

Automated Behaviour Monitoring (ABM) and Advanced Analytics Workshop 5

Advanced Analytics

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*‘[...] further development of the **ABM tools and the analysis of which “big-data” data analytics techniques.**’*

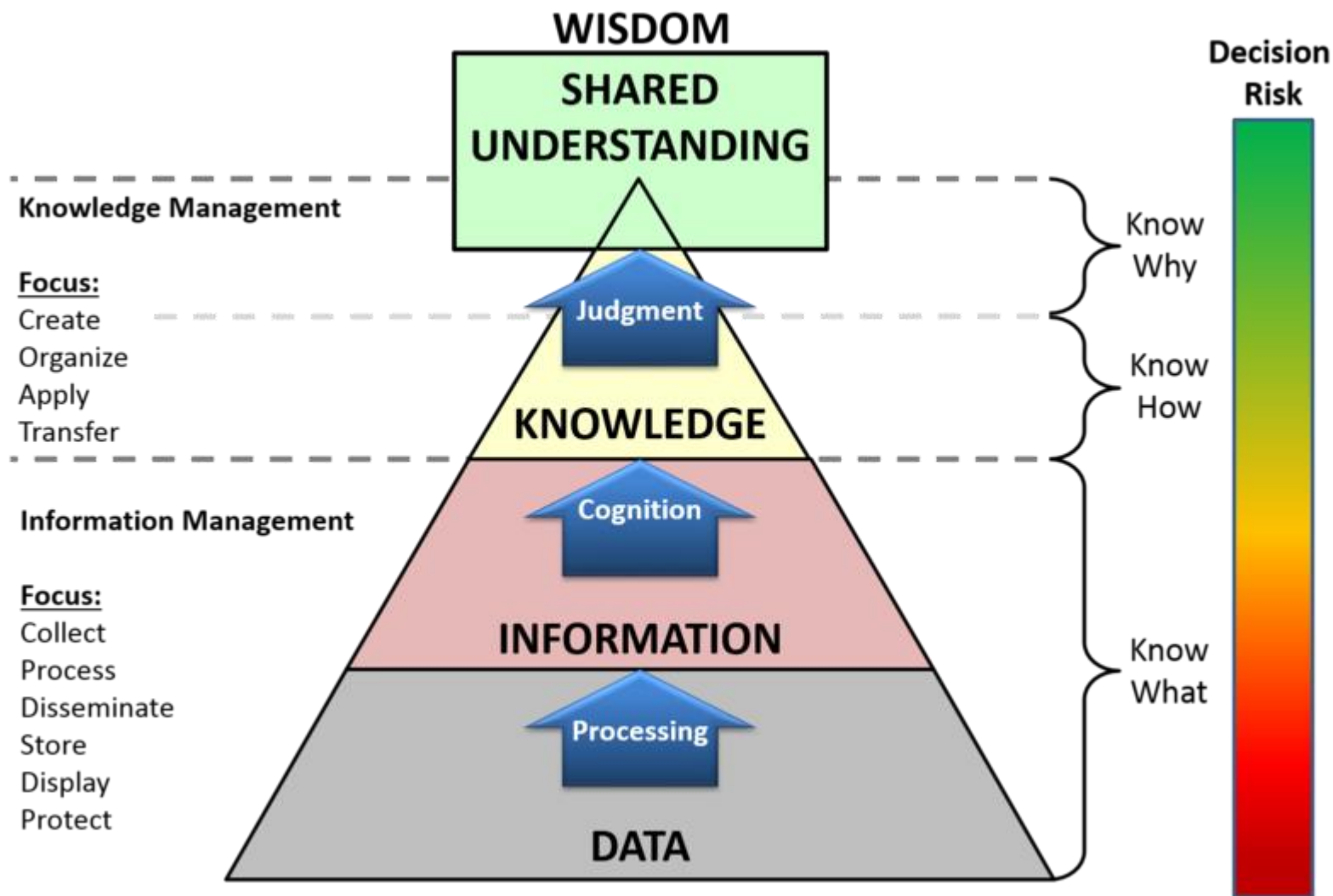
*‘[...] data analytics module is part of a wider development using **cloud-based computer services** to upgrade the performance of EMSA systems and computer-based services, **offering higher performance, bigger capacities to process big data volumes and more functionalities**, partly based on **machine learning and artificial intelligence.**’*

