
Policy paper on Maritime Surveillance

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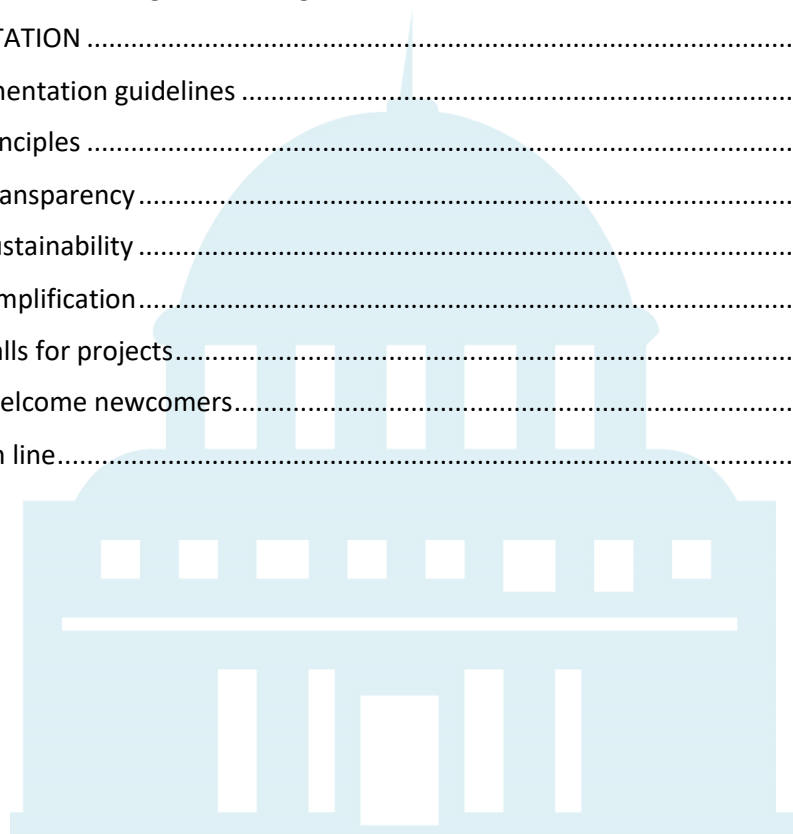
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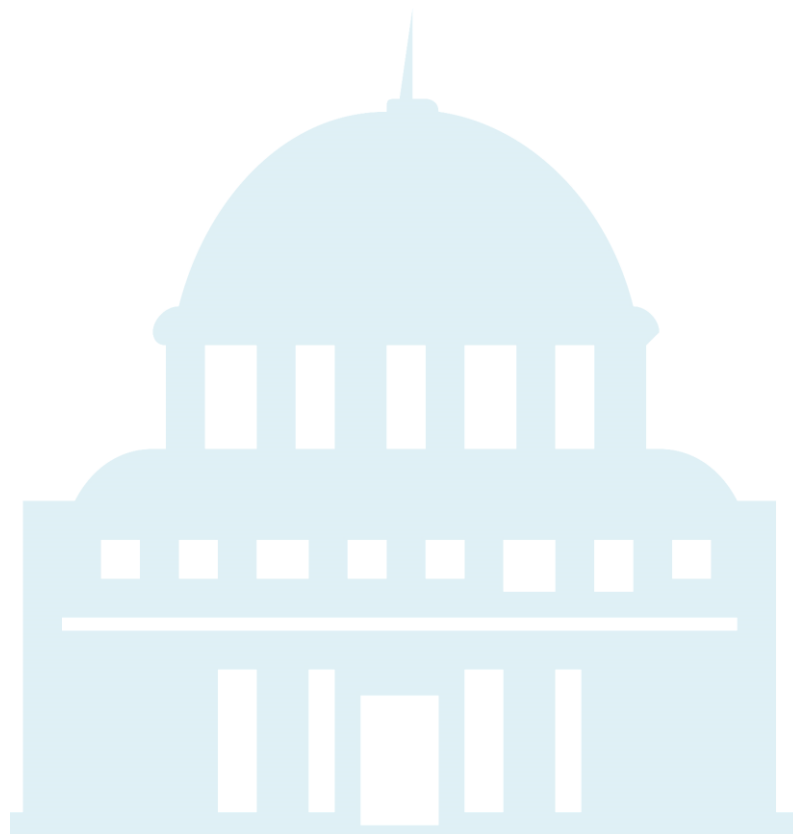
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CMEMS	Copernicus Marine Environment Monitoring Service
CSDP	Common Security and Defence Policy
CISE	Common Information Sharing Environment
EDA	European Defence Agency
EFCA	European Fisheries Control Agencies
EMSA	European Maritime Safety Agency
EO	Earth Observation
ESA	European Space Agency
EUMSS	EU Maritime Security Strategy
EUROSUR	European Border Surveillance system
FRONTEX	European Boarder and Coast Guard Agency
HAPS	High Altitude Pseudo Satellite
HPC	High Performance Computers
ICZM	Integrated Coastal Zone Management
IMS	Integrated Maritime Surveillance
IMP	Integrated Maritime Policy
MARSUR	Maritime Surveillance
MSP	Maritime Spatial Planning
PRACE	Partnership for Advanced Computing in Europe
SAFESEANET	Community vessel traffic monitoring and information system (Dir. 2002/59/EC)
VMS	Vessel Monitoring System



