MEDOSMoSIS
D.3.2.1. Studying Field Report

PART II

National in-depth analysis

Document Control Sheet

Project acronym:	MED OSMoSIS
Project title:	Mediterranean governance for Strategic Maritime Surveillance and Safety issues
Related activity:	A3.2 – Studying Field report PART I
Deliverable name:	D3.2.1 – Global report covering problem diagnosis, needs analysis, interoperability issues, development of platforms for countries without one / expansion of existing platforms capacity
Type of deliverable:	Report
Language:	English
Work Package number:	3
Work Package title:	Studying field
Work Package leader:	DGAM
Partners involved:	All

Author(s):	France: Shom - L. Cotte, D Carval, A.Sommier, A. Souf Croatia: KIP/Plovput LLC Greece: GMMA Italy: Regione Abruzzo Portugal: DGMA Slovenia: NIB Spain: CSIC & Fundación Valenciaport Montenegro: Capt. Vladimir Sparovic
Version:	3
Delivery date:	October 2021
Distribution:	Confidential

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Contents

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

INTRODUCTION

The first part of the Studying Field report (D3.2.1) provided the partnership with a global vision of Maritime Surveillance activities at European level, enabling a better knowledge and understanding of Maritime Surveillance landscape in the Mediterranean area. The survey, to which relevant maritime stakeholders and organisations of each MED OSMoSIS country partner took part and Malta, partner of MSP MED project, provided an overview of stakeholders and their activities, the type of data generally produced and used, information regarding existing geoportals useful or dedicated for Maritime Surveillance activities, limitations and gaps identified in terms of data, tools and interoperability, GIS datasets and tools identified in the Mediterranean region.

Some results were not statistically representative due to the unequal level of participation and the information gathered for each participant country (with for example, sixteen answers for Slovenia and Spain, one for Italy and six for France). More input from Montenegro would be helpful in order to gather more elements relevant to IPA countries.

To supplement the information reported in Part I and draw recommendations at national and European levels when relevant, the MED OSMoSIS partners agreed to build up on the results provided by the survey and provide for each country a thorough analysis at national level addressing more specifically the following topics:

- Governance of Maritime Surveillance activities
- Gaps (data/tools)
- Platforms/geoportals[1].

This second part of the Studying field report therefore provides an analysis in the form of a compilation of national reports submitted by each partner country.

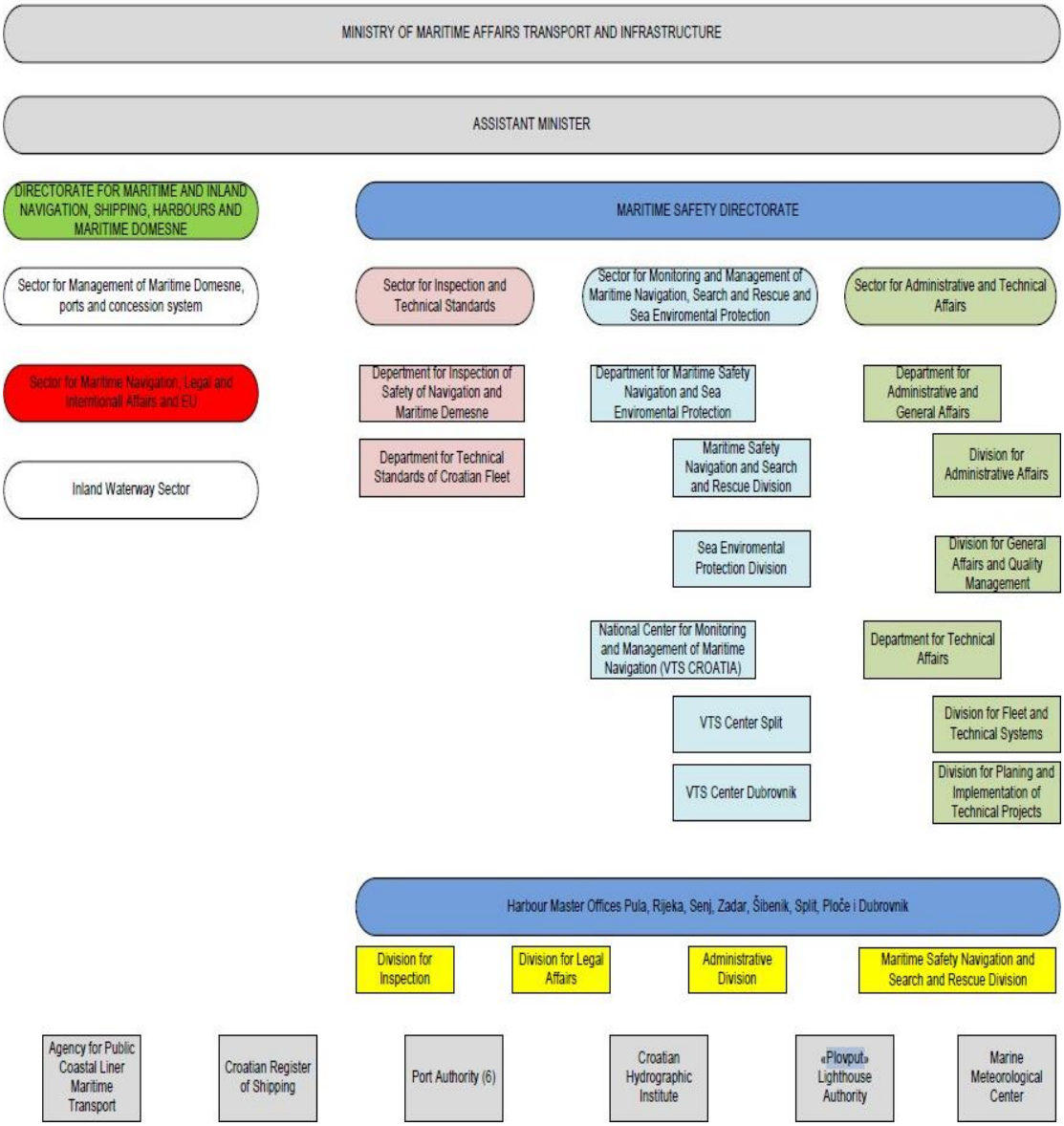
[1] Platform refers to geoportals on which data related to maritime surveillance activities are managed/shared/disseminated to stakeholders of the field. For instance at Shom our "platform" is data.shom.fr where you can have access to bathymetry, currents, maritime limits, etc. It can also be geoportals / portals that provide AIS data, forecast, navigational warnings...

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

CROATIA

1. Overview



CR Figure 1 Maritime governance overview*

Government level[2]

[2] MARITIME DEVELOPMENT AND INTEGRATED MARITIME POLICY STRATEGY OF THE REPUBLIC OF CROATIA FOR THE PERIOD FROM 2014 TO 2020

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Ministry of the Sea, Transport and Infrastructure

- Harbour Master Offices,
- Port Authorities,
- Vessel traffic Monitoring and Information Service,
- Maritime Rescue Coordination Centre – MRCC

Institutions governed by public law:

- Plovput LLC (AToNs),
- The Hydrographic Institute of the Republic of Croatia,
- Agency for Maritime Transport,
- Maritime Meteorological Centre,
- Croatian Register of Shipping.

Others:

- Maritime faculties
- Maritime Schools
- Education centres
- Concessioners

2. Focus on the governance of Maritime surveillance activities

1. Croatian maritime administration

The Croatian maritime administration is primarily composed of the Maritime Safety Directorate and the Directorate for Maritime and Inland Navigation, Shipping, Harbours and Maritime Domain, which both fall under the supervision of the Ministry of the Sea, Transport and Infrastructure (hereinafter referred to as the Ministry). Implementation and enforcement of the mandatory IMO instruments is primarily carried out by these two Directorates along with several other entities which have been established by law or have been appointed by the maritime administration to carry out various tasks on their behalf. There are six Sectors established within the two Directorates.

Under the Maritime Safety Directorate, the three Sectors are: Sector for Inspection and Technical Standards, Sector for Monitoring and Management of Maritime Navigation, Search and Rescue, and

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Sea Environmental Protection, and the Sector for Administrative and Technical Affairs. All three of the Sectors are responsible for implementation and enforcement of IMO mandatory instruments.

The Sector for Inspection and Technical Standards implements regulations in the field, initiates amendments to laws and regulations, participates in drafting laws and regulations, performs inspections and technical supervision, conducts oversight of Recognized Organizations (ROs), and provides training for inspectors and employees.

The Sector for Monitoring and Management of Maritime Navigation Search and Rescue, and Sea Environmental Protection supervises implementation of national legislation pertaining to its area of responsibility, supervises marine traffic services, carries out Coastal State Obligations and participatesin the work of international organizations.

The Sector for Administrative and Technical Affairs coordinate's activities with the management of registers and records, issues maritime certificates, determines professional qualifications of seafarers,as well as necessary skills for boat operators. It also supervises maritime training institutions authorized to provide the certification of services.

Under the Directorate of Maritime and Inland Navigation, Shipping, Harbours and Maritime Domain, the three Sectors are: Sector for Management of Maritime Domain, ports, and concession system, the Sector for Maritime Navigation, Legal, and International Affairs, and the Inland Waterway Sector. Only the Sector for Maritime Navigation, Legal and International Affairs and EU deals with implementation and enforcement of IMO mandatory instruments.

The Sector for Maritime Navigation, Legal and International Affairs and EU prepares drafts legislation in maritime affairs, participates in the work of international organizations, and ensures harmonizationof Croatian legislation with the EU.

The Agency for Casualty Investigations in Air, Maritime, and Rail is located in Zagreb, and is the independent investigation arm with main responsibilities of the investigation of casualties.

The Croatian Register of Shipping is a public institution recognized to carry out statutory certification activities for ships flying the flag of Croatia engaged in national and international voyages.

MRCC Rijeka has the responsibility of carrying out maritime safety related activities in the specific areas of search and rescue and oil pollution response.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Harbour Master's Offices are responsible for carrying out flag State and Port State inspection activities, as well as oversight of the Port Authority activities. They are also responsible for issuing Minimum Safe Manning, CSR, and STCW certificates.

The Port Authorities are public institutions for granting concessions for port operation functions, including handling and monitoring the loading and unloading of all types of cargoes. The Port Authorities monitor the storage, collection, transportation and disposal of waste, including ship generated wastes.

The Vessel Traffic Services are monitoring the ship routeing schemes and ship movements in the inland sea, territorial sea and EEZ.

The Hydrographic Institute of the Republic of Croatia creates and edits navigational charts and other navigational publications as well as carries out hydrographic surveys.

Plovput LLC is responsible for disseminating maritime safety information, waterways, installations, and maintenance of Aids to Navigation. Regulations about way of marking of waterways and aids to navigation prescribe types and characteristics of aids to navigation in the internal sea waters and territorial sea of the Republic of Croatia, their classification and categorization, manner and conditions of their installation, maintenance, removal and deactivation, system of marking (balise) of waterways in the internal sea waters and territorial sea of the Republic of Croatia, manner and conditions of establishing and maintaining the Register of aids to navigation, its content and obligations of natural and legal personswho install or maintain aids to navigation.

2. Ministry of the Sea, Transport and Infrastructure

Coastal State activities

Coastal State activities are carried out by MRCC Rijeka and the VTS Centre Rijeka, VTS Centre Split and VTS Centre Dubrovnik who are all part of the Maritime Safety Directorate. Additional, yet separate agencies are also involved in implementation. They include Plovput LLC and the Hydrographic Institute of the Republic of Croatia.

The Ministry is the entity responsible for the enforcement of coastal State laws and obligations in Croatia. Its mandate is highlighted in the Maritime Code, Ordinances and National Plans.

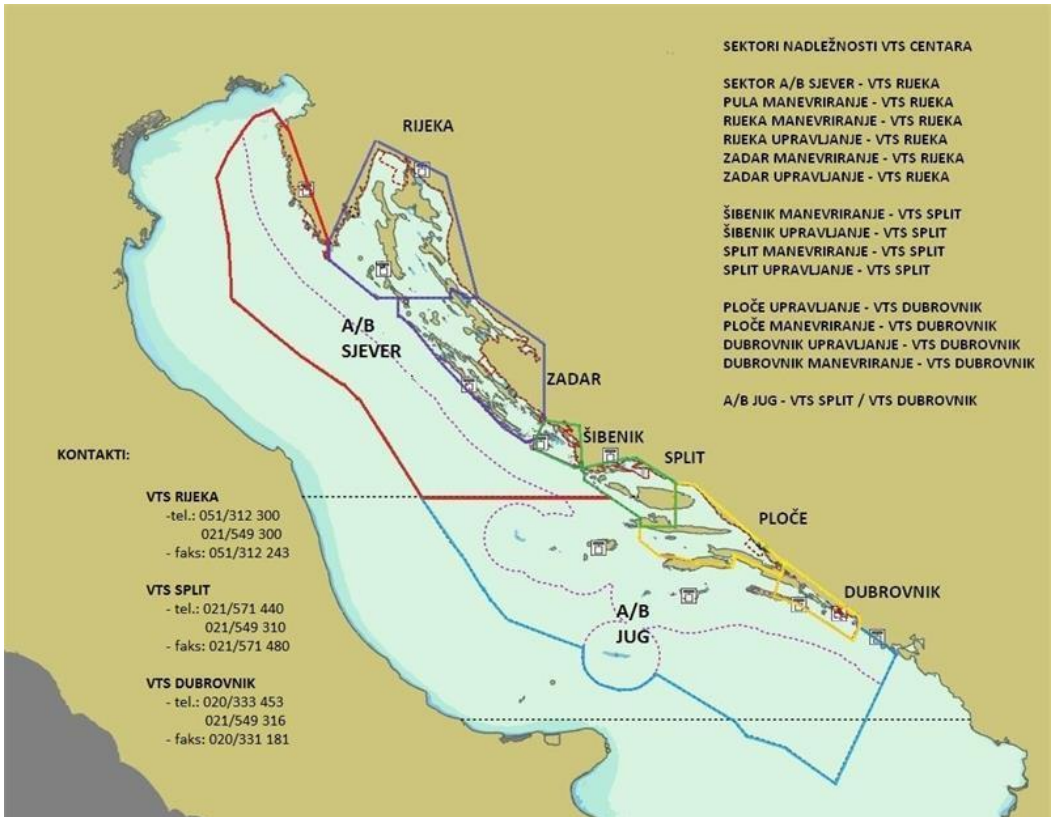
Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Maritime Safety Directorate Administrative structure:

- Sector for Inspection Affairs and Technical Standards
- Sector for Navigation Supervision, Search and Rescue and Environmental Protection
- Sector for seafarers, shipowners, registrars and professional and technical affairs

Harbour Master's Offices perform navigation supervision in the internal sea waters and territorial sea of the Republic of Croatia, search and rescue of human lives and property at sea, inspection safety of navigation, inspection supervision of maritime domain, registration and deletion of ships, and keeping ship registers, determination of seaworthiness, calibration of boats, registration and deletion of boats and keeping of boat registers, tasks of issuing seaman's books, tasks of determining the professional qualification of seafarers for acquiring a maritime profession, and technical affairs of safety of navigation at sea according to a special law and other regulations.

Vessel Traffic and Monitoring



CR Figure 2 Vessel Traffic and Monitoring overview

Picture source: https://mmpi.gov.hr/UserDocsImages/arhiva/w-%20VTS%20HRVATSKA%206_14.jpg,28.06.2021

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Supervision and management of maritime traffic is carried out in order to increase the safety of maritime navigation, the efficiency of maritime transport and the protection of the marine environment, and includes:

1. collection of data on maritime facilities and maritime traffic,
2. providing data to maritime facilities,
3. providing navigation advice and support in navigation to maritime facilities,
4. organization of navigation and management of maritime traffic.

Supervision and management of maritime traffic is carried out through the cooperation of the competent services of the Ministry and port authorities with maritime facilities that sail or are in the area of supervision and management.

The area of maritime traffic control and management includes inland waters, the territorial sea and the protected ecological-fishing zone of the Republic of Croatia.

The activities of supervision and management of maritime traffic are performed by the service of supervision and management of maritime traffic of the Ministry and port authorities in cooperation with port authorities, the company Plovput and the Croatian Hydrographic Institute. The Maritime Traffic Supervision and Management Service may request the cooperation and support of the Coast Guard of the Republic of Croatia, the police and other operational supervisory bodies in the performance of tasks within its competence.

IVEF (Inter VTS Exchange Format)

- Server application for collection, processing and exchange of data on maritime traffic and navigable movements real-time objects between VTS systems or other external users;

- CoastWatch IVEF module: possibility to send / receive data from / to 4 external users Possibilities of application: exchange of data with the competent services in order to create commonmaritime situational images (MDA, CISE), data exchange with VTS services of neighbouring countriesin the Adriatic, connection;

- CoastWatch applications with computer application for collision and strand risk assessment IWRAP (IALA Waterway Risk Assessment Program[3])

[3] https://mmpi.gov.hr/UserDocsImages/arhiva/JPS%20danas%20i%20sutra_MMPI%2022-1_18.pdf, slide17/19, 08.06.2021

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

National Headquarters for Search and Rescue at Sea - 195 Maritime Search and Rescue Service (MRCC[4])

The Search and Rescue Service at Sea in the Republic of Croatia consists of the Search and Rescue Service Headquarters, the National Search and Rescue Coordination Center, the Search and Rescue Sub-Centers (Port Authorities of Pula, Rijeka, Senj, Zadar, Šibenik, Split, Ploče and Dubrovnik), coastal observation units (port offices of all port authorities + coastal radio stations + guarded lighthouses + observation stations of the Croatian Navy), and search and rescue units (naval, air and land units).

To carry out its functions, the MRCC Rijeka uses the National SAR Plan via a 24 hour manned operation center with a communications suite. The Coastal State region includes internal marine waters, territorial sea, EEZ, international waters as agreed via an Agreement with the Italian government in 2000.

The Ministry has authority to garner resources from other government entities such as the Coast Guard and Maritime Border Police.

MRCC Rijeka governs 7 sub-centers which cover the entire coastal region for all cases. These centers are located in Harbour Master Offices in Pula, Senj, Zadar, Šibenik, Split, Ploče, and Dubrovnik.

Training is being conducted regularly such as formal education, seminars, subject matter expert meetings, workshops, EMSA training, and exercises that occur at least once a year.

The main tasks of the National Centre for Coordination of Search and Rescue at Sea are to coordinate search and rescue operations at sea, to monitor maritime traffic and control the safety of navigation, and to coordinate actions in the event of sudden marine pollution.

The area of competence extends from the internal sea waters and the territorial sea of the Republic of Croatia, which the National Centre controls with the help of its sub-centres, to the zone between the territorial sea and the open sea area to the demarcation line with neighbouring countries in the Adriatic Sea. and as such reported to the International Maritime Organization (IMO).

The National Centre - MRCC Rijeka, all sub-centres (Harbour Master's Offices) and their port offices, and all coastal radio stations (Rijeka radio, Split radio and Dubrovnik radio) maintain a maritime radio

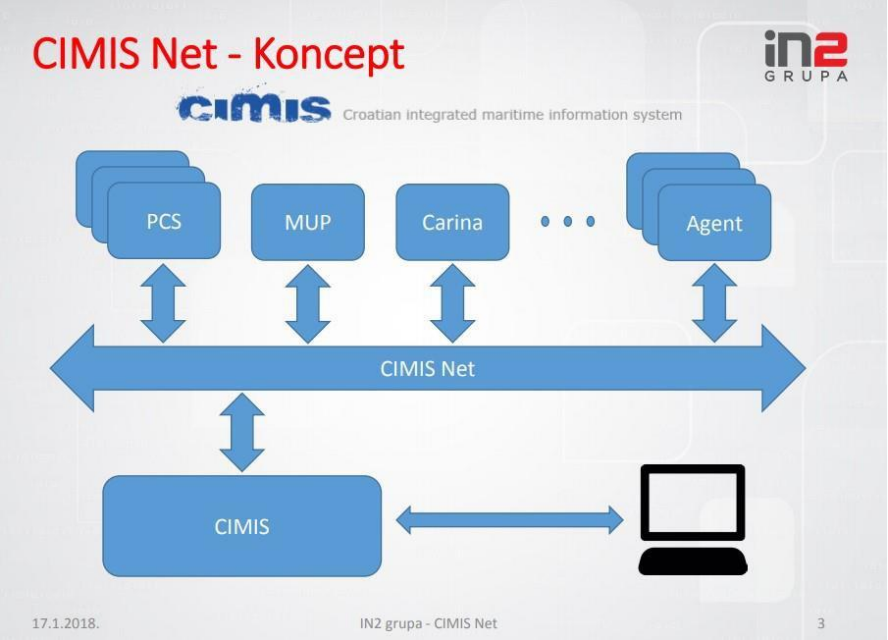
[4] https://mmpi.gov.hr/more-86/sigurnost-plovidbe-104/traganje-i-spasavanje-na-moru-195-ustrojstvo-nis/19612, 28.06.2021

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

service on internationally established frequencies and channels for danger, urgency and safety, and all in accordance with the world maritime system of peril and safety.

CIMIS - Croatian Integrated Maritime Information System – National Single Window

For the needs of the electronic delivery and exchange of data on ships, cargo and passengers in the official procedure of announcement and registration of arrival and departure, as well as s related official procedures. How could the CIMIS system be complete connected to external systems (PCS, MUP, Customs…) and exchange relevant data and information the CIMISNet data exchange system is established.



CR Figure 3: Croatian Integrated Maritme Information System

Picture source: https://mmpi.gov.hr/UserDocsImages/arhiva/CIMISNet_IN2%2022-1_18.pdf, page 03/09, 28.06.2021

Plovput LLC - Aids to Navigation and Maritime Radio Service (Radio Navigational Warnings)

With the aim of providing safety of navigation in the internal sea waters and territorial sea of the Republic of Croatia, Plovput maintains aids to navigation owned by Plovput (Republic of Croatia) and Third persons, at date June 28th 2021 Plovput maintains 1218 AToNs.

Plovput LLC is a State company which has the direct responsibility for the establishment and maintenance AtoN, which include lighthouses (with lightkeepers), coastal lights, light beacons, leading

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

lights, buoys, beacons, leading marks, port lights and bridge marks. They cover seven regions along the coast of Croatia and employ 275 persons. The company operates under a strategic plan and an ISO certified QMS. Plovput LLC is a member of IALA.

Plovput establishes and maintains the WEB GIS application National register of aids to navigation.

Lighthouses are the most important aids to navigation which enable a safe day and night navigation through determined sea regions. They are built at the most prominent or distant points of the Croatian territorial sea. Because of the importance of lighthouses for safety of navigation and in order to protect lighthouse buildings from degradation, 16 lighthouses still have personnel (1 or 2 lightkeepers in a shift).

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

PROCEDURE FOR IMPLEMENTATION OF A NEW AID TO NAVIGATION (AtoN)				
PLANNING		Construction/Implementation	Notifications	
Port authority (MMPPI)	Plovput d.o.o.	Plovput d.o.o.	Plovput d.o.o.	Port authority + Croatian Hydrographic Institute Split + Plovput d.o.o.
▪ Deliver to Plovput Priority plan for construction/ implementation of AtoN in the area of their competence (8 Porth authorities)	▪ In accordance with its priorities and technical possibilities in its Annual Activites Plan Plovput foresees the construction of AtoN in depedence of its capacities and provided financial means.	▪ Plovput investigates the sea area in which the construction of a new aid is planned and if necessary orders bathymetric measurment which determine the precise position of a newaid and delivers the proposal of nautical characteristic for approval of the competent Port Authority. ▪ After having received final agreement of Port Authority Plovput makes project documentation. ▪ After that follows the construction/ implementation of the new AtoN by means of Plovput`s own ships.	▪ Informs the competent Port Authority about thebeginning of works onconstruction/ implementation of anAtoN. ▪ After the conclusion of works makes inspectionand control of the functioning of the new AtoN and informs thereof the Port Authority and delivers toit all the nautical data.	▪ Port Authority informs the Croatian Hydrographic Institute Split which makes the textfor radio notice and delivers it to the Coast Radio Station of Plovputto be broadcasted inNotice to Mariners. ▪ The Croatian Hydrographic Institute Split gives all the data about AtoN in its monthlyedition of Notice to Mariners and draws it in maritime chart and includes it in List of Lightsand other nautical- publications.

CR Table 1 Procedure for the implemenation of a new aid to navigation

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

In accordance with the Global Maritime Distress and Safety System (GMDSS), the eastern part of the Adriatic Sea belongs to A1 Maritime region in which the Republic of Croatia is obliged to provide coverage with VHF, VHF DSC and NAVTEX signal.

With the Law about Plovput it is stated that the above-mentioned activities shall be carried out by Plovput on behalf of the Republic of Croatia.

Maritime radio service of Plovput is carried out by means of VHF, VHF DSC and Navtex systems via three coast radio stations: Rijeka Radio, Split Radio and Dubrovnik Radio.

The activities of Maritime radio service include:

- Permanent watch on emergency and safety of navigation frequencies (VHF ch 16 and VHF DSCch 70) with the scope to protect human lives at sea, in accordance with the Radio Regulations;
- Mediation in cases of emergency and safety which are coordinated by Maritime Rescue Coordination Centre in Rijeka (MRCC), in accordance with the National plan for search and rescue at the sea;
- Mediation in communications regarding request of ships for medical assistance;
- Transmission of Maritime Safety Information (MSI) by means of VHF and Navtex systems;
- Commercial radio service from ships, in accordance with the International Telecommunication Regulations, which is carried out via VHF system;
- Providing of radio service to the Government's bodies (Maritime Rescue Coordination Centre, Harbour Masters' Offices, Police, Navy, Ministries, etc.).

Maritime Safety Information (MSI) broadcasts all three coast radio stations via VHF System in English and Croatian language, as well as CRS Split Radio via Navtex System in English (International NAVTEX Service) and Croatian language (Nacional NAVTEX Service) with a remark that all three CRS participate in preparation and broadcasting of NAVTEX messages. Navtex messages of international importance are sent to Navarea coordinator in English language.

MSI information includes:

- Navigational warnings;
- Weather reports, Meteo (GALE/FOG) warnings ;
- Search and rescue reports;
- Other urgent information about safety of navigation.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Plovput LLC is responsible for broadcasting meteorological information and warnings each day. This is being done three times per day for weather broadcasts, with warnings as necessary, using information provided by the Meteorological Office, Port Authority and other sources. This information is broadcasted in Croatian, German, English, and Italian.

The Hydrographic Institute of the Republic of Croatia (HHI)

One of the basic activities of HHI is construction, *production, publishing and maintenance of charts* in analogue format (paper charts) and digital format (ENC). Nautical chart is a representation of a particular navigation area with the main purpose to ensure safe navigation of ships. They are constructed in Mercator projection at different scales depending on navigational purposes. HHI chart production includes:

- Overview charts – Adriatic Sea, Ionian Sea, and other parts of the Mediterranean Sea
- General charts – Adriatic Sea and a part of the Ionian Sea
- Coastal charts – Eastern Adriatic Sea
- Approach charts – parts of Eastern Adriatic Sea
- Harbour charts – major Eastern Adriatic ports, harbours, anchorages, and channels
- Berthing charts – major ports and harbours in the Croatian part of Eastern Adriatic
- Thematic charts - special charts to be used with Nautical charts
- Other nautical charts

Notices to Mariners (NtM) is a monthly edition of the Hydrographic Institute of the Republic of Croatia. NtM is used for the maintenance of charts and nautical publications. To view NtM, it is required to have a PDF browser installed on your computer.

Information published on the web pages of Notices to Mariners e-Service shall not be considered as official information. Official paper editions of NtM can be ordered on subscription from our authorised distributors[5].

Electronic Navigational Charts (ENC) are databases standardised as to content, structure and format, issued for use with ECDIS on the authority of government authorised hydrographic offices. ENC contains all the chart information necessary for safe navigation, and may contain supplementary information in addition to that contained in the paper chart which may be considered necessary for safe navigation. (IHB 1997)

[5] https://www.hhi.hr/en/e-services/notice-to-mariners, 28.06.2021

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Official electronic navigational charts (ENC) issued by the Hydrographic Institute of the Republic of Croatia are available through PRIMAR RENC (regional ENC coordinating centre) and its network of authorised distributors www.primar.org.

Navigational publications provide extensive information relevant for the safety of navigation which cannot be represented on charts. They are published as occasional publications (Sailing Directions, Lists of Lights and Fog Signals, Nautical Tables, Radio Service) or periodicals (Nautical Almanac, TideTables). These publications are based on the data collected by the HHI, and other entities engaged inthe safety of navigation, being produced according to the recommendations of the InternationalHydrographic Organisation.

Other publications include different scientific and technical editions covering maritime services, navigation, shipbuilding, maritime law, nautical tourism and economy, as well as Special editions series dealing with the history of navigation, hydrography and cartography in the Adriatic.

Hydrographic survey register

GeoAdriatic[6] - Croatian Marine Spatial Data Portal is Croatian Marine Spatial Data Portal - GeoAdriatic provides search and view services for marine spatial data, and e-services from

The scope of the Hydrographic Institute of the Republic of Croatia (HHI). In 2021 Croatian Marine Data Geoportal – GeoAdriatic has been updated with new layers of spatial data falling within the competence of the HHI, as follows:

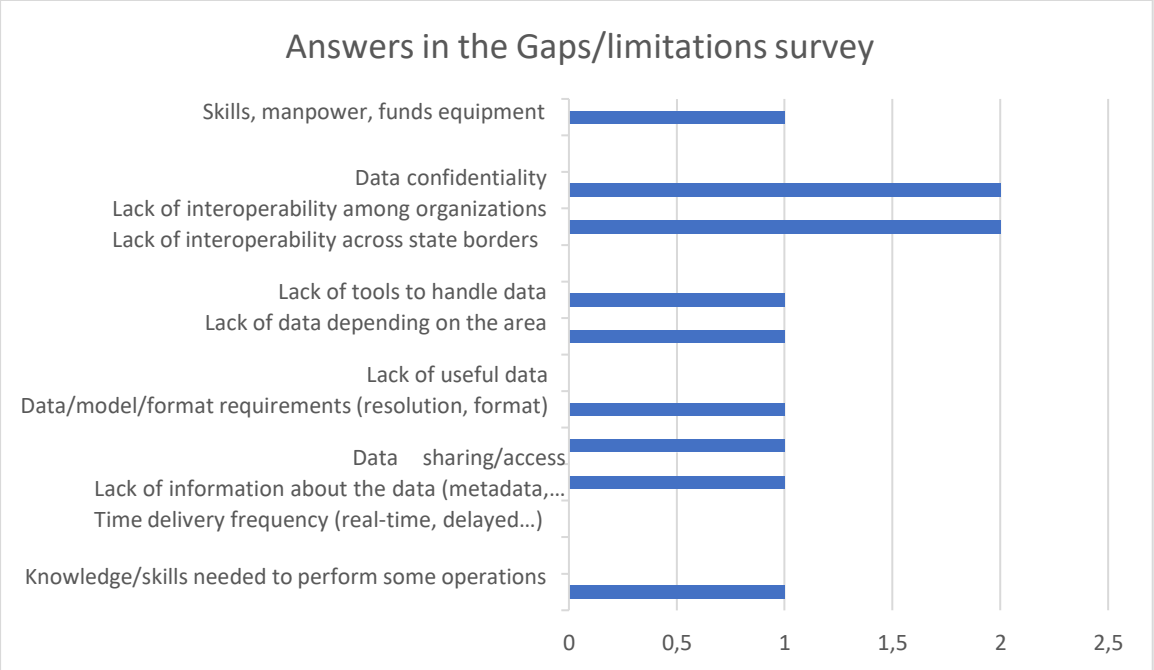
- Areas of competence of harbour master's offices and branch offices
- Adriatic Traffic System – ATS (ADRIREP)
- VTS Croatia
- Thematic chart 101G "Republika Hrvatska – Granice Republike Hrvatske na Jadranskom moru".
- *Adriatic Sea - Portal operativne oceanografije* [7]- Mareograf data collection.

[6] https://geoadriatic.hhi.hr/en/, 28.06.2021
[7] https://adriaticsea.hhi.hr/site/login, 28.06.2021

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

3. Gaps identified in Croatia

The group of stakeholders that was surveyed identified several gaps and limitations that currently exist in Croatia. From the graph below, it is possible to conclude that Lack of interoperability among organizations and across state borders are seen as significant limitations, as half of the surveyed organizations identified them as such.



CR Figure 4 Survey Answers to Gaps/Limitation

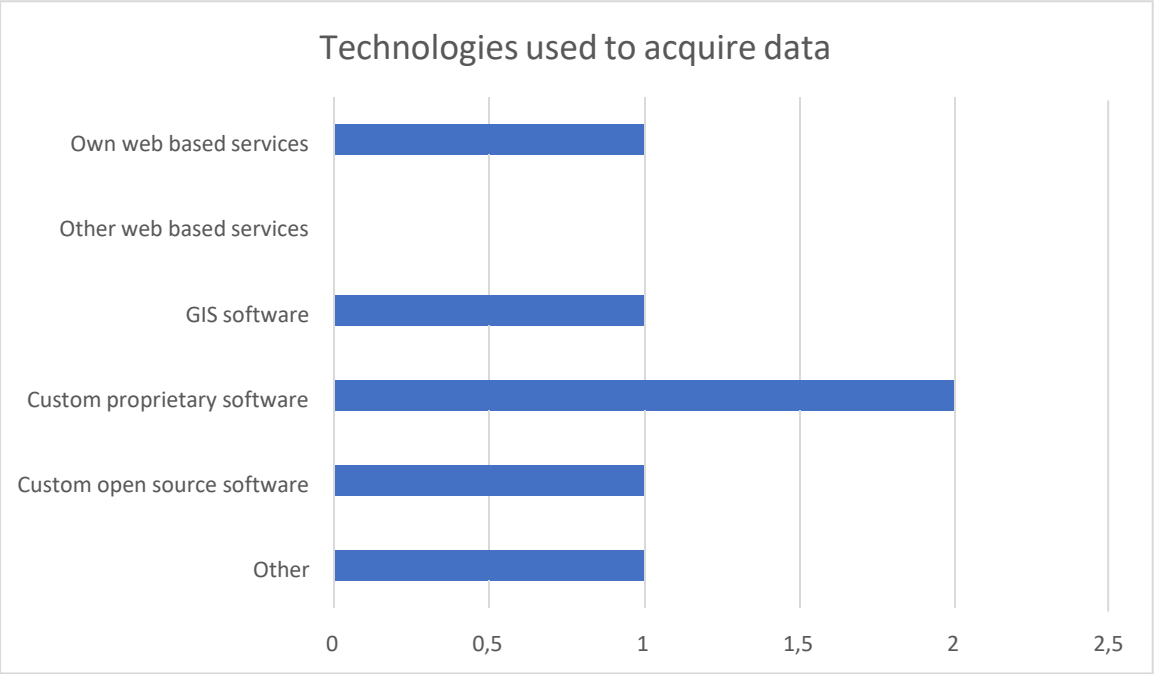
Most of the organisations surveyed are not CISE members, with some of them not being aware of the existence of the CISE data exchange model.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

4. Usage of platforms and Geoportals in Croatia

Different organisations acquire and use data via different methods, tools and technologies. The survey confirmed this by having no tool marked as being the dominant one for acquiring data, even though custom proprietary softwares seem to be used more than the other technologies.

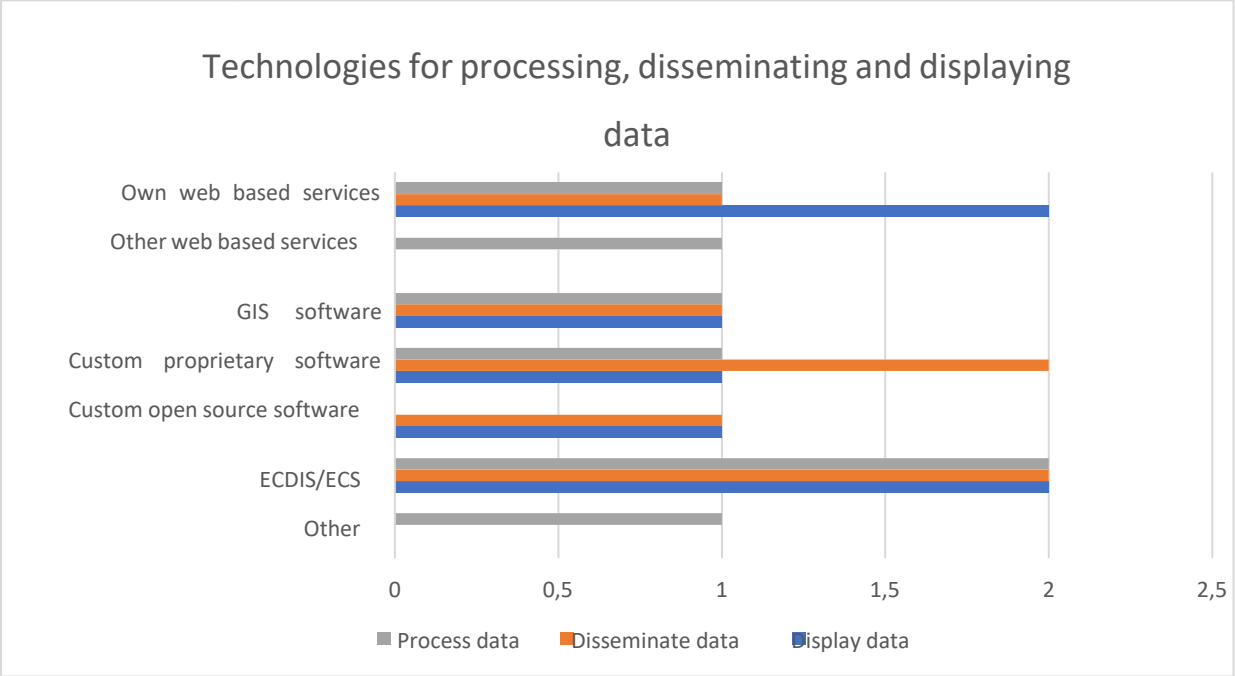


CR Figure 5 Technologies used for data acquisition

A similar situation can be seen if the topic is processing, disseminating or displaying data. Again, thereisn't one technology or tool that can be considered dominant. Some tools, such as the ECDIS/ECS – Electronic Chart Display and Information System is used somewhat more than the other available options.

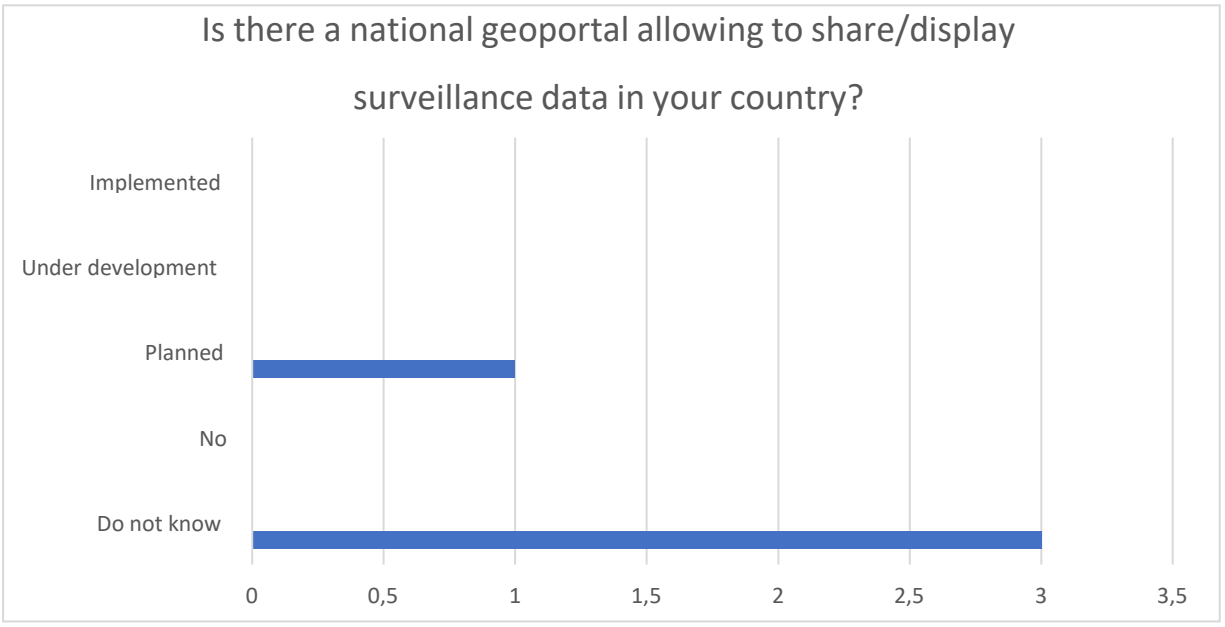
Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional



CR Figure 6 Technologies used for data processing, disseminating and display

Regarding geoportals, most of the surveyed stakeholders have answered that they do not know if there is a national geoportal which allows for sharing and displaying of surveillance data in Croatia, with only one stakeholder answering that the geoportal is currently planned.



CR Figure 7: Existence of national geoportal for data sharing and display

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

5. Conclusions and Recommendations

The Republic of Croatia has an extensive administration for the maritime sector, reaching from the Ministry of the Sea, Transport and Infrastructure, the Maritime Safety Directorate and the Directorate for Maritime and Inland Navigation, Shipping, Harbours and Maritime Domain to the Harbour Master's Offices in eight Croatian ports, as well as individual agencies, institutes and authorities within the maritime sector. Each of these organisations has an important role in managing Croatia's maritime sector, as well as its surveillance.

Coastal State activities are carried out by MRCC Rijeka and the VTS Centre Rijeka, who are both part of the Maritime Safety Directorate. Harbour Master Offices perform navigation supervision in the internal sea waters and territorial sea of the Republic of Croatia. MRCC Rijeka governs 7 sub-centers which cover the entire coastal region for all cases. These centers are located in Harbour Master Offices in Pula, Senj, Zadar, Šibenik, Split, Ploče, and Dubrovnik. Plovput LLC aims to provide safety of navigation in internal sea waters and territorial sea of the Republic of Croatia. Plovput maintains 1218 AToNs, including lighthouses, coastal lights, light beacons, leading lights, buoys, beacons, leading marks, port lights and bridge marks. Plovput also provides coverage with VHF, VHF DSC and NAVTEX radio signal on behalf of the Republic of Croatia, as a technical precondition for maintain permanent watch service and MSI promulgation by Plovput's CRS Rijeka radio, Split radio i Dubrovnik radio. The Croatian Hydrographic Institute constructs, publishes and maintains charts in both analogue (paper) format and digital format (ENC).

The survey on gaps and limitations has shown that the Lack of interoperability among organizations and across state borders are seen as significant limitations. Most of the organisations surveyed are not CISE members and do not know if there is an existing or if there are plans for the creation of a national geoportal for sharing and displaying surveillance data. The usage of tools and technologies for gathering, processing, disseminating and displaying data is divided fairly evenly, with custom proprietary software's having a slight advantage over other tools for acquiring data, and the ECDIS/ECS having a slight edge over other technologies for processing, disseminating and displaying data.

Including the involved stakeholders, as well as other major actors in the maritime sector into the CISE system would allow for easier and more streamlined sharing of new data and information between

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

those organisations. Planning and creating a single national geoportal for sharing and displaying maritime surveillance data would also be of great assistance to enabling data sharing, as well as enabling better cooperation for all involved organisations. It would be of utmost importance raise the organisations' awareness about the existence of such tools, as well as present the benefits these tools can bring.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

TABLE

FIGURES

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

FRANCE

1. General information on the French stakeholders interviewed

The Ministry for the sea was created on the 13th July 2020. Considering their recent appointment, representatives for the ministry could not be consulted at the time of the survey. The Ministry for the Sea however plays a major role and will be mentioned in paragraph 2. Governance of French Maritime Surveillance activities.

1.1. Type of organisations, authority in charge and scope of responsibility

Feedback from stakeholders of six organisations enabled to carry out this in-depth national analysis. All the participating organisations are national administrations. The names of the organisations, the relevant Authority and the scope of their responsibilities are listed in FR Table 1.

For this batch of French stakeholders, the most represented authorities are the Ministry for the Armed Forces (33%) and the Ministry for the Ecological Transition (33%, FR Figure 1). The Ministry of Marine Affairs and the Secretariat-General for the sea are also well represented in the field of Maritime Surveillance (17%, FR Figure 1).

