Member States Training

Providing integrated maritime service(s) – IMS - through EMSA's Integrated Maritime Data Environment

Lisbon/ 21 October 2016

EMSA

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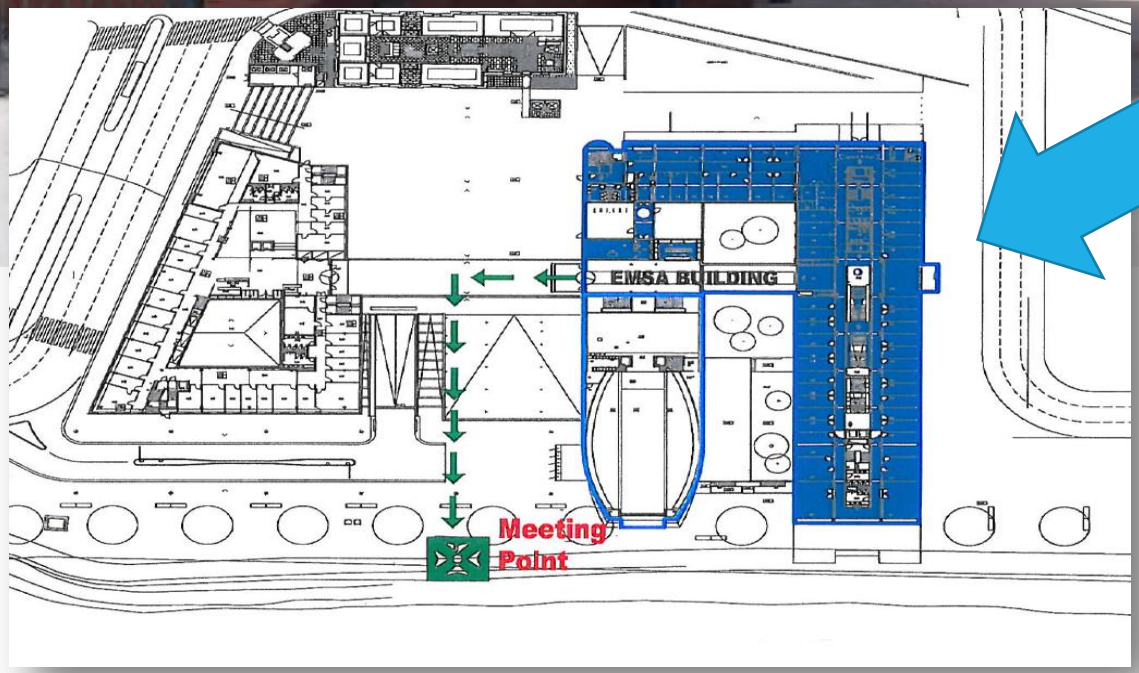
Welcome, Safety information, evacuation procedures

Safety information – evacuation procedures

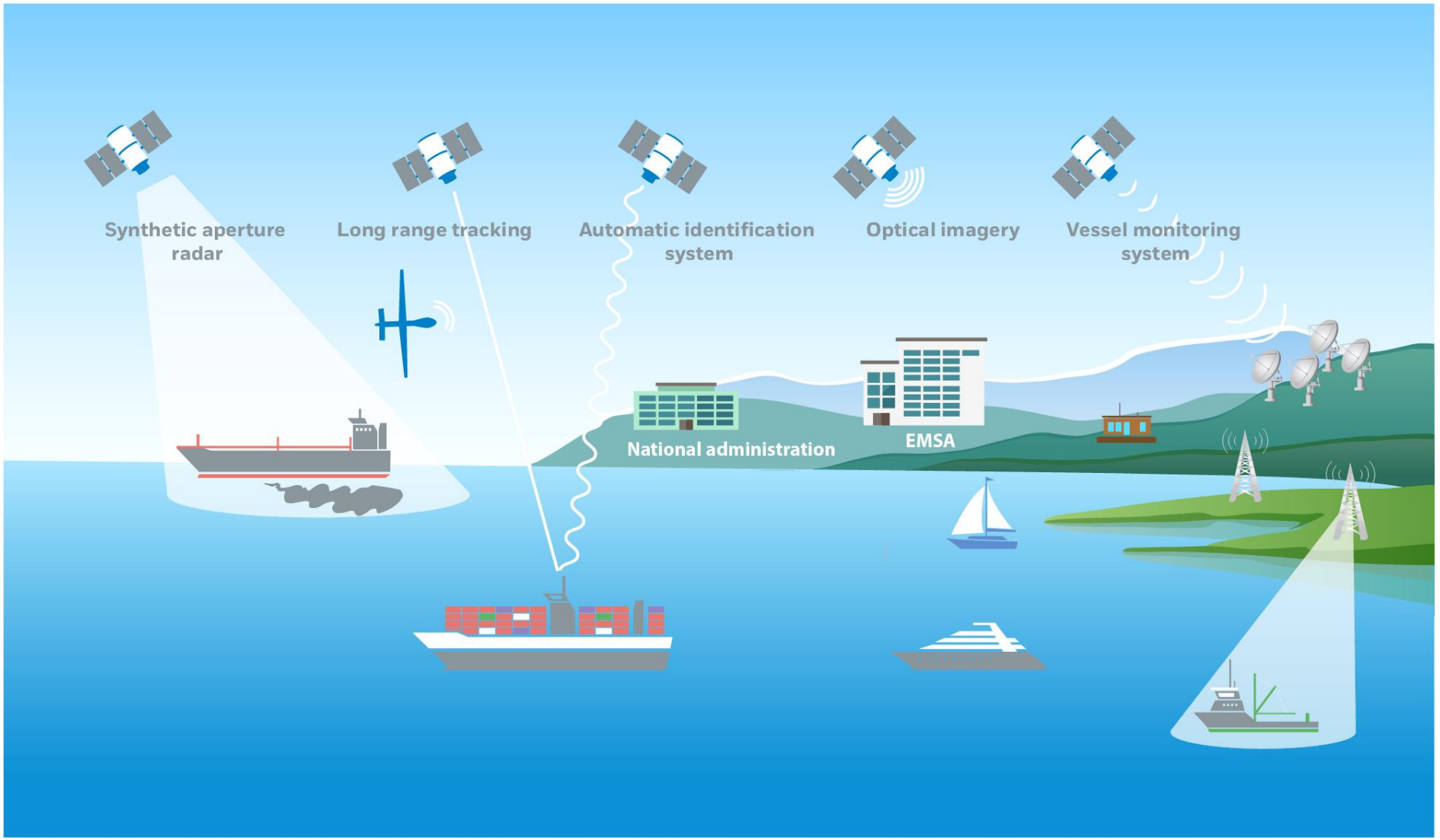


EMSA
European Maritime Safety Agency

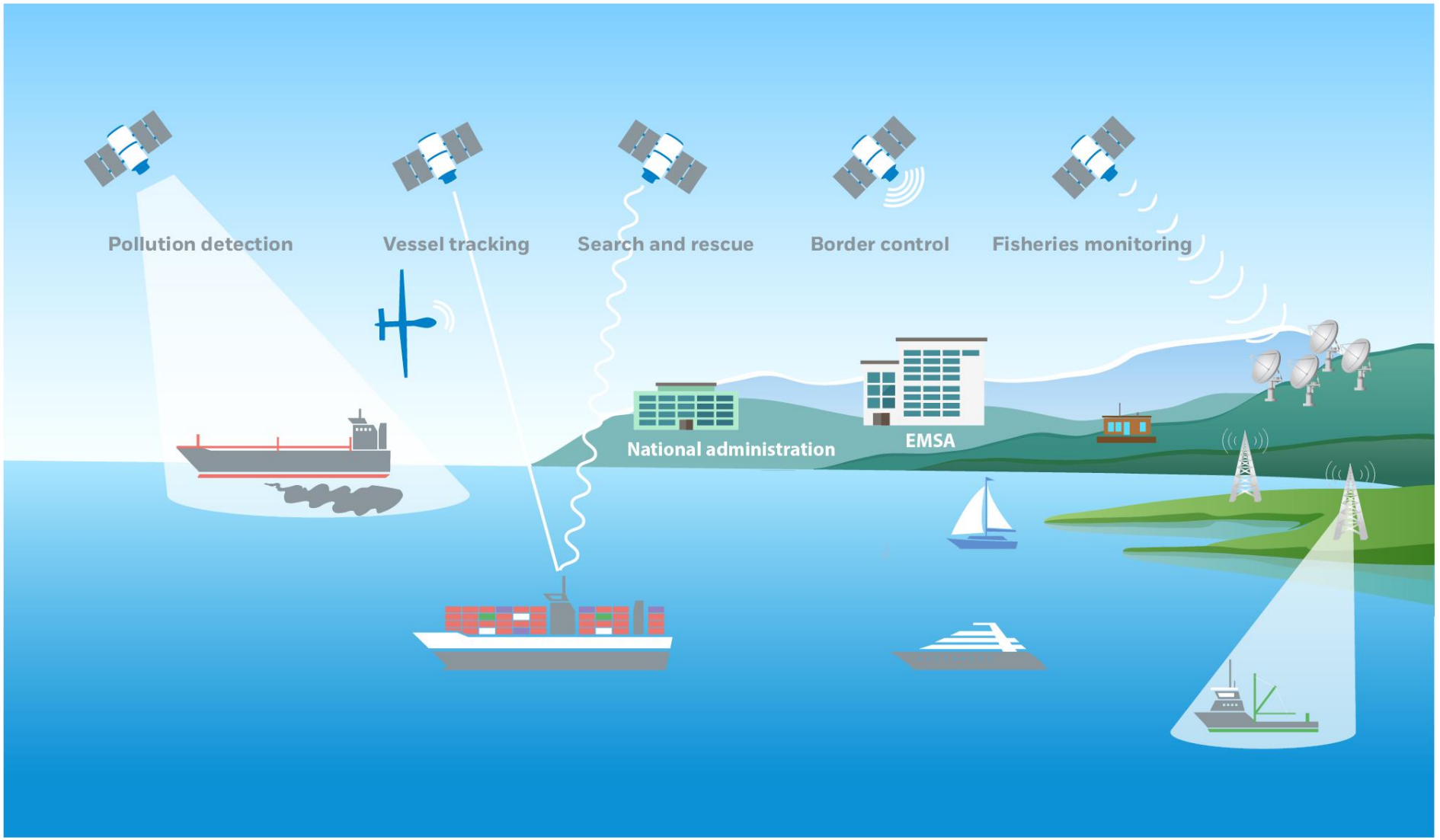
Tour de Table

IMS- Background

Integrated maritime services



Integrated maritime services



Integration = user & political driven approach

Why IMS?

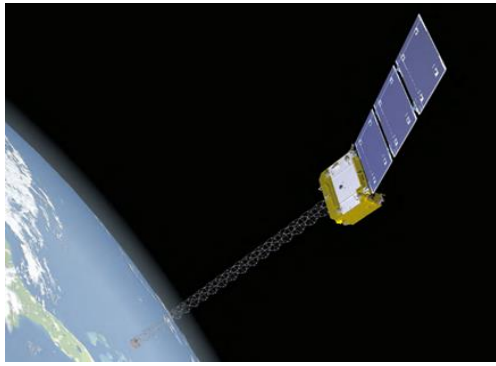
- Over 3000 users of EMSA VTMIS-related systems.
- Large amount of common users accessing different applications – SSN, LRIT, CSN.
- Users are asking for value added information based on integrated data.

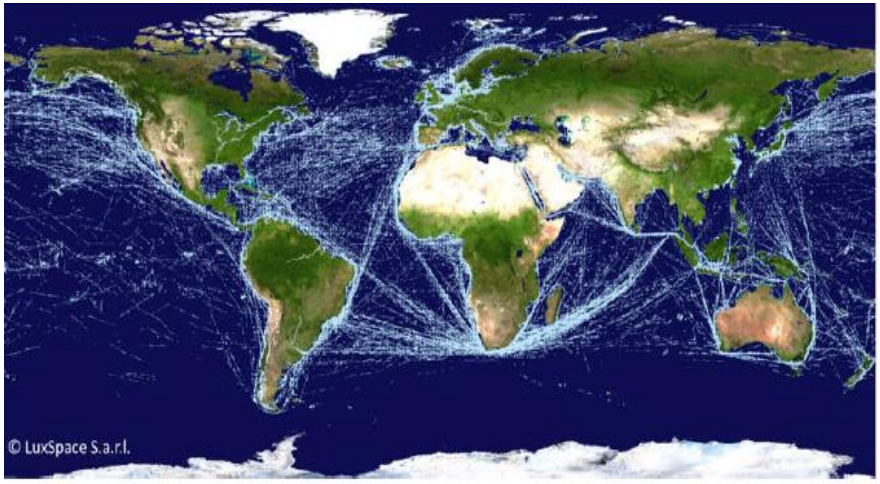
What for?

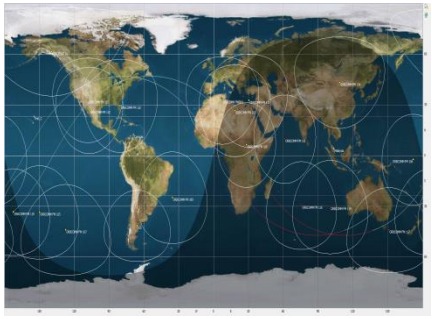
- Maritime Domain Awareness (IMO definition) = effective understanding of anything associated with the maritime domain that could impact the security, safety, economy or environment.
- IMS is a voluntary service provided to national administration having “functions” related to the maritime domain

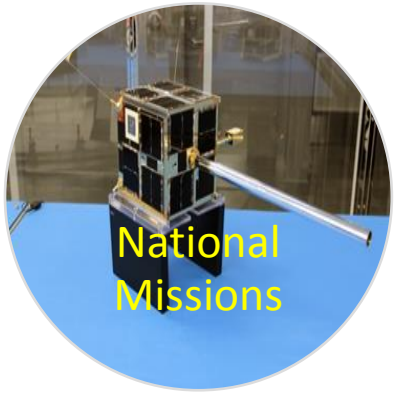
Provision of SAT-AIS data

Provision of high quality SAT-AIS data services to EMSA users









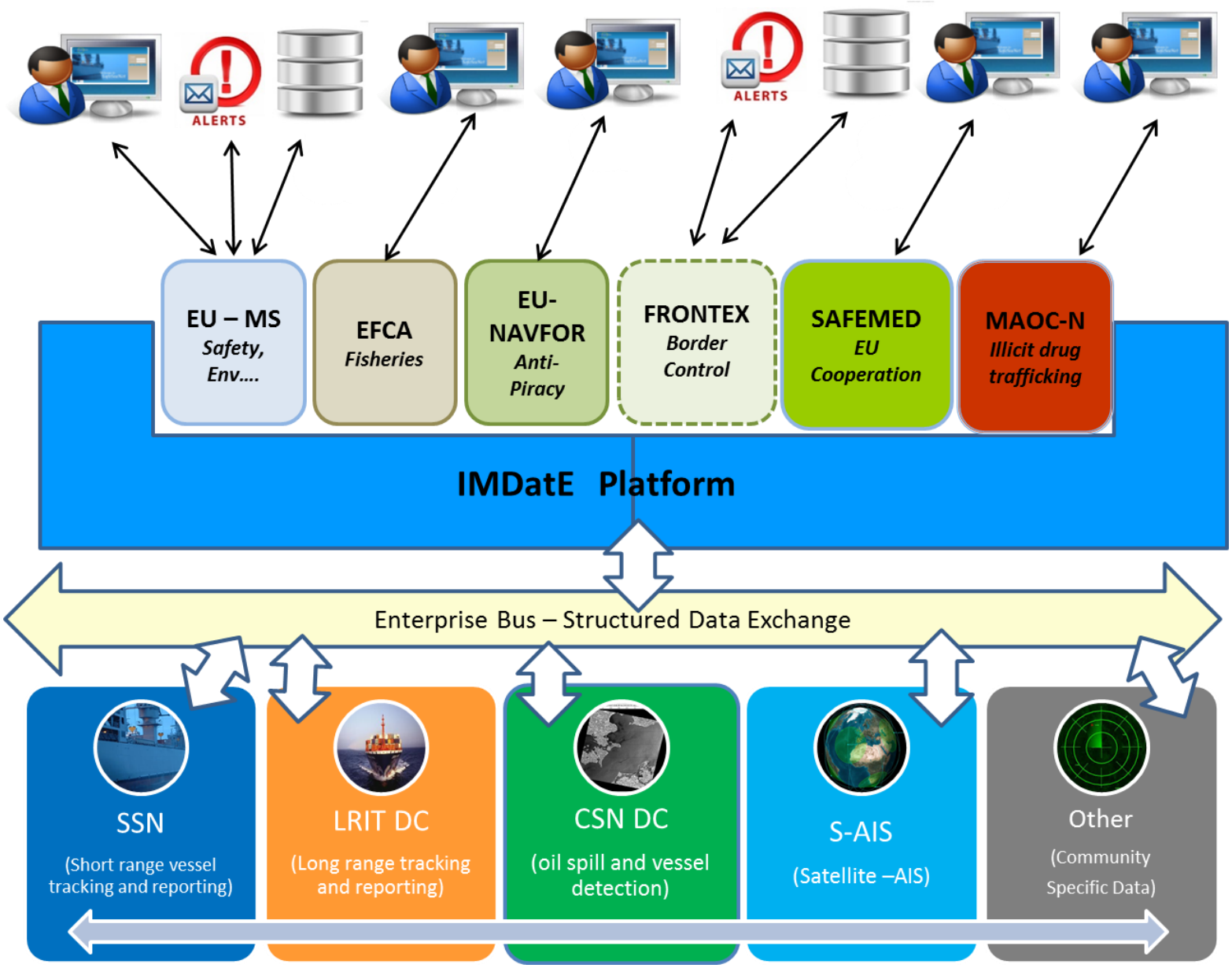
- February 2014 - Service roll-out;
- SAT-AIS Data Processing Centre as part of EMSA's Integrated Maritime Services (IMS);
- Global feed of SAT-AIS data from Norway (national mission) and from a SAT-AIS data provider LuxSpace
  - 16 Orbcomm 2nd Generation constellation:
  - AprizeSat 10 and NORAIS 2 (AIS receiver on the International Space station);
  - SAT-AIS positions are Doppler validated).

Overview of IMDatE platform capabilities

Principles

- "**Integration**": bringing together and combine all available maritime and relevant ancillary information.
- "**Interoperability**": enhancing the ability of diverse maritime (and non) systems to work together.
- "**Harmonisation**": promoting the capability of these systems to follow common guidelines.

Integrated Maritime Services



The IMDatE Concept

- **Access** to the platform can be gained via **i) a web-based user interface, ii) XML-based system-to-system interfaces, and iii) other ways of data export such as email, etc.**

- A **platform** to systematically **collect and fuse ship position reports**, perform **correlation** with the ship detected targets from satellite imagery (or coastal radar – under assessment), and **aggregate available ship information**, to provide **most complete maritime picture**.

