



6th SSN LRIT Group Meeting

Status of the TDMS project

Agenda item 6.6.3

Edmunds Belinskis / Project officer
Department C: Operations/Unit C.2.1

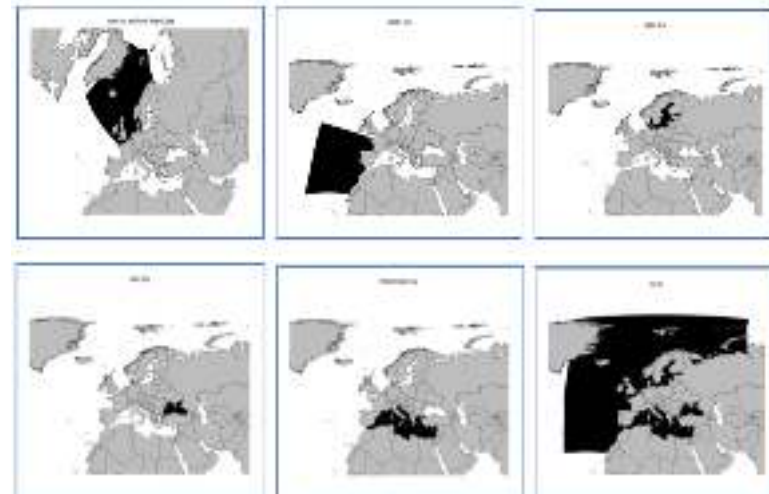
Lisbon / 31 October 2019

Background

- **HLSG DM2** (Brussels, 20 June 2017) agreed on “... mandating EMSA to start preparing for providing traffic density maps, based on AIS data, to interested parties upon request, as a new service.”
- **HLSG DM3** (Brussels, 28 February 2018) approved the methodology proposed and agreed on the service to be provided to the EMODnet Human Activities Portal following the agreement between EMSA and DG MARE.
- SLA between EMSA and DG MARE was signed on 13 March 2019.
- The TDM service is operational and available to the SEG users since 30 August 2019:
 - Data files to EMODnet Human Activities portal
 - Colour maps to the SEG application

Concept

- Ship routes restoring method
- Only AIS data (S-AIS and T-AIS)
- The ship's identity is not disclosed
- **Areas:** North Sea/ North Atlantic; Atlantic; Mediterranean Sea; Black Sea; Baltic Sea and All Europe
- **TDM time criteria:** previous month/ season/ year
- **Ship type ranges (AIS):** "Passenger"; "Cargo"; "Tanker"; "Fishing", "All Other" and "All Traffic"



Methodology

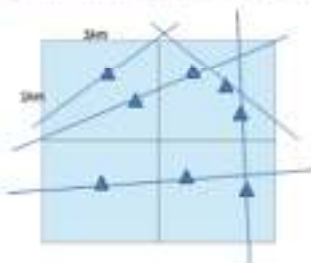
1. Area is divided in grids with 1km*1km cells



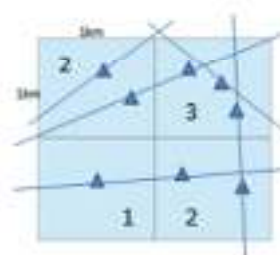
2. The aggregated SPD (position report) of the distinct ships (MMSIs) are overlapped onto the grids



3. The reported positions are connected by line segments, creating polylines (representing ship routes). Polyline are sorted by ship types.



4. Polyline (ship routes) which cross each cell are counted (every time the polyline intersects the cell)



5. The colour classification is applied. Cells with higher number of polylines (ship routes) have darker colour

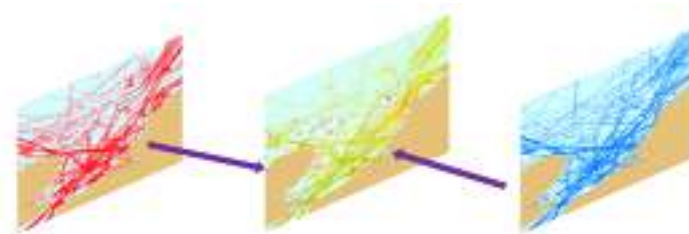




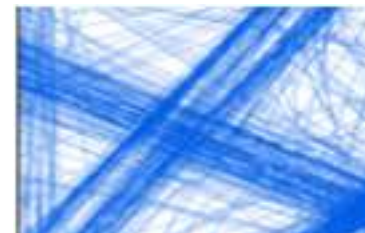
TDMS 2nd phase

- **New types of maps:**

- **Comparative TDM** - will present changes in the traffic density between two selected corresponding TDMs.