FR Table 1**. Interviewed stakeholders, relevant authority and scope of responsibility**

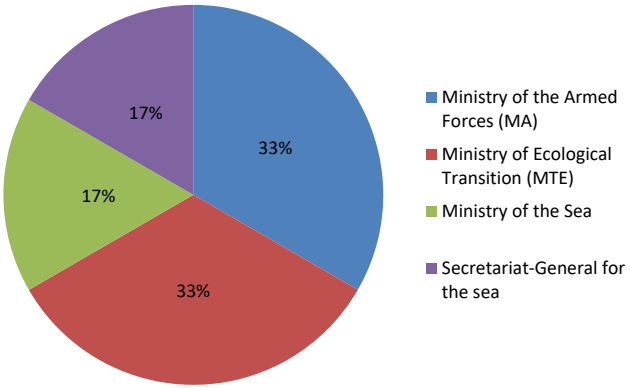
Name	Authority in charge	Scope of responsibility of the respondants
French Navy – Chief of Navy	Ministry for the Armed Forces	All French EEZs and areas of interest for external operations
Ministry for the Ecological Transition (MTE)	Ministry for the Ecological Transition (MTE)	-*
Departmental Directorates for Territories and Sea (DDTM)	Ministry for the Ecological Transition (MTE)	Finistère (French department in Brittany)
Shom	Ministry for the Armed Forces	Metropolitan French coast
Directorate of Maritime Affairs (DAM)	Ministry of Marine Affairs	French EEZ and SAR zones (FR)
CoFGC	Secretariat-General for the Sea	French EEZ

*No information provided.

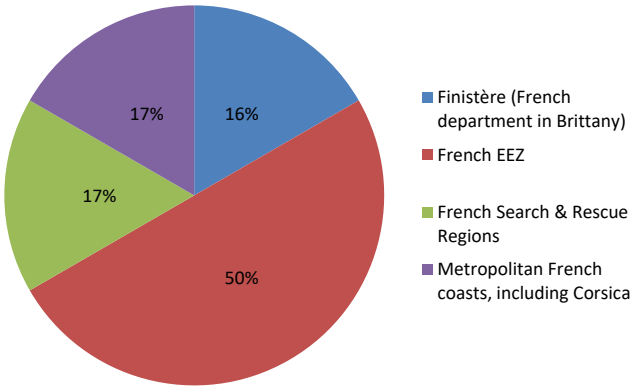
For the six organisations, areas of responsibilities mostly relate to French Exclusive Economic Zone - EEZ - (50%), Search and Rescue - SAR- regions (17%) and French coast (17% - FR Table 1; FR Figure 2). Missions of the French actors interviewed are presented in the following section.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional



FR Figure 1. Authority in charge for the French organisations interviewed in the study.



FR Figure 2. Scope of responsibility of interviewed French stakeholders

1.2. Missions

The role and missions of the surveyed individuals are presented in Figure 3 and FR Table 2. It should be noted that some of them provided a general overview of the missions for their institution. Overall, the stakeholders interviewed are mainly involved with maritime security and safety (12%), surveillance of maritime navigation (12%) and maritime pollution surveillance (12%, Figure 3). Dissemination of information regarding maritime safety (e.g. weather forecasting, tide) and protection of marine environment follows, and counts for 9% of the answers. Information collection and processing associated to maritime safety, fight against illicit trafficking (e.g. drugs, weapons, counterfeits, protected species, cultural assets) and protection and management of fishing resources come in third position with 6% of the answers (Figure 3).

Maritime Search & Rescue activity surprisingly shows a 3% of answers only.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

FR Table 2. Interviewed organisations and corresponding location.
The role and missions of the interviewed representative are also reported, as a complement to Figure 3.

Organism	Location	Role	Details of the missions of the organism
French Navy – French Navy Staff (EMM)	Paris	Thematic Expert	In charge of Maritime Surveillance programmes within the French Navy.
Ministry for the Ecological Transition (MTE)	Brittany	Local Government Representative	No details provided
Departmental Directorates for Territories and Sea (DDTM)	Brittany	Representative of the State (public services included)	Actions to prepare for incidents such as major maritime pollution. Drafting of specific ORSEC[8] constituents.
Shom	Brest – Brittany	Representative of the State (public services included)	Ensures the collection, processing and dissemination of nautical information through the update of nautical charts and publications.
Directorate of Maritimes Affairs (DAM)	Paris	Thematic Expert	https://www.ecologie.gouv.fr/surveillance-et-sauvetage-en-mer
CoFGC	Paris	Representative of the State (public services included)	The operational centre of the coastguard function is in charge of centralising information about maritime incidents with ongoing or future impact on French interests. Provides the monitoring and summary of the event for the benefit of the French government.

The main activities of the interviewees' organisations are summarised in FR Table 3. The French Navy (EMM) and CoFGC are mainly involved in activities linked to maritime security and navigation safety. The Ministry for the Ecological Transition (MTE) and the Directorate of Maritime Affairs (DAM) principally deal with marine environment preservation. The French hydrographic office (Shom) is mostly involved in the collection, processing and diffusion of nautical information (current, wrecks, Separation Traffic Schemes, etc.). The Departmental Directorates for Territories and Sea (DDTM) watches over marine pollution.

[8] ORSEC: The ORSEC plan is the French generic emergency plan in case of disaster, when the local means are not sufficient. ORSEC stands for "Organisation de la Réponse de la SEcurité Civile", i.e. « rescue organisation ».
Source: https://www.gouvernement.fr/risques/dispositif-orsec

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

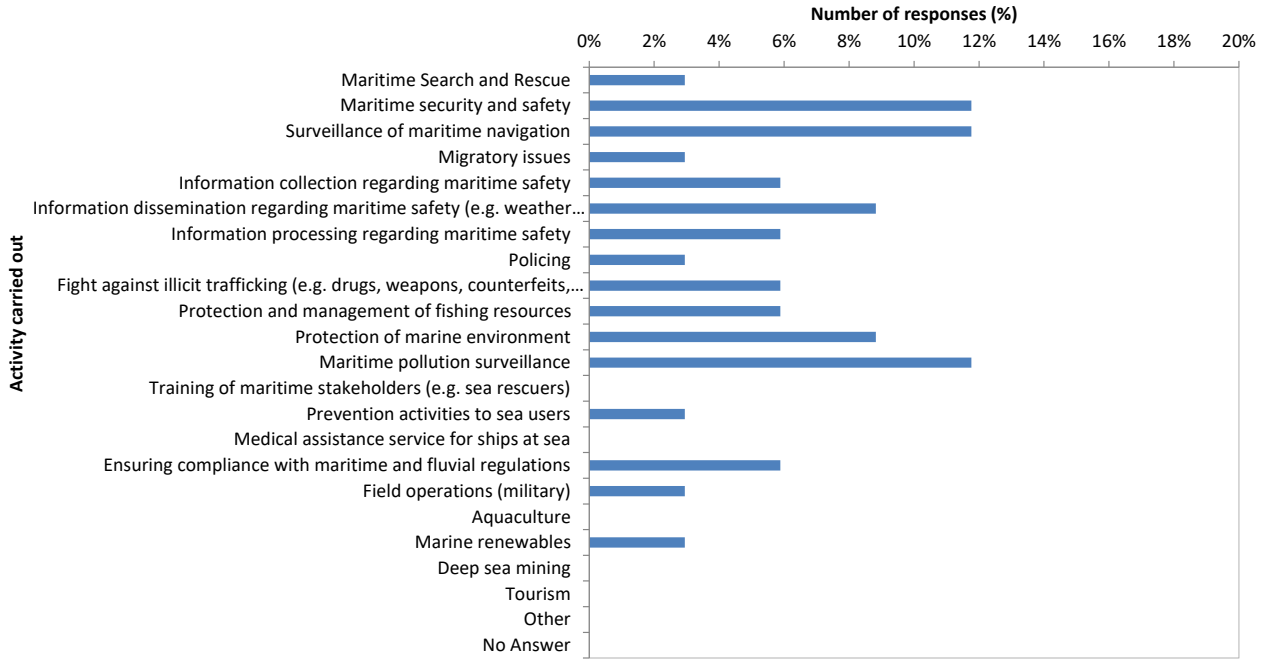


Figure 3. French stakeholders' activities (N = 6 / T = 6).

FR Table 3. Main activities of organisations interviewed
(N = 6; n_{tot}= 34).

Activities	Stakeholder	Responses (n)
Maritime security and safety	EMM, MTE, DAM, COFGC	4
Surveillance of maritime navigation	EMM, MTE, DAM, COFGC	4
Maritime pollution surveillance	EMM, DDTM, DAM, COFGC	4
Information dissemination regarding maritime safety (e.g. weather forecasting, tide)	EMM, Shom, DAM	3
Protection of marine environment	EMM, MTE, DAM	3
Information collection regarding maritime safety	EMM, Shom	2
Information processing regarding maritime safety	Shom, DAM	2
Fight against illicit trafficking (e.g. drugs, weapons, counterfeits, protected species, cultural assets)	EMM, COFGC	2
Protection and management of fishing resources	MTE, DAM	2
Ensuring compliance with maritime and fluvial regulations	MTE, DAM	2
Maritime Search and Rescue	DAM	1
Migratory issues	COFGC	1
Policing	MTE	1
Field operations (military)	EMM	1
Prevention activities to sea users	MTE	1
Marine renewables energies	DAM	1

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

1.3. Collaboration with other Maritime Surveillance actors

The stakeholders surveyed collaborate principally with other French authorities at national level as reported in FR Table 4. These include Customs, Maritime Prefectures and MRCCs[9]. The French Navy also work together with EU Agencies (EMSA[10] and EDA[11]) and the International Organisation NATO[12]. It seems however that very little collaboration takes place with Border States authorities since none was reported by the interviewees.

FR Table 4. Summary of the various collaborations with other Maritime Surveillance actors reported by the respondents.

Organism	Collaborations
French Navy – French Navy Staff (EMM)	Voluntary naval control, Directorate of Maritime Affairs, Customs, Ministry of the Interior, General Secretariat for the Sea, EMSA, EDA[13], NATO[14]
Ministry for the Ecological Transition (MTE)	Customs, Police, French Navy
Departmental Directorates for Territories and Sea (DDTM)	Atlantic Maritime Prefecture, Directorate of Maritime Affairs
Shom	Maritime prefectures, naval operational centres, MRCCs, semaphores, subdivisions of lighthouses and beacons, ports, DDTM/DML
Directorate of Maritimes Affairs (DAM)	French Navy
CoFGC	French Navy, MRCCs, Police, Customs, Civil Security.

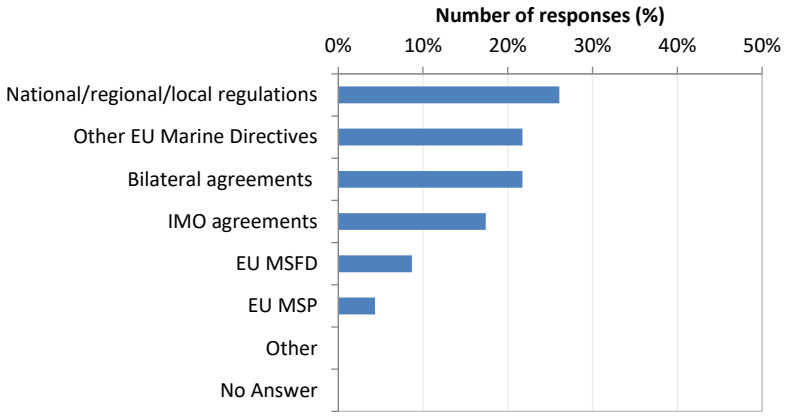
2. Governance of French Maritime Surveillance activities

2.1. Impacting directives and regulations

In line with the observations reported from the global results of the MED OSMoSIS survey (see section 2.4.2), the French actors of Maritime Surveillance are mainly affected by national, regional and/or local regulations (26%, FR Figure 4). EU Marine Directives and bilateral agreements follow with 22% of the answers, usually for joint cross-border cooperation. Unfortunately, no further information was provided with regards to which EU Marine Directives each French interviewee responds to. International Maritime Organisation (IMO) agreements impact 17% of the actors interviewed.

[9] MRCC: Maritime Rescue Coordination Centre.
[10] EMSA: European Maritime Safety Agency (http://www.emsa.europa.eu/)
[11] EDA: European Defence Agency (https://eda.europa.eu/).
[12] NATO: North Atlantic Treaty Organisation (https://www.nato.int/).

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



FR Figure 4. Directives impacting the activities of French stakeholders interviewed

FR Table 5 summarises the impacting regulations and directives per participating organisation.

FR Table 5. Summary table of the regulations / directives affecting the respondents' organisations (N = 6; n_{tot} = 23).

Regulations / directives	Actors	Responses (n)
IMO agreements	MTE, Shom, DAM, COFGC	4
EU MSFD	DDTM, Shom	2
EU MSPD	Shom	1
Other EU Marine Directives	EMM, MTE, Shom, DAM, COFGC	5
Bilateral agreements	EMM, MTE, Shom, DAM, COFGC	5
National/regional/local regulations	EMM, MTE, DDTM, Shom, DAM, COFGC	6

2.2. Structure of Governance in France

Understanding the structure of governance at EU level requires first a clarification of how governance and decision-making are organised within each country of the MED OSMoSIS partnership, i.e. at national level. To this end, two simple summary diagrams listing all authorities and organisations involved in French Maritime Surveillance activities are shown, using official organisation charts provided by each Ministry involved (FR Figure **5** and FR Figure 6).

Five Ministries are financing the authorities and organisations involved in French Maritime Surveillance and navigation safety activities (FR Figure **5**): the Ministry for the Ecological Transition (MTE), the Ministry of Marine Affairs, the Ministry for the Armed Forces, the Ministry of the Economy, Finance and the Recovery (MEFR) and the Ministry of the Interior (MI).

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

2.2.1. Ministry for the Ecological Transition (MTE)

The MTE has direct authority over the six Interregional Directorates for the Sea (DIRM) and 25 Departemental Diretorates for Territories and Sea (DDTM)[15].

Interregional Directorates for the Sea (DIRM):

- The East Channel/North Channel (DIRM MEMN)
- The North Atlantic/West Channel (DIRM NAMO)
- The South Atlantic (DIRM SA)
- The Mediterranean (DIRM MED)
- The Antilles-Guyana ((DM Antilles Guyana)
- The South Indian Ocean (DM SOI)

The DIRMs are in charge of conducting State policies for sustainable development of the sea, management of resources and regulation of maritime activities. For instance, in the Mediterranean, the DIRM promotes integrated management of the sea and coastline under the authority of the competent coordinating prefecture (**FR Figure 5**). Maritime Rescue Coordination Centres (MRCCs) are placed under the authority of the Maritime Prefect of the corresponding sea-basin and of the corresponding DIRM (e.g. the Mediterranean basin and the DIRM MED). Overall, the missions of MRCCs include:

- Rescue coordination at sea;
- Surveillance of maritime navigation and ship security;
- Collection and dissemination of nautical information, in particular VHF radio weather reports.

MRCCs also handle SAR operations in coordination with the French National Marine Rescue Company (SNSM), a non-profit association which missions are:

- save human lives at sea and on the coast (Metropolitan France and Overseas);
- train rescuers;
- Carry prevention actions among sea users.

For each Sea basin, the scope of responsibility of MRCCs is defined in the corresponding map of Action of the State at sea (AEM). As an example, in **Erreur ! Source du renvoi introuvable.**, a snapshot of the

[15] Direction départementale des Territoires et de la Mer

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

map used for the Mediterranean Sea is presented and the MRCC intervention limit area is shown in red (CROSS/MRCC La Garde and Corsica).

Furthermore, in the Atlantic sea-basin (DIRM NAMO & SA), the MRCC Etel is designated as National Fisheries Surveillance Centre (CNSP) and Support Centre for the Monitoring of the Marine Environment (CACEM) as shown in **FR Figure 5**. As CNSP, it stands under the authority of the Director of Maritime Fisheries and the Regional Prefects (represented by the Interregional Directors of the Sea) and:

- coordinates and provides operational control of nautical and aerial means for the administrations involved in maritime fisheries surveillance missions;
- acts as a Fisheries surveillance centre under European Union regulations (satellite monitoring of all fishing vessels in French waters, both in mainland France and overseas);
- is the one operational contact point for collection and processing of all information related to illegal fishing activities.

With regards to its CNSP missions, its duties are carried out on all sea-basins of mainland France as well as in Community (EU) or international waters frequented by French fishing vessels.
As the CACEM, its role is to provide support to the coordinating prefectures for the four sea-basins and overseas territories and the Government's delegate prefects for the Actions of the Sate at sea (AEM) for monitoring and control of the marine environment[16]. To this end, the CACEM:

- makes all applicable texts available on the LEGICEM website;
- supports all departments and control units involved in the monitoring and control of the marine environment, by transmitting the information necessary for the preparation, conduct and progress of missions or by communicating monthly guidelines;
- measures the control effort, by drawing up quarterly statistics and an annual activity report.

<u>The Departmental Directorates for Territories and Sea (DDTM):</u>

The Departmental Directorates for Territories and Sea (DDTM) is in charge of planning and sustainable development policies for territories, including maritime territories. It is responsible for implementing

[16]CACEM Progress report 2019: http://www.dirm.nord-atlantique-manche-ouest.developpement-durable.gouv.fr/IMG/pdf/cacem_-_rapport_d_activites_2019_cle7fe114.pdf

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

guidelines related to the balanced development of both urban and rural territories through agricultural, urban planning, housing, construction and transport policies. It also promotes sustainable development. It also participates to the protection of territories by considering risks, nuisances and pollution. It contributes to enhancing the knowledge of territories and establishing territorial strategies and policies. Finally, it is in charge of protecting and managing the wild fauna and flora, water, natural forest and rural areas and their resources, regulating hunting and fishing, and generally improving the quality of the environment[17].

Among the several DDTM services, one is involved with the management of Maritime activities: the Surveillance and Control of Maritime Activities Service (SSCAM). The SSCAM includes the Port activities Unit (UAP), the Control and maritime Security Unit (UCS), the Maritime Affairs Coastal Unit and the captaincies (**FR Figure 5**).

2.2.2. Ministry of Marine Affairs

Created on the 13th July 2020, the Ministry is in charge of activities related to navigation, security, training, sea users and nautical activities on one hand, and responsible for maritime spatial planning and marine resources policies on the other hand. Together with the MTE and the Ministry of the Interior (MI), the Ministry of Marine Affairs has direct authority over the Directorate of Maritime Affairs (DAM) as well as joint authority with the Ministry of Agriculture and Food over the Directorate of Marine Fisheries and Aquaculture (DPMA), as shown in **FR Figure 5**.

The DAM is responsible for drawing up public policies for the development of sustainable maritime activities. Its field of action includes[18]:

- safety and ecological transition of ships;
- maritime services (signalling, rescue and surveillance) and control of marine environment and fisheries;
- maritime spatial planning and conciliation of uses at sea;
- policies dedicated to seafarers: training, education, employment, labour law, health and social protection;
- monitoring and support for merchant fleet;
- monitoring and support for pleasure boating and water-based leisure activities;

[17] Source: DDTM website
[18] Source: Ministry of Marine Affairs website

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- the budgetary and HR management of the maritime administration, composed of 2,700 agents spread across decentralised services on the French coast and overseas, as well as the transformation and modernisation of this administration and its resources.

The DPMA develops and implements a policy for sea fisheries, sea products and marine and inland aquaculture and contributes to related international and community negotiations.

The Ministry of Marine Affairs also has direct authority over two services attached to the DAM: one under national jurisdiction as the Lighthouse and beacon service (APB) and another as the Delegation for the Sea and Coast (DML) (**FR Figure 5**). The APB installs and maintains the maritime signals set up along the French coasts to alert on dangers, mark maritime routes and access channels to ports, and ensure a peaceful coexistence of uses at sea. This service operates a fleet of twenty vessels (buoy tenders, work vessels, speedboats) to carry out its missions. The DML coordinates the definition and evaluation of policies shared between these directorates and relating to the sea and the coast. It analyses the coherence of orientations of other policies relating to the sea and the coast, within the ministry's field of competence, and proposes the necessary reorientations. It also coordinates the preparation, implementation, monitoring and evaluation of the national strategy for the sea and coast. Finally, it identifies new issues relating to the sea and coastline to ensure that they are considered by the ministry's departments[19].

2.2.3. Ministry for the Armed Forces

The role of the Ministry for the Armed Forces is to ensure the protection of the territory, the population and French interests. It also responds to other missions within the framework of international (NATO) or regional (Europe of Defence) agreements and treaties. In addition to these missions, the Ministry for the Armed Forces is involved in missions of public service: its human and material resources support the actions of other ministries, on a daily basis or in emergencies, on national territory and abroad[20]. The Minister of the Armed Forces is assisted by:

- The Chief of Defence Staff for the general organisation of the armed forces and the joint bodies under his authority (i.e. EMM: French Navy Staff and EMA: French Military Staff), their preparation and conditions of employment, and for capability choices;

[19] Source: https://www.legifrance.gouv.fr.
[20] Source: https://www.defense.gouv.fr/english/portail-defense/ministry/missions

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- The Directorate General for Armaments (DGA) for research, production of forces' equipment, international relations concerning armaments and defence industrial policy;
- The Secretary General for Administration (SGA) in all areas of the Ministry's general administration, in particular in budgetary, financial, legal, patrimonial, real estate, social and human resources matters (not shown in FR Figure 5).

2.2.4. Ministry of the Economy, Finance and the Recovery (MEFR)

As presented in FR Figure 5, the MEFR has direct authority on French Customs (DGDDI). The MEFR and DGDDI services carry out three main missions: combat fraud, support the economic activity and collect taxes[21].

- Mission to combat fraud and major international trafficking:

Customs are in charge of the protection of territories and citizens, economic and financial interests, and cultural and natural heritage at national or community levels. There are involved in the fight against drugs, counterfeit goods, tobacco and arms trafficking, terrorism, financing of criminal activities, and threats to environmental, health and consumer protection.

- Economic mission:

Thanks to an in-depth knowledge of international flows which enables the territory's protection, Customs also support the national economy and French companies. On the basis of the rules set for international trade, they control trade flows with three objectives:

  - fluidity;
  - security;
  - quality, thanks to procedures adapted to companies'needs.

- Fiscal mission:

Each year, the MEFR is attributed around 13% of the Government's budget and, like European counterparts, contributes to the financing of the community's budget.

French Customs, with other administrations, are also involved in the Actions of the State at sea. Their aim is to coordinate various means for interventions at sea. These actions vary and include:

- navigation police ;
- fisheries control;

[21] https://www.douane.gouv.fr/la-douane/qui-sommes-nous/lessentiel-de-la-douane

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- rescue missions;
- pollution response.

Given the consequent material resources and know-how, especially where customs coastguards are concerned, Customs are particularly involved in this fiscal mission, notably through the Customs Coast Guard National Directorate (DNGCD) and the Coast Guards Regional Directorate (DRGC) as shown in FR Figure **5**.

2.2.5. Ministry of the Interior (MI)

The MI has direct authority over the Directorate General of National Gendarmerie (DGGN) and the Directorate General of National Police (DGPN), as per FR Figure **5**. Both Directorates undertake National defence missions such as safety and protection of Navy's installations, protection and control of people and properties, maintenance and restoration of public of order. Various missions at sea also include the protection of marine environment, fisheries resources, recreational boating and fisheries safety, fight against illicit trafficking and piracy[22]. Nautical and Fluvial Brigades (BN and BF) are dedicated to interventions at sea and river waters respectively.

2.2.6. French Coast Guards Function and State action at sea (AEM)

State action at sea covers maritime operations carried out by the Government in the public interest and using its own resources. It does not include defence-related missions. In concrete terms, it entails enforcing Government authority (police operations, maintaining law and order, etc.) and carrying out public service missions (rescue operations, preventing and cleaning pollution)[23].

The organisation of the French coast-guard Function and State action at sea are more detailed in **Erreur ! Source du renvoi introuvable.** Under the authority of the Prime Minister, the General-Secretariat for the Sea supervises the Coast-guards function (CoFGC) and provides advice to the administrations involved in State action at sea (AEM).

[22] Source : www.gendarmerie.interieur.gouv.fr/notre-institution/nos-composantes/au-niveau-central/direction-generale

[23] Source: https://www.defense.gouv.fr/english/marine/operations2/maritime-security-and-safety-and-state-action-at-sea/maritime-security-and-safety-and-state-action-at-sea

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Maritime Prefectures manage operations conducted in the framework of the State action at Sea (AEM), as well as means and resources available for each authority involved in AEM (e.g. Customs). Maritime Zone Commanders (CZM) supervise the action of the French Navy (Figure 6).

Customs are coordinated by regional Customs operational centres (COD: Centres Opérationnels Douaniers), such as Marseille for the Mediterranean for example (not shown in Figure 6). Gendarmeries are coordinated by the Gendarmerie Operational Centres (COG: Centres Opérationnels de la Gendarmerie).

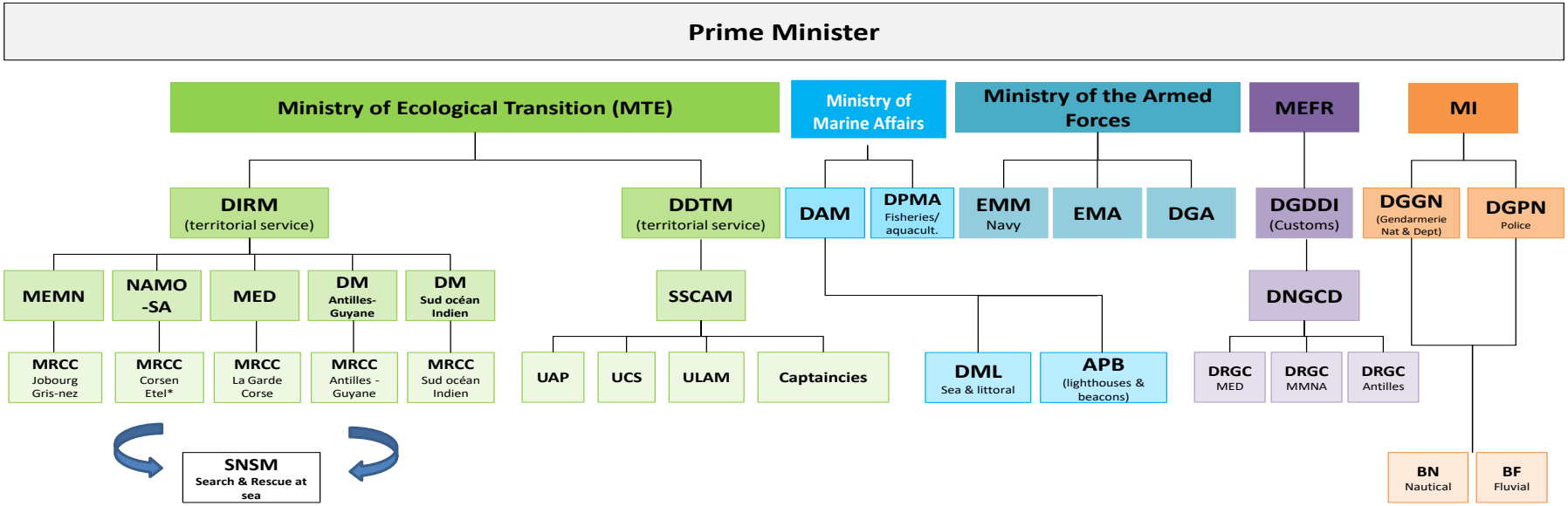
The semaphores, MRCCs, Gendarmerie Operational Centres (COG), customs, etc., together form a network for the monitoring of maritime traffic which node is located in Brest, within the SPATIONAV System.

As far as the Navy is concerned, the French Navy's Operational Command Centre (COM) in Paris supports regional COMs.

.

Project co-financed by the European Regional Development Fund

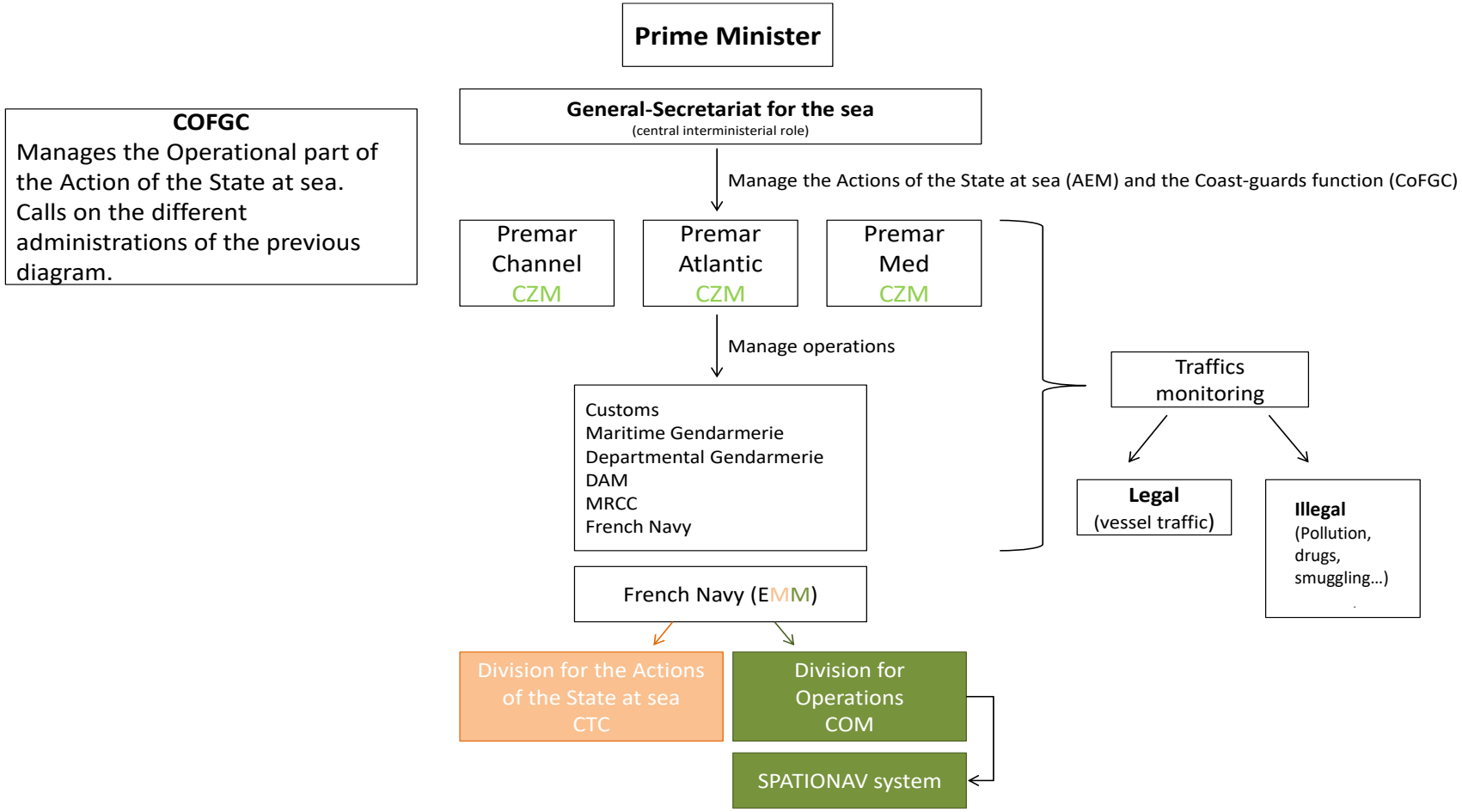
Projet cofinancé par le Fonds européen de développement régional



*CNSP & CACEM

For the Ministry for the Ecological Transition (Green part) – **DIRM**: Interregional Directorates for the Sea (East Channel/North Channel; North Atlantic/West Channel; South Atlantic; Mediterranean; Antilles-Guyana and South Indian ocean. **MRCC**: Maritime Rescue Coordination Centre which report to the corresponding DIRM (1 or 2 MRCC per DIRM). MRCCs handle SAR operations in coordination with **SNSM**: French National Marine Rescue Company. **CNSP**: National Fisheries Surveillance Centre. **CACEM**: Support Centre for the Monitoring of the Marine Environment. **DDTM**: Departmental Directorates for Territories and Sea. **SSCAM**: Surveillance and Control of Maritime Activities Service. **UAP**: Port Activities Unit. **UCS**: Control and maritime Security Unit. **ULAM**: Maritime Affairs Coastal Unit. For the Ministry of Marine Affairs (Blue part) – **DAM**: Directorate of Maritime Affairs. **DPMA**: Directorate of Marine Fisheries and aquaculture. **DML**: Delegation for the Sea and Coast. **APB**: Lighthouse and Beacons Service. Ministry for the Armed Forces (Blue-green) – **EMM**: French Navy Staff. **EMA**: French Military Staff. **DGA**: Directorate General of Armaments. For the Ministry of the Economy, Finance and the Recovery (**MEFR** – purple part) – **DGDDI**: French Customs and indirect taxation authorities. **DNGCD**: Customs Coast Guard National Directorate. **DRGC**: Coast Guards Regional Directorate. For the Ministry of the Interior (**MI –** orange part) – **DGGN**: Directorate General of National Gendarmerie. **DGPN**: Directorate General of National Police. **BN**: Nautical Brigade. **BF**: Fluvial Brigade (Sources: official organisation charts provided by each Ministry and https://mer.gouv.fr/missions-et-organisation).

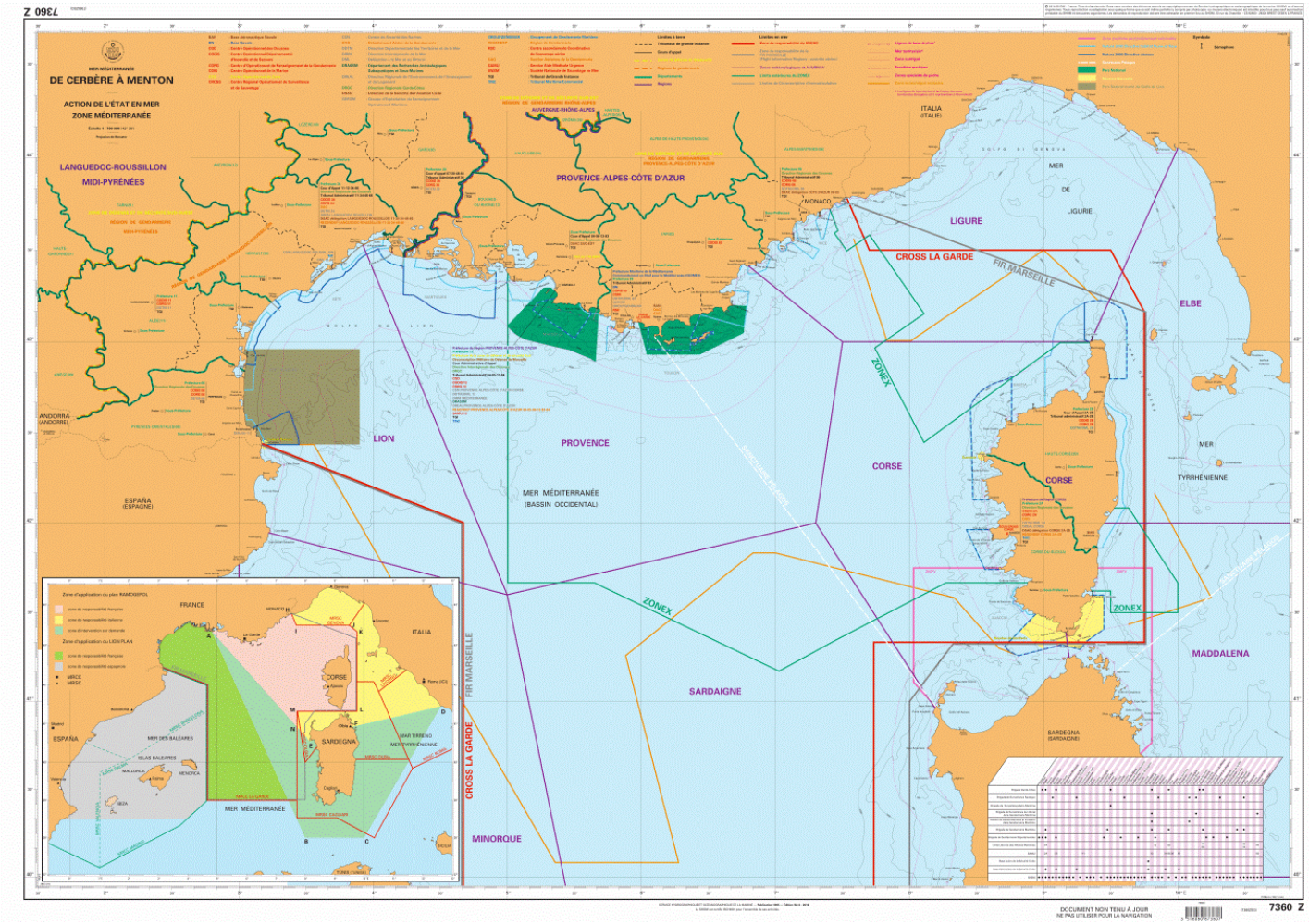
FR Figure 5. Authorities and organisations involved in Maritime Surveillance activities



FR Figure 6. French coast-guard Function and the Action of the State at sea organisation diagram
Premar: Maritime Prefectures; **CZM**: Maritime Zone Commander. The French Navy is divided in 2 Divisions: the **CTC** (Crisis Management Centre) and the **COM** (French Navy's Operational Command Centre).

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional



FR Figure 7. Snapshot of the "State action at sea" map used for the Mediterranean area (AEM 7360Z).
MRCC intervention limit area is shown in red (CROSS/MRCC La Garde and Corsica). A specific map is used for each of the French sea-basin and overseas. These maps are updated by Shom yearly as per each competent Maritime Prefecture's needs.

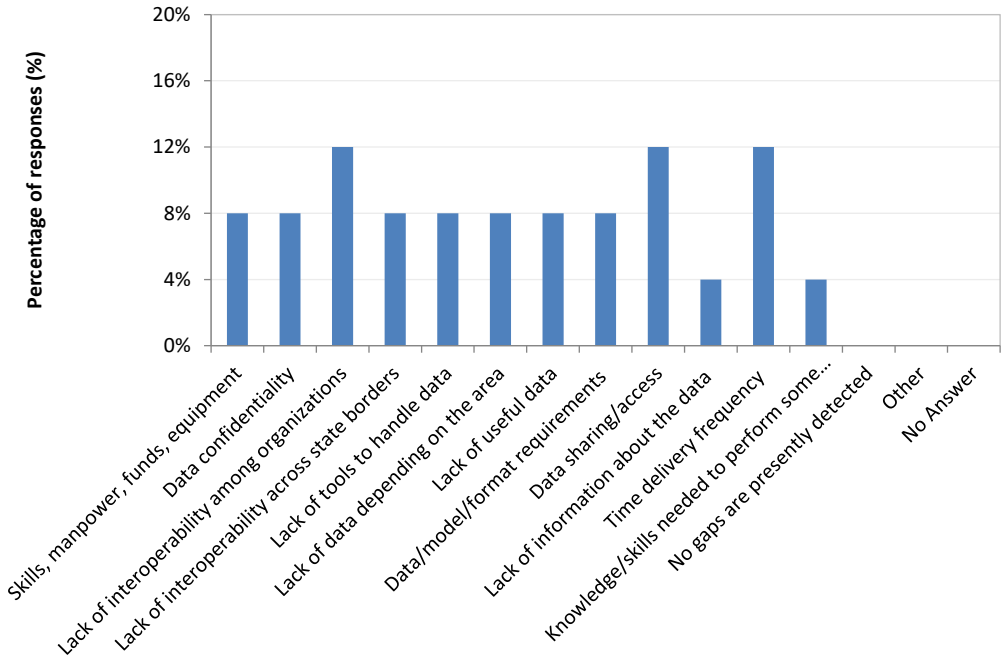
Project co-financed by the European
Regional Development Fund

Projet cofinancé par le Fonds
européen de développement régional

3. Gaps and issues identified in France

3.1 Description of the gaps

The stakeholders surveyed identified several gaps and limitations in their daily activities (FR Figure 8). The three main gaps identified, with 12% of the answers, included the lack of interoperability among organisations, the data sharing/access and the time delivery frequency. These results are in line with those reported in section 2.4.5 of the Global report.



FR Figure 8. Gaps and limitations highlighted by the batch of French stakeholders interviewed.

Other important reported gaps include, with 8% of the total answers each (FR Figure 8):

- Lack of skills, manpower, funds, equipment;
- Data confidentiality;
- Lack of interoperability across state borders;
- Lack of tools to handle data;
- Lack of data depending on the area;
- Lack of useful data;
- Data/model/formats requirements.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régiona

More details regarding the description of the gaps selected through the MED OSMoSIS survey were collected from EMM, DDTM, Shom and CoFGC and are presented in FR Table 6, FR Table 7, FR Table 8, FR Table 9.

FR Table 6. Gaps reported by the French Navy (EMM) and precisions from interviewee for each gap identified.

EMM – Gaps reported	Precisions indicated by the person surveyed
Data confidentiality	Some maritime data may be of a confidential nature in order to preserve the activities of a company or the security of military operations and cannot be disseminated to everyone.
Lack of interoperability among organisations	Lack of interconnection between the various European information systems.
Lack of interoperability across state borders	Lack of interconnection between the various European information systems.
Lack of tools to handle data	Absence of a global database hosting all maritime data.
Data/model/format requirements (resolution, format)	Lack of a data model globally applied and used by all users.
Data sharing/access	Absence of a global database hosting all maritime data; Restriction of access to certain data (e.g. LRIT[24]).

FR Table 7. Gaps reported by the DDTM and precisions from interviewee for each gap identified.

DDTM – Gaps reported	Precisions indicated by the person surveyed
Skills, manpower, funds, equipment	There are few agents with the capacity to exploit the data (research, analysis and output products). The skill is often held by a few people, with the risk of it disappearing when they move or retire.
Data sharing/access	There are numerous data producers and diffusion sites therefore entailing an ignorance of the sources; Data are not centralised and depend on the openness to dissemination of services.

[24] LRIT: Long-range identification and tracking system that allows a global identification and tracking of ships (source: https://www.imo.org/en/OurWork/Safety/Pages/LRIT.aspx).

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

FR Table 8. Gaps reported by the Shom and precisions from interviewee for each gap identified.

Shom – Gaps reported	Precisions indicated by the person surveyed
Lack of useful data	It is certain that we do not receive 100% of the information that could be communicated to us for the updating of nautical charts and books.
Lack of information about the data (metadata, purposes of the data)	Some data are shared to us without metadata (e.g. bathymetry).
Time delivery frequency (real-time, delayed ...)	Periodic actions are carried out by operators from the maritime world (e.g. dredging, bathymetry). The results are transmitted to us late, sometimes not at all.

FR Table 9. Gaps reported by the CoFGC and precisions from interviewee for each gap identified.

COFGC – Gaps reported	Precisions indicated by the person surveyed
Lack of data depending on the area	Data.Shom's nautical charts are limited to French approaches.
Time delivery frequency (real-time, delayed ...)	The AIS data is updated in a variable way depending on the MMIs* used.

*Man-machine interface

Furthermore, the EMM and the CoFGC have identified specific gaps related to the Maritime Surveillance data they use and/or produce. The description of the corresponding gaps is presented in FR Table 10.

FR Table 10. Gaps identified for the data used, reported by the EMM and the CoFGC.

Gaps related to the data used	Precisions indicated by the person surveyed
EMM	Need for global information (especially on the AIS flow) as well as access to the radar detections of all countries that make them available.
COFGC	It would be interesting to obtain "homogeneous" AIS data, complete ship information (number of people on board, cargo, etc.), information on the shipping company and the ship-owner updated according to the systems used.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

FR Table 11. Gaps identified for the data produced by the EMM.

Gaps related to the data produced	Precisions indicated by the person surveyed
EMM	Lack of interoperability with partner information systems (CISE, MARSUR, etc.).

4. Platforms and Geoportals for France

The French stakeholders interviewed were asked to list the existing geoportals handling the data related to Maritime Surveillance and/or navigation safety activities. Only half of the participants provided information on this type of platforms. This confirms that very few geoportals are available and used in France for Maritime Surveillance activities. This feature is consistent with the results presented in section 2.4.6 of the Studying field report.

