

JRC TECHNICAL REPORTS

PMAR Viewer User Manual

Issue Feb 2015

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2015



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JRC94785

EUR 27117 EN

ISBN 978-92-79-45759-3 (PDF)

ISSN 1831-9424 (online)

doi: 10.2788/213253

Luxembourg: Publications Office of the European Union, 2015

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Summary

This document is a user manual for the PMAR viewer, the user interface of the PMAR system that provides Maritime Situational Awareness over ocean-basin wide areas.

This is the second issue, of February 2015, to include the description of newly implemented features. The first issue was that of November 2014. Updates to the previous version are indicated in the text by “*New*”.

The PMAR system was set up to support authorities in Africa with their maritime awareness. PMAR stands for Piracy, Maritime Awareness and Risks, and it refers to a series of R&D projects carried out by the European Commission’s Joint Research Centre (JRC) with the purpose to assess technical means for maritime awareness tailored for users in Africa for counter-piracy and maritime security. The third and latest project, PMAR-MASE, is funded under the MASE program of the 10th EDF (European Development Fund) which aims to improve maritime security in the Eastern-Southern Africa / Indian Ocean (ESA/IO) region, and is implemented under MASE Result 5 overseen by the Indian Ocean Commission (IOC).

The PMAR system collects data from a range of maritime surveillance systems – mainly ship reporting data from terrestrial AIS¹, satellite AIS, and LRIT² –, fuses these data, extracts ship tracks, and predicts current ship positions that are then displayed in real time on an interactive map. In the PMAR-MASE project, this information is offered for the period of one year to two operational centres in the ESA/IO region: the Regional Maritime Rescue Coordination Centre operated by the Kenya Maritime Authority in Mombasa, Kenya; and the Anti-Piracy Unit of the IOC in the Seychelles. The information is shown in the PMAR viewer, which is a web application. The PMAR system is a derivation of the JRC’s Blue Hub maritime surveillance R&D platform.

¹ Automatic Identification System

² Long Range Identification and Tracking

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A. Enrolment

The enrolment procedure is required in order to implement the access security of the PMAR viewer. Access is controlled through a username / password, and through a verification tied to the web browser on the computer, so that the PMAR viewer can only be accessed on that specific computer and browser. Only one instance of the PMAR viewer can be active under that username at the same time. The enrolment procedure installs the verification in the web browser by means of using the email address that is registered with the username.

1. Enrolment procedure

The enrolment procedure needs to be done only once to initialise the browser / computer. After that, you can log in and log out as often as desired. Only in case of a malfunction or security problem will the enrolment procedure need to be repeated.

1a. Open a web browser.

(On the computer where you want to run the PMAR viewer.) The use of the latest versions of Chrome or Mozilla is recommended. (Internet Explorer is not supported.)

The enrolment credentials that are needed to log in to the PMAR viewer, and that are installed during this enrolment procedure, are kept in your web browser as cookies. Therefore, your browser should be configured to accept and keep cookies. This might need some adjustments in your web browser (under tools or settings); see section 3 below.

1b. Point your browser to <https://bluehub.jrc.ec.europa.eu/enroll>

The system will ask you for authorisation. Enter your username and password provided by the system administrator.



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European Commission

JOINT RESEARCH CENTRE

Blue Hub - Integrating Maritime Surveillance Data

European Commission > JRC > IPSC > Maritime affairs > BlueHub

[WebGis](#)

Username: bluehub

Password:

login

The system will confirm your login as follows:



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European Commission

JOINT RESEARCH CENTRE

Blue Hub - Integrating Maritime Surveillance Data

European Commission > JRC > IPSC > Maritime affairs > BlueHub

[WebGis](#)

We have sent you an email to proceed with enrollment and a new password.
The link will expire in 5 minutes
You are now logged out from our systems

It will send an email to your email address (the one that was specified at the first installation) with a web link to continue the enrolment. The link is valid for 5 minutes.

1c. Check your email account for the email with the link.

This can be done on a different computer than where you want to run the PMAR viewer.

1d. Open the link you received in your web browser – this must be done again in the browser and on the computer on which you want to use the PMAR viewer (which may be different than the computer where you received the email). The system will ask you to login again. Use your username and password as in the previous step. The system will confirm your enrolment and will logout again.



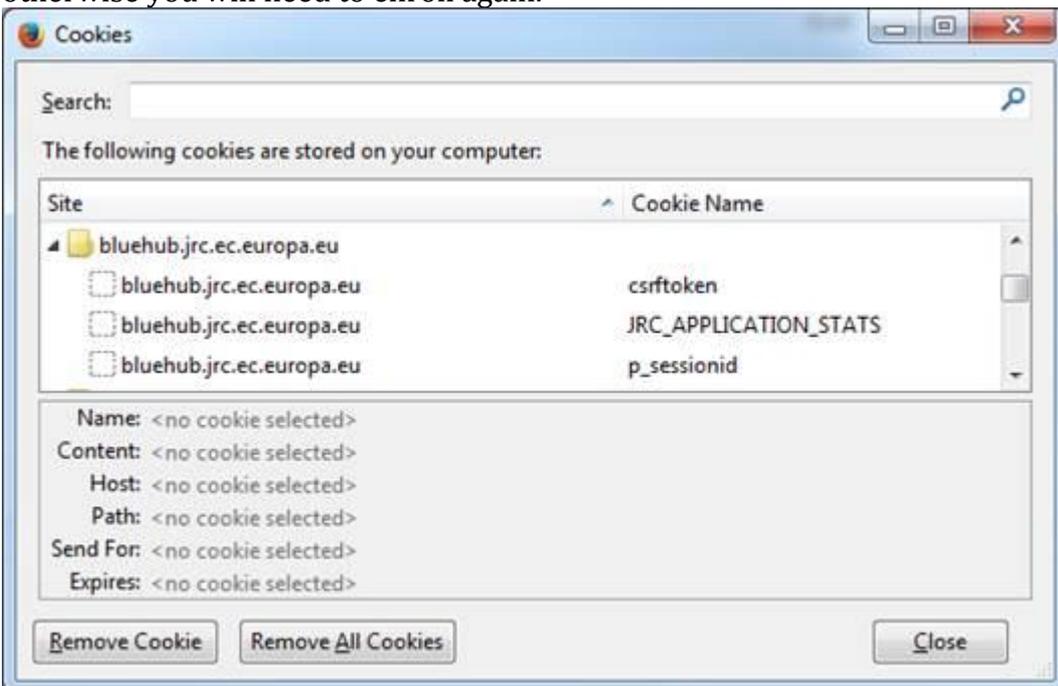
Now the enrolment is completed, and you can proceed to step B for normal daily use (login, use, logout).

2. *When logging in is not possible*

As the information needed for log-in authorisation is kept as cookies in your web browser, it might get lost if you delete cookies or when the browser or the computer crashes. In that case, you cannot log in anymore, and you will have to repeat the enrolment procedure starting from step A.1.

3. *Managing cookies in your browser*

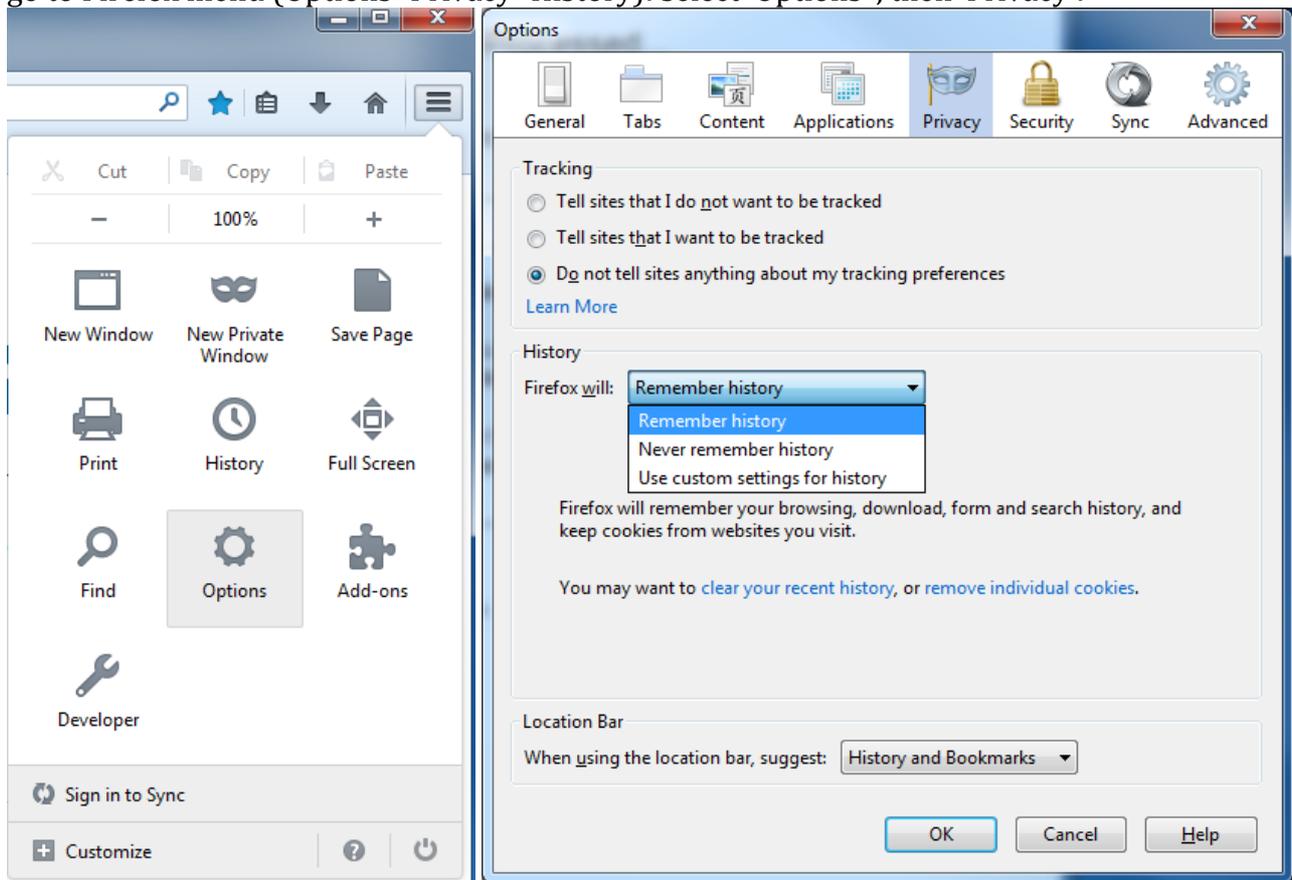
Your authorisation information is kept in your web browser as cookies. The figure below shows an example of the cookies that will be installed. Please do not remove those cookies; otherwise you will need to enroll again.



3a. Managing cookies in Mozilla Firefox

To check your privacy preferences:

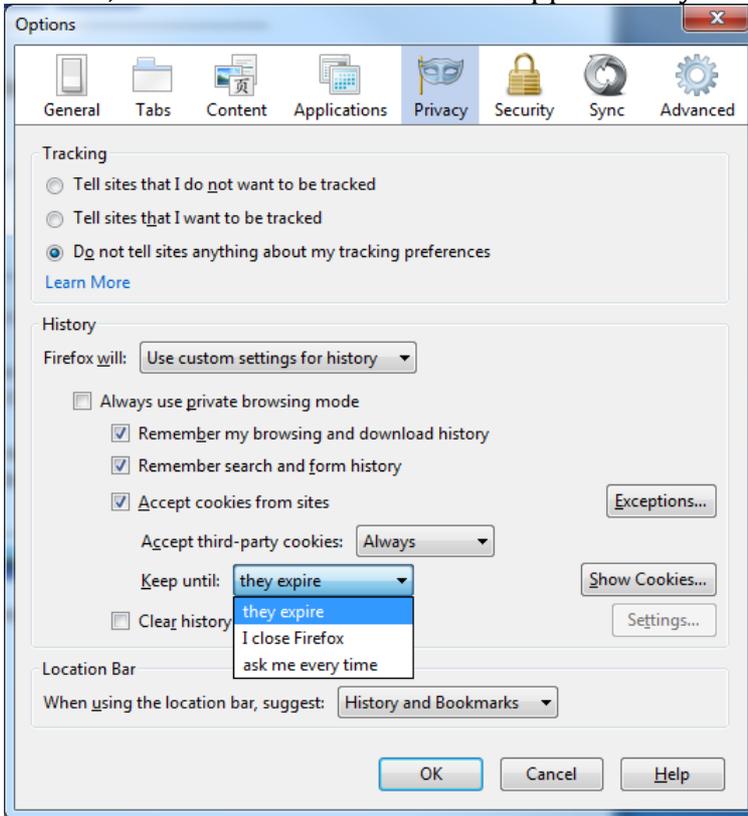
go to Firefox menu (Options>Privacy>History): select 'Options', then 'Privacy':



For the 'History' there are three possibilities:

- 1) 'Remember history' → if you select this option, JRC's cookie will always remain;
- 2) 'Never remember history' → this has to be avoided, it is incompatible with our system;
- 3) 'Use custom setting for history'.

In case you select the last option, please keep our cookies until 'they expire'; do not use 'I close Firefox', otherwise the cookie will disappear every time you close the browser.



If your security policy does not allow that for all websites, at least use "exceptions" in order to "allow" the PMAR cookie.

To display the installed cookies: >Options >Privacy >History >'Use custom settings for history' >'Show Cookies'.

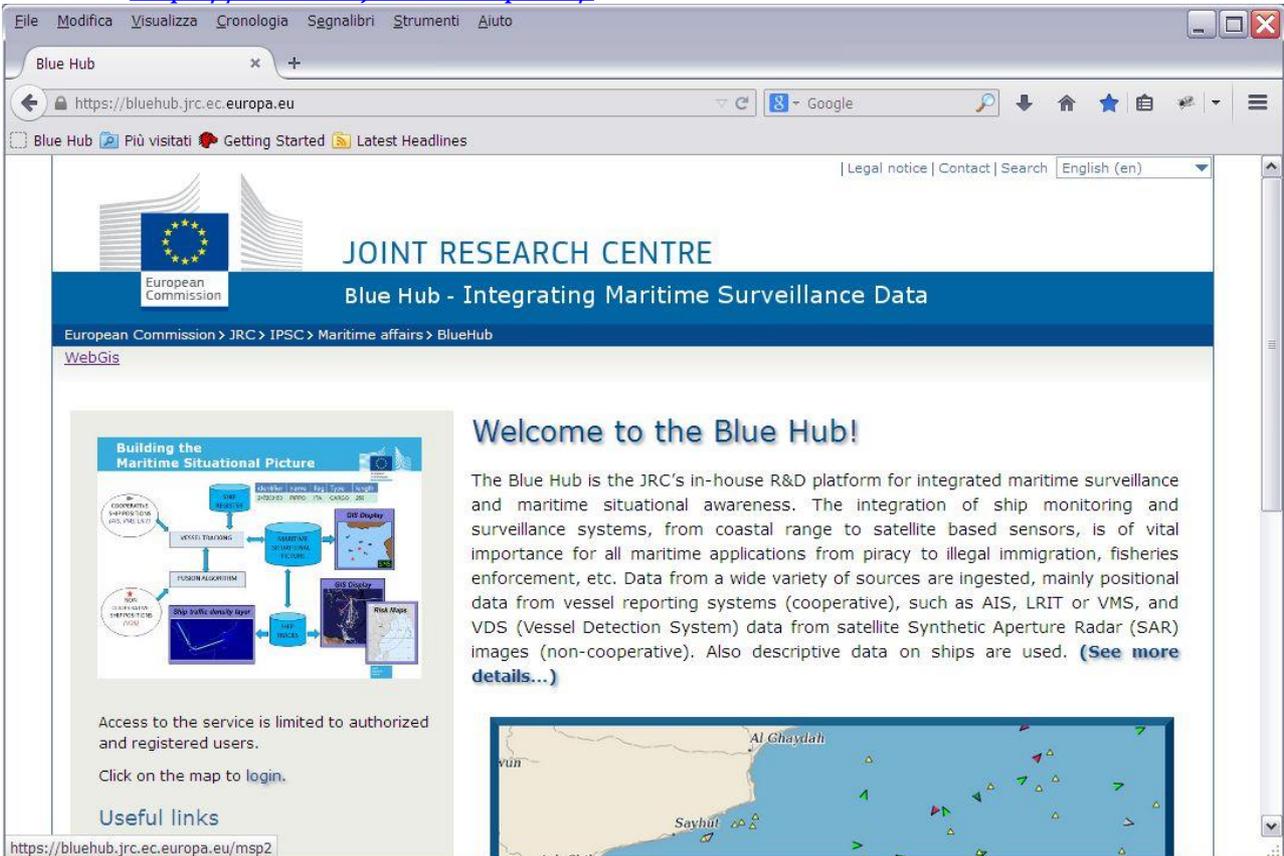
B. To start up normal access

4. Logging in

4a. Open a web browser

This must be done on the computer where you did the enrolment procedure of section 1. The use of the latest versions of Chrome or Mozilla is recommended. (Internet Explorer is not supported.)