- **Vector-type TDM** - will present routes of ships (polylines) within the predefined specific area of interest.

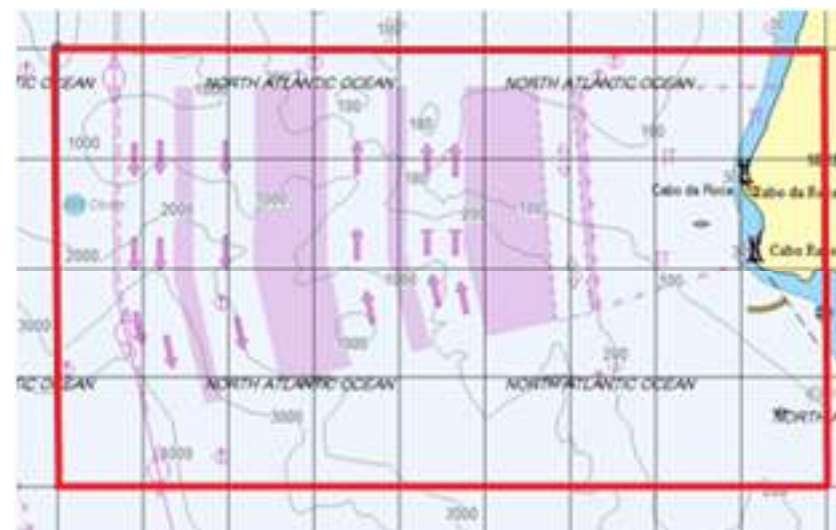


- **Detailed TDM** - will present a traffic density in a specific areas of interests using different grid cell (200x200 m)

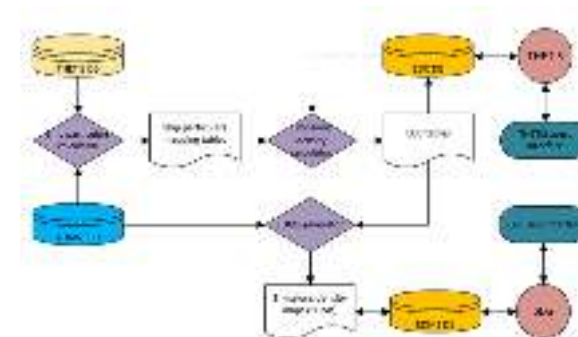


TDMS 2nd phase

- **New services:**
 - **Download TDMs (image file)** – for Standard and Detailed TDMs
 - **TDM generating “on fly”** – for Comparative TDMs
 - **Visualising the density level** (per grid cell) – for all, except Vector TDMs
 - **Elements of statistics** – for Vector TDMs
- **Member States are invited to provide the areas of interests to be included in the service.**
 - Should relate to the TDMS areas
 - Limited in size
 - Borders by coordinates and shapefiles
 - Name



- Emissions calculation tool
- EDMs generating mechanism
- EDMs storing DB
- EDMs presentation through SEG
- Emissions density statistics presentation through THETIS (optional).