More details were collected regarding the national geoportals already implemented. They are listed in FR Table 12. Some geoportals are accessible to the public such as Geolittoral or Geoportail (IGN) whereas others are used for confidential purposes (e.g. MINARM, SPATIONAV). SPATIONAV integrates AIS and RADAR data.

FR Table 12. List of French data portals related to Maritime Surveillance activities and their web access (when provided).

Organism	Geoportal	Description / URL
EMM	Yes	On the Ministry of the Armed Forces internal network, there is an internet web portal provided with limited access to authorised users / internal MINARM
MTE	Does not know	-
DDTM	Yes	Géolittoral http://www.geolittoral.developpement-durable.gouv.fr/sommaire.php3
Shom	Does not know	Datashom does not cover all this, and neither does the IGN's Geoportal (https://www.geoportail.gouv.fr/).
DAM	Does not know	-
COFGC	Yes	SPATIONAV: this geoportal integrates AIS and RADAR data.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

6. Conclusion and recommendations

This in-depth analysis shows how governance and decision-making are structured in France for the Maritime Surveillance and navigation safety activities. The report highlights the complexity of French governance and the multitude of stakeholders involved, which can explain the difficulties encountered for the collection of answers through the MED OSMoSIS survey.

This complex organisation also explains why interoperability among organisations, data access & sharing, and access to up-to-date data are raised as main reported issues.

Exchange and communication between sea user communities, the selection of a common data model to be used at both national and international levels, and adherence to the CISE programme, seem to be essential steps to close the gaps identified.

In France, Shom is highly committed with improving interoperability of data at both national and international levels. Nationally through the study, testing and recommendation intended for French authorities for a data model (EMODnet) in the framework of the European project MSP MED, the compilation and sharing of data on a dedicated geoportal, the development of PING applications or A strong involvement in the CISE programme, within the MEDOSMoSIS project.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Glossary

AEM	State action at sea / *Action de l'Etat en mer*
APB	Lighthouse and beacon service / *Armement des phares et balises*
BF	Fluvial Brigade / *Brigade fluviale*
BN	Nautical Brigade / *Brigade nautique*
CNSP	National Fisheries Surveillance Centre / *Centre National de Surveillance des Pêches*
CACEM	Support Centre for the Monitoring of the Marine Environment / *Centre d'appui au contrôle de*
CoFGC	Coast Guard Function Operational Center / *Centre opérationnel de la fonction des gardes-côtes* /
COD	Customs Operationnal Centre
COG	Gendarmerie Operational Centre
COM	French Navy's Operational Command Centre
CROSS	/ Operational Surveillance and Safety Regional Centre / *Centre Régional Opérationnel de Surveillance et de*
CTC	Crisis Management Center
CZM	Maritime Zone Commander / *Commandant de Zone Maritime*
DAM	Directorate of Maritime Affairs
DDTM	Departmental Directorates for Territories and Sea / *Directions Interrégionales de la Mer*
DGA	Directorate General of Amaments
DGDDI	French Customs French Customs and indirect taxation authorities
DGGN	Directorate General of National Gendarmerie
DGPN	Directorate General of National Police
DIRM	Interregional Directorates for the Sea
DML	Delegation for the Sea and Coast
DNGCD	Customs Coast Guard National Directorate
DPMA	Directorate of Marine Fisheries and Aquaculture
DRGC	Coast Guards Regional Directorate
EEZ	Exclusive Economic Zone
EMA	French Military Staff / *Etat major des Armées* /
EMM	French Navy Staff / *Etat major de la marine*
IMO	International Maritime Organisation
LEGICEM	CACEM's Reference website
MED	Mediterranean governance for Strategic Maritime Surveillance and Safety issues project
MEFR	Ministry of the Economy, Finance and the Recovery
MEMN	East Channel and North Channel area
MI	Ministry of the Interior
MRCC	Marine Rescue Coordination Centre
MSFD	Marine Strategy Framework Directive
MSPD	Maritime Spatial Planning Directive
MTE	Ministry of the Ecological Transition
NATO	North Atlantic Treaty Organisation (also called North Atlantic Alliance)
NAMO	North Atlantic and West Channel area
MED	Mediterranean area
PREMAR	Maritime Prefectures
SA	South Atlantic
SAR	Search and Rescue

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

SGA	Secretary General for Administration
Shom	French hydrographic and oceanographic service
SNSM	French National Marine Rescue Company
SPATIONAV	French Navy surveillance system
SSCAM	Surveillance and Control of Maritime Activities Service
UAP	Port Activities Unit
UCS	Control and maritime Security Unit
ULAM	Maritime Affairs Coastal Unit

FIGURES

TABLES

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

GREECE

1. Focus on the governance of Maritime surveillance activities

1. Maritime border policing

This includes in particular:

a. the adaption of measures for policing and controlling of maritime borders to deal with illegal immigration and the cooperation with other national competent authorities and services.
b. the participation and cooperation with competent services of the European Union, third countries and international organizations aiming and planning and implementation of joint operational activities regarding the fight against illegal immigration and the protection of country's maritime borders, as well as the participation of the Hellenic Coast Guard in similar actions planned by other member states of the European Union.
c. prevention and combating of any other illegal activity.

The **Integrated Maritime Surveillance Bureau (IMSB)** is, mainly, the communication and cooperation contact point of the Hellenic Coast Guard (HCG) with the European Border and Coast Guard Agency (Frontex) as well as the organization that monitors the financial possibilities related to actions for surveillance and situational awareness in the maritime field. In order to achieve this goal, IMSB operates cross-sectorally and in collaboration with other competent Directorates, in order to achieve a high level of integration into the structures and procedures of the HCG.

Particularly, it covers the need for horizontal coordination of the actions and perspectives of the Hellenic Coast Guard but also their connection with the wider European environment. The previous acquires a key-role, especially when taking into account a number of important challenges that the Hellenic Coast Guard is called to manage, which consist mainly of:

a) The implementation of the new European Border and Coast Guard Regulation
b) The planning and implementation of the national program of the newly established Internal Affairs Funds in the new multiannual financial framework 2021-2027 and in particular of the Integrated Management Fund
c) The implementation of the National Integrated Maritime Surveillance System (NIMSS)

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The **Operations Directorate** plans, coordinates, conducts and monitors operations throughout the scope of the mission of H.C.G., including those to respond to maritime search and rescue incidents, applying any relevant Crisis Management System and taking care of issues of armament of H.C.G., through its following departments:

a) Search-Rescue Operations Department
b) Operations-Missions Department
c) Planning, Special Units and Armament Department

The **Operational Means Directorate** is responsible for the organization, the operation, the preparedness, the equipment and the provision of technical support to its naval and vehicle operational means and it also supervises the Aerial Means & Rescue Liaisons Unit through its relevant departments:

a) Department of Vessels-Crafts
b) Department of Vehicles
c) Department of Aerial Means & Rescue Liaisons Unit
d) Department of Repair Bases

The **National Coordination Center for Border Control, Immigration and Asylum**

In accordance with Regulation (EU) No 1052/2013 of the European Parliament and of the Council of 22 October 2013 concerning the establishment of the European Border Surveillance System (EUROSUR), in particular, the exchange of information in the field of border surveillance within Eurosur, each Member State operates and maintains a National Coordination Center, which coordinates and exchanges information with the responsible Authorities for external border surveillance at national level as well as with other coordinating centers and Frontex (EBCG).

According to Law 4058/2012, as amended and replaced by Law 4249/2014 (Articles 101-103), our country, in compliance with the aforementioned Regulation, established the National Coordination Center for Border Control, Immigration and Asylum (N.C.C.B.C.I.A.), with main task the coordinating of actions of all the agencies at national level on issues of immigration and asylum.

The N.C.C.B.C.I.A. is an independent service directly subordinated to the Minister of Citizens' Protection and is the "National Coordination Center" within the meaning of the above regulation,

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

which implements the national border surveillance system and exchanges information among all the competent Member States authorities and Frontex (EBCG).

Administrative structure (N.C.C.B.C.I.A.)

1. Department of Administrative and Coordination.
2. Department of Analysis and Documentation.
3. Department of Education, Development and Technology.
4. Department of Strategic Planning.
5. Department of International Relations.

2. Public and State Security

The exercise of public security includes in particular:

1. The prosecution of crimes against life, personal liberty and property rights.
2. The suppression of the illicit trafficking of antiquities, works of art and cultural goods.
3. Searching and arresting persons who have been prosecuted.
4. Searching for persons who have been disappeared and objects which have been lost or stolen.
5. Collection and utilization of information related to issues of public security department.
6. Cooperation and exchange of information with co-competent national, foreign and international, organizations and Law Enforcement Services, on issues of public security.

The exercise of state security includes in particular:

1. Protecting the State and its Democracy from any undermining acts.
2. Preventing and tacking acts of violence and terrorism.
3. Keeping in Force current legislation concerning trafficking of weapons and explosives.
4. Collecting and utilizing information related to issues of State security and national interest in general.
5. Taking measures to present and encounter incidents of piracy in ships in area of responsibility.
6. Cooperating and exchanging information with co-competent national, foreign and international organizations and Law Enforcement Agencies, on issues of State security.

The responsibilities of the Hellenic Coast Guard also include the prevention and suppression of crime, especially organized crime, which includes the exercise of public and state security.

The **Drugs & Contraband Enforcement Directorate** ensures the prosecution of drug and fiscal crime felonies, in the areas of H.C.G. jurisdiction and coordinates, supports and supervises the task of

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

the Regional Services of H.C.G., in the investigation of cases of its competence, through the following Departments:

a) Drugs Enforcement Department
b) Contraband & Fiscal Crime Enforcement Department
c) Intelligence Analysis and Support Department

The **Security and Sea Borders Protection Directorate**, through the search, collection, analysis and exchange of information and through police cooperation in matters of public, state security and national interest in general, takes care of handling crime, especially organized crime, delinquency and acts of violence and terrorism in the areas of responsibility of H.C.G. It is competent authority for monitoring the application of provisions concerning the movement, stay and work of foreigners in the country and in particular the management of illegal migration. Takes care for the supply of appropriate means and logistical equipment to fulfil its mission. Coordinates, supports and supervises the work of the Regional Services H.C.G, during the investigation of cases in its competences, through the following Departments:

a) Public Security Department
b) State Security
c) Sea Borders Protection Department
d) Operational and Strategic Analysis Department

3. Protection of the marine environment

The **Marine Environment Protection Directorate** supervises, monitors and coordinates the Port Authorities for the prevention and fight against pollution of the sea and the coasts, ensures the strengthening and modernization of the available means and materials for the fight against pollution both in Ports and in general, ensures continuous training of H.C.G. staff in matters within its competence and monitors and participates in the work of international organizations and the EU in matters of protection of the marine environment through the following Departments:

a) Pollution Incident Prevention -Treatment Department

b) Technical Means Department

c) International Cooperation Department

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The preservation and protection of the natural environment is an issue that seriously concerns all the people and Governments of the planet. In particular, the pollution of the liquid element, caused by the human factor, is a great danger for our planet. Greece, a predominantly maritime country, has been sensitized for many years and is fighting its own battle against marine pollution. But Greek citizens, especially those who live and work at sea, are well aware of the importance of its protection for the future and prosperity of this country.

For Greece and the Aegean Sea in particular, with the many sea routes with particularly dense passage of ships, the large number of islands, the unique natural beauties, the invaluable cultural heritage and the great tourist interests, the effective protection of the marine environment is a goal of high priority.

In Greece, the care for the protection of the environment in accordance with the provisions of article 24 of the Constitution, is a fundamental obligation of the State.

In the context of the above Constitutional requirement, the responsibility for the prevention and protection of the marine environment has been assigned primarily to the Directorate of Marine Environment Protection of the Hellenic Coast Guard, which is aware of the above conditions and considering the protection of the sea and coastline is not only the responsibility of modern man directly related to the quality of life and economic development in general, but an essential condition for the smooth living and development of future generations, takes all necessary preventive and repressive measures for the most complete and effective addressing marine environmental protection issues.

4. Control of fishing activities

Fishing is one of the earliest human activities. It is an important part of the Greek economy and especially for the islands that depend heavily on this activity.

Fishing includes both recreational and professional activities. Due to the uncontrolled exploitation of natural resources the fisheries sector frequently struggles with difficulties. In order for these challenges to be dealt with strict measures have been adopted to protect fisheries at national, European and international level. The Hellenic Coast Guard monitors and enforces compliance with fisheries legislation in its area of jurisdiction by carrying out inspections on fishing vessels, vehicles transporting fishery products and points of sale / organized installations of fishery products (fish auctions).

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The fisheries monitoring center (FMC) operates 24 hours per day and it is based at the Fisheries Control Directorate/Department of Fishing Control Applications & Fishing Vessels Monitoring.

Its task is the monitoring, control and surveillance of vessels equipped with vessel monitoring system (VMS).

The FMC, inter alia, carries out controls to detect and prevent illegal fishing activities and if necessary, may engage operational means of the regional Port Authorities»

5. Safety of Navigation

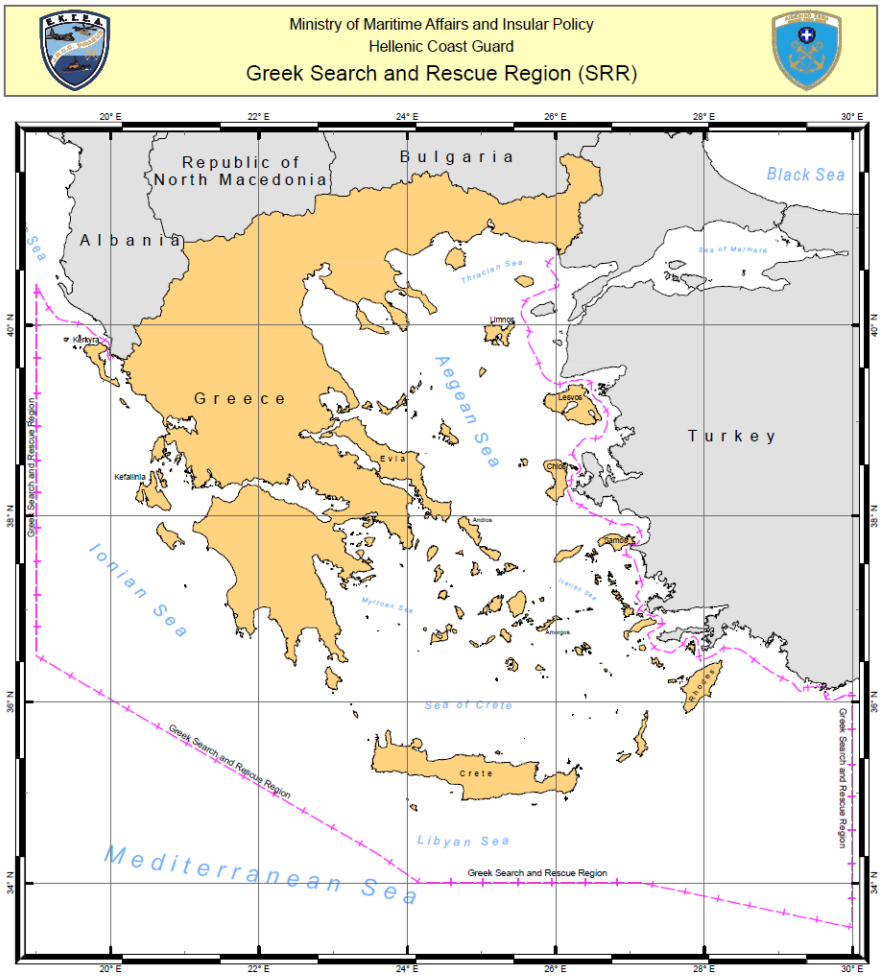
The Safety of Navigation Directorate of the HCG is responsible to determine the terms and conditions regarding the safety of life and property at sea, the establishment of the national regulatory framework on maritime safety issues including also technical aspects concerning the construction and the equipment of the ship, the adaptation of the national law to the EU legislation and the International conventions ratified by Greece, the organization and monitoring of quality control inspections on Greek - flagged ships, as well as foreign - flagged ships which call to Greek ports, according to the Paris Memorandum Of Understanding procedures, as well as the recognition and the authorization of the Recognized Organizations, the administrative investigation of the marine casualties, the promotion and the coordination of the activities dealing with international matters related to the maritime safety. It also plans, develops, and implements the legislative framework on maritime safety domain. It also organizes the operational function of the vessels' traffic monitoring systems (VTS, VTMIS), as well as the systems of coastal surveillance that the Hellenic Coast Guard makes use and finally it has been assigned to develop the Maritime Single Window.

6. Search and rescue

The protection of human life at sea and the provision of assistance to any person in danger, constitute the highest professional and moral obligation of the Hellenic Coast Guard, which is responsible for the coordination of search and rescue (SAR) in the maritime area of responsibility of Greece, cooperating for this purpose with the General Staffs of the Hellenic Navy and Hellenic Air Force.

Greece has a coast line of over 18.400 km with more than 9.800 islands, islets and skerries, over 1,350 bays and inlets, 160 straits and sea channels, 520 ports and a total Search and Rescue region of 1,150,000 km^2. Over 125.000 ships per year pass through the Search and Rescue region of our responsibility, the majority of which are fishing vessels and yachts. Furthermore, as known, our country is in the crossroad of three continents.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



GR Figure 1 Search and Rescue Region (SRR) map

In particular, the coordination of SAR incidents within the Greek Search and Rescue Region (SRR), which coincides with the FIR ATHINAI, is provided by the Joint Rescue Coordination Center (JRCC) of Piraeus on a 24/7 basis, located at the Headquarters of H.C.G and is staffed by specialized personnel of the H.C.G and the Hellenic Air Force. The Joint Rescue Coordination Center (JRCC), is the single national operational center for the coordination of SAR incidents within the Hellenic Search and Rescue Region (SRR) and operates based on the procedures and recommendations set out by IMO and specifically the IAMSAR Manual.

JRCC activities are assisted, as required, by five (05) Maritime Rescue Sub Centers within the Hellenic SRR, namely the MRSCs of PATRA, CHANIA, RHODOS, MYTILINI and THESSALONIKI.

Distress and safety communications are monitored and coordinated via the Coastal Radio Station (CRS) of OLYMPIA Radio, which is privately operated by OTE, and consists of four sub-networks covering the four Sea Areas (universal sea coverage), on behalf of the HCG, under the provisions of a contractual agreement. Operations comply with the IMO standards and include in general:

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

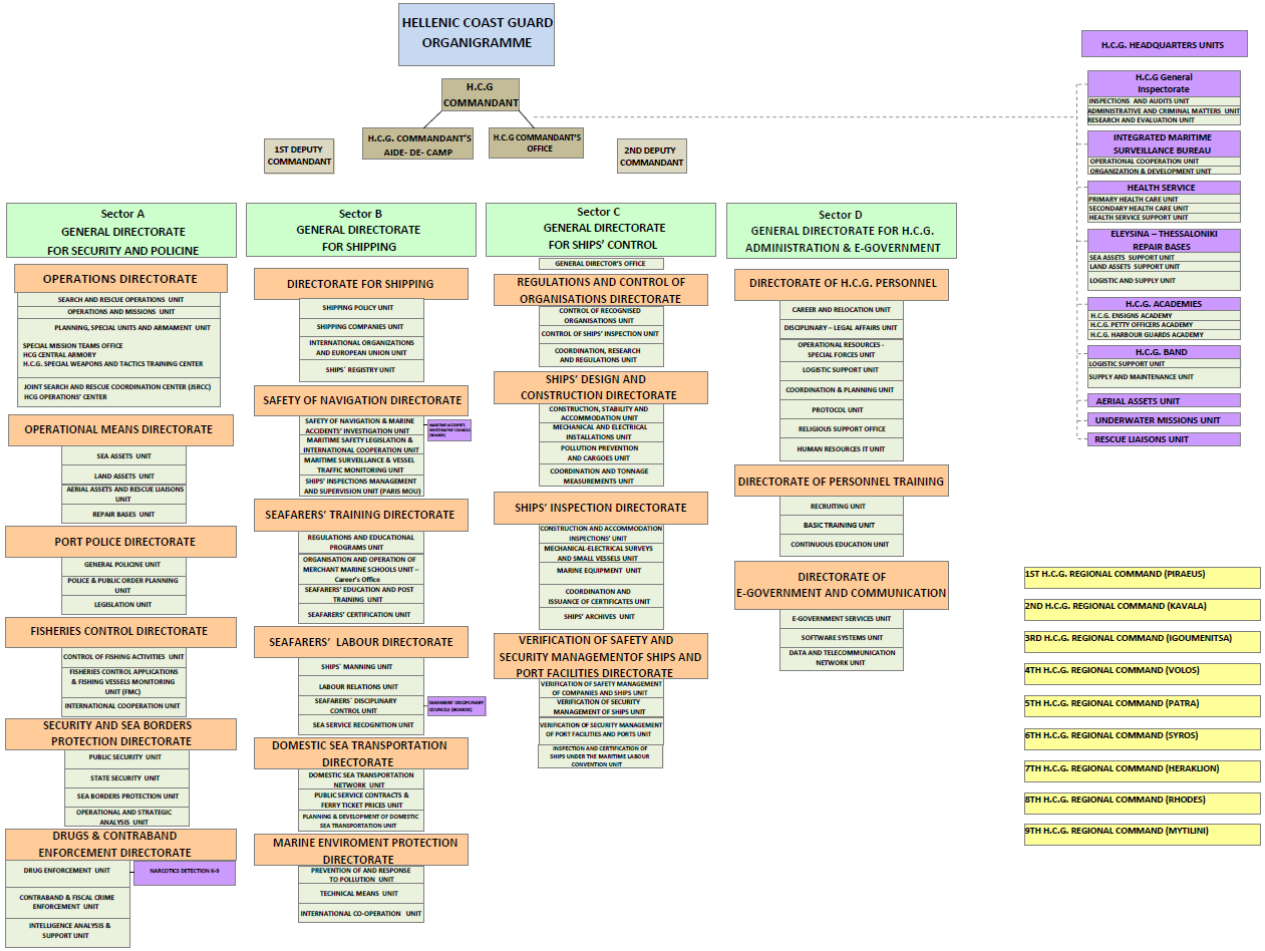
uninterruptible watch-keeping in international distress frequencies, exchange of Distress and Safety voice and data information, GMDSS bulletins (maritime safety information broadcasts, weather warnings, medical info, etc.). Special arrangements are also in place to provide Telemedical Assistance Services (TMAS) to seafarers, via OLYMPIA Radio CRS. Additionally, the HCG operates additional CRSs (JRCC Piraeus and ASPROPYRGOS Radio), for operational, as well as distress communications, as a backup to the OLYMPIA Radio CRS. All relevant GMDSS infrastructure information is regularly communicated to IMO for updating of the "GMDSS MASTER PLAN".

The HCG is also a Ground Segment Provider for COSPAS-SARSAT distress alert signals, operating a Mission Control Centre (GRMCC), with the associated GEOLUT, LEOLUT and MEOLUT stations.

The HCG remains in close cooperation domestically with all responsible Authorities and governmental bodies, such as the Hellenic Navy and Air Force, the Fire Service, the Hellenic Police, the General Secretariat for Civil Protection, the National Center of Emergency Care, etc. In this regard the contribution of the Hellenic Armed Forces has proven to be crucial, taking into account that the Hellenic Navy is providing surface and aerial assets and the Hellenic Air Force is providing aerial assets, to increase our Search and Rescue capacity. Cooperation with the private sector is also encouraged on a local level, where the Local Coast Guard Authorities issue SAR contingency plans, documenting all pertinent information for SAR response and crisis management (including, but not limited to: volunteer network, municipal infrastructure, local Unions and Associations, etc). The HCG has set up the necessary arrangements, in accordance with SOLAS regulation V/7.3, for the establishment of plans for cooperation between passenger ships and SAR services, taking measures to provide guidance to relevant stakeholders, perform periodic exercises, as well as to ensure the enforcement of the relevant provisions.

In the context of the efficient use of available resources in a SAR Operation, the H.C.G operations are conducted by various types of vessels (Offshore Patrol Vessels, Patrol Vessels, Antipollution Vessels, Multipurpose ships) and various types of patrol boats (coastal patrol boats, high-speed patrol boats, S.A.R. boats, tenders), various types of motorcycles and vehicles with surveillance equipment, aerial means of H.C.G. (Aircrafts and Helicopters), and Special Forces of H.C.G for operations during the day and night on a 24/7 basis.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



GR Figure 2 HCG Organization Chart

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

7. Meteorological services

The Hellenic National Meteorological Service (HNMS) provides Met-Ocean Maritime Safety Information (MSI) and marine weather services by:

a) promulgating marine warnings and forecasts for ports and coastal waters,

b) providing specific assistance to authorities responsible for Search and Rescue, and

c) providing specific assistance to authorities responsible for Marine Environmental Emergency Response (e.g. oil spills, floating objects etc).

For the GMDSS is "Issuing Service" for the METAREA-3 being responsible for dissemination of Meteorological Warnings and Forecasts through EGC services. Also is "Preparation Service" for METAREA-3 (E) and Meteo-France is Preparation Service for METAREA-3 (W).

For the IMO/WMO World Wide Met Ocean Information Warning Service (WWMIWS), is METAREA-3 Coordinator charged with coordinating marine meteorological information broadcasts by other services acting as Preparation or Issuing services within METAREA.

HNMS has established a lot of European and international co operations in order to improve its services to the interested parties and also to contribute to the development of the meteorological services at European and international level. HNMS represents Greece in all the following international organizations: WMO, ECMWF, EUMETSAT, EUMETNET, ECOMET, IMO, IHO, ICAO, NATO.

HNMS maintains ship meteorological stations under the WMO's Voluntary Observing Ship (VOS) Scheme and promotes the above programme by encouraging deck officers to carry-out weather observations awarding them for their contribution to meteorological community. Data collected from these stations are of vital importance, in real time, for marine forecasting and further maintained in HNMS's Data-Base provide the basis for research on marine climatology and change.

8. Hydrographic services

The Hellenic Navy Hydrographic Service (Ministry of National Defense) is the national competent authority with exclusive jurisdiction and certification for the editing, issuance, completion and correction of the official nautical charts of Greece and their updates, as well as for issuing, completion and correction of official maritime publications.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

The Safety of Navigation Division of the Hellenic Navy Hydrographic Service is responsible for the promulgation of navigational warnings and dangers to navigation through the NAVTEX system (coastal warnings) and the NAVWARNS broadcast voice system (local and coastal warnings).

The establishment of the NAVTEX System in Greece, has been agreed, in common, by the International Organizations IHO (International Hydrographic Organization) and IMO (International Maritime Organization) (IMO Sub-Committee on Radio Communications - 31st session - COM/31/5/4//13 Mar 1986 and IMO MSC 54 - COM/circ. 99//8 May 1987) and is a part of the Global maritime Distress and Safety System (GMDSS), which is developed inside IMO framework. The Greek NAVTEX Service belongs to the Mediterranean area NAVAREA III, whose coordinator is the Spanish Hydrographic Service. For the implementation of NAVTEX International Service in Greece three (3) stations have been founded, after IMO approval, IRAKLEIO, KERKYRA, LIMNOS, each one serving a specified sea area. Emissions are made by NBDP telegraphy on frequency 518 kHz in English language as well as on the 490 kHz and 4209,5 kHz frequencies in Greek language. On the occasion where HNHS considers necessary the wider dissemination of a navigational warning, they forward it as NAVHELLEN to coordinator NAVAREA III (SPAIN), which has been appointed as the responsible for dissemination of Navigational warnings for the entire Mediterranean – Black Sea area.

HNHS has assumed the role of coordinator for the collection, processing and transmission, for further message emission by the NAVTEX stations that concern the Greek seas, with competent services the Hellenic National Meteorological Service (HNMS) and the Hellenic Coast Guard (HCG).

Exceptional Stormy Winds or Storm Forecasts are emitted immediately after their issuance.

Other means of broadcasting navigational warnings and dangers to navigation (coastal and local warnings) are the NAVWARNS.

NAVWARNS are not printed and are not distributed as Notices to Mariners do, but, due to the emergency of situation, are been transmitted via Radio telephony.

Hydrographic Services provided by Hellenic Navy Hydrographic Service.

The HNHS in order to fulfil the requirements that derive from SOLAS regulations V/4 and V/9 conducts hydrographic surveys, produce nautical charts and publications for mariners and broadcasts Maritime Safety Information (MSI) for the safety of navigation. More specifically:

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Hydrographic Surveys

HNHS performs hydrographic surveys for producing, updating official Greek navigational charts and publications, and for the account of third parties (local port authorities and various public entities). During the surveys geospatial data collection like navigational hazards, obstacles, bathymetry, coastline topography, currents, seabed composition etc. are been collected. The latter is being achieved by facilitating three suitably equipped vessels, three hydrographic launches and numerous of expertise (hydrographers, oceanographers, topographers, specialized scientific and technical, military and civilian staff). The survey vessels are equipped with permanently installed, integrated hydrographic systems, comprising by the following:

- Precise Positioning System (GNSS)
- Multi beam Echo sounder
- Single beam Echo sounder
- Sound Velocity Profiler
- Side Scan Sonar
- Sub Bottom Profiler
- Topographic Survey Equipment
- Grab Sampler & Core Sampler
- Nisk in Bottle
- Conductivity Temperature Depth
- Thermosalinograph
- Current Meters
- Underwater Cameras

Subsequently, data processing takes place, where necessary reductions are made to map reference levels by facilitating the National Tide Gauge Network. Appropriate corrections are implemented and quality control is performed. Finally, a hydrographic first sheet in analogue and digital form is prepared, which is used to produce and update the final products of the HNHS. These data sheets are been archived to the Maritime Geospatial Information System (MGIS) for any future use.

All works and data processing are carried out in line with the technical guidance and specifications of the International Hydrographic Organization (IHO). Such specifications have been incorporated in the standing Hydrographic Directives given to the Hydrographic Survey Teams.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Nautical Charts & Publications

a. The official Electronic Navigational Charts (ENCs) of Greece which are in compliance with the S-57 Ed 3.1 standard of the International Hydrographic Organization (IHO). These charts are intended for professional Electronic Chart Display Information Systems (ECDIS). ENCs for ECDIS are made available encrypted with IHO S-63 standard. They can be used by any other non-ECDIS system that can read S-63 encrypted S57 Ed. 3.1 data (ECS systems). The Greek ENCs are updated monthly and delivered to the mariners through the IC-ENC. The current folio of the Greek ENCs consists of 303 ENCs covering Greek waters.

b. Greek Paper Nautical Charts (XEE), which are in line with IMO's Safety of Life at Sea (SOLAS) provisions and with IHO's S-4 standard. HNHS's paper charts are suitable for both professional use (by vessels not required to use ECDIS), and recreational shipping (leisure boats).HNHS updates monthly the Greek paper charts by issuing the Notices to Mariners (NtM) publication. The current folio of the Greek paper charts consists of 152 National and 34 International (INT) charts.

c. Nautical Publications

(1) **Catalogue of Nautical Charts & Nautical Publications**

The aim of the catalogue is to provide information to the mariners and to all those who navigate the Greek seas about the Nautical charts and Publications of the Hellenic Navy Hydrographic Service

(2) **List of Lights of Hellenic coasts**

The List of Lights is published in cooperation with the Hellenic Navy Lighthouse Authority and includes information lighthouses, lights and floating lights of the Greek coasts. The List of Lights is based on regulations of the International Hydrographic Organization and the International Association of Lighthouse Authority.

(3) **Notices to Mariners (monthly edition)**

The HNHS Notices to Mariners (NtM) monthly edition includes all the newest information regarding the:

- New nautical charts and nautical publications.
- Correction of nautical charts
- Correction of List of Lights
- Correction of Sailing Directions (Ploigos)

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- Correction of the rest of HNHS nautical publications
- Permanent Notices to Mariners (annual edition)

Notices to Mariners give important information on a permanent basis, concerning the Hellenic sea area and the most important shipping lines of the Mediterranean, and, due to their importance, are repeated annually.

(4) **Sailing Directions of Hellenic coasts (Greek Edition)**

Sailing Directions (Ploigos) is an indispensable supplement of nautical charts. Ploigos, gives detailed descriptions of coasts, dangers and ports. In addition, it gives detailed instructions about sailing into bays, ports, straits and channels and all the information needed for a safe trip. There are 4 volumes of Sailing Directions available in Greek language which are kept updated through relative amendments.

(5) **Sailing Directions of Hellenic coasts (English Edition)**

Sailing Directions (Ploigos) is an indispensable supplement of nautical charts. Ploigos, gives detailed descriptions of coasts, dangers and ports. In addition, it gives detailed instructions about sailing into bays, ports, straits and channels and all the information needed for a safe trip. There are 3 volumes of Sailing Directions available in English language which are kept updated through relative amendments.

(6) **Sailing Directions of Hellenic coasts (amendments)**

Amendments of the above-mentioned Sailing Directions publications.

(7) **XEE 64 (INT1 Hellenic version)**

XEE 64 contains Symbols, Abbreviations and Terms used in HNHS Paper Nautical Charts. It is based upon the Chart Specifications of the International Hydrographic Organization.

(8) **Sea Level Statistics**

HNHS Sea Level CD includes statistical sea level data derived from a long-term recording process monitored by HNHS tide gauge network. Sea Level Statistics are available only in digital form and in Greek language

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Safety of Navigation

The HNHS safety of Navigation Division has the mission of informing seafarers about the dangers lurking in the sea when sailing in the HNHS area of responsibility. The main activities are as follows:

- Constantly inform seafarers by transmitting special navigational warnings and NAVTEX messages via the NAVTEX Service and navigational warnings to seafarers in cooperation with the Coast Guard, the National Meteorological Service, and the Hellenic Telecommunications Organization as part of the Global Maritime Distress and Safety System (GMDSS).
- Publish nautical publications (Monthly and Annual issue of Notices).
- Determine sea routes, channels, straits and natural harbors.
- Conduct maritime design for the installation by the Lighthouse Department and other agencies, of lighthouses, beacons, buoys, etc.
- Keep records of wrecks, dirty seabed and buoys for Greece's maritime space.
- To represent the country at the International Maritime Organization and the International Hydrographic Organization, on matters related to its remit.
- Monitor and coordinate issues related to education, information and training of the HNHS staff

It is also actively involved in general and specific issues relating to the safety of navigation, such as:

- Port or other technical projects to be constructed in coastline areas and in the sea.
- Unauthorized works built without permit or beyond the terms of an existing permit in the same area, and complaints about such illegal activities.
- Concession - rental of marine areas to install and operate aquaculture units.
- Concessions for use of seashore and beach areas, as well as terrestrial zones of ports.
- Granting permits for sand extraction.
- Installations of tanks for oil/oil derivatives in seashore - beach areas.
- Drafting - updating of mile distances between Greek ports; calculating mileage as requested by various agencies and bodies.
- Making proposals on matters relating to laying power (PPC) cables, telecommunications (OTE) cables and various pipes on shorelines.
- Issuing opinions on the creation of waterways, determining operational areas for sea wind parks and diving centers.
- Issuing opinions on the method of marking marine risks, channels and straits.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The **Hellenic Navy Lighthouse Service** is the competent Authority for the installation, maintenance repair and supervision of any navigational aids, within the framework of Law 4278/2014. Furthermore, it is responsible for forwarding information on navigational aids to Hellenic Navy Hydrographic Service (HNHS) in order to issue the relevant Maritime Information Note.

Pursuant to Law 4278/14, the relevant procedures for the overall operation of the lighthouse network are regulated by the Hellenic Navy Lighthouse Service, such as the establishment and operation, installation, maintenance/repair, replacement/removal of torches and operating supervision. This Law provides for the installation, maintenance, repair and supervision of any navigational aid. Also, information on navigation aids is forwarded to Hellenic Navy Hydrographic Service by the Hellenic Navy Lighthouse Service, in order to issue the relevant Maritime Information Notice.

The Hellenic Coast Guard takes the appropriate measures in co-operation with the Hellenic Navy Hydrographic Service and the Hellenic Navy Lighthouse Service (Hellenic Navy General Staff/Ministry of National Defense) as well as with the administrative bodies of the Port Authorities. Relevant information to these is promulgated via Hydrographic Service (Hellenic Navy General Staff/Ministry of National Defense) by:

a. Publishing and distributing nautical charts, special naval charts and nautical publications.
b. Issuing of Notices to Mariners for the updating of the charts and other nautical publications
c. Issuing and promulgating of Radio Navigational Warnings.
d. Issuing NAVTEX bulletins via OLYMPIA RADIO CRS, in collaboration with the Hellenic Mercantile Marine and the National Meteorological Service.

Furthermore, the local Coast Guard Authorities notify immediately the Hellenic Navy Lighthouse Service as well as the Hellenic Navy Hydrographic Service in case where a new situation (such as buoy detachment or collection, extinguishing or lamp reset) cancels a relevant notice and requires the issuance of a new one.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

2. Focus on the gaps identified

The protection of human life at sea and the provision of assistance to any person in danger, regardless of ethnicity, race or other factors that may have led them to a distress situation, constitute the highest professional and moral obligation of the Hellenic Coast Guard, which is responsible for the coordination of search and rescue (SAR) in the maritime area of responsibility of Greece, cooperating for this purpose with the General Staffs of the Hellenic Navy and Hellenic Air Force.

For our country, one of the main challenges on a daily basis is consisted of mixed migration flows by sea, of people who, in majority, pass through our country with other European countries as their final destination. The illegal passage of mixed migration flows from the Hellenic maritime borders is conducted from the beginning of the '90s and has become more intense during the past decade, during which our Country has become the recipient of forceful migration pressure in its external sea borders.

In the context of the current phenomenon of massive displacement of populations, the role of the Hellenic Coast Guard was significantly highlighted as a well competent governmental institution for safeguarding external sea borders resulting to the promotion of EU internal security. **In light of the above, enormous effort is being relentlessly carried out by the Hellenic Coast Guard for ensuring situational awareness at the frontline and the implementation of prompt and tailored response measures, via a dense network of intelligence driven patrolling activities.** These activities are aligned with the Hellenic Coast Guard's statutory EU responsibilities and are delivered in full respect of the international fundamental rights regime, with remarkably and world-wide recognized humanitarian results in terms of rescued migrants/ refuges at sea. In this regard, the Hellenic Coast Guard internationally cooperates with the respective EU and other institutions for the dismantling of smuggling networks as well as is in close cooperation with Frontex, in terms of operational activities at the eastern Aegean frontline aiming at the enhancement of existing reaction capacities.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Summary on the main concept of the Development of the National Integrated Maritime Surveillance System (NIMSS)

A. Challenging area of responsibility and scope of the Project:

The Hellenic Coast Guard (HCG) is a law enforcement corps created in 1919. It is currently under the auspices of the Ministry of Maritime Affairs & Insular Policy. It has a wide multi-purpose mandate combining the coastguard functions of all-three relevant European Agencies FRONTEX, EMSA and EFCA.

The HCG has under its responsibility a wide Search & Rescue Region (SRR) of over 1.150.000 km^2 comprising a coastline of over 18.400 km and around 9.000 islands and islets. This huge maritime area of jurisdiction is located on the crossroad of 3 continents, which leads to a high density of maritime traffic and conditions facilitating all kind of smugglings. Moreover, it is in close proximity to conflict areas, which implies incoming migratory flows. The operational difficulties increase even more with the harsh weather conditions (strong winds) prevailing in the area during the whole year.

Since the beginning of August 2012, Greece is experiencing an exponential increase of migratory flows crossing, in an unauthorized manner, the external maritime borders of the Union in the Eastern Aegean Sea. The situation became all the more critical in 2015 as the number of detected Third Country Nationals (TCNs) reached unprecedented levels, the highest recorded since World War II, culminating to over 860.000 persons in about 7.000 incidents.

As a consequence of this phenomenon's intensity, depicted not only by the frequent detections of unauthorized maritime border crossings but also from the dispersion of the incidents over geographical and time dimensions as well as the significant number of people at risk, it is crucial to maintain increased surveillance activities in the Union's southeastern external maritime borders, to avert human tragedies at sea.

Against this background, it is necessary for the HCG to constantly deploy all its available resources. Independently from the actual migratory flows, the HCG maritime fleet is constantly patrolling to its maximal capacity covering every year around 650.000 Nautical Miles performing between 80.000 and 90.000 patrolling hours leading to a consumption of about 7,5 M lt of fuel.

In view of the above, the scope of the development of the NIMSS is the early Maritime Domain Awareness within Hellenic Coast Guard (HCG) area of jurisdiction through real-time and on 24/7 basis surveillance.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

B. NIMSS structure:

In order to achieve its scope, the NIMSS will be composed of:

- 35 Fixed surveillance stations within military premises for their better protection and in order to use existing infrastructure. Each station will include Radar, AIS, meteo station, VHF transceiver and electro-optical sensor in 26 selected locations.
- 2 mobile stations with identical capabilities mounted on off-road truck serving as back-up in case of failure of fixed station or gap-filler.
- 1 Command & Control Center within HCG premises in Piraeus
- 1 Full back-up C2 Center in military premises
- C2 software fusing all the available information
- Telecommunication infrastructure with 419 km of fiber optics and 22 microwave links to complete the backbone of the military secure network through which all information will transit.

The installation of the surveillance stations will start progressively from the North-eastern Aegean region. The Command and Control of the system will be centrally based and as soon as each surveillance station is completed, it will immediately become operational as it will be connected and able to transmit information to the HCG HQs (modular design) through a secure state-owned communication network.

The targets detected by the Radar will be instantly correlated with AIS tracks determining the unknown vessels to be further checked. Depending on the site, the identification may be also performed using the camera. The VHF transceiver installed in each station will allow direct radio communication from the C2 Center to the involved maritime asset in the area.

C. Expected results:

The development of the NIMSS will definitively remedy to the relevant deficiency identified during the unannounced visit of November 2015 and the Schengen Evaluation of April 2016 that led to the Recommendations n°32 and n°33 of the Action Plan.

Indeed, the NIMSS will increase drastically the early detection capabilities allowing the HCG to timely assume preventive actions like early warning of the Turkish Coast Guard enough before the upcoming unauthorized border crossing.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Additionally, the NIMSS will provide the HCG with an adequate and reliable situational picture changing the whole surveillance concept of the HCG from patrol driven to intelligence driven. This will allow the HCG to optimize its fleet management increasing considerably the efficiency of the operational resources, since there will be no more need of constant patrolling, and further improving the timely response capacity.

In fact, the patrol vessels will remain on standby mode in the port and will be deployed for specific purposes after the alert given by the NIMSS. This will lead to the drastic reduction of the assets running expenses as well as of the fatigue of their structure and their engine. Moreover, the crewmembers will be in much better shape to deal with an emergency situation and therefore more efficient since they will sail for specific incidents without having the tiredness of previous long patrolling hours for surveillance. This will equally benefit to all participating maritime assets in FRONTEX-coordinated Joint Operation “POSEIDON”.

Finally, the NIMSS will contribute in very essential way to the protection of the life at sea and the fight against all marine criminal activities creating a safe environment to all citizens.

D. Exchange of information:

The national situational picture at sea will be set up in the main Command & Control Center within the HCG Headquarters in Piraeus and will be instantly available at the back-up C2 Center for the Hellenic Navy, as the other main national stakeholder in maritime surveillance, to have in real time access to the same information. This will enhance the efficiency of the already well-established interagency cooperation with the Armed Forces.

Concerning the cooperation with the NCC, a dedicated standardized automated report depicting the situation at the maritime borders has been foreseen in the technical specifications of the software in order to regularly inform the Hellenic NCC until the establishment of a permanent link.

Due to the level of classification the connection to EUROSUR application was considered as extremely complicated and risky to be included as a mandatory deliverable of the technical specifications for the upcoming contract for the Development of the NIMSS. However, the NIMSS software will be of open architecture and a connection will be explored in the future. Moreover, the contractor has the obligation to deliver a SDK (Software Development Kit) and an API (Application Program Interface) in order to allow us to interconnect other applications.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

E. Tendering procedure & timeline:

Due to its complexity, the NIMSS went through a very long maturity process. Considering the nature of the Project and since the technical specifications include classified data, decision was made to follow a restricted procedure under National Law 3978/2011 (transposing Directive 2009/81/EC) for the awards of contracts in the field of defense and security. The contract notice, budgeted **62 M €** (incl. VAT 24%), was submitted to TED (Tenders Electronic Daily) platform, the Supplement to the Official Journal of the EU, on 30/06/2020 and published on 03/07/2020.