SUMMARY

Maritime surveillance defined in its wider context for the monitoring and control of marine domains is a key transnational issue in the Mediterranean area, encompassing safety, security and environmental dimensions in the perspective of increasing pressures due to vessel traffic, mass tourism, climate change, illegal fisheries and pollution. An improved management of safety, security and marine activities requires a maritime surveillance system implemented at both national and transnational levels to tackle these dimensions, and contribute to the European Green Deal objectives, as part of the European efforts to implement the United Nation's 2030 Agenda for Sustainable Development and its goals.

However, the current maritime surveillance system is unable to address a whole set of new issues resulting from increasing pressures and diversified activities at sea, and the necessity to consider migration, environmental risks and protection, environment and climate change. The challenges specifically relate to cross-cutting inputs from many different sources, and integrate the effects from a wide range of different actors including the different territorial levels and constituencies.

The **European Green Deal**, published in December 2019, clearly states that:

- Conventional approaches will not be sufficient to overcome current challenges and;
- Experimentation and working across sectors and disciplines (involving also local communities) will be key to better protect natural resources, restore ecosystems and improve human health.
- The global climate and environmental challenges are a significant threat multiplier and a source of instability that will reshape geopolitics, including global economic, trade and security interests. On the Mediterranean scale, specific activities will be required to increase climate and environmental resilience, while preventing conflict, food insecurity, population displacement and forced migration. Consequently, climate policy implications should become an integral part of the EU's thinking and action on external issues, including in the context of the Common Security and Defence Policy (CSDP).



A better sharing and management of information and data between different institutional levels, the involvement of public and private bodies, universities, local authorities and citizens through their **digital transformation**¹, is the guarantee for improving the efficiency and response of existing systems.

¹ Transformation in the sense that will address elements of a comprehensive change including the new technological capabilities, the adaptation of supporting regulations, and the way actors will operate in future.

Interreg transnational European programmes, thanks to their cross thematic and multilevel approach, provide a relevant support to achieve progress towards a multilevel governance approach, better involving local / regional authorities and with the involvement of EU citizens in strategic issues. Nevertheless, nothing will change without the involvement of national and EU policy makers who are required to focus on strategies, adapt regulations and coordinate funding.



1. CHALLENGES

1.1 Our common challenge: conciliate the complex and fragmented aims and purposes of Maritime Surveillance

Maritime surveillance must ensure safe and secure marine-related activities (such as vessel traffic, yachting, fisheries, aquaculture, tourism, energy, etc.) through safety measures and actions including search and rescue, addressing environmental threats and risks by adopting a high level of coordination between numerous stakeholders and responsible authorities at different levels.

In addition, Maritime Surveillance should:

- Make **maritime transport** more **effective** and **efficient** for the **users and enterprises** embracing their socio-economic needs and concerns.
- Allow territories, cities and citizens to develop instruments integrating marine environmental and climate change issues into their **risk management practices and responsibilities especially** through the better access to essential data.