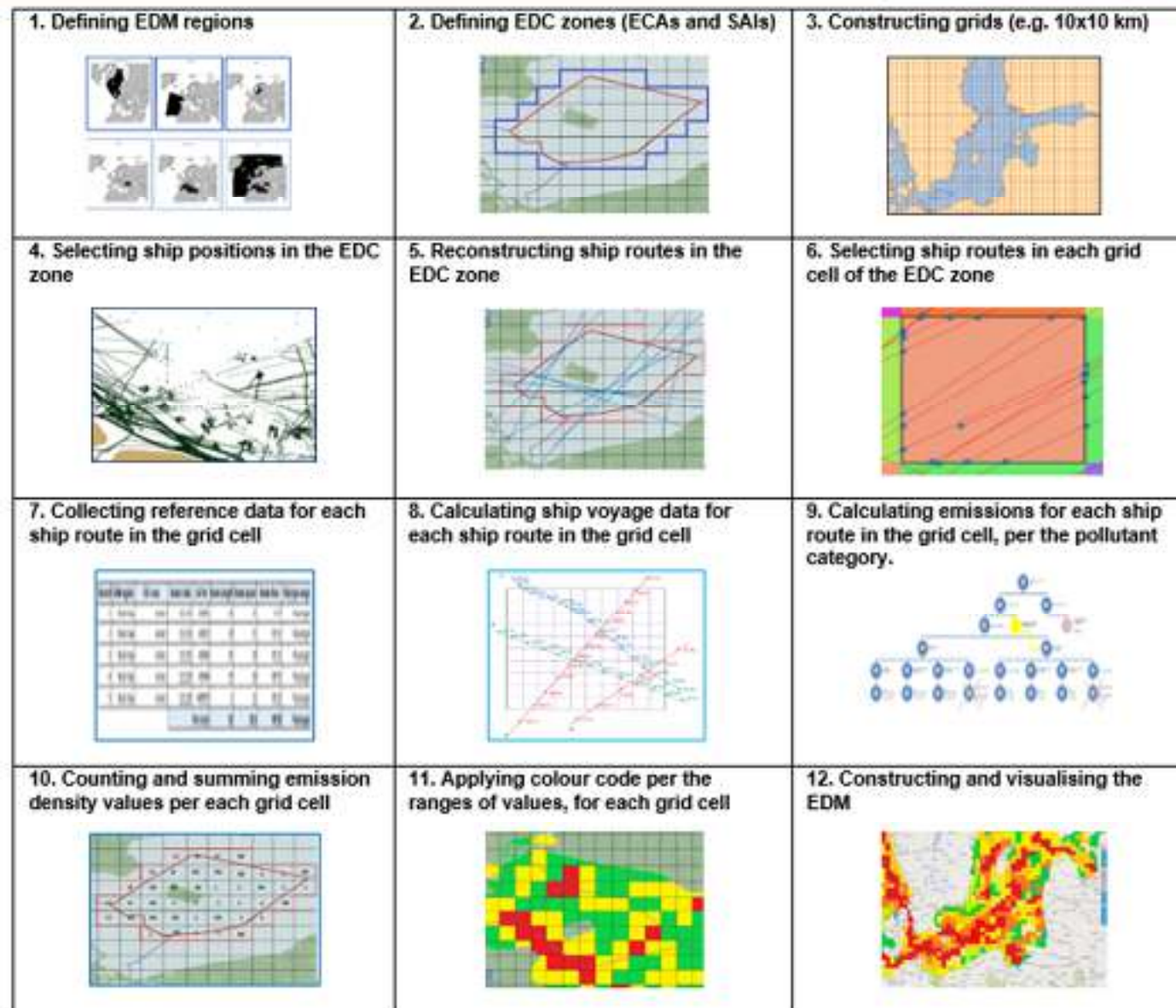
Concept

- Ship routes restoring method
- Only AIS data (S-AIS and T-AIS)
- Reference data: THETIS DB; TDMS; STAR
- Reference Areas: North Sea/ North Atlantic; Atlantic; Mediterranean Sea; Black Sea; Baltic Sea
- Emission density calculation zones (EDC zones): **Emissions Control Areas** (ECAs) and **Specific Areas of Interests** (SAIs)
- TDM time criteria: previous month/ season/ year
- Ship type ranges (AIS): “Passenger”; “Cargo”; “Tanker”; “Fishing”, HSC, “All Other” and “All Traffic”
- Emissions categories
 - Nitrogen Oxides (NOx)
 - Carbon Dioxide (CO2)
 - Sulphur Oxides (SOx)
 - Particulate Matter (PM)