It is worth mentioning the huge interest raised since an unprecedented number of **ten (10)** companies or group of companies submitted a request for participation to the tendering procedure. After the examination of their documentation, only those fulfilling the qualitative selection criteria will be invited, by mid-2021, to take delivery of the technical specifications and to submit a tender within 90 days. The selection procedure is then expected to last about 6 to 8 months, so the contract should be awarded by mid-2022 and signed by the 3rd quarter of 2022. The first two stations shall be delivered 11 months after the signature of the contract, whereas the whole system is to be fully deployed within 36 months.

F. Funding:

After consultation with the E.C. and considering the limitations related to the upcoming end of the eligibility period of the current Multiannual Financial Framework, the Project was decommitted from the Internal Security Fund 2014-2020 on 16/06/2020. The whole budget was then committed provisionally on 19/06 under the National leg of the Public Investment Plan as an interim solution in order to launch the procurement procedure. The project is set as the 1st priority of the HCG in the draft National Program of the Integrated Border Management Fund 2021-2027 submitted by the Ministry of Maritime Affairs & Insular Policy to the Responsible Authority.

In parallel, the HCG in order to ensure the full utilization of the funds earmarked for the NIMSS under the ISF, adopted a mitigation strategy and designed a comprehensive procurement plan with mature actions initially scheduled to be implemented under the next MFF 2021-2027.

Indeed, five additional actions of a total budget of **46,8 M €** were included in the ISF National Program concerning the:

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

a) procurement of surveillance equipment (portable and mounted thermal cameras onboard patrol boats, 16,4 M €),

b) procurement of 22 Rapid Intervention Boats with enhanced surveillance capacity (11,9 M €),

c) procurement of staff operational equipment (9,3 M €),

d) procurement of ICT Systems and equipment (8,1 M €),

e) practical training of HCG Cadets (1,1 M €).

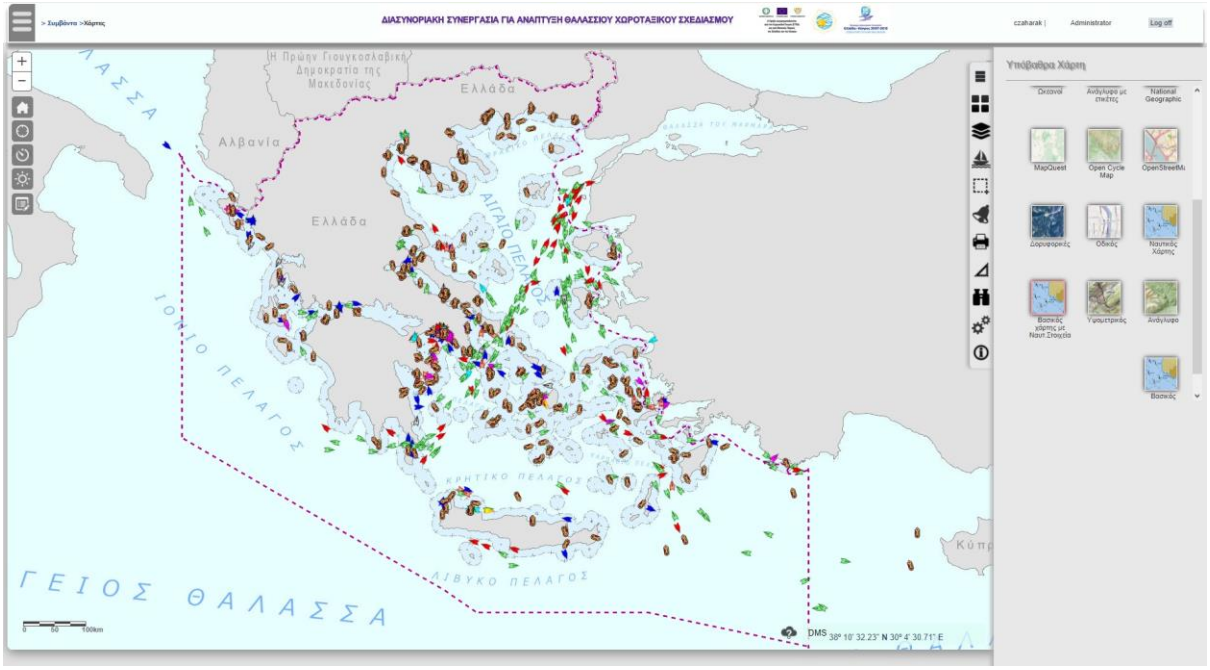
3. Focus on platforms

A **Web GIS** (Arcview) **platform** was established for the MMAIP during the INTERREG Greece-Cyprus 2007-2013 program with the projectTHAL-CHOR.

The object of the THAL-HOR project was the access to the demand for Specialized and Interoperable Geographical Marine Spatial Planning data to individual services, sub-services and Web-GIS services. The intermediate access is basically achieved by the availability of a distinctive ArcGIS Enterprise platform, whenever also requested for each application to capture cross-sectional geospatial applications, for the use of messages offered in the application and for the registration of applications needed.

This infrastructure enables the creation and dissemination of any maritime spatial information, as well as the capture of various reporting systems, following internationally accepted standards of Geographic Information Systems (GIS) technologies. This infrastructure was based on the internationally recognized ArcGIS Enterprise platform, while in particular for the Joint Rescue Coordination Centre (JRCC) of Piraeus, a web application (web-GIS) was implemented to capture all available spatial information, to use decision support tools and to record event data.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



GR Figure 3 Sample view of the web-GIS platform for JRCC Piraeus

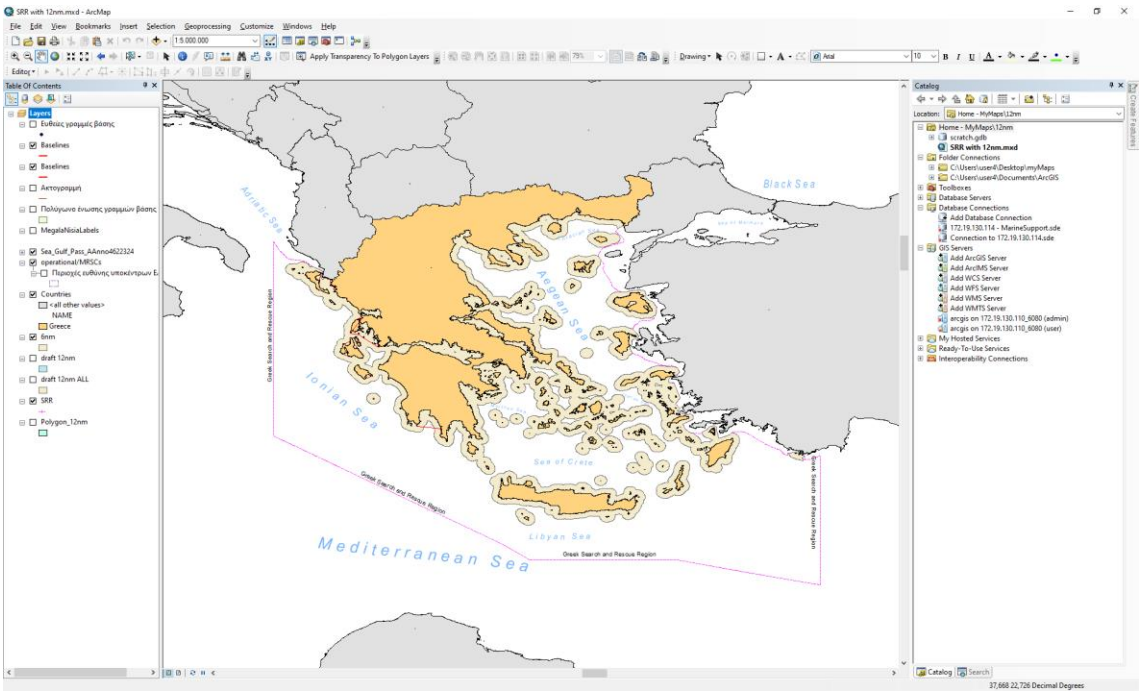
The physical architecture of the system includes:

a) A Data Tier: Database Server in backup layout (Failover). RDBMS software MS SQL Server is installed in the Database Server (the role of the Database Server is to store all kinds of system data, including the Geospatial Database).

b) An Application Tier: At the application level, Map Server and Application Server are installed in a backup device (Failover). The ArcGis Server software is installed on the Map Server with the role of creating and disseminating cartographic content services. In the Application Server the user application is installed through which the authorized access of the users to the available cartographic data services is achieved. The user application was implemented as a web-based application using the “ASP.Net” platform (framework 4.5).

c) An Application Tier: Database Server in backup layout (Failover). RDBMS software MS SQL Server is installed in the Database Server (the role of the Database Server is to store all kinds of system data, including the Geospatial Database). The Presentation level includes the interface for end users and data presentation. The comparative level was implemented by two web servers in a load balancing setup. These servers perform the role of Reverse Proxy Server and serve the requests of external users of the system.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



GR Figure 4 sample view of the GIS desktop software

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

FIGURES

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

ITALY

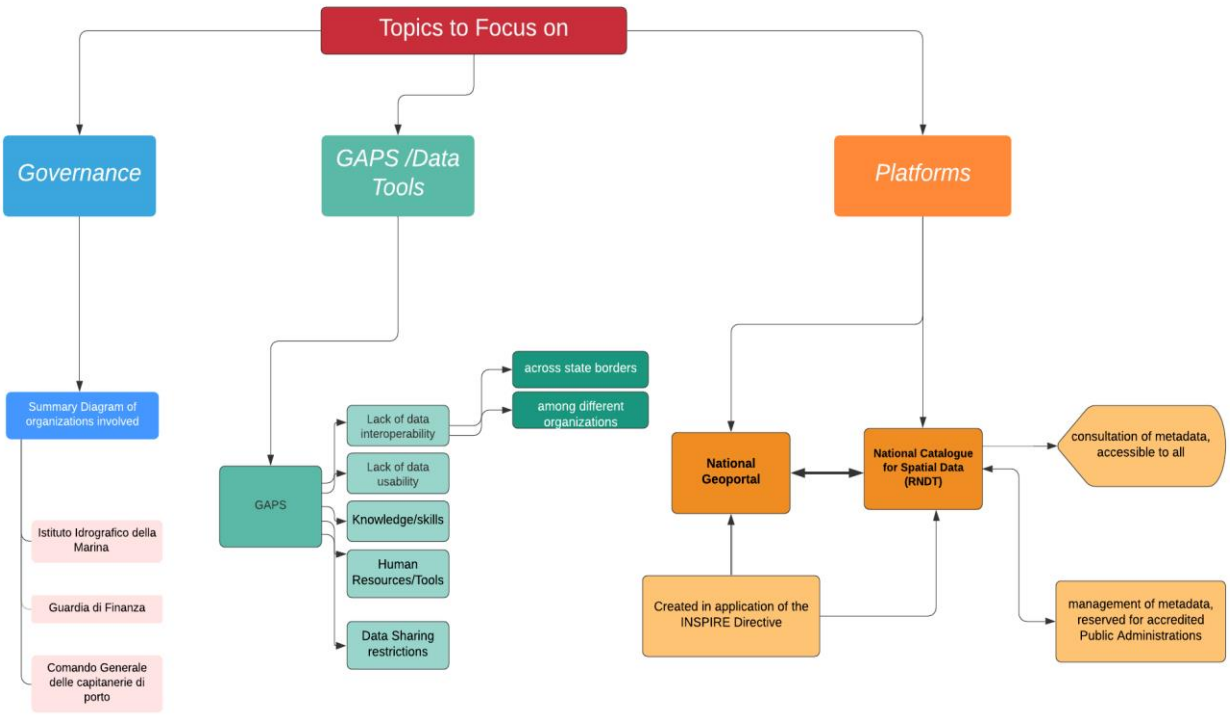
1. National in-depth analysis for Italy

The analysis threshed out in this national report concerns how the governance of maritime surveillance is conducted and managed in Italy, and to what extent data and information exchange on the matter among the stakeholders participating in the MED OSMoSIS occurs and is enabled.

Between the end of 2020 and the beginning of 2021, we managed to collect 9 additional surveys to the one filled out online by the Guardia di Finanza, which is the only one included in the global research in the scope of WP3, activity 3.2. This allowed us to collect and process data from 10 stakeholders in total to be eventually incorporated in the Global report D.3.2.1 as far as Italy is concerned.

The diagram below (Figure 1) outlines a summary of the survey findings as elaborated according to the data provided by the 10 identified stakeholders.

IT Figure 1 Summary diagram of the survey results



Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

2. Focus on the governance of Maritime surveillance activities in Italy

1. Organizations responsible for the governance of maritime surveillance in Italy

The 3 "backbone" organizations directly and actively involved in the governance of maritime surveillance in Italy are the following:

- Istituto Idrografico della Marina Militare (*Hydrographic Institute of the Italian Navy*) produces and delivers the reference navigation maps to the competent authorities, and is responsible for mapping the marine area under the Italian State's jurisdiction;
- Guardia di Finanza carries out police functions at sea, with specific reference to maritime search and rescue, illegal fishing and maritime pollution - it is a CISE (Common Information Sharing Environment) member;
- Comando Generale delle Capitanerie di porto (*Authority governing harbourmasters*) deals with navigation safety and security and with transmitting safety warnings to seafarers.

Following, a detailed description of the three responsible organizations.

Istituto Idrografico della Marina Militare Italiana

The Istituto Idrografico della Marina is based in Genoa, is the Italian Navy's Hydrographic Office and is in charge of the official nautical documentation published in Italy. In order to produce updated and accurate maps, I.I.M. performs regular surveys along the Italian coastline and sea - over 550,000 square kilometres of sea waters and more than 7,800 kilometres of coastline – to collect data for both hardcopy and electronic nautical publications and charts. These products, together with the nautical information data disseminated nationally and internationally, represent the official documentation on navigation safety as required by national and international standards. I.I.M. has always played an active role in the scientific, technological and environmental study and protection of the sea, through projects carried out with universities and research institutes in Italy and abroad. Moreover, I.I.M. organizes specialization courses open to military and civilian students, in collaboration with the University of Genoa. All courses by I.I.M. comply with the relevant national and international standards.

The Institute's main functions concern:

Conduction of surveys: I.I.M. operates three survey vessels, MAGNAGHI, ARETUSA and GALATEA. In order to keep I.I.M. publications and charts constantly updated with particular reference to depths, seafloor, coastlines, harbours and ports, lights and fog signals, I.I.M. regularly plans and carries out hydrographic and geodetic surveys, using their own specialized military and civilian staff and survey vessels, as well as Italian Navy units. I.I.M. survey vessels are fully equipped with positioning systems and multibeam echo sounders. Data collected during geodetic and hydrographic surveys are processed, validated and logged into I.I.M. databases, to be used for the completion of nautical publications. Furthermore, the I.I.M. conducts special surveys in Graham Shoal and Antarctica.

Production of nautical documentation such as

- **Nautical charts**: I.I.M. compiles charts using gnomonic and Mercator projections.
- **Paper Kit Charts**: I.I.M. paper kit charts are smaller than traditional paper charts but just as reliable. They cover the whole Italian waters and coasts in 1:100.000, 1:50.000, 1:30.000 and 1:18.000 scales and are distributed in practical folios. Each kit covers a certain area and contains from 18 to 30 charts, as well as a selection of symbols and abbreviations used in Nautical Charts listed in the INT1 chart.
- **Electronic Navigational Charts**: I.I.M. ENC portfolio provides for all purposes of navigation, from scale charts covering Italian waters, coasts and major harbours to small scale charts covering the Mediterranean Sea and the Black Sea. Currently it amounts to approximately 250 charts. ENCs are constantly updated based on the warnings to seafarers issued by I.I.M..
- **Nautical publications**: these include both hardcopy and electronic charts, books and products required for safe navigation. They complement the nautical charts, including all those data which cannot be represented in a chart, such as coastal views, navigational aids, harbour plans, planning and sailing directions, approaches to harbours and anchorages, and constantly updated according to warnings to seafarers.

Delivery of training to qualified hydrographers. The most important course, in collaboration with the University of Genoa, is the Master's degree in Marine Geomatics, which is nationally and internationally certified, and approved by the FIG/IHO/ICA international board. It is open to military and civilian post-graduate students. Other courses include specialized training in hydrography for officers and petty officers, compass adjusting and ECDIS training.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Guardia di Finanza

The Guardia di Finanza is an Italian police force under the authority of the Ministry of Economy and Finance, is an integral part of the Italian armed forces, as well as of the law enforcement agencies. The duties of the Guardia di Finanza are set forth by law no. 189 of 23 April 1959, and consist in the prevention, search and reporting of tax evasion and financial violations; supervision of compliance with the political and economic provisions; surveillance at sea for financial police purposes. The latter are also carried out through permanent control actions in ports, airports, and border crossings and by means of a dynamic surveillance device extending controls throughout the national territory, with preventive and repressive purposes. In particular, the Corps have always been strongly involved in the fight against the smuggling of manufactured tobacco, customs fraud, and cross-border trafficking of designer fuels, illegally introduced in Italy by criminal organizations operating across member States.

Moreover, Guardia di Finanza is in charge of carrying out customs checks on the illegal trade of endangered plants and animals, as provided by the Convention of Washington (CITES).

In the field of combating international terrorism, Guardia di Finanza carries out its activity with specific reference to the financing of this illicit phenomenon. In particular, the Corps complete and reinforce the anti-terrorism investigative apparatus, which mainly gravitates around the two Police Forces exercising general jurisdiction and combining traditional repressive actions with preventive investigations into the financial flows supporting national and international criminal groups.

The activity of prevention and repression, also as regards drug trafficking, avails of the Corps' "integrated operating system", which allows for sea and air vigilance through its air-naval component, surveillance of the external EU-borders (terrestrial, maritime, airport and intermodal) through fixed control of people, baggage, vehicles and goods, and the economic control of estates.

The **operational functions of sea security** concern the following:

- **the execution of public order and security and land control services** on the sea airspace, without prejudice to the duties of the Department of Public Security and provincial authorities on public order;
- **illegal trafficking at sea**, such as the smuggling of foreign tobacco products and the trafficking of drugs and human beings by transnational criminal organizations, which requires an operative action in close synergy between the air-naval, territorial and specialist components;

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- **the surveillance of maritime borders**, also for the purpose of combating illegal immigration in the sea area under the Italian State's jurisdiction and the contiguous zone, including activities related to international cooperation operations under the aegis of the European Border and Coast Guard Agency – Frontex. In this regard, the tactical coordination is assigned to the Guardia di Finanza - International Coordination Centre of Rome.

Comando Generale delle Capitanerie di Porto

The Authority governing the harbourmasters is historically entrusted with the supervision of all maritime and port activities. It is a specialized body of the Italian Navy, carries out civil tasks related to operations at sea and responds to the Ministry of Sustainable Infrastructure and Mobility. The Authority also operates under the aegis of the various ministries, including the Ministry of Ecological Transition and the Ministry of Agricultural, Food and Forestry Policies, which avail of its specialized skills.

Among its competences are, first of all, the protection of human life at sea, the safety of navigation and maritime transport, as well as the protection of the marine environment, its ecosystems and the surveillance activity of the entire sea fishing chain, and the protection of resources and final consumers. In addition to this are the inspections on national merchant vessels, fishing vessels and pleasure crafts, also conducted on foreign merchant vessels passing through the Italian ports.

Currently, the Authority consists of 11,000 men and women, distributed in a capillary structure consisting of 15 Maritime Directorates, 55 Port Authorities, 51 Maritime District Offices, 128 Local Maritime Offices and 61 Beach Delegations, through which the Authority continues to exercise its powers at sea and along the Italian coastline.

The Authority governing the harbourmasters carries out the following **activities through its structure**:

- **Search and rescue** of human life at sea;
- **Mobile environmental laboratories** operating along the national coastline and equipped with technical tools to carry out sampling activities nearby urban wastewater discharges or purification plants;
- **Navigation safety** carried out by the Sixth Department, the technical body of the Ministry of Sustainable Infrastructure and Mobility responsible for the administrative and functional management of navigation safety and maritime safety;

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- **Port State Control**, namely the inspection activities of foreign vessels;
- **Administrative, licensing and registry activities**, as well as professional qualifications concerning exercise on pleasure crafts;
- **Administrative and judicial police functions** also in the field of pleasure crafts;
- **Protection of the marine and coastal environment** inherent to shipping;
- **Fishing Area Control Centre** carrying out control of fishing and all related financial activities;
- **Protection of submerged archaeological goods**;
- **Maritime Mercantile Administration** concerning the regulation, monitoring and control of ship traffic, safety of navigation and maritime transport, as well as the related supervisory and control activities.

2. Governance of Italian maritime surveillance

Beyond the specific competences individually attributed to the Hydrographic Institute of the Italian Navy, the Guardia di Finanza and the Authority governing the harbourmasters, most recently reorganized by Law no. 124 of 2015, when it comes to maritime governance in Italy the need is to create effective coordination, which presupposes the establishment of a central body in charge of this specific function.

With the suppression in 1993 of the Ministry of Mercantile Marine, established in 1947, its assignments were distributed among the various Ministries. Today, in fact, the Ministry of Sustainable Infrastructure and Mobility is the main heir to the attributions that had been in charge of the Ministry of Mercantile Marine, the Ministry of Ecological Transition is entrusted with the functions relating to the protection of the marine environment, the Ministry of Agricultural, Food and Forestry Policies is assigned responsibilities for sea fishing and aquaculture, while the Ministry Economic of Development performs functions relating to mining at sea.

This fragmentation of competences is certainly not an adequate solution to comply with the strategic choices made within the European Union. However, it has aimed to support the Integrated Maritime Policy (IMP) (Blue Book of the Commission of 10 October 2007) for years, which implies a solid coordinated governance framework for activities related to the uses of the sea, under the responsibility of the Directorate-General for Maritime Affairs and Fisheries (DG Mare), capable of strengthening the interconnections between the various areas and encouraging the integrated exploitation of the seas.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The importance that the sea resource covers from an economic and geopolitical point of view has led other European countries to tangibly translate this awareness into the creation of an adequate and unitary governance through the establishment of an ad-hoc ministry e.g. Ministry of the Sea in Greece, Cyprus , Portugal, or a reference institutional institution e.g. Secretariat of the Sea in France.

In Italy, which boasts almost 8,000 km long coastline and nearly 200,000 enterprises engaged in the so-called “economy of the sea”, the issue has always concerned the cyclical and fleeting impacts.

The “economy of the sea” includes, in a broad sense, the management of ports and rear ports, transport and logistics, shipbuilding activities, fishing and aquaculture, integrated coastal management, nautical tourism, marine extractions. A set of different sectors that requires a unified, integrated and sustainable vision, which can translate, on the one hand, into an effective national strategy for the maritime economy as a whole and, and on the other, into the realization of a new governance model, on which the responsibilities currently distributed among the various departments converge and with which to entrust the coordination of policies and actions that can be implemented in the maritime sector.

An inter-ministerial control room on the sea was recently established, with the participation of representatives from the Ministry of Foreign Affairs and International Cooperation, the Ministry of the Interior, the Ministry of Defence, the Ministry of Economic Development, the Ministry of Agricultural, Food and Forestry Policies, the Ministry of Ecological Transition, the Ministry of Sustainable Infrastructure and Mobility, as well as the intervention of the President of the Federation of the sea.

The purpose of the inter-ministerial control room is to address strategic issues for the country such as the so-called Blue Economy, which concerns the sustainable exploitation of the sea and its resources, and how the delimitation of marine spaces are to be defined in light of the introduction of the bill on the establishment of an exclusive economic zone (EEZ) for Italy.

3. Conclusions

In consideration of the initiative outlined above, namely the establishment of an inter-ministerial control room capable of leading the diverse activities of maritime surveillance in Italy, which sees the involvement of numerous governmental bodies, it is clear that awareness about the strategic and

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

economic importance that the "sea" considered as an asset *per se* and the need for a unitary and integrated vision of the various issues at stake are actually and tangibly gaining ground.

In this regard, Italy is moving towards the establishment of a Ministry of the Sea or a General Secretariat of the Sea under the Presidency of the Council of Ministers, which can become a promoter in the development of a national strategy for the economy of the sea through a comprehensive vision of the various components, and contribute to defining the future European Union maritime policy.

3. Focus on Italian stakeholders

1. General information on the recruited Italian stakeholders

Hereinafter a brief description of the Italian stakeholders involved in the MED OSMoSIS survey.

Istituto idrografico della marina

The Istituto Idrografico della Marina is based in Genoa, is the Italian Navy's Hydrographic Office and is in charge of the official nautical documentation published in Italy (*see subparagraph 2.1. for full description of functions*).

Guardia di Finanza

The Guardia di Finanza is an Italian police force under the authority of the Minister of Economy and Finance, is an integral part of the Italian armed forces, as well as of the law enforcement agencies (*see subparagraph 2.1. for full description of functions*).

Direzione Marittima Genova - Comando Generale delle Capitanerie di Porto

The Maritime Directorate Genova is an administrative subdivision of the Italian Authority governing the harbourmasters (*see subparagraph 1.1.1. for full description of functions*) and is one of the peripheral offices of the administration of the Ministry of Sustainable Infrastructure and Mobility, which are normally located in a main port.

It constitutes the hierarchically highest command the maritime compartments (harbourmaster's offices) and the maritime districts (maritime district offices) are subject to; the local maritime offices and the beach delegations depend on the districts (without territorial jurisdiction).

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

They carry out tasks related to the civil uses of the sea, and functionally respond to the Ministries of Sustainable Infrastructure and Mobility, of Ecological Transition and of Agricultural, Food and Forestry Policies.

ARPA - Agenzia Regionale per la protezione ambientale

ARPA (Regional Agency for environmental protection) carries out technical-scientific activities related to the exercise of the functions of regional interest referred to in art. 1 of Law no. 61 of 1994 and in particular, delivers services in a number of fields of action in support of the regional and local authorities, as well as private companies and citizens, for the purpose of developing intervention programs for prevention, control and supervision of hygiene and environmental protection and verification of the healthiness of the living environments.

The ARPAs involved as stakeholders in the MED OSMoSIS survey concerning Italy are ARPA Calabria and ARPA Marche.

Istituto di scienze Marine – CNR-ISMAR

CNR-ISMAR (Institute of Marine Sciences) is a research institute dealing with marine research within CNR (N*ational Research Council of Italy*), a public body responding to the Ministry of Education, University and Research. It conducts research in the Mediterranean, oceanic and polar regions, focusing on the following subjects:

- the evolution of oceans and their continental margins, studying submarine volcanoes, faults and slides and their potential impacts onshore;
- the influence of climate change on oceanic circulation, acidification, bio-geochemical cycles and marine productivity;
- submarine habitats and ecology, and the increasing pollution of coastal and deep-sea environments;
- the evolution of fish stocks with a view to keeping commercial fishing within sustainable limits and improving mariculture and aquaculture practices;
- natural and anthropogenic factors economically and socially impacting the coastal systems from pre-history to the industrial era.

In particular, CNR-ISMAR also deals with Maritime Spatial Planning (MSP) at national and Mediterranean level, and with developing geoportals and tools in support of MSP decisions.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Lighthouse

Lighthouse was founded in 1986 as GAS (Geological Assistance & Services), and is an international company characterized by a multicultural and highly qualified team operating worldwide. Lighthouse has its offices in the most strategic locations of the Oil&Gas market across the Mediterranean region, North & West Africa, Caspian and the North Sea.

In 2016 Lighthouse merged with Ageotec, the Italian company acknowledged worldwide for its Remotely Operated Vehicles (ROV) and the global supply of survey equipment. The merger strengthened the existing sales structure by involving Ageotec staff in selling ROVs, oceanographic, geophysical and hydrographic equipment.

Macartney

The MacArtney Group is a global supplier of underwater technology products and systems specialising in design, manufacture, sales, and service of a wide range of systems to oil & gas offshore operators, ROVs, diving, and survey contractors, the renewable energy sector, ocean science institutes, and navies around the world. The company offers an extensive variety of advanced and reliable products and system solutions spanning from subsea cables and connectors to state-of-the-art integrated packages, including fibre optic telemetry, underwater cameras and lights, oceanographic instruments, marine winch systems, and remotely operated, towed vehicles. All products supplied are designed and tested to provide high quality, efficient and reliable performance in the challenging underwater environment.

Legambiente Abruzzo

Legambiente was established in 1980, the heir to the first ecological and the anti-nuclear movements that developed in Italy and throughout the Western world in the second half of the 1970s.

A distinctive feature of the association has been scientific environmentalism from the very beginning, and the choice to base every project in defence of the environment on a solid basis of scientific data, according to which realistic and practicable alternatives can be indicated.

The scientific approach combined with an on-going work of information and awareness-raising campaigns, and active involvement of the citizens has ensured that Legambiente is deeply rooted in the social fabric to the extent that it is one of the environmental organizations with the most widespread distribution throughout the territory.

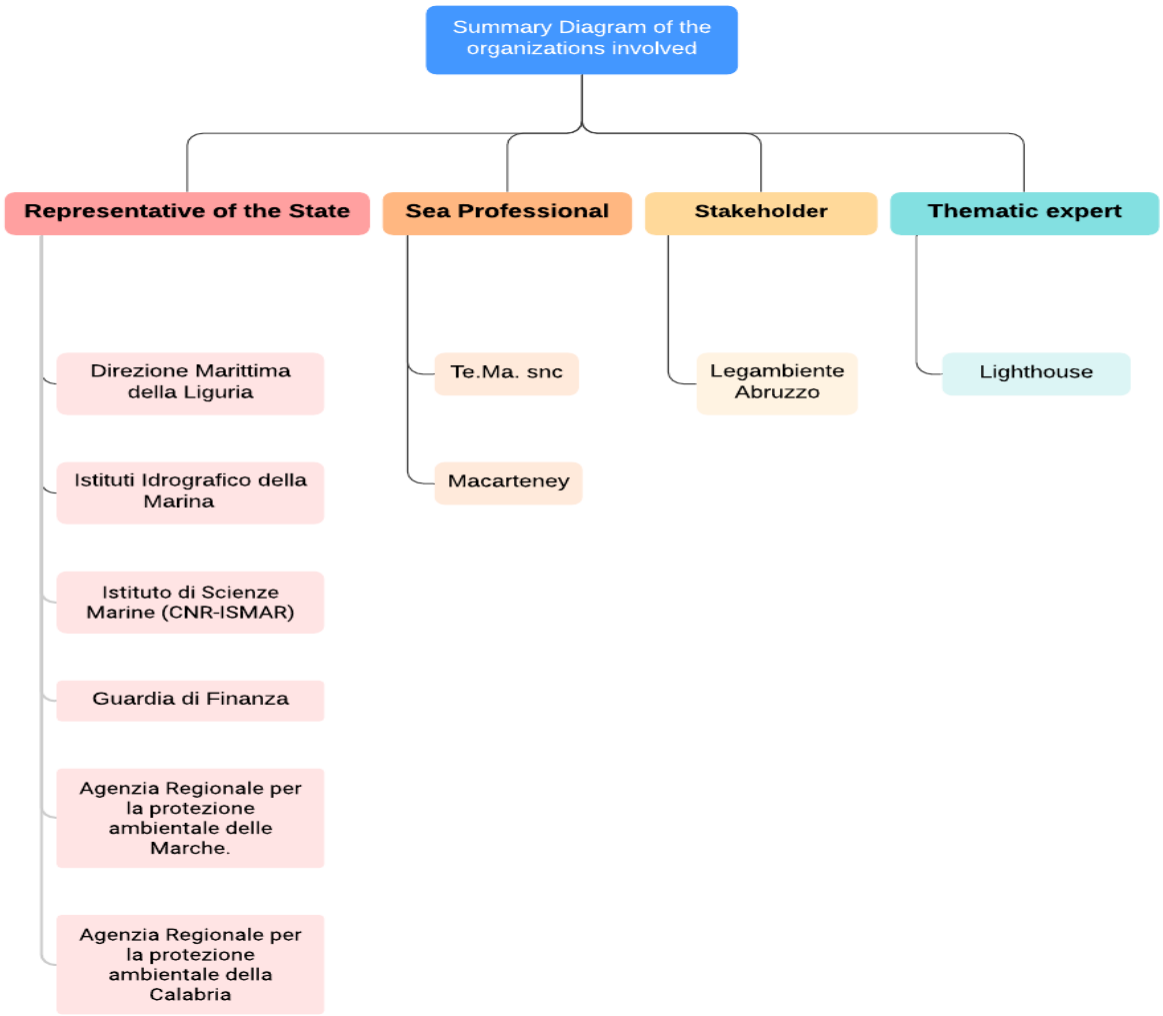
Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Te.ma snc

Founded in 1989, Te.Ma.snc is highly experienced and qualified in delivering services performed with cutting-edge technologies in the field of territorial investigations.

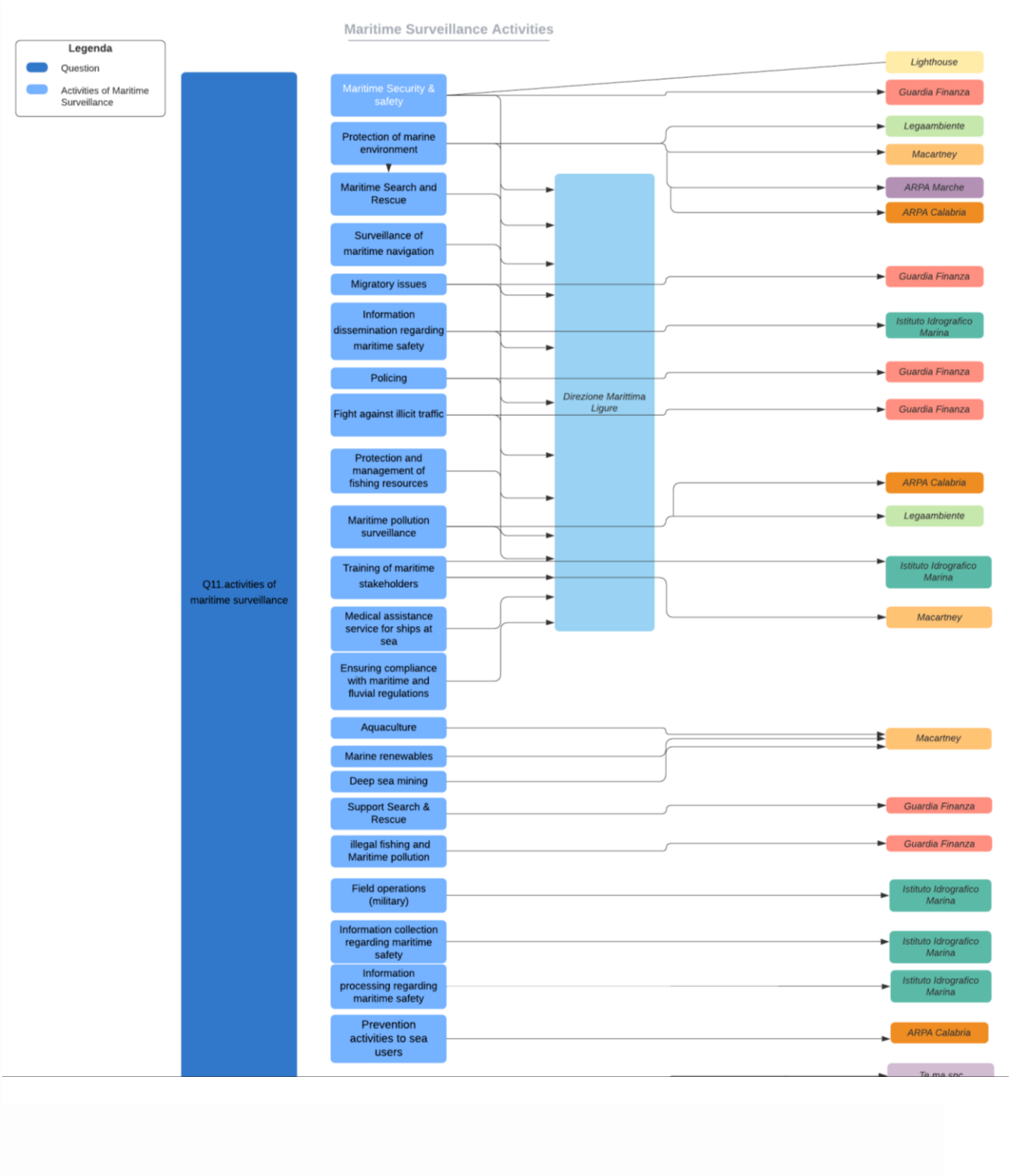
The availability of technologically advanced instrumentation and the high specialization acquired by the partners in the field of marine and terrestrial surveys, allows Te.Ma. snc to perform topographic, bathymetric, geophysical and environmental surveys of the highest quality in marine-coastal environments, lagoons and inland waters.

IT Figure 2: Summary diagram of Italian stakeholders



Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

IT Figure 3: Specific sectors of stakeholders' involvement with reference to maritime surveillance



2. Data used and produced by the stakeholders

In the light of the results emerged, it is worth noting that the stakeholders in Italy mostly use GIS (Geographic Information System) based formats, web service, CSV spreadsheets; whilst scientific

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

formats are reported to be used in two cases, that is the Hydrographic Institute of the Italian Navy - that is the Abruzzo Region's technical partner under MED OSMoSIS, and the only responsible organization for mapping the marine area under the Italian State's jurisdiction - as well as the Institute of Marine Sciences CNR-ISMAR, where, in particular, researchers use multibeam bathymetric data, data on sea and coast use, and data on marine ecosystems.

On the other hand, the data are produced in most cases in situ (met-ocean, ARGO, drifters, moorings, ground and ship-based radars systems, water samples, lab analysis) (6 cases); remote sensing (satellites) (2 cases). Whilst the identified GIS data produced are navigation warnings (2 cases); nautical charts and similar (2 cases); AIS (Automatic Identification System), VMS (Vessel Monitoring System), VDR (Voyage Data Recorder), geo-located regulations (each type is produced in 1 case). Other types of GIS data include DTM; relational DB for web-Gis; data produced by radar stations, military vessels and military airplanes; bathymetric data; marine geology and geophysics data.

4. Focus on the gaps identified

1. Identifying the gaps in the use and sharing of data

The key gaps on the use and sharing of data identified by the Italian stakeholders involved in the MED OSMoSIS survey concern two main aspects, one is more *context-related* and the other is more directly *content-related*. The first one is seemingly due to the lack of data interoperability across State borders, as well as among different national organizations in both the existing technical ICT infrastructures and the different data formats, which often are not ready to use and require further elaborations. In addition, the national regulations currently in force in Italy often restrict data access or sharing among various organizations who need to use data, and do not provide one usable standard format. In this regard, they generally envisage that data is acquired by the stakeholders who are responsible for the concession areas, which may be a hindrance to both the regular use and exchange of data.

The second issue is more specifically liaised to the type of information incorporated in the data gathered in the datasets, which is sometimes not detailed enough (i.e. geodesy data, environmental data, etc.) for specific maritime surveillance purposes, as highlighted by 2 stakeholders. Consequently, the available scientific basis is not sufficient to help project planning and may affect subsequent delivery of high-quality final outputs.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Another relevant side issue identified by the survey is the knowledge/skills gap. In particular, some volunteering organizations indirectly engaged in maritime surveillance in terms of environmental protection often have neither the skilled experts in their workforce, nor the financial allowance and equipment necessary to carry out water quality monitoring.

Moreover, according to the stakeholders who produce data, the main gap concerns the obligation to avail of specific competences as set forth by the national and international regulations of merit. A list of qualified operators who are enabled to conduct survey operations is not provided in Italy, and this often opens the markets to people who are not qualified enough and as a result, synergies among public authorities, private sector and relevant organizations cannot be established efficiently. Moreover, the lack of qualified expertise, of knowledge of the data produced by others, as well as of the availability of human resources to carry out specific operations and of tools to manage data is reported to be the key reason why the data produced is not shared, which as a consequence, hinders the appropriate use of the available data too. Moreover, the data produced undergoes 2 levels of validation before being published in the Geoportal of the Ministry of Ecological transition, and the time needed for this operation is extremely long.

No gaps have been identified in only 3 cases. In particular, CNR-ISMAR reports that the motivation for this is linked to the scientific use made of the data, given that no particular technical restrictions to sharing currently exist. When a well-motivated request is submitted by institutional stakeholders, the data and above all its scientifically interpreted products are shared and used according to the technical purposes they are requested for.

2. Possible solutions

In the attempt to suggest solutions to address the identified gaps, Italy represented by the Abruzzo Region with the technical-scientific partnership of the Hydrographic Institute of the Italian Navy will carry out 2 pilot activities under MED OSMoSIS. The actions are specifically designed to provide the actors involved in the governance of maritime surveillance with the necessary toolkit, so to help improve data usability through harmonization.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Sharing Maps

Creating an e-mapping platform that can make the maps produced by the Hydrographic Institute of the Italian Navy available for use and consultation. The platform is enabled to share and provide data to public administrations, authorities and institutions even if they do not have an ECDIS (Electronic Chart Display and Information System) or a similar system via WebGis. The platform will ensure the integrity of the data produced in IHO S57/S63 format and the reproduction of all the elements integrated in the map databases.

Conveying the variants/updates to the Nautical Chart

Providing the harbourmaster's offices and seafarers with a service that allows them for nautical chart visualization via a WebGis Application. In addition, the service enables to convey communications to the Hydrographic Institute of the Italian Navy (concerning Italy) by means of a mapping toolkit and pre-formatted communication forms, as well as to assess their completeness, correctness and consistency with international and national regulations. The platform shall guarantee integrity and safety of the relevant data concerning the e-maps also in this respect.

3. Conclusions & Recommendations

According to the suggestions directly delivered by the involved stakeholders, it is worth noting that enhancing interoperability and the different approaches to the use of data according to the purpose of final users shall be a relevant step towards improved delivery of data and information.

Furthermore, stronger impact could be obtained by adjusting the regulations currently in force, in order to allow for better use and usability of the data and information made available.

In the specific case of volunteering environmental organizations dealing with maritime surveillance in terms of environmental protection, there is the actual need to allocate financial resources at national level, so that they can tangibly contribute to carrying out water quality monitoring.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

5. Focus on platforms

1. The geodata platforms available in Italy

According to the data reported by the Italian stakeholders in the MED OSMoSIS survey, the operating platforms currently used in Italy are 2, namely the National Geoportal and the National Catalogue for Spatial Data (RNDT).

National Geoportal

The National Geoportal http://www.pcn.minambiente.it/mattm/ was established by Legislative Decree no. 32 of 27 January 2010, in application of the INSPIRE Directive, by means of which the creation of a European data infrastructure to simplify the sharing of spatial information among public administrations was set forth. The creation of a European data exchange system in fact can facilitate public access to environmental spatial information throughout Europe and assist in decision-making processes concerning the environment and the territory.

The Ministry of the Ecological Transition in Italy is the competent authority for the implementation of Legislative Decree no. 32 of 2010 and the National Contact Point for the INSPIRE Directive is set up within the Ministry (ncp.inspire@minambiente.it).

As for the National Geoportal, art. 8 of Legislative Decree no. 32 of 2010 allows interested parties, public and private, to be aware of the availability of spatial and environmental information. Moreover, establishes that the National Geoportal is an access point for the purposes laid down by the INSPIRE Directive at the national level:

- to network services;
- to the catalogues of public authorities;
- to the SINAnet network (SINA - *National Environmental Information System collects data and information necessary to describe and understand environmental phenomena*).

National Catalogue for Spatial Data (RNDT)

The National Catalogue for Spatial Data (RNDT) https://geodati.gov.it/geoportale/ was established with article 59 of the Digital Administration Code (Legislative Decree no. 82 of 2005) and was identified as a database of national interest.

RNDT constitutes the national catalogue of metadata regarding spatial data and related services made available for the Public Administrations; it is also configured as a public register of such data, certifying its existence through the publication of the related metadata.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The RNDT constitutes an integral part of the national infrastructure for territorial information and environmental monitoring, established in Italy with Legislative Decree no. 32 of 2010, for the transposition of the INSPIRE Directive. As a result, it plays the role of national search service for the purpose of implementing the INSPIRE directive as regards metadata.

Through the RNDT portal, the two typical functions of a catalogue service are provided:

- consultation of metadata, accessible to all;
- management of metadata, reserved for accredited Public Administrations.

All the Administrations accredited can manage metadata. Metadata is produced by the Administrations responsible for data and services, which can perform the operations of modifying, updating and deleting the metadata by XML files conforming to the XSD schemas as by Ministerial Decree of 10 November 2011.