In the 5 years strategy:

*‘Move **the EU maritime picture to the cloud** and explore the added value of other cloud-based services.*

*‘**Expand information services to analyse data** and identify trends and **risks** to support safety, security and sustainability’*

From data to knowledge

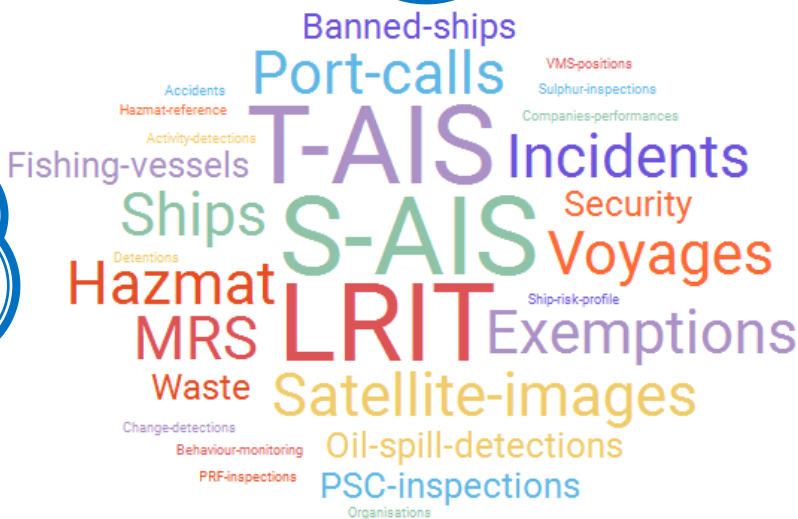


43 DIFFERENT
DATA TYPES

AUTOMATED
ALERTS / DAY
~ 2,000

NOTIFICATIONS /
DAY
~ 20,000

OIL SPILL
DETECTIONS/
YEAR
~ 6,000



VESSEL
POSITIONS /
DAY
~ 20,000,000

EO IMAGES /
YEAR
~ 12,000

- Data collection
- Data correlation
- Data fusion/integration
- Automated Behaviour Monitoring

INDIVIDUAL
VESSELS / DAY
~ 80,000

Data analytics can be defined as the process of analysing raw data to provide more meaningful insights and conclusions about that information.

The term Big Data refers to large volumes of data that cannot be processed effectively with the traditional applications that exist.

Data analytics processes and techniques might also include the adoption of Artificial Intelligence and eventually Machine Learning algorithms.

Resources that can be used to analyse insights which can lead to better decisions at both strategic and tactical level - **Big Data**

Automated processes and techniques involved in gaining insights into a certain dataset as well as the usage of queries and data aggregation procedures to achieve these insights - **Data Analytics**

How can Data Analytics support Member States?

Discuss and identify those data analytics information products, functionalities and tools which are needed by Member State national authorities to perform more effectively their activities.

Outcome of the discussions at the IMS UCM 13 and IMS UCM 14 and ECFF.