Integrated Maritime Surveillance needs to provide authorities with means, functions and procedures to exchange information and data as a pledge of more effective, affordable and accessible systems able to better tackle organisational and integration issues.

Looking at an EU scale, the Integrated Maritime Surveillance competences cannot be limited to the maritime policy. They must be enlarged and linked to the international regulatory framework is currently under the shared responsibility of the European Commission and the Member States, including for research, **technological development and cooperation issues**.

Considering such a complex and fragmented framework of relations and competences, we **recommend** that the **future Integrated Maritime Surveillance in the Mediterranean Basin** to be addressed according the following perspectives:



- ⇒ Setting up of a coherent approach **mixing compulsory and voluntary data and information exchanges**.
- ⇒ Stimulate the cooperation with pre-accession countries² and ENP³ Countries to embrace the scope of the Integrated Maritime Surveillance domain.

1.2 Insularity challenges

Islands constitute a particular field of attention due to questions of accessibility,

² IPA countries: Albania, North Macedonia, Montenegro, Serbia, turkey, Bosnia, Kosovo

³ ENP countries: Algeria, Morocco, Egypt, Israel, Jordan, Lebanon, Lybia, Palestine, Syria, Tunisia (in the South); Azerbaijan, Belarus, Georgia, Moldavia, Ukraine (in the East)

environmental protection, safety or security. Maritime safety and security, in small islands, is a key element of the European Agenda for Sustainable Development, Security Strategy and Integrated Maritime Policy, and the EU Strategy for the Adriatic-Ionian Region (EUSAIR)⁴. Most of Mediterranean islands, particularly in Greece, are peripheral regions situated mostly on the EU's external borders and are particularly vulnerable to challenges such as globalization, demographic trends, climate change, energy supply and, especially for the eastern areas, exposure to increasing migration flows.

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The existing Blue Growth opportunities in islands and the role of Maritime Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM) are equally important, and have to be implemented differently, depending on the respective governance structure and institutional arrangements. Integrated Maritime Surveillance can help MSP/ICZM to better manage conflict, promote multi-use and balancing the context-specific socio-ecological needs and economic opportunities of islands in reflecting their ambitions, priorities and challenges, and guiding investment into the Blue Economy sector development.

Therefore, a stronger and fairer Cohesion Policy should further recognise the geographic constraints of islands and outermost regions, provide further tailored assistance to help them overcome these disadvantages and vulnerabilities, and exploit their opportunities to achieve the EU objectives (for maritime surveillance and beyond). Especially in the small islands, the strengthening of key infrastructures such as modern maritime services and sustainable port infrastructure with highly sophisticated maritime surveillance systems is very much needed as the refugee issue worsens, particularly for the Aegean islands. A prioritization of the type of interventions in coastal and island regions is also needed (including from the side of EU programs), where port facilities are particularly lagging behind in implementing security and integrated maritime surveillance projects, taking also into account the recently revised EU Maritime Security Strategy Action Plan (2018) for the global maritime domain.



- ⇒ Consider Maritime surveillance as a support pillar for MSP/ICZM and blue growth, especially in island areas (management of conflicts of use between activities, protection of the marine ecosystem, risk reduction on human activities such as refugee flows, search & rescue, safety of navigation).

1.3 Maritime Surveillance: a European context posed to enhance cooperation and better tackle climate change issues

Approved in 2007, the **Integrated Maritime Surveillance (IMS)** is one of the main pillars for the implementation of the **EU Integrated Maritime Policy (IMP)** and a relevant tool to ensure and safeguard the sustainable development of the Seas and Oceans, and their coastal zones, thus leveraging and promoting Blue Growth. IMS could also assist countries in implementing Maritime Spatial Planning at various scales.

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The lessons learnt during the current implementation period are clearly directed to **warrant and improve information exchange between civilian and military authorities**, since military authorities are one of the main holders of maritime surveillance data and assets. A great deal of data is also produced and managed by the private sector with maritime traffic routes, aquaculture farms, oil extraction platforms, offshore wind parks, fishing and boating.

