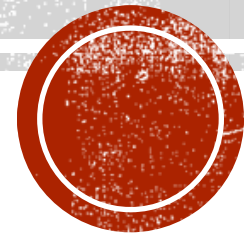




UNITED NATIONS

BIG DATA FOR IMTS, AIS DATASETS AND TRADE STATISTICS



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United Nations Statistics Division

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BIG DATA FOR OFFICIAL STATISTICS

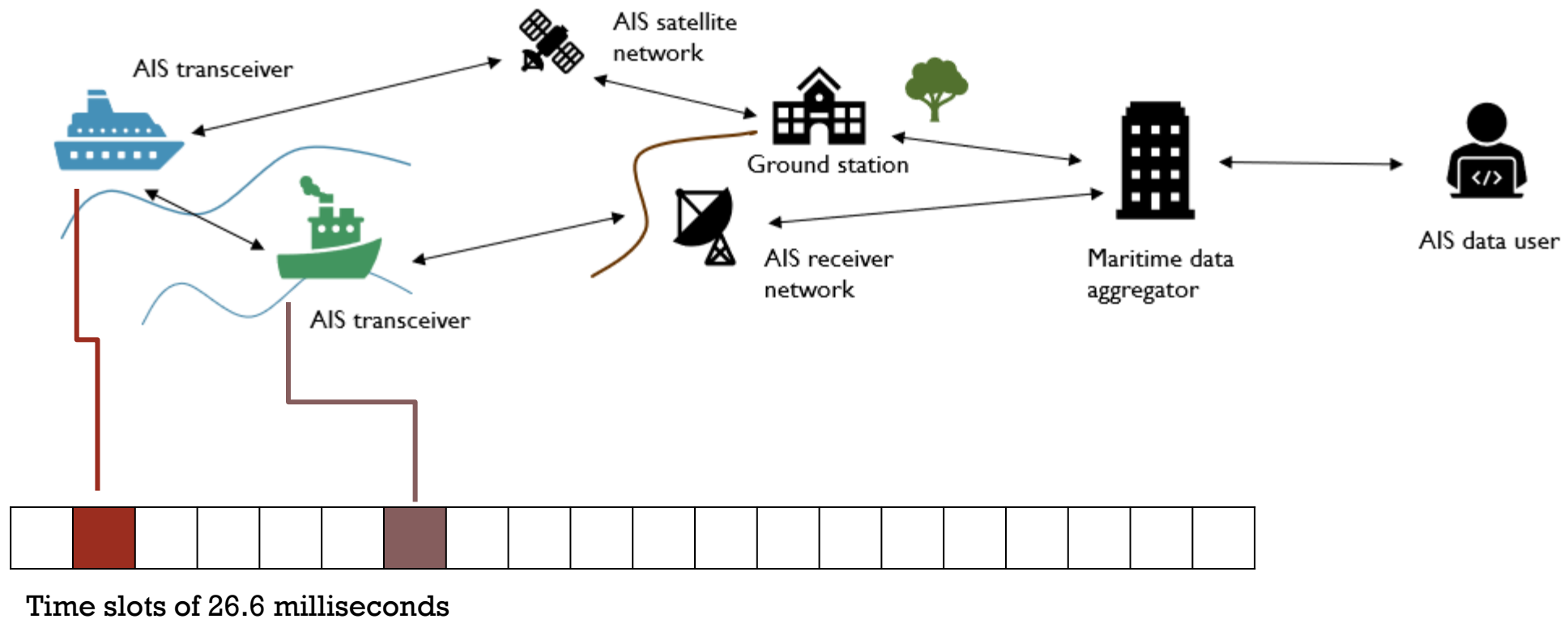
Global Working Group on Big Data for Official Statistics

- Access and Partnerships
- Big Data and the SDGs
- Mobile Phone Data
- AIS Data
- Satellite Imagery and Geo-Spatial Data
- Scanner Data
- Social Media Data
- Training, Skills and Capacity-building
- Global Platform for Data, Services and Applications



WHAT IS AIS DATA – BASIC INFORMATION

- The automatic identification system (AIS) is a tracking system for ships, originally developed for collision avoidance



WHAT IS AIS DATA – BASIC INFORMATION

Dynamic information

- Automatically transmitted
- Every 2 to 10 seconds when moving
- Every 3 to 6 minutes when anchored

- ① Maritime Mobile Service Identity number (MMSI) – nine-digit number
- AIS navigational status
- Rate of turn
- Speed over ground
- Position coordinates (longitude/latitude)
- Course over ground
- Heading
- Bearing at own position
- UTC second