The Administrations that do not manage their own catalogue can use the tools available in the portal, as follows

- registration and management of the PA's catalogue;
- editor, tool for editing and updating metadata through the completion in of e-forms;
- uploading XML files.

The Digital Italy Agency (AgID) is in charge of validating metadata for the publication in the RNDT after checking the completeness and consistency of the files uploaded by the Administrations, who take up the responsibility for the published content.

Both platforms are linked. The Italian Ministry of Ecological Transition is one of the accredited Administrations to RNDT and contributes to populating the platform with its own metadata, in the observance of the INSPIRE Directive. A RNDT catalogue search bar can be found within the National Geoportal in the section "Metadata Catalog" (http://www.pcn.minambiente.it/mattm/en/metadata-catalog/).

2. Conclusions

Undoubtedly, the implementation of the INSPIRE Directive in Italy has allowed for the creation of the 2 spatial data platforms that are currently used today, and the resulting harmonization of the metadata fuelling the systems at the level of the member States enables actual and effective sharing of all available spatial data at European level. According to the results of our questionnaires, 3 are the regular users of the aforementioned platforms.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

FIGURES

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

PORTUGAL

1. General information on the Portuguese stakeholders interviewed

1. Type of organisations, authority in charge and scope of responsibility

The main stakeholders in maritime surveillance in Portugal are organizations which are part of the national administration. This is the case of the Portuguese Navy and the Portuguese Maritime Authority (referred as AMN - Autoridade Marítima Nacional in Portuguese language). Together, they represent the major player in what concerns responsibilities and capabilities to perform maritime surveillance activities.

The National Maritime Authority, when understood as an entity, constitutes the hierarchical top of administration and coordination (inherently the Admiral Chief of the General Staff of the Navy). He is responsible for the coordination of activities (definition of guidelines and directives), of national scope, to be carried out by the Navy, the Directorate General of the Maritime Authority (DGAM) and the Maritime Police (PM), in compliance with the defined guidelines by the Minister of National Defence (MDN).

Stakeholders´ feedback from different entities/organisations within the Portuguese Navy was received and it enabled us to execute this in-depth national analysis. All organisation names with the correspondent authority in charge and scope of responsibility are listed in Table 1.

PT Table 1 List of Portuguese stakeholders interviewed with their corresponding authority in charge and their scope of responsibility.

Name	Authority in charge	Scope of responsibility
Information Technology and Communications Directorate	Portuguese Navy - Ministry of Defence (MDN)	-*
Operational Data Analysis and Management Centre	Portuguese Navy - Ministry of Defence (MDN)	Maritime issues inside the Portuguese Territorial Waters (TTW) and Exclusive Economic Zone (EEZ)

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Information Analysis and Management Directorate	Portuguese Navy - Ministry of Defence (MDN)	-*
Fleet Command HQ - Informations Division	Portuguese Navy - Ministry of Defence (MDN)	Geographic Information Systems (GIS)
Fleet Command HQ - Operations Division - Amphibious Ops Branch	Portuguese Navy - Ministry of Defence (MDN)	-*
Fleet Command HQ - Maritime Operations Centre (MOC) and Maritime Rescue Coordination Centre (MRCC) Lisbon	Portuguese Navy - Ministry of Defence (MDN)	Search and Rescue, maritime situational awareness
Operational Data Analysis and Management Centre - Geospatial Intelligence Section	Portuguese Navy - Ministry of Defence (MDN)	-*
Naval Academy - Science and Technology Department	Portuguese Navy - Ministry of Defence (MDN)	Research area

*No information provided.

Furthermore, all the survey participants play different roles in maritime surveillance: most are state representatives (public services included) (38%) but also data managers (25%), Geographic Information System (GIS) managers (13%), researchers (13%) and others (13%).

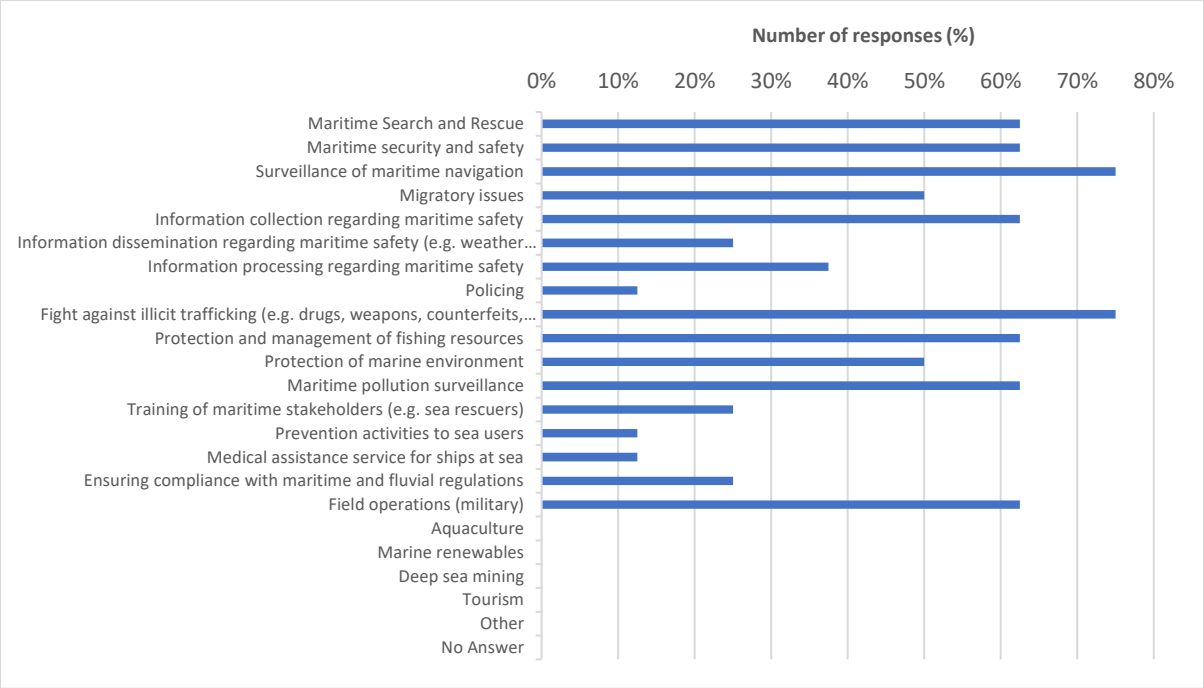
2. Activities

The activities of responsibility of the stakeholders interviewed are presented in Figure 1. The main activities they are involved in are surveillance of maritime navigation (75%), fight against illicit trafficking (e.g. drugs, weapons, counterfeits, protected species, cultural assets) (75%), maritime search and rescue (SAR) (63%), maritime security and safety (63%), information collection regarding maritime safety (63%), protection and management of fishing resources (63%), maritime pollution surveillance (63%), field military operations (63%), migratory issues (50%), protection of marine environment (50%) and information processing regarding maritime safety (38%).

They are also involved in other maritime surveillance activities like information dissemination regarding maritime safety (e.g. weather forecasting, tide) (25%), training of maritime stakeholders (e.g. sea rescuers) (25%), ensuring compliance with maritime and fluvial regulations (25%), policing (13%), prevention activities to sea users (13%) and medical assistance service for ships at sea (13%).

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional



PT Figure 1 Activities in which the Portuguese stakeholders interviewed are involved in

3. Collaboration with other maritime surveillance actors

The stakeholders surveyed collaborate mainly with other Portuguese authorities at national level as reported in Table 2. These include the National Maritime Authority (AMN), National Authority for Civil Protection and Emergency (ANPCE), Directorate-General for Natural Resources, Safety and Maritime Services (DGRM), Maritime Police (PM), Criminal Police (PJ), Immigration and Borders Control Service (SEF), Air Force, Ministry of the Sea and Universities. Although not reported by the responders, the Portuguese Navy is also collaborating with EU Agencies like EMSA[25] and EDA[26], as well as with international organisations like NATO[27].

[25] EMSA: European Maritime Safety Agency (http://www.emsa.europa.eu/)

[26] EDA: European Defence Agency (https://eda.europa.eu/).

[27] NATO: North Atlantic Treaty Organisation (https://www.nato.int/).

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

PT Table 2. Summary of the various collaborations with other maritime surveillance actors reported by the respondents.

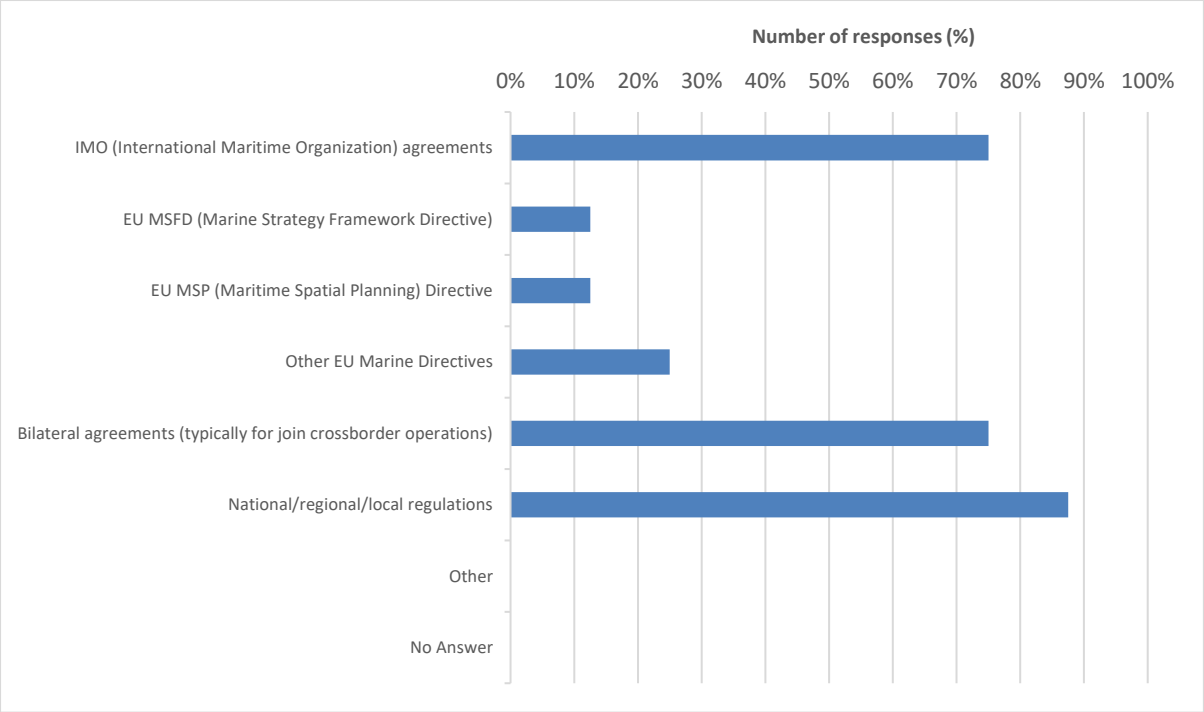
Organism	Collaborations
Information Technology and Communications Directorate	Directorate-General for Natural Resources, Safety and Maritime Services (DGRM)
Operational Data Analysis and Management Centre	Maritime Police (PM), Criminal Police (PJ), Immigration and Borders Control Service (SEF)
Fleet Command HQ - Maritime Operations Center (MOC) and Maritime Rescue Coordination Centre (MRCC) Lisbon	National Maritime Authority (AMN), Air Force, National Authority for Civil Protection and Emergency (ANPCE)
Naval Academy - Science and Technology Department	Ministry of the Sea, Universities

2. Governance of Portuguese maritime surveillance activities

1. Impacting directives and regulations

As depicted in Figure 2, Portuguese actors of maritime surveillance are mainly affected by national, regional and/or local regulations (88%). International Maritime Organisation (IMO) agreements and bilateral agreements (typically for joint cross border cooperation) follow with 75%. Other EU Marine Directives (25%), EU MFSD (Marine Strategy Framework Directive) (13%) and EU MSP (Maritime Spatial Planning) Directive (13%) are also mentioned as impacting directives.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



PT Figure 2 Directives impacting the activities carried out by the Portuguese stakeholders interviewed

2. Structure of Governance in Portugal

The concept of Maritime Authority (MA) may be described as the exercise of state sovereignty in the maritime domain under national jurisdiction in order to achieve compliance with laws and regulations. The MA System is the institutional framework that includes organs and services at local, regional and national level, responsible for coordinating, advising or policing, enforcing the mandate of the MA. The MA System has the following tasks:

- Safety and navigation control;
- Preservation and protection of natural resources;
- Conservation and protection of subaquatic cultural heritage;
- Conservation and protection of the marine environment;
- Prevention and control of pollution;
- Maritime signalling, navigation aids and warnings;
- Management of activities of economic exploitation of living and non-living resources;
- Safeguarding human life at sea and maritime rescue;
- Civil protection at sea and in the coastline;
- Protection of public health;

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- Prevention and persecution of crime, namely in the fight against drug trafficking, terrorism and piracy;
- Prevention and persecution of illegal immigration;
- Coastal safety of maritime and inland waterways.

The coordination of the MA System is ensured by the National Coordination Council. The purpose of this council is to guarantee compliance in maritime jurisdiction within the scope, and in accordance with international law and national laws and regulations. This is a high-level council with the coordination of the Minister of National Defence and which includes other Ministers and representatives from state entities and agencies with responsibilities in maritime affairs:

Minister of MARITIME AFFAIRS – Definition and implementation of safety measures to guarantee safe coastal navigation and on the management ports and harbours. Enforcement of fisheries laws and regulations including fishing gear, quotas, closures and fishing effort to guarantee the sustainable management of marine living resources. Partner in the SIFICAP and the MONICAP systems (Vessel Monitoring Systems - VMS).

Minister for the ENVIRONMENT AND CLIMATE ACTION – Initial technical advice on projects and other private use of the maritime domain. Enforces the precautionary approach to prevent and mitigate eventual effects of pollution incidents. Also responsible for enforcement within these activities.

Minister of JUSTICE – Investigation and eventual prosecution of administrative fines; cooperation with police services on criminal investigation. Ownership registry of small boats.

Minister for the ECONOMY – Initial technical advice on projects relating to the exploitation of mineral resources within the continental shelf seabed under national jurisdiction. Also responsible for enforcement within these activities.

Minister for HOME AFFAIRS – Cooperation and interoperability with other police services (Public Security Police - PSP, National Republican Guard - GNR, Immigration and Borders Control Service - SEF) within the “Internal Security System” and the “Civil Protection Service”.

Minister for HEALTH – Certification and enforcement of working conditions on board vessels.

Ministry of CULTURE – Implementation of safeguard measures regarding the conservation of subaquatic cultural patrimony.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Representatives of the autonomic regions of Azores and Madeira, the Admiral National Maritime Authority (AMN), the Chief of General Staff of the Air Force (FA), the Commandants of the Maritime Police (PM) and of the National Republican Guard (GNR), Directors of the Public Security Police (PSP), Criminal Police (PJ), Immigration and Borders Control Service (SEF), Directorate-General for Health (DGS), Directorate-General for Natural Resources, Safety and Maritime Services (DGRM), and the President of the Portuguese Environment Agency (AMA), also integrate the National Coordination Council.

The following state entities (Figure 3) exercise the mandate of the MA within the framework of the MA System, each with its own specific responsibilities and competencies.

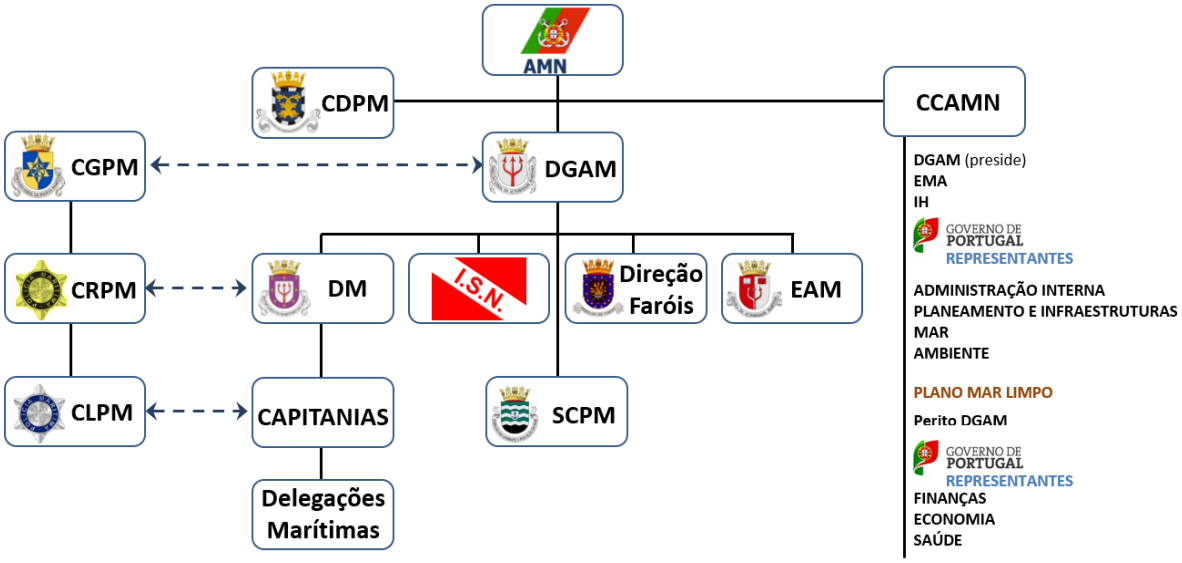
PT Figure 3 State entities exercising the mandate of the Maritime Authority within the framework of the Maritime Authority System: Marinha (Portuguese Navy), AMN (National Maritime Authority), FA (Portuguese Air Force), GNR (National Republican Guard), PJ (Criminal Police), SEF (Immigration and Borders Control Service), ASAE (National Food Safety Authority), DGRM (Directorate-General for Natural Resources, Safety and Maritime Services), ACT (National Working Conditions Authority) and AT (National Fiscal Authority).

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

The AMN, when understood as an entity, constitutes the hierarchical apex of management and coordination and, inherently, this role belongs to the Navy's Admiral Chief of the General Staff. He is responsible for the coordination of national activities to be carried out by the Navy, the Directorate General of the Maritime Authority (DGAM) and the Command of the Maritime Police (CGPM), in compliance with the guidelines of the Minister of National Defence.

The AMN, understood as a structure (Figure 4), is composed of the DGAM, the PM (CGPM, CRPM, CLPM), the Maritime Public Domain Commission (CDPM) and the Advisory Council of the National Maritime Authority (CCAMN), each with its own identity, structure and institutional ethos.



PT Figure 4 AMN Structure
The AMN, understood as a structure, is composed of the Directorate General of the Maritime Authority (DGAM), the Maritime Police (PM), the Maritime Public Domain Commission (CDPM) and the Advisory Council of the National Maritime Authority (CCAMN).

The AMN structure comprehends both advisory (CDPM, CCAMN) and operational bodies (DGAM and PM - CGPM, CRPM, CLPM).

The CDPM is responsible for studying and advising on matters related to the use, maintenance, and defence of the state-owned maritime public domain. It comprises coastal and territorial waters and inland waters subject to the influence of tides, in rivers, lakes and lagoons, as well as their beds and banks. It also integrates the contiguous seabed of the continental shelf, covering the entire Exclusive Economic Zone (EEZ).

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The CCAMN is an advisory board of the AMN, presided by the Director General of Maritime Authority and including representatives from the Portuguese Navy (État-Major - EMA) and the Hydrographic Institute - IH) as well as from the ministries of Home Affairs, Infrastructure, Maritime Affairs, Environment and Climate Action, Finance, Economy, and Health.

The DGAM is a state service, integrated in the Ministry of National Defence, being legally committed to directing, coordinating and monitoring the activities carried out by its departments and services in accordance with national law.

DGAM´s operational structure includes 5 Maritime Departments (DM), 28 Captaincies (Capitanias), Maritime Delegations (Delegações Marítimas), Lifeguard and Maritime Rescue Institute (ISN), Marine Pollution Response Service (SCPM), Lighthouse Directorate (Direção Faróis) and the Maritime Authority School (EAM).

The PM is a civilian armed police service with power of enforcement and prosecution in the Portuguese maritime domain and jurisdiction. It has particular capabilities and skills to perform its tasks at sea and coastal areas, thus assuring the enforcement of the rule of law in the maritime areas under national jurisdiction, including maritime border control.

The PM is part of the MA structure and is under the authority of the Minister of Defence. The PM *Commandant* is also the (Vice-Admiral) Director General of the Maritime Authority. At regional level the Commander of the Maritime Department is also the PM regional commander and, at local level, the Captain of the Port is also the PM local commander.

The Maritime Police and the Portuguese Navy carry out per year more than 5500 actions of surveillance, counter illegal immigration and narcotics trafficking, as well as other law enforcement operations in interagency cooperation.

On average over 70000 hours in 4800 days at sea are spent per year in maritime safety and security duties by these two entities.

Concerning lifeguarding and search and rescue operations, the DGAM and the Portuguese Navy perform more than 500 operations every year with a success rate of 95%.

Additionally, in the last years both Maritime Police and Portuguese Navy have been performing yearly more than 4 operations in the Mediterranean Sea in support of Frontex in its border control and counter irregular migration operations.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

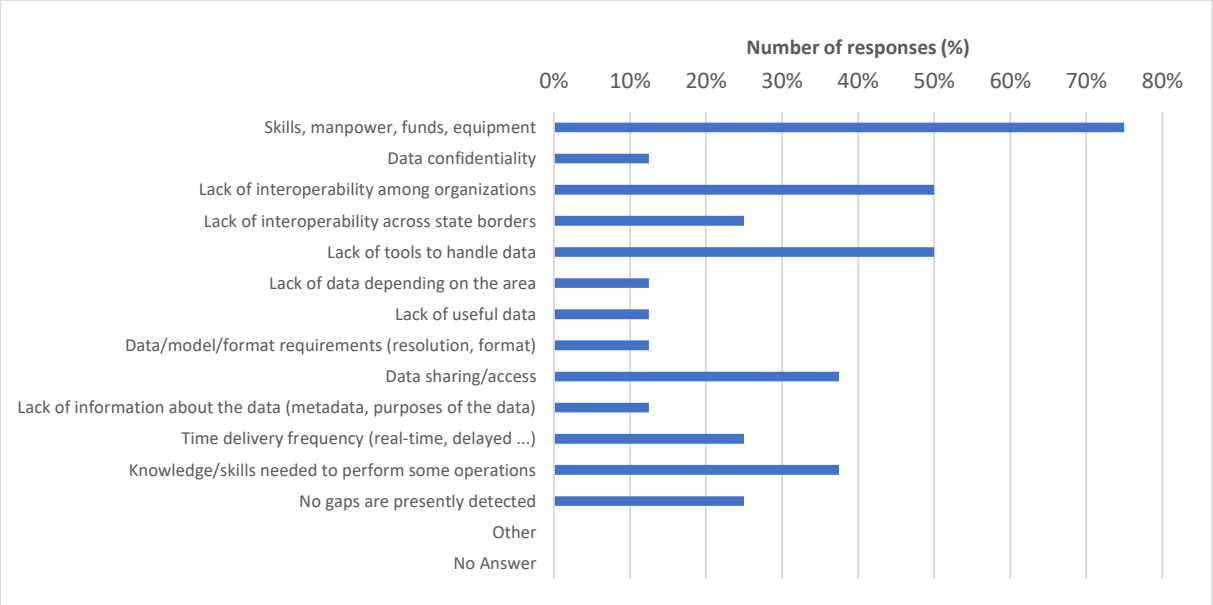
3. Conclusion

The Portuguese maritime domain governance structure (presented here in a simplified version) includes many public entities at national, regional or local level, each with its own responsibilities and competencies. The high number of state entities involved in the maritime domain increases significatively the complexity of the national maritime governance model thus making coordination a constant challenge. However, as the AMN and the Portuguese Navy play a central role in this governance model and as they are working together in close cooperation, this facilitates the conduction of daily activities as well as the response to emergency situations.

3. Gaps and issues identified in Portugal

1. Description of the gaps

Concerning the gaps or limitations detected in participants' daily activities (Figure 5), lack of skills, manpower, funds or equipment are the major cause mentioned (75%). Lack of interoperability among organisations (a significant number of platforms instead of an EU common platform) and lack of tools to handle data are identified as the second cause (50%), followed by no data sharing or access to data and absence of knowledge or skills needed to perform some operations (38%).



PT Figure 5 Gaps and limitations detected in participants' daily activities

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Lack of interoperability across state borders and time delivery frequency (real-time, delayed…) are also mentioned (25%). One fourth of the interviewed replied that no gaps are presently detected.

The less selected reasons (13%) are data confidentiality, lack of data depending on the area, lack of useful data, data/model/format requirements (resolution, format), and finally, lack of information about the data (metadata, purposes of the data) as some GIS data is not well identified with respective metadata.

One gap/limitation identified in the data used is that correlation of different data sources is not always simple if not everybody is using the same data standards. Other limitations are the use of different formats, heavy amount of data, storing difficulties and low operating system speed in operational mode.

On what concerns the gaps/limitations detected in the data produced, they are related with lack of specialized personnel to analyze and process the data produced as well as storage limitations. They also mentioned that there are some specific features missing in the tools used, namely pattern detection, more robust alarmistic, interconnection and tools limitations regarding big data processing.

2. Conclusion

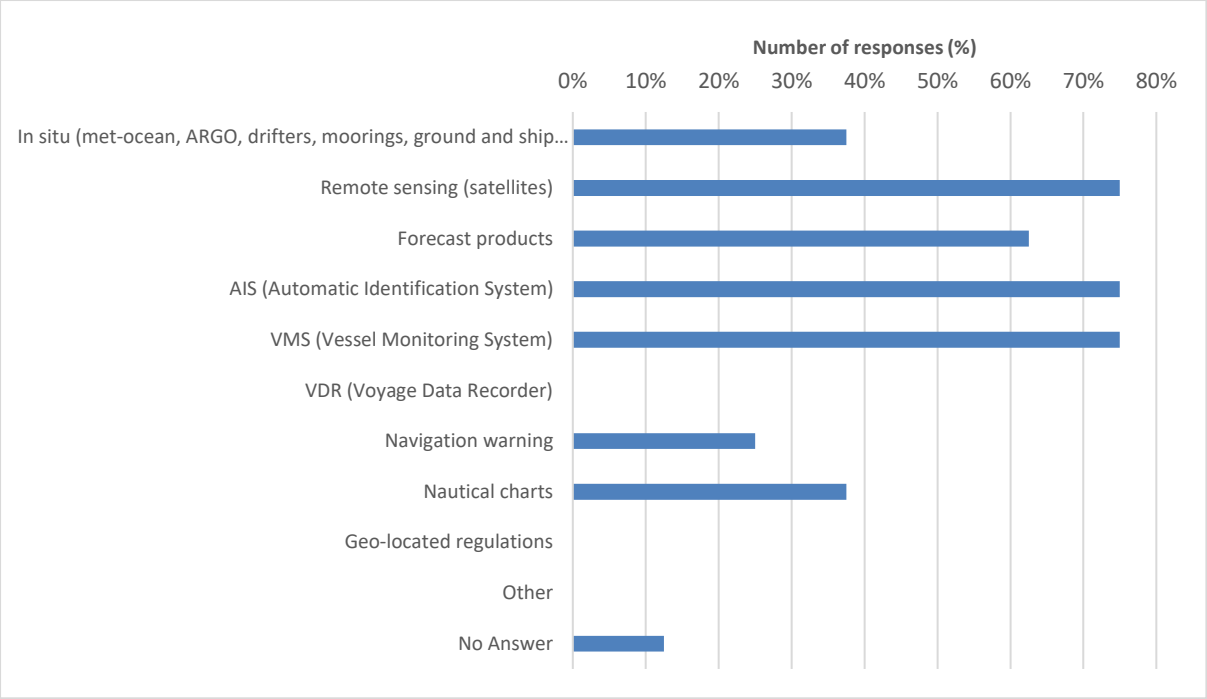
Several gaps and limitations regarding data in the Portuguese stakeholders' daily activities were detected and reported by them. Lack of skills, manpower, funds or equipment is identified as the main cause. Furthermore, the lack of interoperability among organizations, namely the existence of many different platforms instead of an EU common platform, as well as the lack of tools to handle data are mentioned as the second most important reason for the gaps/limitations identified.

4. Platforms and geoportals for Portugal

1. Type of data used

In what concerns the kind of data used by the stakeholders (Figure 6), most of it is from AIS (Automatic Identification System), VMS (Vessel Monitoring System) and remote sensing (satellites). Other kinds of data like forecast products, nautical charts, in situ (met-ocean, ARGO, drifters, moorings, ground and ship-based radars systems, water samples, lab analysis) and navigation warnings are also used.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



PT Figure 6 Data used by the stakeholders in their daily activities

The data formats used are mainly GIS based formats (SHAPE files, raster images), Web services (XML, WFS, WMS, …) and Excel spreadsheets (CSV, …). Scientific formats (netCDF, HDF, GRIB, …) are also used but not as much as the previous ones.

The major data suppliers are the national hydrographic services, European Maritime Safety Agency – EMSA (e.g. CleanSEANET, Sesame), own infrastructure, Copernicus Services and administration services (complementary from regional or national based systems). FRONTEX – European Border and Coast Guard Agency, EFCA – European Fisheries Control Agency, EUROSTATS – Statistical office of the European Union and GEOSS – Global Earth Observation System of Systems, are also data suppliers.

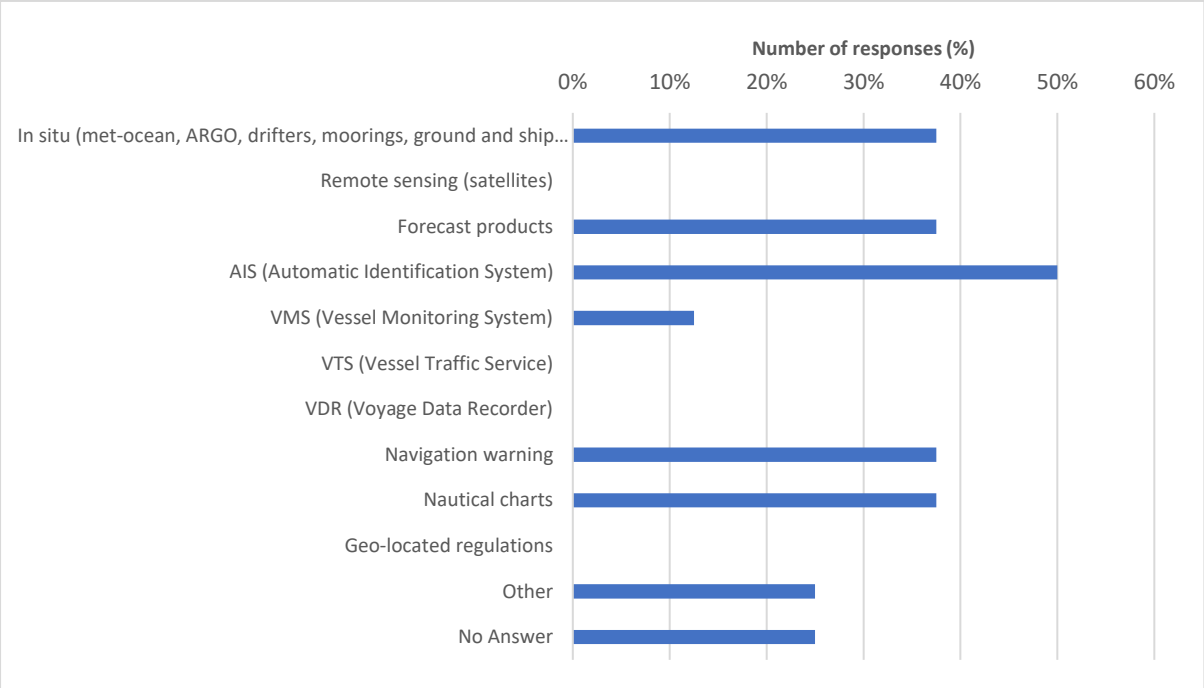
However, some data suppliers are unfamiliar to survey participants as they are not aware or do not use some of them. It is the case of MONGOOS – Mediterranean Operational Network for the Global Ocean Observing System, SEADATANET – Pan-European infrastructure for ocean & marine data management, EMODNET – European Marine Observation and Data Network, EEA – European Environment Agency, ESFRI – European Research Infrastructures (e.g. MEDARGO, EMSO, JERICO), JRC – Joint Research Centre of the European Commission and web repositories (e.g. PANGEA, Nature).

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

2. Type of data produced

In what concerns the kind of data produced (Figure 7), AIS, in situ (met-ocean, ARGO, drifters, moorings, ground and ship-based radars systems, water samples, lab analysis), forecast products, navigational warnings and navigational charts, are the most common types. Furthermore, electrooptic surveillance and intelligence data are also produced.



PT Figure 7 Data produced by the stakeholders in their daily activities

The data formats produced are mainly GIS based formats (SHAPE files, raster images), Web services (XML, WFS, WMS, …) and Excel spreadsheets (CSV, …). Data stream (NMEA, ARPA), video stream and scientific formats (netCDF, HDF, GRIB) are also produced.

Part of the surveillance data produced is disseminated with restrictions regarding data confidentiality as it is shared only with authorized identified stakeholders. The most common language for this data sharing is English but it is also shared in the national language - Portuguese.

The most common technologies/tools used to acquire, process and disseminate data are web-based services (own and other) and GIS software. The own web services used are the COSMOS framework (Portuguese Navy web services) and the Oversee. Other web-based services are EMSA services and web in general. The GIS software used is QGIS (free) and Electronic Charts. Custom proprietary software (MS Office) and open-source software are also used. Custom open-source software used is Postgis and QGIS.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

3. Geoportals dedicated/useful for maritime surveillance activities

Started in 2009, the CISE (Common Information Sharing Environment) project aims to set a sharing environment for maritime surveillance data between EU Member States to improve the efficiency, the quality, the responsiveness and the coordination of surveillance operations. Most participants (63%) are aware of the CISE data exchange model but only 25% are already a CISE member.

Although 63% of the survey participants do not know if there is a national geoportal allowing to share/display surveillance data, 26% are aware of the existence (implemented or under development) of such a portal. An example is the hydrographic geoportal from the Portuguese Navy Hydrographic Institute (https://www.hidrografico.pt).

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

TABLES

FIGURES

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

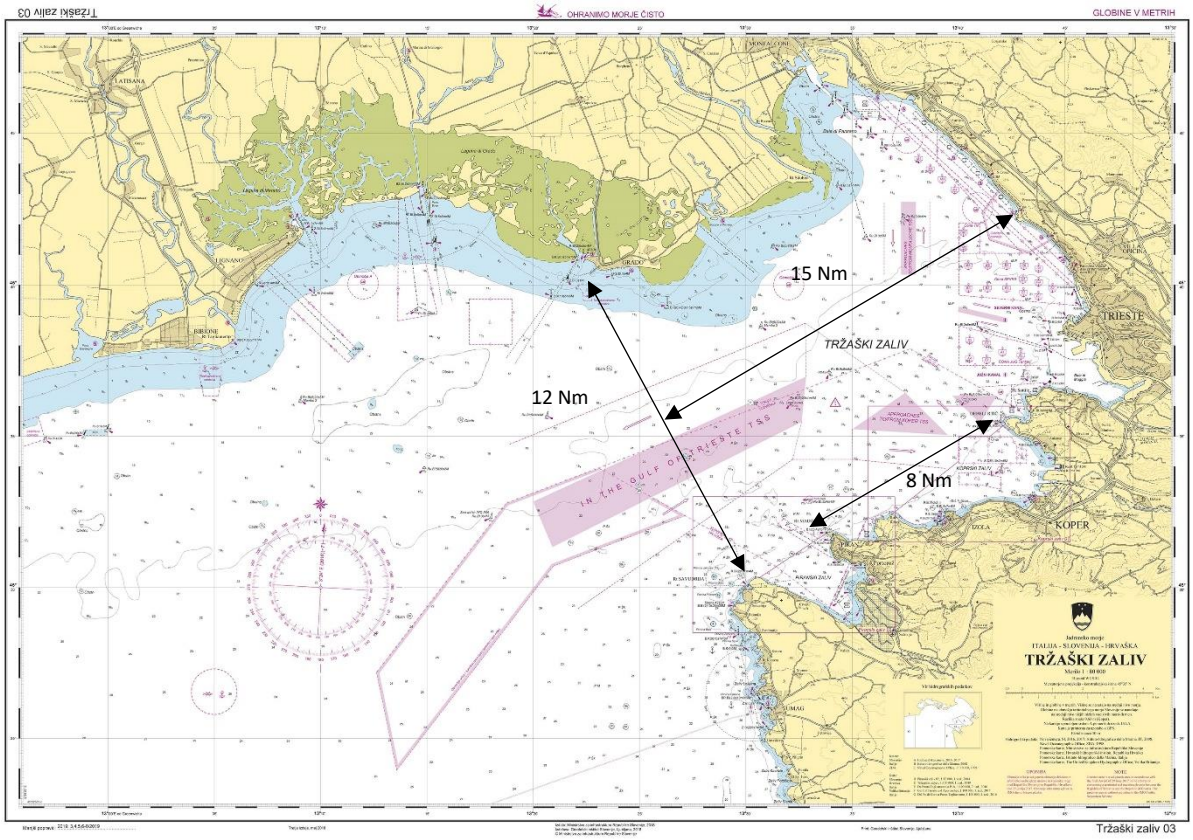
SLOVENIA

Slovenia, compared to the partners of the MED OSMoSIS project, monitors the smallest sea territory. The sea border between Slovenia and Italy has been agreed, while the sea border between Slovenia and Croatia is yet to be defined. This causes many issues, mainly because this border is treated as a Schengen border.

A very intense traffic can be observed in the area with around fifty ships going through Slovenian waters daily to and from the ports of Koper, Trieste and Monfalcone, together with oil fuel tankers heading to Trieste carrying more than forty million tons of cargo a year. During the summer season, an average of two big cruise ships (sometimes up to five) go through these waters, transporting each several thousand people on board. A very dense traffic of small recreational boats (several hundred daily), other crafts (kayak, sup, surf…) and swimmers is also observed over the summer.

In 2020, Slovenia installed new equipment for surveillance purposes, such as new VHF antennas (AIS, DSC, verbal communications…), radar, CCTV, RDF, METOCEAN sensors and pollution detection applications. Also, a redundant control centre for emergencies (for VTS, RCC, Immigration, Civil protection…) was established.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



SL Figure 1 Koper port overview

Most of the documentation flow related to the traffic of the ships in port is handled through the National Single Window (NSW). This kind of surveillance runs well.

In order to clearly present the structure of Slovenian maritime stakeholders, we have divided them into two groups, based on their relationship to the Slovenian government. Governmental stakeholders are run by various ministries and report directly to their respective ministers. On the other hand, non-governmental stakeholders are either private or established by the government with a certain level of autonomy.

For the purpose of this project and easier understanding, we numbered the organisations from 1 to 44. The organisations are numbered in the same way in other types of files.

For the purposes of this project we have included all parties, those who monitor the situation as well as those who are monitored or give/need information.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

1. Governmental stakeholders

1.1. Slovenian Maritime Administration (SMA)

The Slovenian Maritime Administration, SMA, is the main maritime institution of the Republic of Slovenia and operates within the Ministry of Infrastructure. The administration includes a harbour master service (free pratique/clearance issuing, berth monitoring, pilotage, and tugging), rescue coordination centre (RCC), vessel traffic service (VTS), environmental protection of coastal sea division, port state control (PSC) and flag state control (FSC) services. SMA also runs the Slovenian boats and ships register.

1.1.1. The harbour master division

The harbour master division is responsible for issuing free pratique and clearance permissions. In order to allow the ships to proceed with cargo loading or unloading, the division must know if the ship carries all the necessary certificates. To obtain the data needed, the division consults the Republic of Slovenia's Single Window (NEO), a platform where all the certificates are stored by the ship's agent upon the arrival of a particular ship for which the agent provides their services. The harbour master also controls anchoring and berthing of ships, including pilotage and tug assistance. This service issues navigational warnings to all ships in port related to safety of navigational as well notice to mariners and meteorological warnings. On ships' departure the harbour master provides the clearance permission. To perform these tasks, the harbour master uses the Single Window, but can also receive information via VHF radio, AIS, LRIT, SSN, CCTV, visual observations and CSN systems. They also use different databases related to ship's data like ITU MARS, IMEO ISIS, EQUASIS, etc. They can also acquire data from appropriate ships and boats registers. Boat patrols may be launched if needed, for example, to check the adequacy of ship's draughts, small boats at sea, etc.

1.1.2. The Rescue Coordination

The Rescue Coordination Centre coordinates search and rescue (SAR) operations and all the services participating in them and maintains a continuous 24/7 radio watch on VHF DSC radio stations (Area A1) as per the SAR convention and other requirements. RCC is also the national contact point for the alarms launched by ships within the Slovenian SAR area. In the case of an accident, the RCC collects information from a vessel in need of assistance. Those can be obtained directly from the ship in distress by a DSC or voice message sent on a VHF DSC radio station, by a Civil Protection Notification Centre which can be contacted by phone number 112 or by a SAR dedicated phone number 080 18 00. RCC can, however, obtain the needed data indirectly from AIS, Radar and LRIT systems or from

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

CCTV footage and SMA boat patrols. Data about the persons and cargo on board can be acquired from the National Single Window.

1.1.3. Vessel Traffic Service (VTS)

The Vessel Traffic Service (VTS) maintains control over national and international ship and boat traffic in territorial waters of Slovenia. That includes monitoring the movement of *all* vessels, from ocean going ships to the smallest recreational non registered crafts, including kayaks, sups, windsurfs and so on. To ensure safe traffic movement, VTS monitors the functionality of lighthouses, buoys, antennas, meteorological stations, and other safety of navigation objects. VTS collects ship voyage data obtained by static and dynamic information from AIS systems. The service also gathers data from navigational objects and meteorological stations. The data needed for the VTS to operate is provided by AIS, RADAR, and SSN systems, together with CCTV footage. The service can also make direct contact with ships via VHF DSC station or boat patrols. In the case of a detected accident, VTS alerts the RCC.

1.1.4. The Environmental Protection of Coastal Sea division (SVOM)

The Environmental Protection of Coastal Sea division (SVOM) is responsible for maritime pollution safety. The division controls all territorial waters apart from ports which have their own services and take care of cleaning duty if they encounter pollution. If the pollution is too extensive, they receive help from The National Civil Protection. The division gathers information about possible dangerous leaks, sewage and garbage waste and other types of pollution. They collect this information via VHF DSC radio stations or other radio telecommunication devices, but mostly from the harbour master's office or from witnesses as well as from RADAR and CSN systems, or the Civil Protection National Notification Centre (112). In the case of intervention, the division requires data on the extent of pollution, type of pollution, area, meteorological situation, wind and current at the time.

1.1.5. Flag State Control (FSC)

Flag State Control (FSC) and inspectors monitor ships that are sailing under the flag of Slovenia while

1.1.6. Port State Control (PSC)

Port State Control (PSC) verifies randomly chosen ships which arrive in the Port of Koper based on their age, results of previous port state inspections, their national flag and appearance. Port state control inspects those ships for any signs of equipment malfunction or structural anomalies and makes sure that they operate in accordance with national and international laws and conventions. The inspection division of the Republic of Slovenia is also responsible for inspecting any navigational or hydro constructions. In order to determine which ships or construction sites to inspect, PSC and FSC

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

can either use LRIT, SSAS, SSN, CSN and AIS systems, or THETIS, ITU MARS, EQUASIS and other databases. Apart from these sensors, the data can also be obtained by the inspectors themselves during inspections.

1.1.7. The Nautical Documents

The Nautical Documents sector is the last division of the SMA. The service runs the national ships, boats and pilots register. Authorised persons have access to those registers to verify the validity of data from Slovenian vessels.

1.2. Ministry of Infrastructure

The Ministry of Infrastructure oversees and manages tasks in areas of rail, air, road, maritime, and inland water transport. In the area of marine affairs, The Air and Sea Traffic Directorate and the Marine Accident and Incident Investigators are particularly important.

The Air and Sea Traffic Directorate performs general professional and administrative tasks related to the preparation of strategic directions, policies, and development tasks in the field of aviation, maritime, and inland water transport. Those of utmost importance include providing a safe working environment, inspecting the overall working quality of air and water transport services, issuing concession contracts, drafting new laws and overseeing their execution, cooperating with other EU services of the same field, and supervising other ministry departments (SMA, for example). To execute their duty, the directorate gathers statistical data from public and private ports. Most of those are obtained from the SMA.