Likewise, other sources of environmental data should be considered (e.g. habitats and species (underwater), water temperatures, water quality and pollution rates, climate change impact).

Policies and the implementation regarding maritime surveillance systems have evolved towards better cross-sectoral and cross-border articulation between partners from the national level revealing more and more **openness to cooperation**. Logically, this has been clearly **reflected** in the **EU Maritime Security Strategy (EUMSS)** aimed at strengthening cross-border cooperation and the exchange of information.

As a result this has optimized the surveillance of the maritime space as well as the EU's maritime borders, search and rescue, and also improved the conduct of missions of the Common Security and Defence Policy (CSDP) in the global maritime space, and more specifically in the Mediterranean Sea.

At the same time, EU policies have strengthened cooperation between agencies (border, fisheries, security) on the protection and safeguarding of the EU's maritime borders, the customs and economic activities' limits, the fishing areas and other relevant living and non-living resources and maritime activities (ecological areas, cultural, mineral, etc.). To this we need to add the protection of the coastline, its populations, its infrastructure and equipment and goods, linked to the pressures of climate change and the need to strengthen climate resilience, prevention and management of the coastal areas of the Mediterranean Sea.



This major problem is a new challenge for maritime surveillance. Responding to it requires

more coordination and cooperation between institutional levels in a Mediterranean context characterized by the presence not only of EU countries, but pre-accession countries and third countries on the Southern shore that operate in different institutional and regulatory contexts.

European **Interreg** programmes, thanks to their long and robust cooperation processes between transnational partnerships and a dedicated budget, should better address and complement current and future European and international initiatives by opening up and strengthening the links between local, regional, national and European levels.

- ⇒ Information exchange (including between civilian and military authorities) can increase safety, security and help to address climate change challenges. This shall be done bearing in mind that many parameters cannot be made accessible by military ships, and that this issue should be addressed at higher level
- ⇒ Social and environmental responsibility of the private sector operating at sea can lead to benefits to Maritime Surveillance as part of the Green Deal.

1.4 Sub-multilevel governance approach in maritime surveillance: an opportunity to better address Mediterranean issues

As already mentioned, Maritime Surveillance involves numerous and various stakeholders acting at different institutional, geographical and sectoral levels.

With such a diversity of actors and sectors acting in the same sea basin, one can advocate for adopting a converging scheme of implementation, creating a maritime surveillance user community from different levels according to their specific needs and responsibilities. To do so, two different levels shall be involved and articulated:

- **National/European scale** to elaborate and implement sectoral strategies and regulations
- **Local/regional scale** to perform the strategies.

This diversity leads to a **demand** which is still far from being properly explored, but which has however already proved the related potential socio-economic benefits.

Through regional and local awareness-raising, **the engagement of actors in data exchange can be encouraged**. For example, thanks to open data combined with an articulated contribution from the scientific community, citizens and businesses, the potential to increase the user engagement in the digital ecosystem and widening the range of data exchanged can bring significant benefits at the different decision-making domains and other end-users, as well as to the service-providers themselves.

These opportunities are part of a global context of the Mediterranean basin for which European guidelines are defined through the EU Green Deal, the Agenda on Migration and the digital single market, which promote the interoperability and standardization of the maritime surveillance system and operations. This would mean strengthening efforts to achieve a safer, more secure and cleaner Mediterranean Sea as a fundamental prerequisite for investment and jobs in the blue economy sectors. For example, **Earth Observations (EO)** and **In-situ observing systems** provide an immense amount of data having an enormous potential for data re-usage. In this context the Copernicus Programme plays a crucial role by providing a specific marine monitoring service (CMEMS) comprising a component

supporting the provision of in-situ data collections.

Territorial actors (public and private) of the maritime surveillance community could be better and more broadly involved, firstly by **recognising them as producers of territorial data** and, secondly, as **trusted users of data** produced by National or European civil or even military authorities under certain conditions. This requires to better identify and remove focused constraints and to adapt organisations.