Data sets

Overview of previous discussions

Data set	Proposed Priority
Navigational Status	MEDIUM
Flag information	HIGH
Location of the offshore installations and navigational dangers	TBC
Location of historical SAR operations, locations of distress calls (GMDSS)	MEDIUM
Location of fisheries and leisure activities	MEDIUM
GNSS accuracy – cases of potential jamming or spoofing	LOW
Commercial routes per ship flag and per ship type	TBC
Ship owner and changes of the ownership	TBC
ISM Manager	
ISM Responsible	

Derived products

Overview of previous discussions

Derived product	Proposed Priority
Mapping of drifting, speed change, rendezvous at sea, spoofing and not reporting (based on ABMs). Filtering per vessel type and/or flag.	HIGH
Analysis based on historical ABM alerts	HIGH / MEDIUM
Not reporting / dark activities areas	HIGH
Traffic density, per season, vessel type, vessel flag (Black Flags, Selected Flags)	HIGH TDMS already available in SEG
Oil Spills	MEDIUM- HIGH
Accidents/ incidents data (SSN or open source data)	MEDIUM
Vessel Detection System – identification of non-cooperative targets (non-correlated vessels)	HIGH
Detection of the Port Calls globally, based on the position reports	HIGH / MEDIUM
Similar routes/ activity patterns – at global level	MEDIUM
SSN port call cancellations alert	TBC

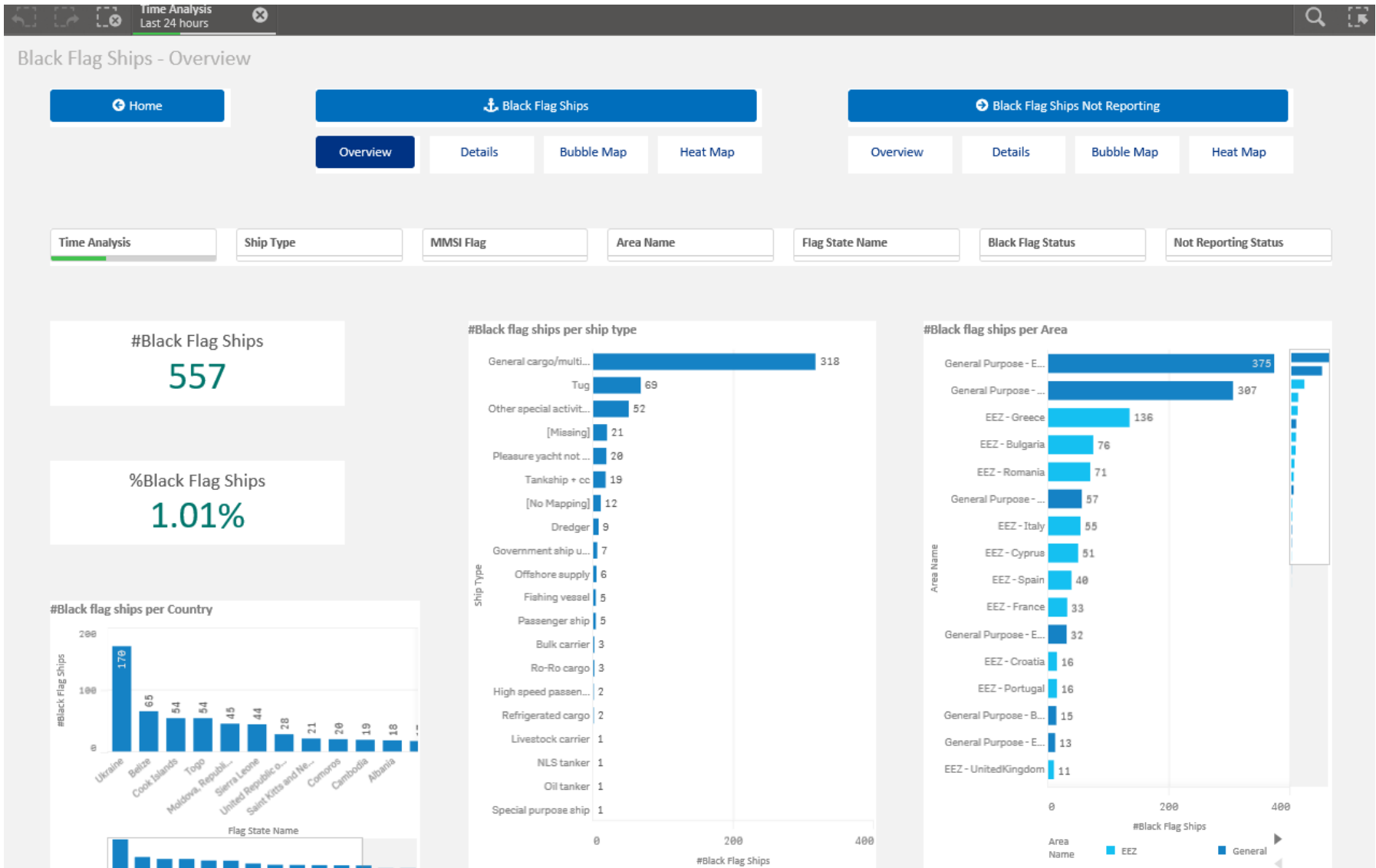
Scenario	Details	Priority/ Status
Now-casting and future casting – prediction of the ship movement	-	TBC
Verification of the declared destination vs. route taken	-	TBC
Dynamic search and automatic allocation of the user specific risk	-	TBC
Detection of the non-viable economic activities	-	TBC

