BlueMassMed Final report

Cross-Border and Cross-Sectoral

Maritime Information Sharing
for a control of activities at sea

EXTRACT

BluemassMed
BLUE MARITIME SURVEILLANCE SYSTEM MED

European Commission

Context

States entrust national agencies with the task of collecting, analyzing and disseminating information in order to ensure responsibilities and efficiency in maritime surveillance domain:

- Maritime Safety, Search and Rescue, Prevention of pollution caused by ships, Maritime Security
- Fisheries control
- Marine pollution preparedness and response, Marine environment
- Customs
- Border control
- General law enforcement
- Defence

A required cooperation

To improve their effectiveness, these actors need to seek and take advantage of the opportunities for enhanced cooperation, both nationally and internationally and mainly at European level.

- By sharing the maritime information they collect and operate,
- By identifying the gaps in present practiced exchanges,
- By buiIding the proper conditions for an enhanced exchange, in safety and security.

Maritime surveillance actors will benefit from a shared situation, in a systematic way, more comprehensive and accurate.

The project

BLUEMASSMED is the first European maritime surveillance pilot project, whose objective is to catalyse and foster cooperation in maritime information sharing between 37 State partners from 6 Member States (MS) bordering the Mediterranean Sea and Atlantic approaches (Ellas, España, France, Italy, Malta, Portugal). It is co-funded by the European Commission (DGMare) and the partners.

France and Italy co-chair the Steering Group, where consensus rule applies. The SG Mer (France) acts as the Lead Partner.

First project's outcomes had a powerful footprint on the launch and development of a European "Common information sharing environment" which is an important enabling platform of the European maritime policy (IMP), promoting sustainable uses of the seas for the well-being of European citizens.

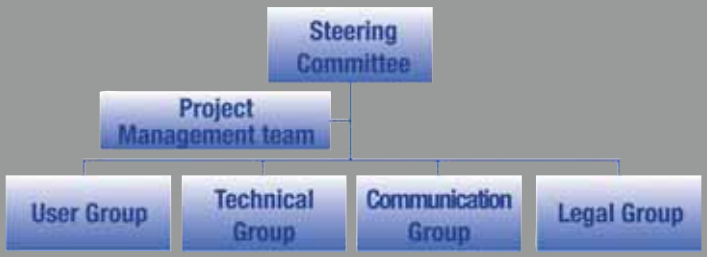
BLUEMASSMED was launched on January 2010 in Paris and will terminate in Summer 2012.

Investing and Building phase:

The Users working group debated and defined the wishable and possible fields for an enhanced cooperation on data and services exchange, aiming at allowing partners to benefit from a better overall situation, regularly spread among players, obeying rules of distribution, traceability treatment clearly established and agreed, providing security and confidence among partners. The Technical working group defined the architecture of the BluemassMed SOA (Service Oriented Architecture), translated the users expressed needs, specified the modalities of exchange (data) and the services to be delivered by the network. It also managed the test and the interoperability of the BluemassMed network.

The Legal working group explored the legal environment of present information management in the different MS and by different actors, as well as potential constraints or obstacles and the possible solutions.

A Communication working group took in charge the internal necessary mutual knowledge and external promotion of the project, then prepares the dissemination of results and proposals, especially through a demonstration and a final report.



Experimentation and demonstration phase:

The partners have the responsibility to develop national BluemassMed Demonstrators powered by their national maritime information systems, aiming at building an operational BMM cloud - a network allowing partners to exchange data and services according to accepted rules - with the aim to establish and maintain a "Shared Basic Common Maritime Picture" (SBCMP).

5 Primary nodes and more than 30 Secondary nodes constitute the BMM network enabling them to "speek the same language".

LEGAL CONCLUSIONS

ENTRY ELEMENTS:

Legal dispositions focusing on information exchange and personal data, statutory provisions of the Lisbon treaty, constitutional texts and principles of the several MS, relevant European legislations and provisions (directives/ regulations/framework decisions), UN Convention on the Law of the Sea (Montego Bay Convention), several International Agreements (IMO, etc.).

OBVIOUS BARRIER to achieve the desired standardization and consolidation of sharing procedures: legal mechanisms concerning data protection (criminal and non criminal) differing from State to State.

MAIN CONCERN and OUTCOME:

Personal data and confidentiality in the national legal framework are unavoidable questions to be adressed properly.

OBSTACLE: extent and opacity of the core of fundamental rights within the national constitutional provisions (compression or limitation of important legal and constitutional principles, legality, proportionality and the right to privacy, etc.).

