



Traffic Density Mapping Service User Guide

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Document History

Version	Date	Changes	Prepared
1.0	10/10/2019	Initial version of the TDM Service	EMSA

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1. Purpose of the document

This document is a user guide for the Traffic Density Mapping service. It provides a general description of Traffic Density Maps (TDM) and explains how they can be displayed in the SafeSeaNet Ecosystem's Graphical user interface (SEG).

This document is available on EMSA's website: <http://www.emsa.europa.eu/related-projects/tdms.html>

2. Background

2.1 Concept

TDMs are a simple and effective way of displaying vessel movement patterns and contribute to a better understanding of maritime traffic. They help having a better understanding of the locations of the main shipping lanes, by whom they are used, and which ship types are navigating on which routes.

The method agreed by the HLSG¹ to generate TDMs is the “**ship routes restoring method**”. This method rebuilds the track of each distinct ship from the recorded positions and counts how many routes are crossing each cell of a grid during a given period of time. This method can be implemented in all regions (coastal and open sea), using all the available ships position data available to EMSA and allows connecting routes even within areas with a low coverage.

TDMs are calculated from historical Terrestrial and Satellite AIS ships position data allowing covering both, EU coastal areas as well as open seas areas not covered by Terrestrial AIS.

TDMs are created for each of the following (predefined) areas:

- Baltic Sea;
- North Sea/North Atlantic;
- Atlantic;
- Mediterranean Sea;
- Black Sea;
- All Europe (i.e. including all the above areas)

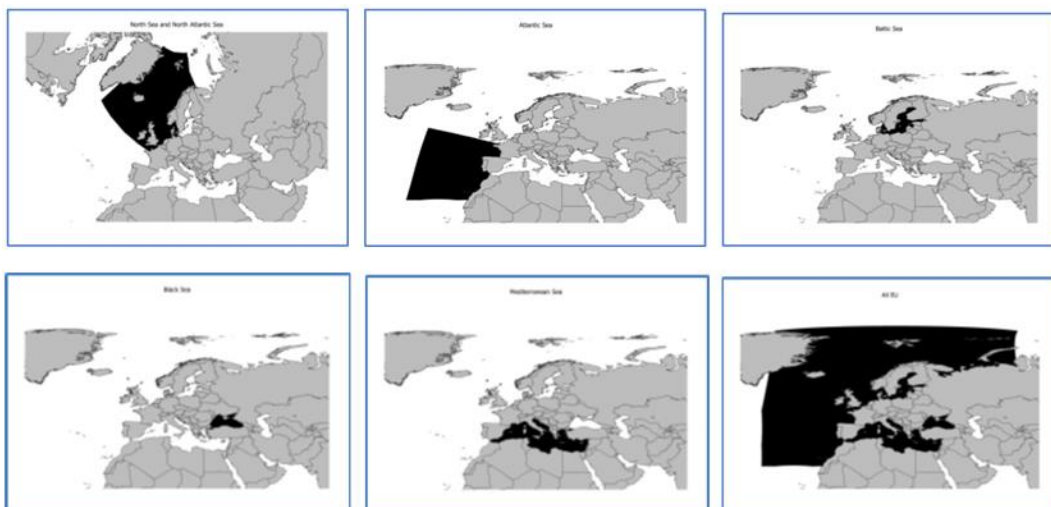


Figure 1: TDMs areas

¹ The High-Level Steering Group for Governance of the Digital Maritime System and Services (HLSG DM) consists of representatives from the EU/EEA Member States and is chaired by the Commission in accordance with the Commission's Decision (EU) 2016/566 (on establishing the high-level steering group for governance of the digital maritime system and services and repealing Decision 2009/584/EC).