Combination of the data sets – pilot scenarios



'Black flag ships around EU'	<p>Vessel is within EU and neighbourhood areas and</p> <p>The flag is 'Black' according to the latest PSC classification;</p>	Launched as a pilot project
'Black flag ships not reporting regularly around EU'	<p>Vessel is within EU and neighbourhood areas; and</p> <p>Flag is 'Black' according to the latest PSC classification;</p> <p>There is a gap of more than 8 hours in the positions reporting</p>	Launched as a pilot project
'Drifting ships in key EU areas'	<p>Vessel is within EU and neighbourhood areas and</p> <p>Vessel was drifting in the last week (reference made to a running ABM).</p>	Launched as a pilot project
'Not Under Command ships in key EU areas'	<p>Vessel had 'Not Under Command' navigational status reported in the last week; or</p> <p>Vessel was drifting in the last week (reference made to a running ABM).</p>	Launched as a pilot project

Pilot implementation



Black Flag Ships - Bubble Map

Home

Black Flag Ships

Black Flag Ships Not Reporting

Overview

Details

Bubble Map

Heat Map

Overview

Details

Bubble Map

Heat Map

Time Analysis

Ship Type

MMSI Flag

Area Name

Flag State Name

Black Flag Status

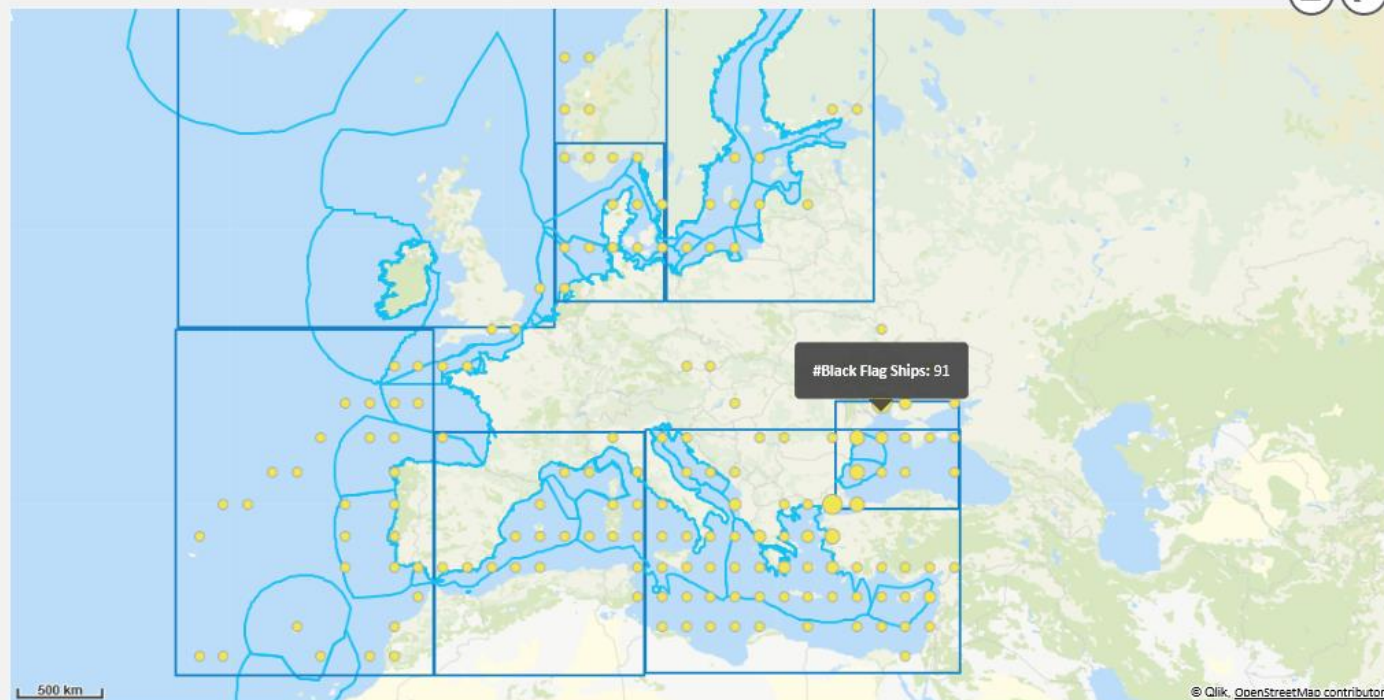
Not Reporting Status

#Black Flag Ships
557

%Black Flag Ships
1.01%

Area

Please, select at least one Grid 2.



Black Flag Ships - Bubble Map

[Home](#)
[Black Flag Ships](#)
[Black Flag Ships Not Reporting](#)
[Overview](#)
[Details](#)
[Bubble Map](#)
[Heat Map](#)
[Overview](#)
[Details](#)
[Bubble Map](#)
[Heat Map](#)