FUNDAMENTAL PREREQUISITE of any data sharing (personal data, professional/commercial secrecy, rights of access, data security policy and access to public sector documents): domain and purpose of the information exchange (illegal trafficking, immigration, etc.) must be clearly and precisely described.

ESSENTIAL REMINDERs:

- no legal restrictions on the exchange of personal data between law enforcement authorities of the MS, if made for purposes of criminal prevention, safeguarding the rights of nationals, residents and commercial, under the consent of the responsible data protection authorities
- trust between partners, in the so-called “communities” as well as cross-border, is mandatory.

OPERATIONAL VISION

Entry elements: operational partners in potential exchange

- belong to different national authorities responsible for different functions contributing to the state action at sea like Maritime safety and security, Defense, Search and Rescue, Environmental protection, Vessel traffic monitoring, Traffic control, Fight against trafficking, Law enforcement, Border control, Customs' control;
- are already used to collect and analyse maritime information for their own purposes, even have some cross border exchange. In their operational context, some of them may also exchange information with their foreign colleagues dealing with the same operational sector;
- do not benefit from a systematic information sharing process, even inside their own sector;
- are foreign to cross-sector and cross-border information sharing process, which is far from their operational approach.

Requirements

The developed architecture shall enable :

- The sharing of maritime situations of the different sectorial administrations, while respecting their own roles and data access privileges setting suitable criteria for the distribution of data between Member States and communities, facing the future requirements of CISE;
- The exchange of value-added information, not limited to sharing of positional data, already available through multiple networks of maritime reporting (AIS, LRIT, etc.);
- The civil-military cooperation through the sharing of resources and information in compliance with the policy of treatment of classified data (dual-use);
- Permit the sharing and the optimization of large scale monitoring assets such as satellites (eg Cosmo-SkyMed, Pleiades, Galileo, satellite AIS, etc.) and patrolling units (aircrafts, helicopters, vessels).

Guidelines:

- BMM operational vision is based on the promotion of the added-value resulting in sharing maritime information both at cross-sector and cross-border levels, starting with a shared basic common maritime picture (SBCMP) enabling collaboratively enhanced maritime situational awareness;
- Exchanging on case-by-case basis sensitive information among a restricted community like operational alerts for instance, is also part of BMM operational vision.

Outcome:

- BMM prototype showed to the operational users (civilian and military) that enhanced cross border and cross sector cooperation and information sharing is pragmatically possible;
- operational vision is now shared by the BMM partners, convinced of its interest facing challenges and risks at sea, transnational in nature, most often interconnected.
- ***BUT*** the establishment of operational standard processes and procedures, the proper protection shared on the basis of agreed access rights remain to be developed;
- the subsidiarity principle is paramount, as probably the key to solving of innumerable light or heavy preventions;
- monitoring and surveillance activities at sea are carried out under the responsibility of Member States and BMM allows full ownership of the process of sharing information.

TECHNICAL CHOICES and FOLLOW UPs

Entry elements:

National maritime surveillance systems are the main sources of maritime information and are not interoperable.

Cost-efficiency and not burdening the day-to-day work of users is required.

Guidelines:

Need of a paradigm shift: from the centralization of information, with consequent limitations in the availability of the same and the need for use of centralized computer systems, to the distribution of open and flexible services, made in distributed computing systems.

To imagine and introduce an open, flexible, secure and decentralized architecture able to make interoperable systems and networks actually working, designed and operated along national choices and to avoid building a new or additional system dealing with maritime information.

Requirements to be addressed through innovative technological choices.

To elaborate High Level System Requirements (Project CCTP), Technical Specifications (System Views), a *Demonstrative network implementation & integration, a related experimental demonstration*, as well as the identification of lessons learned and cost and time planning for the subsequent project phases.

Focus on the actual realization of a shared cross-sector maritime situation (SBCMP), built through the capability of each node of the network to make available to the others the services of common interest (exchange of surveillance information, intelligence and traffic monitoring, correlation of tracks at regional level, discovery of suspect / not cooperating vessels, identification of pollution into areas of interest).

Network realization and testing/working

Five partners (IT ASI, FR Navy/DGA, SP Armada, SP Guardia Civil, PT Marinha) have independently commissioned to different (groups of) private companies the implementation of prototype nodes integrated into a BMM demonstration network (XMSN – Experimental Maritime Surveillance Network) that has been tested and validated in the latter part of the BMM project.