In accordance with the provisions of the Maritime Code and the Maritime Accident Investigation Regulation, the Marine Accident and Incident Investigator investigates the causes of accidents. The Investigator, however, does not investigate who is responsible for them, but the causes leading to the accident. During investigation, they are in close contact with the SMA and, if necessary, with other governmental services to obtain the highest quality information that would help them clarify the circumstances of the accident. Those include eyewitness and crew statements, video footage and AIS, LRIT, RADAR, CSN, SSN, and VDR data, as well as other relative data like the weather and oceanographic situations, etc.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

1.3. Police/Migrations

The Koper Maritime Police Department is a unit of the General Police Directorate which operates under the Koper Police Administration. The maritime station is a special unit since it also performs the protection duties and control of the state border at sea and ports aside form general police tasks.

3-1 To control maritime borders and general safety, the Koper Maritime Police Department uses different patrol boats operated by boat patrol police officers. They primarily control illegal border crossings, but they also monitor criminal acts, mostly illegal fishing. For efficient patrol they work with AIS, RADAR, and VMS systems as well as using visual observation. They must also be acquainted with current and predicted meteorological and oceanographic situations (wind, current, water temperature, tide, etc.).

3-2 Police border control at sea monitors the Schengen borders from land using visual observation, RADAR, and different camera systems. They also coordinate the work of patrol boats. In case they detect illegal activity, they intervene in accordance with their jurisdiction.

3-3 On the other hand, police border control in ports does not have outside patrols; however, they cooperate closely with the sea border control department. The port border control department is located in two borders, Piran and Koper. Every foreign vessel must register its arrival. The police can then inspect everyone's and their ship's documents. If the ship is suspected of posing a threat to security, the police get in touch with the Slovene Intelligence and Security Agency. Apart from that, they also exchange data with other organizations such as INTERPOL, EUROPOL and FRONTEX. Another task force is the border control team, which consists of police officers at border crossings and police controllers, carries out border control at land border crossings and border crossings for maritime traffic and make occasional helicopter overflights.

3-4 The final task force consists of criminal inspectors. They investigate criminal offenses related to maritime transport or instances on vessels such as different violence, thefts, drug smuggling and other criminal offenses.

3-5 The maritime department is connected to the operational-communication centre (113) who operate within the Slovenian police. If a citizen informs the centre about an incident at sea via the 113 number, the centre will assess the seriousness of the situation and, if necessary, inform its relevant services (police patrol vessels, land patrols, etc.) as well as external services through the information centre or services of the SMA. Apart from data collected by direct contact, the police use various means of gathering information.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

All such services collect data from the crews of vessels which cross the state border. They check the compliance of masters' documents and of vessels themselves by maritime patrols. However, they do not have their own register of boats and boat owners, so they must consult the SMA if they want to access this information. On the other hand, they keep their own database at each of the two border crossings for international maritime traffic (in Koper and Piran), where all people who cross the national border at sea must register. In general, the Police use the SIS information system to store data on wanted, missing, and secretly monitored persons or those who are constantly monitored, as well as information on stolen or missing vehicles and objects. In addition, 24-hour video surveillance and occasional pier control are undertaken.

In order to collect the needed data, the police use patrol boats equipped with RADAR and AIS systems alongside VHF DSC radio stations and VMS stations. To prevent criminals from listening to their communications, the patrols use a special TETRA radio communication system (Terrestrial Trunked Radio). If the units encounter a need to track a suspect, they use SEA SEARCHER systems.

Should the need arise, the police activate its helicopter units, equipped with ELT/SARSAT/COSPAS which enable them to track vessels or enhance SAR operations.

1.4. Financial Administration of Koper/Custom Procedures/Customs Illegal Acts Detection

4-1, 4-2 The Customs Service of the Republic of Slovenia is responsible for the control of imports and exports of goods and for the control of goods for which special import and export conditions are set. The service operates within the Financial Administration of Koper.

The most important source of European customs law is the Customs Code. In the Republic of Slovenia, this is enacted by the European Union Customs Legislation Implementation Act (ZICZEU). The term customs union describes an area of almost the entire European Union where the free movement of goods applies. However, if goods arrive or are exported to countries outside the customs union, they are entered into the customs system and require duty.

Goods imported to Slovenia via the Port of Koper from countries outside the European Union are entered into the customs system. The customs service (4-1) is therefore obliged to check the documentation of those goods, and can, if necessary, make an inspection if they suspect any violation of legal provisions or if they are notified by other authorities. The Financial Administration of Koper has a special sector for risk analysis (4-2) in the Port of Koper. The goods may be subjected to invasive

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

inspection if they suspect an illegal activity, but normally they are checked with non-invasive methods (scanners, sensors, etc.). Other appropriate services are contacted if the customs service comes upon an illegal activity outside their level of authority. Those services include The Ministry of Defence for activities involving military equipment, police for activities involving firearms, drugs, illegal migrations, etc., the Administration for Food Safety, the Veterinary Sector and Plant Protection for activities involving animal or plant origin products, SMA for activities involving dangerous goods, and others.

The Customs Service of the Port of Koper gathers information from the port system TinO, where agents, freight forwarders, logisticians, and other stakeholders in maritime transport store their data. To monitor the movement of ships, the service uses data from the National Single Window (FAL Convention) or the TinO system (arrival, pilotage, berth status). The service can also access the

databases of services with whom they cooperate when they track down illegal activities outside their authority.

The price of custom duties is determined by EEC No 2658/87, the Regulation on Tariffs and Statistical Nomenclatures and the Common Customs Tariff by value, quantity, and origin of goods. For passengers, the price is determined by international conventions, national regulations (VAT) and European customs legislation. Today, customs procedures are filed electronically. Slovenian customs service stores declarations in the NCTS (New Computerized Transit System).

Furthermore, the Financial Administration enables access to customs procedures and services electronically via the e-Carina portal and various applications. Those include E-izvoz (for export customs declarations filing and overview), TARIC3 (nomenclature, measuring, anti-damping, tariff trends et.), ETROD (excise duty liable person check-in, electronic excise duty account filing), EMCS (electronic excise duty document filing and approval), E-izvršbe (execution proposal), and customs insurance applications. The MRN (Movement Reference Number) online service is also available to customers. With this service, customers can enquire about their consignment based on the movement reference number. The service also displays Slovenian declarations on transit, export, and import procedures.

1.5. Ministry of Defence

The Ministry of Defence is the primary military body of the Republic of Slovenia, which oversees the armed forces. The Slovenian Armed Forces' primary task is the defence of the Republic of Slovenia.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

They work independently or with an alliance based on international agreements. The naval part includes the 430th Naval Detachment and vessels of the Slovenian Armed Forces, which operate by the provisions of the Defence Act.

The General Staff of the Slovenian Army is the highest body which commands the army and operates within the Ministry. Its purpose is to carry out tasks related to planning and development, as well as organising, training, and operating the army. In the maritime area, the General Staff plans and coordinates military intelligence activities and security tasks. In the event of a detected security threat, it forwards data to other services and international organizations (EU, NATO, UN, and OSCE).

In addition to these tasks, the General Staff also runs a system for the protection of classified information of the army and coordinates the development of communication and information systems. This is especially important in the case of international cooperation and military missions such as Operation Mare Nostrum. The exchange of data in these situations is the basis of the future CISE environment.

5-2 The 430th Naval Detachment operates within the Slovenian Army and the Ministry of Defence, which ensures readiness for operations in the Republic of Slovenia. It also performs the disposal of unexploded ordnance, anti-sabotage operations, anti-terrorist protection, and the protection of allied and Slovene military facilities. The Naval detachment also detects and informs necessary parites in regard to possible sources of threats at sea. In the event of an accident at sea, the 430th Naval Detachment can assist in SAR operations and, in general, take care of traffic control and monitoring.

5-1 The 430th Naval Detachment includes a multi-purpose vessel department consisting of the HPL 21 high-speed patrol boat *Ankaran* and the multipurpose ship VNL 11 *Triglav*. All Naval vessels may assist Slovenian and foreign state bodies and civil individuals who demonstrate need at sea.

To carry out these tasks, the Navy gathers information on all the vessels that navigate in Slovenian seas or those suspected of posing a threat. The superior command obtains the necessary information from internal and external state bodies and foreign military and civilian bodies. From ships, it can obtain information on the location and activity. The Naval vessels are equipped with HF, VHF, satellite communication systems, and unique protected military communication systems to gather data, which prevent individuals from spying. The Naval vessels are equipped with their own sensors intended for navigation; namely, observation devices such as optoelectronic devices, GPS, RADAR, AIS and NAVTEX.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

1.6. Fishery/Fishing inspection

In the Republic of Slovenia the main organisation related to fishing at sea is the Fishing Inspectorate. The inspectorate is a body within the Ministry of Agriculture, Forestry and Food. In the field of maritime affairs, the Maritime Fisheries Inspectorate monitors the implementation of fishing at sea, as well as supervising operations in fishing families, the Fisheries Research Institute, and trade in fishery products.

The primary tasks of inspectors include fishing boat, tools and licence inspections, special licence inspections, commercial and non-commercial fishing licence inspections, the inspection of daily quotas and fishing vessel monitoring. They also check various lists and documents. In general, the inspectorate makes sure that every individual in the fishing business works according to the national laws.

To do their job properly, the inspectors gather information on fishing vessels, fishermen, and fish and shell farms. Since they do not have the authority to gather specific personal data, for example, the data of a fishing vessel which participates in illegal fishing or border crossing, they cooperate with the SMA and Police. Other data is collected using their own sensors.

Data on vessels and fishermen can be obtained by inspectors through logs, VMS, AIS, RADAR, and patrol boats. Fish consignments on the high seas can be tracked with the help of data obtained by the Customs of the Republic of Slovenia through LRIT and SSN systems and foreign sources.

Slovenian and foreign fishing vessels fishing in the territorial seas of neighbouring countries can be monitored by the inspectorate via the above-mentioned sensors. In national territorial waters they can use data from the SMA and the Police of the Republic of Slovenia.

1.7. Fishery Research Institute

The Fisheries Research Institute of Slovenia manages public activities in the fields of freshwater and maritime fishing. It also engages in commercial activities in the areas of sport and recreational fishing and fish farming, and various research in the field of fisheries biology. The institute is accredited to provide socio-economic data on marine fishing, mariculture, and fishery process duty. With gathered information from all fishing vessels, the socio-economic status may be assessed. Alongside that, new measures can be adopted to achieve sustainable development in the fishing sector. The institute's main data sources are the InfoRib information system, FI-PO AJPES financial data and various questionnaires.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

1.8. National Institute of Public Health

The National Institute of Public Health is a service providing data on infection sources, contaminations and disease transmitters in the Republic of Slovenia and its border crossings including ports and airfields. The information gathered by the institute is shared with the World Health Organisation (WHO). Every ship must, upon her arrival, send her Maritime Health Declaration (MHD) and other related documents to confirm that the health status on board the ship is good through NSW and report to the Koper unit of the institute. The unit inspects the adequacy of those and, in the case of emergency, takes necessary measures.

If there is a risk of contagious disease, the institute receives a warning from the European Centre for Disease Prevention and Control's portal EPIS.

1.9. Administration for Food Safety, Veterinary Sector and Plant Protection/Veterinary control/Phytosanitary control

This administration is a governmental inspection body which verifies documents on the transport of food, animals, and plants at national borders and entry points into the EU. It also carries out inspection procedures on the import of the above-mentioned subjects and the import of plant and animal origin food, live plants, plant products, phytopharmaceutical products, and invasive alien species. Inspections include the examination of documents as well as identification and physical checks of controlled consignments, including sampling. Together with the Fishing Inspection, the inspectorate operates within the Ministry of Agriculture, Forestry and Food.

The administration also operates in the Port of Koper, DPE, DPI, and in customs warehouses, where phytosanitary and veterinary inspectors perform the aforementioned inspections. The main goal of those is to establish the compliance of phytosanitary and veterinary products with the requirements of the importing country. To do their job properly the Phytosanitary (9-1) and Veterinary (9-2) Inspectorates in Luka Koper collect and exchange data with agents, freight forwarders, customs and the company Luka Koper on the products in their field of work. They cooperate and exchange relevant data with other supervisory bodies and laboratories, as well as the rest of the EU organisations responsible for this area. The administration collects these data via inspectors. The veterinary inspectorate uses the TRACES system to check the origin of animal products. A new system, IMSOC, is currently being developed.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

1.10. Administration for Civil Protection and Disaster Relief/Civil Protection/Civil Protection Notification Centre/Fire Brigade

The Administration of the Republic of Slovenia for Civil Protection and Disaster Relief - ACPDR is a governmental body which performs tasks of organisation, preparation, and intervention in the event of natural or other large accidents at sea. They work accordingly with the provisions of the Protection against Natural and Other Disasters Act and subordinate acts. The administration also coordinates other ministries that must be involved in rescue operations in the event of a large size accident. They also take care of drafting new laws in the event of accidents, establish safety systems, and maintain existing ones. The main units of the Administration are the Civil Protection Command, the Civil Protection Notification Centre, and the Fire Brigade.

10-1 The Civil Protection of the Republic of Slovenia serves to protect against natural and other disasters. It is an establishment of organized forces for protection, rescue, and assistance. The department of Civil Protection in the Slovenian coastal region conducts protection, rescue, and assistance activities in the event of an accident at sea. It appoints an intervention commander who carries out individual tasks at sea. All forces involved in protection, rescue, and assistance tasks are directly subordinated to them. In the event of a major accident, when neighbouring countries are also endangered by the accident, the commander works alongside the establishment. Ministries and other state bodies organize activities in accordance with the decisions of the commander or the government.

The administration's health service works in accordance with the procedures of the Ministry of Health. In the event of an accident at sea, the Civil Protection provides first aid assistance. Medical assistance is provided by medical personnel in the field or in hospitals, while specialist assistance can only be provided in hospitals. In the case of a pandemic, hygiene measures or pandemic measures are taken by the service of the National Institute of Public Health. Furthermore, the Civil Protection provides supplies of medicine, equipment, and sanitary material. If there are fatalities in an accident, the Administration must arrange for the identification of the dead.

10-2 The Civil Protection Notification Centre (112) can be contacted by any individual who witnesses an accident or is otherwise involved in it. They must provide as much information about the accident as possible. Depending on its nature, the Notification Centre then contacts either the Fire Brigade, the Police, Emergency Medical Services, Vets, Mountain Rescuers, Cave Rescuers, the RCC, SAR service or other rescue services.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

10-3 In the event of a fire at sea or in Slovenian ports, the Fire Brigade intervenes. A fire warning is sent to the RCC Koper, which then forwards it to the Koper Fire Brigade, the SMA, Tug Service, the Environmental Protection of Coastal Sea division, and other bodies. Upon arrival at the scene, the head of the fire brigade's intervention unit reports additional information about the accident to RCC Koper. RCC Koper immediately forwards the received information to every pertinent body. Potential threat to other ships or sensitive areas on the coast is considered. The coordinator may ask for international help if the threat is too severe to handle.

The Civil protection in general gathers information about the location of the accident, number of injured persons, number of casualties, the nature of an accident, the type of ship involved, the cargo it transports, as well as the meteorological state and forecast. This information may be received from witnesses or ships and boats via VHF DSC radio. Other sensors in use include AIS and RADAR systems. For on-scene communications, the administration uses the ZA-RE system apart from VHF radio stations and other devices.

1.11. Ministry of Environment and Spatial Planning/ARSO Water/ARSO Meteorology/VGP Drava Coastline Protection

The Ministry of Environment and Spatial Planning has four services that work in the field of maritime affairs. These are the Maritime Spatial Planning Department, the Slovenian Water Agency, the Environment Agency, and VGP Drava Company.

11-1 Maritime spatial planning (MSP) is a very important task for each country. The regulation for it is directive 2014/89/EU. This directive establishes a framework for maritime spatial planning aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources.

Currently the adoption of a national MSP is in its final phase. The preliminary version was published at the end 2020 for public discussion. This version consisted of 15 layers in which all important “static” activities related to the Slovenian sea were collected.

If the government later decides, this plan can become a base platform (geoportal), wherein together with “dynamic” data (vessel movement, weather data, etc.) all interested parties could perform their tasks within maritime surveillance.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

11-2 The Slovenian Water Agency oversees the water register. They issue water use concessions, permits, and consents, and take care of water facilities as well as gather hydrographic data. Water use consents and permits are issued upon application for the use of water for a specific purpose and time. Information on individual water consents is publicly available through the Environmental Atlas of Slovenia web portal. These include the water consent serial number, their subject, and information on the submitter (or their representative). Water consent is issued within 60, 30, or 15 days, depending on its complexity (determined by paragraph 3 of Article 153 of the Water Act). The portal also displays data on water permits and their border points (range of allocated area). Concessions for the use of water are issued by the directorate to authorize a service for a certain control or to restrict free movement in a certain area. The latter is otherwise unhindered in areas without a concession, since the coast and the sea in the Republic of Slovenia belong to the public good. The agency gathers geodetic and meteorological data from appropriate agencies (the Surveying and Mapping Authority and The Environmental agency) as well as information from the National Register of Cultural Heritage and Real Estate. The data they gather themselves include hydrographic data, data on existing water use permits and concessions, and data on project documentation and land use. The Agency shares their data with services involved in SAR operations, accident investigations, inspections, etc. Some are publicly accessible through the Environmental Atlas of Slovenia web portal.

11-3 The Environment Agency of the Republic of Slovenia provides meteorological data. They gather this through meteorological stations, meteo-radars, and buoys. Based on this information, meteorological warnings are issued.

11-4 The VGP Drava company, which works under concession within the Ministry, is responsible for coastline cleaning in case of pollution. If the pollution is too extensive, the company alerts the Notification Centre, which activates the Environmental Protection of Coastal Sea Division or the National Civil Protection. They detect pollution through the Notification Centre, eyewitnesses, patrols, or other services.

1.12. Ministry of Culture

The ministry is an entity responsible for declaring, managing, maintaining, protecting, and studying Slovenian cultural heritage both on land and sea. They provide information about cultural heritage and collect data on new cultural heritage sites.

The ministry uses the National Register of Cultural Heritage for storing data. Any organisation or person who conducts measurements on land or sea can stumble upon old remains or relics and can,

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

therefore, contact the ministry who upon inspection secure the site. The relics and other useful information are shown on the published map.

2. Non-Governmental Stakeholders

2.1. Municipalities Koper (12), Izola (13), Piran (14) and Ankaran (14)

Municipalities are primarily responsible for spatial planning on sea and land within the municipality. They keep and share data about the coast line, sea depths, sea bed and underwater obstacles (sewage, cables…). They also manage community mooring places.

2.2. Sečovlje Salina Nature Park

The regional park of Sečovlje is in the village itself and covers the area of the saltern of Sečovlje and the sea around it. The organisation strives to preserve rare birds, plants, and other animal species. They collect data inside the nature park and require data about the coast line, sea, and weather.

2.3. National Park Strunjan

The regional park of Strunjan covers the cliffs of Strunjan, Štjuža lagoon, the sea inside the bay of Strunjan to Pacug, the saltern of Strunjan, and the area around the village itself. The park is also a natural park, and is therefore protected. They collect data within the nature park and require data about the coast line, sea, and weather.

2.4. Morigenos

This is a Slovenian Marine Mammal Society - an independent, scientific organisation that combines scientific research, monitoring, education, and public awareness to achieve effective conservation of the marine environment and biodiversity. The central activity of Morigenos is the Slovenian Dolphin Project, a long-term research, monitoring, and conservation programme, focusing on bottlenose dolphins (Tursiops truncatus) in Slovenian and adjacent waters in the northern Adriatic Sea. In the case of maritime disaster this organisation will provide support related to sea mammals and other animals. They produce data based on their field research and require data about the sea and weather.

2.5. Škocjanski zatok

Škocjanski zatok is a natural park connected with the sea, that lies beside the city of Koper. The organisation strives to preserve many plant and animal species, but mostly birds. They collect data within the nature park and require data about the coast line, sea, and weather.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

2.6. DOPPS

DOPPS is the society of birdwatching and bird studies of Slovenia. The society works for the safety of birds and their living environment. By doing so, they help preserve nature and society in general. Their mission is carried out through nature preservation, scientific, public, and educational work, as well as cooperation with other organisations. In the case of maritime disaster, this organisation will be engaged as a support for bird protection (like oil cleaning of birds). They produce data based on their field of research and require data about the sea, weather, and possible accidents and pollution.

2.7. Pilot service

Piloti Koper is an organisation of pilots that provides pilotage in Slovenia's territorial and inland seas. They require data about vessels, the weather, coast line, sea state, and the sea bed. They can provide visual information if required.

2.8. Tug boat service Adria Tow

This towing company operates within the port of Koper. For their operations they need data about vessels, the weather, coast line, sea state, and the sea bed. They can provide visual information if required.

2.9. Port of Koper

A company that takes care of logistics and cargo operations in the port of Koper. For the purposes related to maritime surveillance they provide 7 different tasks:

1 Security (ISPS) – issues port entry permissions and maintains security in the port. They require information about ships, coast line, sea, and weather.

2 Traffic control – controls ship traffic related to commercial purposes (availability of birth, coordination of arrivals and departures…) within the Port of Koper and maintains their navigational objects. Require information about ships, coast line, sea, weather, ATONs and navigational waterways. Can provide visual and CCTV information.

3 IT Centre – Terminal operation and port management system withholds all cargo, mooring, storing and anchoring data as well as all business plans. They maintain and manage all information that comes and leaves the port's information system.

4 Mooring squad – carries out all mooring operations and ensures safe berthing. They require information about ships, coast line, sea, and weather. Can provide visual information.

5 Emergency Safety Centre – receives emergency calls and dispatches appropriate units. Need data about ships, coast line, sea, weather, and the state of emergency in order to provide the required units needed.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

6 Maritime Environmental Protection Unit – cleans pollution in the area of the port and ensures environmental safety. Need information about ships, coast line, sea, weather, and the state of emergency to efficiently and quickly organise pollution cleaning.

7 Spatial planning - devises port's spatial plans (Position of anchorage, quays, shore line, etc.) They require data about coastline, sea, and the sea bed.

2.10. NASBA (National Association of Shipbrokers and Agents)

Union of agents working in the maritime industry. The agents are one of the most important stakeholders, especially related to the data exchange through the National Single Window. They are the link between a ship and maritime governmental and commercial services before a ship arrives, during her lay in port, and even after departure. They provide required data about ships and cargo.

2.11. FIATA – Shippers union

The shippers provide required data about the cargo for other services via the National Single Window. The detailed information about the cargo is very important in the field of maritime surveillance. Especially important in the case of dangerous goods.

2.12. IMDG surveyors

To ensure the proper load of dangerous goods, IMDG surveyors inspect ships, stowage, and packing of dangerous goods, and issue IMDG Cargo Inspection certificates. After the inspection they share the report with the ship's agent who is responsible for uploading the required data to the National Single Window. Surveyors must be authorised by the Slovenian Ministry of Infrastructure based on Off. Gaz. RS, No. 50/95 requirements.

2.13. Mariculture companies

These produce mariculture products in designated areas. They require information about the sea, the sea bed, coast line, and weather. They have to provide information about their work to the fishing inspectorate if necessary, set up buoys, and can provide visual information.

2.14. FPP – Faculty of Maritime Studies and Transport

Part of the University of Ljubljana. They conduct research (28-1) and provide education (28-2) in the field of maritime studies and transport and often work closely with governmental organisations on projects. They require information about the coastline, sea, weather, ATONs, and ships. Other information may be needed for specific research purposes. FPP hosts the redundant VTS and RCC center in case the main one is not able to operate.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

For education purposes, real time data is important to train future seafarers in the use of navigational charts, electronic instruments (AIS, radar…), meteorological data, etc. in the real environment.

2.15. National Institute of Biology

The Marine Biology Station in Piran is part of NIB. They conduct research in the area of physical, chemical, and biological oceanography. They produce information about the sea and weather with the help of research buoys and HF radar. They may require any information needed for specific projects. Through their floating buoys Vida, Zora, and Zarja they share data related to the current situation on the buoys (wind, wave, current…).

2.16. Maritime museum Piran

Displays, restores, and stores objects of Slovenian maritime cultural heritage and cooperates in various projects on cultural heritage protection. They produce historical information and may require any kind of information for specific projects.

2.17. GEPŠ – High School, Electro and Maritime School Piran

GEPŠ provides secondary school education in the fields of maritime studies and electrical engineering. They need data about the sea, the sea bed, and weather, and may require any kind of information for education. Real time data is important to train future seafarers in the use of navigational charts, electronic instruments (AIS, radar…), meteorological data, etc., in the real environment.

2.18. Surveying and Mapping Authority

Perform geodetic measurements for other parties. They provide information about the coastline, sea depths and the sea bed. Information is then given to the ordering party (municipality, Ministry of Infrastructure, Ministry of Defence…). They also provide official navigational charts which cover the Slovenian sea.

2.19. University of Ljubljana (Faculties other than FPP)

Other faculties cooperate in various projects and research in the area of maritime studies and transport and thus provide knowledge from the areas of their expertise. May require any kind of information for research purposes.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

2.20. Primorska University

This is a local university that cooperates in various projects and research in the field of maritime studies and transport and thus provides knowledge from the area of their expertise. May require any kind of information for research purposes.

2.21. Science and research centre Koper

This is an interdisciplinary research institute combining many different fields of research (social studies, history, linguistics, law…). Their Institute of Historical Studies has in the years from its foundation become established as the Slovenian and European historical reference point for researching the history of the coastal area of western Slovenia as well as the key actor in establishing the views of Slovenian history and its different geographical parts. They may require any kind of information for research purposes.

2.22. Other research institution (not otherwise stated)

Other research institutes cooperate in various projects and research in the field of maritime studies and transport and thus provide knowledge from the area of their expertise. They may require any kind of information for research purposes.

2.23. Fishermen

Fishermen catch and raise fish in the Slovenian sea. They have to provide information about their work to the fishing inspectorate if necessary, set up buoys, and can provide visual information.

They need all data related to safety of navigation like ship movements, weather data, depths...

2.24. Ships

Ships sailing in Slovenian seas must provide the required data to SMA, port traffic control, pilots, tugs, their agents, and shippers. They can also report accidents and pollution to authorities and provide visual and radar information. The main sources for data provided are AIS and NSW.

They need all data related to safety of navigation like ship movements, weather data, depths, aids to navigation...

2.25. Recreational boats/yachts/surfers, etc.

All vessels navigating in Slovenian seas need information about the safety of navigation (traffic, weather, charts, AtoNs…). From the other side, they can report accidents and pollution to the authorities and provide visual information.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

2.26. Divers

All divers in Slovenian seas must take all preventive measures to prevent accidents at sea. Thus they need certain information (traffic, weather, prohibited areas...). They can report accidents and pollution to the authorities and provide visual information.

2.27. Swimmers

All swimmers in Slovenian seas have to take all preventive measures to prevent accidents at sea. They need certain information (traffic, weather, restricted areas...). They can report accidents and pollution to the authorities and provide visual information.

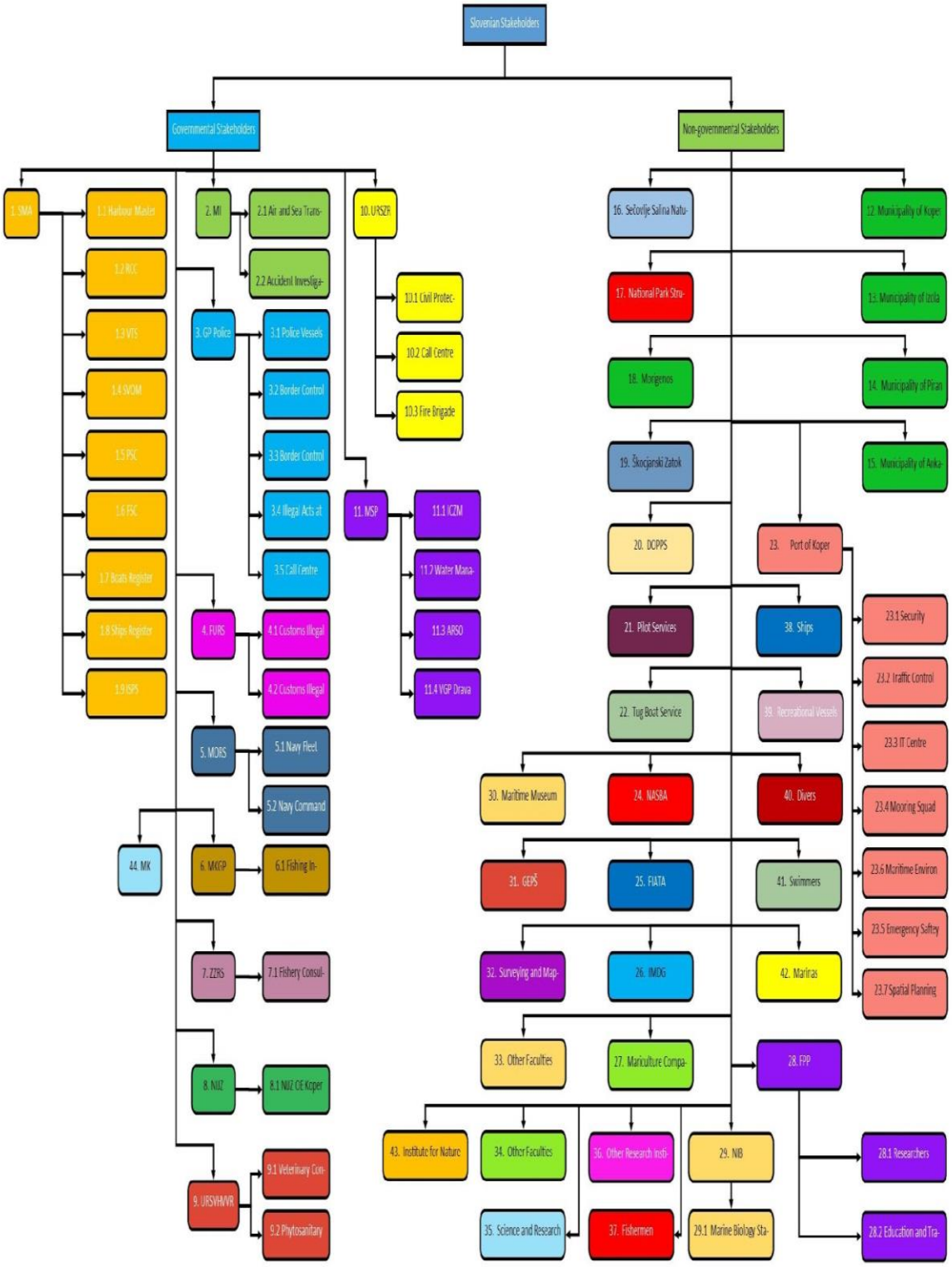
2.28. Marinas (Portorož, Izola, Piran, Koper, Strunjan)

Marinas in the Republic of Slovenia are responsible for managing their areas, conducting spatial planning and ensuring environmental protection. They provide information about ships in their marinas, visual, and CCTV information.

2.29. Institute for Nature Conservation

This is a national institute responsible for declaring, conserving, protecting, and managing nature and natural parks. They also take part in different nature related projects and promote nature conservation. They provide information related to the institute's work and may require any kind of information for their work. They especially have to mark protected areas and provide related information about them.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



SL Figure 2 Slovenian maritime stakeholders

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

3. Focus on the gaps identified

In general, maritime surveillance in Slovenia operates on a high level. All the stakeholders successfully perform the tasks of data gathering and cooperate well. The primary governmental services are joined within the “Coordination of Services at Sea”. Coordination operates in accordance with the Decree on the coordination of services at sea (UL, 102/12). On the other hand, the stakeholders are to a degree deficient when it comes data sharing. This is partly because of poor database structure, but also because some stakeholders (mostly, but not only, the Ministry of Defence and the Ministry of Internal Affairs) are reluctant to share some of their data. Nonetheless, SMA successfully shares their data from the new surveillance centre (like AIS, radar pictures, CCTV…) to the members of the coordination group.

Data sharing through the National Single Window (NSW) is considered the only successful and efficient way of sharing maritime data, especially among ships, agents, the Port of Koper and the all governmental administration bodies.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

4. Focus on platforms

NO platforms identified during the project (NSW excluded)

4.1. Information regarding the existence of geoportals dedicated / useful for maritime; surveillance activities

A great deal of marine affairs information is being gathered, including that in relation to maritime spatial planning, maritime traffic, oceanography, heritage, professional and recreational activities, etc., which are collected by various institutions that have their own portals for their particular needs.

In Slovenia, various organisations gather, process and share data related to their field of work. Each of these organisations maintains their own geoportals, and thus create many separate databases. For instance, the Slovenian Maritime Administration (SMA) has a geoportal based on ECDIS/GIS, which serves as their main traffic surveillance tool. Other stakeholders use their own databases similarly. Some of the stakeholders already share information among them, but accessing many different geoportals involves acquiring access from a variety of geoportal managers. A large database, which would collect and manage all maritime related information, would solve most the existing problems.

The first idea of a joint geoportal for all Slovenian maritime data came with the proposal of the first Slovenian maritime spatial plan by the Slovenian Ministry of Environment and Spatial Planning. The proposed plan includes 15 layers, each showing specific data. The expansion of this proposal would realise the idea of a joint maritime geoportal. Even if this plan is executed, there still remains the question regarding who will run and maintain the extended geoportal, which could be a base for general maritime surveillance. Would this be the Ministry of Environment and Spatial Planning, the Ministry of Infrastructure, the Ministry of Public Affairs, or a completely new organisation?

The answer could be a Common Information Sharing Environment (CISE), an EU initiative which aims to make EU/EEA surveillance systems interoperable and provide concerned authorities from different sectors the information they need to conduct missions at sea.

The basis for the proposed joint geoportal would be a public chart with a defined coastline and basic measured sea depths. Different layers containing public, restricted, and classified data would be applied to the base chart. Access to this information would be divided into three levels of confidentiality:

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- Stream – information intended for general public use is streamed 24/7 and regularly updated. This would include meteorological, sea state, spatial plans, mariculture, ATONs, cultural and natural heritage information and other similar information.
- Subscribe – information intended for specific use, provided to subscribers 24/7. A greater variety of information would be available. For example, this would include AIS and radar data, as well as agricultural and unexploded ordnance cadastres.
- Pull – classified information intended for SAR, military or other special use, only available to authorised persons. This would include precise information and measurements, AIS NATO and other classified data, as well as vessel movement modelling and simulations.

Apart from the input of data by stakeholders, public input could be an option. The general public could contribute temporary information, such as the location and size of fishing nets, divers, wild animal movement, etc. This data would be included in the stream option of the geoportal.

4.2. Identification of GIS datasets and tools in the MED region

Currently, many of the Slovenian actors are not part of various international data exchange correspondences via geoportals. Exceptions include NIB and the National Environmental Agency, which share their oceanographic NRT observations via the geoportal Emodnet Physics. Both institutions also share HF radar observations in NRT with their Italian partners at OGS (National Institute of Oceanography and Applied Geophysics - Istituto Nazionale di Oceanografia e di Geofisica Sperimentale). Some bathymetric data are also shared through the Emodnet Bathymetry portal and are contributed by Geodetic Institute from Slovenia.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

FIGURES

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

SPAIN

1. Focus on the governance of Maritime Surveillance activities

Remark: in the questionnaire there was only one item about governance: "*please indicate which regulations and/or directives affect/condition your activities?*

Taking this into account we start by introducing and exposing several points concerning the governance in terms of maritime surveillance in Spain at three levels: national, international and regional levels.

1. National level

The governance in Spanish maritime surveillance is based on the National Maritime Security Strategy (2013), which develops the forecasts of the National Security Strategy (2013) and adapts them to the special requirements of the maritime sphere, in line with other strategic instruments in the international sphere. The objective in the field of maritime security is to promote a comprehensive security policy by establishing five strategic lines of action:

- Adoption of a comprehensive approach that promotes coordinated and cooperative action by the different administrations in resolving problems affecting maritime safety,
- Adoption of effective and efficient measures in an optimal use of the maximum use of available resources,
- Promotion of international cooperation,
- Promoting collaboration with the private sector,
- Enhancing cybersecurity in the maritime domain.

National maritime security interests are wide-ranging and include the following:

- compliance with national legislation and international law in the maritime areas under our sovereignty and jurisdiction, as well as respect for international regulations on the high seas in compliance with the international commitments acquired by Spain;
- the protection of human life at sea;
- freedom and safety of navigation;
- maritime trade and transport;
- shipping and other maritime industries;

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- the safety of ships under the Spanish flag (merchant, fishing and recreational fleets);
- ports and maritime infrastructures; maritime trade and transport; the shipping industry and other maritime industries;
- ports and maritime infrastructures, including off-shore installations;
- pipelines, underwater pipelines and submarine cables, as well as critical infrastructures located on the coast;
- resources of the marine environment (living and non-living resources);
- the marine environment;
- underwater archaeological heritage.

Given that these interests fall under the responsibility of different ministries, a major coordination effort is needed to coordinate those actions that must be addressed jointly in order to raise security levels. The National Maritime Safety Council (figure 1) is the collegiate body that supports the National Safety Council and brings together all the bodies involved in maritime security:

SP Figure 1: Spanish department involved in the National Maritime Safety Council

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Royal Decree 1695/2012, of 21 September, approves the National Marine Pollution Response System. This system includes two subsystems: **the maritime subsystem**, whose scope of action is maritime waters, and **the coastal subsystem**, whose scope of action is the coast. The first subsystem is made up of a series of contingency plans that concern different areas or structures:

- National Maritime Plan, drawn up by the Ministry of Development
- Territorial Plans, drawn up by the Regions.
- Inland maritime plans, corresponding to a maritime installation located "offshore".
- Inland maritime plans, pertaining to ports that are not State owned
- Inland maritime plans, relating to installations located in the area of State-owned ports
- Inland maritime plans for State-owned ports
- Local plans, drawn up by the competent local administration.

The National Maritime Plan for response to marine pollution was approved on 22 September 2014 by Ministry of Development Order FOM/1793/2014. The Plan establishes the different possible emergency situations that allows to see how the different emergency plans are coordinated.

- Situation 0: This will occur when a marine pollution episode of small magnitude and hazard occurs. In this emergency situation, the inland maritime plan will be activated at the appropriate response level.
- Situation 1: Occurs when a marine pollution episode of medium magnitude or hazard occurs. In this emergency situation, the National Maritime Plan will be activated at the appropriate level of response, in addition to the inland maritime plan, in the event that the source of pollution is in maritime waters.
- Situation 2: This will occur when any of the following circumstances occur:
    - The means available in the plans activated in Situation 1 are insufficient to combat the pollution.
    - The affected or threatened maritime area is particularly vulnerable.
- These situations entail, at the appropriate level of response, the action of the inland maritime plans and the activation of the National Maritime Plan.
- Situation 3. This will occur when there is an episode of marine pollution of great magnitude or danger. In this emergency situation, the National Maritime Plan or the State Plan for the Protection of the Sea Shore against pollution will be activated, as well as, where appropriate, the corresponding inland maritime plans.

In cases where inland maritime plans are activated together with the National Maritime Plan, the coordination of actions will correspond to the management body of the latter. Inland maritime plans, local plans and territorial plans of the Autonomous Communities must be coordinated and adapted to the National Maritime Plan. In the event of joint activation of a

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

territorial plan and the National Maritime Plan, in situations 1 or 2, a coordination body will be set up comprising a representative of the Government Delegation, the maritime captain and the head of the peripheral coastal service competent for the place where the event occurs, as well as three representatives designated by the Region affected.

Territorial Organisation for Emergencies and Rescue

From an operational point of view there are 4 main bodies with responsibilities in maritime surveillance:

- the Navy force, mainly devoted to national defence
- the Guardia Civil, devoted to fiscal control and safekeeping of coasts, ports and frontiers
- the Customs Agency, devoted to the suppression of smuggling offences and infringements, the fight against drug trafficking and other related offences
- the Spanish Coast Guard Agency (SASEMAR), mainly devoted to rescue of human life at sea and preventing and combating pollution of the marine environment.

By far it is SASEMAR the most relevant stakeholder in terms of Maritime Surveillance. SASEMAR is the official stakeholder responsible for Search and Rescue, Vessel Traffic Services and Pollution Combat. It is civil organisation. It responds to all emergencies that may arise at sea: rescues, searches, medical evacuations, towing, pollution control, dissemination of navigational warnings and, of course, the reception and immediate response to distress calls from the sea. There are currently a total of more than 1,300 professionals, distributed among the Company's land and maritime fleet personnel, the Rescue Coordination Centres (CCS), the Strategic Bases, the Central Services and the Jovellanos Safety Training Centre.

Marine emergencies are managed through 20 Rescue Coordination Centres distributed along the coast and coordinated from the National Rescue Coordination Centre (CNCS) in the SASEMAR headquarters in Madrid (fig. 2).

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

SP Figure 2: Spatial distribution of Spanish Rescue Coordination Centres (CCS) from SASEMAR

SASEMAR maritime fleet is made up of 4 multi-purpose rescue and marine pollution response vessels, as well as 10 rescue tugs, 4 "Guardamar" type vessels and 55 rapid intervention vessels known as "Salvamares". In addition, through an agreement with the Red Cross, there are 42 light rescue vessels. The Maritime Rescue air fleet is made up of 11 helicopters and 3 aircraft. These resources are strategically located along the Spanish coasts in accordance with criteria of effectiveness based on minimising response times in order to provide better coverage and efficient action, in line with the forecasts for the occurrence of accidents provided by the study and analysis of recent statistics.

a) Aerial units

For the rescue of human life at sea and aerial reconnaissance, SASEMAR has 11 helicopter bases specifically configured for maritime search and rescue tasks and 3 EADS-CASA CN 235-300 aircraft, equipped with the most advanced technology. The planes carry out maritime patrol missions with a time spent in the air of more than 9 hours, so they can intervene in operations with a range of more than 3,706 kilometres and a radius of action of 1,853 kilometres, with a speed of 437 kilometres per hour.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

b) Maritime units

Salvamento Marítimo has 4 multipurpose vessels whose main characteristic is their versatility in three main aspects:

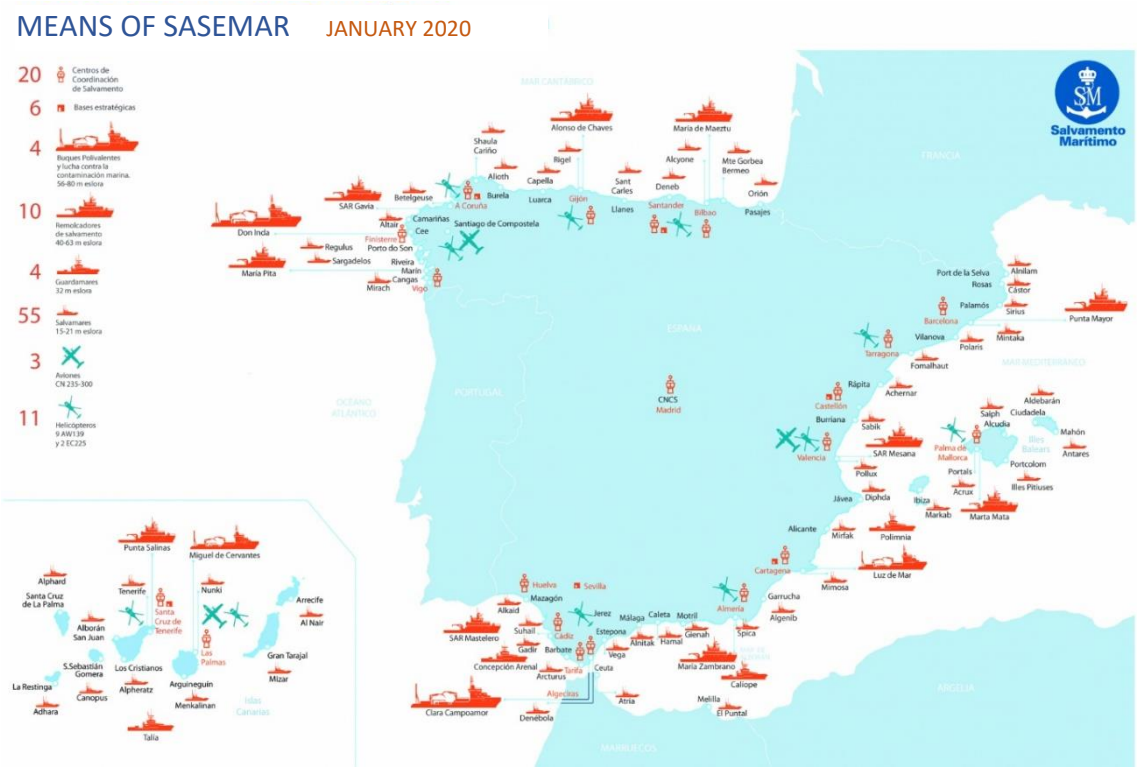
- In the rescue of persons.
- In the fight against marine pollution, as they have the capacity to collect waste at sea.
- In assisting and towing ships and other maritime operations.