Time Analysis

Ship Type

MMSI Flag

Area Name

Flag State Name

Black Flag Status

Not Reporting Status

#Black Flag Ships

76

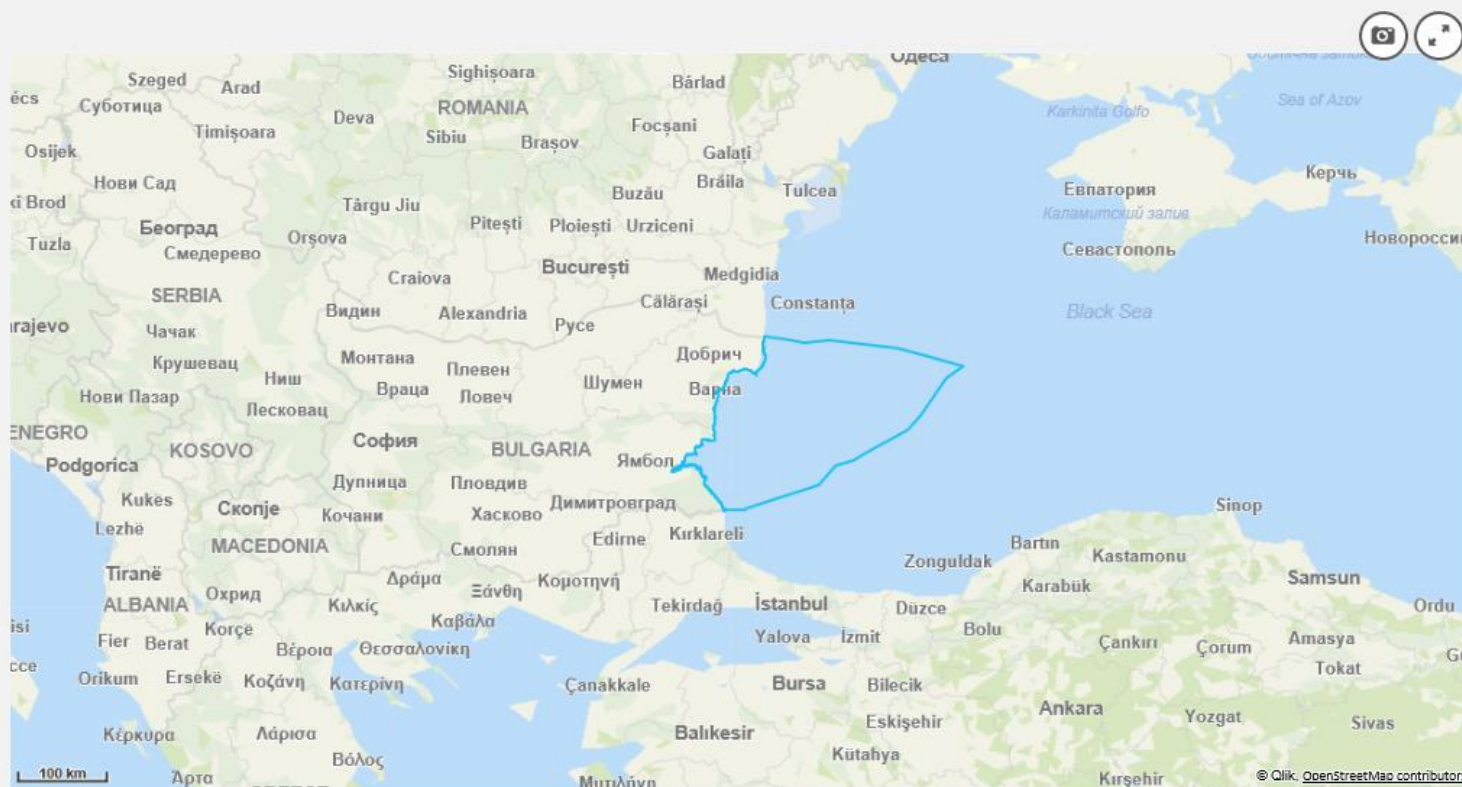
%Black Flag Ships

14.07%

Area

#Black Flag ...