- Live traffic picture and analysis tools to assess **vessel behaviour or specific events** associated to one of more vessels.

- EMSA can deliver **tailor made services** for new users [or user communities].

Member States part of IMS MS Service

22 **TOTAL OF MS INVOLVED IN IMS OVER 4 YEARS**

2016

- Denmark
- Estonia
- Norway

2015

- Latvia
- Lithuania
- Luxembourg
- Poland
- Cyprus

2014

- Belgium
- Croatia
- Finland
- Germany
- Sweden

2013

- France
- Greece
- Ireland
- Italy
- Malta
- Netherlands
- Portugal
- Spain
- United Kingdom

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Overall distribution of IMS users

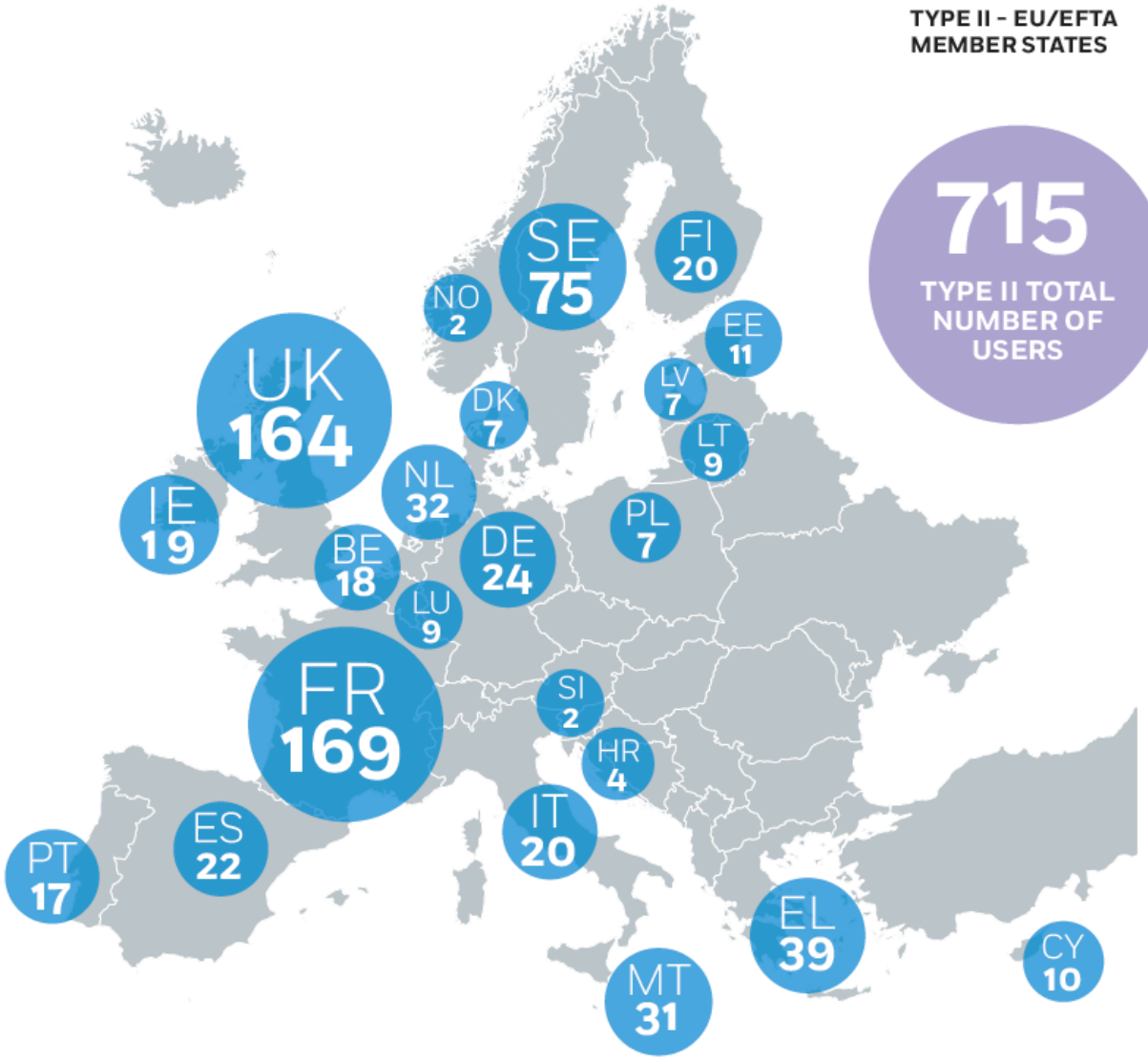
TYPE I - INSTITUTIONS/EU BODIES

167 TOTAL NUMBER OF USERS DISTRIBUTED BETWEEN

EMSA	72
EFCA	44
EC DG OLAF	26
EU NAVFOR	14
FRONTEX	6
MAOC	4
EC DG MOVE	1

TYPE II - EU/EFTA MEMBER STATES

715 TYPE II TOTAL NUMBER OF USERS

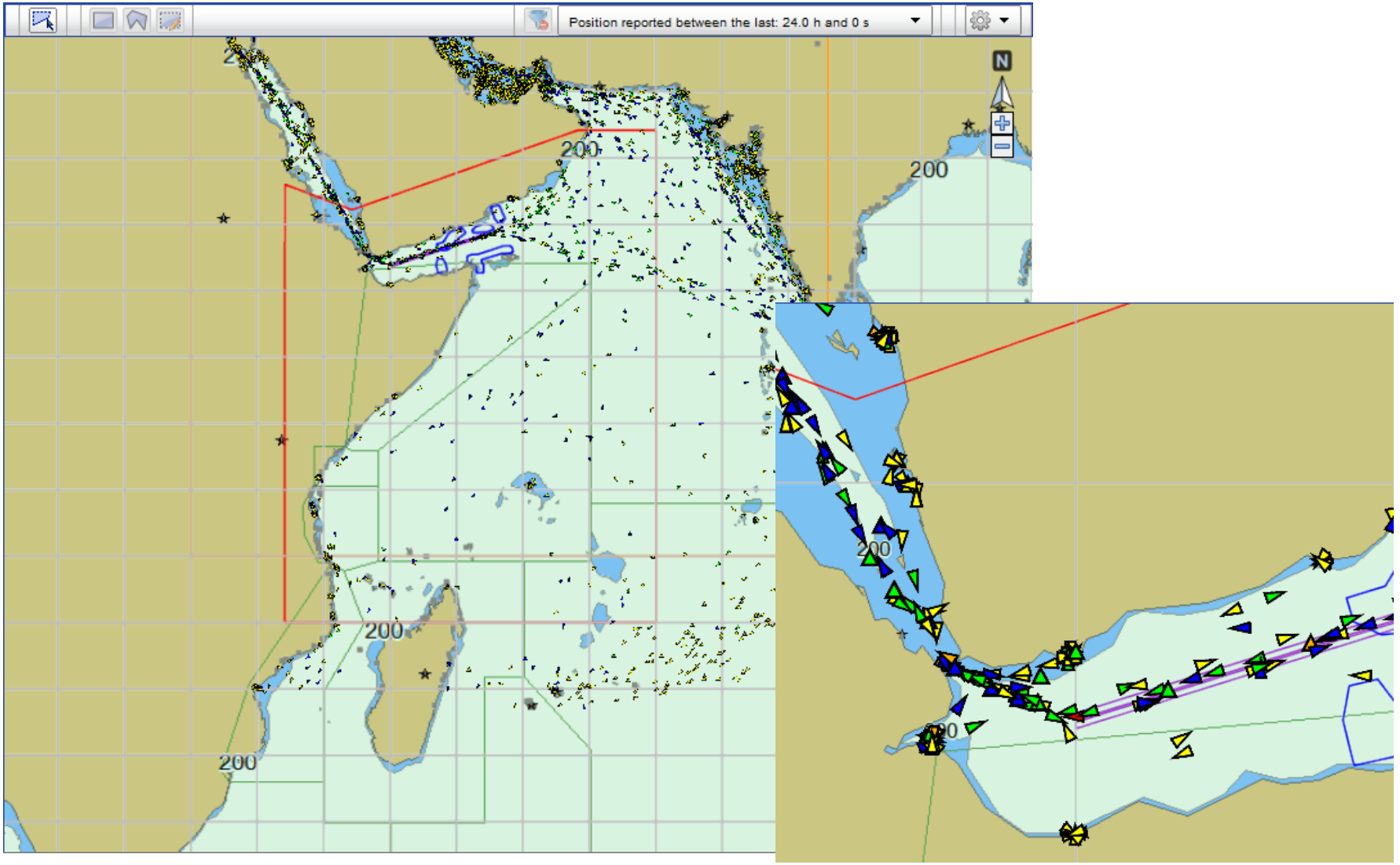


TYPE III - NON-EU MEMBER STATES

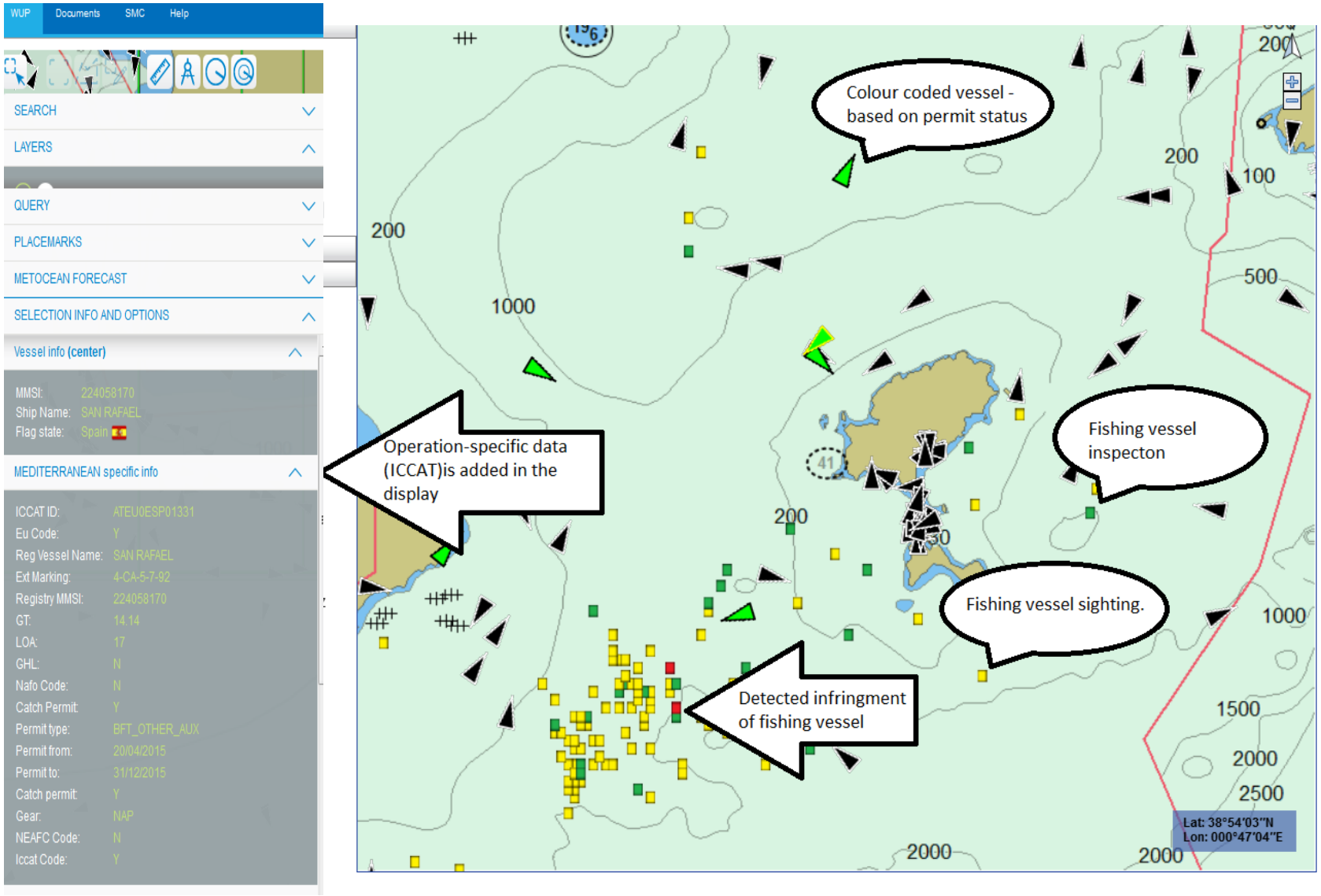
35 TOTAL NUMBER OF USERS INVOLVING

MAROCCO	16	ISRAEL	2
TUNISIA	7	JORDAN	2
ALGERIA	4	AZERBAIJAN	1
GEORGIA	2	LEBANON	1

Anti-piracy support



EFCA customisation



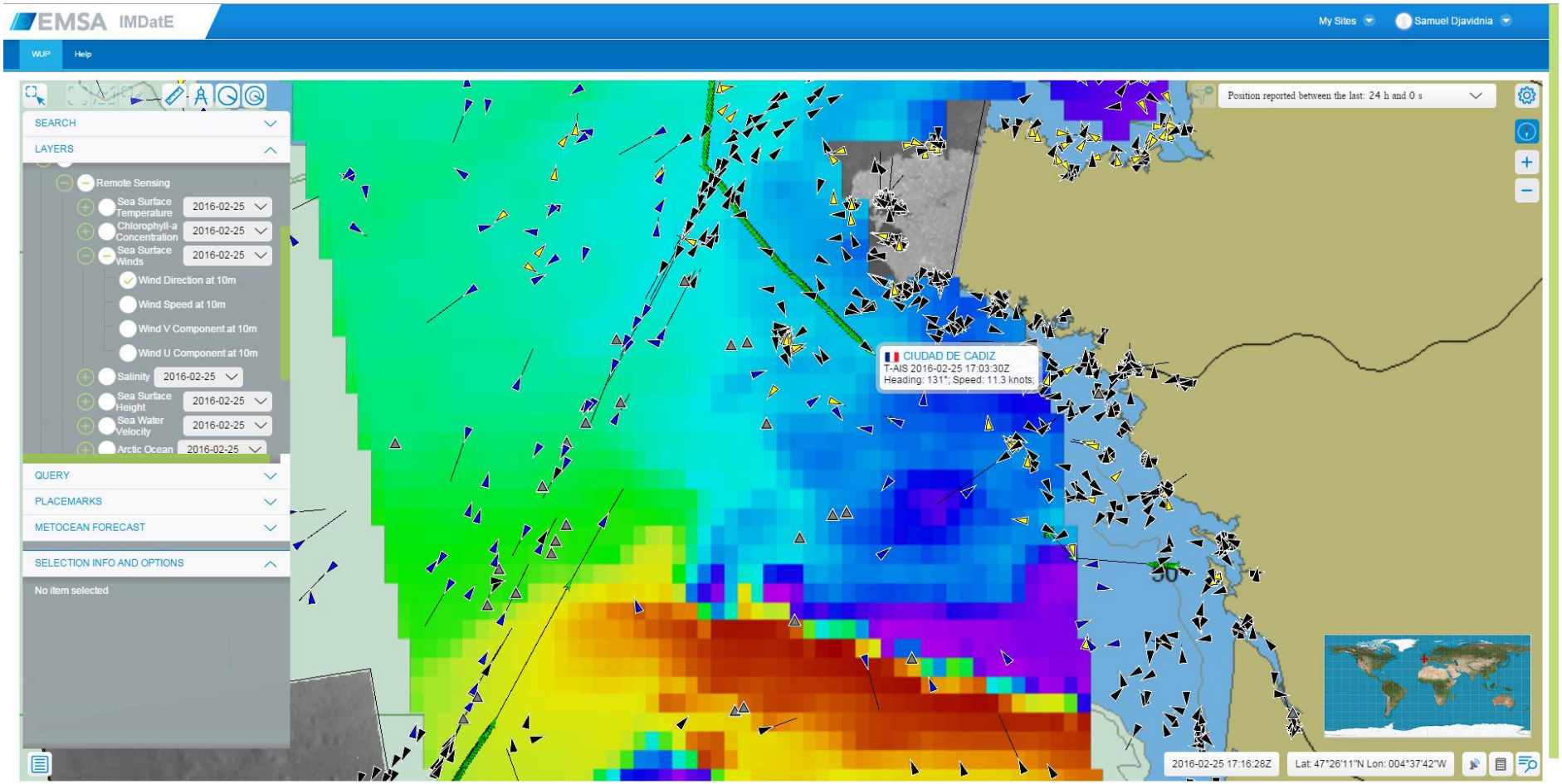
Border Control

Delivery: System-to-system interface

Data Access Rights & Policy

- **Principles**:
  - Respect access rights as established by MS under the relevant Directives/agreements/applications.
  - Added value of having an integrated maritime service lies very much in the availability to share data/information between MS/administrations/sectors/communities as much as possible, and as such we try and encourage the sharing of non sensitive information whenever possible.

Data integration vs data access



IMPORTANT: Data owner determines who sees what. Integration and sharing does not imply that everybody will see everything

live demo

Summary

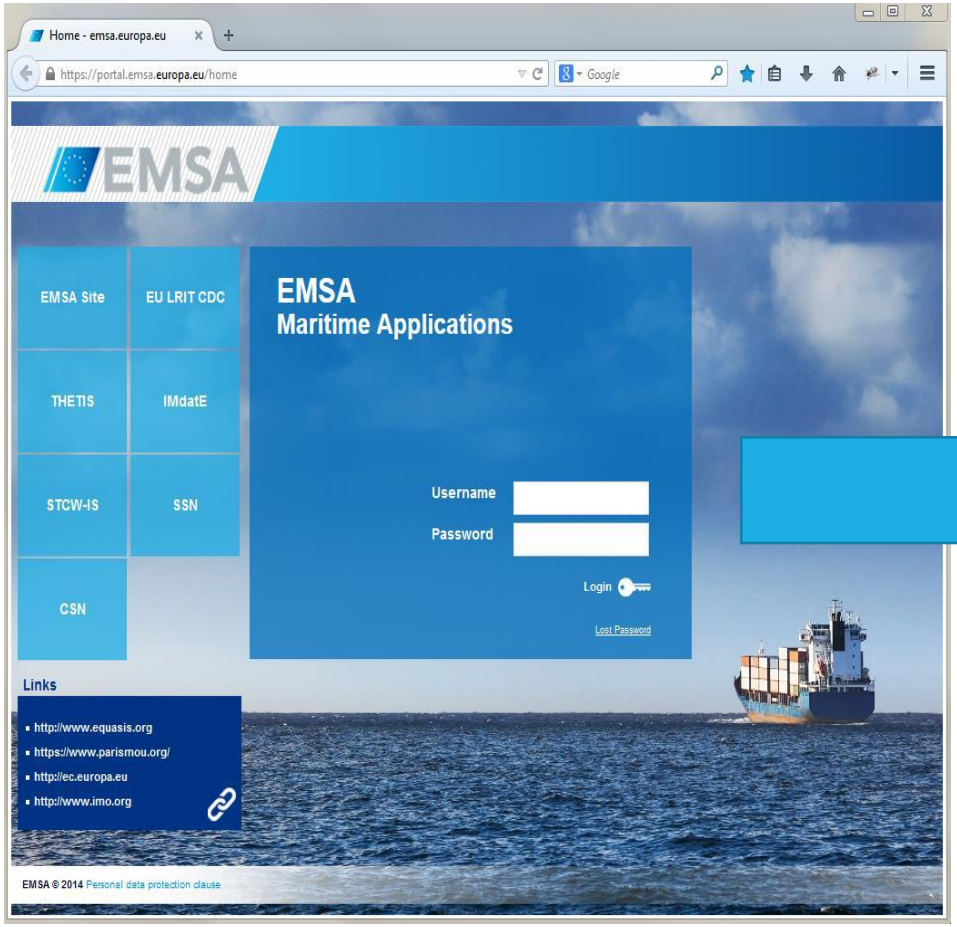
How the IMS could be used in your daily work?

