification algorithm that predicts the vessel types based on the vessel dimensions. Using this algorithm, we can predict the vessel type, grouped into 5 main classes (container, dry bulk, general cargo, vehicles and tanker vessels), of the ~100,000 unique tanker and cargo vessels that call at ports globally and are included in the AIS data.

Disclaimer

The latest week data may contain downward bias because some vessels may still be in the ports and therefore, they are not counted yet in the port calls. To mitigate this downward bias from AIS datasets, figures of last two days of the week (Friday and Saturday) are adjusted based on historical deviation between preliminary and actual observation for that period.

Limitations

The accuracy of the methodology depends on the accuracy and coverage of AIS receivers, and the broadcasting of AIS signals, which differ globally. The development of a generally applicable methodology for deriving port calls may induce some

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\(^1\) https://msi.nga.mil/Publications/WPI
inaccuracies for ports with difficult port boundaries and ports where offshore loading and unloading takes places. General description and limitation of AIS data can be found at https://unstats.un.org/wiki/display/AIS/Overview+of+AIS+dataset.