4b. Go to <https://bluehub.jrc.ec.europa.eu/>



The screenshot shows a web browser window displaying the Blue Hub website. The browser's address bar shows the URL <https://bluehub.jrc.ec.europa.eu/>. The website header includes the European Commission logo and the text "JOINT RESEARCH CENTRE Blue Hub - Integrating Maritime Surveillance Data". Below the header, there is a navigation menu with "WebGis" selected. The main content area features a diagram titled "Building the Maritime Situational Picture" and a "Welcome to the Blue Hub!" message. The welcome message states: "The Blue Hub is the JRC's in-house R&D platform for integrated maritime surveillance and maritime situational awareness. The integration of ship monitoring and surveillance systems, from coastal range to satellite based sensors, is of vital importance for all maritime applications from piracy to illegal immigration, fisheries enforcement, etc. Data from a wide variety of sources are ingested, mainly positional data from vessel reporting systems (cooperative), such as AIS, LRIT or VMS, and VDS (Vessel Detection System) data from satellite Synthetic Aperture Radar (SAR) images (non-cooperative). Also descriptive data on ships are used. (See more details...)" Below the text is a map showing a coastal area with several colored triangles representing ships. A "login" button is visible on the map. The footer of the page shows the URL <https://bluehub.jrc.ec.europa.eu/msp2>.

4c. Click on the map or on "login"

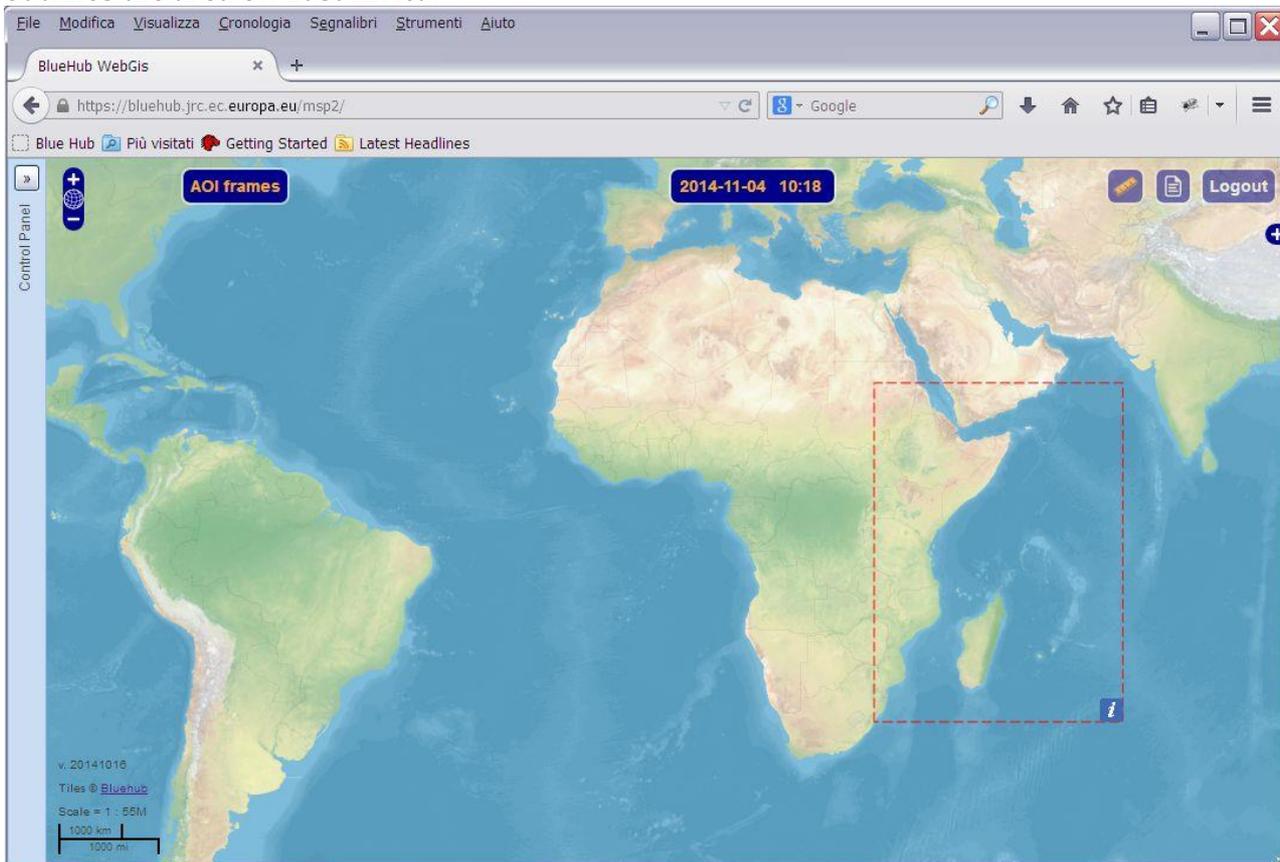
4d. Insert your username and password

In some browsers you can store these, so that they re-appear when you type the first letter of your username.

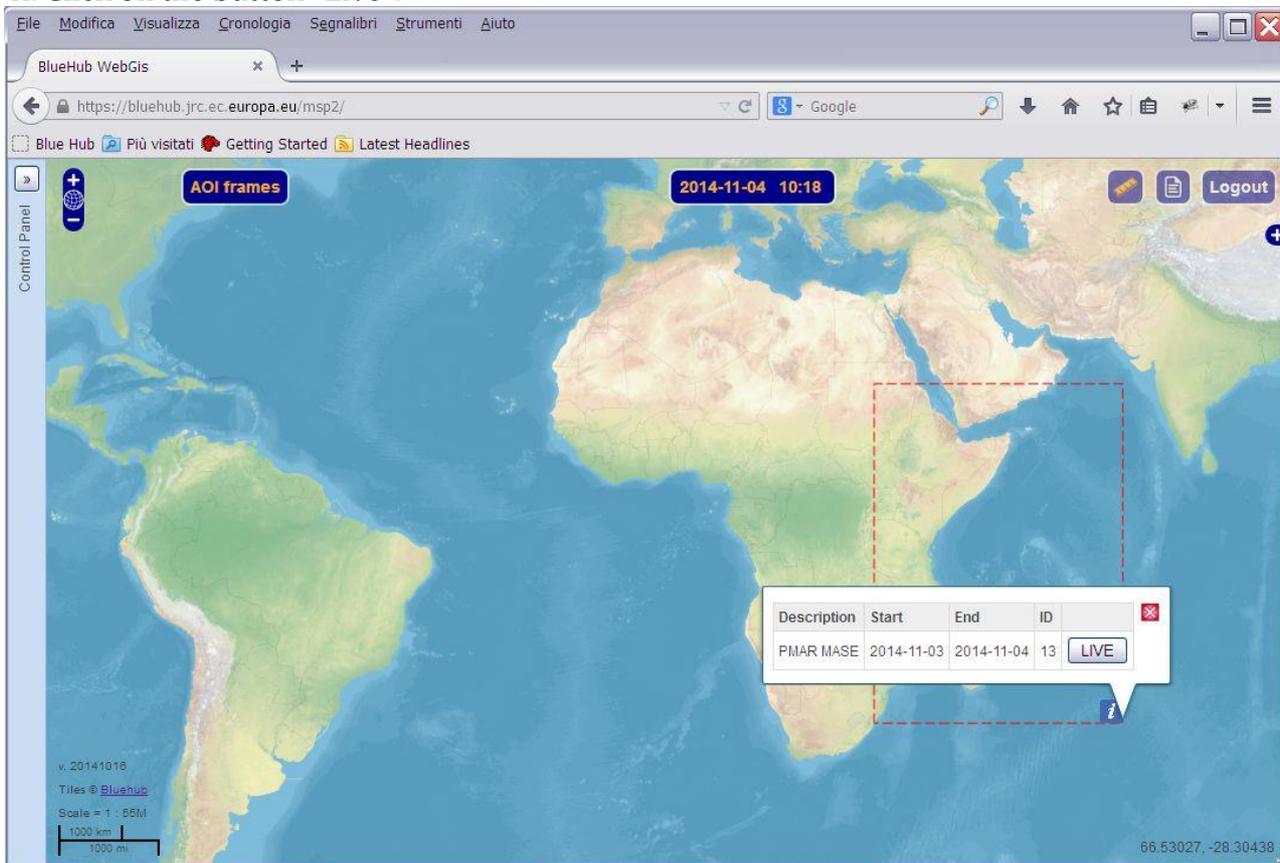


The screenshot shows the login page of the Blue Hub website. The header is identical to the previous screenshot. The main content area is a login form with two input fields: "Username" and "Password". Below the "Password" field is a "login" button. The footer of the page shows the version number "v.20141016" and the last update date "Tue Oct 28 15:02:26 2014".

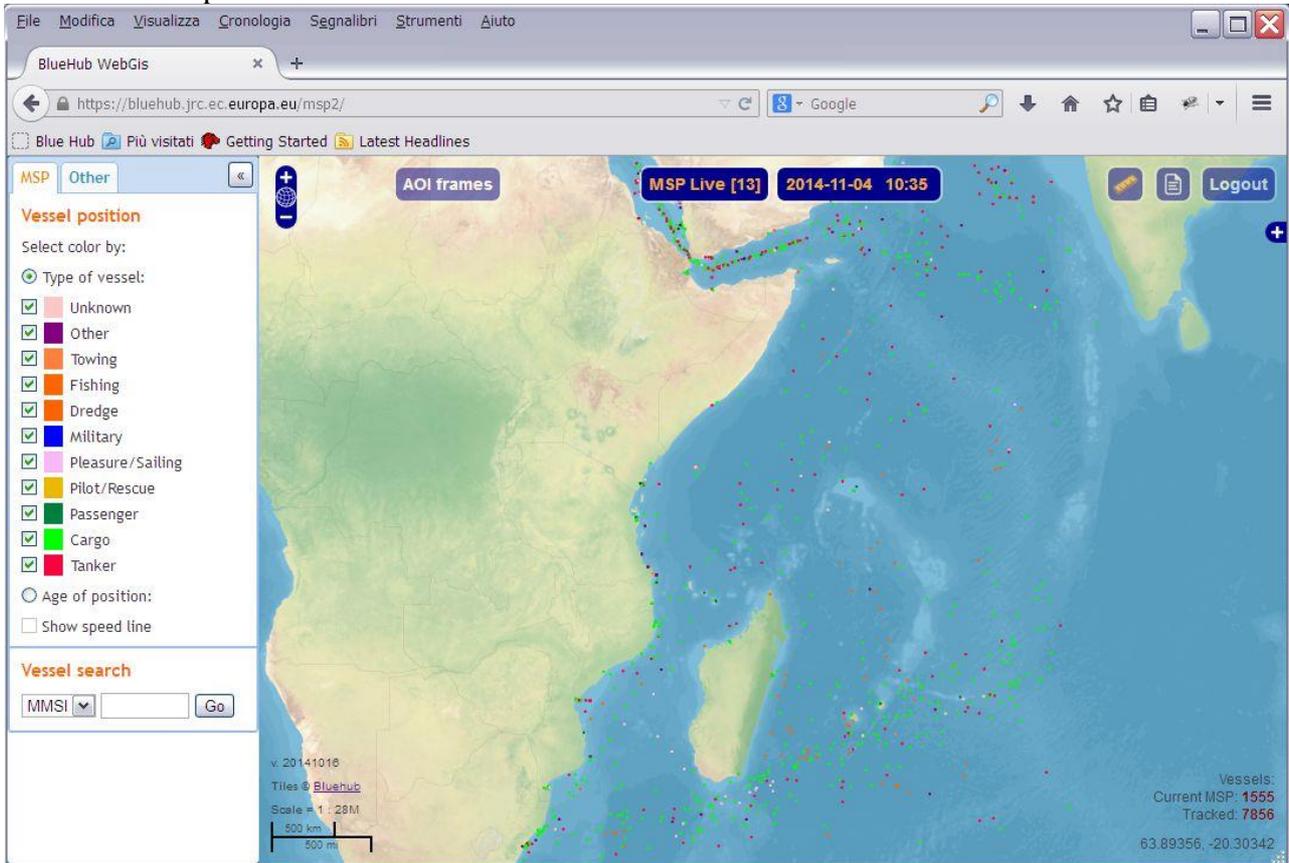
4e. The world map appears. Click on the blue “i” in the corner of the red dashed box that outlines the area off East Africa.



4f. Click on the button “Live”.

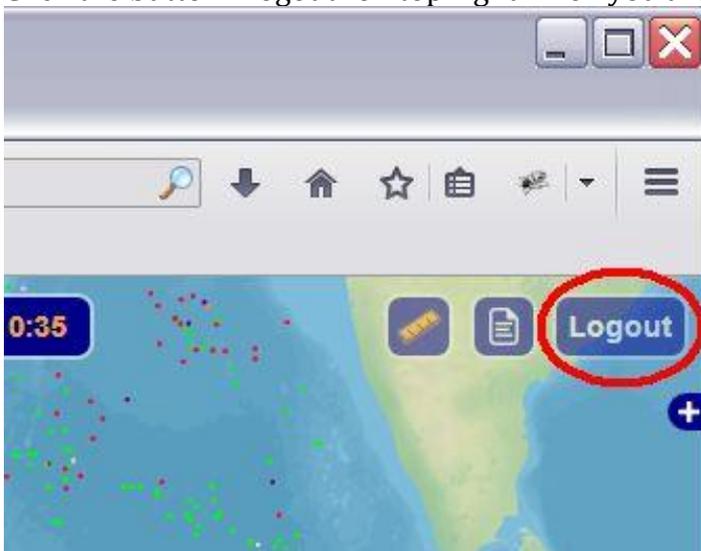


4g. The Maritime Situational Picture (MSP) of the whole area appears. Now you have the live view of the ship traffic.



5. Logging out

Click the button “Logout” on top right when you are finished.