BMM demonstration network has been set-up, composed of 5 Primary Nodes or "National Exchange platforms" connected to over 30 different authorities national maritime surveillance systems, enabling agencies and competent authorities to access information and to share resources through BMM web services provided according to their credentials and privileges.

Result

Adoption of :

- A network centric architecture as the most suitable, and an architectural solution for dual use systems' interconnection on C.I.S.E. (enabling exploitation of classified and security sensitive information)

A two level architecture :

- Primary Nodes (or National exchange platforms): fed by legacy maritime surveillance systems from participating agencies and connected to a wide area network (SSL https protocol on Internet);
- Secondary Nodes (or Agencies exchange desks): capacity to access to and be active in (adding data, tracks and information, etc.) the maritime information and the services offered by the National exchange platform (simple PC with a web-browser connected to the XMSN and accessing to the portal of one of the Primary Nodes).

Beyond implementing services, the National exchange platforms play the role of technical interfaces: one side linked to the involved national or agencies maritime surveillance systems, entirely respecting the national framework and conditions, the other side linked to the BMM network (in the future, to the European Maritime Network).

The WSS SOA (Web Service Security Service Oriented Architecture) paradigm allowing to securely connect disparate systems and networks

A common semantics and implementation of a harmonized set of information services.

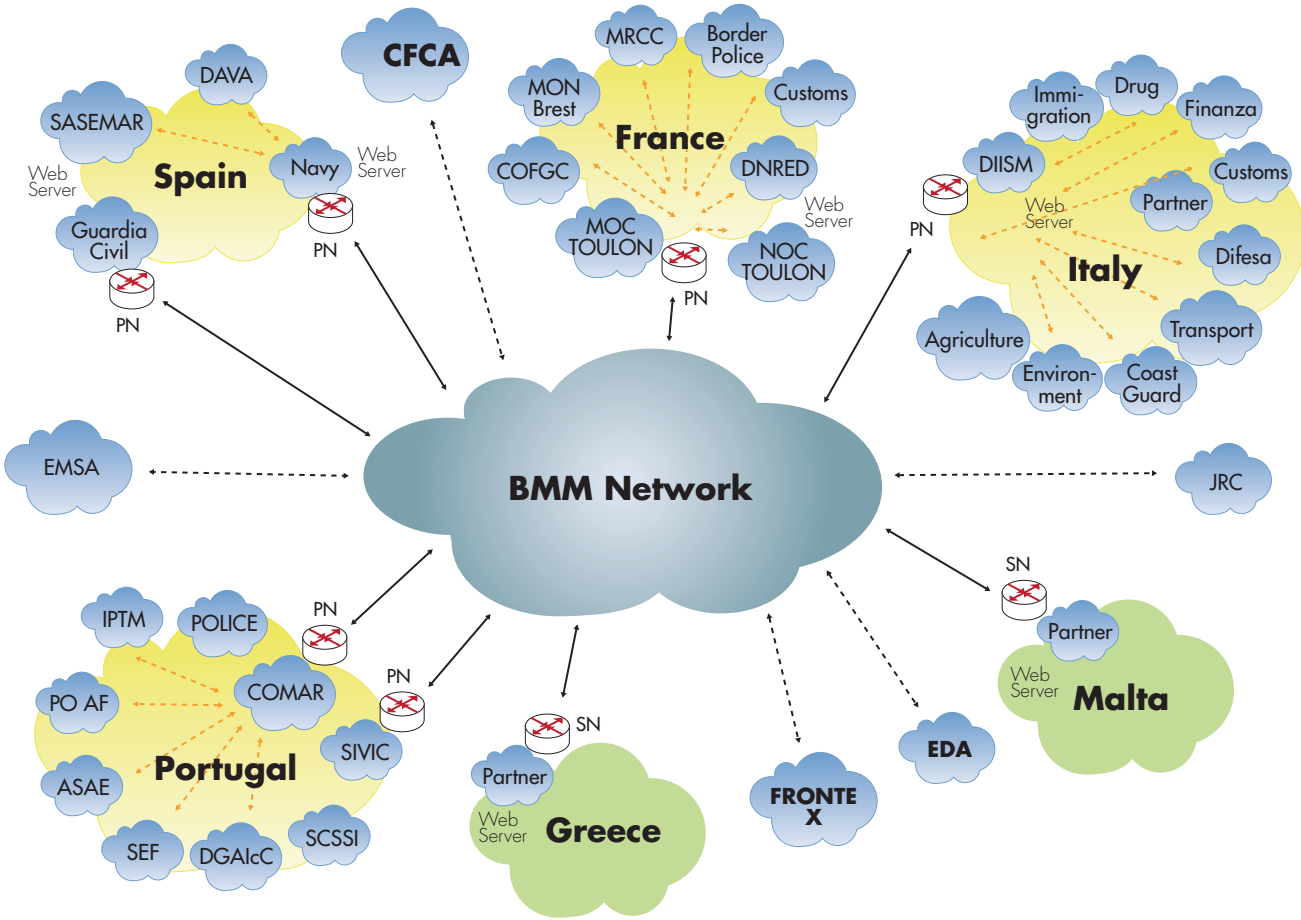
The desired innovative paradigm in a multinational and multi-sectorial project has been translated through the definition of a series of "Standard Views" to specify the operational perspective (Operational Views), the services definition (Service Oriented Views), the reference standards (Technical Views) and requested functionalities (System Views) using the international design methodology *"NATO Architectural Framework"*