- ⇒ The demand side (data users) deserves to better explore data services with release of data flow automatically to users, in machine readable, interoperable form. Data feeds our informed and calculated decisions, choices and actions
- ⇒ The supply side (data providers) needs to be more comprehensive than just ocean observations, entailing all data aspects and types encompassing data on assets, on operations, on performance and logistics, covering data over the widest imaginable spread of scales and categories, including at the citizen individual level. In its full expression, data entails all those inputs that compose information and generation of knowledge, providing quantitative measures and controls of assessments, experiences and performances of our very different and broad daily actions.

2. TECHNOLOGICAL AND OPERATIONAL TRENDS

Technology plays an important role in addressing key security challenges for the EU in the area of maritime surveillance. Innovative technologies are promoted by EU bodies to follow research and development from the industry, and implemented in Agencies and Member States' operations. Digital technologies are a critical enabler in many different sectors including in the marine and maritime realm.

2.1 Advanced technologies: managing data availability at the service of stakeholders, territories and citizens

Nowadays **satellite technologies** are increasingly embedded in maritime surveillance as they provide versatile solutions for gathering relevant information. Satellites are suitable both for wide area surveillance, as well as for monitoring targeted locations; they have access to remote areas; they operate independently of air traffic control; and they can be used for a broad range of activities in maritime security and safety, including those related to maritime pollution, maritime border security, fisheries control, search and rescue, or accident and disaster response. However, real-time observations are a highly resource demanding and expensive task. Nevertheless, and apart from its time-critical costly capability, remote ocean observations from satellites are an unique low-cost source of data for the provision of early warnings through adequate data modelling, prediction, and data integration.

In this context the European Programme for Earth Observation, Copernicus and its core service on Marine Environment Monitoring (CMEMS,



marine.copernicus.eu) play a crucial role by providing free and open satellite data and ocean monitoring products essential for evaluating the state and trends in European and Global ocean environments.

Innovative technologies are promoted by EU bodies to follow research and development from the industry and implemented in Agencies and Member States' operations, in particular with regards to the use of maritime surveillance. In order to accurately and effectively monitor a maritime area, the vast depth and breadth of incoming data **must be interpreted and managed**. Many stakeholders recognize the potential of large-scale image availability for **decision-making process** in domains such as meteorology, security, safety, natural resource inventories, climate change or prevention and the monitoring of natural disasters. In this context, HAPS (**High Altitude Pseudo Satellite**) is considered as highly complementary to the deployment of satellite systems. This platform, deployed in the stratosphere, could provide a significant added value for applications requiring high versatility, great availability, and capability of redeployment, and when the customers are looking for permanent mission, real-time information or high frequency revisit on the target. These developments could help to support the evolution of existing and future missions based on Earth Observation satellites by exploiting the synergy with HAPS capabilities. This could consist of **an opportunity for space technologies to find new markets and applications**.



Unmanned and autonomous systems are increasingly becoming part of daily life. Autonomous vessels and aircraft may soon become the norm rather than the exception on the global Maritime Domain. Unmanned Autonomous Vehicles like sea gliders carry multi-parameter sensor payloads to measure the sea in areas and conditions that were previously unreachable, and collect large volumes of operational data compared to traditional methods. This context raises the question of how the Maritime Surveillance stakeholders might best use these emerging technologies.

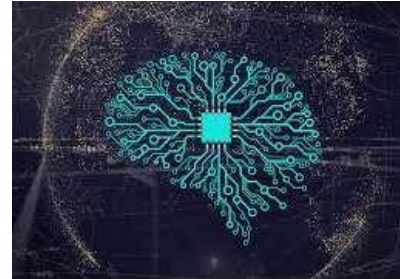


Shore-based centres could monitor autonomous vessels. In spill assessment and response, autonomous systems would provide authorities with a rapid and clear operating picture while simultaneously acting as a force multiplier for responders. Moreover, utilising autonomous drones can perform SAR patterns at a fast rate with a greater probability of detection. Utilised boarding team members for oversight and video evidence during vessel inspections would increase the security of the members on board the vessel being inspected by producing a live video feed directly.