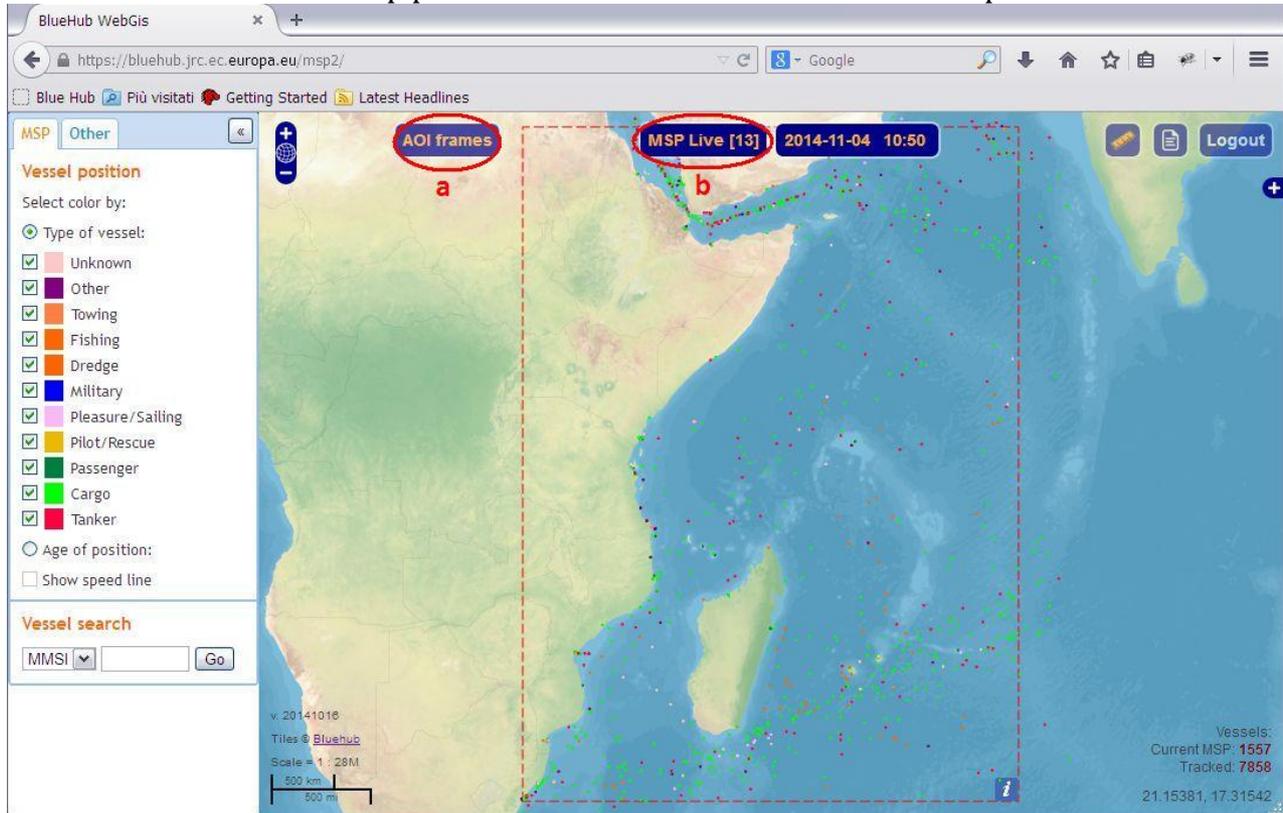
C. Possibilities to use

6. Standard view

The ships are coloured by ship type, as per the legend on the left under the tab “MSP”. The ship positions are predicted to their positions at the Coordinated Universal Time (UTC) date / time indicated in top centre. The picture is refreshed every 15 minutes.

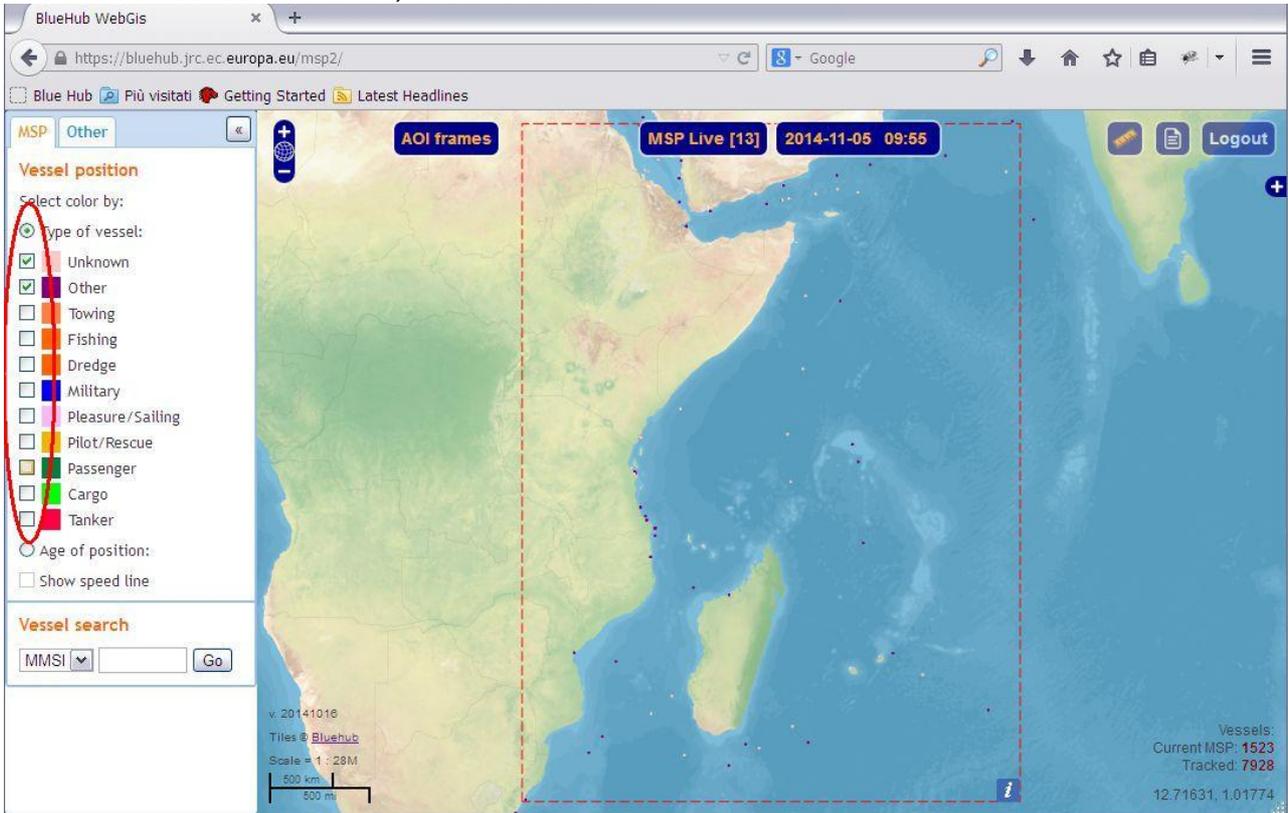
6a. Switch on or off the red dashed outline of the area that is being monitored with the button “AOI Frames” on top.

6b. Turn on or off all the ship positions with the button “MSP Live [13]” at top centre.



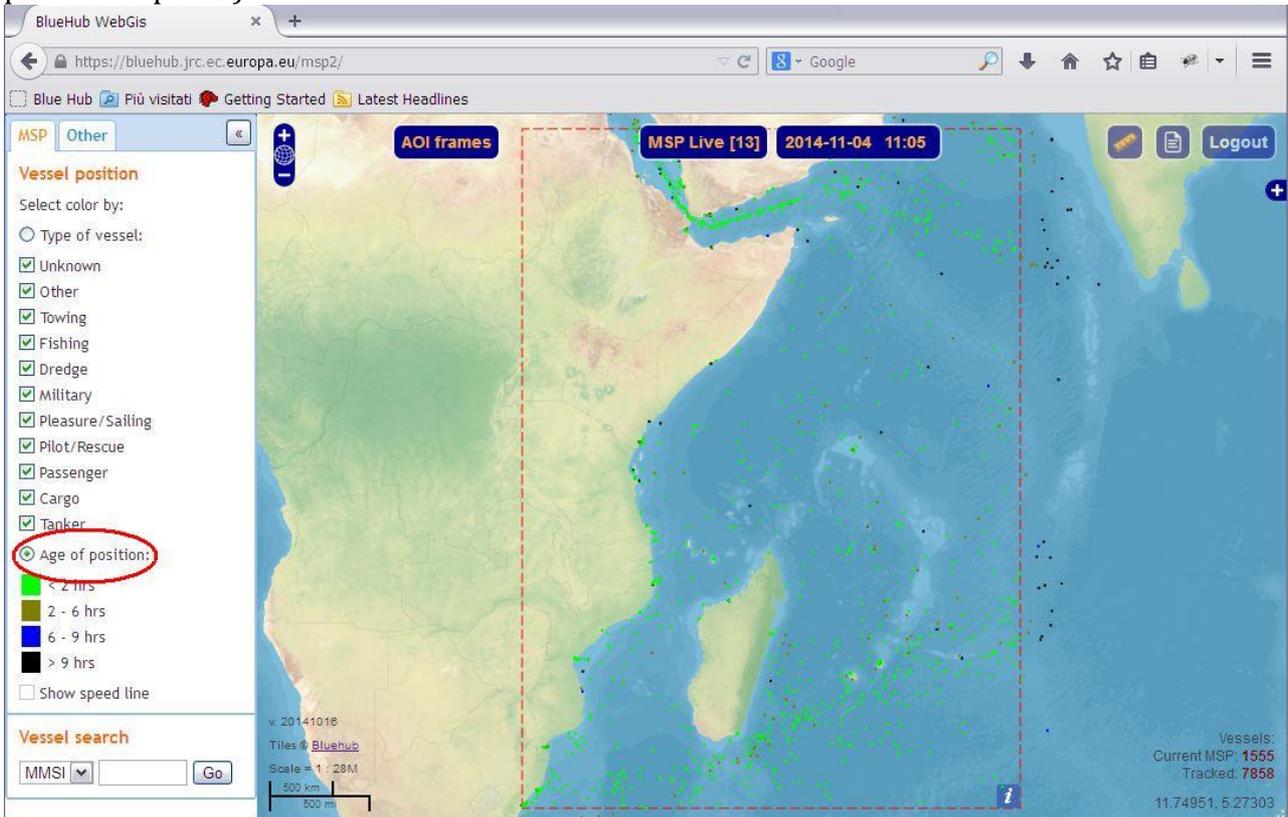
At bottom right, the number of different ships seen in the current picture is shown in red (here, 1557), and below that, the number of different ships ever seen since the start of the tracking run.

6c. Select / de-select vessel types Use the tick boxes on the left, under the tab “MSP”.



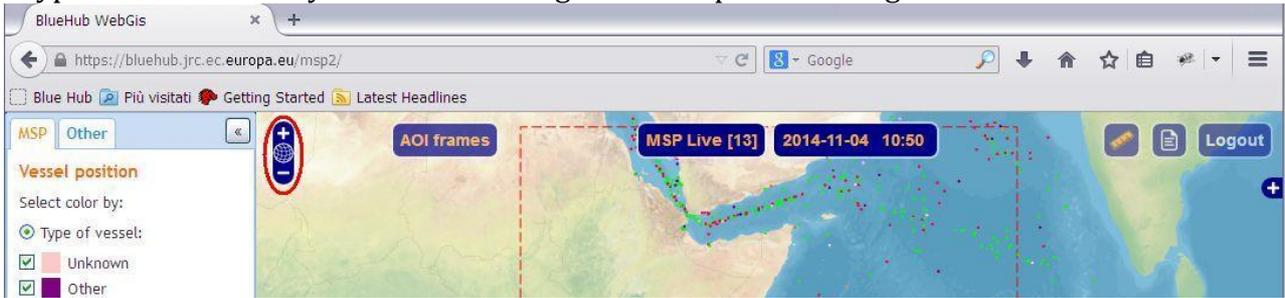
7. Show the freshness of the ship positions

Change the colour coding of the ships, from indicating ship type, to indicating the age of the ship's most recent position report, by clicking “Age of position” on centre left under the tab “MSP”. (The ship positions that are shown are predicted to the present time as indicated in UTC in the blue box on top centre, based on the ships' tracks and the ships' most recent position reports.)



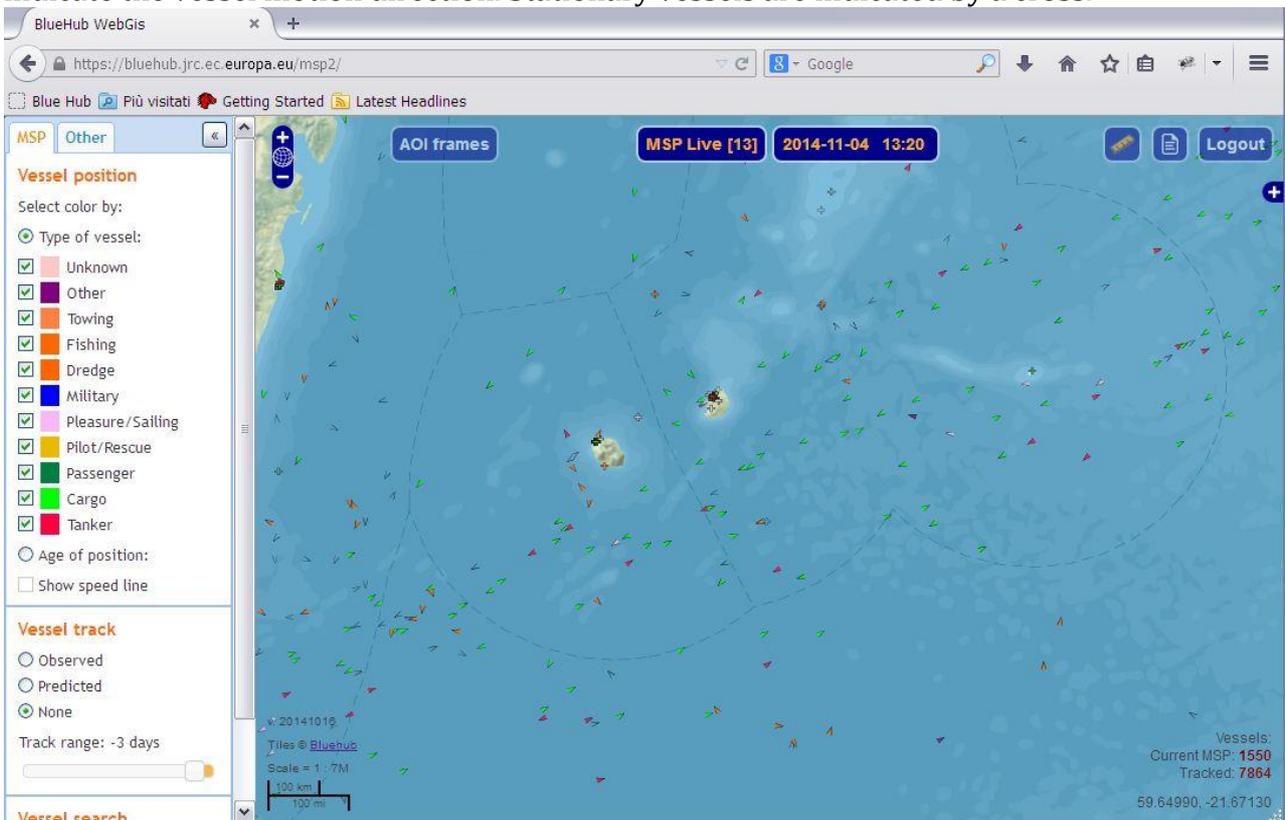
8. *Zooming and panning*

To zoom in or out, use the “+/-” buttons on top left, or use the appropriate mouse or laptop keypad buttons. Pan by click-and-holding on the map and moving the mouse.