Static information

- Manually transmitted
- Every 6 minutes

- ① International Maritime Organization number (IMO) – IMO + seven-digit number, unique reference for ships
- Call sign
- Name
- Type
- Dimensions
- Location of the positioning system's antenna on board the vessel
- Type of positioning system
- Draught
- Destination
- ETA (estimated time of arrival)



WHAT IS THE UN GLOBAL PLATFORM

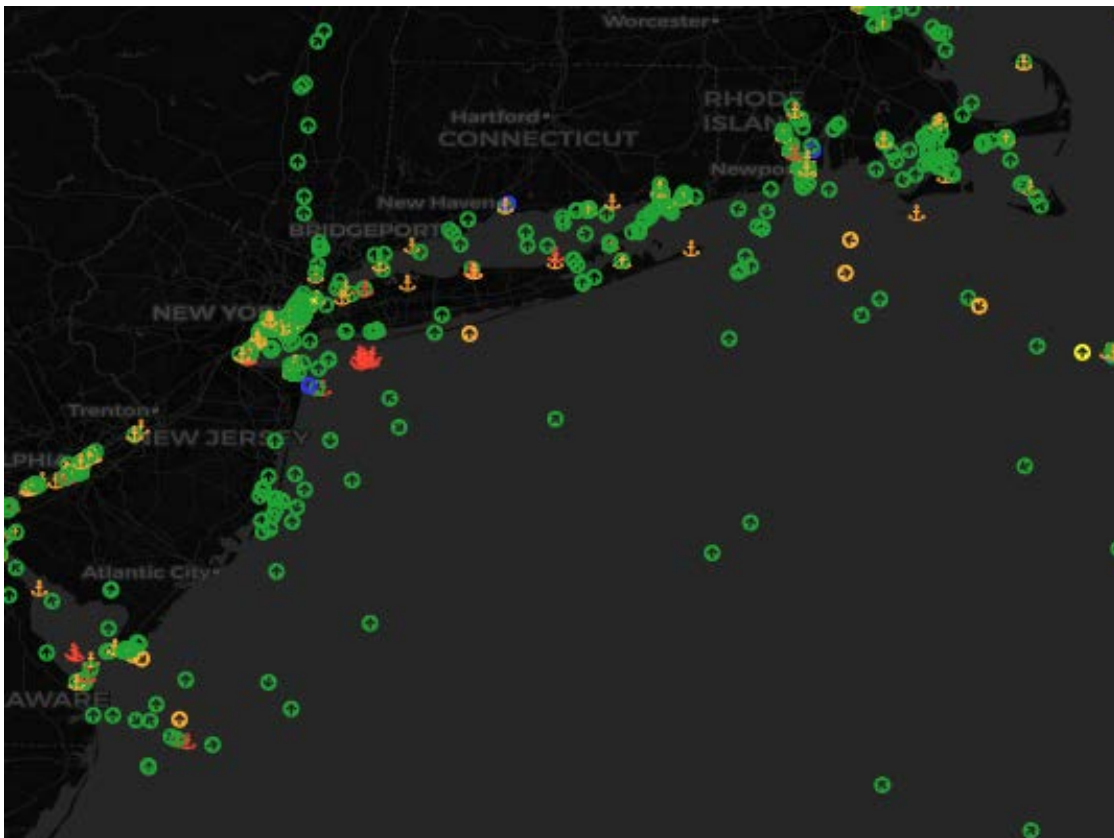
- Global platform for
 - Exchanging ideas and methods for processing, analyzing and visualizing Big Data
 - Storing Big Data sources and enable processing, analyzing and visualizing the data
 - Demonstrating the value of Big Data in better decision making through pilots and case studies
 - Providing training materials and workshops for capacity building

 **BigDataUN** Global Working Group
Marketplace Alpha



AIS DATA - HOW DOES IT LOOK LIKE

- Get a first overview on ships in the selected area
- Get more information by clicking on a single vessel



EE (Live) (3) (40.51, -73.60)

EE (Live) (3)

mmsi	563087300
imo	9,581,447
vessel_name	MAERSK MARU
callsign	9V6431
vessel_type	Tanker
vessel_type_co	80
de	
vessel_type_car	
go	
vessel_class	A
length	177
width	32
flag_country	Singapore
flag_code	563

636018659
MSC NOA

538008153
IONIAN STAR

367459570
CORAL COAST

Nicer presentation of information



OVERVIEW AND MORE SYSTEMS/TOOLS



Platform providing data, methods and code for various fields of official statistics