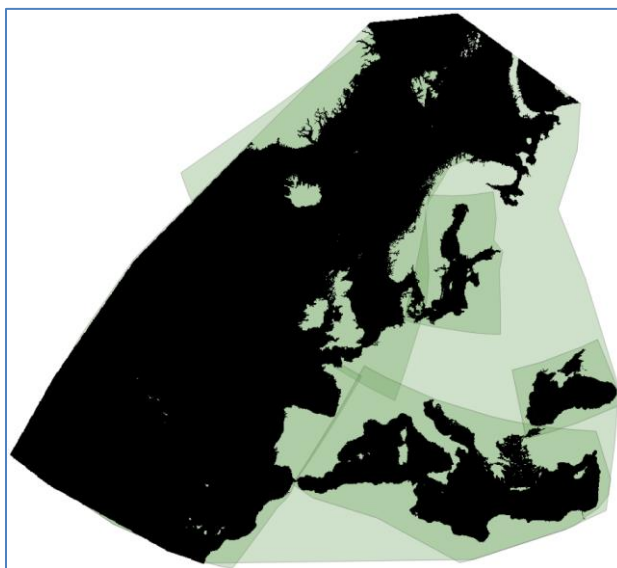


Figure 2: TDMS areas

TDMs are calculated for the following time periods:

- **Month** - presents the data collected during a calendar month, from the first day until the last day of the corresponding month.
- **Season** - presents the data collected during the following periods:
 - Spring (period: March, April, May);
 - Summer (period: June, July, August);
 - Autumn (period: September, October, November);
 - Winter (period: December, January, February);
- **Year** - presents the data collected during a calendar year.

The basic period for the TDM is one month. The monthly maps are combined in order to create seasonal or annual TDMs. All calculations are provided for the preceding period of reference.

TDMs are produced for the following ranges of AIS ship types:

- **Passenger** - AIS type codes 60 to 69
- **Cargo** - AIS type codes 70 to 71
- **Tanker** - AIS type codes 80 to 89
- **Fishing** - AIS type code 30
- **All other** - includes all ship types not listed individually, and
- **All Traffic** - includes all ships monitored.

2.2 Methodology used to create TDMs

The general steps for creating a TDM are: aggregate ship positions, create polylines, sort the polylines per ship type range, count the grid cells crossings, and apply the density classification. The result is a TDM **per ship type range, per area** and **per time period**. The steps are presented in Figure 3. A more detailed description is provided in the TDMS methodology document which is available on EMSA's website: <http://www.emsa.europa.eu/related-projects/tdms.html>.

