



# Maritime spatial planning supported by infrastructure for spatial information in Europe (INSPIRE)

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## ABSTRACT

The implementation of Directive 2007/2/EC - INSPIRE can improve and actually strengthen the information management and data infrastructures needed for setting up Maritime Spatial Planning (MSP) processes. Evidence for this comes from three parallel analyses: links between the MSP Framework Directive and INSPIRE components and implementation; the availability of marine and maritime data through the INSPIRE Geo-Portal; and the adequacy of using an INSPIRE data model for mapping maritime spatial plans. The first item identifies INSPIRE as a relevant instrument not only for data collection, but additionally for increasing transparency of the MSP processes, using already operational national and European data infrastructure. The marine/maritime data availability analysis highlights a significant difference in data sharing within European marine regions. Finally, the INSPIRE data model is adequate for mapping maritime activities and for the integration of sea and land planning in an overview of cross-border planning for a given sea region.

Please check [Appendix 2](#) for definitions of the terminology used.

## 1. Introduction

Ancient sea maps have been traditionally populated by giant serpents and octopuses wrapped around ships, fierce-toothed animals clashing in the waves, deceptively beautiful mermaids and a variety of other chimeric beings.<sup>1</sup> European map makers used such monstrosities to enchant viewers, but also to educate them about the dangers of the marine environment, dangers that could obstruct maritime activities like shipping, fishing or traveling. Sea monsters were not just mere playful illustrations, they were symbols trying to describe the main traits of a bizarre territory, made of a treacherous liquid element, and difficult to chart because of its featureless, and yet dynamical, nature (Ellis, 1994).

Sea monsters started to disappear from maritime maps at the end of the 17th century. As European understanding of the oceans and navigation advanced, more emphasis was placed on the ability of people to

master the watery element, to sail on it and conduct trade on it. Illustrations still appeared on maps, but for more pragmatic reasons: drawings of ships indicated areas of safe passage, while whales or other creatures pointed to good fishing areas (Bagrow, 2010). Some of the mystery was now gone and the sea was becoming yet another cradle of natural resources, rather than a churning darkness to be feared. However, the sense of awe captured in the old maps lingers on, to this very day, as many dangers and obstacles to maritime endeavours are still with us.

Modern maps of marine regions are free of sea monsters, but do point to a set of problems which are difficult to solve. Today, the main obstacle to human activities at sea is primarily competition for maritime space. Moreover, an increasing hunger for the many resources still available in the sea is placing a heavy burden on the preservation of the marine ecological balance. A management effort is required (IOC, 2006; Ardron et al., 2008; Day, 2008; Douvère and Ehler, 2009; EC, 2010) to avoid potential conflicts and create synergies between different activities (Suarez de Vivero and Rodriguez Mateos, 2012; Brennan et al.,

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<sup>1</sup> See e.g. Olaus Magnus, *Carta marina et Descriptio septentrionalium terrarum ac mirabilium rerum in eis contentarum, diligentissime elaborata Annon Domini 1539 Veneciis liberalitate Reverendissimi Domini Ieronimi Quirini*, published in Venezia (Venice?), 1539.

2014), while at the same time maintaining the ecological resilience of marine complex environmental and social systems (Bigagli, 2015). In order to ease this problem, the concept of Maritime Spatial Planning (MSP) has emerged in recent years, with the aim of coordinating diverse sectors such as energy, transport, fisheries, aquaculture, tourism and environmental protection. MSP is seen as a process to dictate “... when and where human activities take place at sea” (Dubois et al., 2016; Pranzini et al., 2015) and to ensure that such activities are as efficient and sustainable as possible. Moreover, this process is supposed to involve all persons or groups that have an interest in it, i.e. the stakeholders, in a transparent way, as a public process of analysing and allocating spatial and temporal distribution of human activities in marine areas, in order to achieve economic, social and ecological objectives specified through a political process (Ehler and Douvère, 2009). In the last decade, MSP has gained considerable importance all over the world as a practical tool to avoid conflicts of use between sectors of human activity, and a way of balancing the objectives of environmental protection, economic growth, and social inclusiveness and justice (Ardron et al., 2008; Douvère and Ehler, 2009; Schaefer and Barale, 2011).

MSP made its official appearance on the European Union (EU) legal stage in July 2014, when the European Parliament and the Council adopted legislation to create a common framework for MSP in Europe, i.e. Directive 2014/89/EU (EU, 2014). According to the MSP Directive, each EU Member State (MS) will be free to plan its own maritime space, whereas regional planning in shared basins will have to be harmonised through a set of common requirements. The expected benefits of such a coordinated MSP approach, instilling predictability and transparency in the whole process, will be to reduce conflicts, to encourage investments, to increase cooperation between administrations in each country and between countries sharing the same basin and, ultimately, to help to protect the marine environment through the assessment of challenges and opportunities for multiple use of sea space.