Receiving and providing AIS data

Storage of data

Processing and visualizing data

Tools for analysis

ORBCOMM

Data aggregator



Data aggregator



Database storing AIS data



Service provider for advanced analytical techniques



Browser-based visualization



Analytics engine for large-scale data processing



Interactive web-application for creating documents



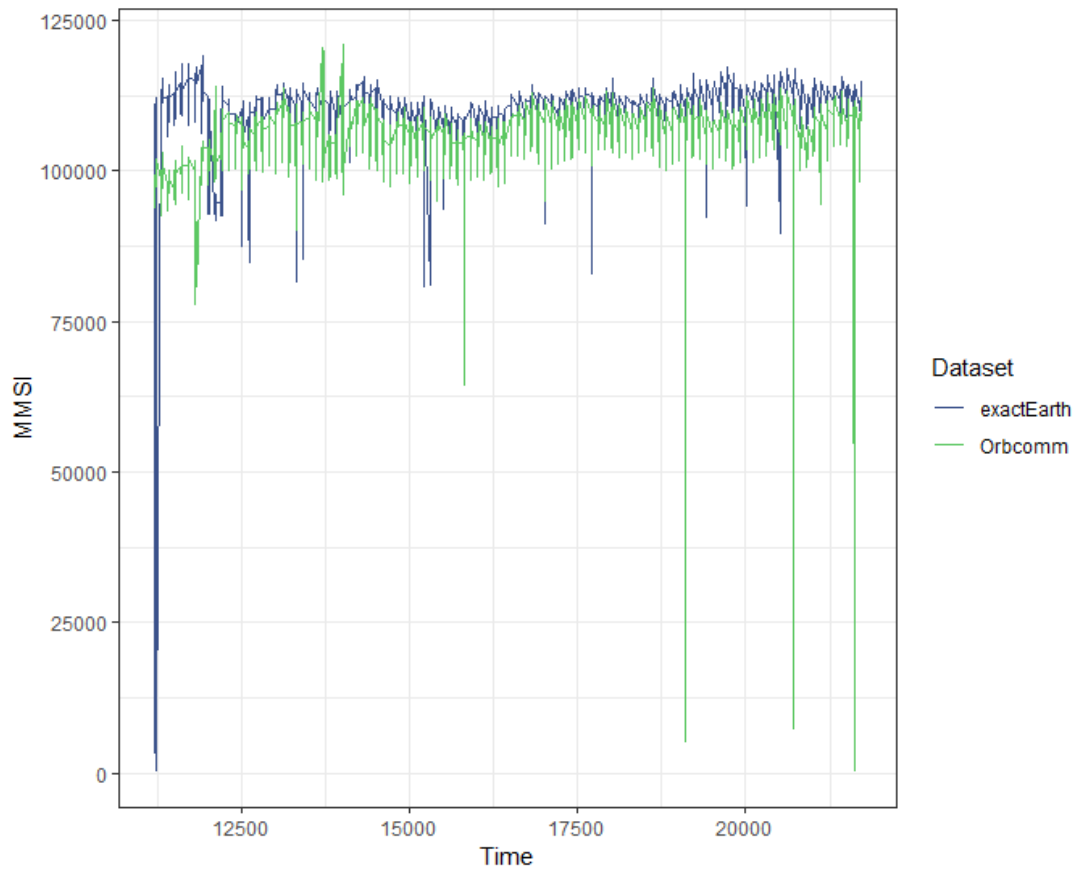
Tool for large-scale geospatial analytics