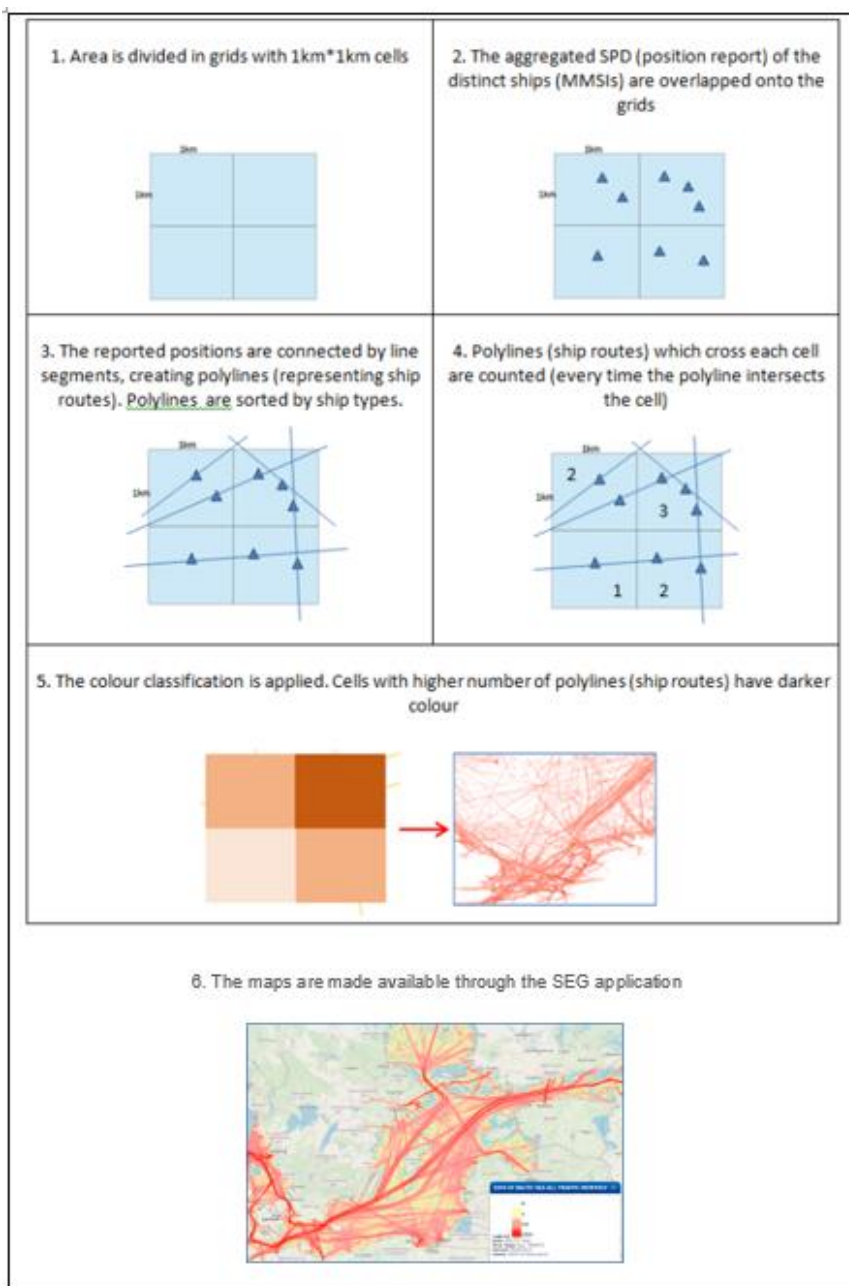


Figure 3: Steps for creating a TDM

2.3 Users

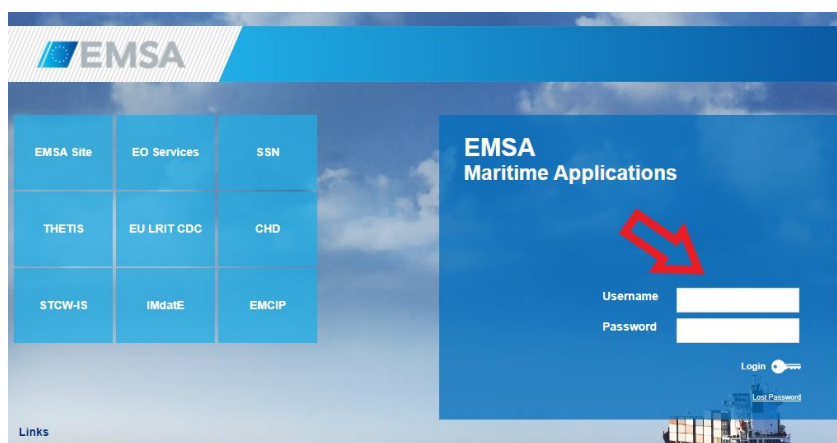
Access to TDMs is restricted to end-users which have access to SEG and given access to operation "IVTMIS".

3 How to display TDMs in SEG

TDMs are available to users through the EMSA SEG application. To access the maps, users should complete the following steps:

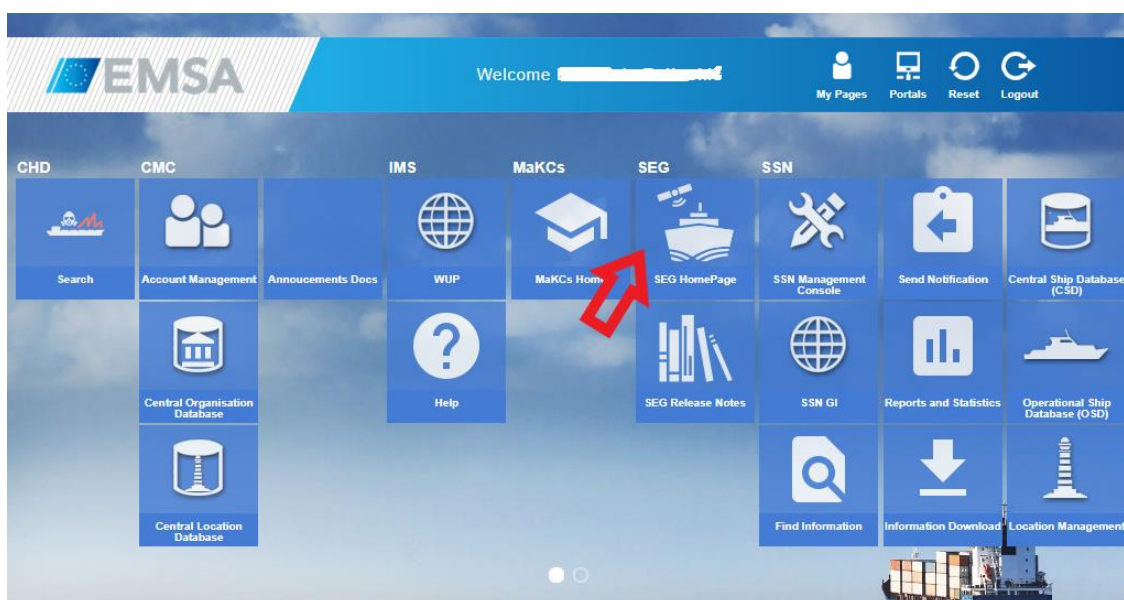
3.1 Access the Maritime Applications Portal (MAP)