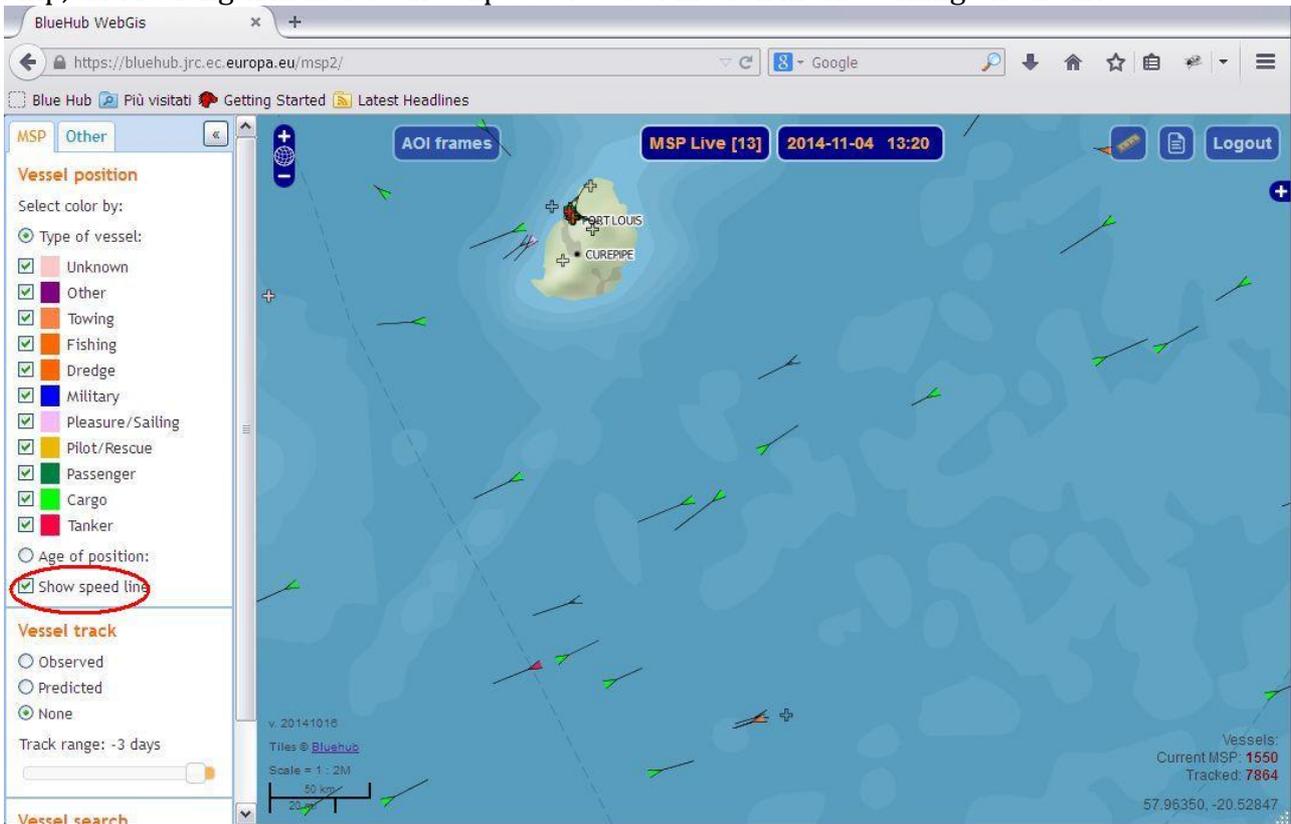


9. *See the directions of the moving vessels*

9a. When zooming in, at one point the vessel symbols change from dots to triangles that indicate the vessel motion direction. Stationary vessels are indicated by a cross.



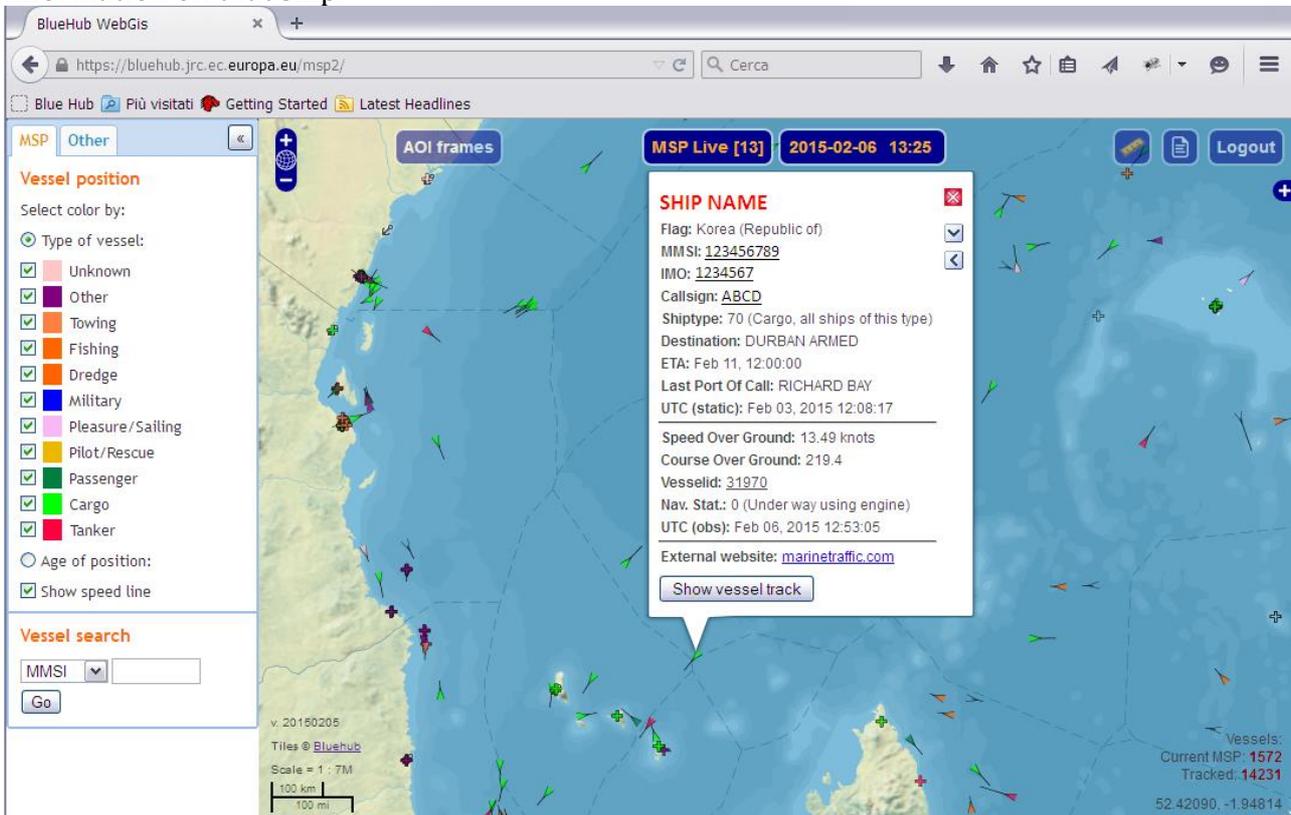
9b. Zoomed in still further, it is possible to display the vessel motion by a line, by ticking the box “Show speed line” in the MSP tab on the left. The line is in the direction of motion of the ship, and its length indicates the expected vessel motion in the coming one hour.



New: The speed lines can be made visible at lower zoom levels than before.

10. Show information on selected ship

10a. Click the position of a ship in the map with the cursor (centre accurately!) to display information on that ship.



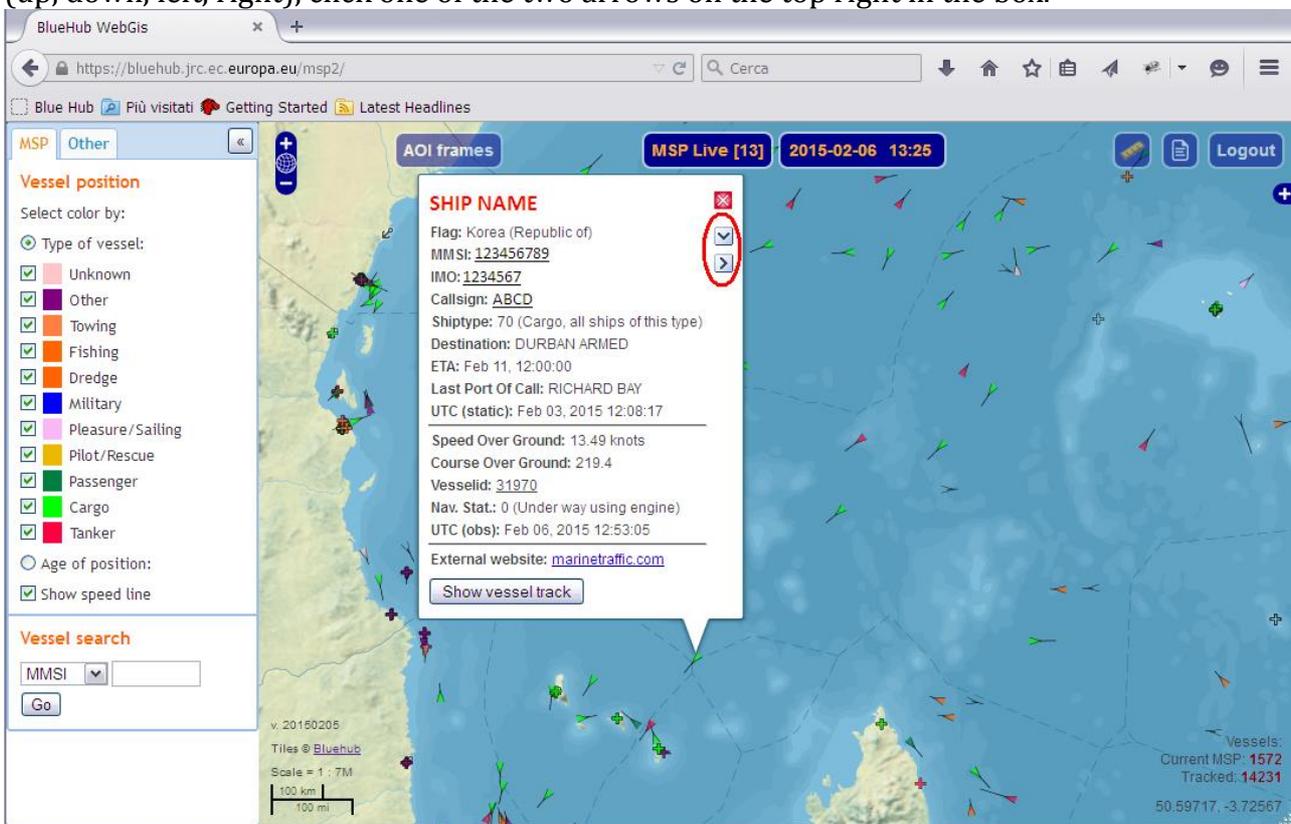
The information in the upper part of the box, above the line, is “static” data about the ship, which does not change so often: Ship name, Flag, MMSI number, IMO number, Call sign, Ship type, Destination, Estimated Time of Arrival (ETA; **New**), and Last port of call. The time shown, “UTC (static)”, is that of most recent reception of this static information. (NB: In the figure above for use in this manual, the ship is anonymised.)

The information in the lower part of the box, below the line, is “dynamic” data about the ship that may change every minute: Speed over ground, Course over ground and Navigation status. **New:** The Navigation status (“Nav. Stat.”) includes not only the numerical code but also the textual meaning.

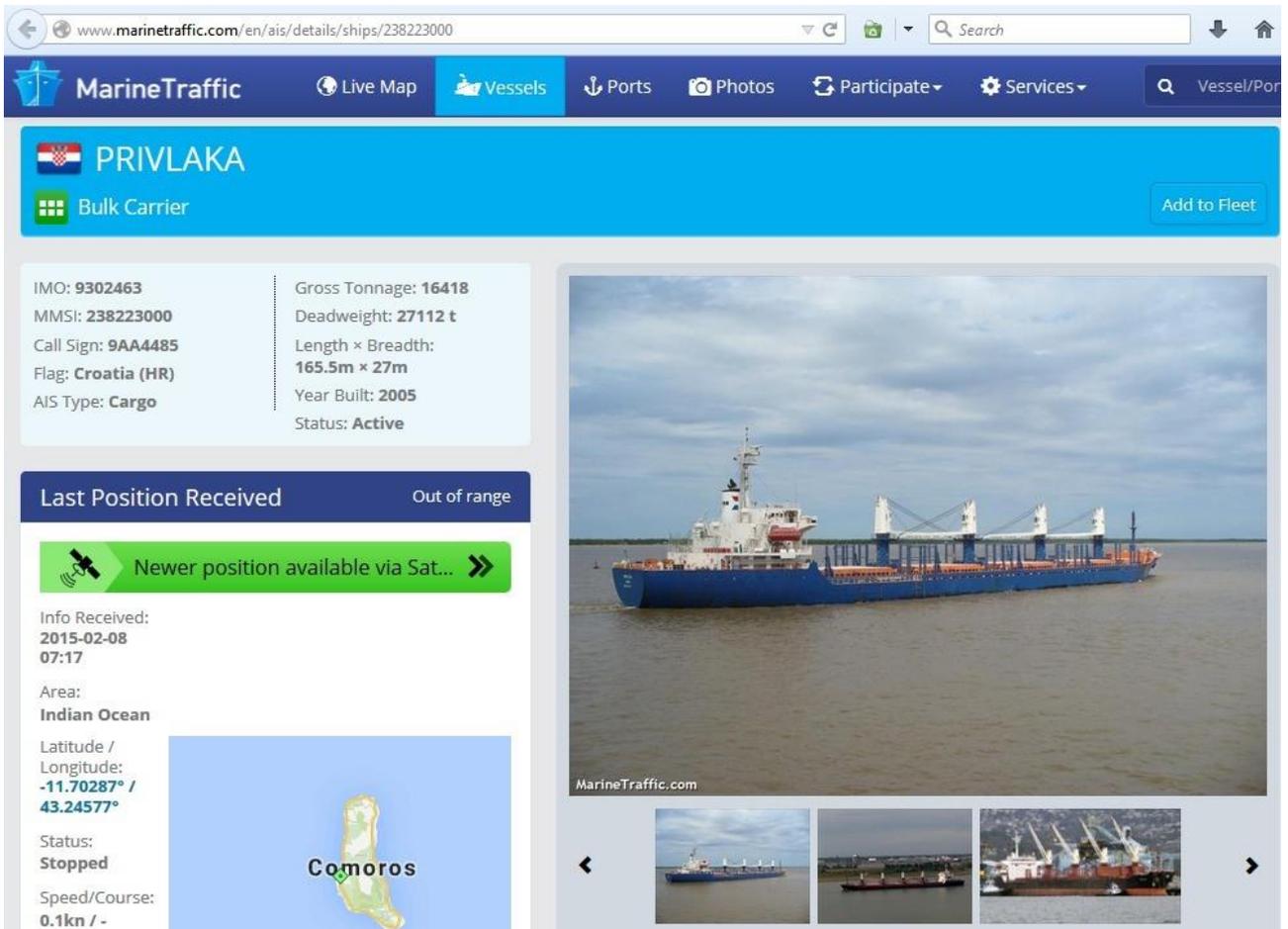
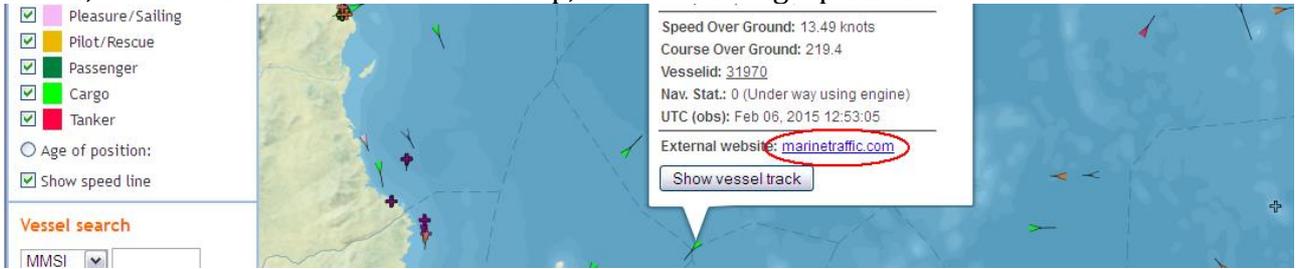
The time shown in this part of the box below the line, “UTC (obs)”, is that of the most recent reception of this dynamic information. Also the internal vessel identifier number, “Vesselid”, is shown.