i



Black Flag Ships - Bubble Map

Home

Black Flag Ships

Black Flag Ships Not Reporting

Overview

Details

Bubble Map

Heat Map

Overview

Details

Bubble Map

Heat Map

Time Analysis

Ship Type

MMSI Flag

Area Name

Flag State Name

Black Flag Status

Not Reporting Status

#Black Flag Ships

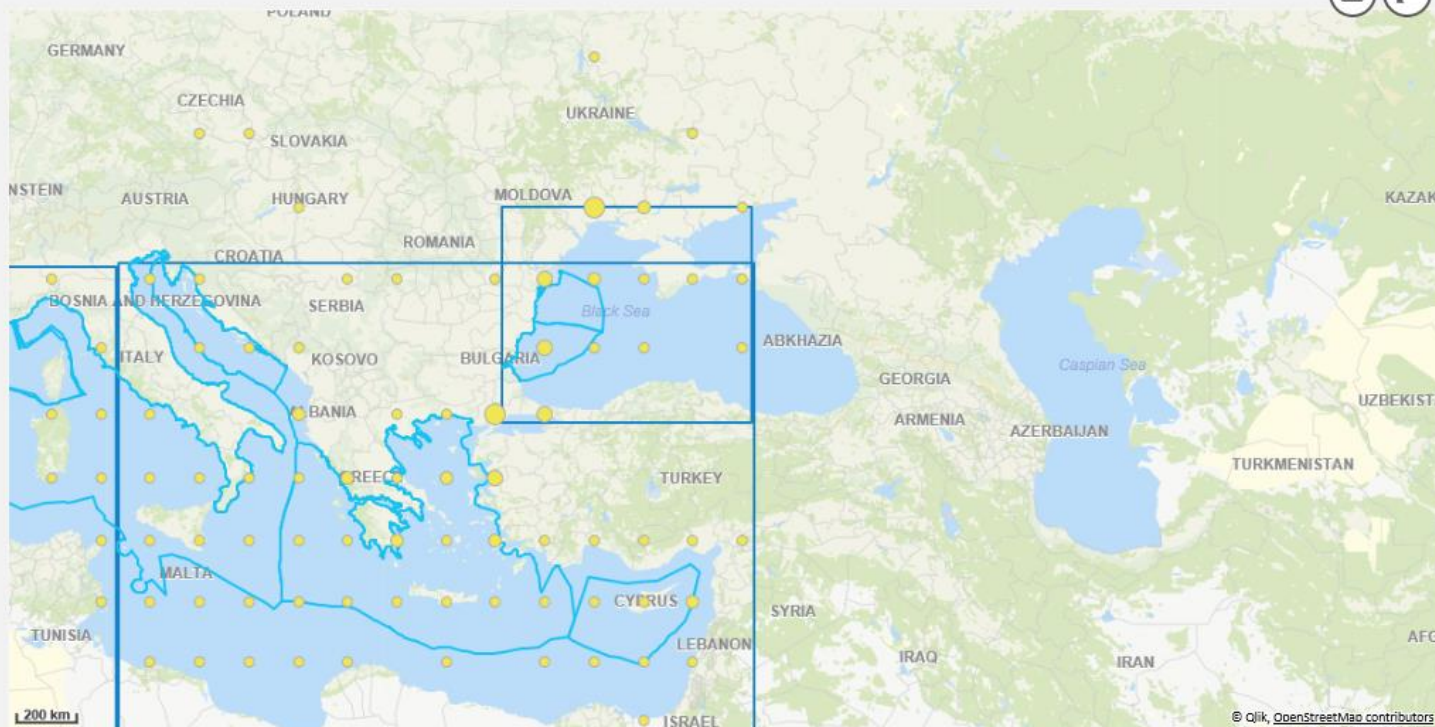
557

%Black Flag Ships

1.01%

Area

181
#Black Flag ...
1