Use your “Username” and “Password” to access MAP.



3.2 Open the SEG application

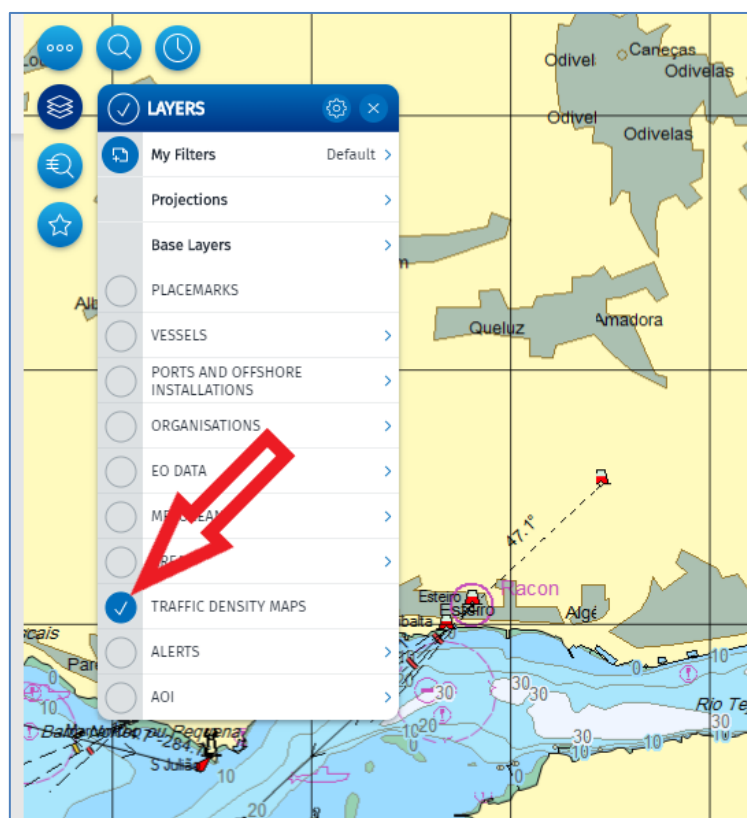
Click on the SEG application icon.



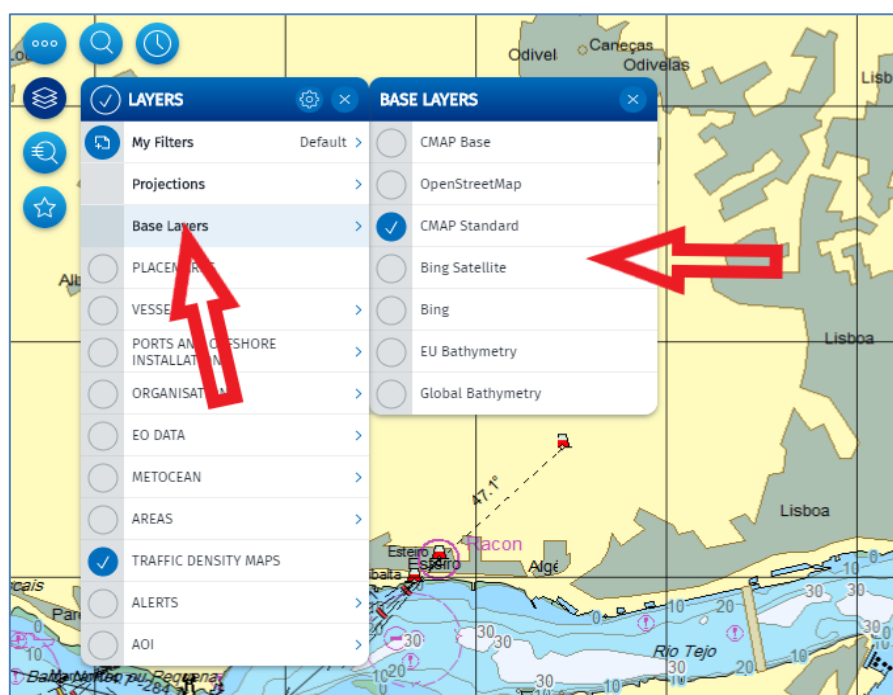
The system will open SEG.