New: Previously, the time of the displayed, predicted ship position was also shown in the box below the line, as “UTC”. This is now removed, because it is identical to the MSP time that is valid for the whole picture and that is indicated on top centre.

10b. **New:** To move the information box in one of four possible positions around the target (up, down, left, right), click one of the two arrows on the top right in the box.



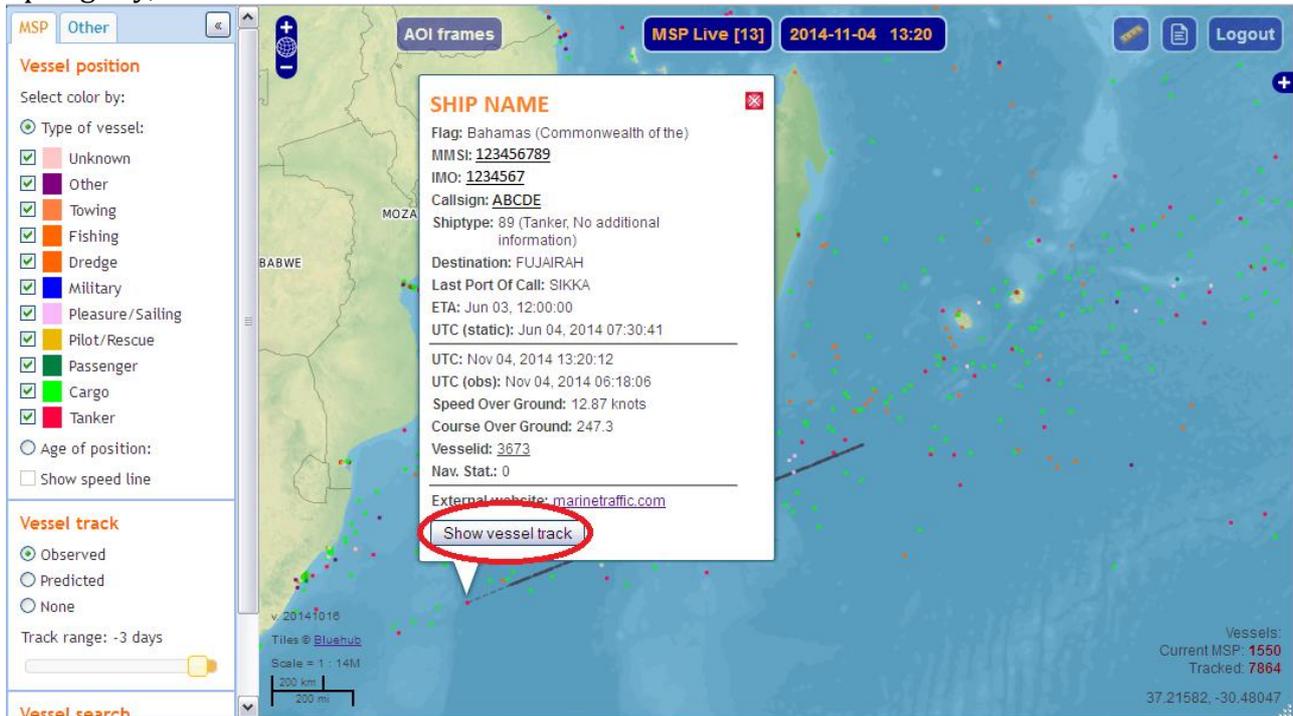
10c. Click the link 'marinetraffic.com' to open a new tab on the external website of marine traffic, which has information on the ship, often including a picture.



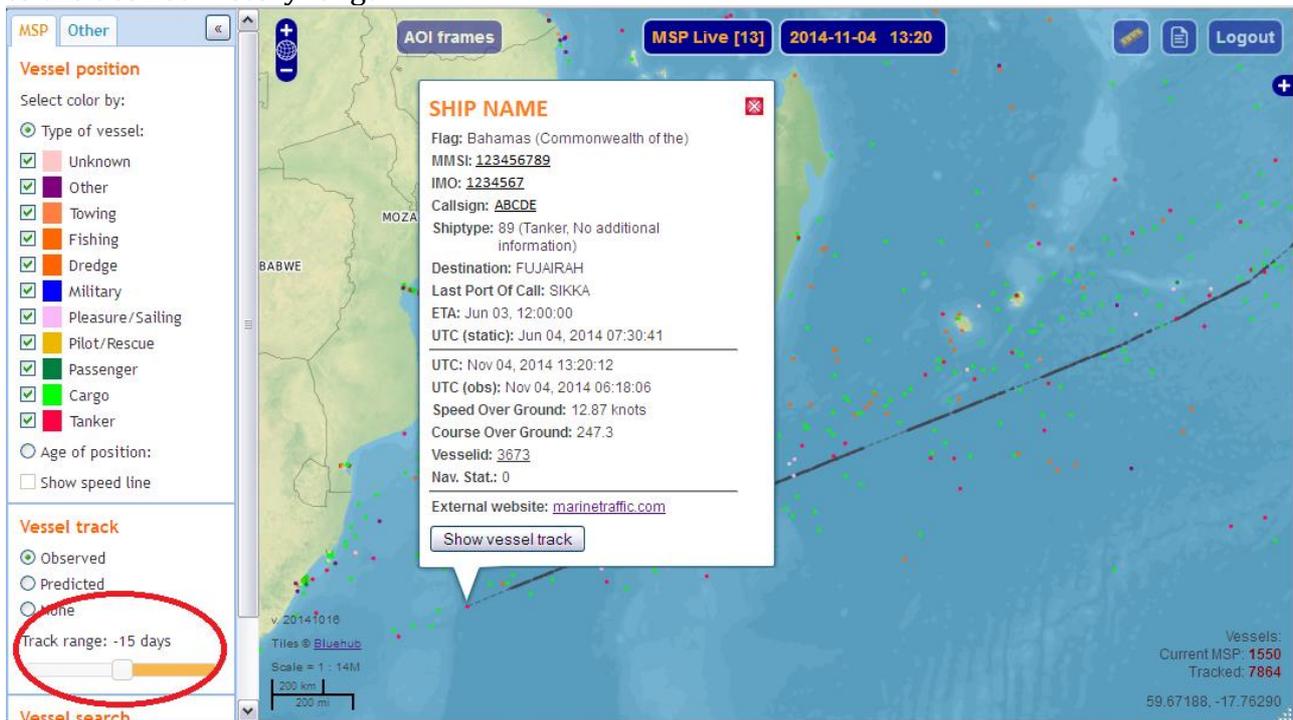
This is the web page of MarineTraffic and is © MarineTraffic.com.

11. Show the track of a selected vessel

Move the cursor over the button “Show vessel track” in the white ship info box so that it lights up slightly, and click the button.



11a. Extend the history of the track by pulling the slider under “Track range” with the cursor to the desired history length.

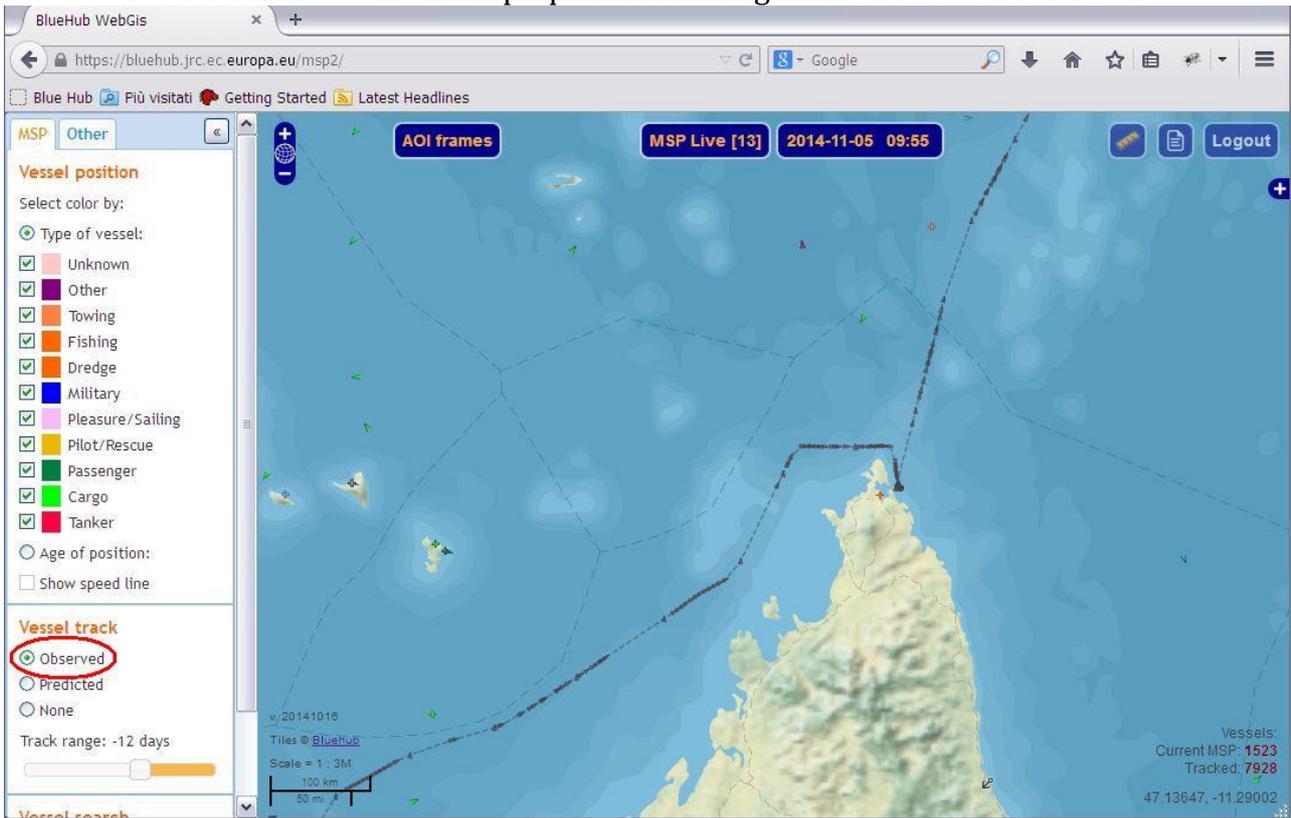


11b. Remove the white ship info box to see what is beneath by clicking the red cross on top right.

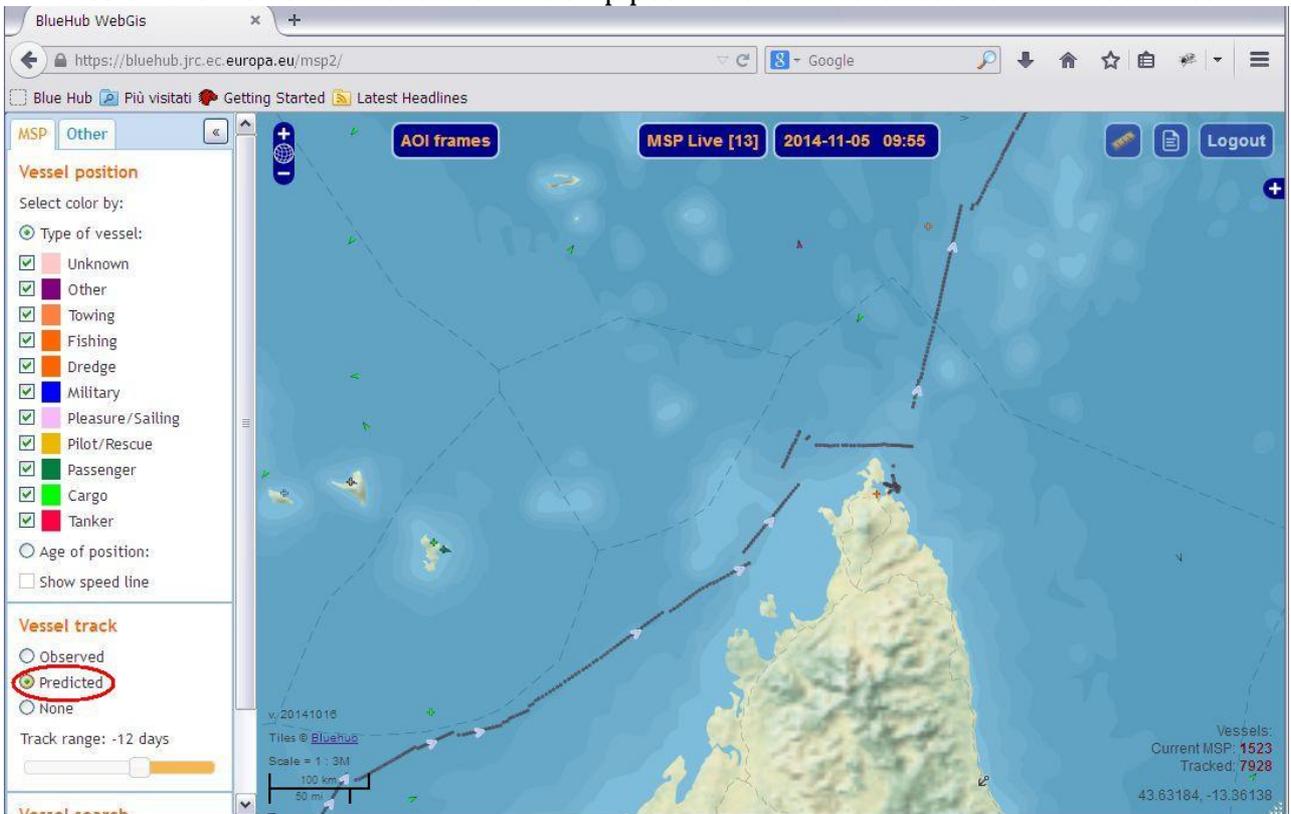


11c. Show the difference between “Observed” track and “Predicted” track by ticking the appropriate box on the left under the tab “MSP”.