IMDatE (Orientation and familiarisation with the user interface)

searching, position sources, filters, layers, visual preferences, place marks, areas

Log-in to the system

https://portal.emsa.europa.eu



Expressive Icons

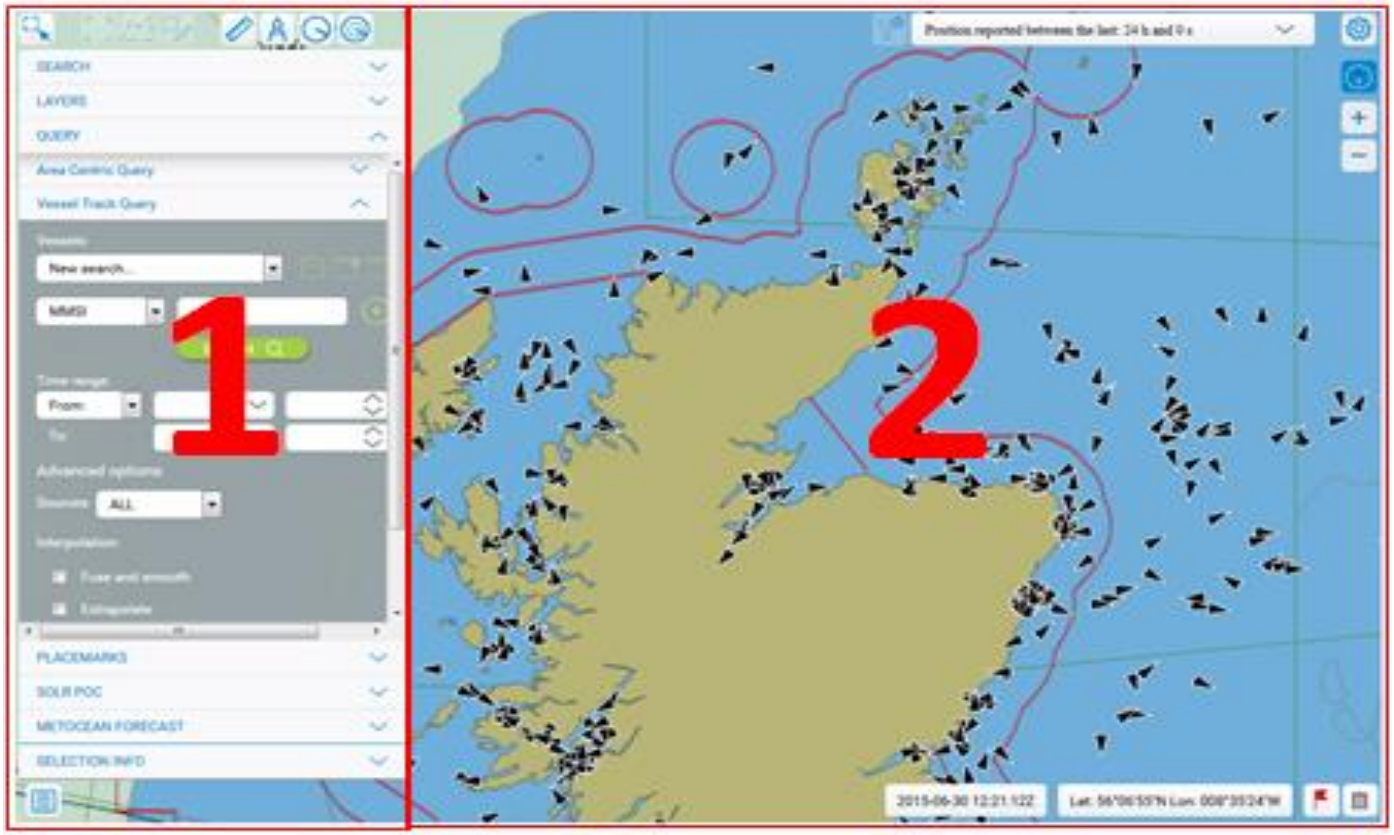
The list of the Expressive Icons used through out the training material

 = Click left mouse button	 = Double Click
 = Click right mouse button	 = Scroll
 = Information	 = Hint
 = Control button	 = Enter button
 = Tab button	 = Tab button triple press
 = Arrow buttons	 = Mouse pointer
 = Drop Down Menu	→ = Will lead to

User Interface main parts

1- Control Panel (on the left hand side)

2- Map (on the right hand side)



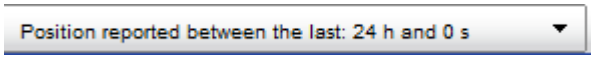
MAP

Client Control 

Measurement Buttons 

Query sub-panel, Areas Buttons 

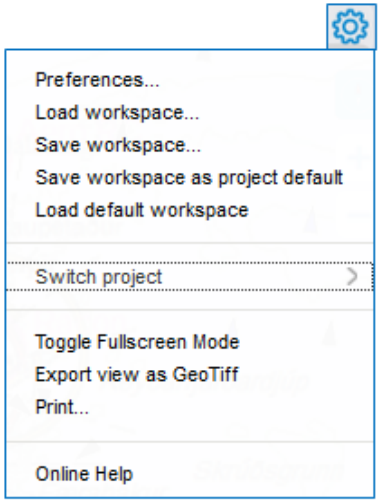
Selection Button 

Position interval slider 0-24h 

Zoom In/Out 

Position 

Map: Client Control



By clicking on the Client Control tab a drop down menu with different options appears

Preferences: The user may choose to save a number of relevant display parameters, map projections, starting view point, etc.

Save/Load workspace: To save and load workspace with user defined parameters.

Load default workspace: Load the default workspace with default parameters.

Switch project: To switch between different projects.

Toggle Fullscreen Mode: To switch to full screen mode or press **F11**

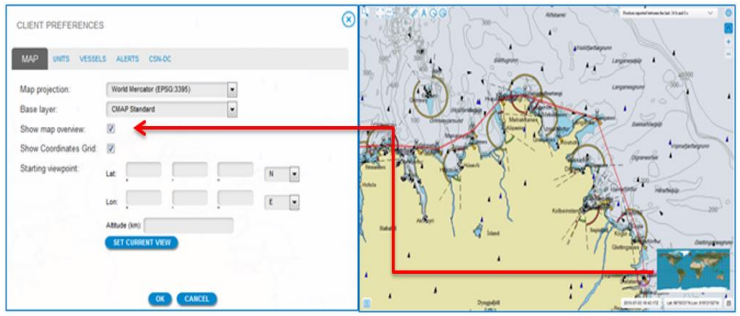
Export view as GeoTiff: To save the map as GeoTiff image

Print: To print the map with a resizable legend that can be adjusted

Online help: Open the PDF user manual

Best practice: First time user, make sure to set up and save preferences that suits you.

Client Preferences → Map



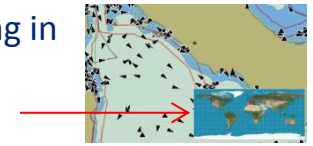
Map projection: The map projections available:

- World Mercator (EPSG:3395)
- Plate Carrée (EPSG:4326)
- Spherical Mercator (EPSG:3785)
- North Polar (EPSG:32661)
- South Polar (EPSG:32761)
- UTM 32N (EPSG:32632)
- UTM 33N (EPSG:32633)

Base layer: The base layers available:

- CMAP Base S52
- CMAP Standard
- CMAP Standard S52
- ArcGIS Ocean
- ArcGIS Satellite Data
- Cubewerx

Show map overview: To show the map overview for orientation when zooming in

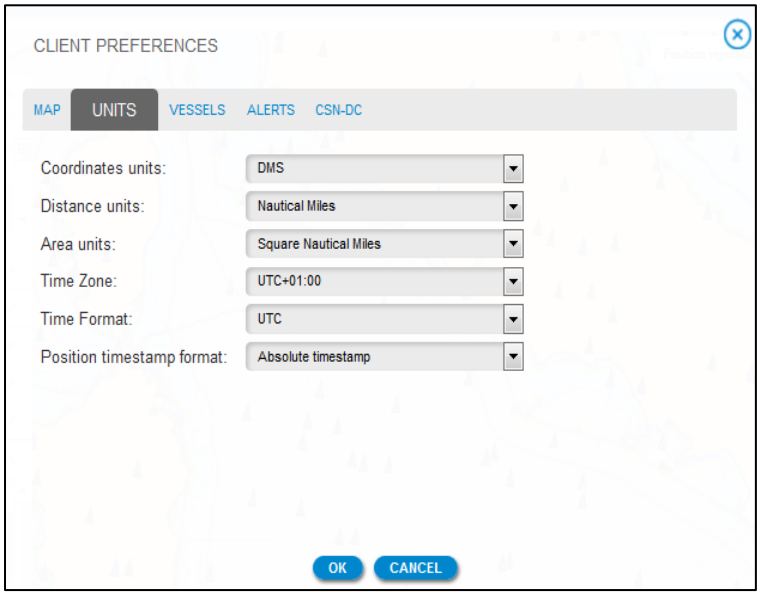


Show Coordinates Grid: To show the grid coordinates

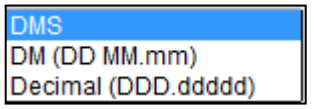
Starting viewpoint: To set starting viewpoint by manually inserting the Latitude and Longitude

Set current view: To set current view as starting viewpoint

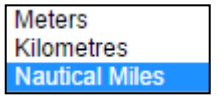
Preferences → Units



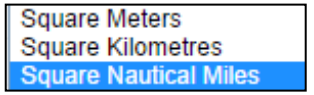
Coordinates units: The coordinates units available:



Distance units: The base layers available:



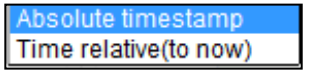
Area units: The area units available:



Time Zone: Can be set to **UTC -12** to **UTC+12**

Time Format: Time format available:

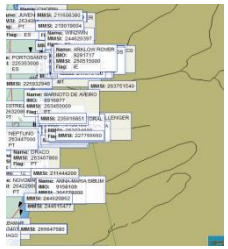
Position timestamp format: Position time stamp available:



Preferences → Vessels

Show dead reckoning lines: To show dead reckoning lines.

Show labels: To show the labels of the ships.

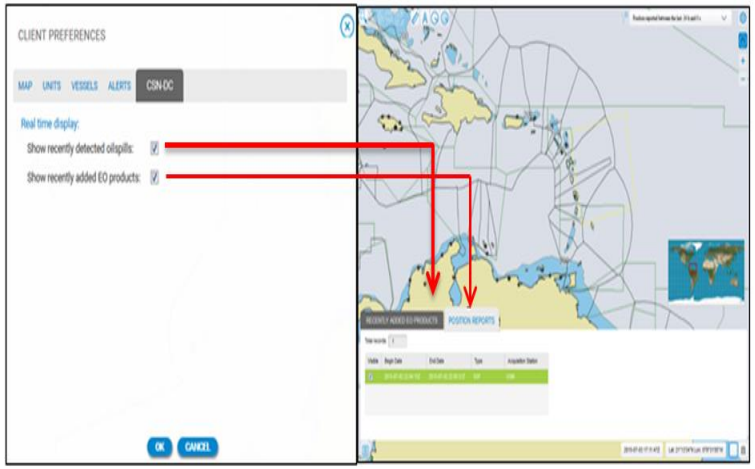


Label information: To set the label information fields through marking the check boxes.

	Field
☑	Name
☑	IMO
☑	MMSI
☑	Flag

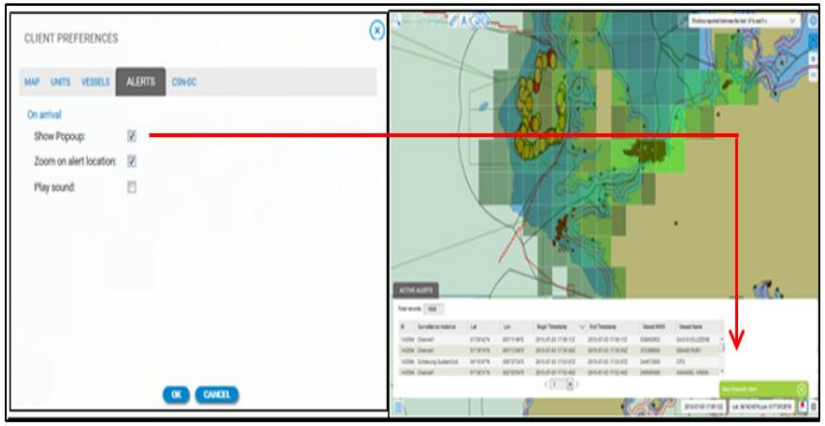
Label activation distance(km): Press Set current distance to set the distance in km.

Preferences → CSN-DC/Alerts



Show recently detected oilspills: To show CSN recently detected oilspills. (Last 24h)

Show recently added EO products: To show CSN recently added EO products. (Last 24h)



Show Popup: To show popup alerts.

Zoom on alert location: To Zoom on alert location when alert is triggered.

Play sound: To play sound when alerts popup.

Exercise 1 - Preferences

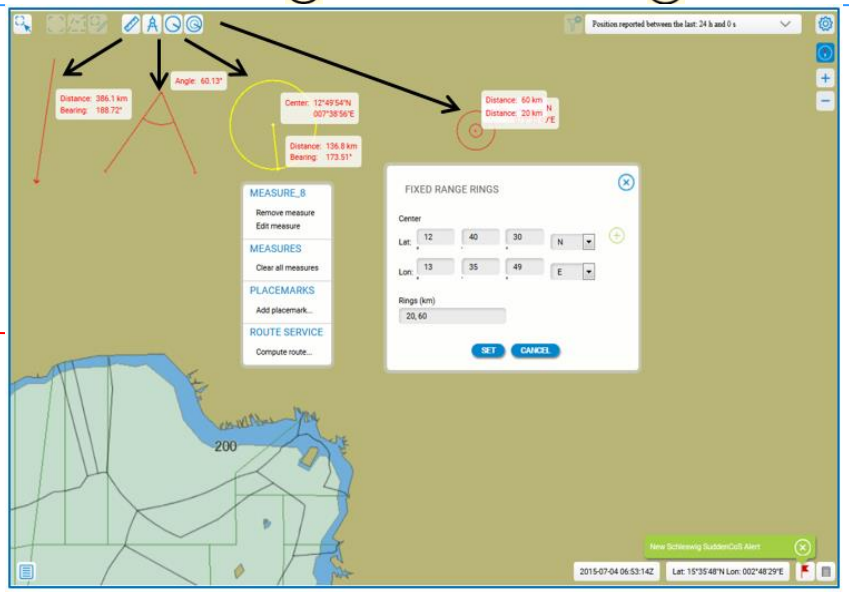
Map: Measurements buttons

To perform different measures on the map

To all measures, to set press and to release press

Remove measure:

1. Mark the measure by it will become yellow.
2. On the map
3. From choose to **remove measure** or **clear all measures**



Distance measure : To measure the distance between two or more points

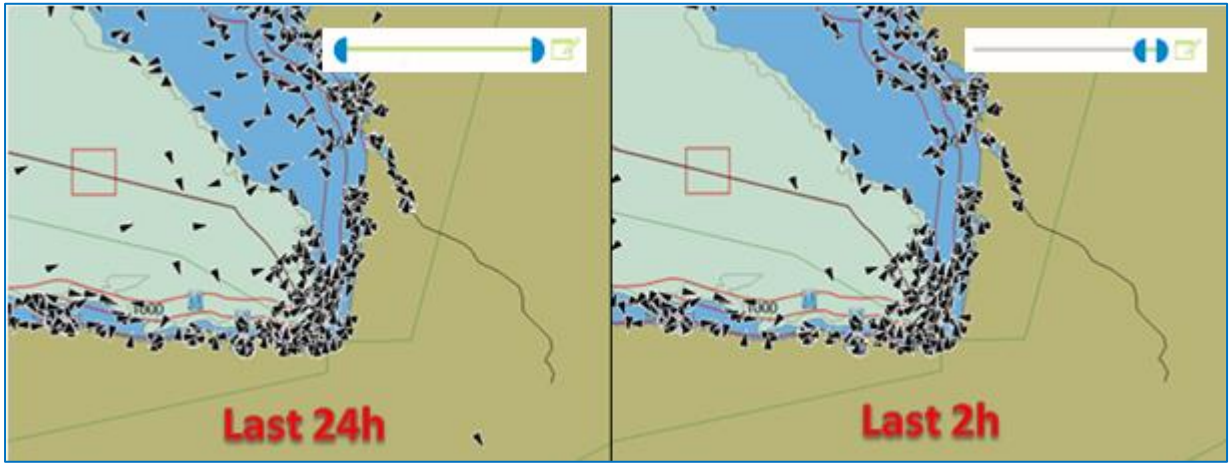
Bearing measure : To measure an angle

Bearing measure : To measure an angle of a circle

Fixed Ranged Rings : To measure distance in fixed ranged ring

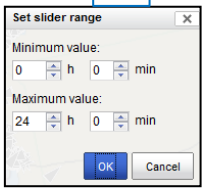
Map: Selection Button

Position interval slider 0-24h Zoom In/Out



Selection Button : To select vessels by drawing a polygon.