3.3 Activate the Traffic Density Maps layer

In the layers panel, select the layer “Traffic Density Maps”



The base layer (background map) can be changed by using the layer “**Base layers**”.

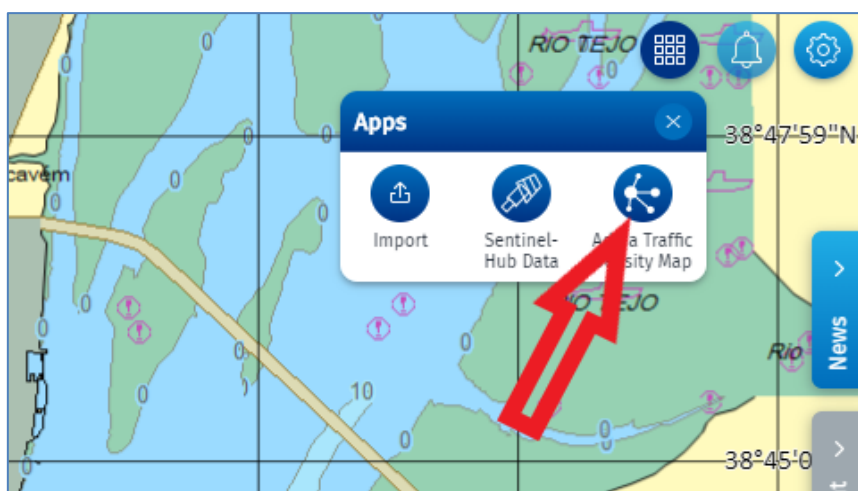


3.4 Open the TDM application

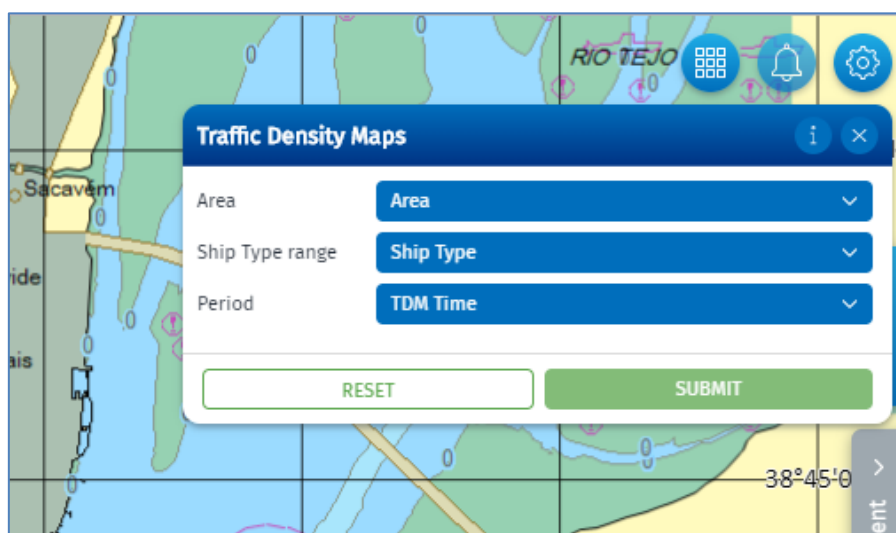
Click on the “Apps” icon. The available applications will open in a new window “App”.