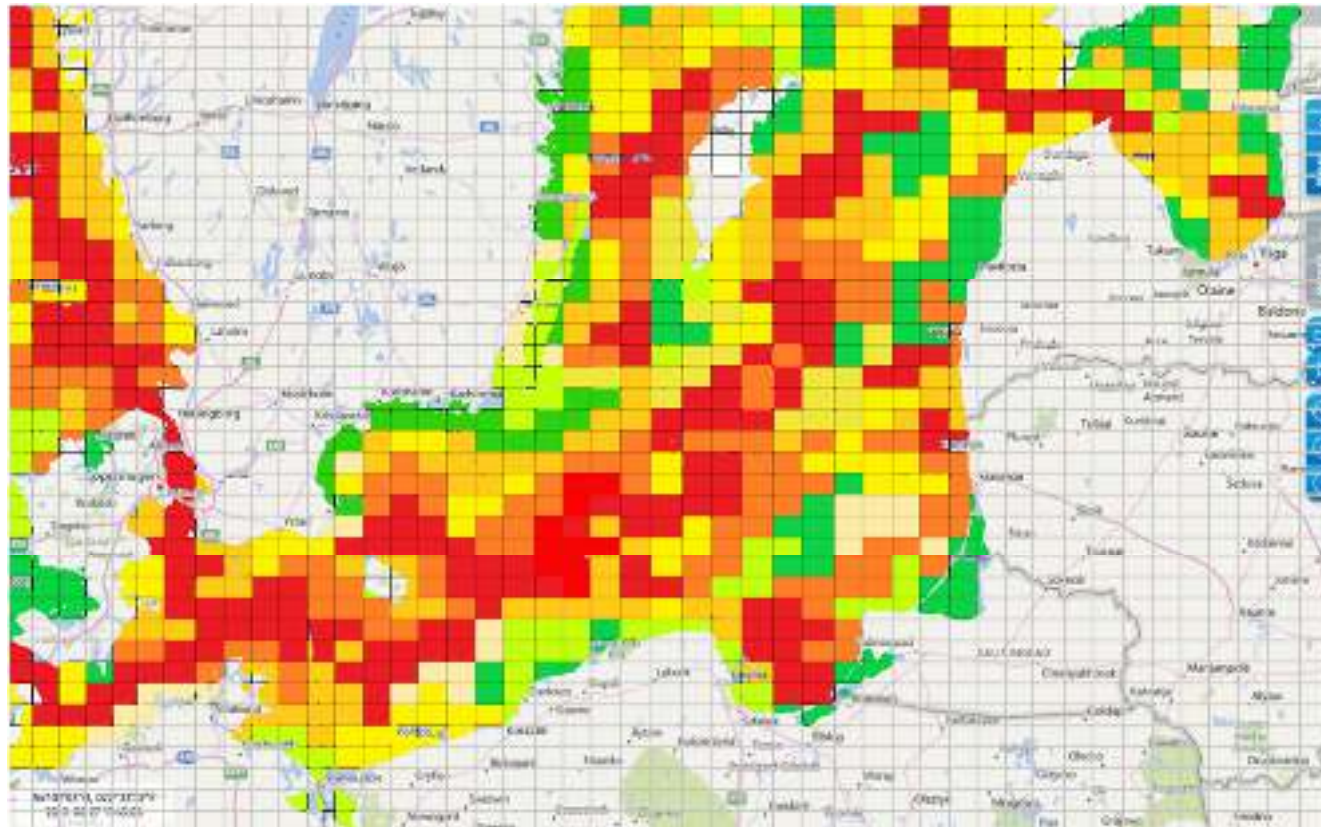
Limitations

- Theoretical calculations (no input of measurements)
- All ships transmitting AIS, but no info on their business
 - E.g.: fishing vessel just slowly moving or trawling? With or without catch?
 - Higher engine power used = more fuel consumed = more emissions produced
 - E.g.: ship is using only a single engine or multiple engines in the area?
 - E.g.: are ships really using clean(er) fuel inside SECA ?
 - And, are ships with scrubbers really using that equipment?
 - Etc.
- Emissions are calculated assuming that no external factors apply (e.g. wind and other local atmospheric circumstances)

Methodology (concept)



Expected result



Outcome (conceptual)

The maps will be created for all combinations of criteria in the table

EDM region	EDC zone	Pollutant category	Ship type range	Time category
North Sea/Atlantic	Zone 1	NOx	All Traffic	Monthly EDM
	Zone....	SOx	Cargo	Seasonal EDM
Atlantic	Zone 1	CO2	Fishing	Annual EDM
	Zone....	PM	Passenger	
Baltic Sea	Zone 1		HSC passenger	
	Zone....		HSC cargo	
Black Sea	Zone 1		All Other	
	Zone....			
Mediterranean Sea	Zone 1			
	Zone....			



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