The observed track shows all the ship’s position messages that have been received:

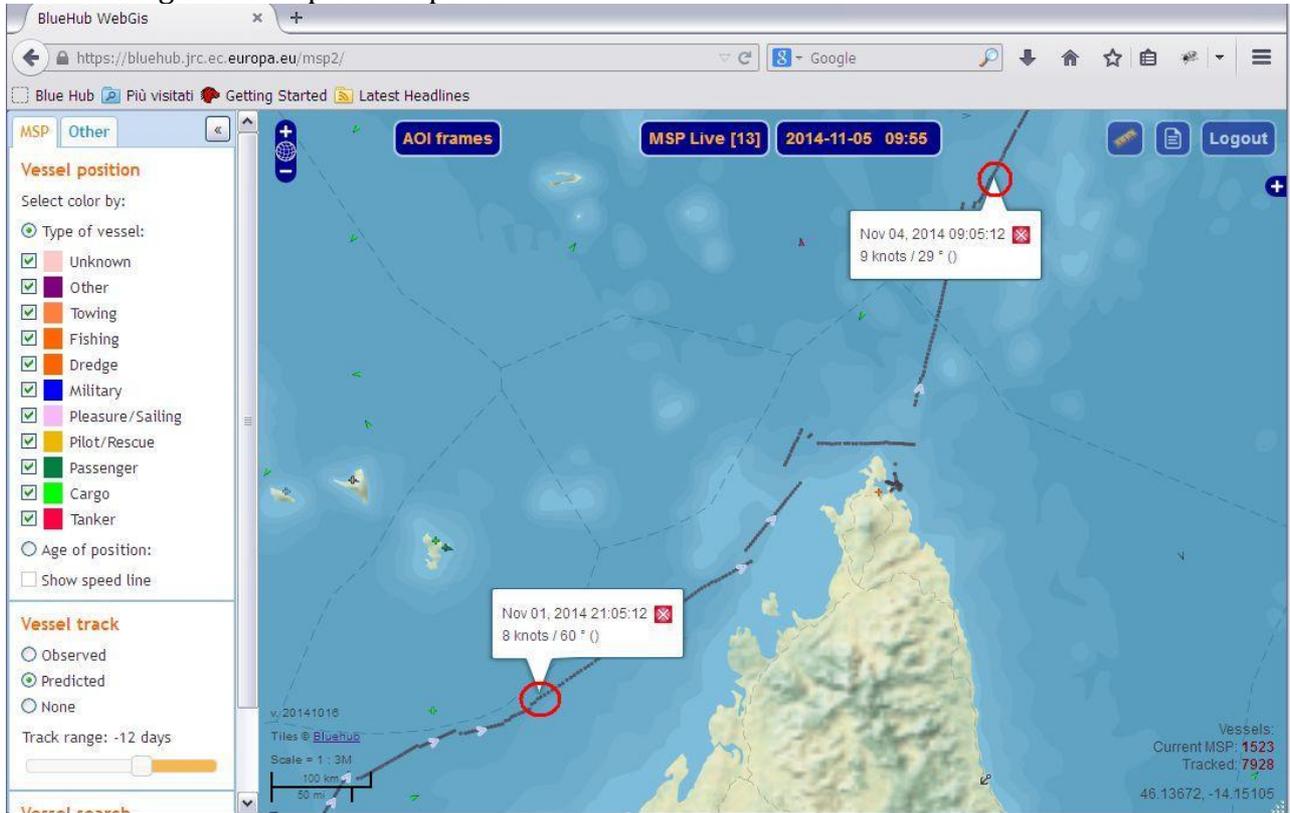


The predicted track shows all calculated ship positions, that have been displayed every 15 minutes on the MSP screen based on the ship positions that were received at those times:



The kinks and discontinuities in the predicted track are the result of fresh ship positions coming in after periods during which dead reckoning predictions were made based on old available ship positions. The white triangles indicate the direction of ship motion.

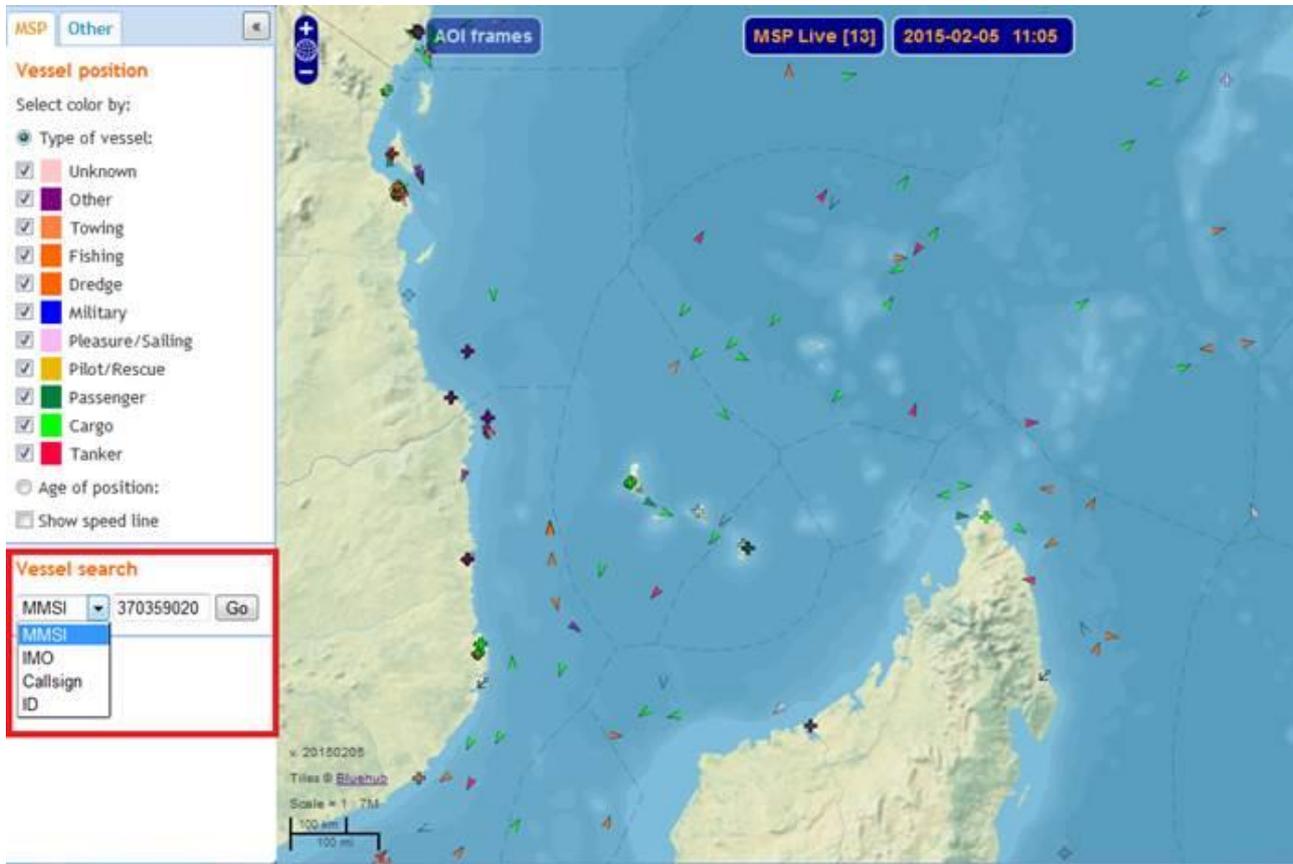
11d. Click any ship position on the track (observed or predicted) to show the time and speed and heading of the ship at that point:



11e. Only one ship track at a time can be displayed. When a new track is requested from another vessel, the previous one will disappear (after a short delay). Remove a displayed track from the screen by ticking "None" under "Vessel track" on the left.

12. Vessel search

It is possible to search a vessel on the current MSP. Under the “MSP” tab, on the bottom section “Vessel search”, the drop-down menu displays all available search criteria (MMSI number, IMO number, Call sign and Internal vessel ID). Select the desired criterion, type the value to be searched in the entry box and press the button “Go”. The vessel will be searched among the vessels on the current MSP, and the corresponding information box will appear. In case the vessel is not found the user is notified.

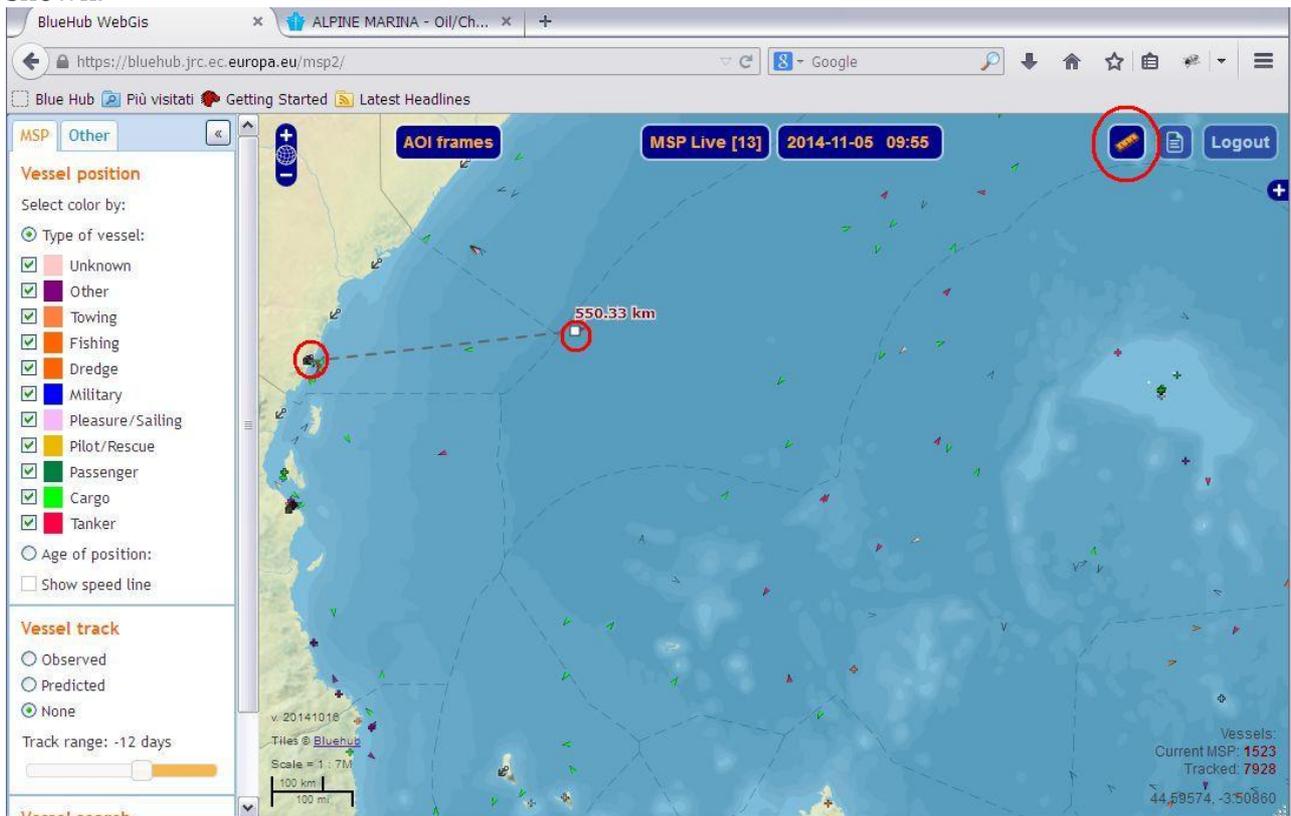


New: Search on MMSI number already existed, but was not documented. Search on the other criteria was added.

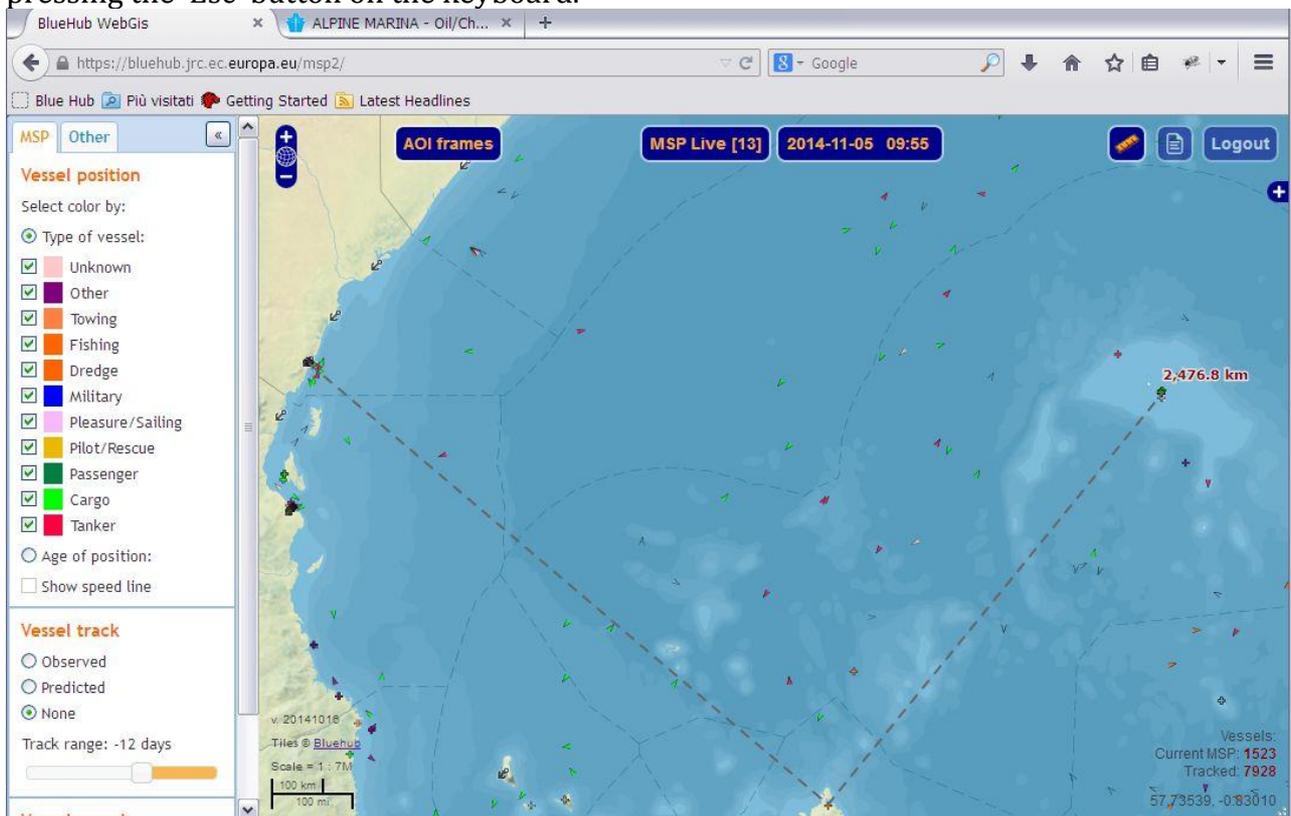
13. Distance measurement

Measure distances by clicking the ruler button on top right.

Move cursor to start position (below, Mombasa was chosen) and click; move cursor to end position (below, a ship just beyond the Kenya EEZ) and double-click. The distance (in km) is shown.

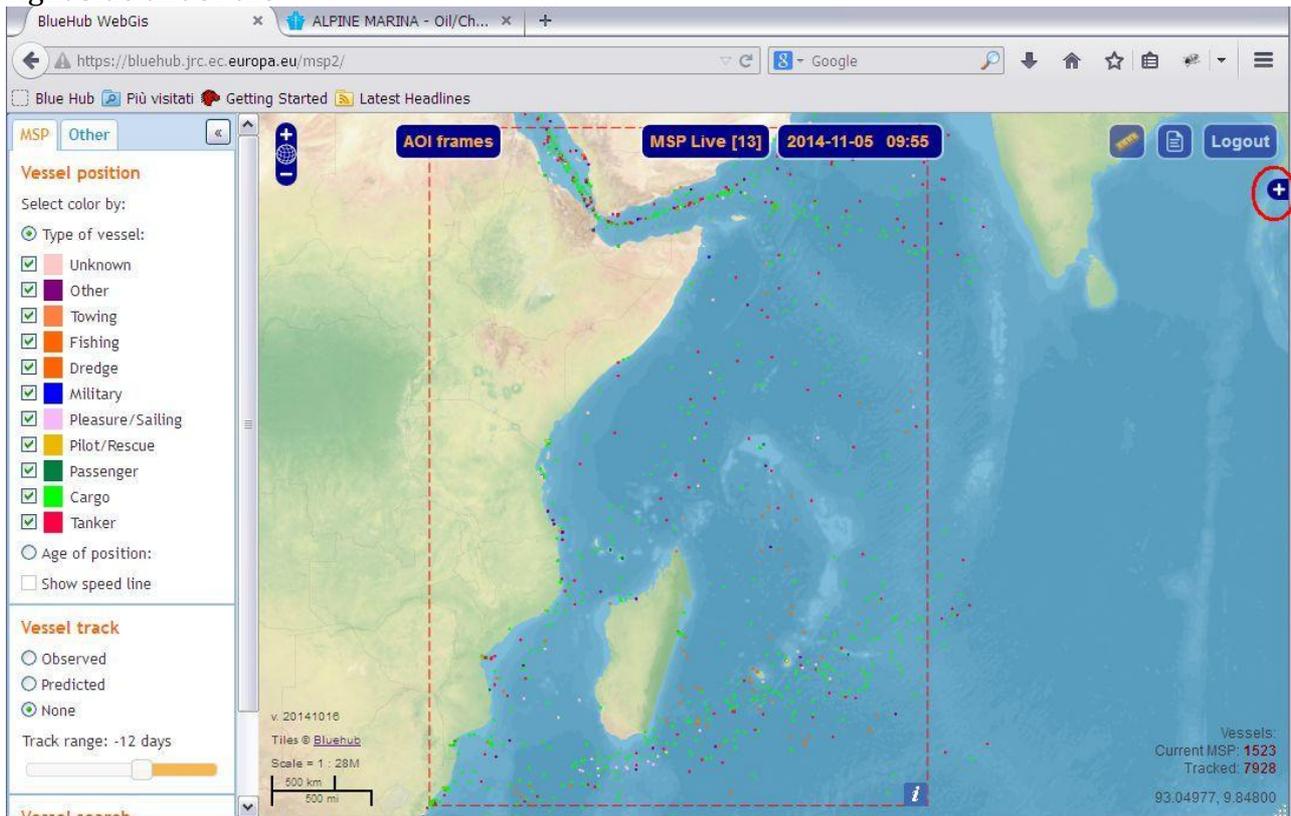


The length of a multi-leg route can be computed by continuing to click points, and finish with a double-click. After a double click, the cursor is ready to start a new distance measurement. Terminate the distance measuring mode by clicking again on the ruler on top right, or by pressing the 'Esc' button on the keyboard.