Click on the “Add Traffic Density Map” icon.



A new panel “**Traffic Density Maps**” will open, allowing to request the TDM to be displayed.

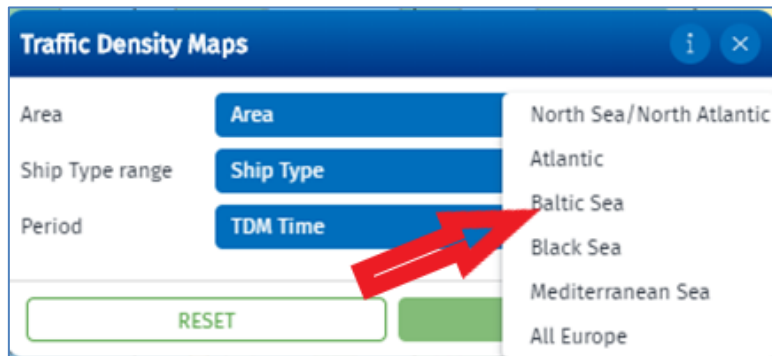


The panel can be moved by grabbing and dropping it to a new location on the screen.

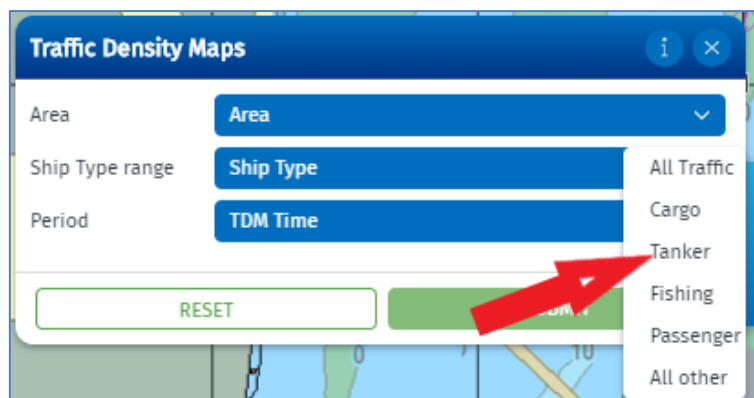
3.5 Select the map

To request a TDM, all the criteria must be selected (**Area**, **Ship Type range** and **Period**) using the drop-down menus.

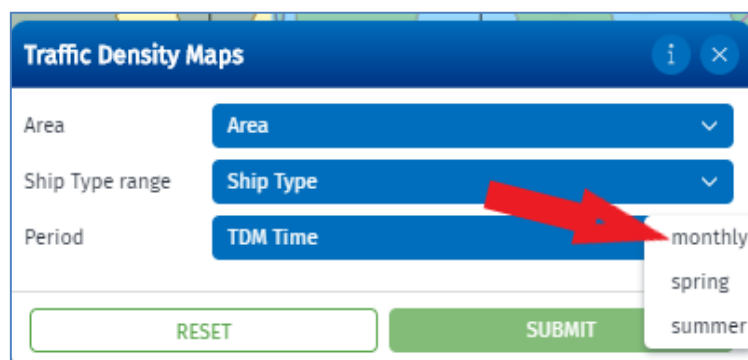
- **Area:** Click on the “**Area**” bar and then on an area (e.g. Baltic Sea) in the drop-down menu.



- **Ship type range:** Click on the “**Ship Type**” bar and then on a ship type range (e.g. Tanker) in the drop-down menu.