Operational oceanography systems (such as HF radars, gliders, fixed moorings and benthic stations) provide accurate routine data in real-time through networked observing systems combined to numerical models that can extrapolate information on the sea in time and space. Such systems provide essential data in the form of hind cast climatological data as well as predictions that support responsible entities in their daily operations, providing essential data such as for assessing the state of health of the sea and decision making (for

strategic planning or operational actions), and serving applications in search and rescue, safer navigation, aquaculture and fisheries, the marine renewable energy sector and many other direct and derived benefits.

Digital technologies are a critical enabler for attaining the sustainability goals of the Green Deal in many different sectors including Maritime Surveillance, by exploring measures to ensure that digital technologies such as **artificial intelligence, 5G, cloud and edge computing** and the internet of things can accelerate and maximise the impact of policies. Digitalisation also presents new opportunities for the remote monitoring of air and water pollution, or for monitoring and optimising how energy and natural resources are used.



- ⇒ Space technologies, digital technologies and autonomous systems constitute crucial tools for the future of Maritime Surveillance.
- ⇒ In a knowledge-based society and the digital age, data is of essence in providing the raw material and the key services to support a range of applications covering operational (monitoring, surveillance, response), planning (policy, strategies, decision-making) and economic (industry, innovation) endeavors.

2.2 Towards a data management strategy

A very large amount of data is produced in connection with maritime activities, the marine environment, or weather monitoring (maritime surface/underwater, air, remote-piloted air systems (RPAS), satellite, civil administration, military, leisure and tourism actors, marine research and monitoring, extraction, shipping industry, non-governmental organizations).

2.2.1. “What decisions could we make if we had all the information we need?”

Due to functional responsibilities, **the collection of data is done separately without being shared** (whether between countries or between different administrations) and consequently the same data may be collected more than once and following different criteria, which hinders harmonization and integration. This leads to the need of **improving data collection and sharing**. Moreover, this data needs to be interpreted and put to use with adequate technical and human resources. A lot of data is available, but used in a limited way and exploited for specific purposes. This pushes the creativeness about the potential of external and new sources of data. Social media generate unstructured data, photos, and video, and emphasise the need for data organisation to allow better uptake and use by multiple users including from the private sector. The expectation is that bigger volumes and better data would give both panoramic and granular views, increasing our ability to see what was previously invisible, understanding details in complex systems that are not easy to resolve, thus helping us to improve our strategies and better conduct our operations. This also raises the question of big data management, storage and use of high-performance computers (HPC) in the MED area⁴.

⁴ Two of the HPC in the PRACE network (Partnership for Advanced Computing in Europe) are in MED countries: Spain and Italy <https://prace-ri.eu/hpc-access/hpc-systems/#MareNostrum>

2.2.2. “How to build trust?”

The production and use of data raise the question of **confidentiality** and **cyber security** issues of connected information systems in the maritime domain, especially where sensitive information is concerned (ensure trust level of data). In order to better use data resources favouring a multilevel approach, the emphasis should be placed on the use of unrestricted data resources with some reservations on military/security data.



As a general statement, datasets should only remain **restricted when it is absolutely necessary**. Some systems cannot appear on the cloud for security issues. In some cases data must be stored within national borders. In general there is however a need to increase efforts for a wider application of FAIR (Findable, Accessible, Interoperable, Reusable) and CARE (Collective benefit, Authority to control, Responsibility and Ethics) principles.

Common data strategies and policy at institutional level (i.e. maritime authorities, transport authorities, territorial cooperation bodies, maritime clusters) integrating multilevel and cross-sectoral perspectives need to be elaborated and include the use of **open data systems to achieve the digital ecosystem** that we need. This requires a better connection with territorial actors (public and private) of the maritime surveillance community.

To do so, institutions have to identify constraints and adapt their standards. A major challenge lies in the quality of the data. In case some data is obtained through unverifiable sources, the whole dataset may not be trusted by the user. Traceability remains therefore essential. This entails automatic tracing and updating of data flows, pipelines and adding value chains. In particular this embraces harmonised standards and a fully machine searchable and actionable digital ecosystem.