Position interval slider 0-24 To visualize vessels between 0-24h according to the user temporal resolution needed.
Slider range minimum and maximum value can be edited by pressing and entering the desired values in the 'Set slider range' window

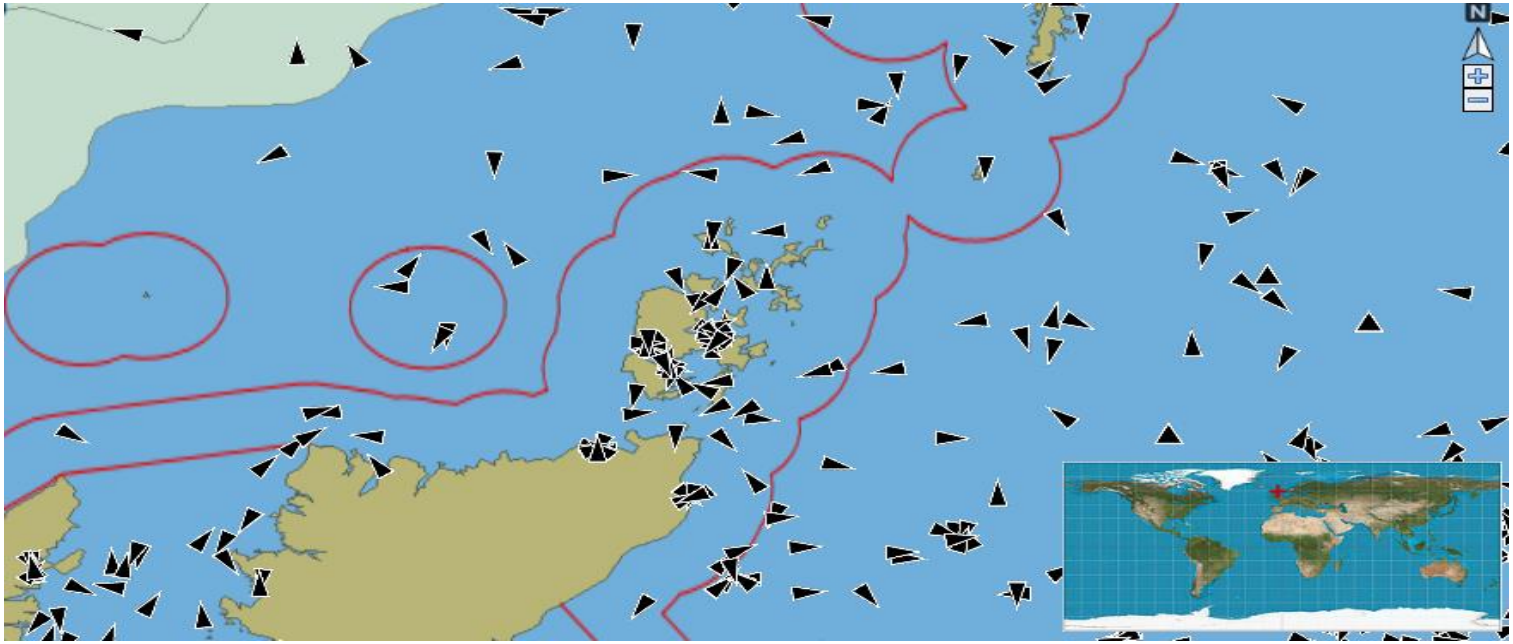


Zoom In/Out : To zoom in/out the map.
Another way to zoom in/out is to use the mouse scroll wheel

Map: Position

To see current position

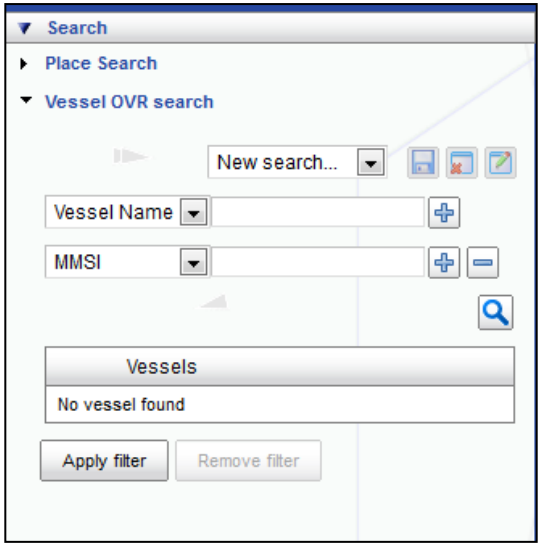
Position map main purpose is orientation which is helpful when zooming in a certain area



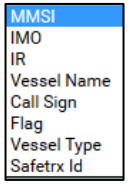
On any place in the position map will redirect to that place

Sub Panel: Search

Search for vessel and have it displayed on the map



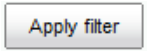
Vessel OVR search: Search for a vessel based on

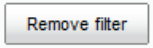


The search criteria can be increased/decreased

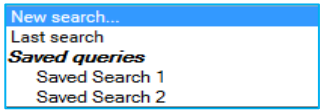
The search can be Saved/Removed/Edited 

To search press 

To only show the vessel found 

To show all vessels again 

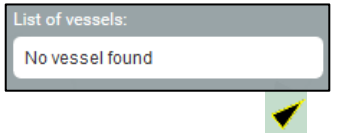
The search operations available



Make a new search

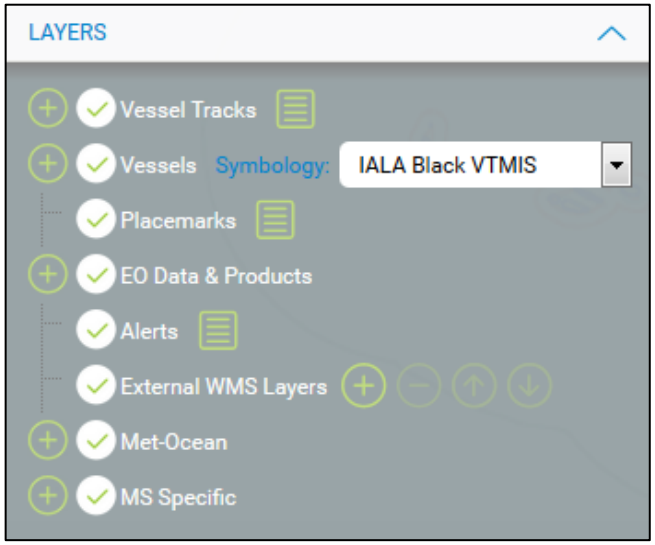
Recall the last search

Recall a saved search

The result of the search is displayed in 

on the vessel found will highlight it on the map

Sub Panel: Layers



Switch on/off information layers

Symbology: The two modes available are: IALA Black VTMIS / IALA Colour VTMIS

Legend: Is displayed in a separate window by pressing

Tree View Checkbox: To Expand/Collapse/Select info layers

External WMS layers: Can be Added/Removed/Moved

Layers settings:

Settings for the selected layer are shown in the **Selection Info** window.
Obs. Settings may differ for different layers.

The two main settings for each layer are:
Opacity: To change opacity of the layer
Position: To reposition the layer

By repositioning the layers, the user can rearrange the layers to have those frequently used lined close to each other

Vessel selection

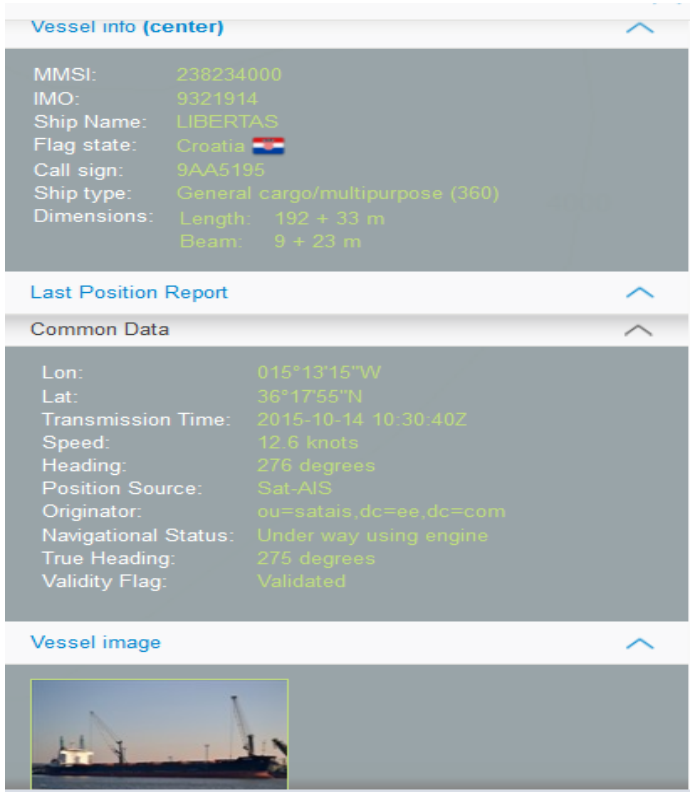
Select vessel/vessels on the map

Vessel selection can be done in two different ways:

1- Set the mouse pointer on a vessel and click

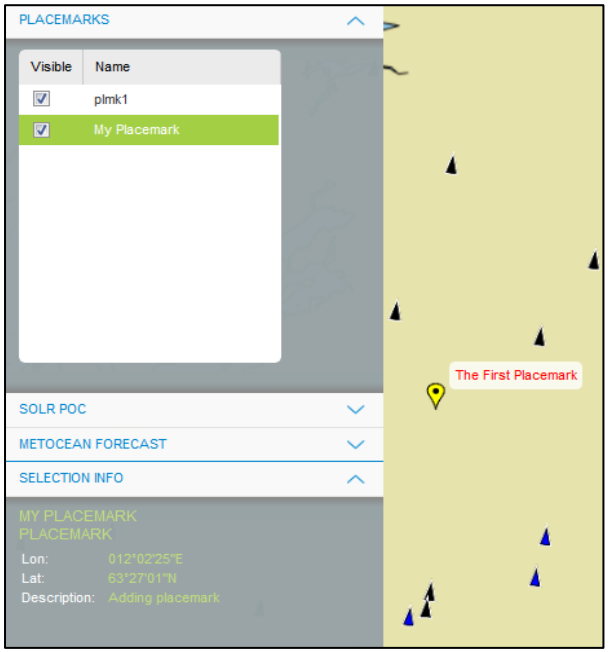
To select several vessels: hold Ctrl , the next vessel and click

2- Press **Select by polygon** and draw a polygon around the vessel/vessels to select



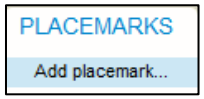
- Vessels, Placemarks, Areas and generally all objects become **yellow** when selected
- Information about the object selected is displayed in the **Selection Info** window
- The information displayed in the **Selection info** window can be expanded or collapsed
- Click on selected object will open
- The amount of vessel information in the **Selection info** window may vary depending on the information available from the different sources

Sub Panel: Placemarks

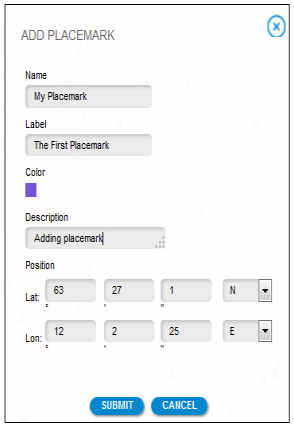


Mark a position or a location

Add Placemark: To add Placemark:



1. On the map click → appears
2. Select '**Add placemark**'
3. Fill in the '**Add Placemark**' dialog window with:
   - **Name:** Name of the placemark
   - **Label:** Name to display on the label
   - **Color:** Choose color of the placemark
   - **Description:** Description of placemark
   - **Position:** Position of the placement is automatically filled in but can be modified manually



4. Press SUBMIT to create the Placemark

Placemark appears in the sub-Panel **Placemarks**

Remove/Edit Placemark: To remove or edit the Placemark:

1. Mark the Placemark, it will become yellow
2. Click → appears

3. To remove select **Remove placemark** and to edit select **Edit placemark**

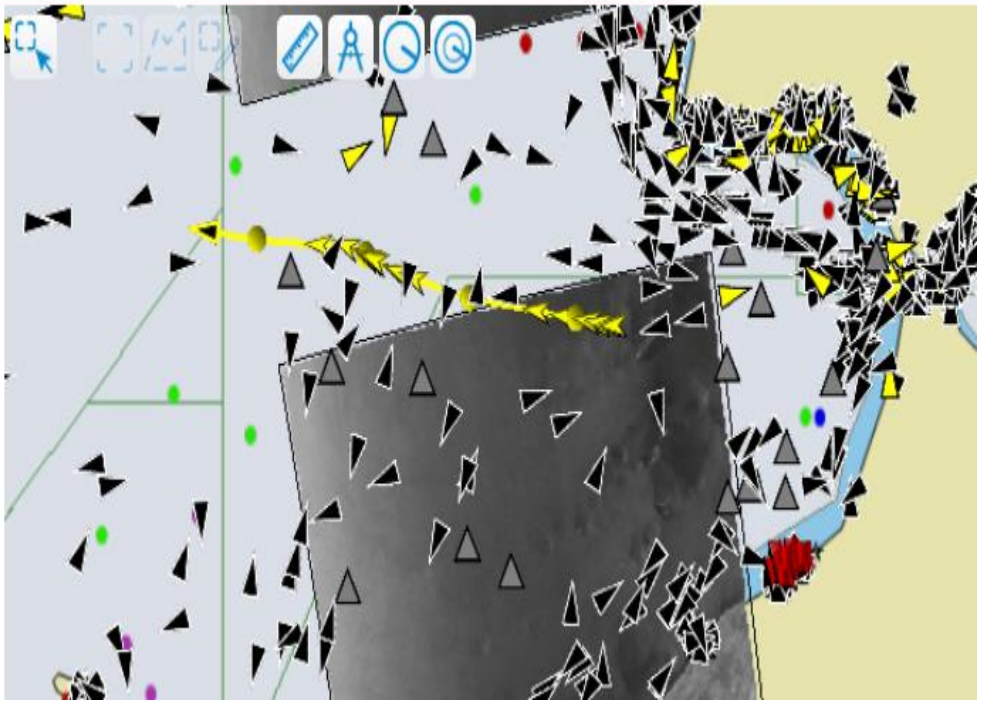
Exercises 2 - 4

IMDatE (Orientation and familiarization with the user interface)

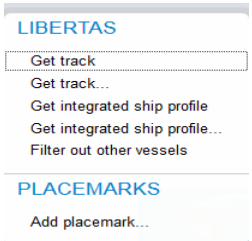
Vessel Track, ACQ, ISP

Get track

Get track of selected vessel/vessels for the last 24h

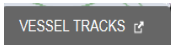


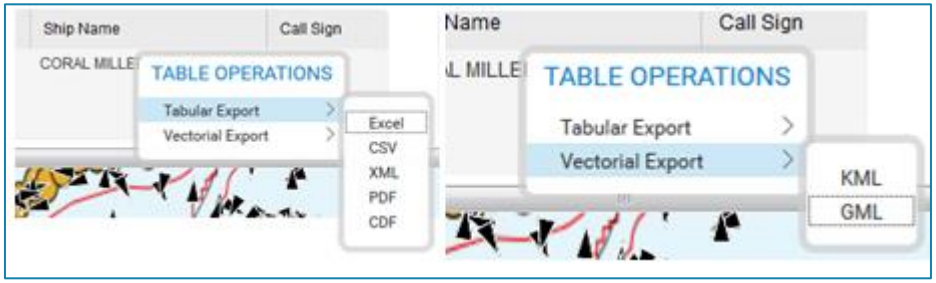
1- Select vessel/vessels
2- Click on the map appears



3- Select **Get track**

The **Get track** option will return the tracks for the last 24h.

- The tracks of the vessel are displayed in the map in **yellow**
- The **Vessel Tracks** tab  floats in containing more detailed info about the tracks
- To hide the **Vessel Tracks** tab, press
- To detach the **Vessel Tracks** tab, press
- **Filter out other vessels** will only show the selected vessel

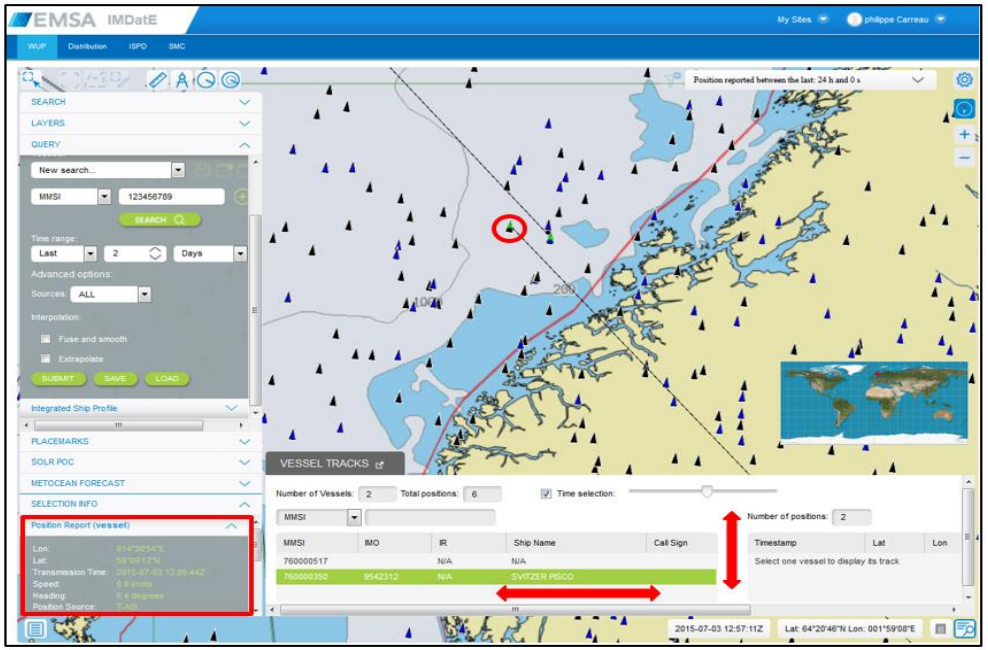


Vessel Tracks tab: Contains:

- Total number of positions found
- Time selection slider to walk through the tracks
- Table on the left with the selected ships
- Table on the right with the tracks of ship selected
- Click on the tracks table, appears with different options to **export the tracks**

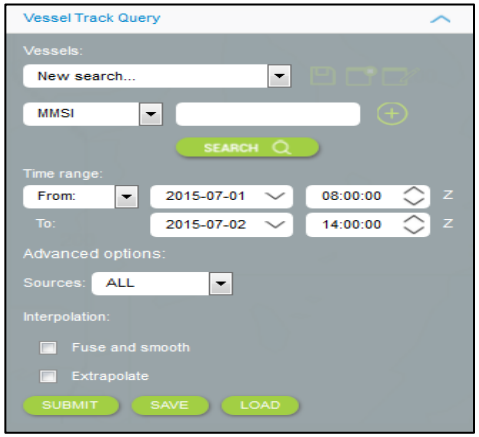
Get track…

Get track of selected vessel/vessels customized

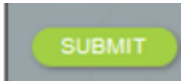


1- Select vessel/vessels
2- Click on the map
appears

3- Select **Get track…**



4- Enter **Time range** and select **Advanced options**
5- Press



Vessel Tracks tab detached

Number of Vessels: 4 Total positions: 463 Time selection:

MMSI

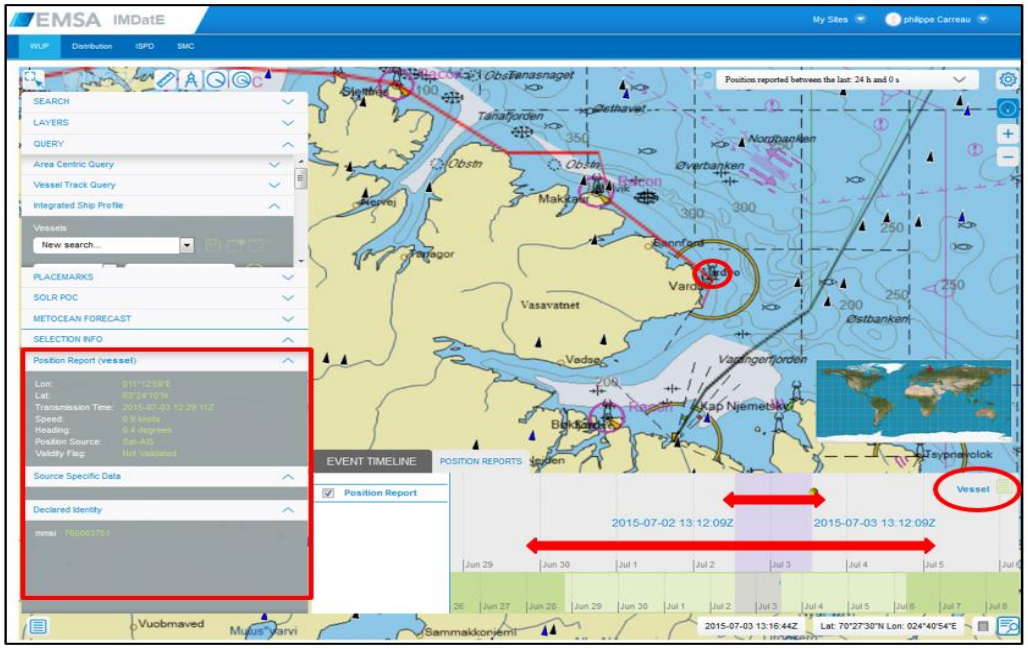
Number of positions: 27

MMSI	IMO	IR	Ship Name	Call Sign
238234000	9321914	N/A	LIBERTAS	9AA5195
538004505	9349980	N/A	CLOVELLY	V7XK9
251322110	7224485	N/A	STEINUNN	TFAG

Timestamp	Lat	Lon	Heading	Speed	Source
2015-10-14 01:05:52Z	37°22'47"N	002°43'46"E	77	8.8	Sat-AIS
2015-10-13 17:32:55Z	37°07'20"N	001°27'42"E	76	8.7	T-AIS
2015-10-13 16:15:35Z	37°04'07"N	001°13'51"E	70	9.2	T-AIS

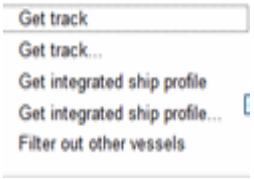
Get Integrated Ship Profile - ISP

Get integrated ship profile of a vessel for the last 24h



1- Select a vessel

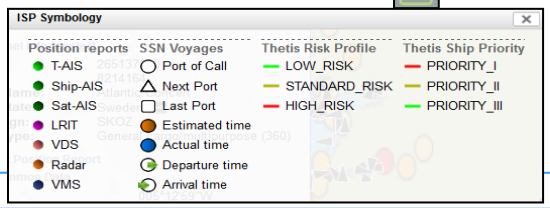
2- Click on the map appears



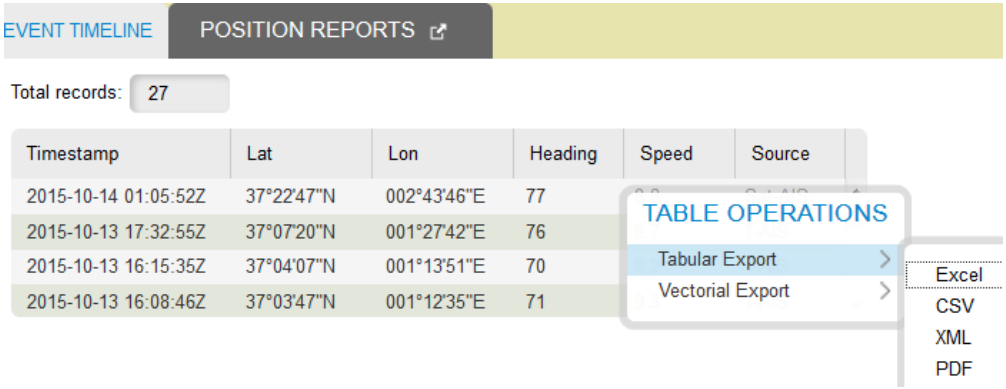
3- Select **Get Integrated Ship Profile** and a new tab EVENT TIMELINE will float in together with the EVENT TIMELINE tab

The **Get Integrated Ship Profile** option will return a set events, if existed for the last 24h.

- Can be used to navigate the event time line Another way to do that is to and click
- The tab Event timeline floats in together with the Position Reports containing different events presented in the time line
- To hide the **Vessel Tracks** tab, press
- To centre the vessel in the map, press Vessel
- To view the ISP Symbology, press

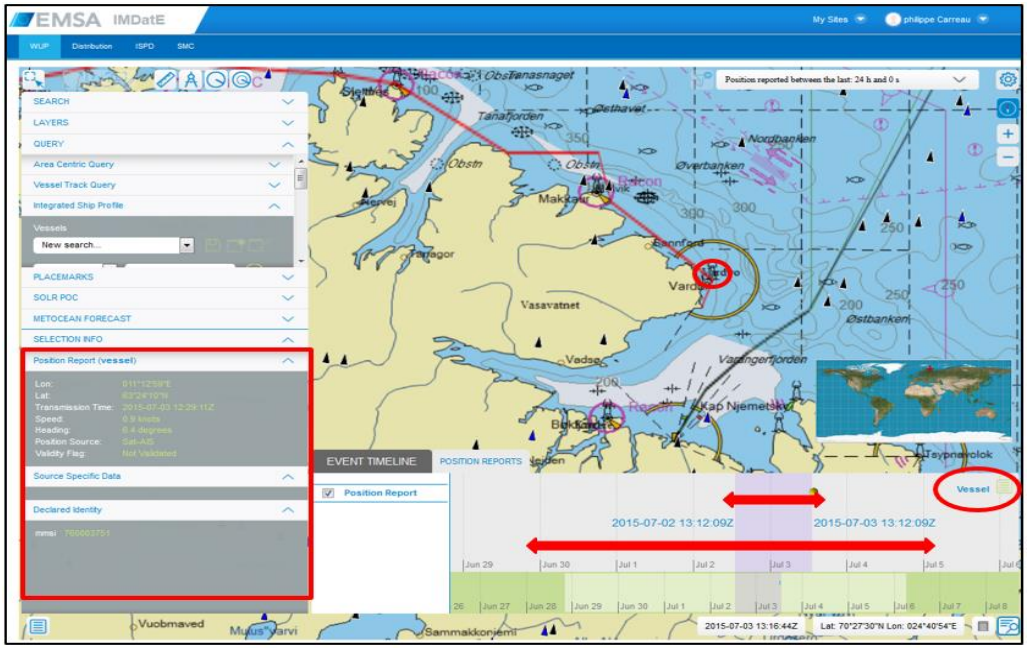


Positions Reports tab of the same vessel



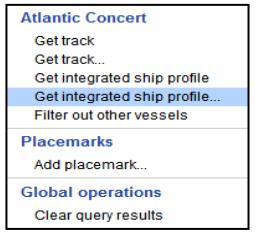
Get Integrated Get Integrated Ship Profile …

Get integrated ship profile of a vessel customized

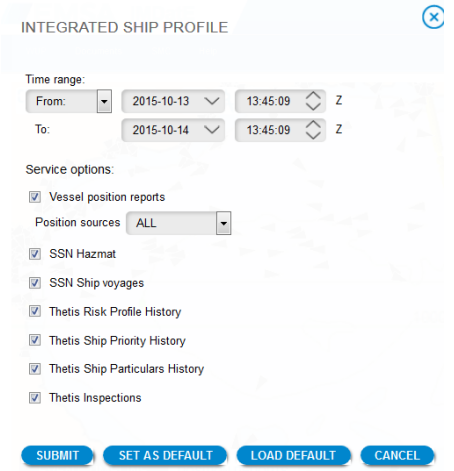


1- Select a vessel

2- Click on the map appears



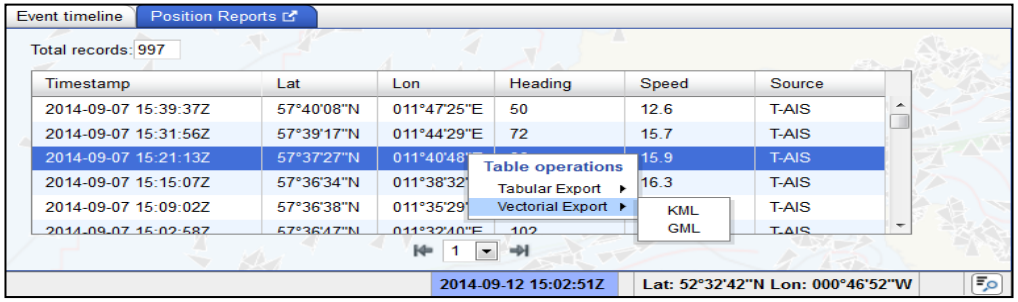
3- Select Get Integrated Ship Profile…



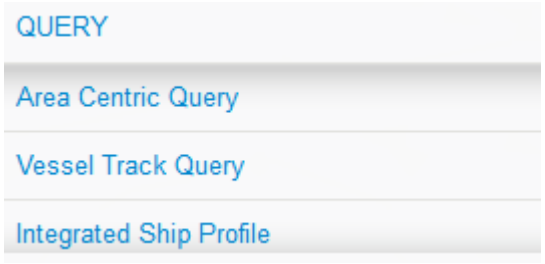
4- Enter Time range and choose Position sources

5- Press Submit

Positions Reports tab of the same vessel /export tracks drop down menu



Sub Panel: Query



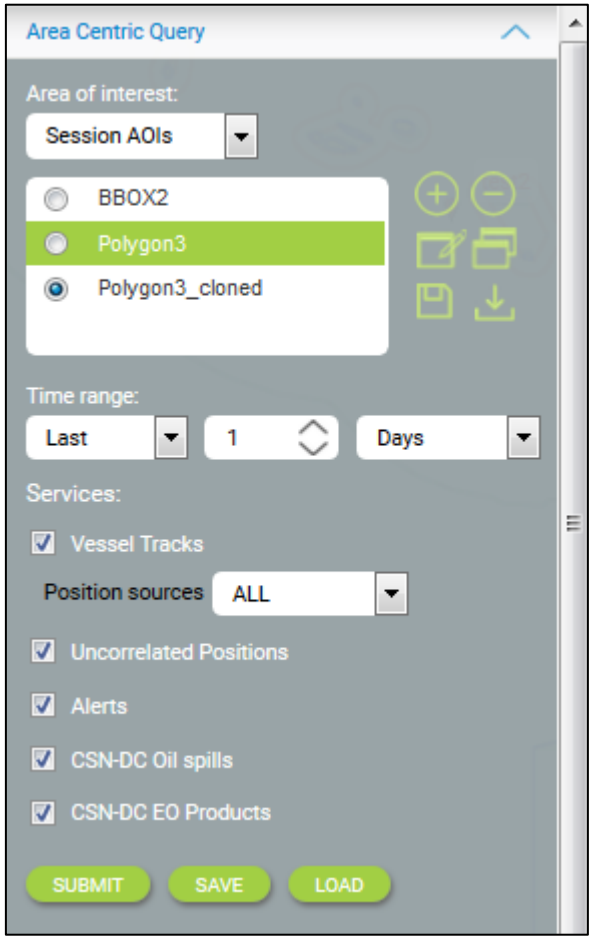
Query the IMDatE database

Area Centric Query: Enables the user to make a query in a defined area and search over a specific time period for vessel tracks, Uncorrelated positions, Alerts, Incidents, CSN-DC oil spills and CSN-DC EO products.

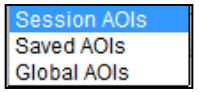
Vessel Track Query: Allows the user to search for one or multiple vessels and have their tracks displayed on the map.

Integrated Ship Profile: Enables the user to make a query for a vessel and get aggregated information for that vessel in the 'Event timeline' panel, to provide better awareness of temporal events and information which is taking place at a specific points of time.

Sub Panel: Query → Area Sub Panel

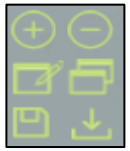


Area of Interest: The available options are:



Select an area: Managing an area can be done using two different set of buttons

- Map set of buttons
- Sub panel set of buttons



Selection methods: Draw Rectangular area 

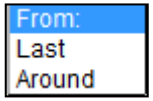
Insert coordinates 

Import from shape file 

The area selected can be: Edited  Renamed  Saved 

Removed 

Time range: The options to specify time and date:



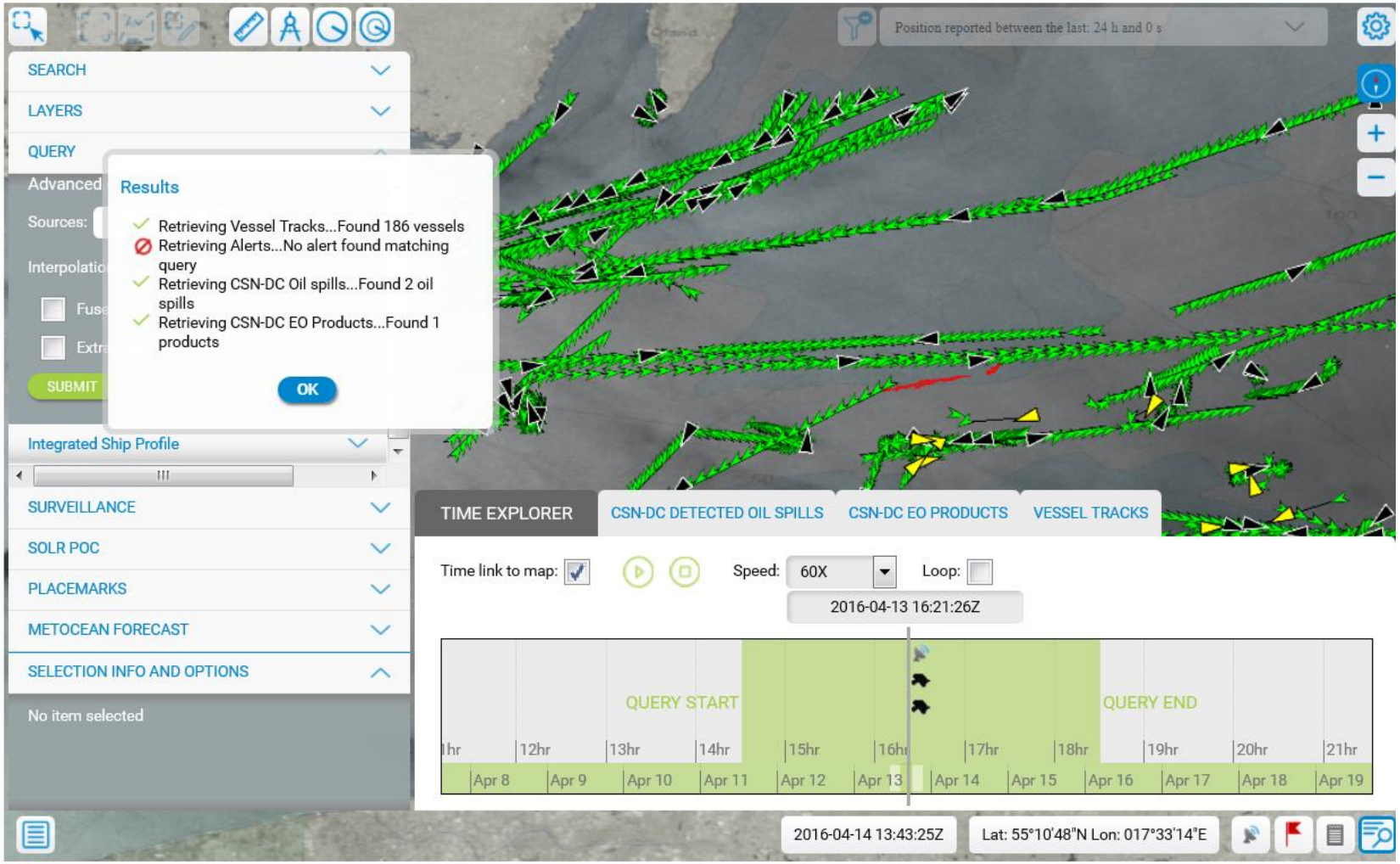
From & To date /time
The Last number of days
Date/time Around +/- days

Services: Choose services through marking the check box ☑

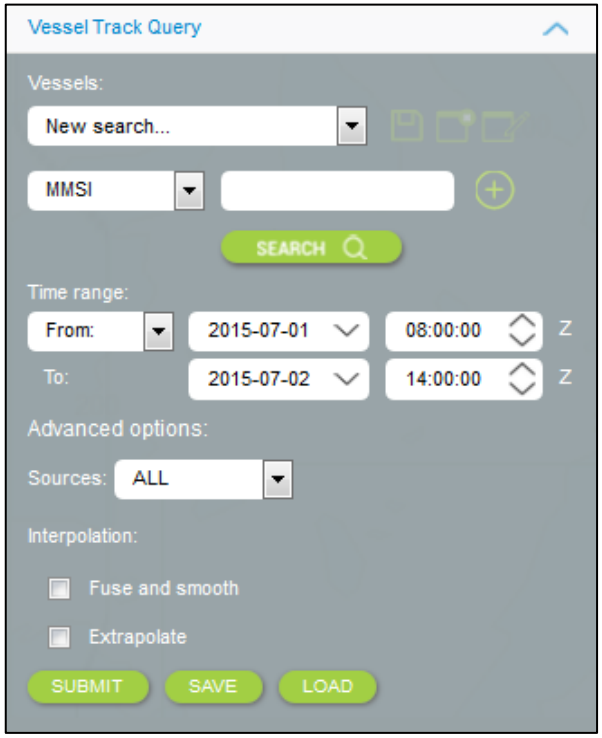
Submit: To submit the queries press 

For vessel tracks service:
MMax time range: 24 h

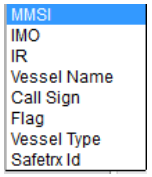
Area centric query - results



Panel: Query → Vessel Track Query



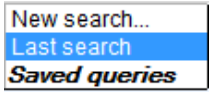
Vessels: Search for a vessel based on



The search criteria can be increased/decreased

The search can be Saved/Removed/Edited

The search operations available

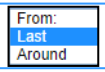


Making a new search
Recalling the last search
Recalling a saved search

The result of the search is displayed in

on the vessel found will highlight it on the map 

Time range: The options to specify time and date:



From & To date /time
The Last number of days
Date/time Around +/- days

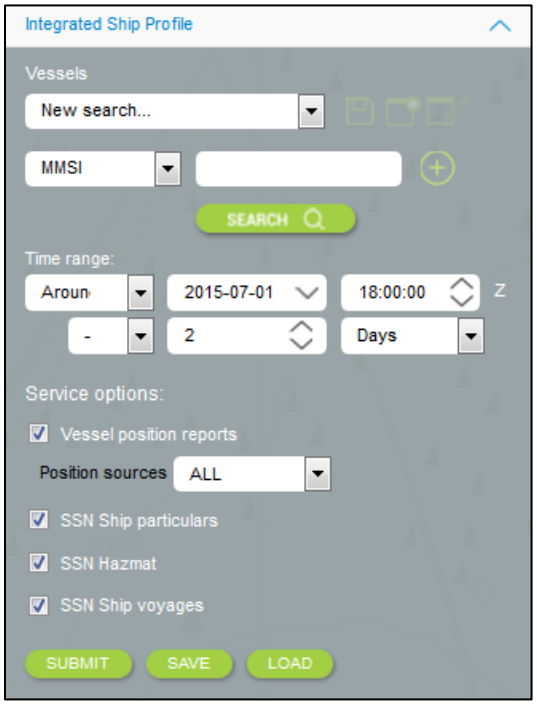
Source: Select position source either ALL or mark ☐

Submit: To submit the query press

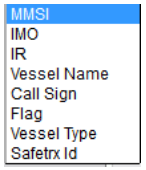
Save: To save the query press

Load: To load a saved query

Sub Panel: Query → ISP panel



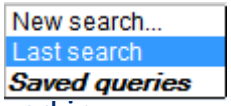
Vessels: Search for a vessel based on



The search criteria can be increased/decreased

The search can be Saved/Removed/Edited

The search operations available

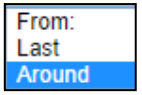


Making a new search
Recalling the last search
Recalling a saved search

The result of the search is displayed in

on the vessel found will highlight it on the map

Time range: The options to specify time and date:



From & To date /time
The Last number of days
Date/time Around +/- days

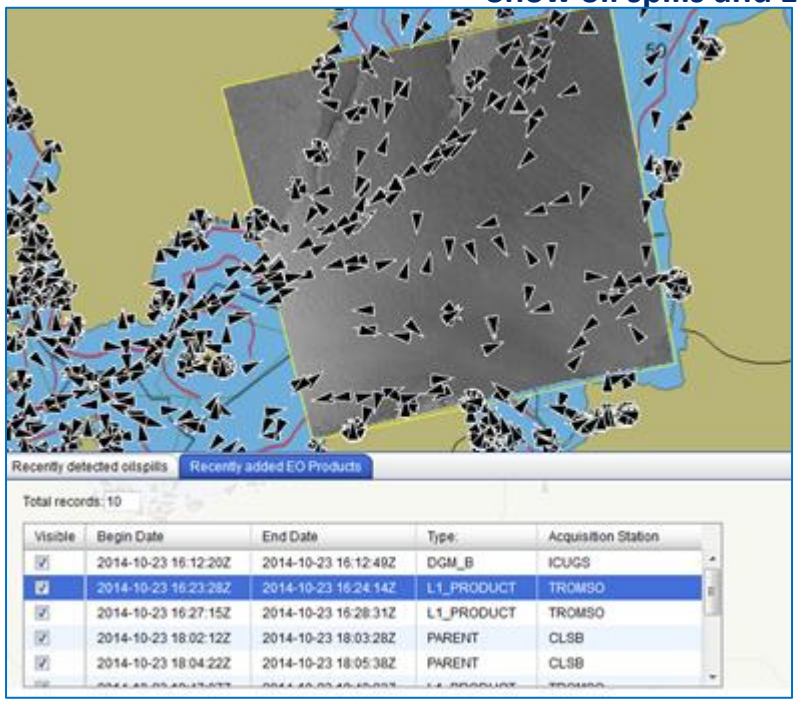
Source: Select position source either ALL or choose source

Submit: To submit the query press
Save: To save the query press
Load: To load a saved query

Exercises 5 - 7

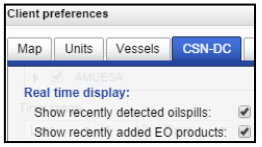
CSN- CSN-DC Earth Observation Products

Show oil spills and EO products



Recently added EO Products tab/Export data

1- In Client preferences CSN-DC select and press OK



Icon will appear on the map

2- Click on

3- For recently detected oilspills, press tab Recently detected oilspills and select from the table.

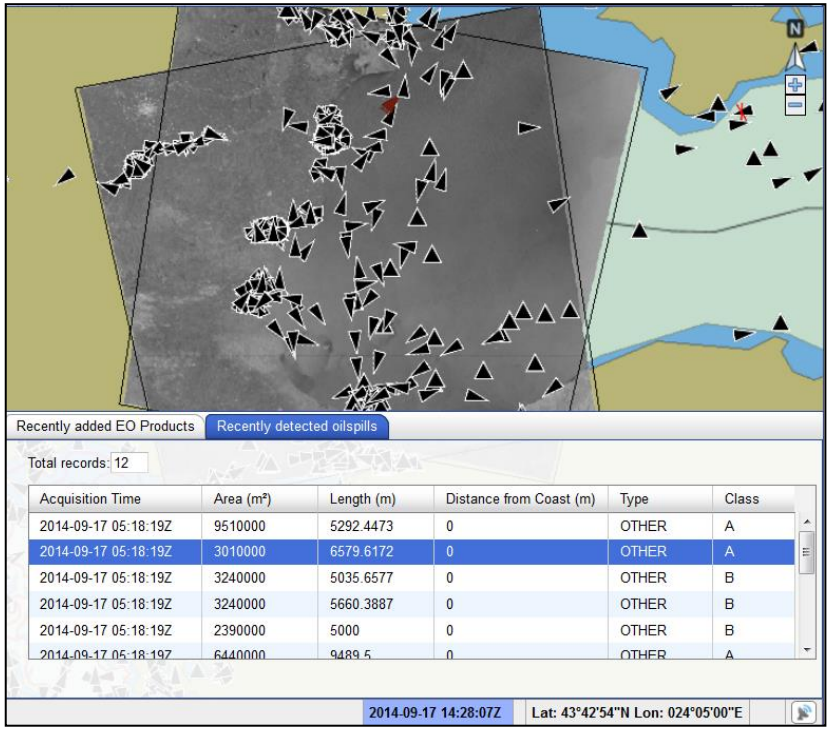
For Recently added EO Products (images), press Recently added EO Products and select from the table.

4- on the selected item from the table to show and redirect on the map.

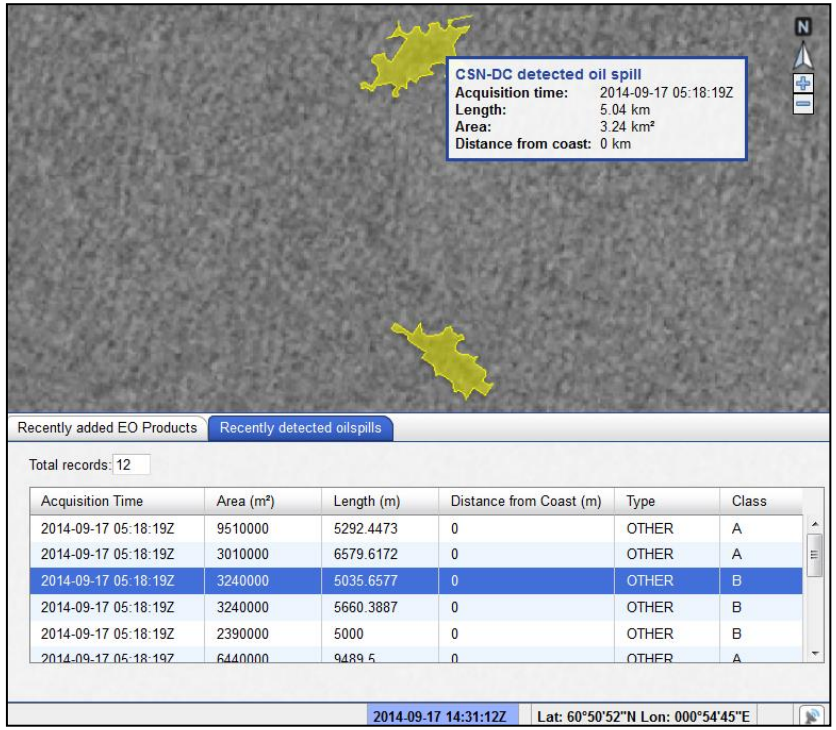
- Information about the item selected will appear in the Selection Info window
- Click → to export data to excel, xml, etc..

CSN-DC Earth Ob CSN-DC Earth Observation Products/detected oil spills

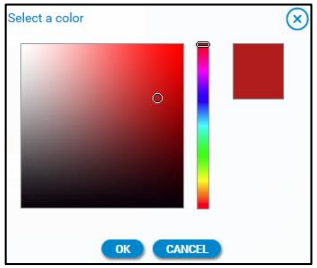
Earth Observation Product



Detected oilspills

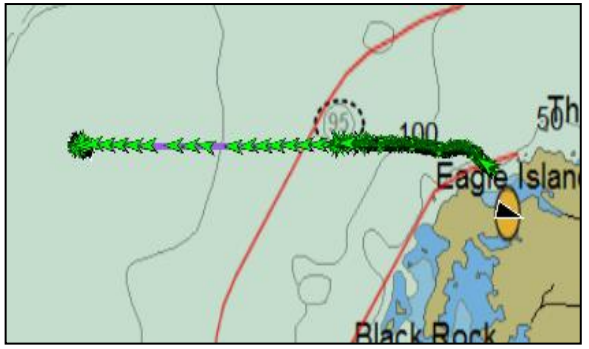


Layers: Vessel Tracks and CSN/DC EO Products



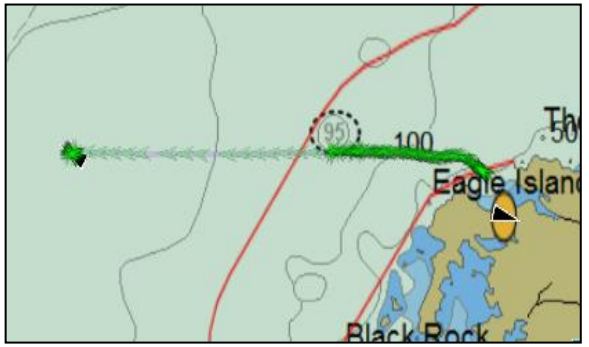
Opacity is set to
Track color is set to
Track width is set to 4

The result is displayed to the right



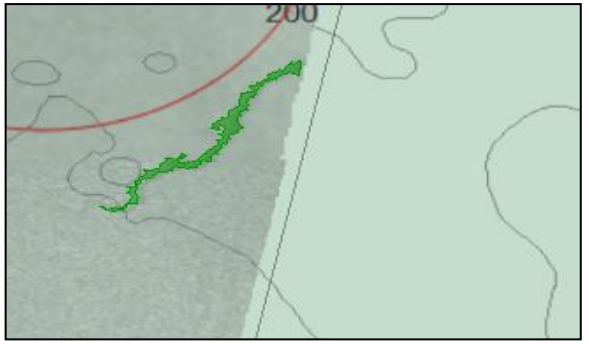
Opacity is set to
Track color is set to
Track width is set to 4

The result is displayed to the right



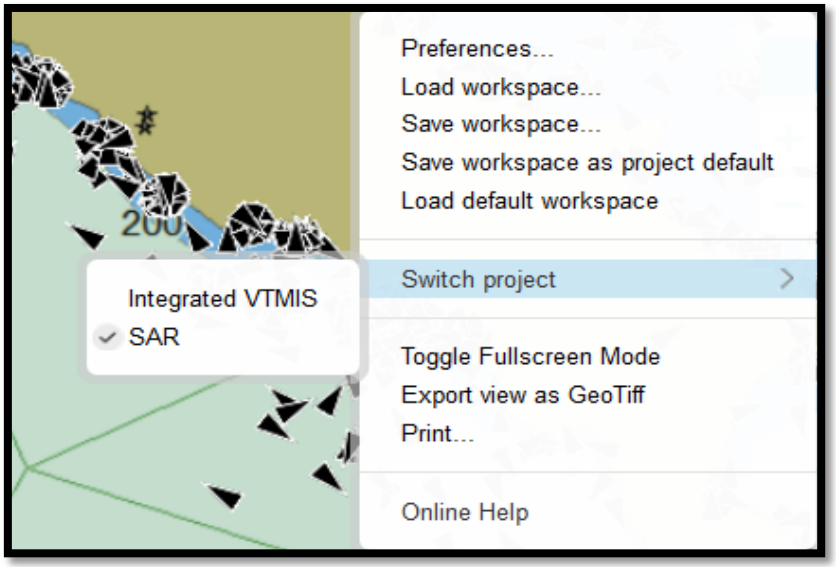
Opacity is set to

The result is displayed to the right



Exercise 8

SAR SURPIC demo



1) Right mouse button click on the centre of the SAR SURPIC

select "Start new SARSurpic operation…"

2) Enter a name and short description of the Operation and select the SURPIC Area type (Circle or Bounding Box) and its size

Then click on the button Submit.

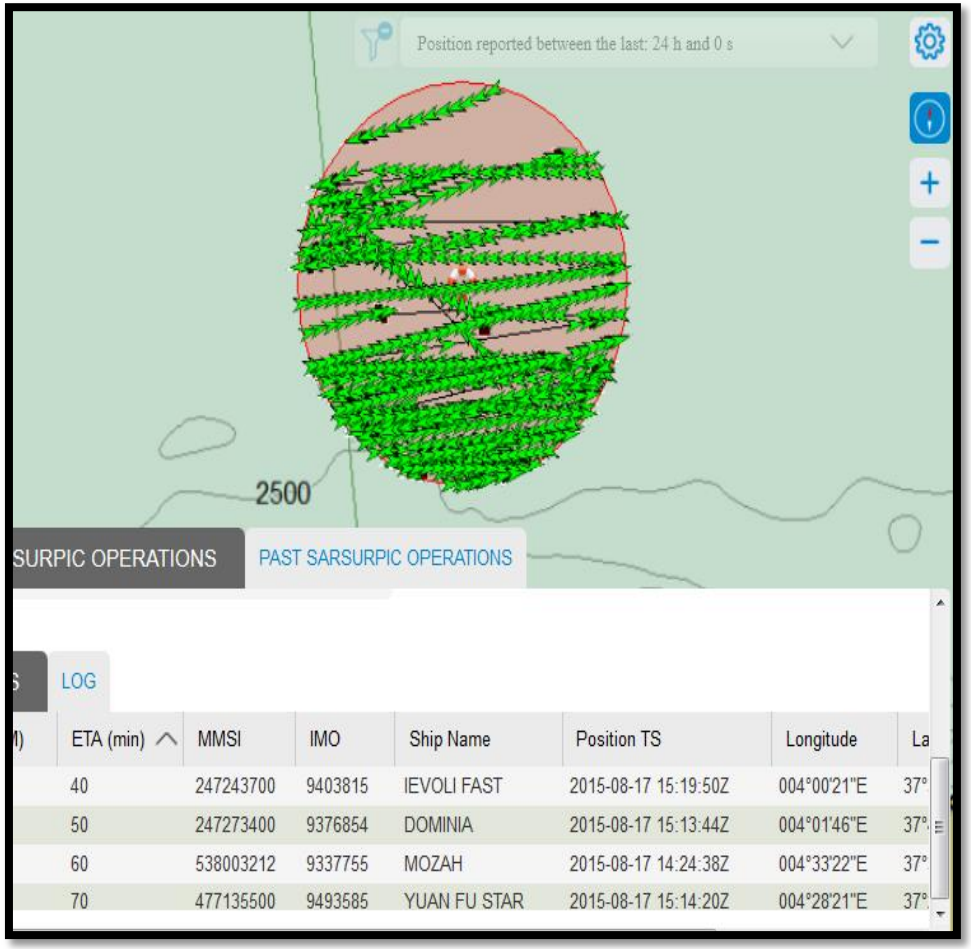
Analyzing the SAR SURPIC Result

After some time (up to 2 minutes) all positions of the last 24 hours will be displayed on the screen, irrespective of the data source (currently T-AIS, Sat-AIS, LRIT).

In the table at the bottom of the screen you can see the list of ships.

You can sort the list by clicking on the title of each column.

Sorting by “Distance to Target” shows the ships that are closest to the SURPIC Centre.



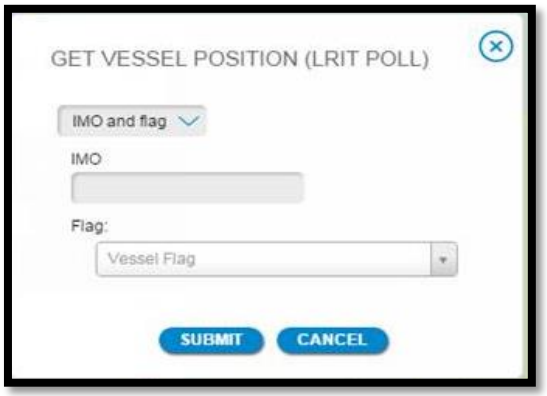
LRIT poll after SAR SURPIC

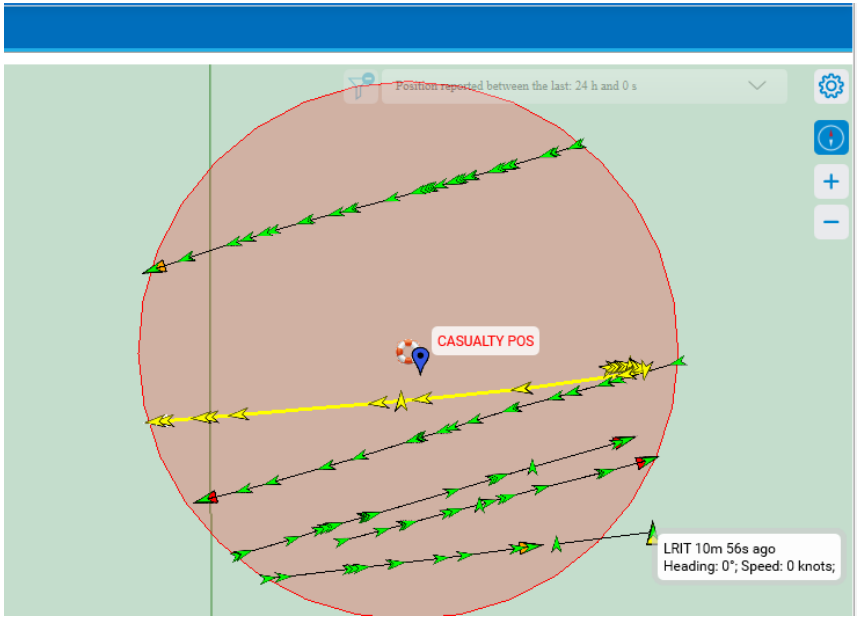
You can request the current position of a ship by using the LRIT Poll function.

Right click on the ship position and select the option “Get Current Position (LRIT poll)”. After a few minutes the current position will appear on the screen.