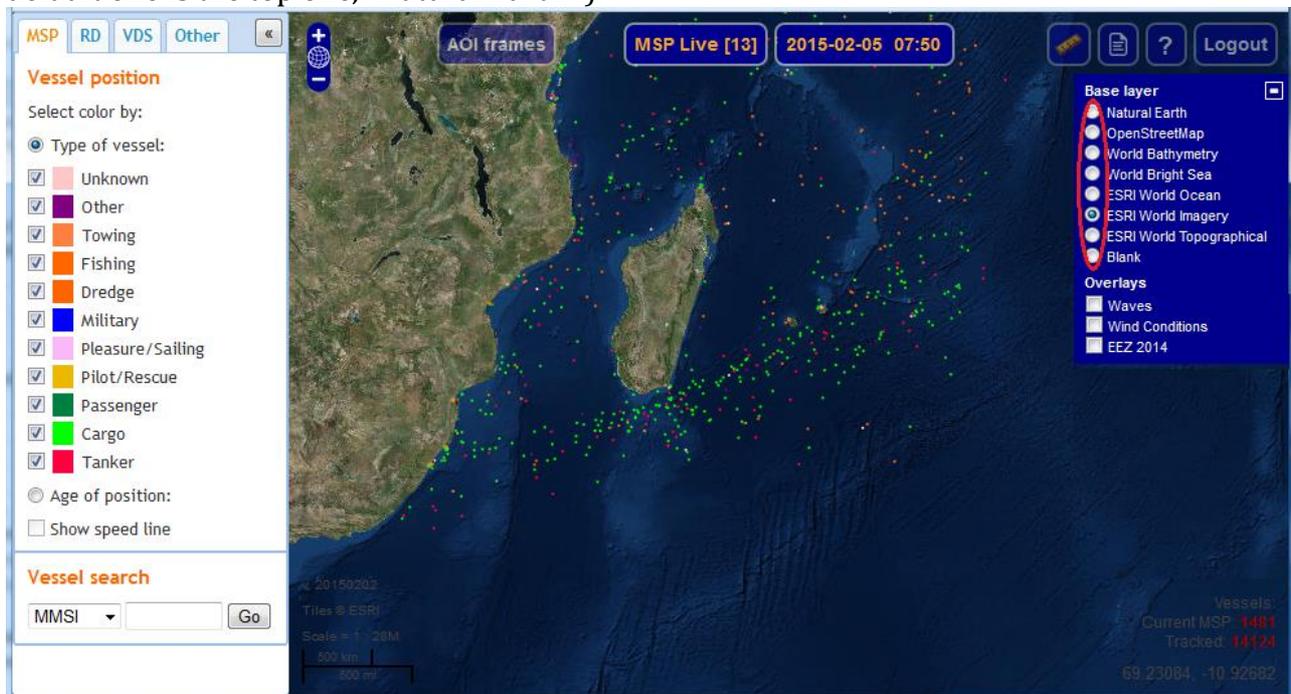
14. Background map layer

14a. Change the background map layer, or overlay a wind map, by opening the menu on the right side under the “+”.



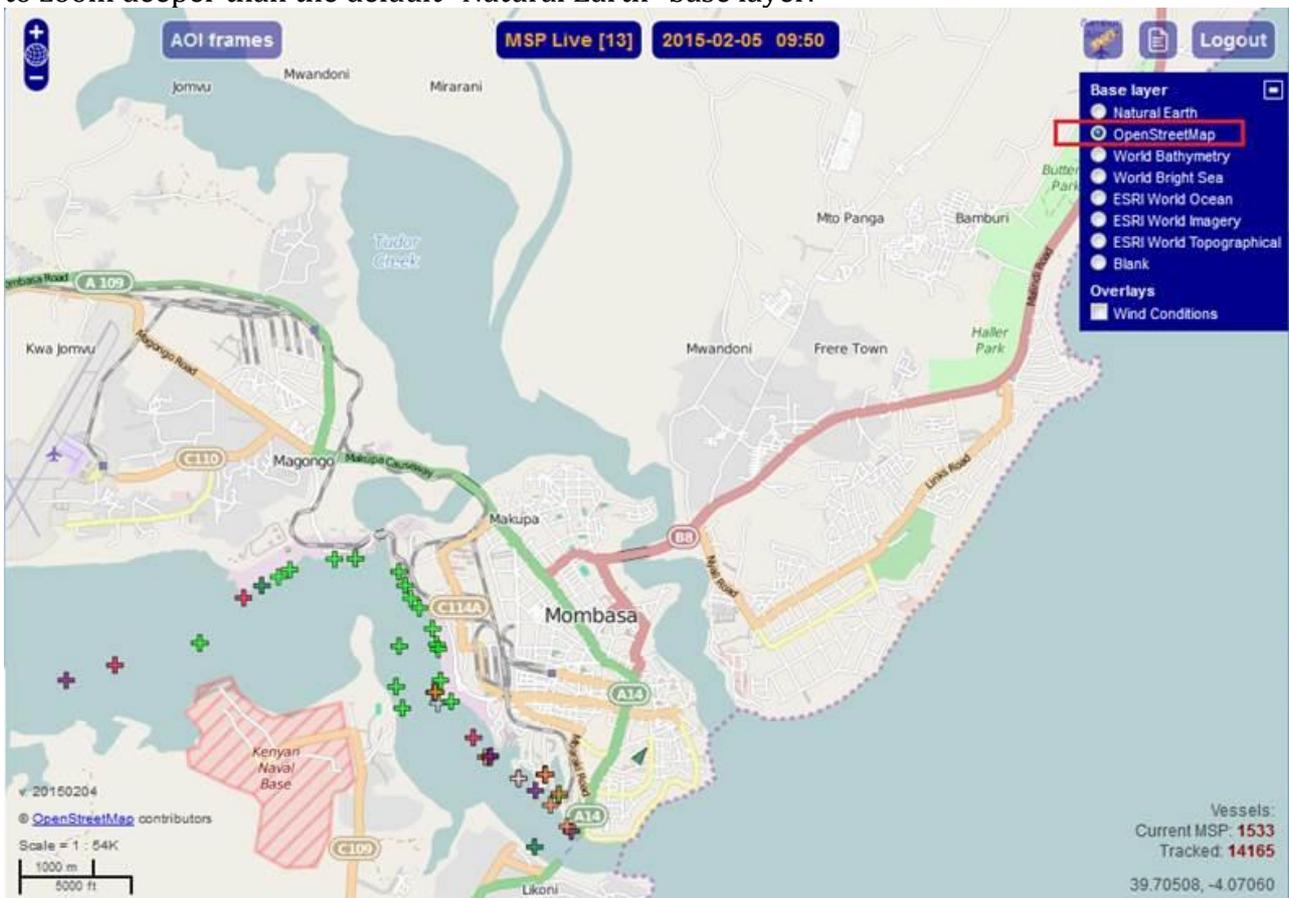
Made with Natural Earth. Free vector and raster map data @ naturalearthdata.com

14b. Choose a background map layer in the right-hand side menu under “Base Layer”. (The default one is the top one, “Natural Earth”.)



This layer: Credits: Esri and its users and partners

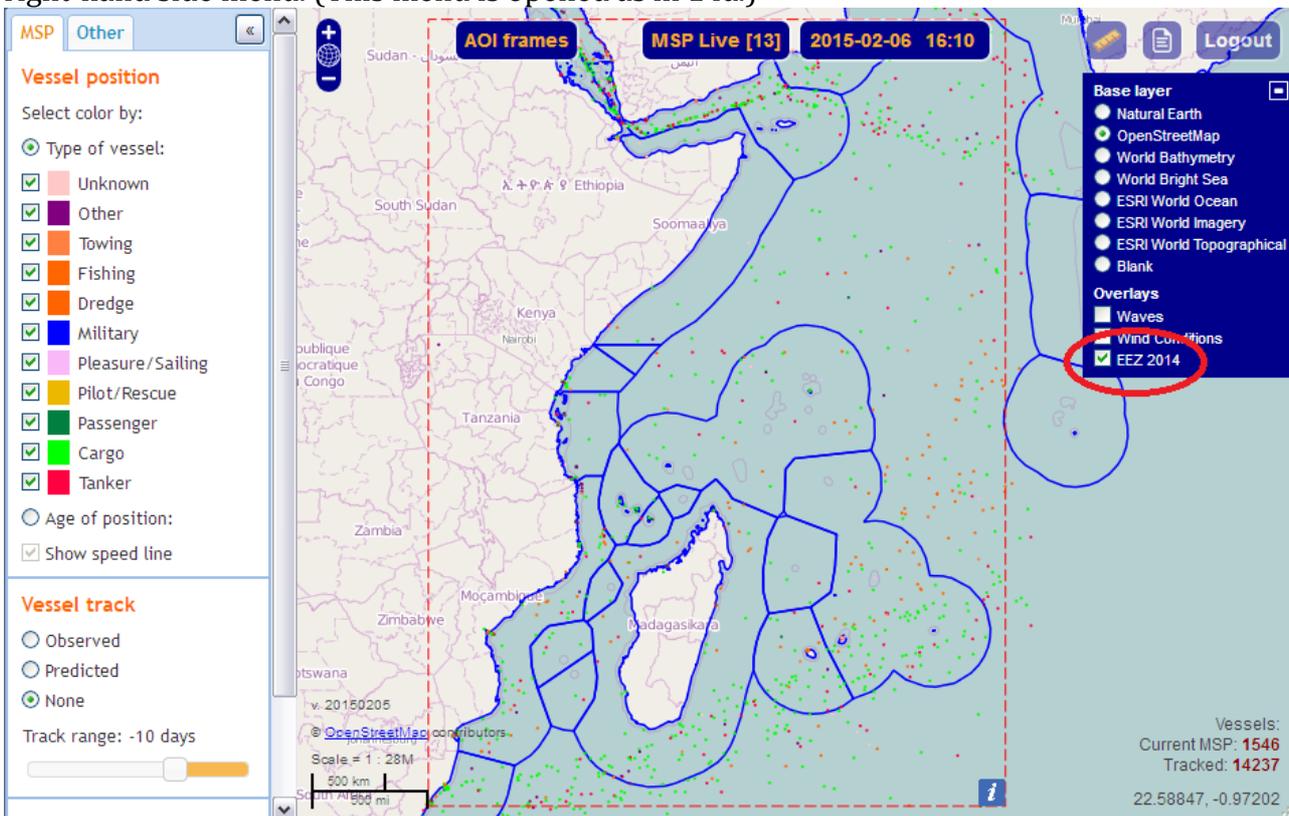
14c. **New:** The OpenStreetMap base layer was added, with a more accurate coastline, allowing to zoom deeper than the default “Natural Earth” base layer.



This layer: © OpenStreetMap contributors

15. Overlay EEZ boundaries

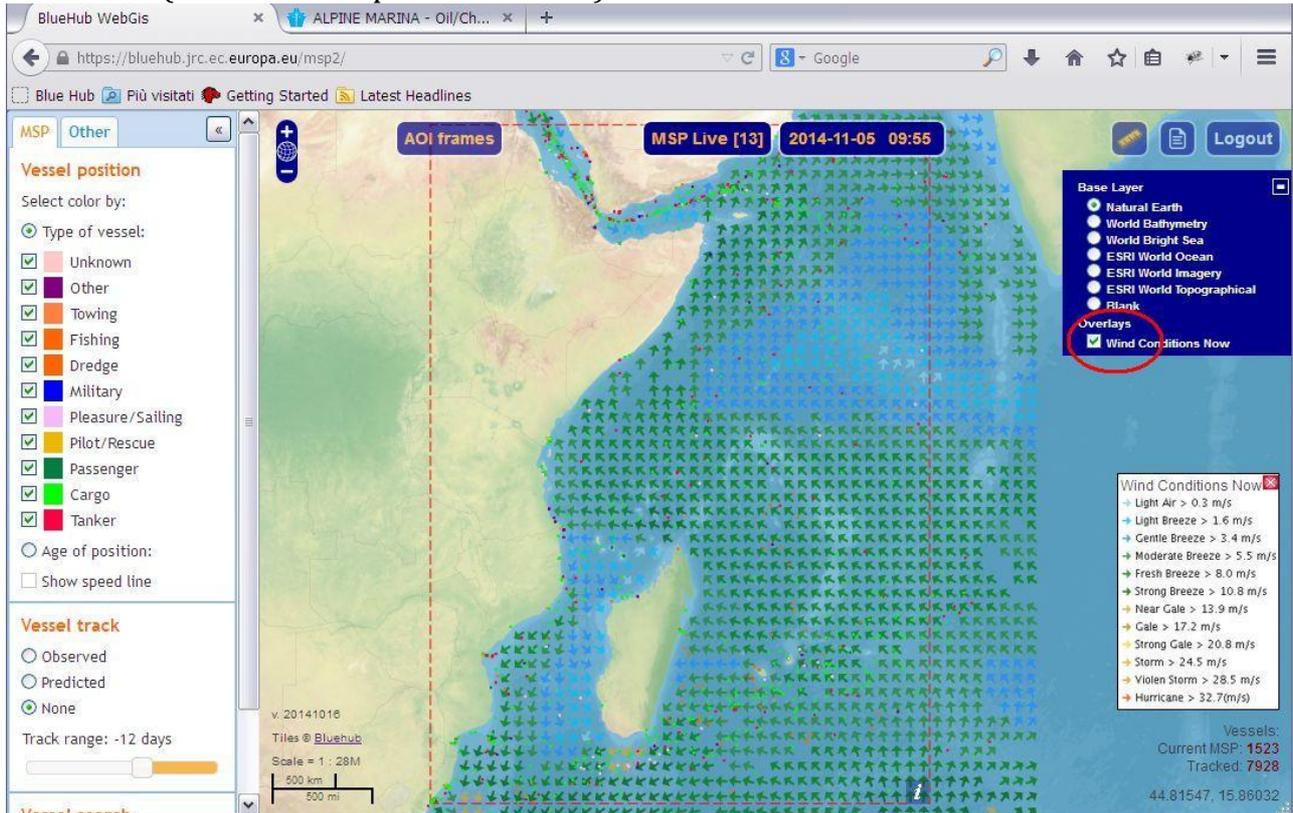
New: Show EEZ boundaries on the map by ticking “EEZ 2014” under the “Overlays” of the right-hand side menu. (This menu is opened as in 14a.)