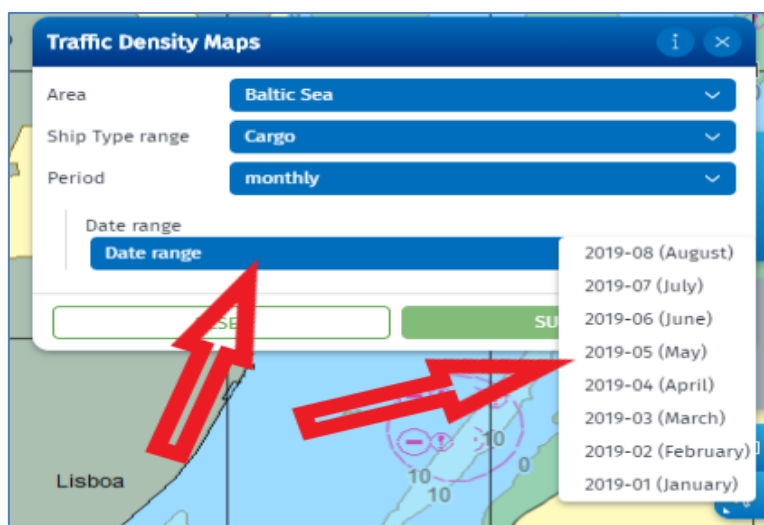


- **Period:** Click on the “**TDM Time**” bar, then click on the time period (e.g. “Monthly”) in the drop-down menu.

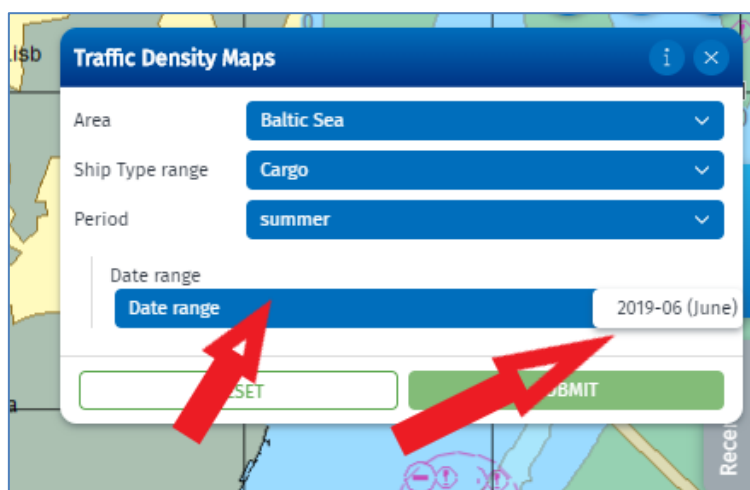


After selecting the period (e.g. monthly TDM), a new selection bar “**Date range**” will be enabled, allowing to specify the month, season or year of the map (e.g. “**2019-08(August)**”).

Click on the “**Date range**” bar and then select the month (or e.g. season) from the drop-down menu. The drop-down menu shows all maps available for this category.

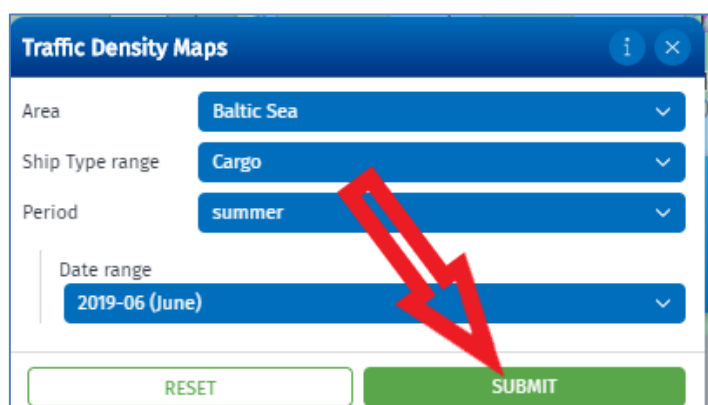


Note: Date ranges of seasonal maps are named by the first month in the season, e.g. the name of the map for spring 2019 is “**2019-03(March)**”.



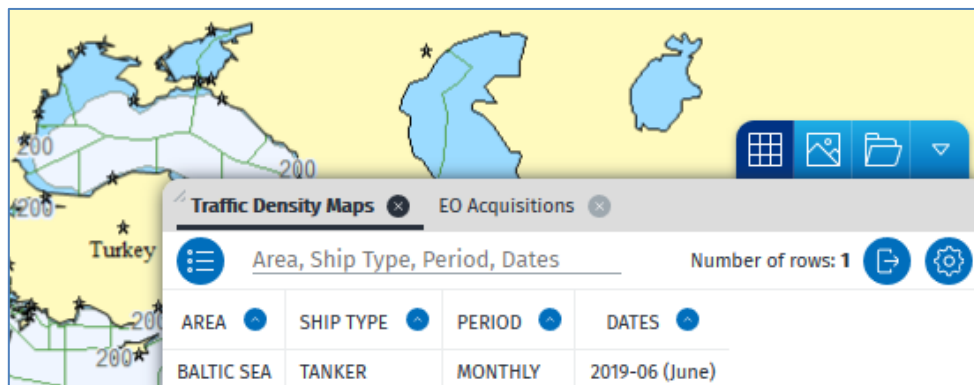
3.6 Request the selected map

Once all criteria are selected, submit your request by clicking on the “**Submit**” button. To reset your selection, use the “**Reset**” button.