Note: - The LRIT Poll every LRIT Ship, even if the IMO/flag information is not present in the IMDatE database. In this case the MRCC Officer has to manually set the IMO/Flag.

If no position appears then the ship is likely not in the SURPIC area anymore or it is not responding to the LRIT Poll.

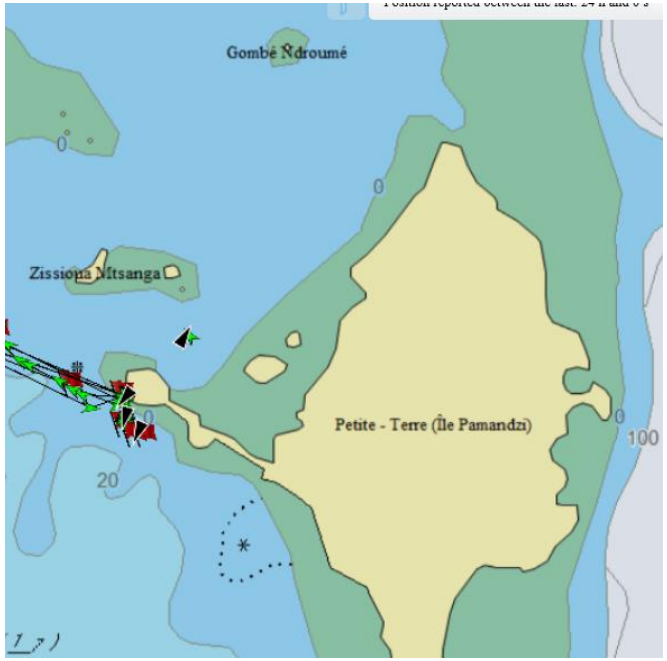


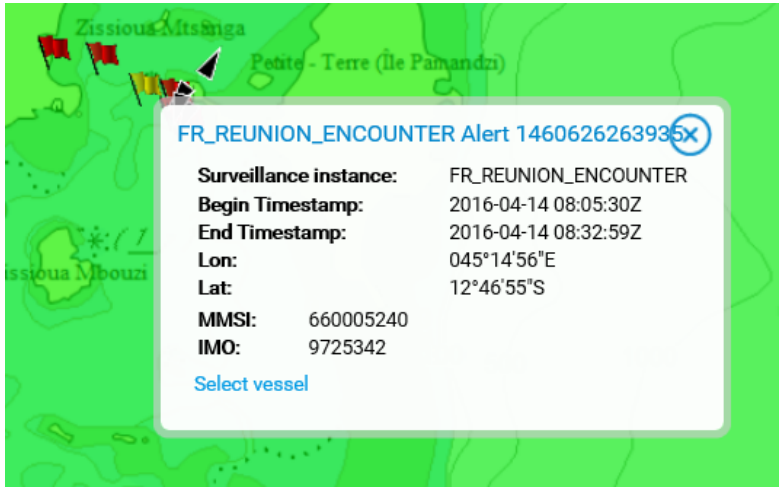


Practical scenarios 1

ABM demo

Anomaly Detection and Automated Behaviour Monitoring (ABM) tools are computer-based systems analysing real time vessel position reports (as made available in EMSA's operational maritime applications) for the detection of abnormal and/or user specific behaviours.





ABM types

ABM Type – description which events are automatically detected	ABM name
Entry of a particular vessel(s) to an area of interest	InArea
Passage of a vessel close to the shore	DistanceToShore
Vessels entering or leaving ports	AtPortAtSea
Anchored vessels	Anchorage
Frequency of vessels' position reports higher or lower than expected	UnderOverReporting
Vessels approaching one another closer than an indicated distance, with a speed below defined threshold	AtSeaEncounter
Change of heading higher than a threshold (e.g. more than 20 deg.)	SuddenChangeOfHeading
Sudden change of speed	SuddenChangeOfSpeed
Change of speed above or below a limit set	SpeedAnomallyOverPeriod
Passage of a vessel close to an area of interest	DistancetoArea
Vessels entering a closed area at a specific time	TimeAndPeriodOfDay

ABM in the context of your organization

How the ABM could be used / are used in your organization?

Practical scenario 2

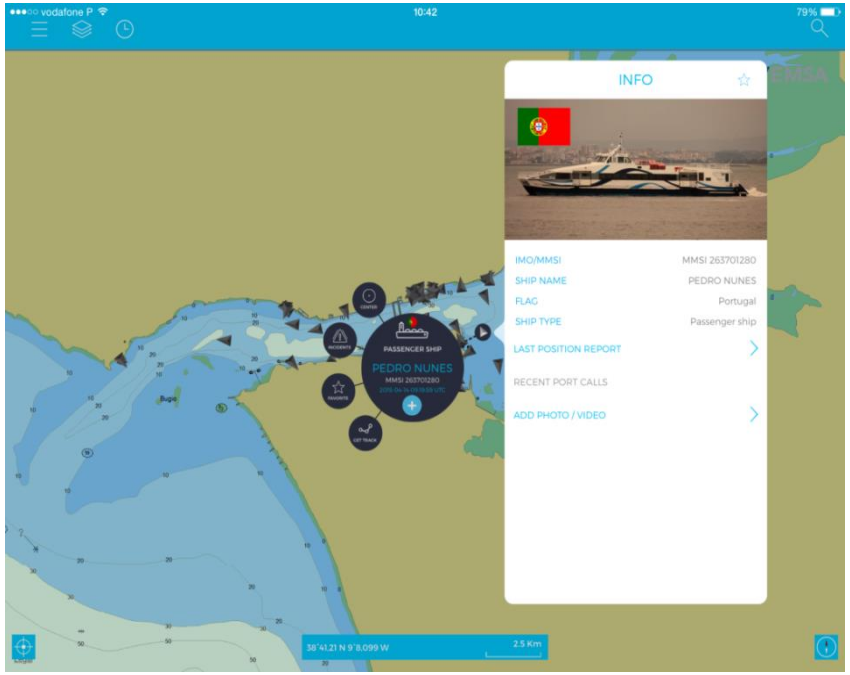
IMS Future

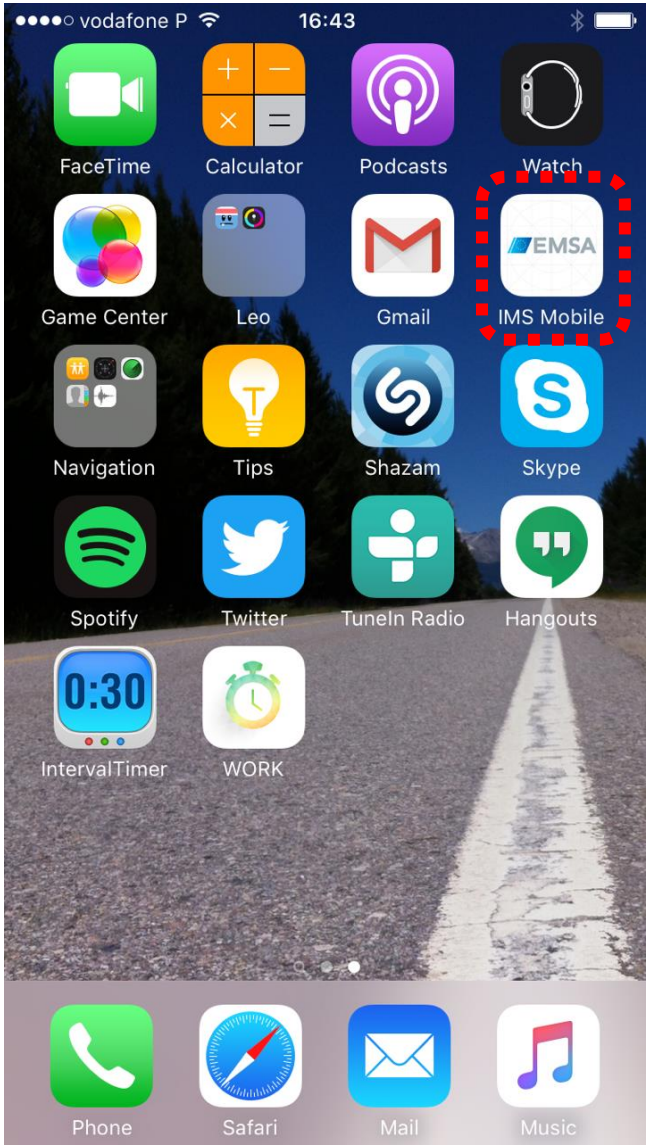
Next steps

- **IMS Mobile App**
- **SafeSeaNet Ecosystem GUI (SEG)**
- **Video streaming**
- **Other developments**

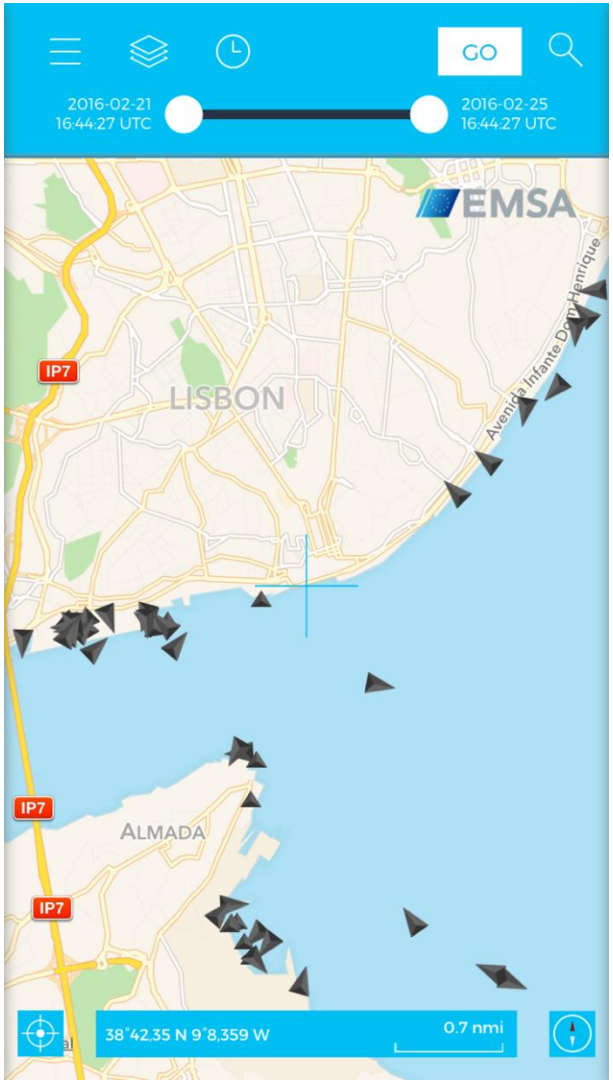
IMS Mobile App (i)

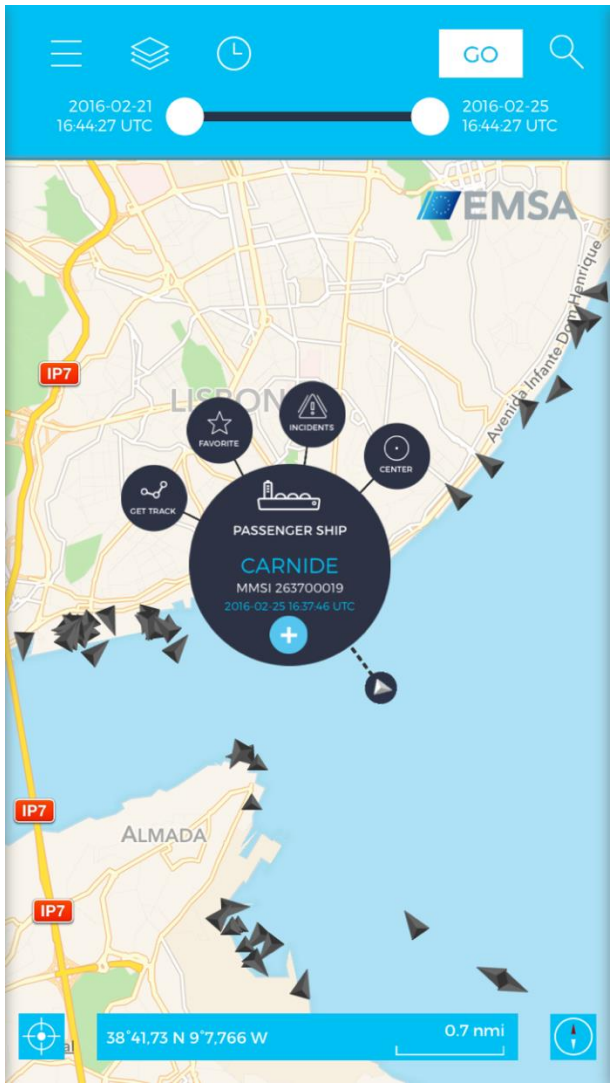
- Development of iOS and Android application to address a set of use cases, including:
  - ✓ Vessel position & information
  - ✓ Area centric query
  - ✓ Incident reporting
  - ✓ Oil spill monitoring and feedback
- Tablet (iPad and Android) version
- Mobile phones (iOS) version

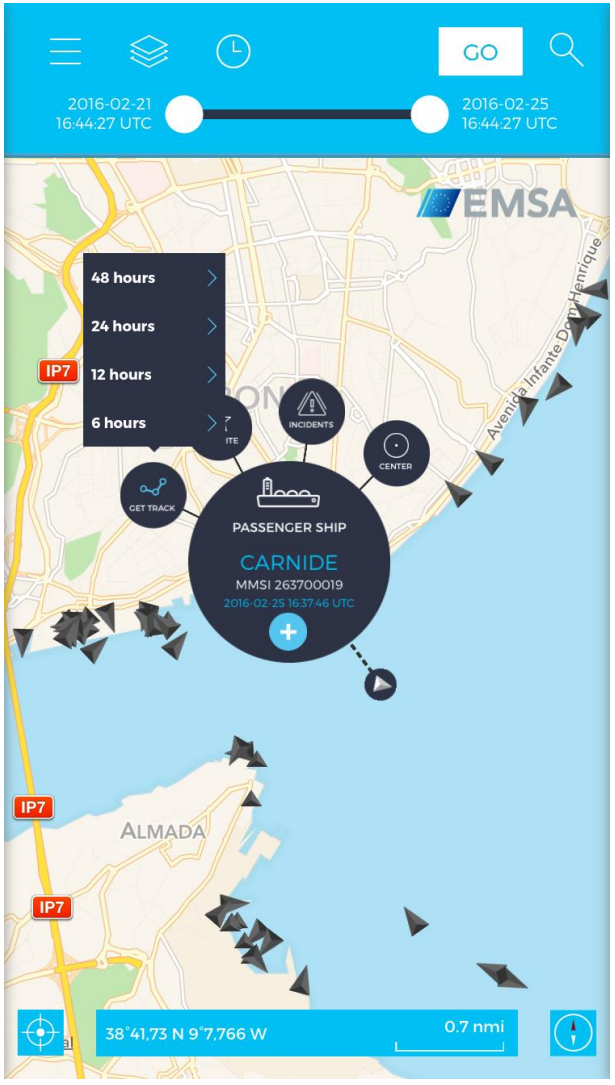




IMS Mobile App (ii)







Demo of the IMS APP

IMS APP

IMS Mobile App (iii)

- How to download?
  - ✓ Search for EMSA IMS Mobile on App Store and Google Play
  - ✓ *Next release expected….*
- How to join?
  - ✓ Channel request through IMS PoC
- Questions?
  - ✓ Email samuel.djavidnia@emsa.europa.eu

SEG

SEG and existing GUIs

New Single GUI

Focus on integrated users / user functions

- Take the best of each existing interface
- Simple and straightforward
- Introduce some innovations and solutions commonly used
- New approach to certain data sets
- Customised for each user community

Existing GUIs

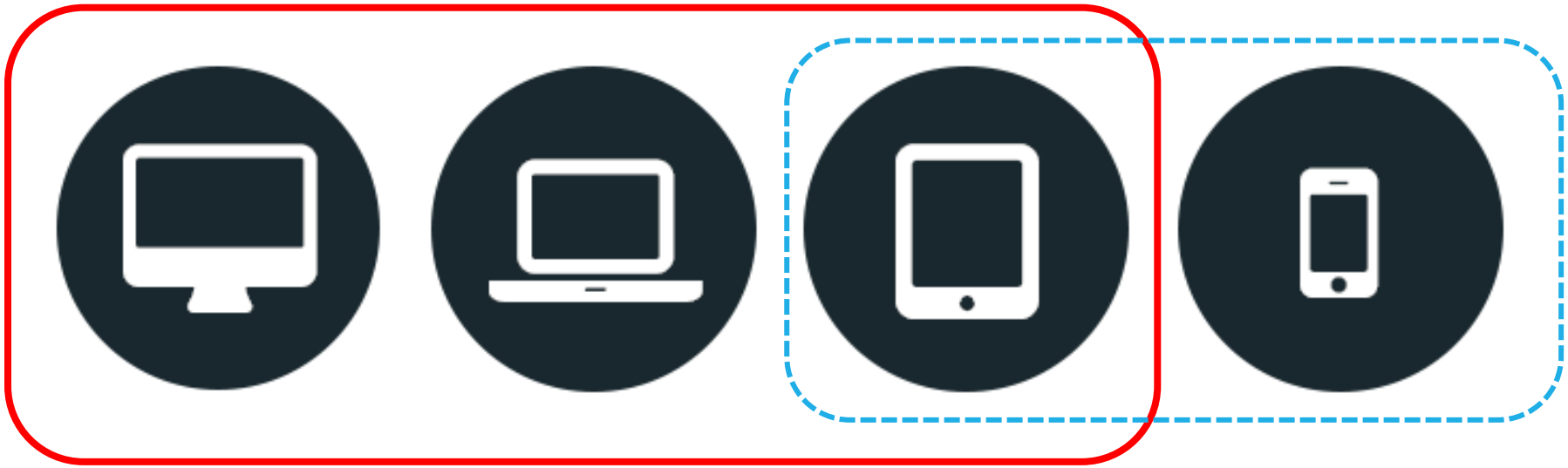
Focused on specific current users / user functions

- Served existing users very well
- Interesting functions in each interface
- Some functionalities are duplicated
- Some elements will remain available e.g. administrative or reference databases (LRIT, SSN TI)

Design, use and portability

SSN Ecosystem GUI

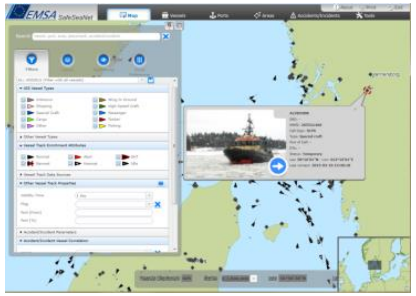
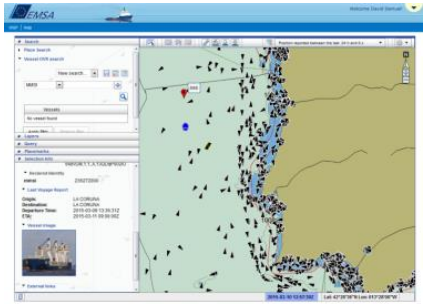
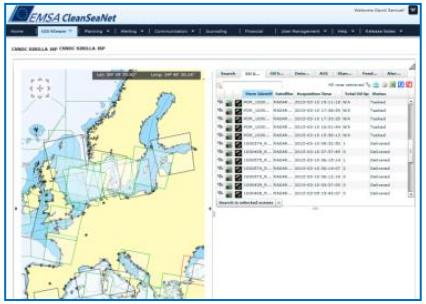
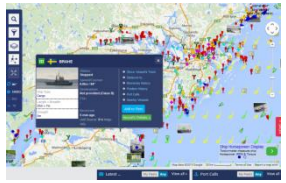
IMS App

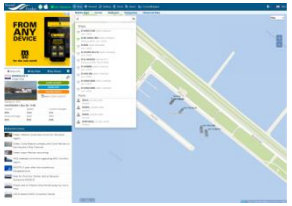


SSN Ecosystem GUI: html on desktop, laptop and tablet.