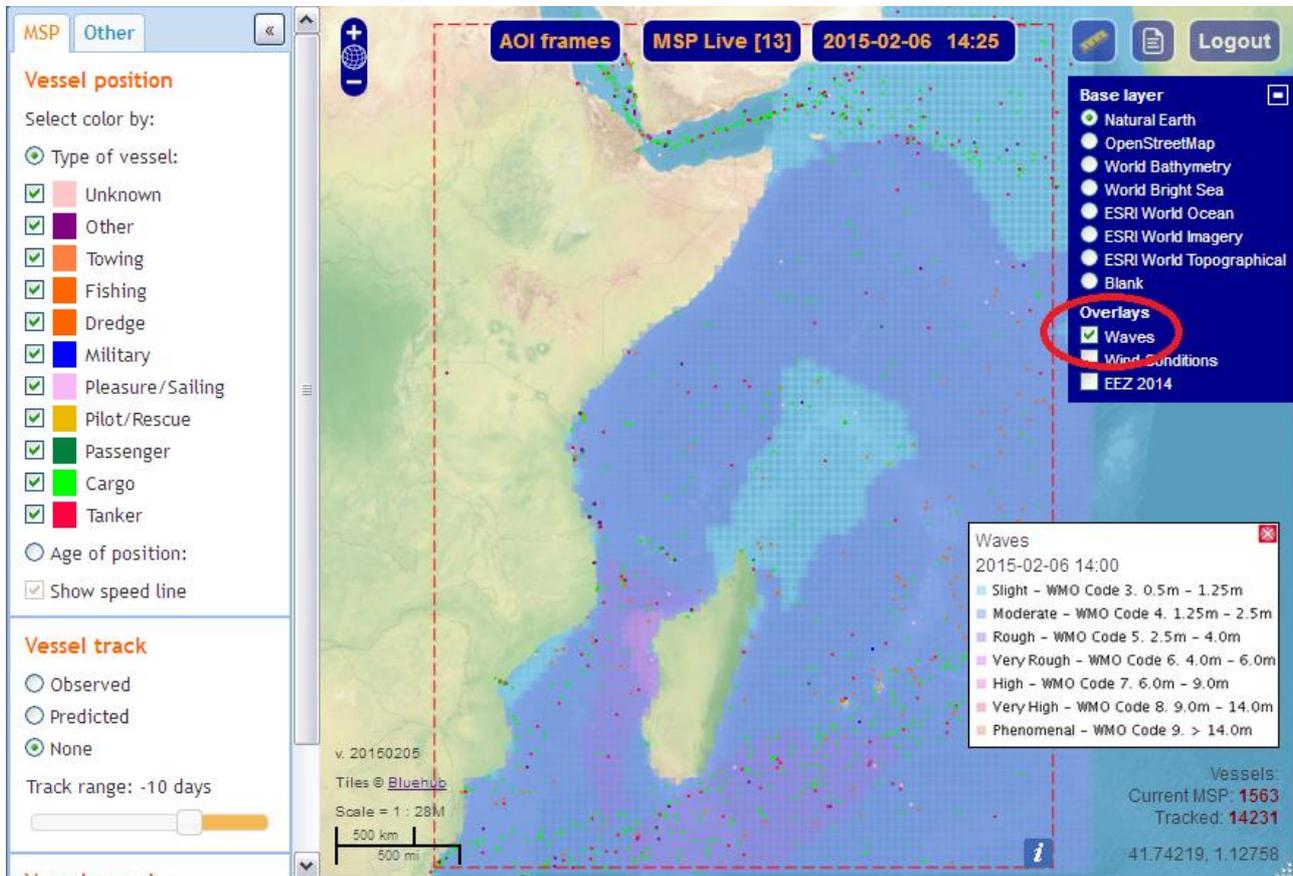
This layer: Flanders Maritime Institute VLIZ (2014). Maritime Boundaries Geodatabase, version 8. Available online at <http://www.marineregions.org/>. Consulted on 2015-02-02

16. Overlay wind and wave fields

16a. Overlay the current wind field by ticking “Wind” under the “Overlays” of the right-hand side menu. (This menu is opened as in 14a.)

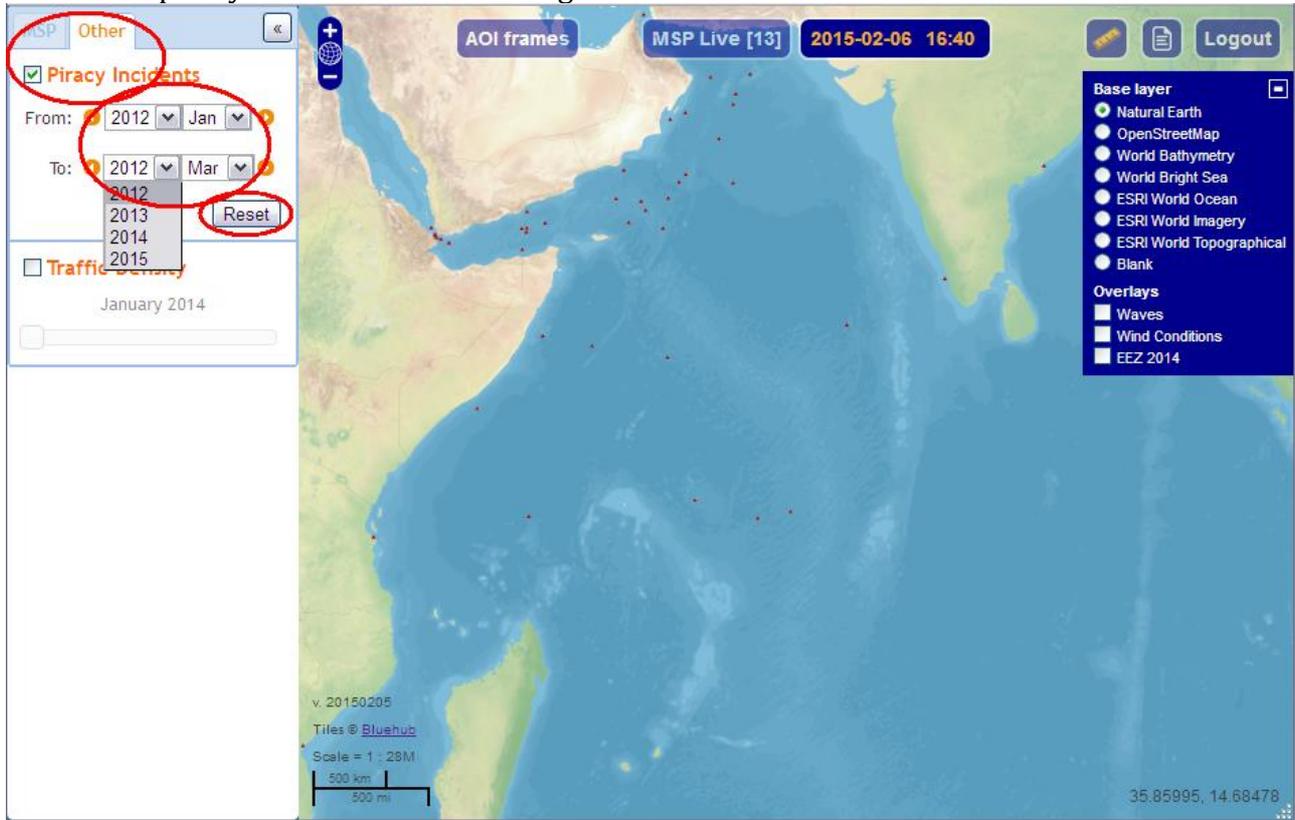


16b. **New:** Overlay the current wave field by ticking “Waves” under the “Overlays” of the right-hand side menu.



17. Piracy incidents

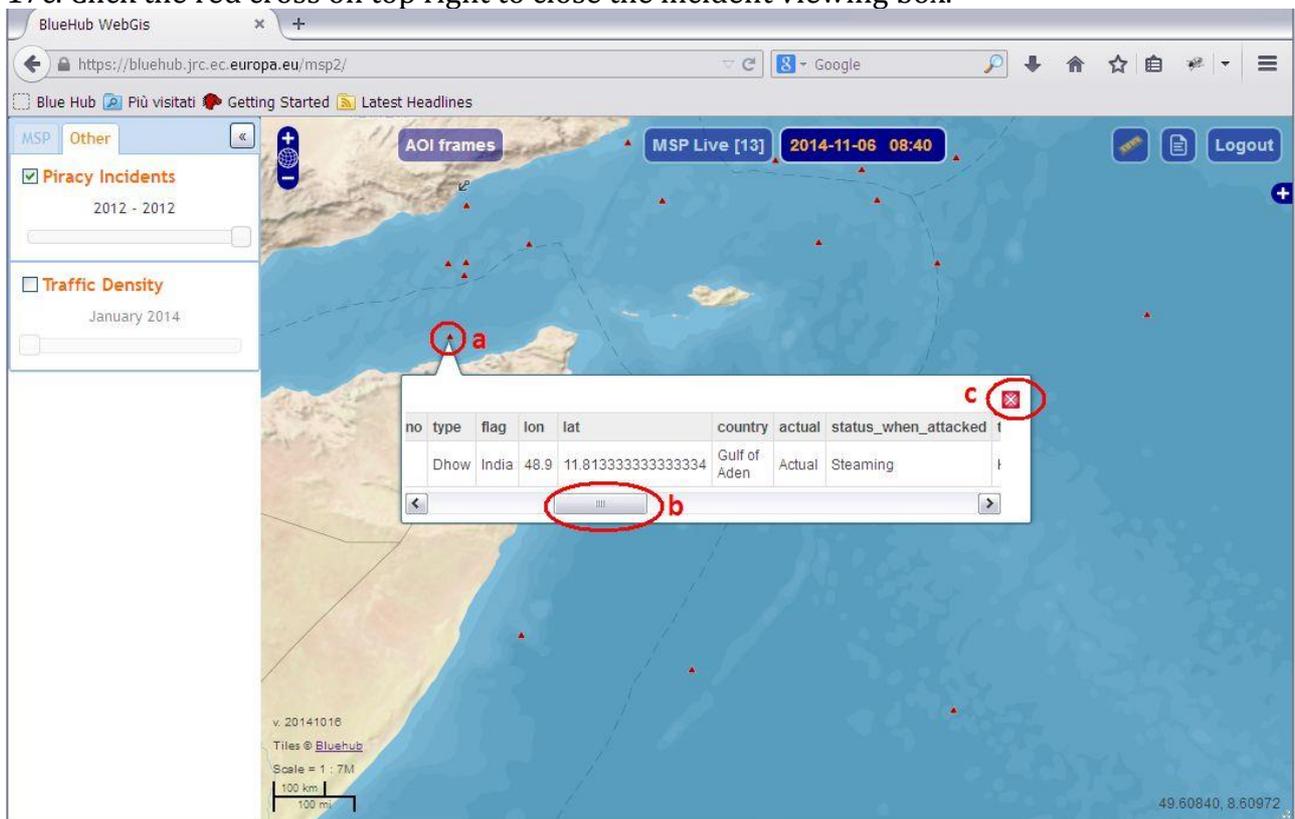
Display historic piracy incidents by clicking the tab “Other” on the left, and under that tab ticking the box “Piracy Incidents”. A period can be selected with the drop-down lists. The button “Reset” resets the month/year period to the maximum available. Ship positions can be turned off (or on again) by clicking on the button “MSP Live” on top centre. The symbols used to indicate piracy incidents are red triangles.



17a. Information on a specific incident is displayed by clicking on its symbol.

17b. Use the slider in the viewing box to see all the content.

17c. Click the red cross on top right to close the incident viewing box.



17d. One of the fields is 'narrations'; place the cursor over this field to see the full narrations text.

The screenshot shows a web GIS interface with a map of the Gulf of Aden. A data popup window is open, displaying a table with the following columns: callsign, speed, freeboard, dwt, original_time_string, and narrations. The 'narrations' column is circled in red, and a red arrow points to a dropdown menu showing '22.02.2012: 113...'. A text box below the table provides a detailed narrative of a piracy incident on 22.02.2012 at 1130 UTC.

callsign	speed	freeboard	dwt	original_time_string	narrations
ABCDE	12.3	7M	115325	1130 UTC	22.02.2012: 113...

22.02.2012: 1130 UTC: Posn: 13.30N - 051.22E, Gulf of Aden. A tanker underway sighted a skiff at 1.6nm approaching at around 20knots. A suspicious dhow was sighted in the vicinity. Master sent distress to navies and informed UKMTO. As the skiff approached weapons were sighted and the onboard armed security team fired a warning shot. Following this the pirates immediately fired upon the tanker with AK-47. There was an exchange of fire between the armed team and the pirates with around 5 - 60 rounds being fired by the pirates before aborting and moving away. A naval helicopter was dispatched.

18. Ship density maps

Display an overlay of monthly ship density maps by ticking the box "Traffic Density" under the tab "Other" on the left, and selecting a month with the slider.

The screenshot shows a web GIS interface with a map of the Gulf of Aden. The 'Traffic Density' checkbox is checked and circled in red. The 'Other' tab is selected, and a slider is visible below it. The map shows a color-coded overlay representing ship density in the region.

19. Getting help

New: The latest version of this manual can be downloaded as pdf document by clicking the question mark button in the upper right of the interface.



D. Credits and references

Ship traffic source data:

- Government-owned satellite AIS data from the Norwegian Coastal Administration (NCA)
- Commercial satellite AIS data from exactEarth, ORBCOMM, LuxSpace, SpaceQuest
- Terrestrial AIS data from MSSIS, courtesy U.S. Dept. of Transportation's John A Volpe Center and U.S. Navy, <http://www.volpe.dot.gov/>
- LRIT data from the vessels reporting to the EU's LRIT Data Centre, courtesy of the respective Flag States and EMSA, <http://www.emsa.europa.eu/>

Map background layers:

- Natural Earth, World Bathymetry, World Bright Sea: Made with Natural Earth. Free vector and raster map data @ [naturalearthdata.com](http://www.naturalearthdata.com), <http://www.naturalearthdata.com/>
- Openstreetmap: © OpenStreetMap contributors, <https://www.openstreetmap.org/about>
- ESRI: Credits: Esri and its users and partners, <http://www.esri.com/data/find-data#basemaps>

Overlays:

- Piracy data from International Chamber of Commerce – International Maritime Bureau (ICC-IMB), <https://icc-ccs.org/piracy-reporting-centre/live-piracy-report>
- EEZ layer: From the Flanders Marine Institute VLIZ (2014). Maritime Boundaries Geodatabase, version 8. Available online at <http://www.marineregions.org/>. Consulted on 2015-02-02
- Wind and wave layers: From the National Weather Service (NWS) of the U.S. National Oceanic and Atmospheric Administration (NOAA), <http://www.emc.ncep.noaa.gov/index.php>. Wind forecast data are from the Global Forecast System (GFS), a global numerical weather prediction system, <http://www.nco.ncep.noaa.gov/pmb/products/gfs/>. Wave data come from the WaveWatchIII global wave forecast model, <http://polar.ncep.noaa.gov/waves/>

Links:

- Link to MarineTraffic: <http://www.marinetraffic.com/>
- JRC's Blue Hub: <https://bluehub.jrc.ec.europa.eu/>

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European Commission

EUR 27117 EN – Joint Research Centre – Institute for the Protection and Security of the Citizen

Title: PMAR Viewer User Manual

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Luxembourg: Publications Office of the European Union

2015 – 32 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1831-9424 (online)

ISBN 978-92-79-45759-3 (PDF)

doi:10.2788/213253

Abstract

This document is a user manual for the PMAR viewer, a facility that provides Maritime Situational Awareness over ocean-basin wide areas. This is the second issue, of February 2015, to include the description of newly implemented features. The first issue was that of November 2014. The PMAR system was set up to support authorities in Africa with their own maritime awareness. PMAR stands for Piracy, Maritime Awareness and Risks, and it identifies a series of R&D projects carried out by the European Commission's Joint Research Centre (JRC) with the purpose to assess technical means for maritime awareness tailored for users in Africa for counter-piracy and maritime security.

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