Black Flag Ships not Reporting - Overview

🏠 Home

🏠 Black Flag Ships

📌 Black Flag Ships not Reporting

Overview

Details

Bubble Map

Heat Map

Overview

Details

Bubble Map

Heat Map

Time Analysis

Ship Type

MMSI Flag

Area Name

Flag State Name

⋮

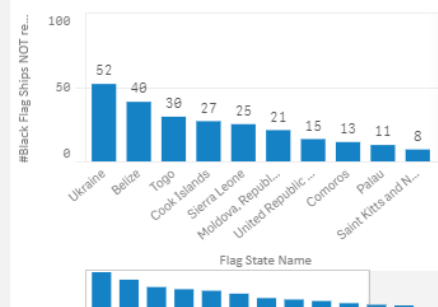
#Black Flag Ships NOT reporting re...

254

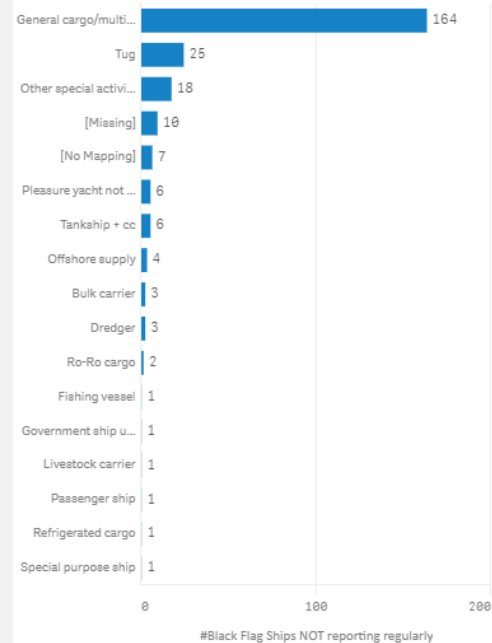
%Black Flag Ships NOT reporting re...