The road to adopting the MSP Directive has been long and complex. Following the establishment of a European Commission (EC) Inter-Service Group on this topic, led by the EC Directorate General for Maritime Affairs and Fisheries (DG MARE), and the publication of a Roadmap on MSP (EC, 2008a), to achieve common principles in the EU, a series of four international stakeholders workshops was held in 2009 (Schaefer and Barale, 2011). This led to the release in 2010 of an EC Communication on MSP Achievements and Future Perspectives (EC, 2010) and to a Proposal for a Directive on MSP, combined with Integrated Coastal Management (ICM) elements<sup>2</sup> (EC, 2013b). This Proposal for a combined MSP and ICM Directive, which was accompanied by related documents on stakeholder consultation and impact assessment (EC, 2013c), later evolved into the 2014 Directive mentioned above, focusing only on a European MSP framework (as ICM issues were considered to be exclusively a national concern). Throughout the period during which MSP was maturing in the EU context, various pilot projects on maritime space mapping were conducted by individual EU Member States (MS) and/or sponsored by the EC as international co-operation initiatives (MESMA, 2009; Adriplan, 2012; BaltSeaPlan, 2012; Stelzenmüller et al., 2013; TPEA, 2014a,b).

A first strand of initiatives took place in the framework of the EU Strategy for the Baltic Region (EC, 2009; EC, 2009b; Bengtsson, 2009), where a coordinated and cooperative approach was implemented, based on transnational cooperation structures and a series of research projects (Zaucha, 2014b). The intergovernmental co-operation of 11 Baltic countries into a framework of “Vision and Strategies in Baltic Sea” (VASAB) initiated the process by issuing the so-called Wismar declaration in 2001 (VASAB, 2001), the first official document

identifying issues related to the transnational spatial planning in the Baltic Sea region (Zaucha, 2014a). Several pilot projects have since followed, contributing to the implementation of a joint MSP approach in an interlinked process. The BaltSeaPlan (2009–2012) and Plan Bothnia (2010–2012) projects implemented practical approaches to MSP in several pilot areas, testing the Intergovernmental Oceanographic Commission (IOC) practical guide to the planning process (Ehler and Douvère, 2009). As stated in the final reports of Plan Bothnia and BaltSeaPlan, a practical approach helped to understand the need to address the transnational data issue (Backer and Frias, 2013; Schultz-Zehden and Gee, 2013; Wichorowski et al., 2011; Zaucha, 2014a; Zaucha et al., 2016; Depellegrin, 2016).

Another example is the regional programme for Adriatic-Ionian maritime spatial PLANning (ADRIPLAN) (EC, 2012; Barbanti et al., 2015). ADRIPLAN aimed at delivering a commonly agreed approach to cross-border MSP. The main output of the project is a series of detailed recommendations on how to harmonise a MSP process that is customised on the Adriatic - Ionian Region characteristics and needs (Barbanti et al., 2015). This process is organised around the four main phases of the planning process (preparation phase, analysis and interpretation phase, planning phase & evaluation, monitoring and adaptive) and a short manual for MSP implementation in the Adriatic-Ionian Region.

In the context of the Atlantic Arc initiative, and following the (directions indicated by the) Atlantic Action Plan (EC, 2011a, 2011b; EC, 2013a), a pilot project was launched for the period 2012–14 in the Celtic Sea and Bay of Biscay, i.e. the “Transboundary Planning in the European Atlantic” (TPEA; TPEA, 2014a,b). The Objective of TPEA was to agree on common, cross-border maritime spatial planning (MSP) methods in the European Atlantic region, including directions for establishing legal certainty for investors and preventing sector conflicts for marine space.

Finally, in the Black Sea, a pilot project was initiated in 2015 (EC, 2007b; EC, 2015), supported by the Regional Strategy (European Parliament, 2011) with the aim of delivering a plan for the sustainable use of the maritime space between Bulgaria and Romania.

It has become clear, from the experience gained from pilot initiatives, that for MSP to succeed it is necessary to accommodate multiple uses in the marine area. Importantly, an effective plan must be based on data that are up-to-date, objective, reliable, relevant and easily compared. A major challenge in this task is to cover the great variety of stakeholders (ranging from scientists to institutional partners and to economic operators), where each uses different types of (spatial) data and information, which in turn are often described by heterogeneous metadata and managed by distinct workflows. For these reasons, data gathering is a fundamental and critical part of the MSP process. Marine and maritime data are available through international repositories and data initiatives – e.g. the European Atlas of the Seas (EC, 2013b; Barale et al., 2015), the European Environment Agency (EEA) databanks (EIONET, WISE, BISE etc.), the European Marine Observation and Data Network (EMODnet), regional sea conventions (OSPAR, HELCOM, Barcelona and Bucharest) and other national data infrastructures.

Once data are identified and gathered, harmonisation issues are likely to emerge (Fugazza et al., 2014). This is even more relevant where a diversity of national legal statuses coexist, particularly when transnational cooperation between neighbouring countries is weak and in the absence of established EEZ (Papageorgiou, 2016). In fact, data needed for the MSP process are diverse by definition, including different domains, geographical areas, spatial and temporal scales, quality and completeness of description, availability, and re-use potential. Further, data availability varies within the EU regions due to differences in applied data management around data infrastructures, documentation (specifications) and metadata catalogues.

Issues and needs related to harmonised data and metadata, available within standardised data flows (Barbanti et al., 2015) have been highlighted by most international pilot projects. These projects have

<sup>2</sup> ICM is a process for the management of the coastal zone using an integrated approach, including all environmental, economic and political aspects, in an attempt to achieve sustainability. The EC Proposal for a combined MSP and ICM Directive aimed at ensuring a holistic approach to managing the sea and its boundaries.

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