Any authorised agency (from a Member State or from a European agency) can easily use such secondary node capacity.

FUTURE MAJOR OUTSTANDING ISSUES for further dedicated efforts, before a full scale engineering solution can be achieved, are:

- Detailed design of the information protection mechanism, enabling user/service authentication and data access and distribution policy enforcement by the Competent Authorities;
- Definition of the operational governance at program management, network management and configuration management level;
- Cooperative development of technological solutions and standards in order to ensure a full life cycle management of the future C.I.S.E. infrastructure;
- Use of Virtual Private Network grid connections (VPN mesh), and appropriate encryption techniques as well as physical separation of networks ensuring the interoperability of civil and military networks (dual-use).

BMM NETWORK
Operational Node Connectivity Description



LESSONS LEARNED and RECOMMENDATIONS

Added value

Added-value of cross-border and cross-sectoral information exchange is now shared by all the BMM partners, willingness to join forces has arised.

Even though the BMM pilot project did not quantified it, maritime information exchange is likely to enable a better control of maritime surveillance expenditure by taking benefit from a wider and better knowledge of the maritime situation by a better use of the intervention's means and allowing collaborative planning between partners.

To ensure full continuity of the BMM proposed technical approach and of cooperation model established within the project towards an integrated maritime surveillance capability in Europe, the following major recommendations can be drawn:

- in the short term (next 3-6 months), it is recommended that the BMM Partner Nations set a joint agreement for the continued operation and validation of the prototype experimental network established by the Project;
- in the mid-term (6-12 months), it is recommended that the BMM Partners promote further cooperation initiative, open to a larger number of participants, for the adoption of the BMM approach for the pre-operational validation of the C.I.S.E. on an European scale, as foreseen by the current DG Mare roadmap for C.I.S.E. implementation. It is worth noting that in this context the exploitation of the results of the BMM project (the harmonised C.I.S.E. front-end) can be extended to those systems that were not included in the BMM project perimeters, and first of all to those covered by the twin pilot project for the Northern European maritime spaces MARSUNO.

Subsidiarity

It is obvious that the maritime surveillance constitutes a complex field where really numerous "finesses" must be taken into consideration (legal status of the seas and oceans, legal arsenals of States and their actors, number of actors, etc.). So it is paramount to make as much as possible use of the subsidiarity principle, the result of which often offers an easier solution to complexity, as it is dealt with within the States.

Cultural shift

"Need to know" principle in balance with "responsibility to share" principle leads to a paradigm shift on behalf of the user's communities towards an increasing common trust and awareness of the "interest to share" and its added value.

Legal considerations and Perspectives

A legal European framework dedicated to Maritime information-sharing needs to be defined.

The possibility of exchanging data with third States (non EU) should be envisaged as well as that of a mixed public-private agreement to handle the question of property on commercial data deriving from the private sector.

There are no legal obstacles in the exchange of data within the Member States regime. Every kind of contribution of basic data (demonstration) is included, as well as sensitive data (police, customs) empowered by the Swedish initiative (EU Council Framework Decision 2006/960/JHA).

A communication to the National Data Protection Authorities is needed (data security policy- individual/ fundamental rights) in order to enable MS to exchange data within the scope of maritime.

The fusion of basic civil-military data and vice-versa was successfully initiated, meaning the already existing military use of civil data is reinforced, as well as military data may be provided for civil purposes.