45.12%

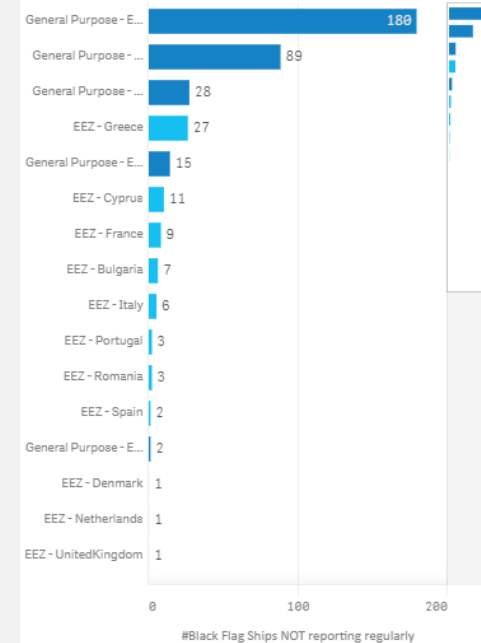
#Black Flag Ships not reporting per Country



#Black Flag Ships not reporting per Ship Type



#Black Flag ships not reporting per Area



Black Flag Ships not Reporting - Details

[Home](#)
[Black Flag Ships](#)
[Black Flag Ships not Reporting](#)
[Overview](#)
[Details](#)
[Bubble Map](#)
[Heat Map](#)
[Overview](#)
[Details](#)
[Bubble Map](#)
[Heat Map](#)
[Time Analysis](#)
[Ship Type](#)
[MMSI Flag](#)
[Area Name](#)
[Flag State Name](#)
[...](#)

#Black Flag Ships NOT reportin...

254

%Black Flag Ships NOT report...

45.12%

Black Flag Ships Not Reporting Details

Ship ID	Ship Name	Ship Type	Flag State Name	MMSI Code	MMSI
Totals					
2299	ETAB	General cargo/multipurpose	Comoros	616	616481000
4229	LADY RASHA	Other special activities	United Republic of Tanzania	677	677030700
4265	PORADA	General cargo/multipurpose	Ukraine	272	272544000
4664	COSA	General cargo/multipurpose	Togo	671	671359000
4806	EMELIE	General cargo/multipurpose	United Republic of Tanzania	677	677016400
4946	FARAH	[No Mapping]	Togo	671	671350000
5196	ASTRA MARINE	General cargo/multipurpose	Moldova, Republic of	214	214180500
5377	CREDO	General cargo/multipurpose	Moldova, Republic of	214	214181100
5951	BRITTA K	General cargo/multipurpose	Sierra Leone	667	667001500
6452	MARZUK	General cargo/multipurpose	United Republic of Tanzania	677	677019400
7626	BARHOM	[No Mapping]	United Republic of Tanzania	677	677016500
7630	ARMONY	General cargo/multipurpose	United Republic of Tanzania	677	677041700
7716	BARHOM II	General cargo/multipurpose	United Republic of Tanzania	677	677043400
8824	VENEZIA	General cargo/multipurpose	Togo	671	671562000
9557	ITIDAL	General cargo/multipurpose	Togo	671	671310000
10282	AVIVA	General cargo/multipurpose	Togo	671	671432000
10361	MARTYN LATSIS	General cargo/multipurpose	Ukraine	272	272031000
10371	RAYAN	General cargo/multipurpose	Togo	671	671208000



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European Maritime Safety Agency