Two of them are 80 metres long, have 20,600 hp and 228 tonnes of towing power. They each have 1,750 m^3 of waste storage capacity on board and are the most powerful means of dealing with serious accidents caused by polluting spills. The multi-purpose vessels can be used as support platforms for maritime operations, as they have a dynamic positioning system, spaces specifically designed and equipped for the work of divers, auxiliary equipment, a communications centre, etc. Other elements such as the seadark radar, the night vision camera (FLIR), fire-fighting equipment and two different hydrocarbon waste collection systems complete the equipment, guaranteeing its operability and suitability for any type of emergency.

SASEMAR has 10 tugboats which, due to their performance, ensure the possibility of towing large vessels and have the operational capacity to intervene in major accidents (fires, pollution, salvage, etc.). The lengths of the different vessels vary from 40 to 63 metres and their firing capacity ranges from 5,092 to 8,800 hp.

In addition, SASEMAR has 4 "Guardamares" with a length of 32 metres, a speed of 27 knots and a range of 1,000 miles and 55 "Salvamares", vessels of 15 or 21 metres in length, reaching speeds of over 30 knots. vessels. These are high-speed, highly manoeuvrable vessels with a shallow draught, suitable for action in circumstances where speed of response plays a fundamental role.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



SP Figure 3 Overview of SASEMAR means

2. International level

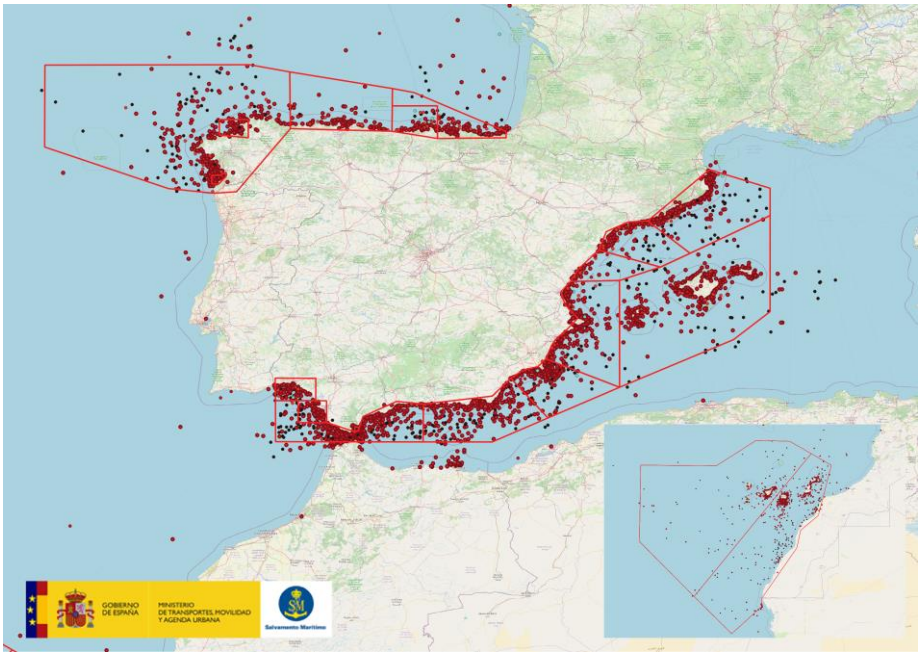
At the international level, Spain assumes that maritime security is a responsibility shared with the international community. Spain's action in this area is part of the efforts made by the United Nations (especially through the International Maritime Organisation, IMO) and the European Union in this sector. Spain is a party to the most important international maritime instruments aimed at protecting the main interests in this field: human life, the environment and marine resources, security and freedom, cultural heritage, etc. Among others, Spain is a signatory to the following regulations:

- The UN Convention on the Law of the Sea (1982).
- International Convention for the Safety of Life at Sea - SOLAS (1974)
- International Convention on Maritime Search and Rescue -SAR- (1979)
- The UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001)
- Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (1976)

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- The Convention for the Protection of the Marine Environment of the North-East Atlantic – OSPAR (1992)
- London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972).

Spain assumes the responsibility for the SAR areas drawn in figure 4.



SP Figure 4 SAR areas assumed by Spain and emergencies attended during 2020

Spain has signed several agreements with neighbouring countries to collaborate in maritime surveillance and in action in the event of accidents, whether for the rescue of people or to fight against marine pollution. Specifically and concerning the northern Mediterranean area, Spain has signed with France what is called "the Spanish-French intervention plan in the event of an accident in the Mediterranean", known by the abbreviated name of “Gulf of Lyon Plan”.

Gulf of Lion Plan

This plan has been in force since 2002 and provides for collaboration in the coordination of SAR operations and the provision of rescue and marine pollution response resources by France and Spain in the event of a maritime accident in the Spanish and French SAR areas of responsibility in the western Mediterranean (Gulf of Lyon area). The third version of the plan entered into

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

force on 1st April 2016 and was signed between the Prefecture Maritime of the Mediterranean (France) and SASEMAR (Spain).

The Gulf of Lyon Plan falls within the framework of the regional agreements provided for in the United Nations Convention on the Law of the Sea (Article 197) and the Hamburg Convention on Maritime Search and Rescue (3.1.8 of the Annex).

The principles of operational coordination as defined in the convention can be summarised as follows:

- The known or presumed position of the accident determines which national authority coordinates the SAR and/or pollution response action, becoming the ACA (Authority Coordinating Action).
- However, the other country may request to be the ACA in the following three situations:
  - The other State is directly threatened by the casualty.
  - The ship or ships involved belong to the other State.
  - Most of the assets likely to be used belong to the other State.
- Three situations are possible in the event of an accident:
  - SAR 1 which is the normal management situation
  - SAR 2 which is an accident of exceptional seriousness
  - POL which represents a contamination.
- The command of the units remains national.
- In order to ensure the coordination of resources and actions at the site of an accident, the ACA may appoint the captain of a ship as the On-scene coordinator (OSC).
- When the zone affects the air-sea area, the RSC Toulon (Rescue Secondary Center) is delegated to direct operations. Given the unity of resources and chains of command, the RSC Toulon activates the MRCC (Maritime Rescue Coordination Center) chain according to procedures identical to those of maritime SAR operations (SECMAR).

In order to keep information updated and to improve cooperation, the following is established:

- The organisation, as a minimum and alternatively, of an exercise every two years with the participation of rescue and/or pollution response resources.
- Permanent contact for the updating of the Plan with an exchange of information concerning:
  - National laws and regulations
  - Implementation of international regulations
  - National organisations
  - Response facilities, resources and equipment
  - Communications

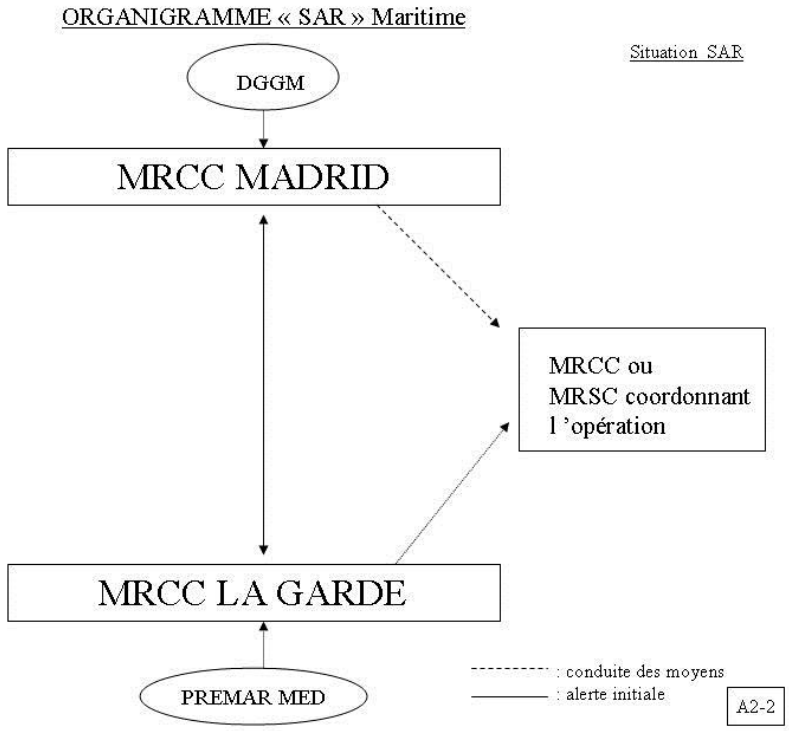
Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

At the operational level, the Spanish centres in the area are the Regional Rescue and Coordination Centres (CRCS) in Barcelona, Tarragona, Palma, Castellón and Valencia, coordinated by the CNCS National Centre for coordination and rescue in Madrid (MRCC Madrid). France concentrates its entire operation at the Regional Operational Centre of Surveillance and of Rescue (CROSS) in La Garde (MRCC La Garde).

Information is exchanged between operational centres (see the scheme of figure 5). When the emergency situation requires a decision or action at a higher level or at ministerial level, the operational authorities must report as follows:

- Spain: SASEMAR informs the Directorate General of the Merchant Navy (DGMM), through the Sub-Directorate for Safety, Pollution and Maritime Inspection. The Director General of the Merchant Navy (DGMM) reports to and receives instructions from the Minister of Transport, Mobility and Urban Agenda. High-level decisions, made between the representatives of France and Spain, reach the DGMM via the Ministry of Transport.
- France: CROSS Med reports to the Maritime Prefect, who reports to the Prime Minister (General Secretariat of the Sea).

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



SP Figure 5 Organization chart of the French-Spanish Lion Plan

Each nation's rescue units are normally authorised to enter or overfly the territorial waters adjacent to a casualty for search and rescue purposes without special notice. Aircraft enjoy a permanent overflight authorisation. MRCCs will facilitate stopovers of each other's assets as necessary.

At the level of anti-pollution and environmental protection the organisation is as follows:

- Spain: The authority responsible for combating pollution at sea is the Ministry of Transport. This responsibility is exercised through the DGMM. The Harbour Masters form the administrative structure on the coast. SASEMAR is the operational instrument of the Administration for the provision of pollution response services. It is also responsible for coordinating the resources allocated for this purpose, both its own and those belonging to other bodies or entities.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- France: the responsible body in this case is COM Toulon of the French Navy. It reports directly to the Mediterranean Maritime Prefect who informs the Prime Minister (General Secretariat for the Sea). When the incident or threat is serious or complex, the Maritime Prefect activates the maritime ORSEC (Organisation of Civil Security Response) level 3 system. In addition to informing the Prime Minister, he also informs the Minister of Ecological Transition, the Minister of the Armed Forces and the Coastguard Operational Centre (COFGC). In the event of pollution threatening the coast, the Prefect of the Department concerned can activate the ORSEC Land device. If the two ORSEC devices are activated simultaneously, the centralising body is the Operational Centre for Inter-departemental Management of the Crisis (COGIC) in which all the ministries concerned are represented.

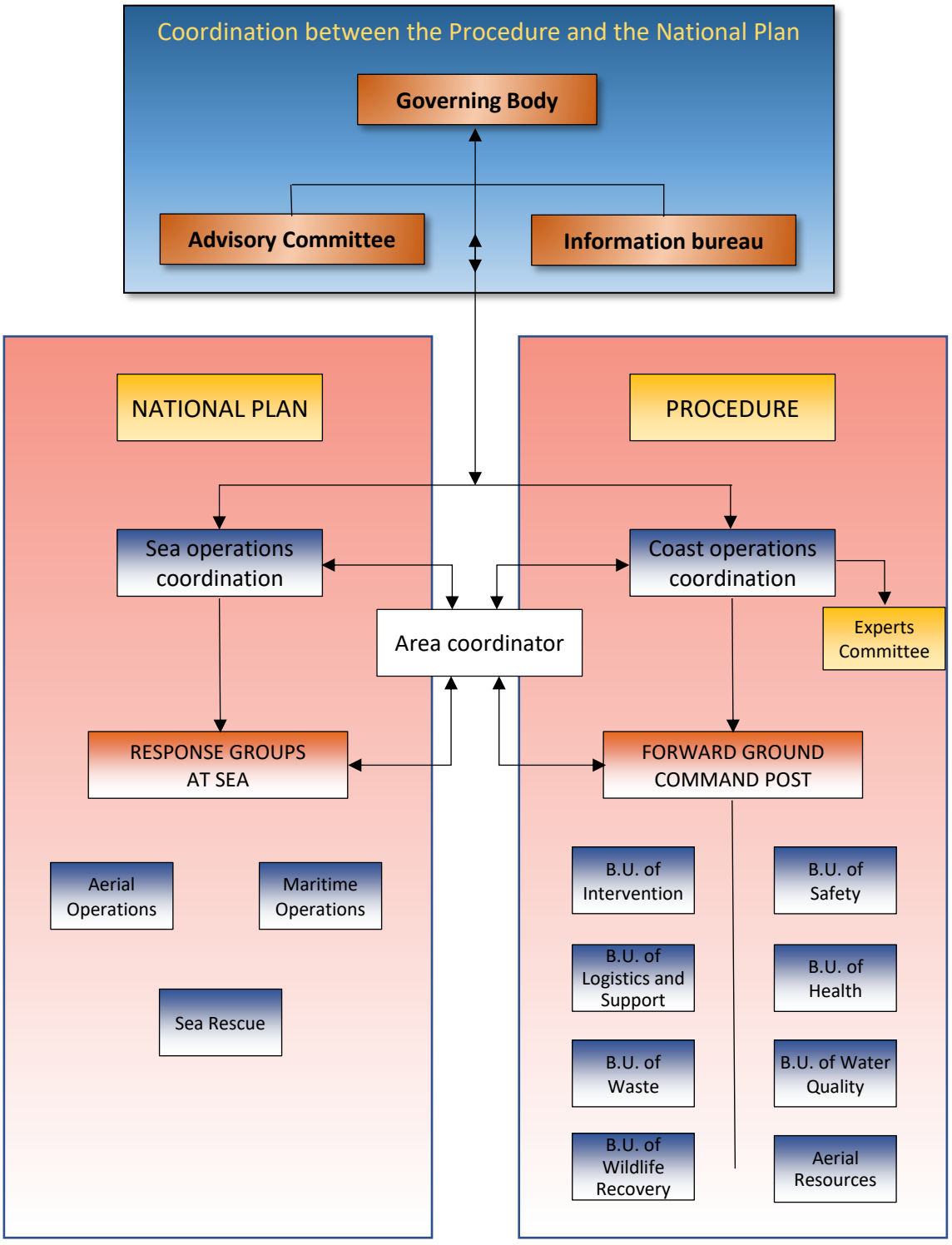
In terms of the use of air assets for pollution surveillance, a joint cell for the organisation and scheduling of air unit flights has been set up to allocate pollution surveillance missions in the border areas of responsibility of the two countries in order to ensure optimal use of French and Spanish assets. Surveillance flights are established taking into account the surveillance of common commercial routes and the prior exchange of information between the respective points of contact in order to establish common procedures in the Mediterranean area.

Pollution-related information can be exchanged between the parties at any time. On the French side, the exchange of initial information is delegated to the CROSS. On the Spanish side, the exchange of initial information is delegated to the CNCS. This exchange does not imply the activation of the GULF OF LYON PLAN.

3. Regional level

As an example, the Regional Valencian Government has a procedure for action against accidental marine pollution in the Valencian Region. It provides information on the coordination that must exist between this plan and the other plans that deal with marine protection at other levels. The following graph shows the coordination between the Procedure and the National Plan:

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional



SP Figure 6: Coordination chart between the Procedure and the National Plan

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The Governing Body will be made up of a representative of the Regional Government, who will be the Minister responsible for civil protection, and a representative of the State Administration, who will be the Government Delegate in Valencia.

- The Head of Emergency and Public Safety Training Area
- The Head of the Fire Services in action
- The Territorial Director of Health or, by delegation, the Director of the Health Emergency Service.
- Director General of Environmental Quality
- Director General for the Natural Environment
- Director General of Territorial Planning and Management
- Director General of Ports and Coasts
- Director General for Fisheries
- A commander of the Unit attached to the Valencian Community of the National Police Force.
- The Mayor or Mayors of the affected municipalities.
- Technicians from the Emergency Area
- Technicians or other experts considered appropriate by the Steering Committee.

The Information Office will be made up of the Heads of the press offices of the following organisations:

- Government Delegation
- Regional Government
- City Council/s
- Company/s
- Ports

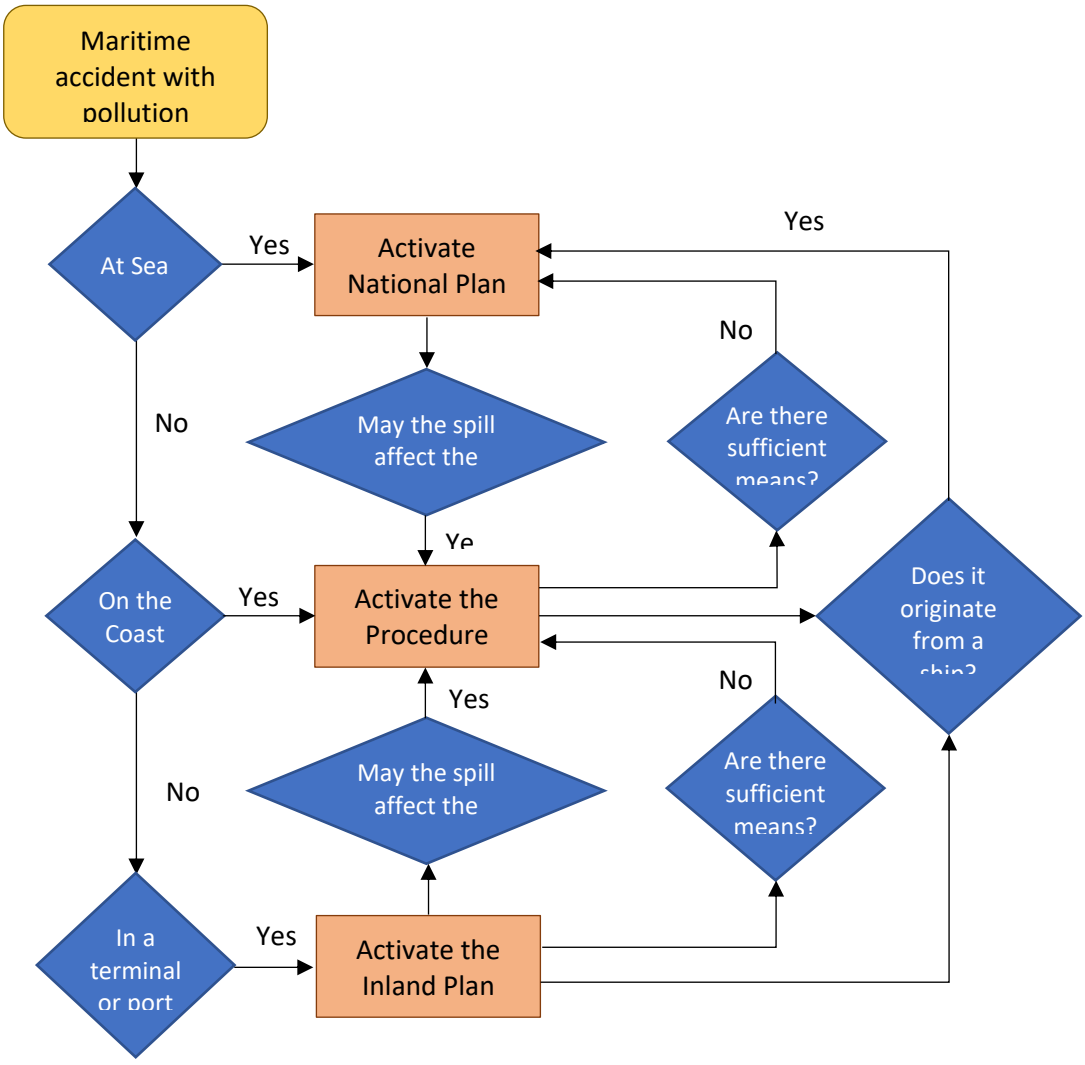
The procedure is also coordinated with other plans of a lower category, such as the following:

- Local Action Plans: to carry out the management and coordination of the MAP, the Municipal Operational Coordination Centre (CECOPAL) is established. The functions of the CECOPAL include coordinating the services and resources of the municipality, supporting the basic intervention units, applying protection measures for the population and issuing warnings to the population.
- External Emergency Plan of each Port Authority: when the EEP of a Port Authority is activated in any of its phases, given the possibility that it may lead to a pollution episode on the coast, the Pre-emergency Procedure will be activated and monitored. If, as a result of the accident, such pollution materialises in the coastal zone, the Procedure will be activated in the appropriate emergency situation, with the Procedure and the Plan acting simultaneously.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- Inland Contingency Plans: If the consequences of an event affect the exterior of the maritime terminal or coastal industry and affects the coast, the Action Procedure is activated. In this case, the Inland Plan will be integrated into the higher level, the personnel belonging to the response groups of the Inland Plan will be incorporated into the Basic Units of the Procedure and will remain under the orders of their coordinators at the Advanced Command Post.
- Companies' External Emergency Plans: when a company EEP is activated, given the possibility that it may lead to a pollution episode on the coast, the Procedure will be activated in a pre-emergency situation and will be monitored. If, as a result of the accident, such pollution materialises, the Procedure will be activated in the appropriate emergency situation, with the Procedure and the Plan acting simultaneously.

The decision flow to know which plans have to be activated on each occasion defined in the Procedure is as follows:



SP Figure 7: Procedure decision flow

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The national response system foresees emergency phases and situations depending on the magnitude and hazard of the event, the affected area and vulnerability, as well as the means required for the response. For each phase, the activation of one or more marine pollution emergency plans is foreseen depending on the circumstances. In general terms, it also establishes the bases for coordinated and effective action with the human and material resources assigned to the different plans that operate jointly in the same success, and defines the criteria for action in the event of marine pollution episodes, adapting the national system to the standards of international treaties and recommendations on the subject. More than one marine pollution emergency plan may be activated, depending on the circumstances. For this reason, it is necessary to clearly establish the interrelation between all the plans, i.e. to define the fields of action according to the competences of the different authorities involved in the management of the emergency and to take into account the coordination mechanisms of the operations of each of the groups involved. The comparison between the Special Emergency Plan for marine water pollution emergencies in Catalonia (CAMCAT) and the National Maritime Plan is set out in the following table.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

SP Table 1 Correspondence between National Plan and CAMCAT Plan phases

CAMCAT phases		**National Plan phases**		**Other plans involved**
Prealert	a) Where polluting matter is likely to reach the sea in significant quantities.	Alert: involves making available the means and resources that can be mobilised for action.		
	b) Where an accident occurs on an installation or ship containing polluting matter and marine pollution is likely to occur within twelve miles.			
	c) Where an accident occurs within 12 miles of an installation or a ship handling polluting substances and minor marine pollution occurs.	Emergency situation 0	a) Marine pollution is within the scope of a maritime plan or local plan. c) Pollution affects or is likely to affect exclusively and to a limited extent the coastline of a local authority.	EEP / ICP, if necessary Relevant LAP/s
	d) Where an accident occurs at an installation or in an offshore industry and can be dealt with by the installation itself without causing marine pollution.		b) Pollution is within the scope of inland maritime plans.	
Alert	a) When an incident occurs at an installation and medium-severity marine pollution occurs within twelve miles of the coast, outside the installation's boundary.	Emergency situation 1	b) The pollution has occurred outside the scope of application of the inland maritime plans.	EEP / ICP, if necessary
	b) Where, as a result of an accident at a land-based installation, chemical pollution occurs which reaches the sea and triggers a pollution episode of medium severity.		c) Due to the circumstances of vulnerability of the affected area, situation 0 being applicable, it is considered necessary to activate the situation 1 plans.	Relevant LAP/s

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

	c) Where there is an accident in an installation or on a ship handling polluting substances and medium-severity marine pollution occurs within 12 miles of the site.		d) Pollution affects the coast.	NMP, if necessary
Emergency 1	a) In the event of very serious marine pollution that may affect land in a vulnerable area.	Emergency situation 2	a) The means available in scenario 1 are insufficient to combat the contamination.	
		Emergency situation 3	a) Pollution affects the coastline of several autonomous communities. b) Pollution may affect the waters or coastline of neighbouring states. c) Pollution occurs in the waters of neighbouring states, but which may endanger Spanish waters or its coasts. d) When the safety of persons and property is endangered, the emergency is declared to be of national interest.	EEP / ICP, if necessary Relevant LAP/s NMP
Emergency 2	b) In the event of very serious marine pollution likely to affect a very large area of land or a particularly vulnerable area.			
		Emergency situation 2	e) The affected area is particularly vulnerable.	EEP / ICP, if necessary Relevant LAP/s NMP, if necessary

* EEP: External Emergency Plan / ICP: Inland Contingency Plan / LAP: Local Action Plan / NMP: National Maritime Plan

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The survey has been answered by 16 stakeholders from Spain. Besides the number of participants is not enough to derive robust statistical analysis, some qualitatively trends can be inferred. The participants have been distributed among the following categories:

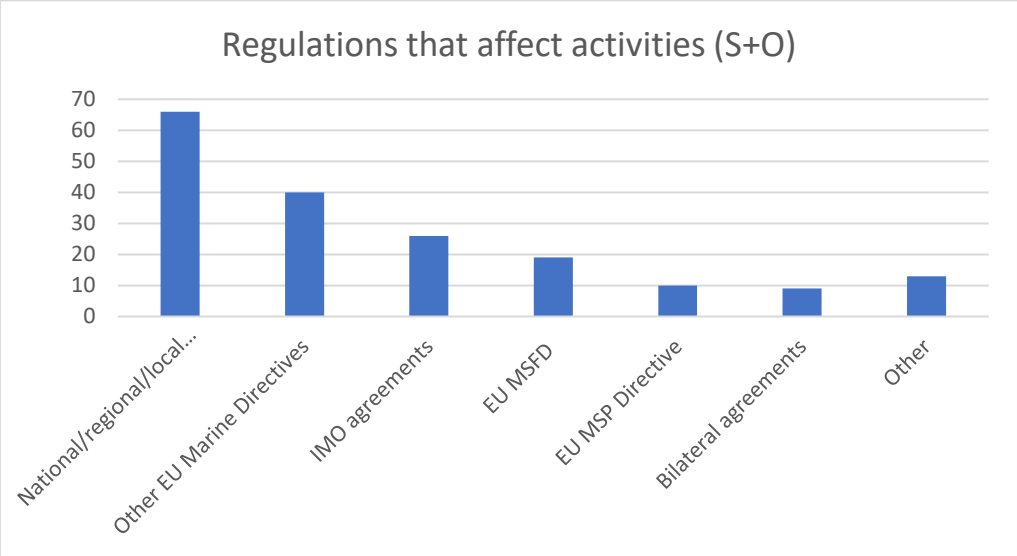
- Administration (national 7, regional 1, local 1)
- Research Institutions (2)
- Private companies (3)
- ONG (1)

From the Administration category, 5 of them come from SASEMAR and the rest mostly from port authorities on the Mediterranean coast.

As mentioned before, concerning the governance issues it has to be remarked that only one specific question on governance was posed:

"Please indicate which regulations and/or directives affect/condition your activities"

The results are summarized in figure 8. As it can be seen the most common selection has been "National/regional/local regulations" (75%), followed by "IMO agreements" (69%). Half of the participants has also indicated the "Other EU Marine Directives"



SP Figure 8: Percentage of answers to governance question

If we consider the data from the SHAREMED poll the answers change slightly, being the second most selected "Other EU Marine Directives" while the "IMO agreements" goes to the third place. However, none of them have been selected by more of the 50% of participants.

The item “National/regional/local” being the most selected answer is somehow the expected answer. Basically, the national regulations are in great part the adoption of international agreements and European directives that are subsequently transposed by regional and local regulations. However, the dichotomy between the second most selected answer given in the MEDOSMOSIS (“IMO agreement...”) and SHAREMED (“European directives…”) surveys reflects a clear segmentation of the communities of stakeholders. While the first community of stakeholders seems more related with safe navigation and safety procedures, the second is more concerned with environmental issues. Probably the common point between both communities is when facing marine emergencies related with pollution, in which both communities are involved. One in surveying and cleaning operations and the other on ecosystem and social impacts.

A second element is related with the selection of “Bilateral Agreements” which is a singular aspect specially affecting to SASEMAR. Only those participants belonging to SASEMAR and one from INTA (Research Institution with aircraft surveillance activities) have selected this item. SASEMAR has signed bilateral agreements with neighbour countries in order to provide the necessary coordination to face emergencies near the borders of SAR. As an example, *the Lyon plan* has been summarised before.

Finally, another element strongly related with governance is the answers on the section about the relationship between Maritime Spatial Planning (MSP) and Maritime surveillance. To the question:

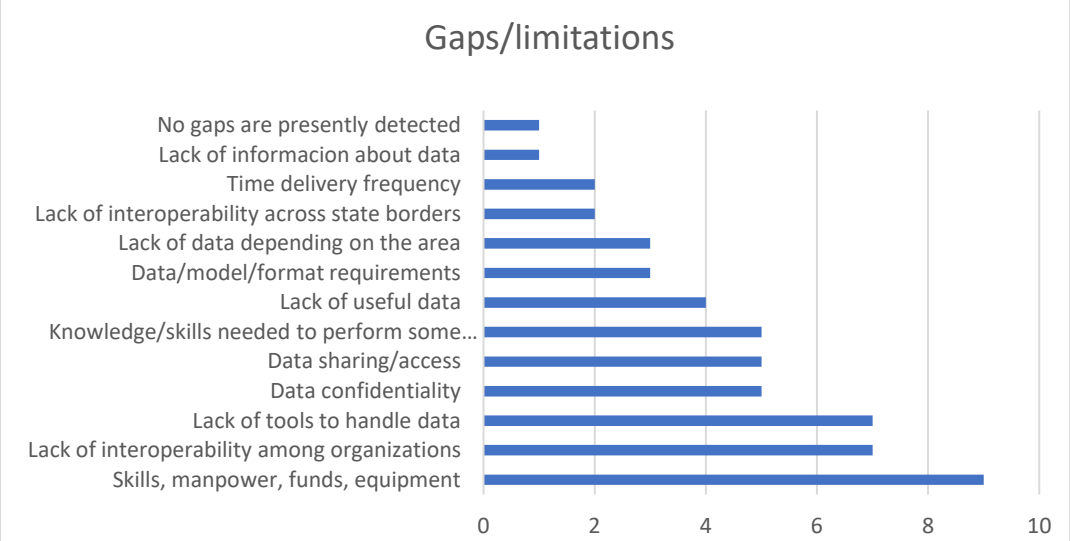
“Do you think the EU Directive on MSP (Maritime Spatial Planning) and the associated national plans have any impact on maritime surveillance activities?”

10 of 16 participants answered not to be aware if MSP Directives have impact on Maritime Surveillance and only 3 answers were affirmative. This is probably related with the same issue, mentioned before, about the EU Directives that may led the perception that EU environmental directives, Marine Spatial Planning and Maritime surveillance are separated issues.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

2. Focus on the gaps identified

Most of the surveyed (15 out of 16) consider that limitations exist to manage most Maritime Surveillance data (Q37, see fig. 9). However, there is not a consensus on which are these limitations. Only one of the proposed items is considered by more than half of the participants: “Skill, manpower, funds equipment”. Two more items are quoted in second place: the “lack of interoperability among organizations” and “the lack of tools to handle data”. The remaining items are considered by less than one third of participants.



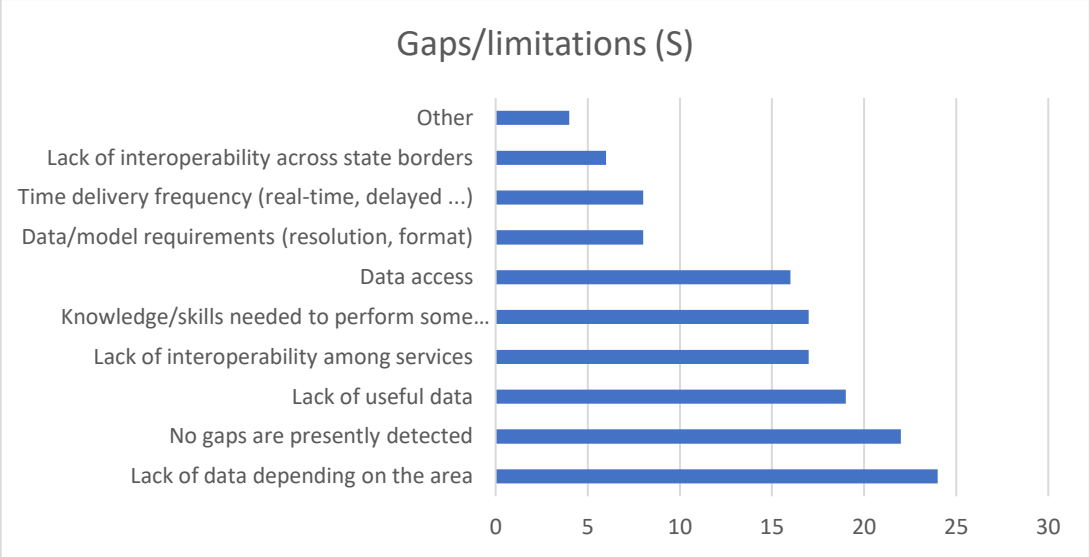
SP Figure 9: Gaps/limitations disaggregated results for Spain

Most of the surveyed (12 out of 16) declare to use data they do not produce. In most cases the data are provided by the own organism (separated departments maybe) but also from external sources (12 out of 12) and in most of cases (8 out of 12) from more than one external sources.

For most of participants that indicate to produce data (8 out of 11), they share at least part of the information. Nevertheless, data is shared in a reduced scope, generally with close administrations. From those that they do not share data at all, or share information partially, the reason pointed out is that they do not have identified the need for such data (4 out of 7). To note that some declare sharing information, but it is not clear to what information they are talking about, and it is clear that the reason is related with confidentiality and restriction issues.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Just as a reference with the SHAREMED survey, the selection is not the same (see fig 10). Remarkably the most selected one in MEDOSMOSIS is absent in SHAREMED. Results from SHAREMED survey indicate that any gap has been selected by more than half of the answers and only one ("lack of data depending on the area") by more than a third while another one third answer that no gaps exist.



SP Figure 10: SHAREMED selection for the Gaps/Limitations question

Fig. 10:

Other remarkable aspects are:

- Only one of the participants quote to be aware of the CISE data exchange model
- Half of data users declare to ignore many of the data suppliers listed in the survey
- For almost all participants using data, the preferred formats are GIS based and to a less extent CSV. This coincides with the preferred format for data display.
- Answers from SHAREMED are complementary to MEDOSMOSIS in terms of data formats
- 10/16 declare to ignore about the existence of national data geoportals

The answers about the description of the gaps are presented in Table 2:

SP Table 2: General gaps description

Skills, manpower, funds, equipment	It should focus more on training. No people skilled on GIS. The ArcGis programme is out of date, sometimes work accumulates and it is difficult to keep the data record up to date. I would need more dedication to get the most out of the data supply. We would need more funding.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

	We have not enough manpower. Impossible to get to Responsible Maritime Surveillance of Spain and the rest of the EU.
Data confidentiality	Faced with the possibility of the opening of a sanctioning file on a vessel, it is not clear to me what information can be shared, how and where. Some species are sensible. Lack of public data on periodic discharges of HC and other data on plastics, microplastics and marine litter on the coast of Spain and the rest of the EU.
Lack of interoperability among organizations	No request for data from other Agencies. SASEMAR hasn't interest on collaborate with other organizations. No information with others organizations. I would like to see more communication or dissemination of the existing data available. All European Smart Ports must have effective emergency oil spill response vessels, prepared to respond to accidental oil spills.
Lack of tools to handle data	There is no standard for information management. Outdated software, SARmap runs on Fortran. Although ArcGis is better for working with the data, Google Earth is easier to use, especially when you have to send the data to people who are not familiar with this type of software and just want to see the georeferenced result. Lack of management tools and/or knowledge of the necessary tools. Lack of public data on periodic discharges of HC and other data on plastics, microplastics and marine litter on the coast of Spain and the rest of the EU.
Lack of data depending on the area	Most areas are producing any kind of data.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Lack of useful data	A lot of unnecessary information that makes it difficult to use what is really useful. Outdated software, SARmap runs on Fortran.
Data/model/format requirements (resolution, format)	Coverage area. RPS format is most common. Nobody is using RTZ at present, only on the simulator.
Data sharing/access	Practically it does not exist any kind on data exchange into the whole organization. Copernico Data. Not all data is freely accessible. Some have to be specifically requested.
Lack of information about the data (metadata, purposes of the data)	Untrained people, most do not know even what a metadata is.
Time delivery frequency (real-time, delayed ...)	Lack of real-time data
Knowledge/skills needed to perform some operations	Among hundreds of operators, no more than 5 persons have studies on GIS or related fields. Need for a pollution database management system. As well as training on it and ARCGIS. Lack of knowledge of needed tools.
Other	Lack of data integration tool (platform)

Some gaps have been also identified related to the data used and related to the data produced:

SP Table 3: Gaps related to data use and production

Gaps related to the data used	I require more details in data in local areas (close to shore). I can't easily access to everyday data generated on searchers. I can't produce nor publish any info about these subjects. I do not have a full guarantee that the data are or will be up to date. Discrepancies and lack of standardisation between the areas to be monitored according to the means of detection.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Gaps related to the data produced	Free access to the few data that the organization produces, in order to generate knowledge that could be (not now) sprawled among SAR community. When it comes to prioritising, salvage is always given priority over pollution, which logically means a delay in everything related to the activity I am carrying out. Improving the delivery of information

3. Focus on platforms

As expected from the answers regarding the preferred formats for using and displaying data, the most common platforms are related with GIS based software as ARCGIS and QGIS. A participant with expertise in training operators for search and rescue activities, has commented that probably the most adequate GIS based platform would be QGIS. A relevant comment from an operator working with pollution surveillance has noted that costs associated to maintain proprietary software, together with the priorities on platforms for search and rescue operations, is a problem to maintain and having updated software for pollution tasks.

In the following we briefly summarize some of the platforms that have been listed in the questionnaire related with Maritime Surveillance activities:

3.1 SIVE

Undoubtedly, one of the most important elements to carry out the missions entrusted to the Civil Guard at sea is the Integral System of External Surveillance (SIVE, from the Spanish el Sistema Integral de Vigilancia Exterior)., where the combination of electronic elements for detection, tracking and monitoring and control extends throughout the coasts of the Canary Islands and the coast near the strait of Gibraltar and its Mediterranean extension, which currently covers from Huelva to Tarragona, as well as Ceuta, the Balearic Islands and Pontevedra.

The objective of SIVE is to improve surveillance of the Spanish maritime border, especially at South. This operational system makes it possible to respond to two of the main challenges we are currently facing: the fight against drug trafficking and irregular immigration.

Following the abolition of internal borders in the European Union, SIVE is a challenge not only for Spain, but also for European security, given our status as the continent's southern border. Within the

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

framework of this programme, a massive incorporation of new technologies has been carried out in the surveillance tasks carried out daily by the Guardia Civil on our southern border. These new technologies allow for a more efficient use of the human resources that the institution dedicates to these purposes.

SIVE is an operational system which, on a technical support, provides the information obtained in real time to a Control Centre which gives the necessary orders for the interception of any element approaching the national territory from the sea. One of the fundamental dimensions of this system is humanitarian, as the SIVE allows remote detection of the vessels, which facilitates the identification and rapid assistance of the victims of this new form of human trafficking. SIVE allows not only to dissuade the mafias from this type of trafficking, but also to save many human lives.

The functions of the system are as follows:

- Long range detection of vessels approaching our coastline.
- Identify the type of vessel and its crew members in order to check for possible illegal action by them.
- Coordinate the tracking, if necessary, of the vessel, using the maritime, air and land resources available to the Guardia Civil.
- Intercept suspected criminals or assist irregular immigrants.

To carry out these missions, SIVE has the following subsystems:

- Detection subsystem: The system has sensor stations that detect vessels at long range. These stations consist of:

  - A radar sensor that detects vessels at a distance of 10 kilometres and transmits the signal to several television monitors.
  - A long-range daytime video camera, with a detailed image and light intensifiers that allow images to be taken in low light.
  - An infrared camera allowing night and day vision, with high contrast image and high immunity to adverse weather conditions.

  These cameras make it possible to confirm the presence of the vessel and identify it at a distance of 5 kilometres.

- Communications Subsystem: This subsystem enables real-time communication through the transmission of images, voice and data. It has quality links, which ensure confidentiality and prevent detection by other communication systems.
- Command and Control Subsystem: SIVE has a Command and Control Centre located in the Guardia Civil Command in Algeciras (Gibraltar Strait) and another in the Command in Fuerteventura (Canary Islands). These centres are responsible for:
  - The centralisation of the signals collected by the sensors.
  - The control of the sensor stations by remote control (operating modes, positioning and approach, fault detection, etc.).
  - Issuing orders to the interception units

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- The control of all operational activities of the Command.

3.2. OILMAP – Oil Spill Modelling software

OILMAP is a user-friendly, Windows-based oil spill model system suitable for use in oil spill response and contingency planning. It includes simple graphical procedures for specifying a spill scenario while integrating both wind and hydrodynamic data. OILMAP provides rapid predictions of spilled oil movement. An included, comprehensive 3D model tracks various hydrocarbon components on the water surface, in the water column, and in the air. OILMAP includes algorithms for spreading, evaporation, emulsification, entrainment, oil-shoreline, oil-reed bed, and oil-ice interaction. Surface and subsurface oil movement can be animated to identify shoreline impacts. In addition, OILMAP outputs graphical and tabular listings of weathering mass balance results and a display of GIS resources impacted by the spill.

Features of OILMAP

- Fully integrated GIS, compatible with other GIS tools
- Incorporate observed overflight data into model predictions
- Apply response strategies – Boom, Buring, Skimming, subsurface dispersant injection (SSDI) and aerial dispersant application

- Map assets, sensitive areas, and facilities using the interactive GIS
- Online web mapping and on-demand met-ocean data services

- Seamless integration of EDS: Environmental Data Server real-time and historical environmental data from top data providers

Applications of OILMAP

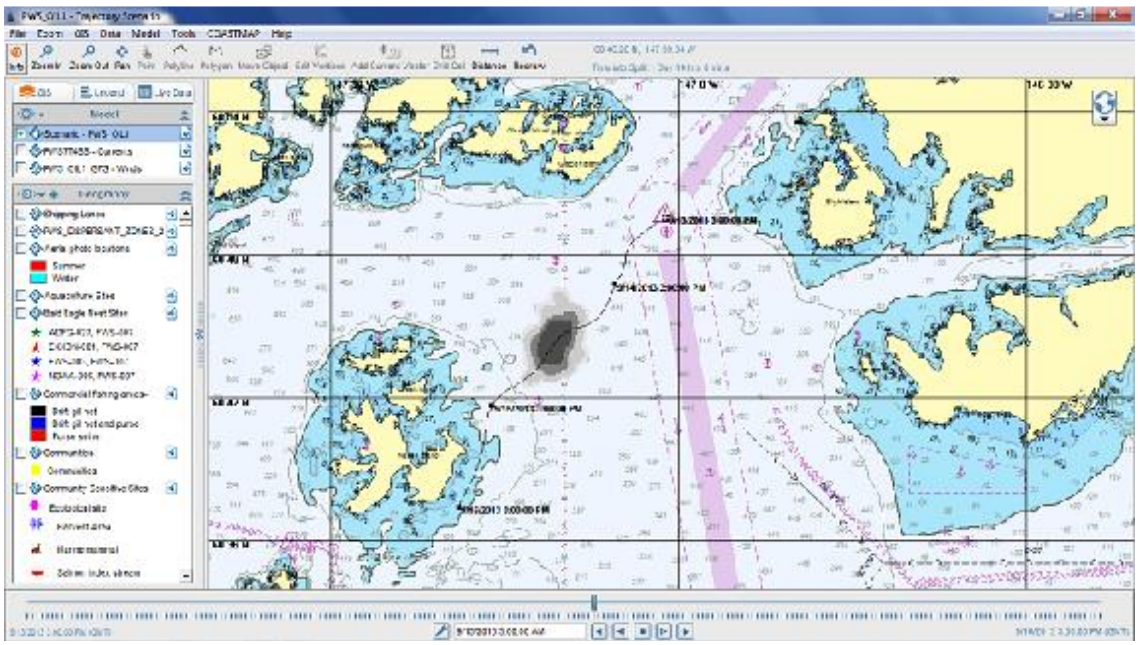
- Oil spill response decision support
- Oil spill response training
- Spill drill exercises
- Contingency planning studies
- Litigation support
- Management of spill related data
- Communicate spill scenarios
- Environmental assessments
- Risk assessments

OILMAP Modules

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The standard OILMAP system contains an oil spill trajectory and fates model, oil database, environmental data tools, and visualization engine. The following modules can be utilized in OILMAP:

- Trajectory & Fates: The trajectory & fates module is a far-field model, for surface and subsurface releases, that predicts the 3D trajectory and fate of oil for instantaneous or continuous release spills.
- Stochastic: The stochastic module can be used for risk assessment and contingency planning. It helps determine the most likely spill paths and the minimum time for oil to reach specific points on monthly, seasonal, or annual basis.
- OILMAPDeep: The OILMAPDeep module is a near-field model used to simulate subsurface releases of oil and gas. OILMAPDeep predicts the near-field plume characteristics and oil droplet size distributions for a specified release.
- Airmap: The Airmap module is an atmospheric dispersion model integrated into OILMAP. It is designed to predict the trajectory and fate of oil in the atmosphere.