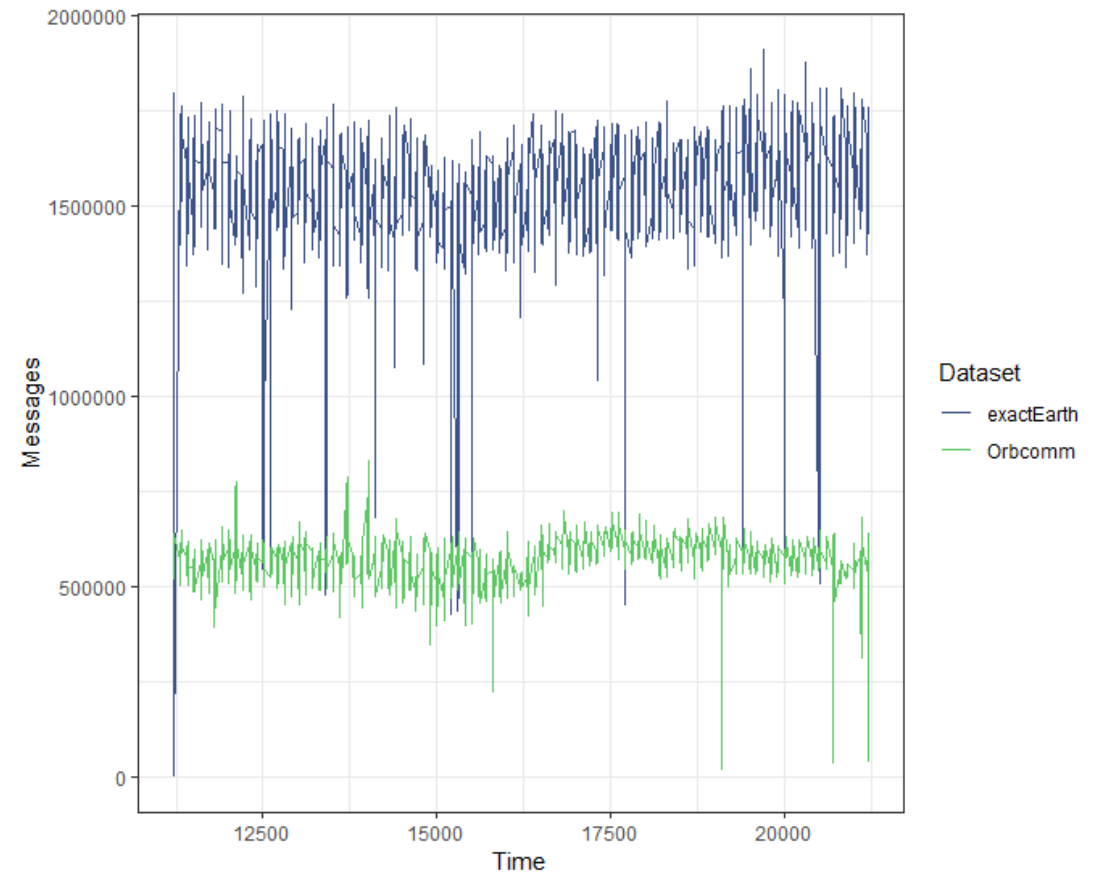
Version control and code sharing



COMPARISON OF MARITIME DATA AGGREGATOR



	Median	Mean
exactEarth	109894	109089
Orbcomm	105550	104976



	Median	Mean
exactEarth	1548598	1527333
Orbcomm	574140	571359



AIS HANDBOOK OUTLINE

1. Introduction
 - a. About Global Working Group
 - b. About AIS Task Team
 - c. About AIS
2. Overview of AIS datasets
 - a. Description
 - b. Data providers
 - c. Source and data aggregator
 - d. Limitations – update frequency, interval
 - e. Quality (input)
3. Data cleaning and preparation
 - a. Data recording processes
 - b. Methods to identify data gaps
 - c. Gaps in coverage
 - d. General and specific data cleaning
4. Case studies
 - a. UK ONS: Port traffic, time spent in ports
 - b. UNCTAD/MarineTraffic: Maritime indicators
 - c. EU JRC: Fishery
 - d. UN Global Pulse: Ship in distress, disease distribution
 - e. CBS Netherlands: Inland waterway
5. AIS data at the UN Global Platform
 - a. Data cleaning and preparation
 - b. Step-by-step guidelines with sample scripts
 - c. Visualization
6. Future work
 - a. Inventory of relevant data sources (i.e., global ship registers, trade data)
 - b. Linking with other data sources
 - c. Other experimental data form AIS



UK USE CASE

- UK uses AIS data to get early economic indicators
- Indicator 1: Time in port – aggregated time in seconds of ships in UK ports
- Indicator 2: Total traffic – number of unique ships entering UK ports

Table: Correlation coefficients for the month-on-month growth rates for the shipping indicators and the economics statistics

	Imports (ONS)	Exports (ONS)
Time-in-Port	0.43	0.06
Port traffic	0.64	0.23



FUTURE IDEAS

Issue	Idea	Outcome
Ships might not cover total trade	Use AIS data for countries that predominantly use shipping as mode of transport for trade	Better coverage of total trade
Correlation is low for total imports and exports	Get indicators for specific goods, e.g., oil exports and imports of specific countries	Higher correlation between AIS indicators and benchmark
AIS data does not include information about the cargo the ships carry	Combine AIS data customs data: with information on vessel type, trade flows, and the countries of departure and destination	More exact and current picture of trade flows
Economic forecasts are not timely	Use information on the speed of vessels, port departures and idle ships	Nowcasts and forecasts of trade and economic growth
Lack of custom data	Use AIS data and other sources to estimate trade	Proxy for missing trade statistics



THANK YOU

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