Issues of intellectual property rights of public entities are out of question in the scope of maritime surveillance.

However, issues regarding the property on commercial data deriving from the private sector may have to be considered under a different approach, namely endeavour the possibility of a mixed public-private agreement (e.g. USA precedent).

Operational considerations and Perspectives

Even though the demonstrative network was built mainly around inter-ministerial Nodes (Italy, France, Portugal and with some limitation Spanish Navy: "national exchange platforms"), the concept of sectoral and multi-sectoral node was also exploited in the BMM architecture and individual agencies can equally be autonomously connected to the network.

BMM noticed that in many EU Member States the cross-sector maritime information exchange is just emerging. To ensure coherence with the cross-border SBCMP, it appears important that a consolidation of this concept and subsequent practice at national level be carried out.

BMM concept and the devised network architecture are fully compatible and supporting such approach, and will be able to provide in the future a unique and comprehensive interoperable network that can be exploited at the same time for sectoral and cross-sectoral information services exchange among competent authorities and European agencies, according to a data distribution and access policy that will result from the combination of constraints enforced by:

- relevant sectoral coordination bodies, as far as the sectoral dimension of the data exchange is concerned;
- national coordination bodies, as far as the sensitivity and national security dimension of the data exchange is concerned;

- future EU coordination bodies, as far as the general cross-sectoral cross-border data exchange policy is concerned (enforcing a "need-to-share" and "responsibility-to-share" paradigm).

Subsequently, one main recommendation from the BMM project is to proceed with the project definition phase, based on the achieved technical results, and keeping at *government/institutional level the design authority*, in order to:

- develop and validate a full scale engineering prototype, implementing all the components, services and capabilities defined in the technical specifications (System View) up to a pre-operational level compatible with the need to proof the operational added value in a sufficiently wide cross sectorial and cross border scenario;
- develop the fully engineered specifications for the operational implementation of C.I.S.E. (final design, procurement, integration and acceptance of the C.I.S.E. components).

Technical considerations and Perspectives

Whatever the need and the constraints, the technical topic is not an obstacle: solutions do exist ! Many of them are available in open-source products.

All the problems have not been studied by BMM and the way to a permanent cross-border and cross-sectoral cooperation is still long main challenges being the legal constraints to take into account and the operational procedures to invent.

BMM recommends keeping a network centric and two-level architecture favouring national maritime information systems interoperability and avoiding hidden industrial interest's considerations, likely to compromise the cooperation between foreign partners.

The proposed technical approach, being based on a transparent and non-hierarchical architectural design, makes BMM developed solution a valuable example for integrating maritime surveillance at European level, as it enables to:

- realize the harmonized cross-sectorial maritime situation;
- assure the Member States to directly control the management of shared information through a national node (National Exchange Platform);
- optimize the available information, thus avoid the waste of resources due to duplication of existing systems in use, provide cooperating neighbouring countries with an open platform to share data, information and services;
- clearly separate exchange mechanism and legacy maritime surveillance systems, each being able to follow their own life-cycle/evolutions;
- allow better use of European resources through direct financing of government that can most appropriately exploit the project results in terms of definition and harmonization of requirements and standardization and reuse of solutions.

Industrial interests

The difficulties encountered by BMM with its call for tender for the experimental system procurement demonstrate the necessity to avoid a potential heavy impact of industrial competition on the process, likely to compromise the cooperation between foreign partners. Promoting a standardisation's approach allowing any agency or any Member State to conduct its own development, and to deal with its own procurement process, constitutes an appropriate answer.

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Future developments at EU level

BMM project major outcome can be thought of as a basic harmonised Front-End capable to adapt any given legacy system (or group of legacy systems) to the C.I.S.E. network thanks to the adopted SOA open approach.

To prolong the BMM achievements and to consolidate the Shared Basic Common Maritime Picture (SBCMP) concept as the key feature enabling cross-sectoral/cross-border decision support capabilities on the C.I.S.E., further harmonization of maritime picture information fusion techniques and standardization of the related operational procedures deserves to be pursued at national (inter-ministerial) level and then at EU level, with corresponding governance schemes at national and EU level, in compliance with the applicable operational and legal constraints.