IMS App: iOS and Android on tablet and smart phone.

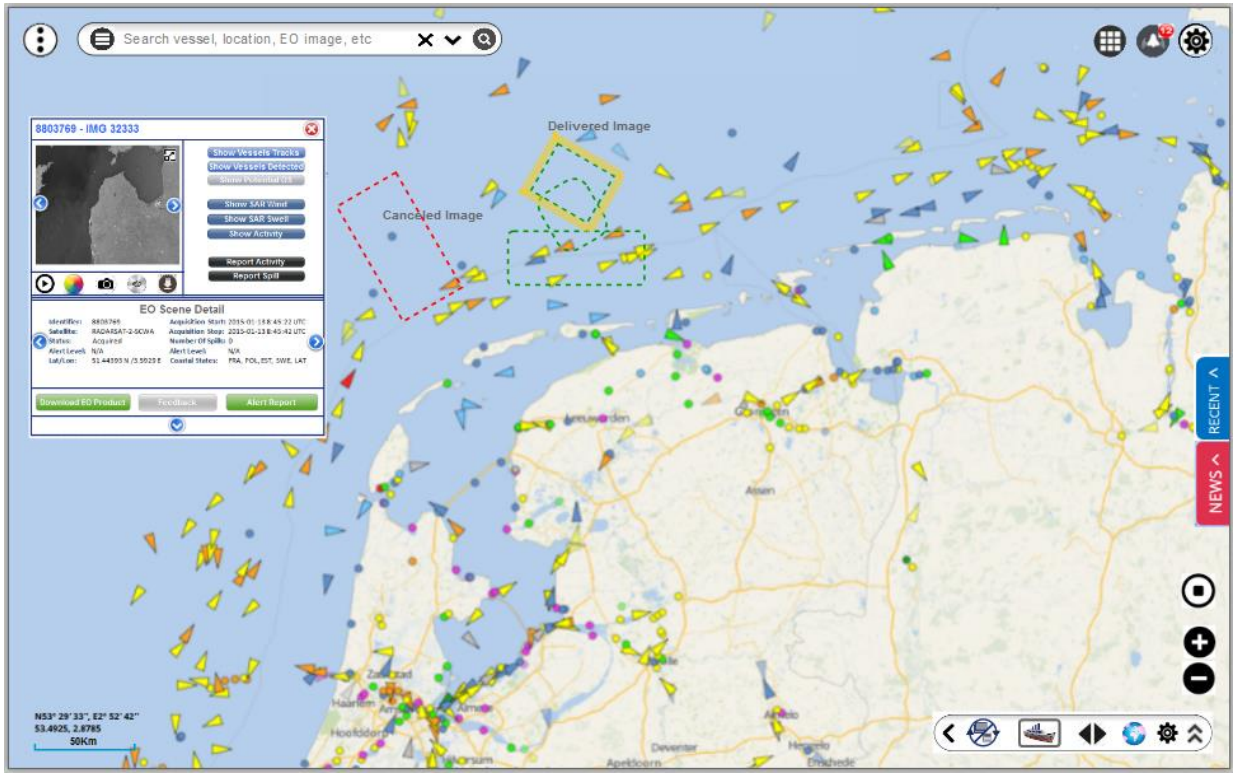
Benchmarking Internal Applications/External Web Applications



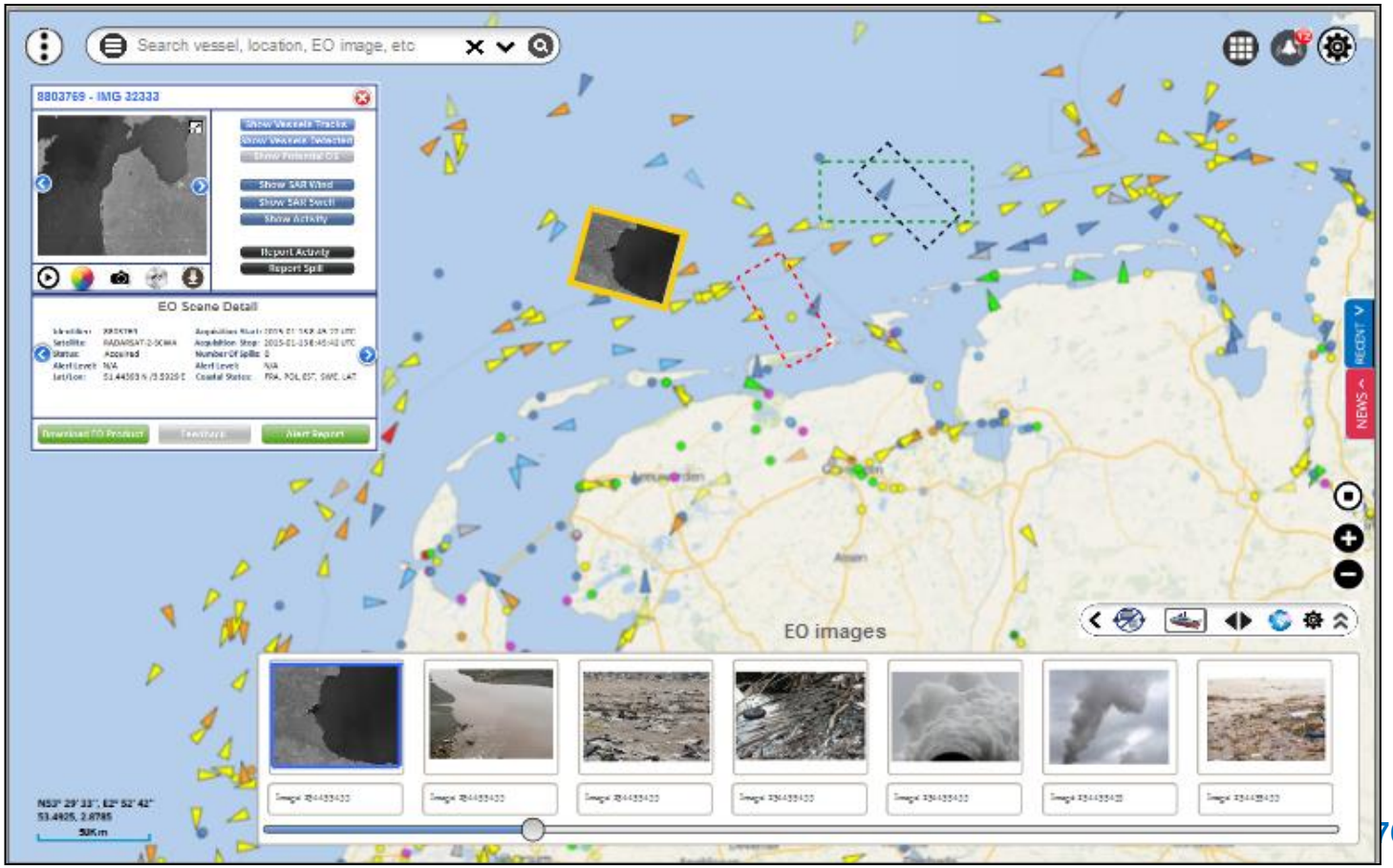

- Business requirements reviews
- Iterations in form of workshops with stakeholders
- User research and usability testing on wireframes

Google Maps, Google earth, Vessel Finder, Marinetraffic, Microstrategy, Different mobile apps

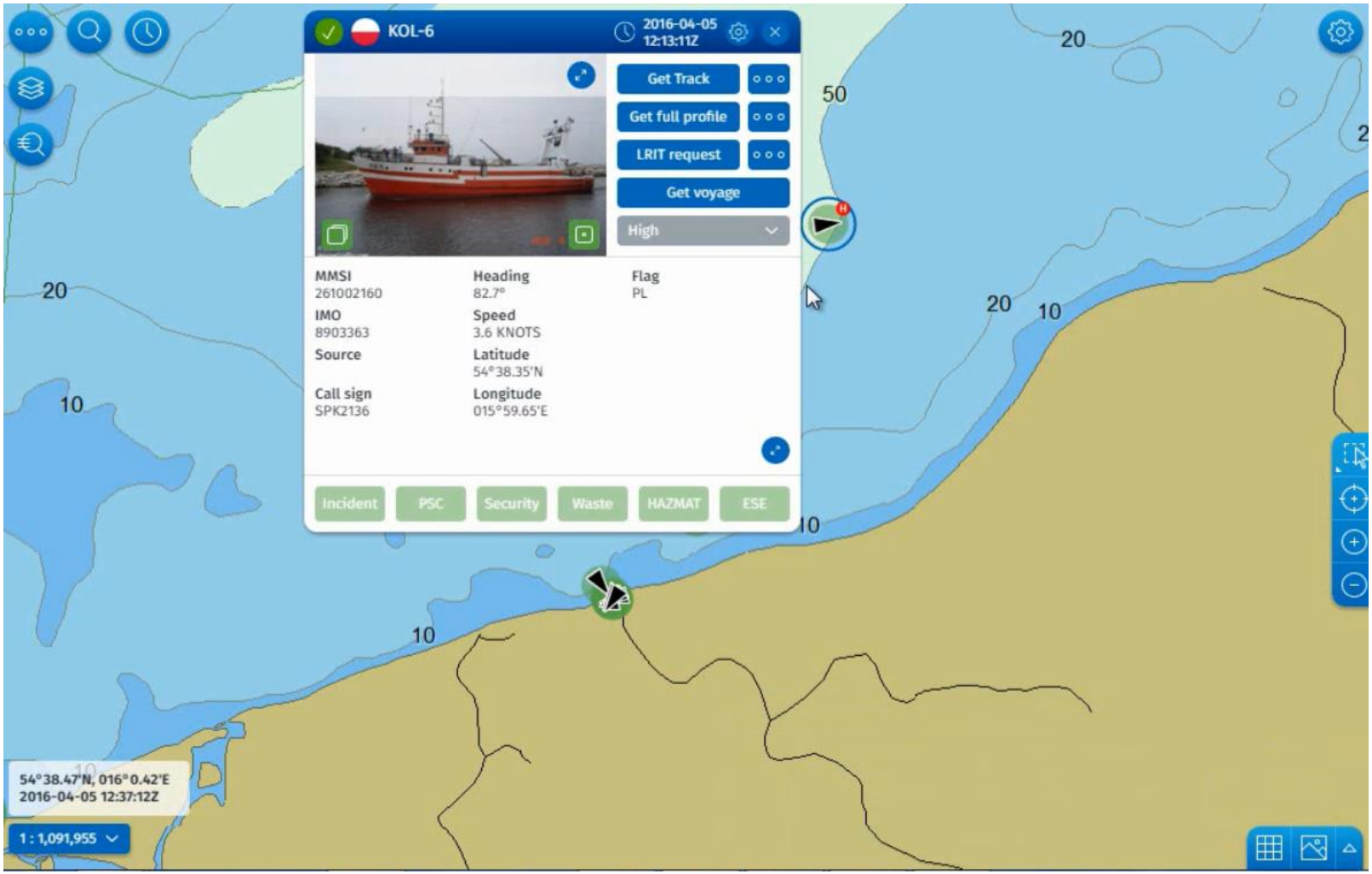


SEG Timeline

- April/July 2016: Intermediate Releases – open only to limited users for testing purposes.
- November 2016: Version 1.0 Go-Live



DEMOS OF SEG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Speed
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Longitude
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PSC
Security
Waste
HAZMAT
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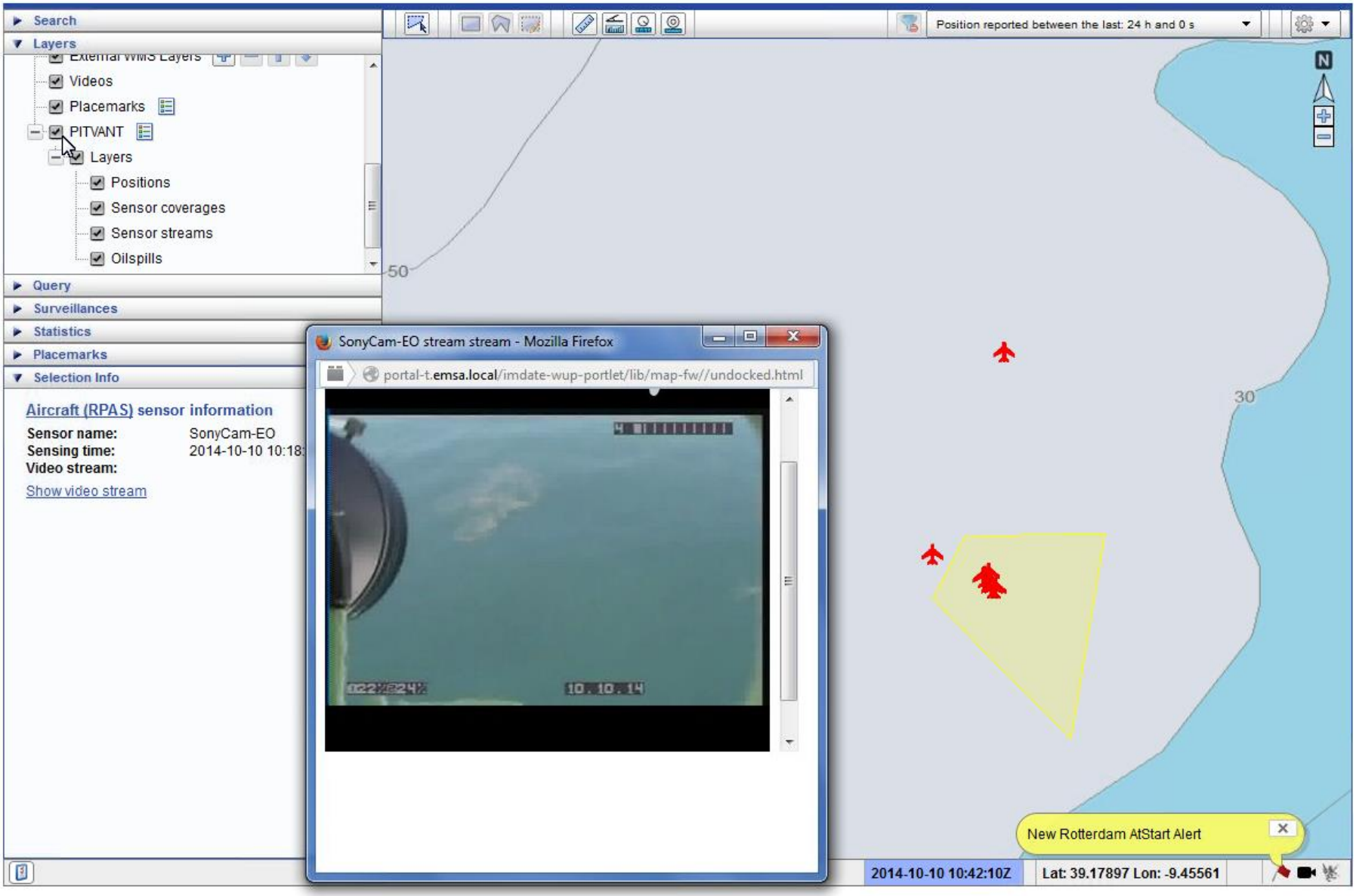
New SEG – user feedback

- What is the most positive aspect of SEG?
- What is the most positive aspect of IMS App?
- How could you use SEG?
- How could you use IMS App?
- What functionalities are still needed for SEG?
- What functionalities are still needed for IMS App?

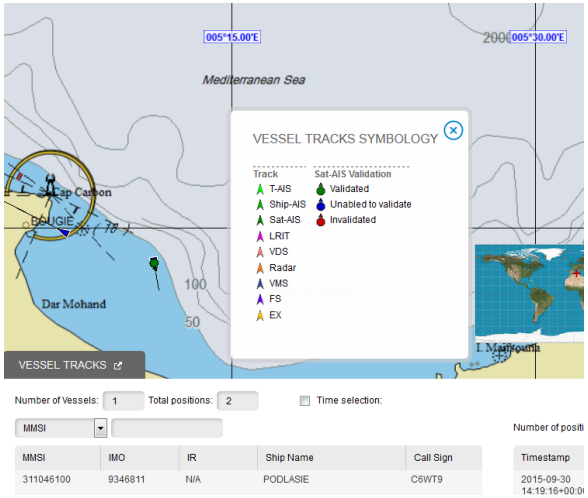
OTHER DEVELOPMENTS

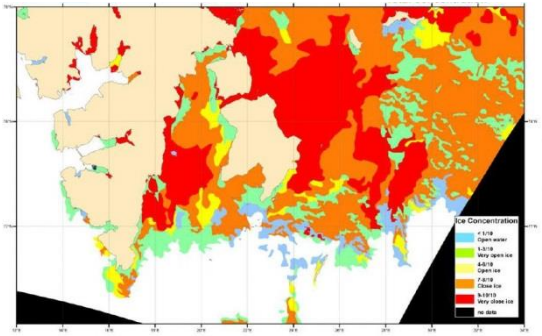
Next steps: Video streams



Future plans and on-going developments

- S-AIS - Validity/Invalidity Check of an AIS message
- S-AIS - Doppler validation
- Specific display of ships exceeding a defined SO^2 (Sulphur) emission threshold
- Display of the ice concentration, ice thickness





IMS and EMSA's support

- **Coordination** of system developments with MSs and COM
- **Operate** the system maintaining technical/operational documentation
- IT and operational **helpdesk**
- **POC for reporting** on quality of systems and information
- **Training** for users

EMSA Maritime Support Services

- IT & operational Helpdesk for EU maritime applications
- Application monitoring & incident management
- SPOC for requesting EMSA pollution response services
- 24/7 services

Contact Details:

Tel: +351 211 209 415

Fax: +351 211 209 480

Email: MaritimeSupportServices@emsa.europa.eu

Summary

- **How the IMS could be used in your daily work?**

- **https://extranet.emsa.europa.eu/evaluation-questionnaire - fill in the feedback form**

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EMSA
European Maritime Safety Agency