- ⇒ Necessity of well-defined data management tools and strategies to build trust, ensure confidentiality and improve policy efficiency
- ⇒ Interconnection of data systems by the harmonisation of data standards for interoperability across disciplines and sectors, making data fitting for multiple usage

2.2.3. EU backbone systems as a reference for better exchange of information

Since each Member-state has its own Maritime Surveillance system, the EU level has developed **coordination tools** to improve surveillance and intervention capacities at transnational level (example with EMSA and the **Common Information Sharing Environment - CISE**).



These tools constitute an overall framework that can be upgraded, developed and adapted in order to improve the capacities and working conditions of actors involved in maritime activities (providers and users of marine data at EU, national, regional and local level).

Various frameworks are co-existing for authorities to exchange maritime information: EUROSUR (FRONTEX), SAFESEANET (EMSA), VMS (EFCA), COPERNICUS (ESA), MARSUR (EDA), Maritime Single Window.

Initiated in 2014, the CISE is gradually and currently being developed jointly by the European Commission and EU/EEA Member States. It will integrate existing surveillance systems and networks and give to all the responsible authorities access to the information they need for their missions at sea. **CISE will make different systems interoperable** so that data and other information can be exchanged easily through the use of modern technologies. Following the deliverables of the project [EUCISE2020](#), and other national interoperability projects, EMSA launched a [CISE transition phase](#), **moving it from an R&D phase to an operational implementation phase** of information exchange which will ensure the coordination between stakeholders.

Considering that the CISE is a good starting point for initiating the multilevel governance approach, and where most of legal obstacles posed by National/EU Regulations are being tackled, CISE can in fact progress towards a more integrated information sharing system. In that regard, a specific attention should be paid to **IPA countries** to integrate them into the EU maritime surveillance systems.

CISE is a reference tool to develop further multilevel governance systems. There is furthermore a need to open new channels to embrace and link to research data. The open access to data between research institutions and agencies remains at large an under achievement at national and European level. The connection of research data resources to environmental concerns and sustainability assessments is definitely lacking. An even greater challenge is to overcome the barriers that divide the data structures supporting marine research, and the data systems perceived to serve national and regional authorities and responsible entities engaged in surveillance, security and defence.



3. POLICY RECOMMENDATIONS

- Increase the complementarity between actors and systems
- Increase connections with environmental issues
- Promote innovation with the support of private stakeholders

3.1 Objectives of the Multilevel governance for Maritime Surveillance in the Mediterranean

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In the context of the above-mentioned considerations, the main assumed hypothesis is that the **implementation of a maritime information exchange process based on a voluntary contribution** addressing a multilevel Integrated Maritime Surveillance, and enhancing access and mobility, including an open access level to citizens in the Mediterranean Basin, could increase the users ecosystem and the territorial socioeconomic benefits, while complementing the major EU and Member State systems.

Moreover the EU Agenda for Migration (2015) and the Digital Single Market vision (DG CONNECT) for promoting interoperability and standardization are impacting over the Mediterranean Basin, and complement this approach.

This could be done through the following main objectives in support of the Integrated Maritime Surveillance as a pillar within the EU Integrated Maritime Policy.

Firstly, increasing the complementarity between actors and systems would require to:

- Make the maritime domain an integrated and connected environment
- Increase the complementarity of assets and joint cross boarder assessments
- Increase interoperability of observation systems (including accessibility of mobile user systems in the Mediterranean basin)
- Update existing systems and improve their use in the related organizations
- Ensure operational upkeep and update of data
- Adapt the legal framework for new assets and organizations.

Secondly, increasing connections with environmental issues would require to:

- Share a common understanding of environmental risks
- Link environmental/biodiversity protection to Maritime Spatial Planning (links to human activities in coastal and marine areas, with conservation and protection as a main use for certain key ecological areas)
- Address the identified threats
- Better consider land-sea interactions (coordination of land and marine managers)
- Approach and engage local constituencies and citizens

Thirdly, promoting innovation with the support of private stakeholders would require to:

- Stimulate and highlight growth opportunities in the marine and maritime domain for business (security, intelligence, services, environment protection of natural resources, key to a sustainable economy),
- Develop a comprehensive and voluntary approach,
- Disseminate needs and requirements for the development of new services.