Further works could be following :

- define a Data Distribution Plan (DDP) in a cross-sectoral landscape, in compliance with the legal framework, to determine the rules to apply in exchanging information, considering the different categories of data (basic, personal, commercial, sensitive, confidential) and the operational sectors;
- develop Standards for data dissemination (format, exchange protocol), services, technical architecture (nodes), building on the first step towards standardization that BMM constitutes;
- study confidential data exchange process, which supposes to control the dissemination and to respect the national information's security processes;
- enhance and improve desirable core and common services, especially on security requirements (authentication, confidentiality, integrity, availability, traceability) and on enrichment of common services (alerts service, vessel of interest service, event common following service, etc.);
- study technical solutions and assess their homologation by all the involved Member States' competent authorities;
- figure out and settle a configuration management process leaded by an *"EU Maritime Information Configuration Board"* with the participation of all EU involved agencies or Member States.

On the satellite area, it is recommended to improve and extend the capacities to share space information (images, AIS, etc.) of national dual systems to be able to share information between accredited institutional European users during joint security operations. For this goal, it is proposed to define an European common platform (adapted to the needs of the maritime surveillance users) which interfaces the existing national civil services and to upgrade the rules and agreements in force accordingly.

Partners to the project:

ELLAS

- Ministry of Citizen's Protection, Hellenic Coast Guard

ESPAÑA

- Ministerio de Asuntos Exteriores y de Cooperación, Secretaría de Estado para la UE, Dirección General de Coordinación de Políticas Comunes y Asuntos Generales UE
- Ministerio de Economía y Hacienda y Administratciones Públicas. A.E.A.T., Departamento de Aduanas e II.EE, Dirección Adjunta de Vigilancia Aduanera
- Ministerio de Defensa, Armada Española, Estado Mayor de la Armada
- Ministerio del Interior, Dirección General de la Guardia Civil
- Ministerio de Agricultura, Alimentación y Medio Ambiente, Secretaria General de Pesca, Dirección General de Recursos Pesqueros y Acuicultura
- Ministerio de Fomento, Dirección General de la Marina Mercante

FRANCE

- Secrétariat Général de la Mer
- Ministère de la Défense, état-major de la Marine
- Ministère de la Défense, direction générale de l'armement
- Ministère du Budget, des comptes publics et de la fonction publique, Direction générale des douanes et droits indirects
- Ministère de l'Ecologie, de l'énergie, du développement durable et de la mer, direction des affaires maritimes
- Ministère de l'Immigration, de l'intégration, de l'identité nationale et du développement solidaire
- Ministère de l'Intérieur, de l'outre-mer et des collectivités territoriales.
- Centre national d'études spatiales

ITALY

- Agenza Spaziale Italiana
- Ministero della Difesa, Stato Maggiore Difesa
- Ministero della Difesa, Stato Maggiore Marina
- Ministero dell'Interno, Direzione Antidroga
- Ministero dell'Interno, Direzione Immigrazione
- Ministero Infrastrutture e Trasporti, Comando Generale delle Capitanerie di Porto-Guardia Costiera
- Ministero Infrastrutture e Trasporti, Direzione Generale Trasporto Marittimo
- Ministero dell'Economia e delle Finanze, Comando Generale della Guardia di Finanza
- Ministero dell'Economia e delle Finanze, Agenzia delle Dogane, Ufficio Antifrode centrale
- Ministero dell'Ambiente e della Tutela del Territorio e del Mare Direzione Generale Protezione della Natura
- Ministero Politiche Agricole Alimentari e Forestali, Direzione Pesca Marittima e Acquacoltura

MALTA

- Office of the Prime Minister of Malta

PORTUGAL

- Direção-Geral de Política do Mar
- Marinha Portuguesa
- Força Aérea Portuguesa
- Guarda Nacional Republicana
- Serviço de Estrangeiros e Fronteiras
- Instituto Portuário e dos Transportes Marítimos
- Sistema de Segurança Interna
- Polícia Judiciária
- Direção-Geral da Autoridade Marítima
- Polícia Marítima
- Autoridade de Segurança Alimentar e Económica
- Autoridade Tributária e Aduaneira

Sailing Together

BluemassMed

BLUE MARITIME SURVEILLANCE SYSTEM MED

FIRST EUROPEAN PILOT PROJECT ON MARITIME SURVEILLANCE

GATHER

IMAGINE **SHARE**

PROVE **ANIMATE**

MERGE **LINK**

COOPERATE

Mission

Identify the obstacles and opportunities for the information sharing environment of the future

Key Figures

6 Nations
37 Administrations
24 months
6,4 millions Euros
252 experts involved

www.bluemassmed.net

This project is co-funded by the European Commission

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