SP Figure 11: OILMAP display overview

3.3. SARMAP – Search and Rescue Modelling

When objects are missing in a marine environment, whether it is missing vessels, missing persons or containers, a primary concern is where these objects will travel and where is the most probable search area. This must be done in an extremely time-effective manner as these are often life and death situations. SARMAP is a search and rescue model system that provides rapid predictions of the

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

movement of drifting objects and missing persons in marine, fresh water and aeronautical environments. SARMAP includes the ability to deploy search & rescue units (SRUs) with search patterns and calculate probability of containment (POC), probability of detection (POD) and probability of success (POS), based on the IAMSAR Manual guidelines.

It includes simple graphical procedures for specifying search and rescue incidents and entering both wind and hydrodynamic data. SARMAP outputs an intuitive graphical overview of the search object trajectory so operators can deliver search area information to on scene assists.

Features of SARMAP

- Model output animation using RPS Timeslider.
- Search object database (101 water objects, 27 aeronautical objects).
- Search and Rescue Unit (SRU) database populated by user.
- IAMSAR and Monte Carlo methods for computing drift.
- Online basemaps. Open Street Maps, Demis and more.
- Supports commercial nautical charts.
- Search Planning Tool for SRU deployment
- Seamless access to Environmental Data Server for real time forecast data.
- Search and Rescue scenario report generation
- Model output AVI creation
- Time Series MS PowerPoint generation
- SRU text reporting (ASCII, Notepad, Word, etc.)
- Online download of software installations, patches and updates

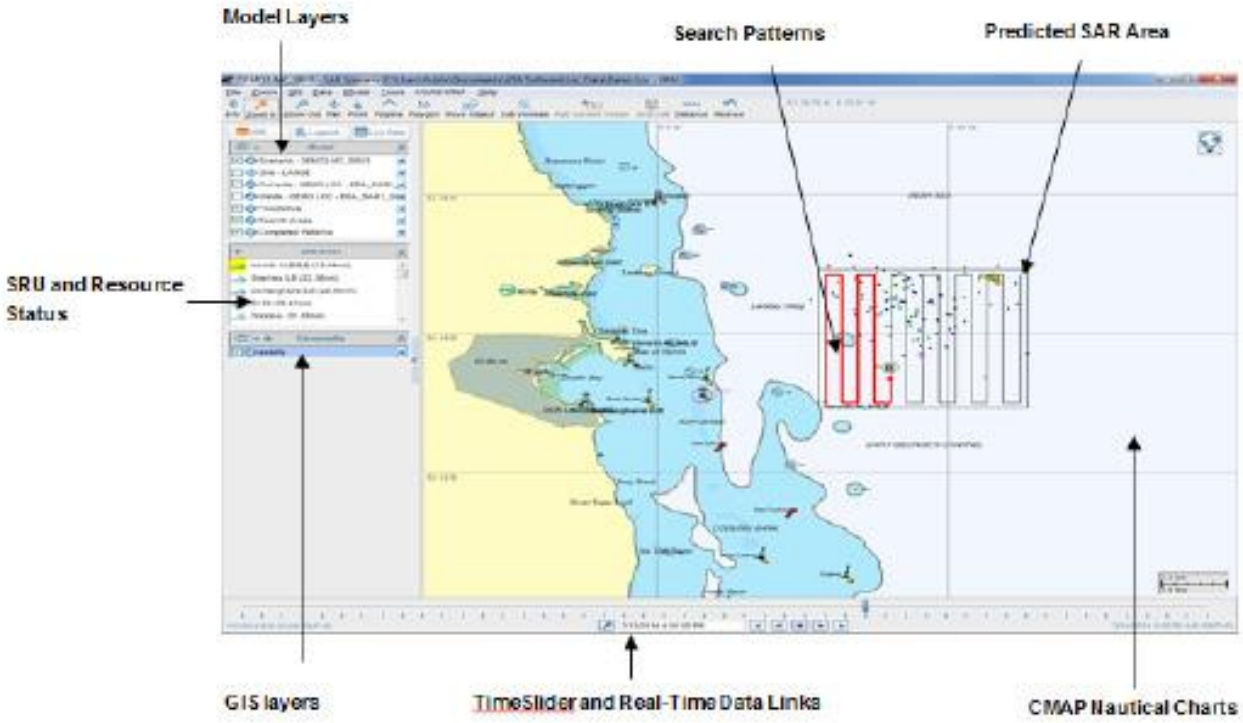
The most important specifications are:

- Met-Ocean Data Integration: The Environmental Data Server (EDS) collects a wide variety of oceanographic and meteorological data that is used for marine response and crisis management as well as providing superior data sources to environmental modelling applications. EDS provides real-time and historical environmental data management, analysis, visualization and internet-based distribution through Web services. EDS connects regional data to operational users. The system collects scientific data in disparate formats and makes available to operational users via standard web services.

- Drifting Object Simulation Engine: SARMAP includes the IAMSAR and MonteCarlo methods for computing drift. Both models can be run for up to 9 unique objects per simulation. Model output results will vary based on the chosen model. Both models can be run in the forward and backtrack mode.
- Target Object Database: SARMAP includes a database of drift behaviour for a variety of objects based on the latest U.S. Coast Guard data. The database contains 101 water objects and 27 aeronautical objects which can be selected from a list in the search and rescue model form.
- Search Planning Tools: SARMAP includes the Optimal Search Planner which allows users to:

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- Store Search and Rescue Units (SRUs) home base locations and properties.
- Deploy SRUs to a model or user defined search area.
- Deploy assets using a variety of pattern types.
- Combine multiple resources for a single or multiple search target(s)



SP Figure 12: SARMAP display overview

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

TABLES

FIGURES

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

MONTENEGRO

1. Overview

Montenegro have relatively short coast located at the south-eastern part of the Adriatic Sea and share its border with Italy, Albania and Croatia. The total costal length is 294 km; sea border length is 148 km; surface area of inland sea is 362 km2; surface area of the territorial sea is 2.099 km2 and surface area of the epicontinental shelf is 3.885 km2. The Adriatic Sea, in general, has frequent shipping movements in all seasons, but it is significantly higher during summers, with lots of small fishing and touristic pleasure boats which all together require particular attendance on their safety.

The institutional frame for public maritime governance in Montenegro is organized in three levels, which can be distinguished as:

the legislative level represented by the Parliament;

the political level represented by the Ministry of Capital Investments, Ministry of Interior Affairs and Ministry of Defense as the parts of The Montenegrin Government;

the implementation level represented by the Administration for Maritime Safety and Port Management, Harbour Masters Offices, Port Authorities, Navy, Maritime Police, and Institute for the hydrometeorology and seismology.

2. Focus on the governance of Maritime surveillance activities

1. Montenegrin Maritime Administration

Maritime administration in Montenegro is mainly composed by the Ministry of Capital Investments (MoCI) and institutions that are part of it or state bodies depending from the Ministry on its legal performance.

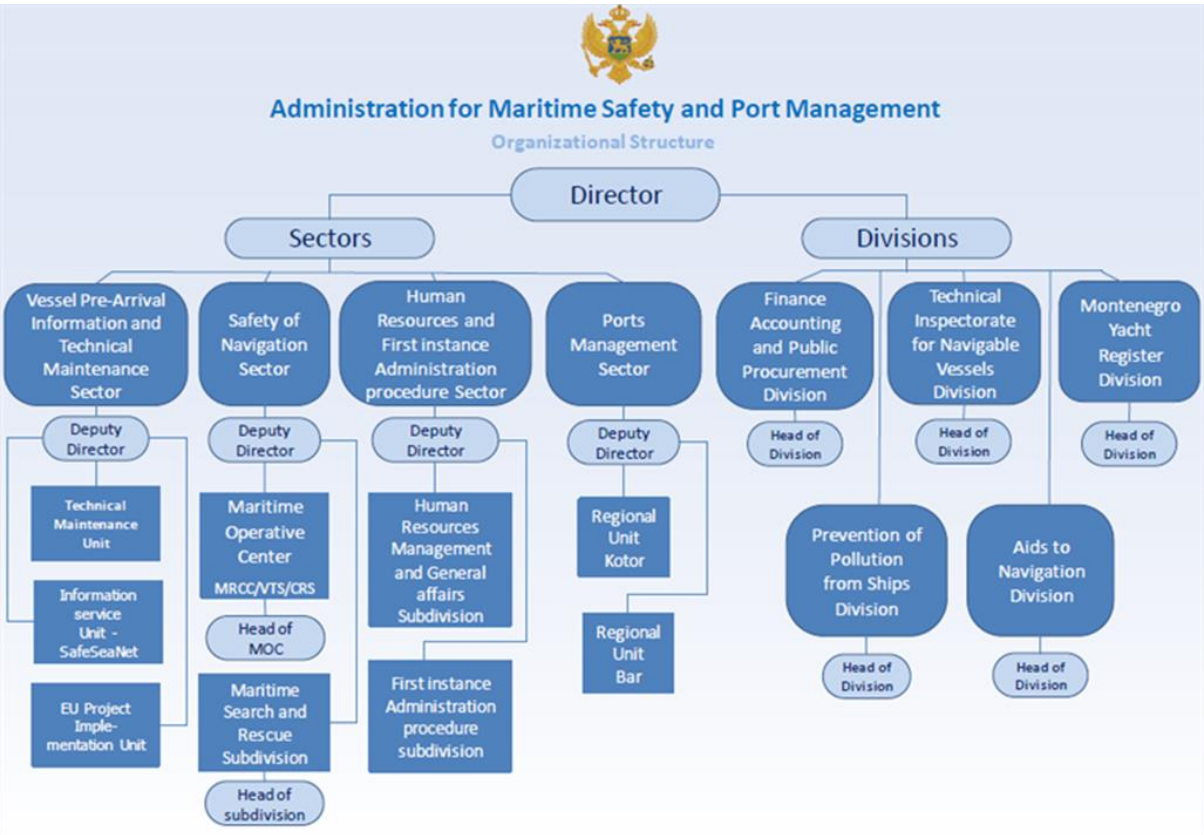
Ministry of Capital Investments acts as a national regulator on maritime safety, maritime security and maritime environmental issues. Within its competence related to maritime transport, it is responsible for proposing a national policy of maritime transport and national strategy for the development of

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

maritime transport, representing Montenegro in international organizations including proposing and negotiating, ensuring proper implementation of international agreements on maritime transport, adopting bylaws and performing other activities in accordance with Law.

Directorate for Maritime Transport and Inland Navigation, as the part of MoCI, performs administrative tasks related to the preparation and evaluation of development investment projects of interest to Montenegro, as well as conducting development policy, monitoring the situation and taking measures in the field of maritime affairs.

Harbour Masters Offices, are state bodies depending from the Ministry on its legal performance which have responsibilities over port traffic and ships' formalities, Port State Control inspections, port and ship security, ship registry and the issue of licensing for seafarers. Montenegro have two Harbour Masters Offices located at Kotor, with branch offices in Tivat and Zelenika, which are in charge for Bay of Kotor and depending waters and at Bar, with branch offices in Budva and Ulcinj which are responsible for rest of Montenegrin coast and branch office in Virpazar which is in charge for Lake of Skadar.



MTN Figure 1 Administration for Maritime Safety and Port Management (AMSPD)

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

Administration for Maritime Safety and Port Management (AMSPD) is a state body depending from the Ministry on its legal performance which is responsible for the the safety of navigation in the territorial sea and internal waters, search and rescue, maritime radio communication, aid to navigation, ship reporting system (ADRIREP), ship statutory inspections, yacht registry, yachts safety technical inspections and environmental protection in the maritime coastal and internal waters. AMSPD could be considered as most important part of maritime administraton in Montenegro related to maritime safety. Activity of AMSPD is organized through particular sectors:

1. Vessel Pre-arrival Information and Technical Maintenance Sector performs activities related to gathering of information on ships entering and leaving Montenegrin ports, as well as keeping a database on the arrival and departure of ships. In addition, the Sector is responsible for preventive and corrective maintenance of the entire infrastructure and technical system of the Administration (VTMIS and GMDSS equipment, aids to navigations installations, ICT equipment, electro-mechanical instruments, vessels and other devices) and their respective record keeping. Furthermore this Sector is incharge for appling International and European standards in the field of maritime digital systems, drafting of periodical plans and programs for preventive and corrective maintenance, investigation of the causes of technical systems failures and the control of their handling. At the end, this Sector is responsible for implementation of instructions and regulations on the protection and safety at work and maintenance of safety equipment, same as implementation of instructions and regulations on fire protection and maintenance of fire protection equipment.

2. Safety of Navigation Sector is responsible for the radio service on navigable waterways for the purpose of maritime traffic, gathering of hydrographic, oceanographic and meteorological data and their radio transmission, monitoring and control of maritime traffic, coordination, organization and conduct of search and rescue operations at sea and prevention of marine pollution from vessels, planning, organization and realization of regular exercises in all field of engagement, collaboration with other government bodies and international organizations in accordance with the National Plan for Maritime Search and Rescue and National Contingency Plan for Response to Marine Pollution from Ships, as well as other activities within the scope of Safety of Navigation. Within this sector there are two departments:
    - The Maritime Operations Center Department performs activities on supervision and control of maritime traffic via VTMIS system and communications via GMDSS devices and radio service thru Barradio coastal radio station (VTMIS, MRCC, ORS) related to

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

navigation safety, protection of human lives and protection sea from pollution from vessels, collection of hydrographic, oceanographic and meteorological data and their broadcasting by radio; radio service on maritime waterways for the needs of maritime traffic and broadcasting Notices to Mariners on the condition of waterways;

- The Search and Rescue at Sea Department perform organization and actions of search and rescue at sea, emergency response in search and rescue operations of people and property and operations to eliminate the consequences of pollution from vessels, by rescue teams in accordance with the National Plan for Search and Rescue at Sea.

3. *Human Resources and First Instance Administrative Procedure Sector* is in charge for human resources management, personnel related and general management affairs, conducting of and deciding in administrative procedures, adjudication and implementation of decisions and other individual acts, undertaking administrative activities and measures and monitoring their enforcement, providing explanations and expert guidelines and instructions in work-related matters and providing expert assistance, implementation of national regulations, international agreements and European conventions, protocols and agreements within the scope of its authority, collaboration with authorized international organizations and competent bodies of other countries within the scope of authority of the Administration.

4. *Ports Management Sector* is responsible for activities related to ports of national importance, supervision of construction, reconstruction, maintenance, management, protection and promotion of ports, control over the use of ports, port services and other port activities, control over construction, reconstruction, maintenance and protection of port infrastructure and superstructure, providing conditions for the functioning of maritime traffic and port services in ports and anchorages, implementation of national legislation, international agreements and standards pertaining to ports, preparation of development plans for ports which are adopted by the Government, ensuring that port operations are conducted in accordance with the market principles, preparation of the criteria for determination of the fees for the use of port infrastructure, preparation of the concession acts if required, taking part in the procedure for awarding and concluding of concession contracts, approval of fees for port services based on the maximum amount established for this type of fee, control over the execution of the concession contracts, regulation and coordination of relations and activities between the concessionaries, keeping the Register of Concessions, ensuring the fulfilment of conditions established in the relevant national and international legislation which regulate the prevention of pollution from ships, protection of the marine environment and

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

coastal area and civil liability for damage caused by pollution, other activities within the scope of the port management.

and particular divisions:

1. *Technical Inspectorate Division* is responsible for the activities in relation with establishing the seaworthiness of ships and other vessels and floating objects at sea and inner watersways of Montenegro which include performing the technical control of the existing vessels and vessels under construction, issuing of ships' documents, books and certificates, calculating tonnage during tonnage measurement of vessels, keeping records related to all activties, providing technical expertise in cases of marine incidents and other activities within the scope of the Division's authority.

2. *Technicl Survey and Regitration of Yachts Division* is incharge for implemantation of The Law on Yachts which defines condictions under which it can be clasfiied as yacht, propelled either by sails or engine, which can have more than one hull, intended and equipped for longer stays at sea (this implies appropriate conditions for accommodation and stay which enables autonomous stay at sea for the persons on board, especially from the standpoint of protection and safety), for pleasure, sport and leisure, with the length of more than 7 meters and used for personal needs or commercial activity.

3. *Aids to Navigation Division* is responsible for safety of navigation in the coastal sea area of Montenegro regarding regulation and maintenance of navigable waterways, installation of safety aids on navigable waterways and ensuring their proper functioning, maintenance of maritime safety devices and structures, collection of fees for the use of aids to navigation devices on waterways, collaboration in the making of nautical charts and nautical publications, preparation and submission of data for the transmission of Notices to Mariners related to aids to navigation, application of international and European conventions and agreements and collaboration with authorized international organizations and performs other tasks within the scope of Division's authority.

4. P*revention of Pollution from Ships Division* is responsible for activities related to prevention of and response to marine pollution from ships in accordance with the National Contingency Plan for Response to Marine Pollution from Ships (NCP), as well as for the periodical updating and upgrading of the NCP. It is also responsible for collaboration with government bodies, international organizations and competent bodies of other countries in the field of prevention of and response to marine pollution, tracking and implementation of international conventions and European directives in the field of pollution prevention and response, revision of plans for the prevention of pollution in ports and marinas; providing expertise regarding the complex issues involved in the pollution prevention and response and responsible for drafting regulations, instructions and procedures within the scope of Division's authority;

5. *Finance, Accounting and Public Procurement Division* is incharge for financial and bookkeeping operations, projection and realization of the program budget, monitoring and realization of contracts and other financial obligations same as for preparation and realization of the public procurement plans and implementation of the public procurement procedures.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

To have a full picture how the maritime administration works in Montenegro we also have to point out that integrated maritime surveillance is the national operational segment conducted through the shared responsibilities. These operations involve the executive powers of the Border Police and the Navy, and, in specific cases such as Search and Rescue (SAR) operations at sea or any kind of sea pollution respond, the AMSPM have overriding authority which means that the rest of the institutions and their assets are at its disposal, command and coordination. Further more:

1. The Ministry of Interior and the Police Directorate have overall responsibility for maritime security, passengers' border control, and transport of dangerous goods.
2. The Directorate for Capital Investments, as depending body of MoCI, is in charge of tasks related to the preparation and evaluation of investment projects of interest to Montenegro, including those which are partly or fully financed from EU funds same as for implementation of IPA cross border projects.
3. Institute for the Hydrometeorology and Seismology of Montenegro is state body in charge for meteorology including weather analysis and forecasts, seismology same as for hydrography, oceanography and nautical charts of Montenegrin coast and related inland waters.

2. Present condition of maritime safety system

For search and rescue operations same as for oil pollution response the most important things are the timely information and position of those asking for help. Maritime safety system in Montengro is based on Vessel Traffic Monitoring Information System (VTMIS) as the interface for visibility and exchange of data. It also coordinates and regulates the traffic throughout the coastline of Montenegro, from the north border with Croatia, over the Italian border, to the south border with Albania, by established Vessel Traffic Service (VTS). Maritime authorities build their situational picture

using stand-alone, conventional legacy maritime surveillance systems, and, utilise standard cooperation mechanisms between the countries. Presently, Montengro use Pelagus VTMIS provided by ELMAN Srl from Italy. VTMIS consist of Maritime Operation Centre (POC) located in Dobra Voda, near the city of Bar, where all data are merged, stored and integrated in SafeSeaNet used for enhance of maritime safety, port and maritime security, maritime environment protection and efficiency of maritime traffic and transport same as in ADRIREP, mandatory vessel traffic reporting system for Adriatic sea; three additional remote VTMIS sensor sites along the coast equiped with contemporary

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

solid state radar sensor station, AIS base station, VHF simplex transmitters, VHF duplex transmitters, VHF radio direction finder, meteorological and hydrographical stations; Global Maritime Distress and Safet System (GMDSS) devices and radio service thru Barradio coastal radio station related to navigation safety, protection of human lives, protection sea from pollution from vessels, collection of hydrographic, oceanographic and meteorological data and their broadcasting by radio, radio service on maritime waterways for the needs of maritime traffic and broadcasting Notices to Mariners on the condition of waterways.

MTN Figure 2 Montenegro Vessel Traffic Service

Particularly important and sensitive segment of AMSPM and its Sector for Safety of Navigation is Maritime Rescue Coordination Centre (MRCC) which is located at city of Bar and it is incharge for entire Montengrin coast and depending waters as per international agreements. MRCC Bar is involved in the all activities of organization and coordination of the search and rescue operations (SAR) at sea in accordance with the National Plan for Maritime Search and Rescue and the International Convention on Search and Rescue, 1979. Also, MRCC Bar is involved in all activities of organization and

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

coordination of the operations related to oil pollution response in accordance with National Plan for Emergency Response in Case of Sea Pollution From Vessels and the International Convention for the Prevention of Pollution from Ships 73/78, which all establishes principles of work, tasks and responsibilities, sanctions and rules of conduct for authorized officers, as well as the manner of using the equipment during periods of readiness and during search and rescue at sea or oil pollution response. For execution of its activities the MRCC Bar have on disposal specialized SAR boats the variety of response equipment for emergency intervention at the sea same as the authority to engage other institutions and their assets including mapower, airplanes, vessels, tugs, equipment, etc.

3. Undergoing activities for improvement of maritime safety system

Montenegro has, for several years in the past, promoted the advancement and strengthening of administrative and technical efficiency of the Maritime safety administration in the area of vessels monitoring. Throughout the previous IPA assistance, various technical assistance has been provided addressing enhancement of the institutional capacities and continuation of the process of harmonization of transport-related legislation.

So, under the IPA 2011 National Programme, a VTMIS has been implemented, including sensor equipment (radar, VHF transceivers, VHF radio direction finder, AIS equipment, meteorological equipment, radio links, diesel generators) at locations Mavrijan (Ulcinj), Crni Rt (Bar) and Obosnik (Herceg Novi). Implementation of phase I of VTMIS has assisted AMSPD in decreasing risks of impact in case of ship catastrophes and facilitating higher control and supervision of the growth of maritime traffic in Montenegrin ports.

Furthermore, within the IPA II, under the Country Action Programme for Montenegro (started 2017), new complementary interventions have been defined aiming to upgrade standards and capacity in the area of maritime and inland waterways transport ensuring better environmental protection. This includes procurement of missing equipment for protection of the sea from pollution, improvement of VTMIS by procurement of adequate equipment in accordance with the technical specification for the supervision and control of maritime traffic in the Bay of Kotor and on Skadar Lake, as specific areas of interest for traffic safety, Implementation of the National Maritime Single Window (NMSW) and procurement of additional equipment for maritime signalization require for increasing of maritime safety. All those activities should be implemented till the end of 2024.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

In the same time, AMSPD also participate in several projects, listed below, for improving the capabilities of Montenegrin Maritime Administration in the field of maritime safety:

1. EFFECTOR

Acronym	An End to end Interoperability Framework For MaritimE Situational Awareness at StrategiC and TacTical OpeRations — **EFFECTOR** No 883374
Topic of the project	Demonstration of applied solutions for improving border and external security
Duration and start	18 months, starting from 1st October 2020
Partners	The total number of partners in the consortium is 16 (industrial and technical partners, academic institutions and end-users)
Summary of the project	The EFFECTOR project aims to enhance maritime surveillance and cooperation between stakeholders through the implementation of the Interoperability Framework, the fusion of related data and analytical services in the field of maritime surveillance and border security, which will enable faster detection of new developments, as well as better information for decision-makers. understanding as well as taking cross-border actions. The EFFECTOR project will provide the possibility of full systemic maritime surveillance and data exchange at the tactical and strategic level, introducing applied solutions to improve external security and borders, including the implementation of a multi-layered data platform in accordance with CISE, adoption of interoperability standards for data processing and systems in maritime environment and demonstration of new concepts and tools for semantic representation, data fusion and analytics at local, regional and international levels.
Web page and social media	https://www.effector-project.eu/ https://twitter.com/effector_h2020 https://www.linkedin.com/company/68868072

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

2. ePIcenter

Acronym	Enhanced Physical Internet-Compatible Earth-frieNdly freight Transportation answer – **ePIcenter** No 861584
Topic of the project	MG-2-9-2019 of H2020 Mobility for Growth "InCo Flagship on Integrated multimodal, low-emission freight transport systems and logistics"
Duration and start	42 months, starting from 1st June 2020
Partners	The total number of partners in the consortium is 33 (industrial and technical partners, academic institutions and end-users) from 15 countries
Summary of the project	The goal of the project is to create an interoperable cloud-based environment with extended software and artificial intelligence-based solutions adapted for end-users, with the support of participants in the global transport chain. The project will consider the needs of modern consumers for cheaper and faster transport of goods, with the introduction of transport innovations such as hyperloop, autonomous/robotic systems (T-floors), state-of-the-art blockchain technologies and technological initiatives, increased digitalization in transport, single window), EGNOS precision positioning, and Earth observation program - COPERNICUS. Also, the goal of the project is to accelerate the introduction of the Physical Internet (Physical Internet), which will benefit peripheral regions and developing countries. It is also planned to introduce methods for an easier way for ships to arrive in ports, which will reduce crowds and queues.
Web page and social media	https://epicenterproject.eu/ https://www.linkedin.com/company/epicenter-eu https://twitter.com/epicenter_eu

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

3. RESPOND-A

Acronym	Next-generation equipment tools and mission-critical strategies for First Responders – **RESPOND-A** No 883371
Topic of the project	Demonstration of applied solutions for improving border and external security
Duration and start	36 months, starting 1st June 2020
Partners	The total number of partners in the consortium is 34 (industrial and technical partners, academic institutions and end-users) from 12 countries
Summary of the project	There is an increasing need for organizations/institutions in the first line of response (FR) to introduce reliable and efficient information management systems that provide greater awareness of the situation and a better common operational picture. To keep up with current trends, the RESPOND project aims to develop solutions for users, using 5G wireless communication, augmented and virtual reality, autonomous robot and drones in coordination, intelligent carrying sensors and smart monitoring, geovisual analytics and extensive analysis data, thus providing passive and active localization and monitoring. For this purpose, RESPOND-A provides training for user organizations in order to get acquainted with the technological outcomes of the project and their performance and efficiency in classified training facilities for project partners with hydro-meteorological, geophysical and technological disaster scenarios.
Web page and social media	https://respond-a-project.eu/ https://twitter.com/respond_a https://www.linkedin.com/in/respond-a-project-2938381b3/

4. ANDROMEDA

Acronym	*An EnhaNceD Common InfoRmatiOn Sharing EnvironMent for BordEr CommanD, Control and CoordinAtion Systems* – **ANDROMEDA**
Topic of the project	Demonstration of applied solutions for improving border and external security
Duration and start	18 months, starting from 1st September 2019
Partners	The total number of partners in the consortium is 19 (industrial and technical partners, academic institutions and end-users) from 9 countries
Summary of the project	The aim of the project is to unlock the full potential of the CISE concept, by validating over a long period of time CISE compatible command, control and coordination systems from several coastal and border agencies. At the same time, further improvement, validation and demonstration of CISE is envisaged by expanding its scope to land borders and adapting relevant C2 solutions and related services. This will be achieved by expanding the case-based CISE data model and adapting state-of-the-art command and control systems to fully align with the improved CISE model and messaging patterns.
Web page and social media	https://www.andromeda-project.eu/index.html https://twitter.com/andromeda_h2020?s=20 https://www.linkedin.com/in/andromeda-horizon2020-project

5. COMPASS2020

Akronym	*Coordination Of Maritime assets for Persistent And Systematic Surveillance* — '**COMPASS2020**
Topic of the project	Demonstration of applied solutions for improving border and external security
Duration and start	18 months, starting from 1st May 2019
Partners	The total number of partners in the consortium is 14 (industrial and technical partners, academic institutions and end-users) from 8 countries
Summary of the project	To address the various challenges in maritime safety, the COMPASS2020 project has been launched, which aims to demonstrate the combined use and smooth coordination of crew and drones to achieve greater coverage, better quality of information and shorter response times in maritime surveillance operations. The solution will be based on a concept of operations that uses multiple airborne and underwater unmanned vehicles with improved capabilities and will be supported by a central, interoperable mission system (MS) that enables the operation of these platforms. The main goal of the COMPASS2020 project is to demonstrate an operational solution to ensure constant monitoring, improving the maritime image for maritime authorities and thus increase cost-effectiveness, accessibility and reliability.
Web page and social media	https://www.compass2020-project.eu/ https://www.linkedin.com/groups/13744501/

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

6. EUREKA

Acronym	*Adriatic-Ionian joint approach for development and harmonization of procedures and regulations in the field of navigation safety* – **EUREKA** No 1212
Topic of the project	Connected (Adriatic-Ionian) Region; Enhance capacity for integrated transport and mobility services and multimodality in the Adriatic-Ionian region
Duration and start	30 months, starting from 1st December 2020
Partners	The total number of project partners is **8** (Ministry of the Sea, Transport and Infrastructure of Croatia; Ministry of Infrastructure and Transport – Coast Guard Headquarters of Italy; Ministry of infrastructure – Slovenian Maritime Administration; Ministry of Infrastructure and Energy of Albania; **Administration for Maritime Safety and Port Management of Montenegro**; Ministry of Maritime Affairs and Insular Policy – Hellenic Coast Guard Headquarters; University of Rijeka – Faculty of Maritime studies and Faculty of Maritime Studies Kotor - University of Montenegro) **+ 1** (associated partner, Ministry of Communications and Transport of Bosnia and Hercegovina).
Summary of the project	The overall objective of the EUREKA project is to increase the level of maritime safety in Adriatic-Ionian region by introducing systematic cooperation and coordination of maritime administrations of all countries of the region. Additionally, specific objectives are to develop systematic coordination, harmonize the legal basis for cooperation, increase the level of data exchange, harmonize and standardize the VTS service and develop a common education system for VTS operators. The project results include the establishment of the Maritime Safety Permanent Transnational Network that will continuously improve all the

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

	areas of regional maritime safety, coordination and cooperation through the activity of thematic working groups. The main contribution of the project is reffered to: a) the modernization of ADRIREP, the system which will, through the proposal of new IMO Resolution, analyze different possibilities, develop new procedures, test and legally regulate; b) harmonization and standardization of VTSs in AI region; c) analysis, development and piloting of the harmonized training for VTS operators, including the standard of competences; d) introduction of the Sea Traffic Management Service system, which is innovative in Adriatic-Ionian region and which definitely contributes to the optimization of logistical processes in maritime transport and ports.
Web page	https://eureka.adrioninterreg.eu/

It is important to point out that The European Commission gave approval to Montenegro for participating into the CleanSeaNet and EU LRIT Data Centre. So far, this system has been designed exclusively for members of the EMSA (EU countries, Norway and Iceland) and Montenegro is the first "third country", outside the EU, which is connected to this system, since Montenegro fulfilled all the necessary conditions to participate in it, due to the assessment of the European Commission and EMSA. MoCI and EMSA signed a contract on the use of LRIT system by Montenegrin side. By this, Montenegro achieve substantial savings in comparison to the previously established national LRIT Data Centre. AMSPD is in charge of the implementation of the system in Montenegro, including its use.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

3. Gaps identified

By the evaluation of present condition of the Maritime safety in Montenegro and as per stakeholders, further gaps have been identified:

- Lack of interoperability among the various stakeholders and across state borders,
- Lack of data exchange and delay in data delivery,
- Lack of National Single Window (NSW) and consequently also National Maritime Single Window (NMSW) and full implementation of Convention for Facilitation of International Maritime Traffic (FAL Convention)
- Lack of participation in Common Information Sharing Environment (CISE)
- National legislative framework, including local laws, rules and recommendations are not amended promptly as per relevant requirements of SOLAS and other Conventions, IMO Resolutions and other applicable international rules, regulations and recommendations.
- Actual condition of some Aids to navigation which require replacement, renewal and modernization,
- Partial lack of proper equipment for SAR operations and marine pollution respond,
- Having in mind specific configuration and uniqueness of Bay of Kotor it is obvious the lack of the adequate system for monitoring of ships in the bay, in order to provide safety at sea, pollution prevention and preservation of biological diversity in the Bay of Kotor.

4. Usage of platforms and geoportals

According to available information it can be concluded that different parties, including authorities, use different methods, tools and technologies to collect required data, same as for usage, processing, disseminating and displaying those data and there is no platform which is standard for Montenegro. The same situation is regarding geoportals as there is no national geoportal which allows for sharing and displaying of surveillance data in Montenegro.

5. Conclusions and recommendations

As already stated, Montenegro is making significant efforts in the advancement and strengthening of administrative and technical efficiency of the Maritime administration related to maritime safety. It could be concluded that those efforts including implemntaiton of VTMIS are great step foreward but this have to be just the first of many further steps which have to be taken for overcoming the gaps

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

already identified and furder which can arrise, during interconnection and inclusion of Montenegrin national maritime safety system in regional and EU levels, which have to be imperative.

Montenegrin national VTMIS system is already specified in the manner to support and to be compatible with existing regional and EU systems like SafeSeaNet and ADRIREP and also it complies with IALA Recommendation V-145 on the Inter-VTS Exchange Format (IVEF) which is the standard for exchanging VTMIS data in the future. In the same time MoCI and AMSPD participate in several projects in the way to increase capabilities of Montenegrin Maritime Administration particularly related to maritime safety.

In line with this it is strongly recommended:

- Further development and improvement of VTMIS particularly regarding supervision and control of maritime traffic in the Bay of Kotor and on Skadar Lake which will significantly improve the control of maritime safety in these areas together with continue endeavors toward providing full access to SafeSeaNet intended for vessel traffic monitoring as SafeSeaNet for most of users show map-based graphical web interface (GIS), which makes the system easy to understand and operate, and makes possible for users to quickly obtain what they need.

- Procurement of all missing equipment related to SAR operations at sea, prevention of potential risks of pollution and response in adequate time in cases of oil spills from ships or coastal oil platforms in territorial waters or ports same as related to improvement of aids to navigation along the cost.

- Implementation and providing access to National Single Window (NSW) system which enables a single submission (only once) of electronic documents by the trader such as single data preparation and submission of customs declaration and duty payment for customs release and clearance. The NSW is also a facility that allows parties involved in trade and transport to submit and exchange standardized information and documents with a single-entry point to fulfill all import, export, and transit-related regulatory requirements.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

- As per NSW the National Maritime Single Window (NMSW) is similarly defined as a place where all information is entered only once and becomes available to various parties, but related to the maritime environment. Its focus lies on the data associated with vessels, and not the data about cargo and trading. The NMSW, as an authority dealing with clearance of the ships, should, at a minimum, cover the handling of IMO FAL dana related to the vessel, where general safety and security information regarding the transported cargo is included. Furthermore, the NMSW should be developed to deal with reporting formalities that are the result of international laws which the individual country has acceded at the regional and international levels.

- Encourage the participation of AMSPD and other interested parties in The Common Information Sharing Environment (CISE), an EU initiative providing a decentralised framework for point-to-point information exchange across sectors and borders. CISE aims to make European and national maritime surveillance systems interoperable, enabling all concerned authorities to exchange information in an automatic and secure way. Carrying out many different operational surveillance tasks, national authorities directly benefit from being connected to CISE, in various sectors such as safety and security of maritime transport, fisheries control, marine pollution preparedness and response, protection of marine environment, customs, border control, general law enforcement and defence. CISE enables an effective understanding of all activities carried out at sea that could impact the security, safety, economy or environment of the EU and its member countries.

All mentioned activities, conclusions and recommendations will lead to fulfillment of all obligations related to maritime safety which Montenegro have as the EU candidate country and member of IMO and other international organizations dealing with maritime safety.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

FIGURES

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

CONCLUSION

This in-depth analysis completes the overview of maritime surveillance and safety actors provided in the first part of the report (Studying Field report PART I), and gives a more detailed picture of the different stakeholders involved for each participating country. This compilation of national reports also builds up on the results of the survey and, together with the identification of national specific issues, reinforces the conclusions initially drawn.

A point often highlighted by the different institutions and countries is the lack of interoperability of the data as well as the lack of knowledge of the available data at the country's level, within the different participants for maritime surveillance and navigation safety. The report, by listing various geoportals, gives a number of platforms that can be communicated, utilized and maybe copied for the creation of national geoportals.

The other main significant issues highlighted are the absence of one global database hosting maritime data, and the lack of interconnection between existing European information systems. To answer those needs, the project MEDOSMoSIS is co-funding a GIS portal base platform for Greece (4.3.2) to improve interconnections with Third Party systems. The project also develops improvements to the French geoportal data.shom.fr in order to integrate information from partner countries and facilitate display in English language of data (4.3.13 Interoperability tools), and supports the Italian (Abruzzo) geoportal's capacity increase (4.3.10).

The CISE programme, to which MED OSMoSIS actively contributes through the pilot study led by Shom (4.3.14), is aiming to tackle these issues as well. The CISE project develops an information-sharing platform based on State Members surveillance systems and European agencies in order to improve data and information exchange. The aim is to establish a common language of exchange for all maritime surveillance stakeholders. The data exchanged within the CISE network will be data related to the maritime domain, with a priority for the safety and security sector. CISE will also provide situational awareness and up-to-date operational information (e.g. AIS data). This will reinforce the maritime authorities' efficiency within each Member State and help reduce operating costs. Any actor willing to exchange maritime surveillance data can join the network on a voluntary basis. More information is available in the "CISE preliminary study" (D4.2.1) shared by Shom with the MEDSOSMoSIS partners.

Project co-financed by the European Regional Development Fund
Projet cofinancé par le Fonds européen de développement régional

The development within the project of the API S-124 dedicated to the production and diffusion of navigational warnings by web services in France (4.3.12 Navigation warnings), tested by some MED OSMoSIS partners, aims at facilitating the sharing of navigation safety data with the partners and end-users equipped with ECN in a smooth scheme.

Finally, another key point to address for all participating countries would be the level of awareness concerning maritime spatial planning (MSP). Knowledge of MSP will have to be developed since National plans are to come into force from 2022. An impact on the way maritime surveillance and safety activities are carried out is to be expected. Wider communication regarding MSP may be needed to inform sea users as well as surveillance and safety stakeholders. European projects such as MSP MED act in this direction and raise awareness around MSP.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Summary table of issues, recommendations and platforms listed per partner country

	Problem diagnosis highligted	interoperability issues	Recommendations	Platforms / Geoportals
Croatia	Unawareness of CISE data exchange model Unawareness of existing national geoportal	Lack of interoperability among organizations and across state borders seen as significant limitations (half of the surveyed organizations identified them as such)	- Include involved stakeholders, as well as other major actors in the maritime sector, into the CISE system - Plan and create a single national geoportal for sharing and displaying maritime surveillance data - raise the organisations' awareness about the existence of tools tools, as well as present the benefits	
France	Absence of global database hosting worlwide maritime data	- lack of interconnection between existing European information systems - lack of international data model	- adhere/participate to CISE network - use of a common data model that will be used nationally and internationally (Emodnet) - improve interoperability between sea user communities	- Ministry of Armed Forces internal network internet web portal (limited access to authorised users / internal MINARM) - Géolittoral : http://www.geolittoral.developpement-durable.gouv.fr/sommaire.php3 - https://www.geoportail.gouv.fr/ - SPATIONAV: this geoportal integrates AIS and RADAR data - data.shom.fr
Greece	the connection to EUROSUR application was considered as extremely complicated and risky to be included as a mandatory deliverable of the technical specifications for the upcoming contract for the Development of the NIMSS		NIMSS software will be of open architecture and a connection will be explored in the future. Moreover, the contractor has the obligation to deliver a SDK (Software Development Kit) and an API (Application Program Interface) in order to allow us to interconnect other applications.	Web GIS (Arcview) platform was established for the MMAIP during the INTERREG Greece-Cyprus 2007-2013 program with the projectTHAL-CHOR.

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

	Problem diagnosis highligted	interoperability issues	Recommendations	Platforms / Geoportals
Italy	- National regulations currently in force in Italy often restrict data access or sharing among various organizations who need to use data, and do not provide one usable standard format. - Information not detailed enough for data gathered and incorporated to datasets - Skills/knowledge: lack of skilled experts, financial allowance, equipment for quality monitoring (environmental protection).	- Lack of data interoperability across State borders, as well as among different national organizations in both the existing technical ICT infrastructures and the different data formats, which often are not ready to use and require further elaborations.	- Enhance interoperability and the different approaches to the use of data according to the purpose of final users - Adjust regulations to allow for better use and usability of the data and information Allocate financial resources at national level to Environmental organizations involved in maritime surveillance: environmental organisations so that they can tangibly contribute to carrying out water quality monitoring	National Geoportal http://www.pcn.minambiente.it/mattm/ National Catalogue for Spatial Data (RNDT) https://geodati.gov.it/geoportale/ Metadata Catalog: http://www.pcn.minambiente.it/mattm/en/metadata-catalog/
Portugal	Lack of manpower, skills, funds, equipment	Numerous platforms instead of one EU common platform Lack of tools to handle the data		https://www.hidrografico.pt
Slovenia	Lack of data sharing Poor database structure Reluctance from some stakeholders to share data			National Single Window : only successful and efficient way of sharing maritime data, especially among ships, agents, the Port of Koper and the all governmental administration bodies
Spain	Lack of Skill, manpower, funds equipment Lack of interoperability among organizations Lack of tools to handle data Lack of data depending on the area Data access Unawareness of the existence of national geoportals Unawareness of the data suppliers GIS-related cost (updates and maintenance)	Unawareness of CISE data exchange model		ARCGIS and QGIS SIVE OILMAP SARMAP

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

	Problem diagnosis highligted	interoperability issues	Recommendations	Platforms / Geoportals
Montenegro	Lack of data exchange Delay in data delivery Lack of National Single Window (NSW), National Maritime Single Window (NMSW), and implementation of Convention for Facilitation of International Maritime Traffic (FAL Convention) Delay in amending National legislative framework as per relevant requirements of SOLAS and other Conventions, IMO Resolutions and other applicable international rules, regulations and recommendations. Aids to navigation which require replacement, renewal and modernization, Lack of SAR and pollution equipment Specific configuration of Bay Lack of adequate ship monitoring system	Lack of interoperability among the various stakeholders and across state borders	Further development and improvement of VTMIS particularly regarding supervision and control of maritime traffic in the Bay of Kotor and on Skadar Lake Procurement of missing equipment related to SAR operations at sea, prevention of potential risks of pollution Implementation and access to National Single Window (NSW) system NMSW to cover the handling of IMO FAL data NMSW to deal with reporting formalities resulting from international laws Participation of AMSPD and other interested parties in CISE an EU initiatives	

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional

Project co-financed by the European Regional Development Fund

Projet cofinancé par le Fonds européen de développement régional