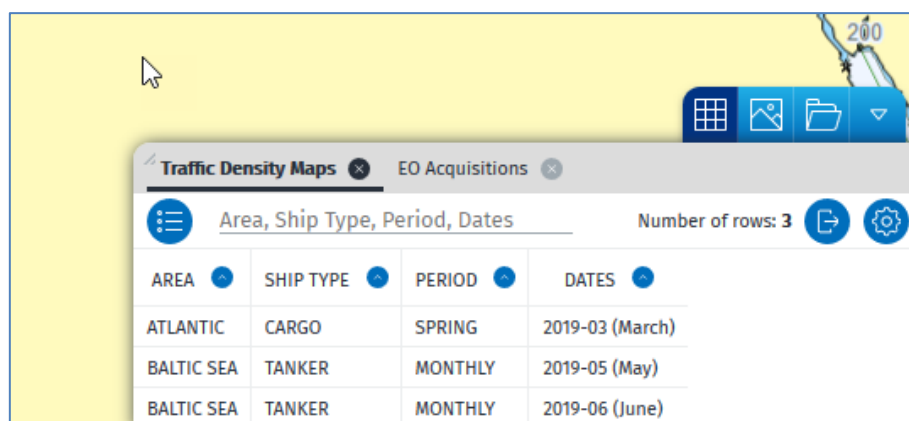


Your requested map will be displayed on the screen. Use SEG functionalities to zoom it to the required level, center it or move to a specific location.

The TDM will be added to the list in the TTT panel in the bottom-right corner of the page.

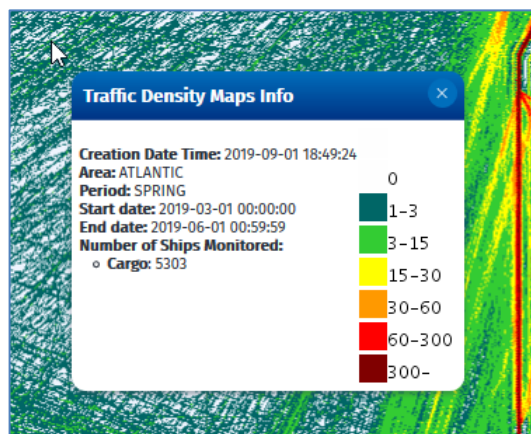


Several TDMs may be requested. You may select which TDM to display by clicking on a row in the list in the TTT panel.



3.7 View information and legend of a TDM

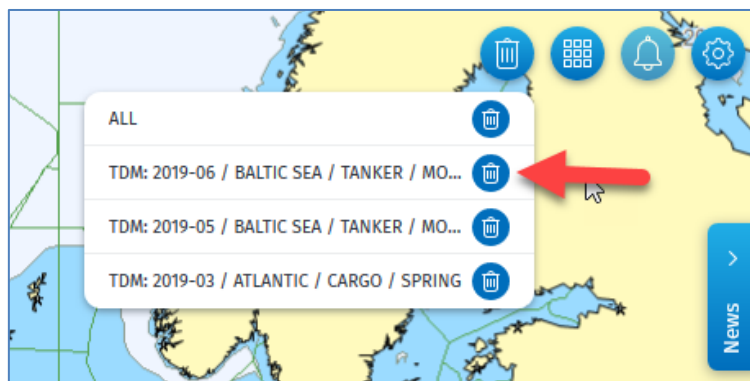
Click at any place on a TDM to open the “Traffic Density Maps Info” panel. The panel will provide the details about the TDM and its legend.



The panel can be moved by grabbing and dropping it to a new location on the screen.

3.8 Remove a TDM

TDMs can be removed from the display by using the “trash” icon in the top-right corner of the page. Click on the trash icon in the list to remove the corresponding TDM.



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