3.2 Dissemination to regional strategies in the Mediterranean

Dissemination must be seen as embracing integration/mainstreaming, liaising/cooperation and communication activities. In this context, a two-fold formal process must ensure the following. On one hand, ESIF mainstream programmes having potential for overlapping and correlation with MED project results are properly addressed in terms of a transfer planning activity, thus informing discussions on the future of the MED/INTERREG Programme by involving their community, the European Commission and other relevant policy-makers. To this end, **appropriate policies and financial instruments** supporting such territorial and maritime basin's strategic projects need to be improved and put in place, thus ensuring implementation coherence, and system's life-cycle sustainability for the medium to long-term.

On the other hand, a liaising activity is required to strengthen functional relationships, community's engagement and capitalization of results/outputs achieved through networked initiatives. To this end, the Union for the Mediterranean (UfM), UNEP-MAP protocols, EUSAIR Strategy, ADRION, the WestMed - Initiative for the sustainable development of the blue economy in the Western Mediterranean- together with BlueMed – the research and innovation initiative to promote the Blue Economy in the Mediterranean – will complement the set of more relevant objectives to be pursued, thus requiring stronger liaison mechanisms.

The policy choice to build such an envisaged bottom-up strategy from the territories engaging all the relevant stakeholders represents a challenging innovative approach. Investing in the capacity to integrate their project results into mainstream Programmes, thus aligning the different sources of financing towards strategic goals while promoting strong liaison links between their communities, will capitalize on the improvement of transnational cooperation in the MED.

4. IMPLEMENTATION

- Integrate new technologies and services
- Allow the emergence of multiple cross-sectorial knowledge
- Develop clusters from citizens up to EU and multinational institutions
- Overcome sectorial, transnational and multinational barriers

4.1 Implementation guidelines

The promotion of a **decentralised structure including a voluntary-basis participation for a multilevel maritime surveillance framework** is key to enlarge the user's ecosystem. In turn, this approach should bring added value and complementarity to existing maritime data systems, services and sharing processes, while avoiding duplication. Moreover, such a multilevel implementation approach should be part of a more comprehensive information and exchange framework across the EU, and its implementation should work towards coherence within that framework.

Thus, the implementation of a voluntary and decentralised framework for multilevel maritime surveillance would follow a vision expressed with four guidelines:

1. Be ready to integrate **new technologies and services** to develop the Blue Economy
2. **Move from information sharing to data sharing** as a raw material allowing the emergence of multiple contexts/cross-sectorial knowledge, following a harmonised approach to data management and exchange through common data strategies and policies
3. **Develop clusters** from citizens up to EU/Multinational institutions to build trust between different levels
4. **Overcome sectorial, transnational and multinational barriers** to the access and analysis/elaboration of data, supporting overarching decision making processes.

4.2 Key principles

In a more operational way, these recommendations should be implemented following the five key principles necessary to ensure their efficiency and sustainability.

4.2.1 Transparency

To promote **transparency** for projects and systems dealing with data management and maritime surveillance; support systems that provide a better and more open access to public and private data

4.2.2 Sustainability

To support projects, tools and systems that will have the capacity to evolve, integrate and use different types of inputs and data, including the perspective of future still unidentified newcomers (ex. public and private contributors, citizens, and NGOs)

4.2.3 Simplification

ICT systems generate very high flows of information and data with increasing number of systems and applications. It is essential to raise **simplification** as a systematic concern and priority for projects focused on networking systems and data management (ex. use existing systems, upgrade, improve and do not create new ones)

4.2.4 Calls for projects

To use calls for projects to promote multilevel data sharing systems in key issues related to maritime surveillance and marine environment (protection, monitoring, coordination, maritime spatial planning, integrated coastal zone management, and management of marine protected areas)

4.2.5 Welcome newcomers

To mobilise actors still unacquainted to Interreg and cooperation projects, and create links between sectors or governance levels (ex. transnational and national agencies, arbitral proceedings, legal instances, DG Mare, DG Research and Innovation, private bodies...).

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4.3 Bottom line

